UNIVERSITY OF CALCUTTA

Notification No. CSR/ 100 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 24.09.2018 (vide Item No.20) approved some revisions in the existing Syllabus and Regulations of 2-year 4-Semester M.A. course in English under CBCS (as notified in Notification No.CSR/36/18 dated 13.08.2018), in the Post-Graduate Departments of the University and in the affiliated Colleges offering Post-Graduate Courses under this University, laid down in the accompanying pamphlet.

The above shall be effective from the academic session 2018-2019.

(Dr. Soumitra Sarkar)
Registrar (Officiating)

SENATE HOUSE
KOLKATA-700073
The 14th November, 2018

REVISED CSR FOR M.A. IN ENGLISH (UNDER CBCS), 2018

THE REGULATIONS FOR THE SEMESTERISED 'MASTER OF ARTS IN ENGLISH', A TWO-YEAR POSTGRADUATE DEGREE PROGRAMME (CHOICE BASED CREDIT SYSTEM) 2018, UNIVERSITY OF CALCUTTA

1. Title and Commencement

1.1 These Regulations shall be called **THE REGULATIONS FOR THE SEMESTERISED 'MASTER OF ARTS IN ENGLISH', A TWO-YEAR POSTGRADUATE DEGREE PROGRAMME (CHOICE BASED CREDIT SYSTEM) 2018, UNIVERSITY OF CALCUTTA.**

1.2 These regulations shall come into force with effect from the academic year 2018-2019.

1.3 These regulations will remain valid until further amendment by the concerned authorities.

2. Duration of the Programme

The 2-year 'Master of Arts in English' programme (under CBCS) shall be for a minimum duration **of four (04) consecutive semesters of six months each, i.e. two (02) academic years** and will start as notified by the university authority.

A candidate shall have to clear all the semesters within four years from the academic year of his/her first admission to the university failing which enrolment of the candidate shall stand cancelled.

3. Admission

The admission to the 'Master of Arts in English' Programme shall only be in the first semester, at the beginning of each academic year as per existing University of Calcutta regulations.

4. Attendance

4.1 A candidate attending at least 75% of the total number of classes* held shall be allowed to appear in the concerned Semester End Examinations subject to fulfilment of other conditions laid down in the regulations.

4.2 A candidate attending at least 60% but less than 75% of the total number of classes* held shall be allowed to appear in the concerned Semester End Examinations subject to the payment of prescribed condonation fees and fulfilment of other conditions laid down in the regulations.

4.3 A candidate attending less than 60% of the total number of classes* held shall not be allowed to appear in the concerned Semester End Examinations and he/she has to take admission to the same Semester in the immediately following academic year for attending the classes and appearing in the

said Semester End Examination. Such a candidate will not be allowed to continue in the next higher semester, if any.

* Such attendance will be calculated from the date of commencement of classes or the date of admission whichever is later.

5. Programme Structure

5.1 Postgraduate Degree Programme, namely 'Master of Arts in English' of the University of Calcutta consists of

1. Core Courses (CC)
2. Discipline Specific Elective (DSE) courses
3. Generic Elective (GE) Courses.

5.2 Core and Discipline Specific Elective courses carry 90% credit weightage, whereas Generic Elective courses carry 10% credit weightage.

5.3 Each course carries 50 marks/4credits. There will be 14 compulsory core courses. In addition, a student will have to mandatorily choose 4 DSE courses (one in Semester II, two in Semester III and one in Semester IV) out of 13 (DSE courses) and enrol on 2 GE courses (one in Semester III and the other one in Semester IV).

5.4 Each course shall have an alphanumeric code.

6. Course Structure for 'Master of Arts in English' under CBCS

Each course (except CC XIV and Language based courses – CC V, CC IX, DSE V and DSE X) will comprise two units. There will be a pool of texts / sub-units in the syllabus for each course (except CC XIV and Language based courses – CC V, CC IX, DSE V and DSE X) out of which three texts / sub-units will be taught per unit. Selection of texts may vary from one batch to another and will be announced at the beginning of each semester. There will be no unit divisions in language based four courses -- CC V, CC IX, DSE V and DSE X. All the components in CC V, CC IX, DSE V and DSE X may not be taught in a particular semester – the components to be taught in these four courses in any semester will be announced at the beginning of each semester.

The course structure will be as follows:

Year	Course	Details	Credits	Marks
YEAR ONE	**SEM-I**	Core Courses 1 to 5	4 Credits for each course	250

			Total 4x5 = 20 Credits	
	SEM-II	Core Courses 6 to 9 One DSE course from DSE 1 to DSE 3*	4 Credits for each course Total 4x5 = 20 Credits	Core Course 200 DSE 50
YEAR TWO	**SEM-III**	Core Courses 10 to 11 Two DSE courses from DSE 4 to DSE 8* One GE course	4 Credits each course Total 4x 5 = 20 Credits	Core Course 100 DSE 100 GE 50
	SEM-IV	Core Courses 12 to 14 One DSE course from DSE 9 to DSE 13* One GE course	4 Credits each course Total 4 x 5 =20 Credits	Core Course 150 DSE 50 GE 50
14 Core Courses, 4 Discipline Specific Elective Courses & 2 General Elective Courses			**Total 80 Credits**	**Total 1000 Marks**

* Not all DSE courses may be offered in a particular semester. The number of students to be enrolled for any DSE course may be regulated by the Department taking into consideration the resources available. The enrolment for the DSE courses shall be on a first come, first served basis, provided the student fulfils the relevant prerequisites for that course, if any. A minimum of five students need to enrol in a DSE course, otherwise the course will not be offered.

7. Question Pattern for Examinations

7.1 Each course will be evaluated through an **Internal Assessment (IA) of 10 marks** and a **Semester End Examination of 40 marks.**

7.2 In CC XIV (Course on Essay), students will have to write on an unseen topic (10 marks) out of 3 options in the Internal Assessment and one Essay (40 marks) out of a choice of 8 topics in the Semester End Examination.

7.3 In Semester End Examination, questions will be set only from the **three texts / sub-units** taught per unit in all papers, except CC V, CC IX, CCXIV, DSE V and DSE IX. Semester End Examination will have the question pattern of **15 + 5 per unit** – students will have to write **one question of 15 marks** and **one short question of 5 marks** from each unit in all CCs (except CC V, CC IX and CCXIV) and DSE courses (except DSE V and DSE IX). In these courses, only one 15 marks question and one 5 marks question will be set from each text/sub unit in the Semester End Examination.

7.4 In GE courses, students will have to answer **one question** of **20 marks from each unit** in Semester End Examination**. Only one 20 marks question** will be set from each text/sub unit in the Semester End Examination for GE papers.

7.5 No student may write more than one answer from the same text / sub-unit in the Semester End Examination in all courses except CC V, CC IX, DSE V and DSE X.

7.6 The pattern of setting of questions and the related marks division in both Internal Assessment (10 marks) and Semester End Examination (40marks) in CC V, CC IX, DSE V and DSE X will be **flexible**.

8. EXAMINATION

8.1 The 2-year 'Master of Arts in English' Programme under CBCS shall consist of four (04) consecutive semesters (Semester - I, Semester – II, Semester – III and Semester – IV).

8.2 All courses / papers in the 'Master of Arts in English' Programme shall be evaluated through an **Internal Assessment Examination** (10 marks) and a **Semester End Examination** (40 marks)**.** Each course carries 50 marks/4credits**. Both the Internal Assessment and the Semester End Examination are equally obligatory for all candidates**. **An examination shall be held always under the current syllabus**.

8.3 Semester End Examinations are to be held ordinarily at the end the concerned semester.

8.4 If a candidate fails to secure pass marks in one or more papers in 3rd and / or 4th End-Semester examinations, he/she may appear in the supplementary examinations to be held after 3 months of the publication of results of 4th semester examination.

8.5 Non-appearance (absence) in any examination for any reason shall be counted as a chance. Failure to fill up the examination form shall also be considered as a missing chance.

8.6 A failed candidate, intending to re-appear in a subsequent semester examination has to submit examination form / application to the Controller of Examinations through the Head of the Department (Principal for affiliated colleges) as per the notice to be issued by the department of Controller of examinations.

The candidate has to clear the entire course within 4 years from the year of first admission in that course.

8.7 A candidate pursuing 'Masters of Arts in English' Programme has to score a minimum of 40% marks (including Internal Assessment) in each course / paper in order to earn the corresponding credit for the concerned course / paper and a minimum of 40% marks in aggregate taking into

consideration all the courses / papers of all semesters as a whole, i.e. CC, DSE & GE courses / papers, in order to get the Postgraduate Degree.

8.8 A candidate may appear in any higher Semester End examination(s) without appearing in lower Semester End Examination(s) subject to Clause **4.3**.

8.9 Internal Assessment has to be done in the semester in which a candidate becomes eligible to appear in the concerned end semester examination. The candidates remaining absent in the Internal Assessment will be awarded zero (0) marks in the Internal Assessment. Marks obtained in the Internal Assessment shall be retained for the entire duration of his/her enrolment.

8.10 A candidate who is eligible to appear in any of the Semester End Examinations does not enrol or does not appear in the examinations or fails to secure pass marks at the concerned examinations as stated in clause 8.7 above, will be allowed to attend the classes in the next higher semester, as applicable.

8.11 Modalities of Internal Assessment will be decided by the PGBOS.

8.12 All paper setters, examiners, scrutineers, re-examiners and members of the Board of Moderators for each Semester End Examination will be appointed by the University Authorities on the recommendations of the Postgraduate Board of Studies (PGBOS) in English as per University of Calcutta regulations.

9. Re-Examination

9.1 A candidate will be eligible to re-examine his/her script if he/she appears in the concerned Semester End Examination as a whole.

9.2 A candidate shall be allowed to apply for re-examination, within fifteen days from the publication of results, of not more than two (02) courses/ papers in each semester, provided that he/she has scored qualifying marks , i.e. 40% in the remaining courses/papers of that semester. **Re-examination of the Internal Assessment part in any course is not allowed under any circumstances.**

9.3 In re-examination of courses/papers for any Semester End Examination of two-year 'Master of Arts in English' Programme, the marks awarded by the re-examiner in a course / paper will be taken as the marks obtained by the candidate in that paper. If on re-examination of a course/paper , the marks get enhanced by more than **15%** or get reduced by more than **5%** than that awarded by the original examiner (the percentage is to be calculated on the basis of the full marks in that paper), the

script of the paper shall be referred to a third examiner. Among the marks awarded by three examiners, i.e. the original examiner, the second examiner (re-examiner) and the third re-examiner, the average of the closer two marks will be awarded, provided that such a final award does not result in lowering of the class or status obtained by the candidate prior to the re-examination in which case(s) the original award be retained.

10. Cancellation of Examination(s)

A candidate may apply for cancellation of enrolment of the concerned Semester End Examination within fifteen days from the date of completion of the said examination.

11. Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA)

11.1 Point Grade System shall be followed for the purpose of Grade Point Calculation as per University of Calcutta regulations.

11.2 Semester Grade Point Average (SGPA) of a particular semester shall be calculated as per University of Calcutta regulations.

11.3 Cumulative Grade Point Average (CGPA) over all the four semesters shall be calculated as per University of Calcutta regulations.

11.4 The final mark sheet, on completion of Four Semesters, shall include the SGPA of Four Semesters, CGPA, Letter Grade, the marks obtained, total marks and the credit earned.

12. Degree

If a candidate pursuing 'Master of Arts in English' Programmes clears all the papers and secures 40% and above marks in aggregate of all semesters (in terms of clause **8.8)** will be declared obtaining '**Master of Arts in English**' Degree with his/her CGPA and the corresponding Letter Grade.

CBCS SYLLABUS

M.A. IN ENGLISH

UNIVERSITY OF CALCUTTA

The Department of English Language and Literature, University of Calcutta, follows a specific vision. Along with academic excellence, the Department believes in imparting to the learners a training that would enable them to become responsible, perceptive and functional citizens who will contribute to the well-being of their society and their nation. The present course is thus designed to nurture a critical and historical awareness that can only be attained through a thorough understanding of the texts and concepts included. The curriculum aims to create a balance between texts and textuality, socio-cultural and linguistic theory, language studies and profession-oriented training. It is created with an intention to equip the learners not only with ideas he/she needs to understand the key periods in the history of English Literature but also the global events and concepts that influence and mould them. Literature and language are intricately intertwined, this course believes that a greater comprehension of language and its development will create a greater depth in perception and appreciation of literature, culture and human progress. Although the aim of this course is to make the learners ready for employment, it will also ensure that any learner who is trained through this course should have the skill to confidently engage in further research in varied disciplines such as literature, language, English Language Teaching (ELT), culture or political studies, to name a few.

COURSE DETAILS:

	Course (Semester – Sem)	**Details (Core Course – CC, Discipline Sepcific Elective Course – DSE*, Generic Elective Course – GE)**	**Credits**	**Marks**
YEAR ONE	**SEM-I**	CC I: British Literature from Geoffrey Chaucer to the Beginning of English Civil War CC II: Elizabethan and Jacobean Drama CC III: British Literature from the English Civil War to the French Revolution CC IV: British Literature from the French Revolution to the End of the Victorian Age CC V: Introduction to Linguistics and Structure of Modern English	4 Credits each course Total (4 x 5 =) 20 Credits	CC 250

	SEM-II	CC VI: British Literature from the End of the Victorian Age to 1945 – Poetry and Novel CC VII: British Literature from the End of the Victorian Age to 1945 – Drama, Short Fiction and Non-Fiction CC VIII: British Literature from 1946 to the Present – Poetry and Novel CC IX: English Language Teaching I DSE (***any one*** from the following) • DSE I: Ancient European Literature • DSE II: Nineteenth Century American Literature • DSE III: Indian Literature I	4 Credits each course (4 x 5 =) Total 20 Credits	CC 200 DSE 50
YEAR TWO	**SEM-III**	CC X: British Literature from 1946 to the Present – Drama, Non-Fiction and Short Fiction CC XI: Literary Criticism I DSE (***any two*** from the following) • DSE IV: Modern European Literature • DSE V: Sociolinguistics, Phonetics and Phonology • DSE VI: Indian Literature II • DSE VII: Colonialism and Postcolonialism • DSE VIII: American Literature of the Twentieth Century GE I: Film and Literature	4 Credits each course (4 x 5 =) Total 20 Credits	CC 100 DSE 100 GE 50
	SEM-IV	CC XII: Literary Criticism II CC XIII: Literary Theory CC XIV: Essay DSE (***any one*** from the following) • DSE IX: New Literatures • DSE X: English Language Teaching II • DSE XI: Gender and Literature • DSE XII: Modernism and Postmodernism • DSE XIII: Popular Culture GE II: Children's Literature	4 Credits each course (4 x 5 =) Total 20 Credits	CC 150 DSE 50 GE 50
14 Core Courses, 4 Discipline Specific Elective Courses & 2 Generic Elective Courses			**Total 80 Credits**	**Total 1000 Marks**

Each course (except CC XIV and Language based courses – CC V, CC IX, DSE V and DSE X) will comprise two units. There will be a pool of texts / sub-units in the syllabus for each course (except CC XIV and Language based courses – CC V, CC IX, DSE V and DSE X) out of which three texts / sub-units will be taught per unit. Selection of texts may vary from one batch to another and will be announced at the beginning of each semester. There will be no unit divisions in language based four courses -- CC V, CC IX, DSE V and DSE X. All the components in CC V, CC IX, DSE V and DSE X may not be taught in a particular semester – the components to be taught in these four courses in any semester will be announced at the beginning of each semester.

* Not all DSE courses may be offered in a particular semester. The number of students to be enrolled for any DSE course may be regulated by the Department taking into consideration the resources available. The enrolment for the DSE courses shall be on a first come, first served basis, provided the student fulfils the relevant prerequisites for that course, if any. A minimum of five students need to enrol in a DSE course, otherwise the course will not be offered.

QUESTION PATTERN FOR SEMESTER END EXAMINATION

- Each course will be evaluated through an **Internal Assessment (IA) of 10 marks** and a **Semester End Examination of 40 marks.**
- In CC XIV (Course on Essay), students will have to write on an unseen topic (10 marks) out of 3 options in the Internal Assessment and one Essay (40 marks) out of a choice of 8 topics in the Semester End Examination.
- In Semester End Examination, questions will be set only from the **three texts / sub-units** taught per unit in all papers, except CC V, CC IX, CCXIV, DSE V and DSE IX. Semester End Examination will have the question pattern of **15 + 5 per unit** – students will have to write **one question of 15 marks** and **one short question of 5 marks** from each unit in all CCs (except CC V, CC IX and CCXIV) and DSE courses (except DSE V and DSE IX). In these courses, only one 15 marks question and one 5 marks question will be set from each text/sub unit in the Semester End Examination.
- In GE courses, students will have to answer **one question** of **20 marks from each unit** in Semester End Examination**. Only one 20 marks question** will be set from each text/sub unit in the Semester End Examination for GE papers.
- **No student may write more than one answer from the same text / sub-unit** in the Semester End Examination in all courses except CC V, CC IX, DSE V and DSE X.

- The pattern of setting of questions and the related marks division in both Internal Assessment (10 marks) and Semester End Examination (40marks) in CC V, CC IX, DSE V and DSE X will be **flexible**.

DETAILED SYLLABUS

SEMESTER I

CORE COURSE I

British Literature from Geoffrey Chaucer to the Beginning of English Civil war

Course Objectives: The course attempts to trace the trajectory of modernity in England as implied by the writings of the late mediaeval period. Such modernity, coupled with the discourse of Humanism which settles much later in England compared to the rest of the continental Europe, defines the spirit of the age. The genre, the style and the technique of the larger body of literature of the early modern era, being informed by the thoughts of the classical world, would continue to shape the future course of literature and culture in England vis-à-vis the world. How such ramification takes place is suggested by a section of the components of the course that points to the colonial enterprise of the nation amenable to the discovery of the 'new' lands. The course is designed to facilitate the learners to understand the politics of the white, masculine self reflected in the texts included in the course.

Unit I (Poetry and Drama) [25 Marks]

1. Geoffrey Chaucer – *The General Prologue, The Nun's Priest's Tale, The Knight's Tale*
2. *Sir Gawain and the Green Knight*
3. William Langland - *The Vision of Piers Plowman*
    a. The Prologue ['The Field of Folk']
    b. Passus 1 ['The Treasure of Truth']
    c. Passus 5 ['Piers Plowman Shows the Way to Saint Truth']
    d. Passus 6 ['The Plowing of Piers's Half-Acre']
    e. Passus 7 ['Piers Tears Truth's Pardon']
    f. Passus 18 ['The Crucifixion and Harrowing of Hell']
4. *Everyman*
5. Edmund Spenser – *The Faerie Queene* , Book I
6. Sonnets:
    a. Thomas Wyatt – 'My galley charged with forgetfulness'
    b. Earl of Surrey – 'The soote season'
    c. Philip Sidney – *Astrophel and Stella* 1 and 39
    d. Samuel Daniel – 'Care charmer sleep, son of the sable Night'
    e. Michael Drayton – 'Since there's no help'

7. Shakespearean Sonnets: 23, 65, 73, 106, 127, 147
8. Metaphysical Poems:
    a. John Donne – 'The Canonization', 'The Extasie', 'The Sunne Rising'
    b. George Herbert – 'The Collar'
    c. Andrew Marvell – 'On a Drop of Dew', 'The Garden'
    d. Henry Vaughan – 'Regeneration'

<u>Unit II (Prose)</u> [25 Marks]

1. Thomas More – *Utopia* / *History of King Richard III*
2. Robert Fabyan - *The New Chronicles of England and of France*
    'The Sixth Part: Alfred'
    'The Seventh Part: William the Conqueror'
    'Of King Henry the Seventh'
3. Thomas Malory – *Morte d'Arthur* / Anonymous – *Reynard the Fox*
4. John Lyly – *Eupheus*
5. Thomas Nashe – *The Unfortunate Traveler*/ Robert Greene – Selections from his *Pamphlets*
6. Francis Bacon –Essays (selections)
7. Robert Burton – *Anatomy of Melancholy* (selections)
8. John Milton – *Essays* (selections) / Thomas Hobbes – *Leviathan* (selections)

Suggested Further Reading:

Hirsh, John C. *Chaucer and the Canterbury Tales: A Short Introduction.* New York: Blackwell Publisher, 2007. Print.

Pugh, Tison. *An Introduction to Geoffrey Chaucer*. Chicago: University Press of Florida, 2007. Print.

Brown, Peter, ed. *A Companion to Chaucer*. London*:* Blackwell Publisher, 2004. Print.

Duncan, Thomas G. *A Companion to the Middle English Lyric*. London: Blackwell Publisher, 1997. Print.

Reisman, Rosemary M. *British Renaissance Poets*. London: Canfield Salem Press Inc, 2003. Print.

Rhodes, Neil. *English Renaissance Prose: history, language, and politics*. London: Medieval and Renaissance Texts and Studies, 1887. Print.

Gregerson, Linda. *The Reformation of the Subject: Spenser, Milton and the Protestant Epic*. London: Cambridge University Press, 2001. Print.

Hattaway, Michael. *A Companion to English Renaissance Literature and Culture*. London: Blackwell Publisher, 2007. Print.

Callaghan, Dympna. *Shakespeare's Sonnets.* London: Blackwell Publisher, 2000. Print.

Hamilton, Donna B, ed. *A Concise Companion to English Renaissance Literature.* London: Blackwell Publisher, 2006. Print.
Clements, Arthur L. *Poetry of Contemplation: John Donne, George Herbert, Henry Vaughan, and the Modern Period*, New York: State University of New York Press, 1994. Print.

CORE COURSE II

Elizabethan and Jacobean Drama

Course Objectives: The paper is divided into Unit I, comprised of any three Shakespearean plays, and Unit II, comprised of any three non-Shakespearean plays, with the general objective of familiarizing students with the rich dramatic history of the age. Needless to say, certain plays are natural conglomerates, certain plays are seminal to our understanding of the popularity of Renaissance drama across time and space. The shifting trends of staging and criticism sometimes play a role in the choice of play texts but our objective is also to make our students aware of the history of transmission of these texts as well as performance history.

Our Department had legendary teachers of Renaissance drama in the past, no doubt reflecting the strong tradition of Shakespearean studies in Bengal. Another objective of the course is to incorporate the study of landmark productions, especially local adaptations. The plays call for student performances, being of the nature of plays-in-performance.

The broad objectives are

- Textual explication: details of Elizabethan language like word usage, wordplay and punning, image clusters, motifs and themes
- Reading in context of the socio-cultural background and the intellectual and artistic milieu
- Readings incorporating the critical approaches necessitated by the chosen play
- Studying the stage and film history

Unit I (William Shakespeare) [25 Marks]

1. *A Midsummer Night's Dream*
2. *Richard III*
3. *Hamlet*
4. *Othello*
5. *Antony and Cleopatra*
6. *King Lear*
7. *The Winter's Tale*
8. *The Tempest*

Unit II (Renaissance Drama other than Shakespeare) [25 Marks]

1. Thomas Kyd – *The Spanish Tragedy*
2. Christopher Marlowe – *Doctor Faustus*
3. Ben Jonson – *Volpone*
4. Thomas Middleton and William Rowley – *The Changeling*
5. John Marston – *The Malcontent*
6. Thomas Dekker – *The Shoemaker's Holiday*
7. Philip Massinger – *A New Way to Pay Old Debts*
8. Cyril Tourneur – *The Revenger's Tragedy*

Suggested Further Reading:

Adelman, Janet. *Suffocating Mothers: Fantasies of Maternal Origin in Shakespeare's Plays, Hamlet to The Tempest.* Routledge, 1991. Print.

Barber, Cesar Lombardi. L. *Shakespeare's Festive Comedy*. Princeton University Press, 1959. Print.

Belsey, Catherine. *The Subject of Tragedy*. Routledge, 1985. Print.

Bradbrook, M.C. *Themes and Conventions of Elizabethan Tragedy*. Cambridge U. P, 1980. Print

_____. *The Growth and Structure of Elizabethan Comedy*. Chatto & Windus, 1973. Print.

Bradley, A C. *Shakespearean Tragedy*. Macmillan, 1992. Print.

Braunmuller, A.R. and Michael Hattaway, ed. *The Cambridge Companion to English Renaissance Drama*. Cambridge UP, 2003. Print.

Dollimore, Jonathan. *Radical Tragedy*. Palgrave Macmillan, 2010. Print.

Dollimore, Jonathan and Sinfield, Alan, ed. *Political Shakespeare: Essays in Cultural Materialism*. Manchester UP, 1994. Print.

Drakakis, John, ed *Alternative Shakespeares*. Routledge, 2002. Print.

Greenblatt, Stephen. *Marvelous Possessions: The Wonder of the New World*. University of Chicago Press, 1991. Print.

Jardine, Lisa. *Still Harping On Daughters*. Harvester Press, 1983. Print.

Kott, Jan. *Shakespeare Our Contemporary*. W.W. Norton, 1974. Print.

Loomba, Ania and Orkin, Martin ed. *Postcolonial Shakespeares*. Routledge, 1998. Print.

Spurgeon, Caroline. *Shakespeare's Imagery and What It Tells Us*. Cambridge UP, 1935. Print.

` **CORE COURSE III**

British Literature from the English Civil War to the French Revolution

Course Objectives: This course on Neoclassical British literature attempts to bring into the fore 'the dialectic of enlightenment'. The texts of this course as products of the changing pattern of history

from Revolution in England in mid seventeenth century to that in late eighteenth century France broadly comment upon the ushering in of a different kind of modernity in Europe availed through social, political and cultural changes. They also show how the literary/cultural milieu shifts from embracing the empiricist assumptions to adopting the modes of idealism as apparently two contradictory facets of enlightenment. The emergence of the middle class, an issue gradually developing since the English Revolution, in the public sphere of the English life is marked by the components of this course.

Unit I (Poetry and Drama) [25 Marks]

1. John Milton – *Paradise Lost* Books IV and IX / *Samson Agonistes*
2. John Dryden – *Absalom and Achitophel*
3. Alexander Pope – *Epistle to Dr. Arbuthnot*
4. William Blake – *Songs of Innocence and Experience*
5. William Wycherley – *The Country Wife* / George Etherege – *The Man of Mode*
6. John Dryden – *All for Love*
7. John Gay – *The Beggar's Opera*
8. Oliver Goldsmith – *She Stoops to Conquer*

Unit II (Prose) [25 Marks]

1. Daniel Defoe – *Moll Flanders*
2. Jonathan Swift – *Gulliver's Travels*
3. Lawrence Sterne – *Tristram Shandy*
4. Henry Fielding – *Tom Jones*
5. Samuel Johnson – Selections from *Lives of Poets* / Selections from Periodical Essays
6. Frances Burney – *Evelina*
7. John Evelyn – *Diary* and Samuel Pepys – *Diary*
8. Matthew Gregory Lewis – *The Monk*

Suggested Further Reading:

Fisk, Deborah Payne. *The Cambridge Companion to English Restoration Theatre*. London: Cambridge University Press, 2003. Print.

Barnard, John. *The Critical Heritage (The Collected Critical Heritage: the Restoration and the Augustan*, New York: Routledge Publication, 2004. Print.

Hill, Christopher. *Milton and the English Revolution.* London: Oxford University Press, 1988. Print.

McKeon, Michael. *The Origins of English Novels, 1600-1740*. Cape Town: Baltimore Press, 1978. Print.

Anderson, James Winn. *John Dryden and His World*. London: Yale University Press, 1975. Print.
McMurran, Mary Helen. *The Spread of Novels: Prose Fiction in the Eighteenth Century*. London: Princeton University Press, 1983. Print.
Bevis, Richard. *English Drama: Restoration and Eighteenth Century*. Chicago: Routledge Publications, 1989. Print.
Brooks, Cleanth. *Historical Evidence and the Reading of Seventeenth Century Poetry*. London: University of Missouri Press, 1972. Print.
Kilgour, Maggie. *The Rise of Gothic Novel*.London: Routledge Publication, 1885. Print.
Ackroyd, Peter. *Blake*. Manchester: Vintage Books, 1997. Print.

CORE COURSE IV

British Literature from the French Revolution to the End of the Victorian Age

Course Objectives: The change in the spirit of literature and culture of Eurpoe/England initiated by the French Revolution and the Industrial Revolution is reflected upon the texts offered in this course. A shift in the philosophical understanding, a shift from the empirical to the idealist is discernible in the literary texts offered in this course. But since the nineteenth century British literaute is not a not a smooth and monolithic progeess, the texts of this course, written after 1837, signal the dilemma, debates and anxiety of the nation vis-a-vis the empire. The learners are expected to uncover the concerned social, cultural and political agenda hidden in the literature of the period.

Unit I (Poetry) [25 Marks]

1. William Wordsworth – *The Prelude*, Books- I & XIII (1805 version)
2. Samuel Taylor Coleridge – *Christabel*, 'Rime of the Ancient Mariner', 'Dejection: an Ode', 'Frost at Midnight'
3. John Keats – *The Eve of St. Agnes*, *Hyperion*, *Lamia*, 'Ode on a Grecian Urn', 'Ode to Psyche'
4. Percy Bysshe Shelley – *Prometheus Unbound*
5. Alfred Tennyson – *In Memoriam* (Selections)
6. Robert Browning – 'Childe Roland', 'Fra Lippo Lippi', 'Andrea Del Sarto', 'The Bishop Orders his tomb At St. Praxed's Church', 'Caliban upon Setebos', 'Prospice'
7. Mathew Arnold – 'Requiescat', 'The Scholar Gypsy', 'Thyrsis', 'The Forsaken Merman'

8. Gerard Manly Hopkins – 'The Windhover', 'Felix Randal', 'Pied Beauty', 'Thou Art Indeed Just Lord', 'As Kingfishers Catch Fire'

<u>Unit II (Prose)</u> [25 Marks]

1. Jane Austen – *Mansfield Park*
2. William Hazlitt – 'On Gusto', 'On Nick Names', 'On a Sun Dial', 'My First Acquaintance with Poets'
3. Elizabeth Gaskell – *Mary Barton* / Dickens – *Dombey and Son*
4. Thomas Hardy – *Tess of the D'Urbervilles*
5. Walter Makepeace Thackeray – *Vanity Fair*
6. George Eliot – *Middlemarch*
7. Thomas Carlyle – *On Heroes and Hero Worship* (Selections)
8. Matthew Arnold – *Culture and Anarchy* / Walter Pater – *Appreciations* (Selections)

Suggested Further Reading:

Abrams, M. H. *The Mirror and the Lamp*. New York: Oxford University Press, 1953. Print.

Bloom, Harold. *The Visionary Company*. Ithaca: Cornell University Press, 1971. Print.

Maxwell, Richard, and Katie Trumpener. *The Cambridge Companion to Fiction in the Romantic Period*. Cambridge, UK: Cambridge University Press, 2008. Print.

Mellor, Anne Kostelanetz. *Romanticism and Gender*. New York: Routledge, 1993. Print.

Wright, Raymond. *Prose of the Romantic Period, 1780-1830*. Harmondsworth: Penguin Books, 1956. Print.

Wu, Duncan. *A Companion to Romanticism*. Oxford, UK: Blackwell Publishers, 1998. Print.

Amigoni, David. *Victorian Literature*. Edinburgh: Edinburgh University Press, 2011. Print.

Christ, Carol T, and John O Jordan. *Victorian Literature and the Victorian Visual Imagination*. Berkeley: University of California Press, 1995. Print.

Kaplan, Cora. *Victoriana: Histories, Fiction, Criticism*. Edinburgh: Edinburgh University Press, 2007. Print.

Mazzeno, Laurence W. *Twenty-First Century Perspectives on Victorian Literature*. Maryland: Rowman & Littlefield, 2014. Print.

Slinn, E. Warwick. *Victorian Poetry as Cultural Critique: The Politics of Performative Language*. Charlottesville: University of Virginia Press, 2003. Print.

CORE COURSE V

Introduction to Linguistics and Structure of Modern English

Course Objectives:

- To introduce learners to the basic concepts and issues of linguistics
- To provide learners an insight into the structure and the usage of modern English
- To enable learners to evaluate and analyse the structures of different grammatical constituents of English

1. **Introduction to Linguistics**
    a. Definition and scope of Linguistics; Language – features & functions; Human language and animal communication; Assumptions of modern Linguistics, Levels of Linguistic Analysis
    b. Introduction to various schools of Linguistics – Traditional, Structural & Transformational Generative
2. **Structure of Modern English**
    a. Morphology – definition and scope; Types of morphemes; Morphological processes; Morphs and allomorphs; Morphological analysis; Morphological and morphophonemic rules; Feature percolation conventions
    b. Syntax – definition and scope, Structure of Noun Phrase, Prepositional Phrase, Verb Phrase, Adjective Phrase & Adverb Phrase; Clause – classification, structure and function; Focus; IC analysis; PS rules; TG Grammar – surface and deep structure interrelations
3. **Semantics**
    a. Definition and scope; Semantic features; Semantic roles; Lexical relations; Theories of Semantics

Suggested Reading:

Akmajian, Andrian, et al. Linguistics -- *An Introduction to Language and Communication*. New Delhi: Prentice-Hall of India, 1996. Print.

Baker, C.L. *English Syntax*. Cambridge, MA: MIT Press, 1995. Print.

Crystal,David. *Linguistics*. Harmondsworth: Penguin, 1978. Print.

____ . *What is Linguistics?* London: Edward Arnold, 1985. Print.

Gleason, Henry Alan. *An Introduction to Descriptive Linguistics.* New Delhi: Oxford and IBH, 1970. Print.

Hockett, Charles Francis. *A Course in Modern Linguistics*. New Delhi: Oxford and IBH, 1970. Print.

Huddleson, Rodney. *An Introduction to English Transformational Syntax*. London: Longman, 1976. Print.
Lieber, Rochelle. *Introducing Morphology*. Cambridge: Cambridge University Press, 2015. Print.
Lyons, John. *Language and Linguistics*. Cambridge: Cambridge University Press, 1981. Print.
O'Grady, William, Michael Dobrovolsky and Mark Aronoff. *Contemporary Linguistics: An Introduction*. New York: St. Martin's Press, 1991. Print.
Palmer,Frank. *Grammar*. London: Longman and ELBS, 1985. Print.
Quirk, Randolph, et al. *A Comprehensive Grammar of English*. London: Longman, 1982. Print.
Radford, Andrew. *English Syntax: An Introduction*. Cambridge: Cambridge University Press, 2004. Print.
Verma, S.K. and Krishnaswamy, N. *Modern Linguistics – An Introduction*. New Delhi: Oxford University Press, 1989. Print.
Yule, George. *The Study of Language*. Cambridge: Cambridge University Press, 1997. Print.

SEMESTER II

CORE COURSE VI

British Literature from End of the Victorian Age to 1945 – Poetry and Novel

Course Objectives: While one streak of the Modernist literature was critically engaged in exploring the interiority of human psyche, perhaps influenced by Freud and Bergson, the other streak was equally concerned with projecting the social upheavals amenable to the first World War. The mechanism of the bourgeois ideology fostered by the realist representation of time and space is challenged by the content, style and technique of the texts written in this period. As conflicting social issues and agenda conglomerate in the discourse of literature, the learners are expected to 'appreciate' the texts offered in this course from their understading of the history of the era.

Unit I (Poetry) [25 Marks]

1. W.B. Yeats – 'Byzantium', 'Sailing to Byzantium', ' The Circus Animals' Desertion', 'Lapis Lazuli', 'An Acre of Grass', 'Easter 1916'
2. Thomas Hardy – 'The Tramp Woman's Tragedy', 'Logs on the Hearth', 'Men who March Away', 'The Bird-Catcher's Boy', 'The Dead and the Living One'
3. D. H. Lawrence – 'Sorrow' 'Green', 'Snake', 'Piano' 'Autumn Rain', 'New Heaven and Earth'
4. T.S Eliot – *The Waste Land* / *Four Quartets* / 'Ash Wednesday', 'The Journey of the Magi', 'Marina', 'A Song of Simeon'

5. Ezra Pound – *Hugh Selwyn Mauberley* / 'The Seafarer', 'Medallion', 'Portrait d'unne Femme' / Canto I (from *The Cantos*)
6. W.H. Auden – 'Shield of Achilles', 'Stop all the Clocks', 'Musee de Beaux Arts', 'Refugee Blues', 'September 1, 1939'
7. Louis MacNeice – 'The Streets of Laredo', 'Bagpipe Music', 'Prayer Before Birth', 'The Sunlight on the Garden', 'Obituary'
8. Dylan Thomas – 'A Refusal to Mourn the Death, by Fire, of a Child in London', 'Do not go Gentle into that Good Night', 'Shiloh's Seed', 'Poem in October', 'Fern Hill'

Unit II (Novel) [25 Marks]

1. James Joyce – *A Portrait of the Artist as a Young Man* / *Ulysses*
2. Virginia Woolf – *To the Lighthouse*
3. Joseph Conrad – *Nostromo*
4. D.H. Lawrence – *The Rainbow*
5. Graham Greene – *Brighton Rock*
6. Aldous Huxley – *Brave New World*
7. E.M. Forster – *A Passage to India*
8. Evelyn Waugh – *Brideshead Revisited*

Suggested Further Reading

Kermode, Frank. *Continuities,Modern Essays.* London: Routledge, 2014. Print.

Morris, John Anthony. *Writers and Politics in Modern Britain (1880-1950).* London: Hodder and Sloughton, 1977. Print.

Leavis, Frank Raymond. *New Bearings in English Poetry*. London: Penguin, 1972. Print.

Lodge, David. *The Language of Fiction.* London: Routledge, 2002. Print.

Kaplan, Sydney Janet. *Feminine Consciousness in the Modern British Novel*. Chicago: University of Illinois Press, 1975. Print.

Bradbury, Malcolm and McFarlane, James. ed. *Modernism.* London: Penguin, 1991. Print.

CORE COURSE VII

British Literature from End of the Victorian Age to 1945 – Drama, Short Fiction and Non-Fiction

Course Objectives: This course is a continuation of Core Course VI. The plays included in this course signal the variety in form and content that the Engish stage was experiencing in the first half of the twentieth century. The variety ranges from the Irish agenda to the representation of English history and religion articulated through poetic effusions. The course emphasises the genre of the short

story which as an emerging phenomenon is concerned with the 'small experiences' no less significant to contribute to the making of the modernist sensibilities.

Unit I (Drama) [25 Marks]

1. J.M. Synge – *Playboy of the Western World / Deirdre of the Sorrows*
2. W. B. Yeats – *Purgatory*
3. John Galsworthy – *Strife*
4. James Barrie – *The Old Lady shows her Medal*
5. George Bernard Shaw – *Man and Superman / Back to Methuselah*
6. Sean O'Casey – *The Silver Tassle*
7. T.S. Eliot – *Murder in the Cathedral*
8. Noël Coward – *Blithe Spirit*

Unit II (Short Fiction and Non-Fiction) [25 Marks]

1. D.H. Lawrence – Short Stories: 'Odour of Chrysanthemums', 'The Man Who Died', 'The Rocking-Hose Winner', 'The Captain's Doll', 'Tickets Please'
2. W. Somerset Maugham – Short stories: 'The Verger', 'The Vessel of Wrath', 'Lord Mountdrago', 'The Colonel's Lady', 'The Treasure', 'Rain'
3. Katherine Mansfield – Short stories: 'The Garden Party', 'The Canary', 'The Daughters of the Late Colonel', 'At the Bay', 'Bliss', 'Prelude'
4. George Orwell – Short stories: 'The Spike', 'A Hanging', 'Freedom of the Park', 'Nonsense Poetry', 'Poetry and the Microphone', 'You and the Atomic Bomb'
5. James Joyce – *Dubliners*: 'The Sisters', 'An Encounter', 'Eveline', 'The Boarding House', 'Grace', 'The Dead'
6. T.S. Eliot – 'Tradition and Individual Talent', 'Baudelaire', 'What is a Classic?', 'The Frontiers of Criticism', 'The Social Function of Poetry'
7. Ezra Pound – *Literary Essays* / F. R. Leavis - *Revaluation*
8. Bertrand Russell – 'Problems of the Future', 'The World as it could be made' (*Roads to Freedom*), 'The Liberation of Women' (*Marriage and Morals*), 'Fear of Public Opinion' (*Conquest of Happiness*), 'Truth and Falsehood' (*Basic Writings of Bertrand Russell*), 'The Impulse to Power' (*Power: A Social Analysis*) / Aldous Huxley – 'Wordsworth in the Tropics', 'Fashions in Love', 'Vulgarity in Literature', 'Politics and Religion', 'Tragedy and the Whole Truth', 'Pascal', 'A Case of Voluntary Ignorance'

Suggested Further Reading:

Roebuck, Janet. *The Making of Modern English Society from 1850*. London: Routledge and Kegan Paul, 1973. Print.

Rose, Jonathan. *The Edwardian Temperament*. London: Ohio University Press, 1986. Print.
Grene, Nicholas. *Synge: A Critical Study of the Plays*. New Jersey: Rowan and Littlefield, 1975. Print.
Price, Alan. *Synge and Anglo-Irish Drama*. New York: Russell and Russell, 1961. Print.
Kaye-Smith, Sheila. *John Galsworthy*. New York: Henry Holt and Company, 1916. Print.
Jordan, Anthony J. *W. B. Yeats: Vain, Glorious, Lout – A Maker of Modern Ireland*. Westport Books, 2003. Print.
Geduld, M. Harry. *James Barrie*. New York: Twayne Publishers, Inc, 1971. Print.
Kaufmann, Ralph James, ed. G.B. *Shaw: A Collection of Critical Essays*. New York: Prentice Hall, 1965.
Jones, David E. *The Plays of T. S. Eliot*. London: Routledge, 1960. Print.
Mathiessen, Francis Otto. *The Achievement of T. S. Eliot*. New York: Oxford University Press, 1959. Print.
Spanos, William. *The Christian Tradition in Modern British Verse Drama: The Poetics of Sacramental Time*. New Bumswick: Rutgers, 1967. Print.
Atkinson, Brooks. *Sean O'Casey: From Times* Past. ed. Robert G Lowery. London: Macmillan, 1982. Print.
Niven, Alastair. *D. H. Lawrence: The Novels*. Cambridge: Cambridge University, 1978. Print.
Ellmann, Richard. *James Joyce*. New York: Oxford University Press, 1982. Print.
Blamires, Harry. *The Bloomsday Book: A Guide through Joyce's "Ulysses"*. London: Methuen & Co., 1966. Print.
Gardner, Helen. *The Art of T.S. Eliot*. London: Cresset Press, 1949. Print.
Spender, Stephen. *Eliot*. Great Britain: Fontana Press, 1986. Print.
Lucy, Sean. *T.S, Eliot and the Idea of Tradition*. London: Cohen. 1960. Print.
Nadel, Ira B. *The Cambridge Introduction to Ezra Pound*. Cambridge: Cambridge University Press, 2007. Print.
Alan Wood. *Bertrand Russell: The Passionate Sceptic*. London: George Allen & Unwin, 1957. Print.
John Lewis. *Bertrand Russell: Philosopher and Humanist*. London: Lawerence & Wishart, 1968. Print.
Reilly, Patrick. *George Orwell: The Age's Adversary*. Basingstoke: Macmillan, 1986. Print.

CORE COURSE VIII

British Literature from 1946 to the Present – Poetry and Novel

Course Objectives: The end of the Second World War completely changed the economic and philosophical scene. The trajectory of civilization now headed into a time that focused more on materialism than spiritual value. The past was dissected and re-viewed from an almost nihilistic point of view. Late twentieth century literature negotiates this element of non-belief. It also looks askance at

the notion of the modern that was celebrated with the coming of the new century, and encapsulates a search for the post-modern. This course looks at the significant poets and novelists who not only lived through and recorded the times, but were perhaps the ones who constructed the new way of life that the world has come to accept. Most of the poets included wrote before and after the war and their poems reflect the passage of time and the passing of thoughts. The novels selected represent their time as well as the changing psyche of the human animal. Through these representative texts, this course aims to present to the learners the entire psycho-social and philosophical shift that twentieth century saw. A thorough knowledge of these texts will allow the learner to understand the time that we inhabit.

Unit I (Poetry) [25 Marks]

1. Philip Larkin – 'Poetry of Departures', 'An Arundel Tomb', 'The Whitsun Weddings', 'The Explosion', 'Aubade'
2. Geoffrey Hill – *Mercian Hymns* I-X, *The Triumph of Love* XIII, XVII, LXX
3. Carol Ann Duffy – 'War Photographer', 'Selling Manhattan', 'Litany', 'Mrs Midas', 'Anne Hathaway'
4. Ted Hughes – 'The Ancient Heroes and the Bomber Pilot', 'Lupercalia', 'Wodwo', 'Crow's Theology', 'Wolfwatching'
5. Elizabeth Jennings – 'Sequence from Childhood', 'Poem in Winter', 'Gift of Tongue', 'In Retrospect and Hope', 'Afterwards'
6. Thom Gunn – 'Incidents on a Journey', 'Autumn Chapter in a Novel', 'The Goddess', 'Sunlight', 'Jack Straw's Castle'
7. Stephen Spender – 'I think continually of those who were truly great', 'Ultima Ratio Regum', 'Pylons', 'An Elementary School Classroom in a Slum'
8. Seamus Heaney – 'Personal Helicon', 'Ocean's Love to Ireland', 'Sweeney Redivivus', 'The Sounds of Rain', 'The Fragment'

Unit II (Novels) [25 Marks]

1. William Golding – *Lord of the Flies*
2. Kingsley Amis – *Lucky Jim*
3. Muriel Spark – *The Prime of Miss Jean Brodie*
4. Anthony Burgess – *A Clockwork Orange*
5. Angela Carter – *Night at the Circus*
6. Kazuo Ishiguro – *Remains of the Day*
7. A.S. Byatt – *Possession*
8. Ian McEwan – *Amsterdam* / *Atonement*

Suggested Further Reading:

Hamilton, Ian, ed. *Twentieth Century Poetry in English*. London: OUP, 1996. Print.

Tuma, Keith. ed. *Anthology of Twentieth-Century British and Irish Poetry*. London: OUP, 2001. Print.

Cook, Albert. *Forces in Modern and Postmodern Poetry*. New York: Peter Lang, 2008. Print.

Gregson, Ian. *Contemporary Poetry and Postmodernism: Dialogue and Estrangement*. London: MacMillan, 1996. Print.

McHale, Brian and Platt, Len. Eds. *The Cambridge History of Postmodern Literature*. New York: CUP, 2016. Print.

Eds. Ramazani, Jahan and Ellman, Richard and O'Clair, Robert. *The Norton Anthology of Modern and Contemporary Poetry*. New York: W. W. Norton and Company, 2003. Print.

Bradbury, Malcolm. *The Novel Today: Contemporary Writers on Modern Fiction*. London: Fontana Press, 1990. Print.

Edwards, Brian. *Theories of Play and Postmodern Fiction*. London: Routledge, 1998. Print.

Marshall, Brenda K. *Teaching the Postmodern Fiction and Theory*. New York: Routledge, 1992. Print.

Bran, Nicol. *The Cambridge Introduction to Postmodern Fiction*. Cambridge: CUP, 2009. Print.

McHale, Brian. *Postmodernist Fiction*. London: Routledge, 1987. Print.

CORE COURSE IX

English Language Teaching I

Course Objectives

- To provide learners an insight into the differences between language acquisition and language learning
- To enable learners to critically examine the psychological and linguistic influences on ELT, namely behaviourism, cognitivism and humanism
- To familiarize learners with major theories of second language acquisition
- To make learners understand the significance of learner errors
- To introduce learners to theoretical concepts basic to the development of LSRW and different types of grammar, vocabulary and study skills
- To expose learners to issues related to curriculum planning and syllabus design

1. **Language Acquisition**

a. Key concepts and terms – Mother tongue; First language; Second Language; Foreign language; Heritage language; Naturalistic vs. instructed learners, Acquisition vs. learning
b. Stages of language acquisition
c. Views of the language teacher and learners
d. Psychological and linguistic influences on English Language Teaching – Behaviourism; Cognitivism; Humanism
e. Major theories of Second language acquisition – Acculturation model, Accommodation theory; Discourse theory; Monitor model; Variable Competence Model; Universal hypothesis; Neurofunctional theory
f. Interlanguage hypothesis
g. Contrastive hypothesis
h. Error analysis

2. **Developing Skills –I**
    a. LSRW – theoretical aspects; task types; Problems & solutions
3. **Developing Skills –II**
    a. Grammatical, Vocabulary and Study skills – theoretical aspects
4. **Curriculum Planning & Syllabus Design**
    a. Theoretical aspects; Major models of curriculum; Principles of curriculum planning; Major types of ESL syllabus; Evaluation of syllabus

Suggested Reading:

Brown, H. Douglas. *Principles of language Learning and Teaching*. 2nd ed. Englewood Cliffs, N J: Prentice Hall, 1994. Print.

Corder, Stephen Pit. *Introducing Applied Linguistics*. Harmondsworth: Penguin, 1973. Print.

_____. 'The significance of learners' errors'. *IRAL* 5: 161-9, 1967. Print.

Ellis, Rod. *Understanding Second Language Acquisition*. Oxford: Oxford University Press, 2012. Print.

Gardner, Rodert C. and Lambert, Wallace E. *Attitudes and Motivation in Second Language Learning*. Rowley, M A: Newbury House, 1972. Print.

Krashen, Stephen D. *Second Language Acquisition and Second Language Learning*. Oxford: Pergamon Press, 1981. Print.

_____. *Principles and Practice in Second Language Acquisition*. Oxford: Pergamon Press, 1982. Print.

_____. 1985. *The Input Hypothesis: Issues and Implications*. New York: Longman.

Lado, Robert. *Linguistics across Cultures*. Ann Arbor: University of Michigan Press, 1957. Print.

Lightbown, Patsy and Nina Spada. *How Languages are Learned*. Oxford: Oxford University Press, 1993. Print.
Littlewood, Wiliam. *Foreign and Second Language Learning*. Cambridge: Cambridge University Press, 1984. Print.
McLaughlin, Barry. *Theories of Second Language Learning*. London: Edward Arnold, 1987. Print.
Selinker, Larry. 'Interlanguage'. *International Review of Applied Linguistics* 10/3: 201-31, 1972. Print.
Sharwood-Smith, Michael. *Second Language Learning*. London: Longman, 1994. Print.
Skehan, Peter. *A Cognitive Approach to Language Learning*. Oxford: Oxford University Press, 1998.
Skinner, Burrhus Frederic. *Verbal Behaviour*. New York: Appleton Crofts, 1957. Print.
Spolsky, Bernard. *Conditions for Second Language Learning*. Oxford: Oxford University Press, 1989. Print.
Stern,Hans Heinrich. *Fundamental Concepts of Language Teachi*ng. Oxford: Oxford University Press, 1983. Print.
Stevick, Earl W. *Humanism in Language Teaching*. Oxford: Oxford University Press, 1990. Print.
Ur Penny. *A Course Language Teaching*. Cambridge University Press, 2012. Print

DEPARTMENT SPECIFIC ELECTIVES

(***Any one*** of the following)

DSE I

Ancient European Literature

Course Objectives: The course is designed to expose the learners to the ideas, history, narrative, performances and the rituals of the classical world often considered to have constructed all the future discourse of literature and culture in Europe and some other parts of the world. This course will also help the learners to understand the growth and the development of literature better as they often resort to the thoughts of the classical world.

Unit I [25 Marks]

1. Plato – *The Symposium / The Republic* (Book X)
2. Horace – *Odes, Book I-i, BooK II- iv, Book III-iv,xxv*
3. Virgil – *Aeneid*

4. Homer – *The Odyssey*
5. Theocritus – 'The Herdsmen', 'The Battle of Bards', 'The Sorceress'
6. Juvenal – *Tenth Satire*
7. Ovid – *Metamorphoses* Book I: 'Io and Isis', Book III: 'Tiresias', 'Pentheus and Bacchus'
8. Cicero – *The Republic and the Law*

Unit II [25 Marks]

1. Aeschylus – *Agamemnon*
2. Sophocles – *Antigone*
3. Euripides – *Medea*
4. Aristophanes – *The Frogs*
5. Menander – *The Girl from Samos*
6. Plautus – *Brothers Menaechmus*
7. Terence – *The Eunuch*
8. Seneca – *Thyestes*

Suggested Further Reading:

Nietzsche, Friedrich. *The Birth of Tragedy*. Trans. Douglas Smith. Oxford: Oxford University Press, 2000. Print.

Kitto, H. D. F. *Greek Tragedy: A Literary Study*. London: Methuen, 1939. Print.

Loraux, Nicole. *The Mourning Voice: An Essay on Greek Tragedy*. Trans. E.T. Rawlings. Ithaca, New York: Cornell University Press, 2000. Print.

Knox, Bernard. *Word and Action: Essays on the Ancient Theatre*. Baltimore and London: Johns Hopkins University Press, 1979. Print.

Dover, Kenneth J. *Plato's Symposium*. New York: Cambridge University Press, 1980. Print.

Beer, Josh. *Sophocles and the Tragedy of Athenian Democracy*. Greenwood Publishing, 2004. Print.

Gagarin, Michael. *Aeschylean Drama*. Berkeley: University of California Press, 1976. Print.

Segal, Charles. *Dionysiac Poetics and Euripides' Bacchae*. Princeton: Princeton University Press, 1982. Print.

Kaster, Robert A.; Nussbaum, Martha C. (Eds.) *Seneca: Anger, Mercy, Revenge*. Chicago: University of Chicago Press, 2012. Print.

Kiernan, Victor. *Horace: Poetics and Politics*. St Martin's Press, 1999. Print.

McNeill, Randall. *Horace*. Oxford: Oxford University Press, 2010. Print.

Horsfall, Nicholas. *The Epic Distilled: Studies in the Composition of the Aeneid*. Oxford and New York: Oxford University Press, 2016. Print.

Farrell, Joseph and Michael C.J. Putnam, eds. *A Companion to Vergil's Aeneid and its Tradition.* Chichester/Malden, MA: Wiley-Blackwell, 2010. Print.

DSE II

Nineteenth Century American Literature

Course Objectives: Since America as a new 'nation' was struggling to establish its identity, the 'narration' in literature was assuming an ambivalent form. Along with offering indigenous elements and puritan sensibilities, which ironically are also derivative in nature, the literature of this period was thoroughly embracing the English/European thoughts and ideas. The learners, through this course, are exposed to the symbiotic relationship between these two worlds.

Unit I (Poetry and Non-fiction) [25 Marks]

1. Walt Whitman – 'France, The Eighteenth Year of These States', 'Crossing Brooklyn Ferry', 'I Sing the Body Electric', 'When Lilacs Last in the Dooryard Bloom'd', 'Poets to Come'
2. Emily Dickinson – 'The Soul selects her own society', 'I dwell in Possibility', 'Me from Myself–to Banish', 'It's Easy to Invent a Life', 'Because I could not stop for Death'
3. Henry Wadsworth Longfellow – *The Song of Hiawatha* ('Introduction', 'Hiawatha's Childhood', 'The Death of Kwasind', 'Hiawatha's Departure')
4. Edgar Allan Poe – 'Alone', 'The Raven', 'A Dream within a Dream', 'Lenore', 'The Haunted Palace'
5. Ralph Waldo Emerson – *The American Scholar*
6. Henry David Thoreau – *Walden* (Selections)
7. Mark Twain – 'Is Shakespeare Dead?'
8. Frederick Douglas – *Narrative of the Life of Fredrick Douglass*

Unit II (Novels) [25 Marks]

1. Nathaniel Hawthorne – *The Scarlet Letter*
2. Herman Melville – *Moby Dick*
3. Mark Twain – *Adventures of Huckleberry Finn*
4. James Fenimore Cooper – *The Last of the Mohicans*
5. Harriet Beecher Stowe – *Uncle Tom's Cabin*
6. Stephen Crane – *The Red Badge of Courage*
7. Henry James – *The Turn of the Screw*
8. Short Stories (any three)
    a. Washington Irving – 'The Legend of Sleepy Hollow'
    b. Edgar Allan Poe – 'Fall of the House of Usher', 'The Cask of Amontillado'
    c. Charlotte Gilman Perkins – 'The Yellow Wallpaper'

d. Kate Chopin – 'Regret'

Suggested Further Reading:

Bercovitch, Sacvan, and Cyrus R. K Patell. *The Cambridge History of American Literature*. Cambridge: Cambridge University Press, 1994. Print.

Crane, Gregg D. *The Cambridge Introduction to the Nineteenth-Century American Novel*. Cambridge, UK: Cambridge University Press, 2007. Print.

Ford, Boris. *The New Pelican Guide to English Literature, Vol. 9*. Harmondsworth: Penguin Books, 1982. Print.

Gray, Richard. *A History of American Literature*. Malden, MA: Blackwell Pub., 2004. Print.

Scofield, Martin. *The Cambridge Introduction to the American Short Story*. Cambridge, UK: Cambridge University Press, 2006. Print.

DSE III

Indian Literature I

Course Objectives: The course is designed to make the students aware of the polyphonic images of the Indian society represented through the literary discourse. The texts in this course point to the introduction and growth of Indian literature before Independece. And it also attempts to capture a varied and rich sensibility perhaps common to cultures across India. The inclusion of both kinds of texts, originally written in English and translated ones, would point to the politics of language reflected upon literature and culture. The variety of texts would also suggest an ambivalent attitude towards colonial resistance realised since the latter half of nineteenth century.

Unit I (Novels) [25 Marks]

1. Raja Rao – *Kanthapura*
2. Fakir Mohan Senapati – *Six Acres and a Third* (Trans. Ravi Shankar Mishra, Satya P. Mohanty, Jatindra K. Nayak and Paul St-Pierre)
3. Bankim Chandra Chatterjee – *The Poison Tree: A Tale of Hindu Life in Bengal* (Trans. Miriam S. Knight)
4. R.K. Narayan – *Swami and Friends*
5. Mulk Raj Anand – *Two Leaves and a Bud*
6. Munshi Premchand – *The Gift of a Cow* (Trans. Gordon C. Roadermal)
7. Rabindranath Tagore – *Gora* (Trans. Sujit Mukherjee)
8. Ismat Chughtai – *The Crooked Line* (Trans. Tahira Naqvi)

<u>Unit II (Short Fiction, Plays and Non-fiction)</u> [25 Marks]

1. Rabindranath Tagore – Selected Short Stories. Ed. Sukanta Chaudhuri: 'The Ghat's Story', 'Ramkanai's Folly', 'The Exercise Book', 'Kabuliwala', 'Hungry Stone', 'The Wife's Letter', 'Woman Unknown', 'Balai'
2. Sri Aurobindo – *Perseus the Deliverer*
3. Bharati Sarabhai – *The Well of the People*
4. Dinabandhu Mitra – *The Indigo Planting Mirror*
5. Poetry
    - Toru Dutt – 'Sita', 'The Lotus'
    - Henry Louis Vivian Derozio – 'To India - My Native Land', 'The Harp of India', 'The Fakeer of Jungheera'
    - Michael Madhusudhan Dutta – 'The Captive Ladie'
    - Sarojini Naidu – 'Palanquin Bearers', 'The Indian Gypsy', 'Harvest Hymn'. 'Suttee'
6. Pandita Ramabai – *The High-Caste Hindu Woman*
7. Michael Madhusudan Dutt – Selected Letters
8. Jawaharlal Nehru – *The Discovery of India*

Suggested Further Reading:

Iyengar, K.R Srinivasa. Indian Writing in English. New Delhi: Sterling, 1984.

Kumar, Jainendra. *Premchand: A Life in Letters*. Agra: Y K Publishers, 1993.

Mehrotra, Arvind Krishna, ed. *A History of Indian Literature in English*. New York: Columbia University Press, 2003.

Menon, Muhammad Umar. *The Greatest Urdu Stories Ever Told*. New Delhi: Aleph Book Company, 2017. Print.

Mukherjee, Meenakshi. *The Twice Born Fiction: Themes and Techniques of the Indian Novel in English*. New Delhi: Pencraft International, 2001.Print.

Mukherjee, Meenakshi. *Realism and Reality: The Novel and Society in India*. London: Oxford University Press, 1988. Print.

Naik, M.K. *Aspects of Indian Writing in English*. Madras: Macmillan, 1979. Print.

Naik, M.K. *A History of Indian English Literature*. New Delhi: Sahitya Akademi, 1982. Print.

Narasimhaiah, C.D. *The Swan and the Eagle*. Shimla: Indian Institute of Advanced Study, 1969. Print.

Paranjape, Makarand. *Towards a Poetics of the Indian English Novel*. Shimla: Indian Institute of Advanced Study, 2000. Print.

Tagore, Rabindranath. *Selected Short Stories*. Ed. Sukanta Chaudhuri. New Delhi: Oxford University Press,2001. Print.

Butalia, Urvashi and Ritu Menon, eds. *In other words: New writing by Indian Women*. New Delhi: Kali for Women, 1992. Print.

SEMESTER III

CORE COURSE X

British Literature from 1946 to the Present – Drama, Non-Fiction and Short Fiction

Course Objectives: Twentieth century theatre is a complex world. More than other forms, theatre is the space where the immediate finds immaculate expression. The plays included in this course epitomize the variety of concerns that the British, as well as the world, has had to come to terms with. From the idea of the quotidian to that of the highly philosophical, these plays represent the whole paradigm shift experienced by the western world. The short stories explored new horizons, deliving into realism and fantasy. Non-fiction directly addressed the issues such as migration and the course of civilization and studies of cultures and travel became immensely popular. This course aims to capture a slice of that experience and enable the learners to look at the theatrical evolutions and evolutions in forms of prose other than the novel, and how these create often curious mirror-images of the life that we must experience. With ample possibilities of theoretical familiarization, this course aims to provide the learners with a training in the art and craft of the forms included.

Unit I (Drama) [25 Marks]

1. Arnold Wesker – *Roots*
2. Robert Bolt – *A Man for all Seasons*
3. Harold Pinter – *The Homecoming*
4. John Osborne – *The Entertainer*
5. Edward Bond – *Saved*
6. Tom Stoppard – *Jumpers*
7. Peter Shaffer – *Equus*
8. Caryl Churchill – *Top Girls*

Unit II (Non-fiction Prose and Short Fiction) [25 Marks]

1. Gerald Durrell – *My Family and Other Animals*
2. Peter Brook – *Threads of Time,* Section I
3. William Dalrymple – *In Xanadu*
4. Michael Palin – *Sahara*
5. Robert MacFarlane – *The Mountains of the Mind*
6. George Mikes – *How to be an Alien*
7. David Olusoga – *Black and British: A Forgotten History*
8. Short Fiction (any two)

a. Ray Bradbury – 'The Veldt', 'The Night'
b. Alan Sillitoe – 'The Loneliness of the Long Distance Runner', 'The Match'
c. Roald Dahl – 'The Landlady', 'The Visitor'
d. Zadie Smith – 'The Embassy of Cambodia', 'Miss Adele Amidst the Corsets'

Suggested Further Reading:

Edwards, Brian. *Theories of Play and Postmodern Fiction*. London: Routledge, 1998. Print.

Marshall, Brenda K. *Teaching the Postmodern Fiction and Theory*. New York: Routledge, 1992. Print.

D'haen, Theo and Bertens, Hans. Eds. *British Postmodern Fiction*. Amsterdam: Rodopi, 1993. Print.

Bran, Nicol. *The Cambridge Introduction to Postmodern Fiction*. Cambridge: CUP, 2009. Print.

McHale, Brian. *Postmodernist Fiction*. London: Routledge, 1987. Print.

Sacido, Jorge. Ed. *Modernism, Postmodernism and the Short Story in English*. Amsterdam: Rodopi, 2012. Print.

Patea, Viorica. Ed. *Short Story Theories: A Twenty-First-Century Perspective*. Amsterdam: Rodopi, 2012. Print.

March-Russell, Paul. *The Short Story: An Introduction*. Edinburgh: Edinburgh University Press, 2009. Print.

Kershaw, Baz. *The Cambridge History of British Theatre, Volume 3, Since 1895*. Cambridge: Cambridge University Press, 2004. Print.

Billington, Michael. *State of the Nation: British Theatre Since 1945*. London: Faber and Faber, 2009. Print.

Lacey, Stephen. *British Realist Theatre: The New Wave in its Context 1956-1965*. London and New York: Routledge, 1995. Print.

CORE COURSE XI
Literary Criticism I

Course Objectives: While the first unit of the course outlines the development of the classical trend of criticism, the second unit demonstrates how the earlier model is adopted by the early modern and the neoclassical criticism. Along with commenting on the history, philosophy and culture of the age concerned, the critical writings of the course anlyse how they function as a contributive force in shaping literature. The philosophical orientation suggested by the writings of the course would help the learners to better understand the literary texts offered in other courses.

Unit I (Classical) [25 Marks]

1. Plato – *The Republic*, Books II and III, *Ion*
2. Aristotle – *Poetics*
3. Horace – *The Art of Poetry*
4. Longinus – *On the Sublime*
5. Quintilian – *Institutio Oratoria* Books 8 &9.
6. Plotinus – 'On the Intellectual Beauty' from *Fifth Ennead*
7. Giovanni Boccaccio – *Genealogy of the Gentile Gods* (Chapters VII, IX, XIII, & XVII from Book XIV)
8. Dante Alighieri – *The letter to Cangrande della Scala*.

Unit I (Renaissance to Neoclassical) [25 Marks]

1. Philip Sidney – *An Apology for Poetry*
2. Pierre Corneille – *Of the Three Unities of Action, Time, and Place*
3. John Dryden – *An Essay of Dramatic Poesie*
4. Alexander Pope – An Essay on Criticism
5. Edward Young – *Conjectures on Original Composition: In a Letter to the Author of Sir Charles Grandison*
6. Edmund Burke – *A Philosophical Enquiry into the Origin of our ideas of the Sublime*
7. Samuel Johnson – 'Preface to Shakespeare'
8. Maurice Morgann – 'Essay on the Dramatic Character of Sir John Falstaff'

Suggested Reading:

Cheney, Patrick, and Frederick A De Armas. *European Literary Careers: The Author from Antiquity to the Renaissance*. Toronto: University of Toronto Press, 2002. Print.

Habib, M. A. R. *Literary Criticism from Plato to the Present*. Chichester, West Sussex,U.K.: Wiley-Blackwell, 2011. Print.

Kennedy, George Alexander. *The Cambridge History of Literary Criticism, Vol. 1: Classical Criticism*. Cambridge: Cambridge University Press, 1989. Print.

Kulkarni Anand B. and Chaskar Ashok G. *An Introduction to Literary Criticism and Theory*. Orient Blackswan, Hyderabad, 2015

Leitch, Vincent B, et al, eds. *The Norton Anthology of Theory and Criticism.* New York, NY: W. W. Norton & Co., 2010. Print.

Murray, Penelope and Dorsch, T. *Classical Literary Criticism.* London: Penguin Books. 2000.Print.

Norton, Glyn P. *The Cambridge History of Literary Criticism, Vol. 3: The Renaissance*. Cambridge: Cambridge university press, 1999. Print.

Vickers, Brian. *English Renaissance Literary Criticism.* Oxford: Clarendon Press, 1999. Print.

DEPARTMENT SPECIFIC ELECTIVES

(*Any two* of the following)

DSE IV

Modern European Literature

Course Objectives: The selection of the texts for this course is varied and sprawling. They are representative of the age, culture and space that had produced them. This selection of iconic and experimental pieces of literature, chosen from different parts of Europe, would enlighten the learners in their way of understanding the other canonical literatures. The experiment in poetic form, in theatrical representation and in fictional prose writings would offer the learners a different taste which at the same time will enrich the critical acumen to understand society, culture and literature.

Unit – I (Poetry and Plays) [25 Marks]

1. Charles Baudelaire – *Les Fleurs du mal*
2. Rainer Maria Rilke – *Duino Elegies*
3. Arthur Rimbaud – *A Season in Hell*
4. Anton Chekov – *Cherry Orchard*
5. Henrik Ibsen – *Hedda Gabler*
6. Jean-Paul Sartre – *The Flies*
7. Bertolt Brecht – *Mother Courage and her Children*
8. Federico Garcia Lorca – *Blood Wedding*

Unit II (Novels) [25 Marks]

1. Honoré de Balzac – *Father Goriot*
2. Leo Tolstoy – *Anna Karenina*
3. Fyodor Dostoyevsky – *Crime and Punishment*
4. Franz Kafka – *The Trial*
5. Thomas Mann – *Death in Venice*
6. André Gide – *Straight is the Gate*
7. Gustave Flaubert – *Madame Bovary*
8. Short Stories:
    a. Albert Camus – 'The Host'
    b. Maxim Gorky – 'Twenty Six Men and a Girl'
9. Heinrich Böll – 'Stranger, Bear Word to the Spartans We...'

Suggested Further Reading:

Bradbury and McFarlane (Eds.) *Modernism: A Guide to European Literature 1890-1930*. New Delhi: Penguin, 2007. Print.

Cohen, Walter. *A History of European Literature: The West and the World from Antiquity to the Present*. Oxford: Oxford University Press, 2017. Print.

Hyslop, Lois Boe. *Baudelaire, Man of His Time*. Yale University Press, 1980. Print.

Metzger, Erika, A. and Michael M. Metzger. *A Companion to the Works of Rainer Maria Rilke*. Rochester, 2001. Print.

Leeder, Karen, and Robert Vilain (Eds.). *The Cambridge Companion to Rilke*. Cambridge: Cambridge University Press, 2010. Print.

Cordle, Thomas. *André Gide (The Griffin Authors Series)*. Twayne Publishers, Inc., 1969. Print.

Gray, Ronald. *Kafka: A Collection of Critical Essays*. Englewood Cliffs, NJ: Prentice-Hall, 1962. Print.

Greenberg, Martin. *The Terror of Art: Kafka and Modern Literature*. New York: Basic Books, 1968. Print.

Deleuze, Gilles; Guattari, Félix. *Kafka: Toward a Minor Literature*. Minneapolis: University of Minnesota Press, 1986. Print.

Reed, Terence James. *Death in Venice: Making and Unmaking a Master*. New York: Twayne Publishers, 1994.

Hirschbach, Frank Donald. *The Arrow and the Lyre: A Study of the Role of Love in the Works of Thomas Mann*. The Hague: M. Nijhoff, 1955. Print.

Laing, R. D., Cooper, D. G.. *Reason and Violence: A Decade of Sartre's Philosophy, 1950–1960*. New York: Pantheon, 1971. Print.

Wittmann, Heiner. *Sartre and Camus in Aesthetics*: *The Challenge of Freedom*. Ed. by Dirk Hoeges. Print.*Dialoghi/Dialogues*. *Literatur und Kultur Italiens und Frankreichs*, vol. 13, Frankfurt: Peter Lang, 2009. Print.

Benjamin, Walter. *Understanding Brecht*. Trans. Anna Bostock. London and New York: Verso, 1983. Print.

Ewen, Frederic. *Bertolt Brecht: His Life, His Art and His Times*. Citadel Press Book edition. New York: Carol Publishing Group, 1992. Print.

DSE V

Sociolinguistics, Phonetics and Phonology

Course Objectives:

- To familiarise learners with major concepts and issues related to Sociolinguistics

- To introduce learners to theoretical and practical aspects of Phonetics and Phonology

1. **Sociolinguistics**
    a. Definition and scope; Language varieties; Languages in contact; Language change; Style, register and jargon; Diglossia; Language and culture; Language and gender; Language and power

Suggested Further Reading:

Holmes, Janet. *An Introduction to Sociolinguistics*. London: Longman, 1992. Print.

Hudson, Richard.A. *Sociolinguistics*. Cambridge University Press, 1990. Print.

Trudgill, Peter. *Sociolinguistics*. Harmondsworth: Penguin, 1983. Print.

Wardhaugh, Ronald. *An Introduction to Sociolinguistics*. Cambridge, MA: Basil Blackwell, 1992. Print.

Phonetics and Phonology

a. Definition and scope; Airstream mechanism; Organs of speech; Consonants and vowels – description & classification; Phoneme and allophone – definition & identification; Syllable – structure and types; Stress, rhythm and intonation; Assimilation and elision; Phonemic transcription; Idiosyncrasies of Indian speakers of English; Teaching of English pronunciation.

Suggested Reading

Balasubramanian, T. *A Textbook of English Phonetics for Indian Students.* New Delhi: Macmillan, 1981. Print.

Bansal, R.K. and J.B. Harrison. *Spoken English for India: A Manual of Speech and Phonetics*. Hyderabad: Orient Blackswan, 2013. Print.

Carr, Philip. *English Phonetics and Phonology: An Introduction*. Blackwell, 1999. Print.

Gimson, Alfred Charles. *An Introduction to the Pronunciation of English*. London: Edward Arnold, 1980. Print.

Jones, Daniel. An *Outline of English Phonetics*. Cambridge: Cambridge University Press, 1997. Print.

____ . *English Pronouncing Dictionary*. Cambridge: Cambridge University Press, 2012. Print.

O'Connor, J D. *Better English Pronunciation.* ELBS and Cambridge University Press, 2000. Print.

Roach, Peter. *English Phonetics and Phonology: A Practical Course.* Cambridge: Cambridge University Press, 2000. Print.

DSE VI

Indian Literature II

Course Objectives: Though not changed overnight the spirit of post-Independence literatue in India distinguished itself from and at times challenged the notions disseminated through pre-Independence literature. The represtation of nation and nationalism became far more complicated as all the domains what together we call Indian literature, embraced different forms experiments in order to address postcolonial anxieties often coupled with the politics of globalisation. Since the texts in this course often explore contemporary politics and history, the learners would receive and 'read' the narrative codes from a personal point of view tempered with the lived experiences.

Unit I (Novels and Short Stories) [25 Marks]

1. Durgabai Vyam and Subhash Vyam and et al – *Bhimayana: Experiences of Untouchability*
2. Shrilal Shukla – *Raagdarbari* (Trans. Gillian Wright)
3. Ilanko Atikal – *Cilappatikaram* (translation: R. Parthasarthy)
4. Anita Desai – *In Custody*
5. Amitav Ghosh – *The Hungry Tide*
6. Salman Rushdie – *Midnight's Children*
7. Khuswant Singh – *Train to Pakistan*
8. Short Stories:
    a. Temsula Ao – 'Laburnum on my Head', 'Three Women', 'Sonny'
    b. Prajwal Parajuly – 'Let Sleeping Dogs Lie'. 'Missed Blessing', 'No Land is Her Land'
    c. Mamang Dai – 'the boy who fell from the sky', 'the strange case of kalen, the hunter' from *The Legends of Pensam*

Unit II (Plays and Poems) [25 Marks]

1. Girish Karnad – *Hayvadana / Fire and the Rain*
2. Badal Sircar – *Evam Indrajit*
3. Vijay Tendulkar – *Ghasiram Kotwal*
4. Mahesh Dattani – *Final Solutions*
5. Habib Tanvir – *Charandas Chor*
6. Robin S. Ngangom – 'Poetry', 'Native Land', 'Body', 'Homeland I Left'

7. Nisim Ezekiel – 'Urban', 'The Professor', 'Night of the Scorpion', 'Poet Lover Birdwatcher' / Dom Moraes – 'The Garden', 'Architecture', 'Absence', 'Key'
8. Jayanta Mahapatra – 'A Grey Haze over the Ricefields', 'Deaths in Orissa', 'Ash', 'The Captive Air of Chandipur on Sea', 'Sanskrit'

Suggested Further Reading:

Ahmed, Aijaz. *Indian Literature – Notes Towards a Definition of Category*. London: Verso, 1992. Print.

Bhatia, Nandi. ed. *Modern Indian Theatre: A Reader*. Delhi: Oxford University Press, Delhi. 2005. Print.

Dharwadkar, Aparna Bhargava ed. *Theatres of Independence: Drama, Theory and Performance in India since 1947*.University of Iowa: Iowa City Press, 2005.

Mehrotra, Arvind. ed. *The Oxford India Anthology of Twelve Modern Indian Poets*. Delhi: Oxford University Press. 1992. Print.

Naik, M.K. *Aspects of Indian Writing in English*. Madras: Macmillan, 1979. Print.

Paranjape, Makarand. *Indian Poetry in English*. Madras : Macmillan, 1993. Print.

Rushdie, Salman. *Imaginary Homelands: Essays and Criticism 1981-1991*. London: Granta Books. Print.

Wakankar, Milind. 2010. "Subalternity at the cusp: Limits and openings of the dalit critique." *Subalternity and Religion: The Pre-history of Dalit Empowerment in South Asia*. New York: Routledge. Print.

DSE VII

Colonialism and Postcolonialism

Course Objectives: The course is divided into two parts. While the first part is dealing with the theoretical grounding the second part includes texts that invariably display the agenda that entail the social, political and cultural issues of erstwhile colonies. Given some of the texts directly explore the issues of colonial oppression other section discreetly brings into the fore the anxieties and interpellative forces hidden in the larger postcolonial discourse. This course is designed to facilitate the learners to understand the poitics of the production, distribution and the reception of litearary texts and to develop a different perspective for the act of 'reading'.

Unit I [25 Marks]

1. Edward Said –*Orientalism* (Selections)

2. Frantz Fanon – *Wretched of the Earth*
3. Ranajit Guha ed – *A Subaltern Studies Reader* (Selections)
4. Ngugi Wa Thiong'o – *Decolonizing the Mind*
5. Chandra Talpade Mohanty – 'Under Western Eyes: Feminist Scholarship and Colonial Discourses'
6. Homi Bhabha – 'The Other Question'
7. Dipesh Chakrabarty – *Provincializing Europe* (Selections)
8. Partha Chatterjee – *Nation and its Fragments* (Selections)

Unit II [25 Marks]

1. Sir Walter Raleigh – *The Discovery of Guiana*
2. John Masters – *Bhowani Junction*
3. Rudyard Kipling – *Kim* / Maud Diver – *The Englishwoman in India*
4. J. M. Coetzee – *Foe* / *Waiting for the Barbarians*
5. Wole Soyinka – *A Dance of the Forests*
6. Amitav Ghosh – *Sea of Poppies*
7. Ruth Prawer Jhabvala – *Heat and Dust* / V.S.Naipaul – *The Writer and the World*. Essays (selections)
8. Edward Kamau Brathwaite – *The Arrivants: A New World Trilogy* (selections)

Suggested Further Reading

Cesaire, Aime. *Discourse on Colonialism.* New York: New York University Press, 2000. Print.
Raychaudhuri, Tapan. *Europe Reconsidered*. London: Routledge, 2015. Print.
Said, Edward. *Culture and Imperialism.* London: Vintage, 1994. Print.
Sartre, Jean-Paul. *Colonialism and Neocolonialism.* New York: Routledge, 2001. Print.
Spivak, Gayatri Chakravorty. *A Critique of Postcolonial Reason.* Boston: Harvard University Press, 1999. Print.
Vishwanathan, Gauri. *Masks of Conquest.* London: Faber and Faber, 1990. Print.

DSE VIII

American Literature of the Twentieth Century

Course Objectives: The turn of the century saw remarkable developments in the history of American Literature. With the two great wars and a number of socio-racial issues finding prominence, the trajectory of American Literature changed drastically. This course aims to create a comprehensive

understanding of the new century and how it mapped the new dynamics of America, and that of the entire world.

Unit I (Poetry and Drama) [25 Marks]

1. William Carlos Willams – 'Overture to a Dance of Locomotives', 'The Attic which is Desire', 'The Catholic Bells', 'The Poet and his Poems', 'An Early Martyr'
2. Langston Hughes – 'Let America Be America Again', 'The Weary Blues', 'Harlem', 'The Negro Speaks of Rivers', 'Dream Variations'
3. Gary Snyder – 'At Tower Peak', 'Old Bones', 'Hay for the Horses', 'Axe Handles', 'Smoky the Bear Sutra'
4. Marianne Moore – 'The Buffalo', 'That Harp You Play So Well', 'Appellate Jurisdiction', 'The Wizard in Words', 'Black Earth'
5. Eugene O'Neill – *Long Days Journey into Night*
6. Tennessee Williams – *The Glass Menagerie*
7. Arthur Miller – *All my Sons*
8. Lorraine Hansbury – *A Raisin in the Sun*

Unit II (Fiction) [25 Marks]

1. F. Scott Fitzgerald – *The Great Gatsby*
2. William Faulkner – *The Sound and the Fury*
3. Ernest Hemingway – *The Old Man and the Sea*
4. Toni Morrison – *Beloved*
5. Jhumpa Lahiri – *The Namesake*
6. Harper Lee – *To Kill a Mockingbird*
7. Leslie Marmon Silko – *Ceremony*
8. Short Stories (any two)
    a. John Cheever – 'Reunion', 'O City of Broken Dreams'
    b. Donald Barthelme – 'The Balloon', 'Kierkegaard Unfair to Schlegel'
    c. Jamaica Kincaid – 'Girl', 'Holidays'
    d. Bharati Mukherjee – 'Hindus', 'Visitors'

Suggested Further Reading:

Bigsby, Christopher William Edgar. *A Critical Introduction to Twentieth-Century American Drama.* Cambridge, Mass.: Cambridge university press, 1985. Print.

Duvall, John N. *The Cambridge Companion to American Fiction After 1945*. Cambridge: Cambridge University Press, 2012. Print.
MacGowan, Christopher J. *The Twentieth-Century American Fiction Handbook*. Chichester, West Sussex: Wiley-Blackwell, 2011. Print.
Zilboorg, Caroline. *American Prose and Poetry in the Twentieth Century*. Cambridge: CUP, 2000. Print.
Bradbury, Malcolm. *The Modern American Novel*. Oxford: Oxford University Press, 1983. Print.
Braxton, Joanne M. *Black Women Writing Autobiography*. Philadelphia: Temple University Press, 1989. Print.
Gray, Richard. *After The Fall: American Literature Since 9/11*. Chichester, West Sussex: Wiley-Blackwell, 2011. Print.
Matthews, John T. *A Companion to the Modern American Novel 1900-1950*. Malden, MA: Wiley-Blackwell, 2009. Print.
Wong, Shawn. *Asian American Literature*. New York: Harper Collins, 1996. Print.
Watts, Jerry Gafio. *Heroism and the Black Intellectual*. Chapel Hill: University of North Carolina Press, 1994. Print.

GENERIC ELECTIVE I

Film and Literature

Course Objectives: The first unit of the course would elaborate on the history and movements of cinema for laying bare the mechanism which calls for a dialogue between cinema and literature. Several art and literary movements will also be discussed to show their overhauling impact on cinema. The second unit of the course is designed to discuss such dialogic forces more directly. Famous screen adptaions of literary texts will be discussed to address the debates of authorship and the shift in language, from the verbal to the visual.

Unit I (History of Film) [25 Marks]

1. Film in America
2. Film in Europe
3. Film in Japan
4. Film in Russia
5. Film in India
6. Film in Africa

Unit II (Film Texts) [25 Marks]

1. Satyajit Ray – *Charulata* (1964)
2. Vijay Anand – *The Guide* (1965)
3. Pier Paolo Pasolini – *Edipo Re* (1967)
4. Francis Ford Coppola – *The Godfather* Part I (1972)
5. David Lean – *A Passage to India* (1984)
6. Vishal Bharadwaj – *Maqbool* (2003)

Suggested Further Reading:

Monaco, James. *How to Read a Film*. London: OUP, 1977. Print.

Corrigan, Timothy. *Film and Literature*. New York: Routledge, 2011. Print.

Nowell-Smith, Geoffrey. Ed. *The Oxford History of World Cinema*. Oxford: OUP, 1996. Print.

Ellwood, David. Ed. *The Movies as History: Visions of the Twentieth Century*. Gloucestershire: Sutton Publishing, 2000. Print.

Hill, John and Gibson, Pamela Church. Eds. *World Cinema: Critical Approaches*. Oxford: OUP, 2000. Print.

Hill, John and Gibson, Pamela Church. Eds. *Film Studies: Critical Approaches*. Oxford: OUP, 2000. Print.

Roberge, Gaston. *The Subject of Cinema*. New Delhi: Seagull, 2005. Print.

Aycock, Wendell and Schoenecke, Michael. Eds. *Film and Literature: A Comparative Approach to Adaptation*. Lubbock: Texas Tech University Press, 1988. Print.

Rothwell, Kenneth S. *A History of Shakespeare on Screen: A Century of Film and Television*. Cambridge: CUP, 1999. Print.

SEMESTER IV

CORE COURSE XII

Literary Criticism II

Course Objectives: The history of ideas in England has always been informed by the thoughts developed and nurtured by other European countries. Nineteeth century British literary criticism is no exception. The first unit which includes texts originally written in other European languages examines the dialogue between what the rest of the Europe develops in the world of thoughts and the way English culture receives them. In continuation the essays included in the second unit, explores similar kind of dialogue taking place in the first half of the twentieth century.

Unit I (Late Eighteenth and Nineteenth Centuries) [25 Marks]

1. Friedrich von Schiller – From *On the Aesthetic Education of Man:* Second, Sixth and Ninth Letters.
2. Gotthold Ephraim Lessing – From *Laocoön*
    a. Preface
    b. Chapter XVI
3. Germaine Necker de Staël – *On Literature Considered in Its Relationship to Social Institutions*
4. P.B. Shelley – *A Defence of Poetry*
5. John Keats – Selected Letters
    a. To Benjamin Bailey (November 22, 1817)
    b. To George and Thomas Keats (December 21, 1817)
    c. To John Taylor (February 27, 1818))
    d. To Richard Woodhouse (October 27, 1818)
6. Charles Baudelaire – *The Painter of Modern Life*
    a. *From* I. Beauty, Fashion, and Happiness
    b. *From* III. The Artist, Man of the World, Man of the Crowd, and Child
    c. IV. Modernity
    d. *From* IX. The Dandy
    e. XI. In Praise of Cosmetics
7. Matthew Arnold – 'Function of Criticism at the Present Times', 'The Study of Poetry'
8. Henry James – 'The Art of Fiction'

<u>Unit II (Twentieth Century)</u> [25 Marks]

1. T. S. Eliot – 'To Criticize a Critic', 'The Metaphysical Poets', 'Hamlet and his Problems'
2. Sigmund Freud – 'The Uncanny', 'Fetishism'
3. Carl Gustav Jung – 'The Archetypes and the Collected Unconscious'
4. Cleanth Brooks - *The Well Wrought Urn*: Chapter 11. The Heresy of Paraphrase
5. William K. Wimsatt Jr. and Monroe C. Beardsley – 'The Intentional Fallacy'
6. Jean-Paul Sartre – 'Why Write?'
7. Raymond Williams – *Culture and Society: 1780-1950* (Selections)
8. Mikail Bakhtin – 'Discourse in the Novel'

Suggested Further Reading:

Brown, Marshall. *The Cambridge History of Literary Criticism, Vol. 5: Romanticism*. Cambridge: Cambridge University Press, 2000. Print.

Habib, M. A. R. *The Cambridge History of Literary Criticism, Vol. 6: The Nineteenth Century (1830-1914)*. Cambridge: Cambridge University Press, 2013. Print.

Hoffman, Daniel, and Samuel Hynes. *English Literary Criticism: Romantic and Victorian.* New York: Appleton-Century-Crofts, 1963. Print.

Hohendahl, Peter Uwe, and Klaus L Berghahn. *A History of German Literary Criticism, 1730-1980*. Lincoln: University of Nebraska Press, 1988. Print.

Kulkarni Anand B. & Chaskar Ashok G. *An Introduction to Literary Criticism and Theory*. Orient Blackswan, Hyderabad, 2015. Print.

Nisbet, Hugh Barr, and Claude Julien Rawson. *The Cambridge History of Literary Criticism, Vol. 4: The Eighteenth Century*. Cambridge: Cambridge University Press, 1997. Print.

Simpson, David. *German Aesthetic and Literary Criticism*. Cambridge: Cambridge University Press, 1984. Print.

Eagleton, Terry. *Criticism and Ideology: A Study in Marxist Literary Theory*. London: NLB, 1976. Print.

Jancovich, Mark. *The Cultural Politics of the New Criticism*. Cambridge: Cambridge University Press, 1993. Print.

Knellwolf, Christa, Christopher Norris, and Jessica Osborn. *The Cambridge History of Literary Criticism: Vol. 9: Twentieth-Century*. Cambridge: Cambridge University Press, 2001. Print.

Kulkarni Anand B. and Chaskar Ashok G. *An Introduction to Literary Criticism and Theory*. Orient Blackswan, Hyderabad, 2015. Print.

Menand, Louis, Lawrence S Rainey, and A. Walton Litz. *The Cambridge History of Literary Criticism, Vol. 7: Modernism and the New Criticism*. Cambridge: Cambridge University Press, 2000. Print.

Patton, Laurie L, and Wendy Doniger. *Myth and Method*. Charlottesville: University Press of Virginia, 1996. Print.
Stolt, Robert. *Russian Formalism.* München: GRIN Verlag, 2010. Print.
Wolfreys, Julian. *Modern British and Irish Criticism and Theory*. Edinburgh: Edinburgh University Press, 2006. Print.

CORE COURSE XIII

Literary Theory

Course Objectives: Since the essays of the course represent specific schools of thoughts and ideas, they will be treated as reference points to discuss larger implications of the concerned literary vis-a-vis cultural theories. The iconic eaasys of the course, from their theoretical stand, elaborate on the issues of race, gender, ideology, history, identity, language and human psyche that will help the learners uncover the politics of all forms of texts in the context of the globalised world of late capitalism.

Unit I [25 Marks]

1. Boris Eichenbaum – *The Theory of the Formal Method* (Selections)
2. Georg Lukacs – 'Ideology of Modernism'
3. Max Horkheimer and Theodor W. Adorno – *The Culture Industry: Enlightenment as Mass Deception* (selections)
4. Stephen Greenblatt – *The Power of Forms in the English Renaissance* (Introduction)
5. Michel Foucault – 'What is an Author?'
6. Wolfgang Iser – 'Interaction between Text and Reader'
7. Roland Barthes – 'The Death of the Author'
8. Tzvetan Todorov – 'Structural Analysis of Narrative'

Unit II [25 Marks]

1. Jacques Derrida – 'Deconstruction with reference to "Structure, Sign and Play" in the Discourse of the Human Sciences'
2. Sandra M. Gilbert and Susan Gubar – *The Madwoman in the Attic.* Chapter 2: 'The Woman Writer and the Nineteenth Century Literary Imagination'
3. Stephen Slemon – 'Unsettling the Empire: Resistance Theory for the Second World'
4. Laura Mulvey – *Visual Pleasure and Narrative Cinema* (Introduction)
5. Adrienne Rich – Foreword to 'Compulsory Heterosexuality and Lesbian Existence'

6. Jean Baudrillard – *The Precession of Simulacra* (selections)
7. bell hooks – 'Postmodern Blackness'
8. Jürgen Habermas – *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society* (Part II, selections)

Suggested Further Reading:
**See Suggested Further Reading Section of Core Course XII

CORE COURSE XIV
Essay

Course Objectives: The Essay is a very effective testing technique for assessing students of language and literature. Through the writing of the Essay, students can express their grasp and knowledge of all that has been taught to them. It is simultaneously a test for evaluating higher order skills and a challenge and this is the space where students can express their critical thoughts and ideas. The Essay is, by definition, not bound by any rule(s) but involves both the authoring and the crafting skills. It allows students to go beyond and explore their own capabilities. The Essay, therefore, is a significant part of any goal-oriented curriculum.

1. Essay of 50 marks.

DSE
(***Any one*** of the following)

DSE IX
New Literatures

Course Objectives: This course aims to familiarize learners with writers of new literatures from around the world and enable them to comprehensively appreciate various cultures. The texts chosen are representative of the decolonized or settler cultures that have evolved into nationalities. The past and current flow of population, commodities and ideas; the margins writing back to the centre or rewriting and reappraising the centre are reflected in these texts.

<u>Unit I</u> [25 Marks]

1. Chinua Achebe – *No Longer at Ease*
2. George Lamming – 'Pleasures of Exile'
3. David Malouf – *An Imaginary Life*
4. Peter Carey – *True History Of The Kelly Gang* / Jack Davis – *No Sugar*
5. Nadine Gordimer – *July's People*
6. Alice Munro – *Selected Stories*
7. Margaret Atwood – *The Handmaid's Tale*
8. Sally Morgan – *My Place*

<u>Unit II</u> [25 Marks]

1. V.S. Naipaul – *A House for Mr Biswas*
2. Derek Walcott – *Dream on Monkey Mountain*
3. Ben Okri – *An African Elegy*
4. Joy Kogawa – *Obasan*
5. Michael Ondaatje – *The English Patient*
6. Rohinton Mistry – *A Fine Balance*
7. Tsitsi Dangaremba – *Nervous Conditions*
8. Chimananda Ngozi Adichie – *Purple Hibiscus*

Suggested Further Reading:

Bennett, Bruce and Strauss, Jennifer, ed. *The Oxford Literary History of Australia.* OUP, 1998. Print.

Howells, Coral Ann. *Margaret Atwood.* Palgrave Macmillan, 2005. Print..

Howells, Coral Ann and Kröller, Eva-Marie., ed. *The Cambridge History Of Canadian Literature.* Cambridge UP, 2009. Print.

Irele, F. Abiola and Gikandi, Simon, ed.*The Cambridge History of African and Carribean Literature. Vol I and II.* Cambridge UP, 2008. Print.

Pierce, Peter, ed. *The Cambridge History of Australian Literature.* Cambridge UP, 2011.Print.

Thieme, John, ed. *The Arnold Anthology of Post-Colonial Literatures in English,* Arnold, 1996. Print.

Quayson, Ato, ed. *The Cambridge History of Postcolonial Literature. Vol I&II.* Cambridge UP, 2011. Print.

DSE X

English Language Teaching II

Objectives

- To familiarize learners with different approaches and methods in ELT
- To expose learners to the nature of materials for language learning and make them evaluate and adopt materials in accord with specific criteria
- To introduce learners to the classification of tests and make them recognize the features of a good test
- To provide learners with the basics of various techniques of testing with their relative merits and demerits
- To expose learners to issues related to classroom interaction and management
- To make learners critically evaluate major issues and appreciate recent trends in ELT in India

1. **Approaches and Methods in Language Teaching**
    a. Grammar -Translation Method; Direct Method; Reading Method; Audio-Lingual Method; Structural Approach; Communicative Approach; Lexical Approach; Silent Way; Suggestopedia; Community Language Learning; Total Physical Response; Content-based, Task-based, and Participatory Approaches; New trends and perspectives
2. **Language Teaching Materials**
    a. Theoretical aspects; Pedagogic and non-pedagogic materials; Teaching aids; Impact of technology on language teaching materials; CALL – the basics; Evaluation of materials; Recent trends in materials design
3. **Testing and Evaluation**
    a. Theoretical aspects; Principles of evaluation; Types and techniques of evaluation
4. **Classroom interaction**
    a. Types, tools and techniques
5. **Classroom management**
    a. Problems and solutions
6. **ELT in the Indian Context**
    a. Major issues; Changing perspectives

Suggested Reading:

Branden, Kris Van Den, Martin. Bygate, and John.M. Norris. *Task-based Language Teaching: A Reader*. Amsterdam: John Benjamins Publishing, 2009. Print.

Brown, H Douglas. *Principles of language Learning and Teaching*. 2nd ed. Englewood Cliffs, N J: Prentice Hall, 1994. Print.

Davies, Alan. *Principles of Language Testing*. Oxford: Basil Blackwell, 1990. Print.

Finocchiaro, M and Brumfit, C. *The Functional-Notional Approach from Theory to Practice*. Oxford: Oxford University Press, 1983. Print.

Harris, David Payne. *Testing English as a Second Language*. New York: McGraw-Hill, 1969. Print.

Harrison, Andrew. *A Language Testing Handbook*. London: Macmillan, 1983. Print.

Hedge, Tricia. *Teaching and Learning in the Language Classroom*. Oxford: Oxford University Press, 2000. Print.

Holliday, Adrian. *Appropriate Methodology and Social Context*. Cambridge: Cambridge University Press, 1994.

Larsen-Freeman, Daine. *Techniques and Principles in Language Teaching*. Oxford: Oxford University Press, 1986. Print.

Nagaraj, Geetha. *English Language Teaching*. New Delhi: Orient blackswan, 2011. Print.

Nunan, David. *Language Teaching Methodology*. New York: Prentice Hall, 1991. Print.

Richards, Jack C. and Rodgers, Theodore S. *Approaches and Methods in Language Teaching*. 2nd ed. Cambridge: Cambridge University Press, 2001. Press.

Stevick, E. *Humanism in Language Teaching*. Oxford: Oxford University Press, 1990. Print.

Ur Penny. A Course Language Teaching. Cambridge University Press, 2012. Print.

Yalden, Janica. *The Communicative Syllabus: Evolution, Design and Implementation*. Oxford: Pergamon, 1983. Print.

DSE XI

Gender and Literature

Course Objectives: The paper has two units, Unit I, comprised of Feminist Texts [of which three shall be offered] and Unit II deals with Sexual Identity in Literature [any three texts]. In Unit I, Feminism is the unifying force behind writing from the West and East [more specifically, India]. The cause of women writing for and by themselves do not lack either ground breaking works or thought-provoking theories. The course modestly attempts to represent the significant Others of the human population in a brief span. Unit II ventures into the less explored area of Queer Studies, looking at texts expressing erotic desire and dealing with various aspects of same-sex relations, coming to terms with one's sexual identity, androgyny and the fluidity of gender. The broad objectives are

- To posit gender as a social construct.
- To represent women's voices and histories, breaking the silence of patriarchal oppression.
- To explore the plurality of concerns despite terms like 'feminist' or 'queer'.
- To accommodate the negation of gender stereotypes in a more inclusive world.

Unit I [25 Marks]

1. Elizabeth B. Browning – *Aurora Leigh* Book V
2. Virginia Woolf – *Mrs Dalloway*
3. Sylvia Plath – *The Bell Jar* / Doris Lessing – *The Golden Notebok*
4. Maxine Hong Kingston – *The Woman Warrior*
5. Elaine Showalter – 'Feminist Criticism in the Wilderness', 'Toward a Feminist Poetics' / Gayatri Chakravorty Spivak – Three Women's Texts and a Critique of Imperialism
6. Ashapurna Debi – *Subarnalata* (trans . Gopa Majumdar) / Suniti Namjoshi – *Feminist Fables*
7. Amrita Pritam – *Pinjar* / Attia Hosain – *Sunlight on a Broken Column* /
8. Manjula Padmanabhan – *Lights Out!*

Unit II [25 Marks]

1. Sappho – Poems: 31, Ode to Aphrodite, 94, Midnight Poem, poem no. 2, 105a
2. Judith Butler – *Gender Trouble*
3. Virginia Woolf – *Orlando*
4. Jeanette Winterson – *Oranges are Not the Only Fruit*
5. Ursula K. Le Guin – *The Left Hand of Darkness*
6. Henry David Hwang – *M. Butterfly*
7. Shyam Selvadurai – *Funny Boy*
8. Gloria Anzaldua – *Borderlands* / A. Revathy – *The Truth About Me: A Hijra Life Story*

Suggested Further Reading:

Butler, Judith. *Undoing Gender*. Routledge, 2004. Print.

Freedman, Estelle B, ed. *The Essential Feminist Reader*. Modern Library, 2007.Print.

Gopinath, Gayatri. *Impossible Desires: Queer Diasporas and South Asian Public Cultures.* Duke University Press, 2005.Print.

Hall, Donald E.and Jagose, A, ed. *The Routledge Queer Studies Reader*. Routledge, 2012. Print.

hooks, bell. *Ain't I a woman: Black Women and Feminism*. South End Press, 1981. Print.

Millett, Kate. *Sexual Politics*. Rupert Hart-Davis, 1971. Print.

Mohanty, Chandra Talpade .*Feminism Without Borders: Decolonizing Theory, Practicing Solidarity*.. Duke university Press, 2003. Print.

Mohanty, Chandra Talpade and Alexander, M. Jaqui, ed. *Feminist Genealogies, Colonial Legacies, Democratic Futures*. Routledge Press, 1996. Print.
Moi, Toril. *Sexual/textual Politics: Feminist Literary Theory*. Methuen,1985. Print.
Panja, Shormishtha and Lal, Malashri et al, ed. *Signifying the Self: Women and Literature.* Macmillan India, 2004. Print.
Scott, Sue and Morgan, David. ed. *Body Matters Essays on the Sociology of the Body*. Psychology Press, 1993. Print.
Sedgwick, Eve K..*Epistemology of The Closet*. University of California Press, 2008.Print.
Tharu, Susie and Lalita, K, ed. *Women Writing In India* Vol. I & II. O.U.P, 1991. Print.
Vanita, Ruth, ed.*Queering India: Same-sex Love and Eroticism in Indian Culture and Society*. Psychology Press, 2002. Print.
Vanita, Ruth and Kidwai, Saleem, ed. *Same-sex Love In India: Readings in Indian Literature.* Springer, 2016.Print.
Whitehead, Stephen M and Barrett, Frank, ed. *The Masculinities Reader*.Wiley, 2002. Print.

DSE XII

Modernism and Postmodernism

Course Objectives: Since postmodernism is both, an extension and a rejection of modernism the texts selected for the course would enlighten on the social and cultural factors that generated the ideas of modernism amd postmodernism. The variety of genres to be discussed in this course would certainly point to the narrative and the formalist tropes common to all the texts. More over the inclusion of the American texts would encourage the learners to compare European modernism and postmodernism with the overseas counterparts.

Unit I (Poetry and Drama) [25 Marks]

1. Luigi Pirandello – *Six Characters in Search of an Author / Henry IV*
2. Jean Anouilh – *Antigone*
3. Samuel Beckett – *Endgame*
4. Eugene Ionesco – *Rhinoceros*
5. Jacques Prévert – *Paroles*
6. Bertolt Brecht – *Poems 1913-1956*
7. Guillaume Apollinaire – *Alcools*
8. Edward Albee – *Who's Afraid of Virginia Woolf*

Unit II (Novels) [25 Marks]

1. John Fowles – *The French Lieutenant's Woman*

2. Albert Camus – *The Outsider*
3. Italo Calvino – *If on a Winter's Night a Traveler / Invisible Cities*
4. Gabriel García Márquez – *One Hundred Years of Solitude*
5. Milan Kundera – *The Unbearable Lightness of Being*
6. Umberto Eco – *The Name of the Rose*
7. Isabel Allende – *The House of the Spirits*
8. Kurt Vonnegut – *Slaughterhouse-Five*

Suggested Further Reading:

Stainton, Leslie. *Lorca: A Dream of Life*. London: Farrar Straus & Giroux, 1999. Print.

Gibson, Ian. *Federico García Lorca*. London: Faber & Faber, 1989. Print.

Bassanese, Fiora A. *Understanding Luigi Pirandello: Understanding Modern European and Latin American Literature*. Carolina: U of South Carolina Press, 1997. Print.

Caputi, Anthony. F. *Pirandello and the Crisis of Modern Consciousness*. Illinois: University of Illinois Press, 1988. Print.

Badiou, Alain. *On Beckett*. Trans and Ed. by Alberto Toscano and Nina Power. London: Clinamen Press, 2003. Print.

Hayman, Ronald. *World Dramatists: Eugène Ionesco*. New York: Frederick Unger, 1976. Print.

Benjamin, Walter. *Understanding Brecht*. Trans. Anna Bostock. London and New York: Verso, 1983. Print.

Salami, Mahmoud. *John Fowles's Fiction and the Poetics of Postmodernism*. Associated University Presses, 1992. Print.

Aubrey, James R. *John Fowles - A Reference Companion Greenwood Press*, 1991. Print.

Hanna, Thomas. *The Thought and Art of Albert Camus*. Chicago: Henry Regnery Co. 1958. Print.

Theody, Philip. *Albert Camus: A Study of his Works*. London: Hamish Hamilton. 1957. Print.

Chubb, Stephen. *I, Writer, I, Reader: the Concept of the Self in the Fiction of Italo Calvino*. Leicester: Troubador, 1997. Print.

Gabriele, Tomassina. *Italo Calvino: Eros and Language*. Teaneck, N.J.: Fairleigh Dickinson University Press, 1994. Print.

Bhalla, Alok, Ed. *García Márquez and Latin America*. New Delhi: Sterling Publishers Private Limited, 1987. Print.

Donskis, Leonidas. *Yet Another Europe after 1984: Rethinking Milan Kundera and the Idea of Central Europe*. Amsterdam: Rodopi, 2012. Print.

Sallis, Steven. "Naming the rose: readers and codes in Umberto Eco's novel". The *Journal of Midwest Modern Languages Association*. Vol. 19, no. 2: 3-12. 1986. Print.

DSE XIII

Popular Culture

Course Objectives: The term 'popular' may seem ordinary and innocuous to most. But, according to a number of thinkers, it contains perhaps the most significant ideas that define a time. Although, 'popular' has often been disregarded by the critical establishments, yet a close study of the elements uncover surprising truths. This course aims to look at certain sections of popular culture – examining both the idea of the 'popular' and of 'culture'. Through both theory and late twentieth century models this course aims to introduce the learners to the necessary concepts and enable to read for themselves how the culture constructs function in society.

Unit I (Theory) [25 Marks]

1. Walter Benjamin – 'The Work of Art in the Age of Mechanical Reproduction'
2. Noam Chomsky – 'Introduction' to *Manufacturing Consent: The Political Economy of the Mass Media*
3. Theodore Adorno and Max Horkheimer – 'The Culture Industry: Enlightenment as Mass Deception'
4. Roland Barthes – *Mythologies* (Selections)
5. John Berger – *Ways of Seeing*
6. Umberto Eco – *On Beauty: A History of a Western Idea* (Selections)
7. Susan Sontag – *Against Interpretation* (Selections)
8. Stuart Hall – 'The Work of Representation'

Unit II (Texts) [25 Marks]

1. Graphic Novels
    a. René Goscinny and Albert Uderzo – *Asterix the Legionary*
    b. Art Spiegelman – *Maus*
    c. Marjani Satrapi – *Persepolis*
    d. Samhita Arni and Moyna Chitrakar – *Sita's Ramayana*
    e. Chindu Sreedharan – *Epic Retold*
2. Popular Music
    a. Bob Dylan
    b. Cole Porter
    c. The Beatles
3. Cinema
    a. Ajoy Kar – *Saptapadi*
    b. Ramesh Sippy – *Sholay*

c. George Lukács – *Star Wars*
d. John Musker and Ron Clements – *Aladdin* / Roger Allers and Rob Minkoff – *The Lion King*

4. Fiction
    a. Ian Fleming – *From Russia with Love*
    b. Alistair MacLean – *The Guns of Navarone*
    c. Anne Rice – *Interview with the Vampire*
    d. Alexander McCall Smith – *The No. 1 Ladies' Detective Agency*
5. Comic Strips / Comics
    a. Archie
    b. The Superhero
    c. R. K. Laxman – *The Common Man*
    d. Dennis the Menace
6. Book Covers / Film Posters

Suggested Further Reading:

Storey, John. *Cultural Theory and Popular Culture: A Reader*. Atlanta: The University of Georgia Press, 1998. Print.

----- . *Introductory Guide to Cultural Theory and Popular Culture*. San Francisco: Pearson Longman, 2009. Print.

----- . *Cultural Theory and Popular Culture*. London and New York: Routledge, 2018. Print.

Mukerji, Chandra and Schudson, Michael (eds.). *Rethinking Popular Culture*. Oakland: University of California Press, 1991. Print.

Sturken, Martin and Cartwright, Lisa. *Practices of Looking: An Introduction to Visual Culture*. New York: Oxford University Press, 2003. Print.

Nayar, Pramod K. *Introduction to Culture Studies*. New Delhi: Viva, 2011. Print.

GENERIC ELECTIVE II

Children's Literature

Course Objectives: This course aims to familiarize the students with concepts, genres and the politics of Children's Literature. The fact that such literature is anything but childish and is often designed with either commercial or/and political motivations will find proper discussion here. Looking at a number of global and local instances, the students will evaluate and appreciate the timelessness of the classics and will make a comparative analysis with contemporary 'young adult' forms that are popular at the moment. How this kind of literature is created and how the mind of the child is envisioned through a necessarily 'adult' lens, will be the focal point of these discussions.

Unit I (Folk and Fairy Tales) [25 Marks]

1. *Arabian Nights*
2. *Thakurmar Jhuli* (Trans. Sukhendu Roy)
3. Folktales from India
4. Folktales from Africa
5. Russian Fairy Tales
6. Fairy Tales by Grimm Brothers
7. Fairy Tales by Hans Christian Anderson
8. American Indian Mythology

Unit II (Fiction) [25 Marks]

1. Lewis Carroll – *Alice's Adventures in Wonderland*
2. Rudyard Kipling – *The Jungle Books*
3. A. A. Milne – *Winnie-the-Pooh*
4. J.R.R. Tolkien – *The Hobbit*
5. J.K. Rowling – *Harry Potter and the Philosopher's Stone*
6. Satyajit Ray – *The Golden Fortress*
7. Stephanie Meyer – *Twilight*
8. Suzanne Collins – *The Hunger Games*

Suggested Further Reading:

Perrault, Charles. *The Complete Fairy Tales.* New Delhi: Oxford University Press, 2010. Print.

Hahn, Daniel. *The Oxford Companion to Children's Literature*. Oxford: Oxford University Press, 2015. Print.

Rudd, David. *The Routledge Companion to Childrens Literature.* Oxford: Routledge, 2010. Print.

_____. *Reading the Child in Children's Literature.* London: Palgrave MacMillan, 2013. Print.

Reynolds, Kimberley. *Children's Literature: A Very Short Introduction*. Oxford: Oxford University Press, 2011. Print.

Murphy, G. Ronald. *The Owl, The Raven and the Dove: The Religious Meaning of the Grimm's Magic Fairy Tales*. Oxford: Oxford University Press, 2002. Print.

Hunt, Peter. *Understanding Children's Literature*. Oxford: Routledge, 2005. Print.

Jaques, Zoe. *Children's Literature and the Posthuman: Animal, Environment, Cyborg.* New York: Routledge, 2015. Print.

Salem, Linda C. *Children's Literature Studies: Cases and Discussions*. Santa Barbara: Libraries Unlimited Inc., 2005. Print.

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 93 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 24.09.2018 (vide Item No.20) approved some revision in the existing Syllabus and Regulations of 2-year 4-Semester M.A. course in Urdu under CBCS (as notified in Notification No.CSR/52/18 dated 13.08.2018), in the Post-Graduate Departments of the University and in the affiliated Colleges offering Post-Graduate Courses under this University, laid down in the accompanying pamphlet.

The above shall be effective from the academic session 2018-2019.

10/11/2018

SENATE HOUSE
KOLKATA-700073
The 10th November, 2018

(Dr. Soumitra Sarkar)
Registrar (Officiating)

10/11

DEPARTMENT OF URDU
UNIVERSITY OF CALCUTTA

Regulations for the Degree of Master of Arts, M.A. in URDU under CBCS from 2018-2020 Session and onwards.

These Regulations may be called the **University of Calcutta Regulations for the Degree of Master of Arts, M.A. in URDU under CBCS from 2018-2020 Session and onwards.**

They shall apply to every candidate applying for admission, and subsequent registration, conduct and conferment of the Degree of Master of Arts, M.A. in URDU of this University. The above shall be effective from 2018-2020 Session and onwards.

1. To be considered for admission to M.A. in Urdu, a candidate must have obtained B.A degree with Urdu Honours.
2. The M.A. Examination in Urdu shall be held in four semesters.
3. A candidate must pass the entire M.A. Examination consisting of four Semesters within three consecutive years with reference to the date of admission to qualify for the degree.
4. In each academic year there shall be two Semester, ordinarily starting at July and January respectively. July – December session will comprise First and Third Semesters. January – June session will comprise Second and Fourth Semester.
5. The First and Third Semester Examinations shall be held ordinarily in December and the Second and Fourth Semester Examinations shall be held in June for each academic year.
6. The First and Second Semester examinations shall comprise five Core Course respectively each of 50 Marks. 40 Marks in Theory (written Exams) 10 Marks in Internal Assessment (In Written form).The Third and Fourth Semester Examinations shall comprise Three Core Course, One Discipline Specific Elective and One Generic Elective each of 50 Marks. 40 Marks in Theory (written Exams) 10 Marks in Internal Assessment (In Written form).
7. A candidate shall be eligible to sit in a semester examination provided he may prosecute a regular course of studies for that semester and attends at least 65% of the total number of classes separately held during the year. A student who has attended at least 55% of the classes but less than 65% of the classes shall, however, be eligible to appear in the examination upon obtaining condo nation order from the Vice-Chancellor and payment of requisite short percentage fee as may be prescribed by the University from time to time.
8. A candidate attending less than 55% of the classes shall not be allowed to sit in the examination. Such candidates shall be allowed to take fresh admission in the same semester in the following academic session and this opportunity of re admission cannot be availed of more than once during the entire tenure of studentship.
9. It shall be compulsory for candidates to pass each paper of the program to qualify for the degree.

10. To pass a paper a candidate shall have to get at least 40% marks. This is applicable to Internal Assessment also.
11. A candidate securing 60% or more marks in aggregate shall be placed in the First class and the ones with at least 40% but less than 60% marks in aggregate shall be placed in the second class. A candidate with less than 40% of marks in aggregate shall be declared unsuccessful.
12 There shall be no provision of improvement for candidates having already qualified for any particular papers. However, a candidate may apply for re-examination of the Theory (written) papers. No such option shall be available for Internal Assessment.
13 Re-examination of only one paper per semester shall be allowed for the candidates appearing at a semester examination as a whole provided he has secured at least 40% marks in rest of the papers of that semester examination.
14 All supplementary examinations should be completed within one year of the original examination.
15 Having been unsuccessful / failed or remaining absent in maximum of two papers a candidate shall be eligible to appear at the supplementary examination according to the University rules.
16 Candidates who are unsuccessful or remain absent in more than two papers can appear at the same semester without appearing at the higher semester and without attending the class.
17 A Candidate unsuccessful in Internal Assessment can appear in the same test held in the next year.
18 The candidate shall have to take the supplementary examination at the earliest available chance.
19 Absence in a paper in the examination or not enrolling for the examination itself shall be treated as one missed chance.
20 If a candidate fails to secure the qualifying marks (40%) in the supplementary examination then the candidate shall be considered unsuccessful.
21 In case of inability to appear at the supplementary examination, the candidate shall be considered unsuccessful.
22 To be entitle for award, rank and medal, a candidate must compete and qualify in all papers in each semester in first available chance.
23 Paper setters, moderators, examiners, scrutinizers for each paper shall be appointed by the authority on the recommendations of P.G. Board of Studies in Urdu.
24 Paper setters, moderators, examiners, scrutinizers for internal assessment shall be appointed by the P.G.Board of Studies in Urdu.
25 All examination scripts (both theory and internal assessment) shall be examined by the single internal examiner.
26 Duration of examination of each paper of 40 marks shall be two hours.
27 Duration of examination of each internal assessment paper of 10 marks shall be 30 minutes.
28 The detail Course Structure and Syllabus for the Degree of Master of Arts, M.A. in URDU under CBCS from 2018-2020 Session and onwards are as follows

Course Structure and Syllabus for the Degree of Master of Arts, M.A. in URDU under CBCS from 2018-2020 Session and onwards.

Sem. 1 Core Course

C.C 1 : Lesanyat Aur Urdu Zaban Ki Tarikh
C.C 2 : Tarikh-e-Adab Urdu Aagaz Ta Haal
C.C 3 : Urdu Ghazal- Kalasiki
C.C 4 : Urdu Mein Ghair Afsanwi Nasr (Inshaiya-Sawaneh-Khudnawisht Wagairah)
C.C 5 : Urdu Dastan Wa Manzoom Dastan

Sem. 2 Core Course

C.C 6 : Urdu Ghazal-Jaded
C.C 7 : Urdu Mein Ghair Afsanwi Nasr (Maqala-Khaka-Tanzo Mizah Wagairah)
C.C 8 : Urdu Fiction-Novel, Afsana, Drama
C.C 9 : Iqbal-Bang e Dara Ke Hawale Se
C.C 10 : Iqbal-Bale Jibreel Aur Zarb e Kalim Ke Hawale Se

Sem. 3 Core Course

C.C 11 : Urdu Nazm-Qasida, Marsia, Masnawi, Nazm (Quli Qutub Shah Ta Josh)
C.C 12 : Urdu Nazm (Taraqqi Pasand Adabi Tahreek Ta Jadidiat)
C.C 13 : Bengal Mein Urdu Adab (19th Century)

Discipline Specific Elective *(Choose any One from the following)*

D.S.E 1 : Adabi Tahreekat (Aligarh Tahreek Ta Roomani Tahreek)
D.S.E 2: Jadid Urdu Shairi (Ghazal Mein Naye Tajrabe)

Generic Elective *(Choose any One from the following)*

G.E 1: Jadid Urdu Shairi (Nazm, Geet, Sanet Wagairah)
G.E 2 : Urdu Mein Tarzuma Nigari

Sem. 4 Core Course

C.C 14 : Urdu Tanqeed (Taraqqi Pasand Adabi Tahreek Se Qabl)
C.C 15 : Urdu Tanqeed (Taraqqi Pasand Adabi Tahreek Ke Baad)
C.C.16 : Bengal Mein Urdu Adab (20th Century)

Discipline Specific Elective *(Choose any One from the following)*

D.S.E 3 : Adabi Tahreekat (Taraqqi Pasand Adabi Tahreek Ta Jadidiat)
D.S.E 4 : Ghalib (Khususi Motala)

Generic Elective *(Choose any One from the following)*

G.E 3 : Meer (Khususi Motala)
G.E 4 : Urdu Aur Taqabli Motala-e-Adab

Total Course 20
Total Credits 80
Total Marks 1000

Each Course Carries 04 Credits
Each Course Carries 50 Marks
Each Semester carry 250 Marks / 20 Credits

40 Marks in Theory (written Exams)
10 Marks in Internal Assessment (In Written form)

Core Course	C.C	16 X 4 = 64 Credits
Discipline Specific Elective	D.S.E	2 X 4 = 8 Credits
Generic Elective	G.E	2 X 4 = 8 Credits

.....
Total 80 Credits

4 Credit means 4 hour Classes in a week x 16 weeks (04 Months) = 64 hours for each courses.

Semester wise Table

Course	Semester 1	Semester 2	Semester 3	Semester 4
C.C	5 C.C 1 to 5	5 C.C 6 to 10	3 C.C 11 to 13	3 C.C 14 to 16
D.S.E			1 D.S.E 1 or 2 (Option)	1 D.S.E 3 or 4 (Option)
G.E			1 G.E 1 or 2 (Option)	1 G.E 3 or 4 (Option)
Total No. of Courses and Marks	5x50= 250	5x50= 250	5x50= 250	5x50= 250
Total Credits	20	20	20	20
Total Credits 80 in 4 Semester Total Marks 1000 in 4 Semester				

Syllabus for the Degree of Master of Arts, M.A. in URDU under CBCS

from 2018-2020 Session and onwards.

Sem. 1 Core Course

C.C 1 : Lesanyat Aur Urdu Zaban Ki Tarikh

لسانیات اور اردو زبان کی تاریخ

- لسانیات کے بنیادی خدوخال، تعریف اور دیگر علوم سے رشتہ
- لسانیات کی شاخیں۔ توضیحی لسانیات۔ تاریخی لسانیات۔ زبان کے بنیادی اور آفاقی اصول
- اطلاقی لسانیات۔ اشترا کی مطالعۂ زبان۔ زبان کا بین العلومی تناظر
- زبان کا آغاز اور اس کے متعلق تھیوریاں۔ اردو کی پیدائش کے سلسلے میں مختلف نظریات۔ اردو اور برج بھاشا۔ اردو اور دکنی۔ اردو اور پنجابی۔ اردو اور کھڑی بولی
- زبان کے مختلف خاندان۔ آریاؤں کا داخلۂ ہند۔ ہند آریائی خاندان۔ ہند آریائی ادوار۔
- ہند آریائی پراکرتیں۔ ہند آریائی اپ بھرنشیں۔ اردو زبان کا آغاز وارتقاء

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Sem. 1 Core Course

C.C 2 : Tarikh-e-Adab Urdu Aagaz Ta Haal

تاریخ ادب اردو : آغاز تا حال

- اردو کا ابتدائی زمانہ:

(اردو کے مختلف نام۔ اردو شعر و ادب کے مختلف نمونے۔ امیر خسرو۔ صوفیائے کرام کی خدمات۔ خواجہ بندہ نواز، اشرف جہانگیر سمنانی، فریدالدین گنج شکر، شرف الدین یحیٰ منیری، وجیہ الدین گجراتی، اشرف بیابانی، وغیرہ کی خدمات کا جائزہ۔ کبیر، گرونانک، رام دیو وغیرہ کی خدمات)

- اردو زبان: آغاز و ارتقا:

جنوبی ہند:

(دکن میں اردو کا آغاز و ارتقا۔ بہمنی دور۔ عادل شاہی و قطب شاہی دور۔ ایک نئی مشترک تہذیب کا فروغ۔ قلی قطب شاہ، وجہی، فضلی، ابن نشاطی، ولی، سراج وغیرہ کا تفصیلی مطالعہ۔ نظامی کی مثنوی کدم راؤ پدم راؤ کی تاریخی اور لسانی اہمیت)

شمالی ہند:

(شمال میں اردو کا فروغ۔ ولی دکنی کے اثرات۔ سبکِ ہندی کی روایت۔ فورٹ ولیم کالج سے پہلے، فورٹ ولیم کالج، دلّی کالج، اردو کے دو بڑے اسکول: دلّی اور لکھنو کے حوالے سے نثر اور شاعری کی مختلف صورتوں کا فروغ)

- اردو ادب کے قدیم رجحانات:

(ایہام گوئی، اصلاحِ زبان اور اصلاحِ سخن کی روایت [دہلی اور لکھنو میں])

- اردو ادب کے جدید رجحانات:

(نظم جدید، علی گڈھ تحریک، ترقی پسند تحریک، حلقۂ اربابِ ذوق، جدیدیت اور مابعد جدیدیت کے حوالے سے)

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Sem. 1 Core Course

C.C 3 : Urdu Ghazal- Kalasiki

اردو غزل : کلاسیکی

- غزل کا مفہوم۔غزل کا فن اور اس کی ہیئت۔غزل کے موضوعات۔غزل کی ابتدائی شکل۔
- دکن اور شمال میں غزل کا ارتقا۔غزل کی شعریات اور اس کے وجودیاتی اور علمیاتی تصورات۔غزل کی مقبولیت کے اسباب۔
- دبستانِ دہلی کی غزل کا امتیاز۔لکھنوی دبستانِ غزل کی خصوصیات۔
- ۱۸۵۷ء کے بعد اردو غزل کے موضوعات۔غزل پر اعتراضات کا سلسلہ۔حالی،عظمت اللہ خاں اور کلیم الدین احمد کا نظریہ۔
- اردو غزل پر اقبال کی غزل گوئی کے اثرات-غزل کا احیاء-حسرت کی غزل گوئی۔
- درج ذیل شعرا کا خصوصی مطالعہ:

  ولی،سراج،میر،مصحفی،آتش،غالب،مومن،داغ،شاد،حسرت،اقبال۔

متنی تدریس

- ولی دکنی : یاد کرنا ہر گھڑی اس یار کا
  جلوہ گر جب سوں وہ جمال ہوا
- سراج اورنگ آبادی : چراغِ مہہ سے روشن تر ہے حسنِ بے مثال اس کا
  شکر اللہ ان دنوں تیرا کرم ہونے لگا

- میر تقی میر : دیکھ تو دل کہ جاں سے اٹھتا ہے
  گرمی سے میں تو آتشِ غم کی پگھل گیا

- غلام ہمدانی مصحفی : تجھ سے گر وہ دلا نہیں ملتا
  اک حرفِ کن میں جس نے کون و مکاں بنایا

- آتش : توڑ کر تارِ نگہ کا سلسلہ جاتا رہا
  وحشتِ دل نے کیا ہے وہ بیاباں پیدا

- مرزا غالب : نقش فریادی ہے کس کی شوخیٔ تحریر کا
سب کہاں کچھ لالہ و گل میں نمایاں ہو گئیں

- مومن خاں مومن : وعدۂ وصلت سے دل ہو شاد کیا
غیروں پہ کھل نہ جائے کہیں راز دیکھنا

- داغ دہلوی : خاطر سے یا لحاظ سے میں مان تو گیا
ملتے ہی بے باک تھی وہ آنکھ شرمائی ہوئی

- شاد عظیم آبادی : زیست ہے نام تیری فرقت کا
خدا جانے سنا کانوں نے کیا، آنکھوں نے کیا دیکھا

- سر محمد اقبال : نالہ ہے بلبلِ شوریدہ ترا خام ابھی
پریشاں ہو کے میری خاک آخر دل نہ بن جائے

- حسرت موہانی : روشن جمالِ یار سے ہے انجمن تمام
حسنِ بے پروا کو خود بین و خود آرا کر دیا

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Sem. 1 Core Course

C.C 4 : Urdu Mein Ghair Afsanwi Nasr (Inshaiya-Sawaneh-Khudnawisht Wagairah)

اردو میں غیر افسانوی نثر : انشائیہ، سوانح، خودنوشت وغیرہ

- نثر کی تعریف ۔ نثر اور نظم میں فرق ۔ نثر کی امتیازی خصوصیات ۔ اردو نثر کی ابتدائی کاوشیں ۔ افسانوی اور غیر افسانوی نثر میں فرق ۔ اردو کی غیر افسانوی نثر کی مختلف اصناف کا تعارف ۔ تذکرہ ۔ مکتوب ۔ انشائیہ ۔ سفرنامہ ۔ مقالہ ۔ خاکہ ۔ خودنوشت سوانح ۔ رپورتاژ ۔ صحافت ۔ تاریخ نویسی ۔ وغیرہ ۔ اردو میں غیر افسانوی نثر کا ارتقائ ۔
- تذکرہ نگاری کی روایت ۔ میر کا تذکرہ نکات الشعرا
- دہلی کالج کے مصنفین ۔ سرسید اور ان کے معاصرین ۔ ماسٹر رام چندر، سرسید، حالی، شبلی، نذیر احمد، ذکاءاللہ کی نثر کا تفصیلی مطالعہ ۔
- ادبی مکاتیب ۔ فن ۔ اسالیب ۔ ارتقائی سفر ۔ غالب، آزاد، اقبال، نیاز اور فیض کے خطوط ۔
- انشائیہ کی فنی خصوصیات ۔ اردو میں انشائیہ نگاری کا آغاز وارتقا ۔ محمد حسین آزاد، عبدالحلیم شرر، فرحت اللہ بیگ وغیرہ کی انشائیہ نگاری ۔
- سوانح نگاری ۔ فنی خصوصیات ۔ اردو کے اہم سوانح نگار ۔ حالی اور شبلی کی سوانح نگاری کا خصوصی مطالعہ ۔ یادگارِ غالب اور الفاروق کا عمومی مطالعہ ۔
- خودنوشت سوانح نگاری ۔ فنی خصوصیات ۔ جوش، آل احمد سرور، امرتیہ پریتم، ندا فاضلی، انتظار حسین وغیرہ کی خودنوشت سوانح ۔
- ادبِ لطیف کی روایت ۔ سجاد حیدر یلدرم، سلطان حیدر جوش، نیاز فتح پوری، سجاد انصاری وغیرہ کا تفصیلی جائزہ ۔

متنی تدریس

- کربل کتھا — ''جب مرض حضرت کے ۔۔۔۔۔ بیماری نہایت شدت پر ہوئی''
- غالب کا خط — ''جانِ غالب، تمہارا خط ملا ۔ غزل اصلاح کے بعد پہنچتی ہے''
  میر مہدی مجروح کے نام (خط نمبر ۳۱)
- ابوالکلام آزاد کا خط — ''قید و بند کی زندگی کا یہ چھٹا تجربہ ہے ۔۔۔۔۔'' (خط نمبر:۶)
- اقبال کا خط — ''کل ظفر علی خاں صاحب سے سنا تھا''
  (اکبر الٰہ آبادی کے نام)
- فیض کا خط — ''تمہیں اور تمہارے گھرانے کو ۔۔۔۔۔'' (خط نمبر:۲۰)

- جنت الحمقاء — محمد حسین آزاد
- مردہ بدست زندہ — فرحت اللہ بیگ
- میری موجودہ زندگی — جوش ملیح آبادی
- سیلِ زمانہ — سجاد حیدر یلدرم
- برسات — نیاز فتح پوری

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Sem. 1 Core Course

C.C 5 : Urdu Dastan Wa Manzoom Dastan

اردو داستان و منظوم داستان

- فکشن کی تعریف، امتیازات اور اقسام- داستان، منظوم داستان، ناول، ناولٹ، افسانہ، ڈراما۔
- داستان- ایک صنف کی حیثیت سے- مختصر قصوں اور طویل داستانوں کا جائزہ، داستان کی تکنیک، دلچسپی، طوالت، قصہ در قصہ، رومانی فضا، فوق الفطرت عناصر اور ان کی مختلف جہتیں- کرداروں کی نوعیت، طلسمی داستانوں کے اسالیب- خیر و شر کا تصادم۔
- داستانوں کا معاشی، معاشرتی اور سیاسی پس منظر داستانوں کی تہذیبی اور ثقافتی قدر و قیمت۔
- اردو داستانوں کا آغاز و ارتقاء- سب رس مہر افروز دلبر، طلسم ہوش ربا- بوستان خیال وغیرہ کے حوالے سے- فورٹ ولیم کالج کے تحت لکھی جانے والی داستانیں- داستانوں کے زوال کے اسباب۔
- اردو میں منظوم داستانوں (مثنوی) کا آغاز و ارتقاء- شمالی ہند، دکن اور لکھنؤ کی منفرد مثنویوں کا تعارف- ملّا وجہی، میر تقی میر، میر حسن، دیا شنکر نسیم اور نواب مرزا شوق کے حوالے سے۔

متنی تدریس

ملّا وجہی	—	سب رس	— آغاز داستان کے چار صفحے
میر امن دہلوی	—	باغ و بہار	— سیر پہلے درویش کی
رجب علی بیگ	—	فسانۂ عجائب	— مکمل دیباچہ
ملّا وجہی	—	قطب مشتری	— درشرح شعر گوید
میر تقی میر	—	مثنوی در ہجو خانہ خود	— ابتدائی ۴۰/اشعار
دیا شنکر نسیم	—	گلزارِ نسیم	— آوارہ ہونا بکاؤلی کا تاج الملوک گل چیں کی تلاش میں

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Sem. 2 Core Course

C.C 6 : Urdu Ghazal-Jaded

اردو غزل : جدید

- ادبی تحریکات اور اردو غزل۔ ترقی پسند تحریک۔ جدیدیت۔
- غزل کے نئے موضوعات اور اسالیب۔ یگانہ آرٹ۔
- اردو غزل پر ترقی پسند تحریک کے اثرات۔ غزل میں سماجی، سیاسی، اقتصادی، اخلاقی موضوعات۔
- ۱۹۶۰ء کے بعد جدید غزل کا رنگ و آہنگ۔ نئی شعری روایت۔ علامتوں کا استعمال۔ اینٹی غزل، آزاد غزل وغیرہ کا جائزہ۔
- درج ذیل شعرا کی غزل گوئی کا خصوصی مطالعہ:

یگانہ، فراق، فیض، ناصر کاظمی، مجروح سلطان پوری، جاں نثار اختر، بانی، زیب غوری، شکیب جلالی، شہریار، ظفر اقبال، ندا فاضلی، عرفان صدیقی۔

متنی تدریس

- یگانہ : دنیا کا چلن ترک کیا بھی نہیں جاتا
  گوشہ گیری ہے اک انوکھا سانگ

- فراق گورکھپوری : زمیں بدلی ، فلک بدلا ، مذاقِ زندگی بدلا
  کسی کا یوں تو ہوا کون عمر بھر ، پھر بھی

- فیض احمد فیض : اب وہی حرفِ جنوں سب کی زباں ٹھہری ہے
  ترے غم کو جاں کی تلاش تھی، ترے جانثار چلے گئے

- ناصر کاظمی : شہر در شہر گھر جلائے گئے
  گلی گلی آباد تھی جن سے کہاں گئے وہ لوگ

- جاں نثار اختر : فرصتِ کار فقط چند گھڑی ہے یارو
  اشعار مرے یوں تو زمانے کے لئے ہیں

- منچندابانی : ہم ہیں منظر سیہ آسمانوں کا ہے
عجیب رونا سسکنا نواحِ جاں میں ہے

- زیب غوری : گوہر ، صدف لباس سے باہر نکال لے
وہ کہہ رہا ہے یہی ہے شکستہ تن میرا

- شکیب جلالی : جہاں تلک بھی یہ صحرا دکھائی دیتا ہے
خموشی بول اٹھے ، ہر نظر پیغام ہو جائے

- شہریار : دھوپ کے دشت میں بے سایہ شجر میں ہم تھے
مشعلِ درد پھر اک بار جلالی جائے

- ظفر اقبال : ہزار ربط بڑھائیں خیالِ خام سے ہم
ایک ہی نقش ہے جتنا بھی جہاں رہ جائے

- ندا فاضلی : کبھی کسی کو مکمل جہاں نہیں ملتا
بات کم کیجیے ، ذہانت کو چھپاتے رہئے

- عرفان صدیقی : کوزہ گر پھر اسی مٹی میں ملاتا ہے مجھے
بہت دنوں تو رہا اپنا نکتہ چین بھی میں

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Sem. 2 Core Course

C.C 7 : Urdu Mein Ghair Afsanwi Nasr (Maqala-Khaka-Tanzo Mizah Wagairah)

اردو میں غیر افسانوی نثر: مقالہ، خاکہ، طنز و مزاح وغیرہ

- اردو نثر میں طنز و مزاح کی روایت۔ اردو طنز و مزاح کا فروغ۔ اردو کے ابتدائی طنز و مزاح نگار۔ فرحت اللہ بیگ، پطرس بخاری، مشتاق احمد یوسفی، شفیق الرحمن کے کارناموں کا تفصیلی جائزہ۔
- علمی نثر کی خصوصیات۔ مقالے کا مفہوم۔ دیگر مماثل اصنافِ نثر کا فرق۔ اردو میں علمی نثر کا آغاز و ارتقائ۔ سرسید کی مقالہ نگاری۔ سید سلیمان ندوی کی مقالہ نگاری۔ عابد حسین، خواجہ غلام السیدین، مولانا عبدالماجد دریابادی اور دیگر اہم مقالہ نگار۔
- خاکہ نگاری کی روایت۔ فنی خصوصیات۔ سوانح نگاری اور خاکہ نگاری کا فرق۔ اردو کے اہم خاکہ نگار۔ عبدالحق اور رشید احمد صدیقی کی خاکہ نگاری کا تفصیلی جائزہ۔

متنی تدریس

● میں اور میبل	پطرس بخاری
● انتخاب از اسبابِ بغاوتِ ہند (۱۸۵۷ء کا غدر)	سرسید احمد خاں
● نور خاں	عبدالحق
● محمد علی	رشید احمد صدیقی

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Sem. 2 Core Course

C.C 8 : Urdu Fiction - Novel, Afsana, Drama

اردو فکشن : ناول، افسانہ، ڈراما

- ناول کی اقسام- اجزائے ترکیبی- داستان، ناول، افسانہ اور ڈرامے کا فرق۔
- اردو ناول کا آغاز وارتقاء- معاشرتی اور فنّی تغیرات، اصلاحی، رومانی، سماجی، سوانحی، تاریخی، سرّی (جاسوسی) ناول کا جائزہ۔
- سرسیّد تحریک، ترقی پسند تحریک اور جدیدیت کے رجحانات اردو ناول میں۔
- نذیر احمد، مرزا ہادی رسوا، رتن ناتھ سرشار اور عبدالحلیم شرر کی ناول نگاری کی امتیازی خصوصیات۔
- ناول میں حقیقت نگاری- پریم چند اور ان کا فن- وجودیت اور شعور کی رو- بیسویں صدی کے ناول نگار بحوالہ کرشن چندر، عزیز احمد، قرۃ العین حیدر، عبداللہ حسین، شوکت صدیقی اور دوسرے۔
- امراؤ جان ادا، گئودان، آگ کا دریا کا تفصیلی جائزہ۔
- اردو میں افسانہ نگاری کا آغاز وارتقاء، مختلف اقسام، حکایات، قصّے اور افسانے کا فرق- اجزائے ترکیبی- وحدت تاثر۔
- سجاد حیدر یلدرم، نیاز فتح پوری، سلطان حیدر جوش اور پریم چند کی افسانہ نگاری۔
- ترقی پسند تحریک، انگارے اور اردو افسانے پر ان کے اثرات، افسانے کا سفر دیہات سے شہر کی طرف- افسانہ اور حقیقت نگاری، نفسیات نگاری۔

متنی تدریس

کفن	—	پریم چند
کالو بھنگی	—	کرشن چندر
ببل	—	راجندر سنگھ بیدی
ٹوبہ ٹیک سنگھ	—	سعادت حسن منٹو
آنندی	—	غلام عباس
چوتھی کا جوڑا	—	عصمت چغتائی

پرندے پکڑنے والی گاڑی — غیاث احمد گدی

- ڈرامے کی تعریف- اجزائے ترکیبی- اقسامِ ڈرامہ- اسٹیج ڈرامہ، ادبی ڈرامہ، یک بابی، ریڈیائی، ٹیلی ڈرامے کا تکنیکی فرق۔
- اردو ڈرامے کی اجمالی تاریخ، ڈرامے کے ابتدائی نقوش، امانت کی اندر سبھا، نوابی دربار اور آغا حشر اور ان کے ہمعصروں کے ڈرامے۔
- ادبی ڈرامے کی روایت- امتیاز علی تاج، محمد مجیب، عابد حسین وغیرہ کے ڈرامے۔
- یک بابی ڈرامے کا جائزہ- منٹو، مرزا ادیب، اُپندر ناتھ اشک، کرشن چندر وغیرہ کے حوالے سے۔
- ''انارکلی'' کا تنقیدی مطالعہ۔

Sem. 2 Core Course

C.C 9 : Iqbal-Bang e Dara Ke Hawale Se

اقبال : بانگ درا کے حوالے سے

- حیاتِ اقبال۔ اقبال کے عہد کا سیاسی وسماجی پس منظر۔ عہدِ اقبال کی اردو شاعری۔ اقبال کی ابتدائی شاعری۔ ہندوستان کا تہذیبی احیائ۔ سماجی اور تعلیمی اصلاحات کی تحریکیں۔ قومی اور وطنی شاعری۔
- رومانی تحریک۔ خصوصیات۔ اقبال پر رومانی تحریک کے اثرات۔ اقبال کی غزل۔ روایتی غزل میں نئے رجحانات۔
- اقبال کی نظم نگاری بانگِ درا کی روشنی میں۔
- پہلی اور دوسری جنگِ عظیم کے آثار۔ اقبال کی شاعری پر عالمِ اسلام اور روس کے اثرات۔

متنی تدریس

''بانگِ درا'' سے درج ذیل کلام:

نظمیں :
- گلِ رنگیں
- شکوہ
- خضرِ راہ
- بلادِ اسلامیہ

غزلیں :
- الٰہی عقلِ خجستہ پے کو ذرا سی دیوانگی سکھا دے
- زمانہ دیکھے گا جب مرے دل سے محشر اٹھے گا گفتگو کا

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Sem. 2 Core Course

C.C 10 : Iqbal-Bale Jibreel Aur Zarb e Kalim Ke Hawale Se

اقبال : بالِ جبریل اور ضربِ کلیم کے حوالے سے

- تحریکِ آزادی۔ برصغیر کے ملّی مسائل اور اقبال۔ مغربی تہذیب و تمدن پر اقبال کی تنقید۔ نوآبادیاتی فکر سے متعلق اقبال کے تصورات۔ اقبال کی غزل گوئی و نظم گوئی۔ (’بالِ جبرئیل‘ اور ’ضربِ کلیم‘ کی روشنی میں)
- اقبال کا فلسفیانہ نظام۔ ابنِ عربی، نطشے اور برگساں کا اثر۔ اقبال کا تصورِ عشق۔ تصورِ خودی۔ مردِ مومن۔ شاہین۔ کرگس۔ ابلیس۔
- اقبال کی نثر نگاری – مضامین، مکتوبات، خطبات۔
- اقبال کے معاصرین۔ اقبال کے اثرات بعد کے شعرا پر۔

متنی تدریس

’’بالِ جبرئیل‘‘ سے درج ذیل کلام:

نظمیں :
- لینن خدا کے حضور میں
- ذوق و شوق
- جبرئیل و ابلیس

غزلیں :
- میری نوائے شوق سے شور حریمِ ذات میں
- اگر کج رو ہیں انجم آسماں تیرا ہے یا میرا
- گیسوئے تاب دار کو اور بھی تاب دار کر

’’ضربِ کلیم‘‘ سے درج ذیل کلام:

نظم :
- شعاعِ اُمید

غزلیں :
- تیری متاعِ حیات ، علم و ہنر کا سرور
- نہ میں عجمی ، نہ ہندی ، نہ عراقی و حجازی

Sem. 3 Core Course

C.C 11 : Urdu Nazm-Qasida, Marsia, Masnawi, Nazm (Quli Qutub Shah Ta Josh)

اردو نظم : قصیدہ، مرثیہ، مثنوی، نظم (قلی قطب شاہ تا جوش)

- نظم کا اصطلاحی مفہوم-نظم کی اقسام-قصیدہ، مرثیہ، مثنوی، پابند نظم، نظمِ معرا، آزاد نظم، نثری نظم، گیت، سانیٹ وغیرہ۔
- قصیدہ

قصیدہ بحیثیت صنف سخن-قصیدہ کی تعریف اور اس کی ہیئت- دیگر اصنافِ سخن سے امتیاز-قصیدہ کے اجزائے ترکیبی-تاریخی، معاشرتی اور معاشی پس منظر-موضوعات اور اسالیب۔ دکن، شمالی ہند اور لکھنؤ میں قصیدہ نگاری کا آغاز وارتقاء-سودا اور ذوق کا خصوصی مطالعہ۔قصیدہ کا عروج وزوال

- مرثیہ

مرثیے کا لغوی اور اصطلاحی مفہوم-اجزائے ترکیبی-صنف مرثیہ کی تاریخ وتعریف-اقسام-موضوعات-اسالیب۔ دکن، دہلی اور لکھنؤ میں مرثیے کا عروج واستحکام اور زوال۔انیس ودبیر کا خصوصی مطالعہ۔

- مثنوی

مثنوی کی تعریف-اجزائے ترکیبی اور ہیئت-آغاز وارتقائ-مختلف مثنوی نگاروں کا عمومی جائزہ۔

- نظم

نظم بحیثیت صنف-آغاز وارتقاء-اقسام-ہیئتی-تکنیکی اور موضوعاتی اعتبار سے جائزہ۔نظم کے ابتدائی نقوش-دکن میں۔شمالی ہند میں نظم گوئی کا آغاز۔۱۸۵۷ء کے انقلاب کے اثرات-انجمنِ پنجاب سے پیدا شدہ رجحانات-حالی، آزاد اور ان کے معاصرین کی نظم گوئی-انگریزی نظموں کے تراجم

۔

اردو نظم میں ہیئت کے تجربے-اس کے اثرات-اکبرالہ آبادی، اقبال، چکبست، جوش وغیرہ کا خصوصی مطالعہ۔

متنی تدریس

- قصیدہ : اُٹھ گیا بہمن ودے کا چمنستان سے عمل (سوداؔ)
- قصیدہ : ساون میں دیا پھر مہہ شوال دکھائی (ذوقؔ)
- مرثیہ : فرزند پیمبر کا مدینے سے سفر ہے (انیسؔ)
- مرثیہ : پیدا شعاعِ مہر کی مقراض جب ہوئی (دبیرؔ)

- مثنوی: ملّا وجہی — مدح ابراہیم قطب شاہ گوید (قطب مشتری)
  میر تقی میرؔ — محبت نے ظلمت سے کاڑھا ہے نور (شعلۂ عشق)
- نظم: قلی قطب شاہ — فتنۂ دکھن
  نظیر اکبر آبادی — کوڑی
  حالی — مناجاتِ بیوہ
  اکبر الٰہ آبادی — دربار ۱۹۱۱ء
  اقبال — ابلیس کی مجلسِ شوریٰ
  چکبست — قومی مسدّس
  جوش — ایسٹ انڈیا کمپنی کے فرزندوں کے نام

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Sem. 3 Core Course

C.C 12 : Urdu Nazm (Taraqqi Pasand Adabi Tahreek Ta Jadidiat)

اردو نظم : ترقی پسند تحریک تا جدیدیت

- اردو میں ترقی پسند ادبی تحریک- اردو نظم پر ترقی پسند تحریک کے اثرات- سماجی حقیقت نگاری اور اشتراکیت کا تصور- فیض اور مخدوم کا خصوصی جائزہ۔
- حلقۂ ارباب ذوق کے زیر اثر نظموں میں نیا رجحان- داخلیت اور تجرید۔
- میراجی اور ن-م- راشد کا خصوصی مطالعہ۔
- اختر الایمان کی نظم گوئی۔
- جدیدیت بحیثیت رجحان- نظم سے متعلق شمس الرحمن فاروقی کے تصورات۔
- عمیق حنفی- شہریار- بلراج کومل- محمد علوی- عادل منصوری- کمار پاشی- ندا فاضلی کا خصوصی مطالعہ۔

متنی تدریس

سمندر کا بلاوا	—	میراجی
خودکشی	—	ن-م- راشد
انتباہ	—	فیضؔ
یادیں	—	اختر الایمان
آئینہ خانے کے قیدی سے	—	عمیق حنفی
نیا کھیل	—	شہریار
یہ زرد بچے	—	بلراج کومل
آخری دن کی تلاش	—	محمد علوی
وقت کی پیٹھ پر	—	عادل منصوری
لفظوں کا پُل	—	ندا فاضلی
مٹی کی کان	—	افضال احمد سید
ریشم بننا کھیل نہیں	—	علی اکبر ناطق

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Sem. 3 Core Course

C.C 13 : Bengal Mein Urdu Adab (19th Century)

بنگال میں اردو ادب : انیسویں صدی

- بنگال میں اردو زبان و ادب کا آغاز، سماجی اور سیاسی پس منظر۔
- بنگال میں اردو کا ارتقائی سفر انیسویں صدی کے اواخر تک۔

(الف) قدرت، مخلص، انشاء اور طپش۔

(ب) مظہر علی خاں ولا، شیر علی افسوس، معین الدین فیض، کاظم علی جواں، نہال چند لاہوری، کرشنا دیب بہادر کنور۔

(ج) مولوی رشید النبی وحشت، ضیغم، عبدالغفور نساخ، قاضی صادق اختر، عصمت اللہ انسخ وغیرہ۔

- فورٹ ولیم کالج کی ادبی خدمات کا عمومی تعارف-گل کرسٹ، حیدر بخش حیدری، میر امن، حفیظ الدین بردوانی، مولوی اکرام علی اور دوسرے نثر نگار
- ۱۸۵۷ء کی ناکام جنگِ آزادی کے اثرات- واجد علی شاہ اور ان کے ہم عصروں کی ادبی خدمات۔ سیّد محمد آزاد، عبدالغفور شہباز، نساخ، واقف وغیرہ کی نثری خدمات۔

متنی تدریس

- قدرت : ہماری خاک پر بلبل یہ کہتی بے قرار آئی
  دمِ تیغ کا میں ہوں تشنہ لب مجھے مرگ سے سروکار ہے

- مخلص : صنم کے دل کو مری آہ و نالہ آب کرے
  مجلس سے روتی شمع نہ وقت سحر گئی

- انشاء : کوئی اس دام محبت میں گرفتار نہ ہو
  رونا ہی تھا یہ موجب افشاے راز عشق

- طپش : الم سے، درد سے، خونِ جگر سے، یاس سے، غم سے
  فغاں لب پر، سرشک آنکھوں پہ، نالہ دل میں رہتا ہے

- نساخ : جب تک کہ حالِ زار پہ وہ مہرباں نہ تھا
  رکھتے ہیں اس بت کو ہم جاں سے عزیز

- داستان : انتخاب از مذہب عشق-نہال چند لاہوری-آغازِ داستان۔
  انتخاب از رانی کیتکی کی کہانی-انشاءاللہ خاں انشاؔ۔
- خودنوشت : انتخاب از ''خودنوشتِ نساخ''
- ڈراما : بیمار بلبل-احمد حسین واقفؔ

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Sem. 3 Discipline Specific Elective *(Choose any One from the following)*

D.S.E 1 : Adabi Tahreekat (Aligarh Tahreek Ta Roomani Tahreek)

ادبی تحریکات :علی گڑھ تحریک تا رومانی تحریک

- علی گڑھ تحریک

علی گڑھ تحریک کا پس منظر ـــــــ فورٹ ولیم کے اثرات ۔تحریکِ سید احمد بریلوی۔آریہ سماج تحریک ۔دِلّی کالج تحریک ۔

- سرسید احمد کا سیاسی موقف ۔حالات کا حقیقت پسندانہ تجزیہ۔رسالہ اسبابِ بغاوتِ ہند۔سرسید اور اصلاح، معاشرت ۔سائنٹفک سوسائٹی ۔علی گڑھ انسٹی ٹیوٹ گزٹ ۔تہذیب الاخلاق اور زبان کے تحفظ کا مسئلہ۔سرسید کے رفقاء کی ادبی خدمات ۔

- انجمنِ پنجاب

دِلّی کالج کے ادیبوں کی لاہور میں آمد۔ انجمنِ پنجاب کا قیام ۔ اغراض و مقاصد۔ ہفتہ وار مباحثے۔ مشاعرے۔موضوعی نظموں کے اوّلین تجربات ۔اردو نظم کی مختلف صورتیں۔انجمنِ پنجاب کے اثرات ۔اسمٰعیل میرٹھی، اقبال، محمد حسین آزاد، وغیرہ کی ادبی خدمات ۔

- رومانی تحریک

اردو میں رومانی تحریک ۔علی گڑھ تحریک کا ردِعمل ۔رومانیت کی روایت ۔رومانی تحریک کے ادبا اور ان کی رومانیت ۔ابوالکلام آزاد، سجاد انصاری، مہدی افادی، حجاب امتیاز علی ۔ نیاز فتح پوری، قاضی عبدالغفار، مجنوں گورکھپوری، ل-احمد اکبر آبادی، سجاد حیدر یلدرم، سلطان حیدر جوش، خلیق دہلوی وغیرہ۔ اردو شاعری میں رومانیت ۔اختر شیرانی، جوش وغیرہ کی ابتدائی شاعری ۔دیگر رومانی شعرا۔

متنی تدریس

● نظم اور کلامِ موزوں کے باب میں	مولانا محمد حسین آزاد
● سری نگر کی ایک شام	ل-احمد اکبر آبادی
● کلمۃ الحق	حالی
● گل بانگِ قفس	اختر شیرانی
● دیدنی	جوش ملیح آبادی

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Sem. 3 Discipline Specific Elective

D.S.E 2 : Jadid Urdu Shairi (Ghazal Mein Naye Tajrabe)

جدید اردو شاعری : غزل میں نئے تجربے

- غزل میں نئے تجربے-لسانی، موضوعاتی، مقامی رنگ کی شمولیت۔
- رمزیت اور علامتی انداز کا فروغ-اینٹی غزل۔
- اردو غزل کا ساختیاتی مطالعہ۔
- کچھ اہم غزل گو شعرا اور ان کی غزل گوئی کے رجحانات۔

سلیم احمد، ناصر کاظمی، بانی، ظفر اقبال، زیب غوری، احمد مشتاق، عرفان صدیقی۔

متنی تدریس

- سلیم احمد : نایاب ہیں اتنے کہ جہاں میں نہیں ملتے
- ناصر کاظمی : شہر در شہر گھر جلائے گئے
- بانی : اس تند سیاہی کے پگھلنے کی خبر دے
- ظفر اقبال : قافیہ چاہیے کھانے کے لئے
- زیب غوری : بے حسی پر وہ مری خوش تھا کہ پتھر ہی تو ہے
- احمد مشتاق : کہیں اُمید سی ہے دل کے نہاں خانے میں
- عرفان صدیقی : مری طرف تری موج نوا چلی ہی نہیں

- چند اہم نظم گو شعرا اور ان کی نظم گوئی کے رجحانات۔
- میرا جی، راشد، اختر الایمان، خلیل الرحمن اعظمی، مجید امجد، محمد علوی، کمار پاشی، منیب الرحمن۔

متنی تدریس

- میراجی — چل چلاؤ
- ن-م-راشد — نمرود کی خدائی
- اختر الایمان — ایک لڑکا
- خلیل الرحمن اعظمی — میں گوتم نہیں ہوں
- مجید امجد — توسیعِ شہر
- محمد علوی — خالی مکان
- کمار پاشی — یہ گرتا ہوا شہر میرا نہیں
- منیب الرحمن — باز دید

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Sem. 3 Generic Elective *(Choose any One from the following)*

G.E 1 : Jadid Urdu Shairi (Nazm, Geet, Sanet Wagairah)

جدید اردو شاعری : نظم، گیت، سانیٹ وغیرہ

- تقسیمِ ہند سے پیدا ہونے والی سیاسی وسماجی تبدیلیاں۔ نئے مسائل۔ نئے ادب کا سیاسی اور سماجی پس منظر۔ جدیدیت کے پیش رو۔ حسرت، یگانہ، فراق، فیض، وغیرہ۔
- جدیدیت کا رجحان۔ جدیدیت کا تصور۔ اظہار کے نئے پیرائے۔ عصری حسیت۔ نئی شاعری میں نئے موضوعات۔
- نظم اور اس کا فروغ۔ روایاتِ سابقہ سے انحراف۔ نظمِ آزاد اور نثری نظم۔ امکانات۔ گیت کا احیائ۔ سانیٹ، ترائلے، ہائیکو وغیرہ۔

متنی تدریس

● گیت	اَن جانے نگر من مانے تھے	میرا جی
● گیت	جیون شور بھرا سناٹا	ندا فاضلی
● آزاد نظم	نہ مرنے والا آدمی	اختر الایمان
● نثری نظم	ہوا پر دستک	بلراج کومل
● سانیٹ	انسان	ن-م-راشد

☆☆☆

Sem. 3 Generic Elective

G.E 2 : Urdu Mein Tarzuma Nigari

اردو میں ترجمہ نگاری

- ترجمے کا فن۔تاریخ، روایت، اہمیت، ضرورت، مقصد اور امکانات
- تراجم اور اصطلاح سازی کے مسائل۔ترجمہ کے بنیادی مسائل۔نثر اور شاعری کے تناظر میں
- ترجمے کی اقسام (لفظی، ادبی، طبی، قانونی)۔ترجمے کا بین العلومی رشتہ
- اردو میں ترجمہ کی روایت۔فورٹ ولیم کالج اور دلی کالج کے تراجم۔سرسید کی سائنٹفک سوسائٹی
- ترجمہ بحیثیت ذریعۂ ترسیل

ترجمے کی ناگزیریت، ترجمے میں عہد بہ عہد ترقی کے بڑھتے امکانات، ایک خود کفیل مضمون کی حیثیت سے ترجمے پر مکالمہ، ترجمے کی راہ سے ہندستانی ادب کا عالمی ادبی ورثے سے اخذ واستفادہ

- اردو میں ترجمے کی موجودہ صورت حال۔اردو کے اہم مترجمین کے کارناموں کا جائزہ

متنی تدریس

- گر ترجمے سے فائدہ اخفائے حال ہے — محمد حسن عسکری
- تراجم اور اصطلاح سازی کے مسائل — آل احمد سرور
- دریافت اور بازیافت کا معاملہ — شمس الرحمن فاروقی

مشق

- اردو کی کسی نظم کا انگریزی ترجمہ
- اردو کے کسی ادبی اقتباس کا انگریزی ترجمہ
- انگریزی کے کسی ادبی اقتباس کا اردو ترجمہ
- انگریزی سے کسی تکنیکی یا علمی متون کا اردو ترجمہ
- انگریزی سے کسی اخباری یا صحافتی رپورٹ/متون کا اردو ترجمہ

Sem. 4 Core Course

C.C 14 : Urdu Tanqeed (Taraqqi Pasand Adabi Tahreek Se Qabl)

اردو تنقید : ترقی پسند ادبی تحریک سے قبل

- ادب کیا ہے- ادب کے مشرقی و مغربی نظریات، علم و فن کا فرق۔
- تنقید کا مفہوم- ادب اور تنقید- تنقید کا منصب، تحسین، تشریح، تجزیہ، تنقیص۔
- تخلیق، تنقید اور تحقیق کا فرق اور ان کے باہمی رشتے۔
- مشرقی تنقید اور اس کی بنیادیں- معانی، بیان، بدیع، فصاحت، بلاغت۔
- اردو تنقید کا آغاز- تذکروں کی اہمیت اور افادیت، اردو میں تذکرہ نگاری کی روایت۔
- ادب اور تنقید کا نیا دور، اردو تنقید پر مغرب کے اثرات۔ سرسیّد کی اصلاحی تحریک۔
- حالی، شبلی اور محمد حسین آزاد کی تنقیدیں۔
- عبدالرحمن بجنوری، مولوی وحیدالدین سلیم، نیاز فتح پوری، مولوی عبدالحق وغیرہ کے تنقیدی کارنامے۔

☆☆☆

Sem. 4 Core Course

C.C 15 : Urdu Tanqeed (Taraqqi Pasand Adabi Tahreek Ke Baad)

اردو تنقید : ترقی پسند ادبی تحریک کے بعد

- ترقی پسند تحریک کے زیرِ اثر تنقید- ادب اور زندگی کا رشتہ- تہذیبی اور معاشی عوامل ادب کا مارکسی نقطۂ نظر۔
- ترقی پسند نقاد، مجنوں گورکھ پوری، اختر حسین رائے پوری، سجاد ظہیر، احتشام حسین، سردار جعفری، ممتاز حسین، عزیز احمد، محمد حسن۔
- ترقی پسند تنقید کا ردِّ عمل، کلیم الدین احمد، آل احمد سرور، محمد حسن عسکری، خورشید الاسلام۔
- تنقید کے مختلف دبستان- ان کا مفہوم- تاثراتی، رومانی، نفسیاتی، جمالیاتی، مارکسی، ساختیاتی، اسلوبیاتی تنقیدیں اور ان دبستانوں کے نمائندہ نقاد۔
- تنقید کے بعض دوسرے رجحانات- تجربے اور جدید تنقیدی رویئے- خلیل الرحمن اعظمی اور شمس الرحمن فاروقی کی تنقید۔
- عملی تنقید کا مفہوم، لسانی اسلوبیاتی، فنی، فکری تجزیہ۔
- عملی تنقید کے مختلف رویئے- سماجیاتی، نفسیاتی، جمالیاتی، اسلوبیاتی۔
- مختلف شعری اصناف کی تنقید کے اصول- فکشن، غیر فکشن کی عملی تنقید- (عملی تنقید کے لئے ایم۔اے اردو نصاب میں شامل متن برائے تدریس)

☆☆☆

Sem. 4 Core Course

C.C 16 : Bengal Mein Urdu Adab (20th Century)

بنگال میں اردو ادب : بیسویں صدی

- بیسویں صدی کے نصف اول میں بنگال میں اردو شاعری اور نثر کا ارتقاء

ابوالقاسم شمس کلکتوی، وحشت کلکتوی، ناطق لکھنوی، آرزو سہارنپوری، عباس علی خاں بیخود، آصف بنارسی، عندلیب شادانی، شاکر کلکتوی کی شاعری۔ آغا حشر، ابوالکلام آزاد، نصیر حسین خیال، عبدالرزاق ملیح آبادی، ل-احمد اکبرآبادی کے نثری کارنامے اور دیگر ہمعصر ممتاز نثر نگار۔

- ترقی پسند تحریک اور بنگال کے اردو شعرأ پر اس کے اثرات- پرویز شاہدی، جمیل مظہری اور ان کے ہم عصر شعرأ- نیاز حیدر اور اشک امرتسری کی عوامی شاعری۔
- بنگال میں اردو شاعری— آزادی کے بعد۔
- جدیدیت کا رجحان اور اس سے متاثر فن کار۔
- مغربی بنگال کا شعری مزاج۔
- بنگال میں اردو کی مختلف اصنافِ ادب کا تاریخی ارتقاء-مثنوی، غزل، نظم، داستان، افسانہ، ڈرامہ، تنقید، طنز و مزاح، تذکرہ اور ادبی صحافت۔

متنی تدریس

غزلیں

- وحشت کلکتوی : میں ہی فقط نہ خستۂ دردِ نہاں ہوا
کسی پر یہ وجودِ کالعدم ہو بار کیا میرا

- پرویز شاہدی : موقعِ یاس کبھی تیری نظر نے نہ دیا
خاموشی بحرانِ صدا ہے تم بھی چپ ہو ہم بھی چپ

- جمیل مظہری : بدنام نہ کیوں ہو خم گردن یہ خودی کا
پرکھ چکا ہے تجھے بارہا شعور مرا

رُباعیات

آصف بنارسی کی صرف دو رباعیات:

- آصف بنارسی : امید پہ ہی زیست کا ہے دارومدار
  خود مشکلیں اپنے لئے پیدا نہ کرے

نظمیں

- بے چہرگی — پرویز شاہدی
- حسین — سیّد حرمت الاکرام

نثر

- چڑیا چڑے کی کہانی — مولانا ابوالکلام آزاد
- دو مزدور — ل-احمد اکبرآبادی
- آنے والا دن — عبدالرزاق ملیح آبادی

☆☆☆

Sem. 4 Discipline Specific Elective *(Choose any One from the following)*

D.S.E 3 : Adabi Tahreekat (Taraqqi Pasand Adabi Tahreek Ta Jadidiat)

ادبی تحریکات : ترقی پسند ادبی تحریک تا جدیدیت

- ترقی پسند تحریک

سیاسی، سماجی اور اقتصادی پس منظر-ترقی پسند تحریک کا منشور اور ترقی پسندوں کا سیاسی مؤقف۔

مختلف ادبی اصناف پر ترقی پسند تحریک کے اثرات-شاعری-افسانہ-ناول-تنقید۔

- حلقۂ اربابِ ذوق

ترقی پسند تحریک کا ردِّعمل-اغراض ومقاصد-حلقۂ اربابِ ذوق کی شاعری-افسانہ،تنقید-حلقۂ اربابِ ذوق کے اثرات۔

- جدیدیت

جدیدیت کا پس منظر اور آغاز-جدیدیت کی فلسفیانہ اساس-جدیدیت کے پیش رو-نئی علامتوں کی تلاش-۱۹۶۰ء کے بعد جدیدیت کے تعلق سے نئے مباحث-نمائندہ شعرأوادبأ کی خدمات کا تنقیدی جائزہ۔

- مابعد جدیدیت

مابعد جدید نظریئے کا آغاز-جدیدیت اور مابعد جدیدیت کا فرق-تھیوری کے مباحث-ساختیات وپس ساختیاتی نظریہ-بیانیہ کی واپسی-مہابیانیہ کا آغاز-۸۰ء کے بعد کے شعرأوادبأ کے کلام کا جائزہ۔

متنی تدریس

- اوورکوٹ (افسانہ) غلام عباس
- بابو گوپی ناتھ (افسانہ) منٹو
- بجوکا (افسانہ) سریندر پرکاش
- ڈار سے بچھڑے (افسانہ) سیّد محمد اشرف
- لیمپ جلانے والے (افسانہ) صدیق عالم
- میرا سفر (نظم) علی سردار جعفری
- کتبہ (نظم) محمد علوی
- شاعری میں نے ایجاد کی (نظم) افضال احمد سید

☆☆☆

Sem. 4 Discipline Specific Elective

D.S.E 4 : Ghalib (Khususi Motala)

غالب : خصوصی مطالعہ

- غالب کی حالات زندگی۔ غالب کے عہد کا ادبی، سماجی، تہذیبی اور سیاسی منظر نامہ
- غالب سے قبل اردو شاعری کی روایت۔ غالب کے عہد کی شاعری کا عمومی مزاج۔ غالب کی شاعری سے ایک نئی روایت کا آغاز
- غالب کی شاعری اور نئی شعریات کا طلوع
- غالب کے ممتاز معاصرین۔ غالب کے شارحین
- خدائے سخن، میر کہ غالب۔ غالب پرستی اور غالب شناسی کے اہم موڑ
- غالب کی زبان، روزمرہ یا استعارہ۔ انسانی تعلقات اور غالب کی شاعری۔ غالب کا اسلوب۔ غالب کا تصور کائنات
- غالب کے مطالعے کی اہمیت۔ غالب کی تخلیقی حسیت۔ غالب کی عالمگیر مقبولیت۔
- غالب تنقید۔ حالی، بجنوری اور شمس الرحمن فاروقی کی غالب تنقید کا خصوصی مطالعہ
- غالب تحقیق۔ متداول دیوان اور نسخہ حمیدیہ کا خصوصی مطالعہ
- غالب کی شعری اور نثری کائنات۔ غزل گوئی، قصیدہ گوئی اور خطوط نگاری کا تفصیلی جائزہ
- متنی تدریس:

غزل

حسن غمزے کی کشاکش سے چھٹا میرے بعد
بلا سے ہیں جو بہ پیش نظر درودیوار
نہ گل نغمہ ہوں نہ پردہ ساز
پھر کچھ اک دل کو بیقراری ہے

- خطوط مرزا ہرگوپال تفتہ کے نام خط نمبر ۲

مرزا ہرگوپال تفتہ کے نام خط نمبر ۳

نواب علاء الدین احمد خاں علائی کے نام خط نمبر ۴

میر مہدی مجروح کے نام خط نمبر ۹

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Sem. 4 Generic Elective *(Choose any One from the following)*

G.E 3 : Meer (Khususi Motala)

میر : خصوصی مطالعہ

- میر کی حالات زندگی۔ میر کے عہد کا ادبی، سماجی، تہذیبی اور سیاسی منظر نامہ
- میر سے قبل اردو شاعری کی روایت۔ میر کے عہد کی شاعری کا عمومی مزاج۔ میر کی شاعری سے ایک نئی روایت کا آغاز
- میر کی شاعری اور شعریات کا طلوع
- میر کا ذکر تذکروں میں۔ میر کی آپ بیتی۔ میر کے ممتاز معاصرین۔
- خدائے سخن، میر کہ غالب۔ میر شناسی اور غالب پرستی
- میر کی زبان، روزمرہ یا استعارہ۔ انسانی تعلقات اور میر کی شاعری۔ اسلوبیات میر۔ میر کا تصور کائنات۔ میر کی شعری لسانیات
- میر کے مطالعے کی اہمیت۔ میر کی عالمگیر مقبولیت۔
- میر تنقید۔ شعر شور انگیز کا خصوصی مطالعہ
- میر تحقیق۔ ظل عباس عباسی کے مرتبہ کلیات میر کا خصوصی مطالعہ
- میر کی شعری کائنات
- غزل۔ قصیدہ۔ مثنوی۔ مرثیہ۔ واسوخت اور رباعی کا تنقیدی اور تجزیاتی مطالعہ
- متنی تدریس:

غزل

پیری میں کیا جوانی کے موسم کو روئیے
گل کو محبوب ہم قیاس کیا
یارب کوئی دیوانہ بے ڈھنگ سا آ جاوے
آئے ہیں میر کافر ہوکر خدا کے گھر میں

- مثنوی

در بیان دنیا

- رباعی

محشر میں اگر یہ آتشیں دم ہوگا
ہم میر برے اتنے ہیں وہ اتنا خوب
ہم میر سے کہتے ہیں نہ تو رویا کر

Sem. 4 Generic Elective

G.E 4 : Urdu Aur Taqabli Motala-e-Adab

اردو اور تقابلی مطالعۂ ادب

- تقابلی مطالعۂ ادب ۔تعریف، مقصد، ضرورت اور دائرۂ کار
- تقابلی مطالعۂ ادب (عالمی تناظر)

مشرق و مغرب کے ادب کی سمت و رفتار، اساسی تصورات، امتیازات، ادبی خیمے، تحریکیں اور امکانات

- عربی

کلیلہ و دمنہ، الف لیال، سمیر المہذب، نجیف محفوظ کے ناول اور دیوان الحماسہ و دیوان متنبی کے منتخب اشعار و اقتباسات کے اردو متون کا مطالعہ

- فارسی

خسرو، سعدی، حافظ، رومی، خیام کے منتخب ادبی شہ پاروں کے اردو تراجم اور اس کا تفصیلی مطالعہ

- انگریزی

کیٹس، الیٹ، شیکسپیئر وغیرہ کے منتخب اردو اقتباسات اور متون کا مطالعہ

- تقابلی مطالعۂ ادب (ملکی تناظر)

میر، غالب، سرسید، حالی، اقبال، منٹو، غلام عباس، کرشن چندر، راجندر سنگھ بیدی، عصمت چغتائی، قرۃ العین حیدر کی تخلیقات کا تقابلی مطالعہ

ٹیگور، کالی داس، مہادیوی ورما، مہاشیوتا دیوی، پریم چند، پانیشور ناتھ رینو، نرالا کی تخلیقات کا مطالعہ

- تقابلی مطالعۂ ادب میں ترجمہ بحیثیت ذریعۂ ترسیل

ترجمے کی ناگزیریت، ترجمے میں عہد بہ عہد ترقی کے بڑھتے امکانات، ایک خود کفیل مضمون کی حیثیت سے ترجمے پر مکالمہ، ترجمے کی راہ سے ہندستانی ادب کا عالمی ادبی ورثے سے اخذ و استفادہ اور تقابلی ادب کے بڑھتے رجحانات

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UNIVERSITY OF CALCUTTA

Notification No. CSR/ 78 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 13.07.2018 (vide Item No.11) approved the Syllabus of M.Sc. Course of Study in Zoology under CBCS in the Post-Graduate Departments of the University and in the affiliated Colleges offering Post-Graduate Courses under this University, as laid down in the accompanying pamphlet.

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 17th August, 2018

(Debabrata Manna)
Deputy Registrar (Acting)

Syllabus for a 2-year Semester System in M.Sc. (Zoology)

Session: 2018 -2020

Department of Zoology, University of Calcutta
35, Ballygunge Circular Road, Kolkata – 700 019

UNIVERSITY OF CALCUTTA
SYLLABUS STRUCTURE FOR M.Sc. (ZOOLOGY)
SEMESTER COURSE (Session 2018-2020)

1st Semester			
Code	**Subject**	**Marks**	**Credits**
ZCT 101	Non-Chordate Biology	40	3
ZCT 102	Ecological Theories	40	3
ZCT 103	Cell Biology	40	3
ZCT 104	Genetics	40	3
ZCT 105	Parasitology	20	1.5
ZCT 106	Insect Biology	20	1.5
ZCP 107	Laboratory Course for Core Subjects	50	5
2nd Semester			
Code	**Subject**	**Marks**	**Credits**
ZCT 208	Chordate Biology	40	3
ZCT 209	Developmental Biology	40	3
ZCT 210	Immunology	40	3
ZCT 211	Biochemistry and Genetic Engineering	40	3
ZCT 212	Endocrinology	20	1.5
ZCT 213	Aquatic Biology	20	1.5
ZCP 214	Laboratory Course for Core Subjects	50	5
3rd Semester			
Code	**Subject**	**Marks**	**Credits**
ZCT 315	Taxonomy and Biostatistics	40	3
ZCT 316	Animal Behavior and Wildlife Biology	40	3
ZCP 317	Laboratory Course for Core Subjects	30	3
ZET 318-331	Elective Theory*	40	3
CBCC A	CBCC A	50	4
CBCC B	CBCC B	50	4
4th Semester			
Code	**Subject**	**Marks**	**Credits**
ZCT 432	Applied Ecology	40	3
ZCT 433	Evolution	40	3
ZCT 434	Comparative Animal Physiology	40	3
ZCP 435	Laboratory Course for Core Subjects	30	3
ZLI 436-449	Lab Internship (Internal Assessment, Dissertation & Seminar)*	20+30+30	6.5
ZCP 450	Grand Viva	20	1.5

*Elective Theory and Lab Internship (Lab Internship will be of one year duration, ie., 3rd and 4th Semesters)

SHC	ZET 318/ ZLI 436	Aquatic Ecology & Fisheries Science	UC	ZET 325/ ZLI 443	Molecular Cell Biology
SR	ZET 319/ ZLI 437	Environmental Biology & Toxicology	SS	ZET 326/ ZLI 444	Disease Biology
GS	ZET 320/ ZLI 438	Entomology & Wildlife Biology	SG	ZET 327/ ZLI 445	Cytogenetics & Genomics
MD	ZET 321/ ZLI 439	Genetics of Human Diseases	ERB	ZET 328/ ZLI 446	Translational Biology
PB	ZET 322/ ZLI 440	Biodiversity & Ecosystem Function	AB	ZET 329/ ZLI 447	Applied Immunology
GA	ZET 323/ ZLI 441	Resource Ecology	SBC	ZET 330/ ZLI 448	Reproductive Endocrinology
AD	ZET 324/ ZLI 442	Applied Insect Science	RT	ZET 331/ ZLI 449	Human Evolutionary Genetics

Division of practical marks:

Practical of 20 marks - 10 (Practical) + 5 (Internal Assessment) + 5 (Viva-voce)
Practical of 30 marks - 20 (Practical) + 5 (Internal Assessment) + 5 (Viva-voce)
Practical of 50 marks - 30 (Practical) + 10 (Internal Assessment) + 10 (Viva-voce)
Practical of 75 marks - 50 (Practical) + 15 (Internal Assessment) + 10 (Viva voce)

The students will submit a Dissertation (50 marks) on their Elective paper opted. Both the Seminar and Dissertation Report will be evaluated by external examiner.

Course Structure

A] **Core Subjects** : Compulsory for all
B] **Elective Subjects** : Student will choose any one of the ten Elective subjects being offered
C] **Choice Based Credit Course** : Student will choose any two of the nine CBCCs being offered, one from each group

MARKS/CREDIT	MARKS			CREDIT		
	THEORY	PRACTICAL	TOTAL	THEORY	PRACTICAL	TOTAL
SEMESTER I	200	50	250	15	5	20
SEMESTER II	200	50	250	15	5	20
SEMESTER III	220	30	250	17	3	20
SEMESTER IV	120	130	250	9	11	20
GRAND TOTAL:			1000			80

1st Semester			
Code	**Subject**	**Marks**	**Credits**
ZCT 101	Non-Chordate Biology – GKS/GA/PB/ERB	40	3
ZCT 102	Ecological Theories – GA/SHC/PB	40	3
ZCT 103	Molecular Cell Biology – UC/SR/SBC/ERB	40	3
ZCT 104	Genetics – SS/SG/RT	40	3
ZCT 105	Parasitology – ERB/GKS/AD	20	1.5
ZCT 106	Insect Biology – GKS/AD	20	1.5
ZCP 107	Laboratory Course for Core Subjects	50	5

ZCT 101 Non-chordate Biology 40 Marks 3 Credits

1. Evolution of metazoans; origin, radiations and extinction of invertebrate groups; evolution of polarity and early organizer concept
2. Types of invertebrate feeding
3. Biological and medicinal importance of sponges
4. Biology of Entoprocta and Cycliophora
5. Mechanics of invertebrate movement/locomotion; muscular activity and skeletal system; invertebrate swimming and flight
6. Factors influencing respiration (body and size, activity, feeding, temperature, oxygen tension and salinity)
7. Invertebrate defense against predators and parasites
8. Regulation of reproductive process- reproductive cycle, biorhythmicity
9. Organization of nervous system: nervous system, nerve net, central and peripheral nervous system, invertebrate brain
10. Regeneration in Cnidaria and Annelida
11. Thermoregulation and Osmoregulation in different invertebrate groups

ZCT 102 Ecological Theories 40 Marks 3 Credits

1. Population Ecology

1.1 Population growth models (Beverton Holt, Ricker, Time lag)
1.2 Life history strategies and their evolution
1.3 Meta-population. Levin's model, extinction risk.

2. Ecological Communities

2.1 Species abundance models.
2.2 Niche and competition theories (Lotka Volterra model, Isoclines, Niche prediction)
2.3 Elements of Landscape ecology
2.4 Food web models and network
2.5 Biodiversity and ecosystem function
2.6 Prey-Predator Models

3. Evolutionary and Behavioral Ecology

3.1 Ecological specialization and generalization
3.2 Parent – offspring conflict
3.3 Evolution of sex and sex ratio.
3.4 Mating systems with special reference to birds and mammals.
3.4 Communication
3.5. Foraging

ZCT 103 Cell Biology 40 Marks 3 Credits

1. Plasma membrane- structure and functional inter-relationships including membrane assembly
2. Structure and function of animal tissues
3. The cytoskeleton, cellular transport, extracellular matrix
4. Cell signaling and cell-cell interaction
   4.1 Cell surface and intracellular receptors
   4.2 Signaling pathways and cross talk mechanisms
5. Cell death mechanisms
   5.1 Autophagy
   5.2 Apoptosis
   5.3 Anoikis
6. Staining and dyes in identification of specific tissues. Stains- definition, physical & chemical classification, nomenclature, mordants, metachromasia
7. Tools and techniques in cell biology

ZCT-104 Genetics 40 Marks 3 Credits

1. Chromatin Dynamics:

1.1 Chromatin remodeling; Replicative nucleosomal assembly; nucleosome positioning at functional promoter.
1.2 Molecular nature of functional status of chromatin; chromatin silencing & positing effect variegation.
1.3 Histone code, reader-writer complex

2. DNA replication and regulation

2.1 Enzymology of eukaryotic replication and gene amplification.
2.2 Role of Non-coding RNA in prokaryotic and eukaryotic DNA replication.

3 Regulation of gene expression

3.1 Transcription in eukarytotes: Initiation, elongation & termination
3.2 Epigenetic regulation: Dosage compensation in Mammals and Drosophila.
3.3 Genetic imprinting: Mechanism and Model
3.4 Catalytic & small RNAs; Gene silencing.

4 Translation & Post Translational events

4.1 Translation in eukaryotes: Initiation, Elongation and termination.
4.2 Protein splicing, chaperones and protein folding.
4.3 Post translational mRNA decay.

5 Recombination & repair

5.1 Recombination in eukaryotes; Recombination types.

5.2 Enzymology of human meiotic recombination; Molecular anatomy of synaptonemal complex.

5.3 Enzymes involved in DNA repair mechanisms.

6 Transposable Genetic Element

6.1 Ac-Ds element in Maize, IS element in bacteria, Composite transposon, Retrotransposon.

6.2 P-element in Drosophila, Hybrid dysgenesis and role of piRNA in transposon silencing.

6.3 Role of transposable element in evolution and genome modification.

7 Microbial Genetics

Conjugation, Transduction, Regulation of Lytic and Lysogenic cycle.

8 Somatic cell genetics.

8.1 Cell fusion, heterokaryon selection & hybridoma technology.

8.2 Chromosome mapping.

ZCT 105 Parasitology 20 Marks 1.5 Credits

1. Human clinical and veterinary parasitology- detection, diagnosis, prophylaxis, treatment, and pharmacology (emergent parasites)
2. Community medicine
3. Host parasite interaction- immunological nuances in vertebrates and invertebrates and epidemiological surveillance tools.
4. Vector biology with special reference to Malaria and Kala-azar.
5. Genome organization in Plasmodium
6. Molecular basis of antigenic variation in Plasmodium

ZCT 106 Insect Biology 20 Marks 1.5 Credits

1. Food and digestion, feeding potential of insects in response to food availability
2. Excretory mechanism of insects with special reference to Cryptonephridial mechanism
3. Tracheal and plastron respiration of insects
4. Insect immune defense
5. Metamorphosis, diapauses and their interrelationship and regulation
6. Atypical modes of reproduction
7. Stridulation and its biological significance
8. Bioluminescence

ZCP 107 Laboratory Course for Core Subjects 50 Marks 5 Credits

1. Special structures (i) Stomatogastric nervous system in cockroach
   (ii) Poison gland of Ant/Spider
   (iii) Mounting of mouth parts of mosquito-identification of genera & sex
   (iv) Haltere in housefly, mouth parts of housefly.
2. Comparative anatomy of Excretion & Nervous systems in Annelid, Insect and Molluscan models.
3. Analysis of aquatic habitat and community.
4. Analysis of terrestrial habitat and community
5. Drosophila genetic crosses, Induction of mutation in Drosophila by P-M Mutagenesis, preparation of polytene chromosome, Karyotyping
6. DNA isolation and Agarose Gel Electrophoresis
7. Restriction digestion
8. Identification of mammalian tissue sections.
9. Tissue fixation, microtomy and double staining of tissue sections.
10. Sessional work (Internal evaluation)
11. Viva voce

2nd Semester			
Code	**Subject**	**Marks**	**Credits**
ZCT 208	Chordate Biology – SBC/SG/SHC	40	3
ZCT 209	Developmental Biology – ERB/SG/AB/UC	40	3
ZCT 210	Immunology – ERB/SR/AB	40	3
ZCT 211	Biochemistry and Genetic Engineering – AS/GA/SS/SG/RT	40	3
ZCT 212	Endocrinology – SBC/MD	20	1.5
ZCT 213	Aquatic Biology – SHC/SBC	20	1.5
ZCP 214	Laboratory Course for Core Subjects	50	5

ZCT 208 Structure and Function of Chordates 40 marks 3 Credits

1. **Protochordata**
   1.1. Fine structure of notochord in Amphioxus.
   1.2. Modern interpretation of origin of early chordata.
2. **Integumentary system**
   2.1. Cell association
   2.2. Glandular System
3. **Skeletal system**
   3.1. Origin of jaw and modification of jaw bones and types; functional and evolutionary significance.
   3.2. Jaw kinetics in relation to feeding.
4. **Circulation**
   4.1. Heart and circulation in fetal and neonatal mammal
   4.2. Evolution of portal system.

5. **Nervous system & Sense organ**
   5.1. Sensory receptors and classification.
   5.2. Organ of olfaction and taste.
6. **Structural Adaptation**
   6.1. Structural elements of body and their properties.
   6.2. Mechanics of support and movement
   6.3. Swimming adaptation.
   6.4. Cursorial adaptation.
   6.5. Flying mechanism.

ZCT 209 Developmental Biology 40 marks 3 Credits

1. **Principles of Developmental Biology**
   - Potency, commitment, specification, induction, competence.
   - Determination and Differentiation; morphogenetic gradient, cell fate and cell lineages.
   - Cell to cell communication during early development.

2. **Metamorphosis and organogenesis in model organisms**
   - *Drosophila*: Axes, compartment and pattern formation, HOX gene and their regulation.
   - *Caenorhabditis elegans*: Early development and vulva formation.
   - Xenopus: Organizer formation, mesoderm specification.
   - Zebrafish: Cell movement and signal during early development, Patterning, polarity and regionalization of nervous system.
   - Limb development in vertebrate.

3. **Regenerative Biology**
   - Cellular and molecular aspects, Genomic equivalence and cytoplasmic determinants.

4. **Environment and Development**
   - Environmental control of gene regulation, Epigenetic regulation of developmentally relevant genes.

ZCT 210 Immunology 40 marks 3 Credits

Phylogeny of Immunity
Immunobiology of Invertebrates. Principal strategies, immune-responsive cells and tissues. Phenoloxidase cascades, natural and inducible immune response.

Innate Immunity
Overview. Features. Epithelial Barrier. Neutrophil and Macrophage Function. Defense mechanism to Infection (Migration, Inflammation and Phagocytosis).
Function of NK cell. Cross-talk with Adaptive Immune system

Antigens Capture and Presentation
Concept of APC .Structure and Function of MHC molecule. MHC processing and presentation

Antigen Recognition
B cell and T cell receptor complex. Formation and selection of diversity receptors. VDJ recombination

Cell Mediated Immunity
APC- T cell interaction. IL-2 Receptor Role. Clonal Expansion. Th1, Th2 and Th17 response. Cytotoxic T cell function. T cell signaling

Humoral Immunity
Neutralization and Opsonization. Functional aspect of B- cell. Class switching. B cell signaling

ZCT-211 Biochemistry and Genetic Engineering 40 marks 3 Credits

1. Amino acid (classification, basic properties; peptides: primary, secondary, tertiary and quarternary structures, carbohydrate (basic structure, classification and simple properties of monosaccharides; examples of di-oligo & polysaccharides) and lipid (basic structure & simple properties of membrane lipids), outline of metabolic pathways of these major biomolecules with mention of rate limiting steps; names of simple precursors of some important bioactive molecules such as dopamine, melanine, porphyrin, cholesterol, purine & pyrimidines. Some important catabolites such as billirubin, uric acid etc; Metabolic disorders.

2. Enzymes: classification, kinetics, examples of inhibitions & inhibitors; modulations

3. Bioenergetics (anaerobic and aerobic respiration, oxidative and substrate level phosphorylation) basic concept of ETC and ATP synthesis, uncouplers. Spontaneous reaction (concept of -ve del G)

4. Vitamins and minerals: use of vitamines as coenzymes with the relevant reaction involved) deficiencies.

5. Chemistry of free radicals and antioxidants.

6. Recombinant DNA technology
   a. Eukaryotic cloning vectors, cloning strategies, identification of specific clones.
   b. cDNA library and Genomic library.
   c. Generation of transgenic animals.
   d. Gene knock-out and gene silencing.

7. Genomics, Proteomics & Bioinformatics
   a. Definition and Basic concept; ESTs, Organization of human genome repeat sequence, multigene families and genome conservation.
   b. DNA micro-array and its use.
   c. Genome wide DNA methylation and acetylation and their significance.
   d. Proteomics & Bioinformatics: Basic concept and use.

8. Gene therapy & Pharmacogenomics
   a. Various approaches of gene therapy.
   b. Stem cell therapy and microRNA therapy.
   c. Concept of pharmacogenomics; Use of pharmacogenetics for disease prognosis and treatment, response and toxicity.

9. Molecular techniques.
   Polymerase chain reaction (PCR), RT-PCR, Pulse Field Gel Electrophoresis, Site-directed mutagenesis, Gel retardation assay, RNAse protection assay, DNA fingerprinting, FISH, Southern, Northern and Western blot technique.

ZCT 212 Endocrinology 20 marks 1.5 Credits

1. Pheromones: Classification, chemical nature, structure, functions, relevance in applied fields, clinical applications.
2. GI tract hormones: Source, composition and functions.
3. Thymic hormones and cell immunity.
4. Pineal gland structure, biosynthesis of melatonin, diurnal variations of pineal gland functions.
5. Hormones and human health: Stress, metabolic and reproductive disorders (Pituitary, Pancreas, Thyroid, Testis, Ovary) - molecular basis and therapeutics.

ZCT 213 Aquatic Biology 20 marks 1.5 Credits

1. Deep Sea Environment and Biological adaptations of Aquatic biota . Hydrothermal vent and life processes. Molecular mechanism of adaptation to salinity in euryhaline and stenohaline species in coastal and intertidal ecosystem.
2. Chemical cues for orientation and navigation of aquatic organisms in response to emergent sensory requirements in complex aquatic environment.
3. Respiration and energy yield as survival strategies in fauna inhabiting extremities of aquaic environments,
4. Molecular and integrative physiology of reproduction and larval recruitment of aquatic biota

ZCP 214 Laboratory Course for Core Subjects 50 Marks 5 Credits

1. Morphometric analyses of different fish specimen and interpretation of food habit and respiratory efficiency.
2. Collection of different swim bladder from different fish specimen (collected from market) and comparative study on functional efficiency of swim bladders.
3. Study of adaptive features and interpretation of significance from morphology of preserved specimen.
4. Determination of glucose in different patho-physiological condition.
5. Estimation of total protein from tissues of animal model.

6. DNA isolation and agarose gel electrophoresis
7. Thin layer chromatography
8. Processing and double staining of different stages of estrous cycle of rats.
9. Identification of endocrine gland sections
10. Identification of parasitic forms.
11. Dissection and identification of histological slides of spleen and thymus
12. Immunization Protocol Demonstration of Thioglycolate induced peritonitis (cell infiltration and inflammatory exudates).
13. Identification and demonstration of Primary and secondary lymphoid organ
14. Haemagglutination
15. ELISA method
16. Immunofluorescence.
17. Sessional Work (Internal Evaluation)
18. Viva-Voce

3rd Semester			
Code	**Subject**	**Marks**	**Credits**
ZCT 315	Taxonomy and Biometry – RT/GA/PB/AD	40	3
ZCT 316	Animal Behavior and Wildlife Biology – GKS/GA/SBC/PB	40	3
ZCP 317	Laboratory Course for Core Subjects	30	3
ZET 318-331	Elective Theory and Internal Assessment*	30+10	3
CBCC A	CBCC A	50	4
CBCC B	CBCC B	50	4

ZCT 315 Taxonomy & Biostatistics 40 Marks 3 Credits

1. Characters and character states

1.1. Types of character: primitive and advanced, missing, polymorphic, micro, cryptic and internal

1.2. Character state transition, environmental effect and their significances

1.3. Artifacts and special characters

2. Taxa and species

2.1. ICZN-nomenclature rules

2.2. Species concept

2.3. Phylogenetic nomenclature

3. Approaches in classification

3.1. Cladistics

3.2. Phenetics

3.3. DNA Barcoding

4. Trends in Phylogenetic reconstruction

4.1. Tools used in building a phylogenetic tree: their advantage and drawbacks

4.2. Distance and character based methods in phylogenetic reconstruction

5. Descriptive Statistics

5.1 Statistics and Biological data – basics inclusive of the distributions
5.2 Measures of central tendency
5.3 Visual representation of data- leaf and stem diagram, box-plot analysis
5.4 Basics of probability

6. Sampling and Analysis

6.1 Sampling theory: Statistical inference and hypothesis testing
6.2 t-tests and applications in biology
6.3 Analysis of variance and experimental designs Non Parametric Tests
6.4 Correlations and regression analysis

ZCT 316 Animal Behavior and Wildlife Biology 40 Marks 3 Credits

1. Genes and Behaviour

2. Cooperation and conflict

2.1 Range of cooperative behavior and theories of cooperation, Kin selection
2.2 Elaborate ornaments: Fisher's hypothesis and Handicap hypothesis
2.3 Conflict over mate choice

3. Foraging

3.1 Optimal foraging theory
3.2 Foraging and predation risk: defense strategies against predators
3.3 Territoriality and Group foraging

4. Aggression

4.1 Aggressive behaviour
4.2 Game theory models and strategies – Prisoners' dilemma and reciprocal altruism and evolution of sociality

5. Wildlife habitat ecology: Biomes of the world – an overview; biome types of India: alpine tundra, grassland, forest, desert, aquatic and wetlands (unique features, distribution, vegetation, faunal make up and adaptations). Forest types of India

6. Protected area concept: Protected area network in India; Design and management of nature reserve; concept of corridor; joint forest management.

7. Conservation biology of important wild animals: Conservation status, habit & habitat, behavioural biology, threats and conservation management of the following animals. Himalayan salamander / Olive ridley turtles / Great Indian bustard / Himalayan musk deer/ Greater one-horned rhinoceros / Fishing cat / Ganges river dolphin.

8. Basic Concept of Wildlife Biology: Definition and importance of wildlife ; Wildlife wealth of India ; Threatened wildlife and IUCN status - Concept of Extinct, Critically Endangered, Endangered, Vulnerable and rare species ; Red data book;

9. Wildlife conservation Indian perspective: Aims & Objectives of wildlife conservation. A brief idea about Indian wildlife, causes for depletion of Indian wildlife; wildlife conservation in India- through age, post-independence initiatives. Different approaches for conservation – *in situ* and *ex situ,* Conservation breeding; Threats to wildlife conservation in India.

10. Protected Area Concept: In situ conservation- problems and prospects; Sanctuaries, National parks, Community Reserves and Conservation Reserves; Biosphere Reserve, Case studies - Sundarban Biosphere Reserve.

11. Wildlife Habitat Ecology: Concept of Biome, Biome types of India –a general account. Case studies: Tropical rain forest – characteristics, faunal make up and animal adaptations.
12. Wildlife sampling: random sampling, systematic sampling, stratified sampling, cluster sampling.
13. Peoples' participation in wildlife activities: Community participation in conservation; JFM.

ZCP 317 Laboratory Course for Core Subjects 30 Marks 3 Credits

Developing habitat description, mapping and elevation, learning operations for estimation of wildlife populations, and description of wildlife populations. Addressing social issues of conservation. Some of the skills as in the following list are to be imparted:

- Bird / butterfly sampling
- Small mammal trapping
- Population estimation using Mark-recapture method, Transects.
- Habitat structure description methods
- Reptile and amphibian sampling
- GPS use, plant identification
- Introduction to radiotelemetry
- Larger mammal population estimation techniques

Elective Papers

SHC	ZET 318	Aquatic Ecology & Fisheries Science	UC	ZET 325	Molecular Cell Biology
SR	ZET 319	Environmental Biology & Toxicology	SS	ZET 326	Disease Biology
GS	ZET 320	Entomology & Wildlife Biology	SG	ZET 327	Cytogenetics & Genomics
MD	ZET 321	Genetics of Human Diseases	ERB	ZET 328	Translational Biology
PB	ZET 322	Biodiversity & Ecosystem Function	AB	ZET 329	Applied Immunology
GA	ZET 323	Resource Ecology	SBC	ZET 330	Reproductive Endocrinology
AD	ZET 324	Applied Insect Science	RT	ZET 331	Evolutionary Genetics

ZET 318 Aquatic Ecology and Fisheries Science 40 Marks 3 Credits

1. Ecological Zonations, characteristics and biodiversity of Freshwater, Estuarine and Marine ecosystems. Nutrient generation, cycling and productivity, Bioresources and Bioactive compounds from estuarine and Marine resources. Exclusive Economic Zone – Potentials and exploitation. Remote sensing and GIS for Fish stock analysis
2. Metapopulation and Metacommunity approaches for fish assemblages, Coarse and Fine filter methods for conservation of aquatic bioresources
3. Fish Nutrition- Stages of Nutrient Acquisition, Temporal pattern of nutrient acquisition, Integration of nutrient acquisition – compartment models, gut-reactor model, state-space model, nutritional requirement of cultivable fish and prawn, nutritional

bioenergetics, energy efficiency in fish production, Feeding schedules and ratio, feed performance, feed formulation, processing, storage and application, Fish growth estimation.

4. Fish Pathology and Defense mechanism - Factors of fish health and integrated health management, Infection and Immune responses to pathogens in environment – Transformation of infection into disease, cells and tissues of the immune system of fish – cellular and humoral defenses, Cells and tissues of the immune system of fish – cellular and humoral defenses, Immunomodulation – exogenous and endogenous factors.
5. Brief account of Sustainable technology for Aquaculture (Freshwater, Estuarine and Mariculture), Advancements in technology for finfish and shellfish culture, Modern hatcheries and management, Technology of stock improvement – cryopreservation, hybridization, polyploidy and transgenesis, xenogenesis, sex reversal and breeding. Principles and design of Raceway, cages and Pen enclosures, Recirculating systems, Intensive Fish Hub, Integrated Aquaculture.
6. Fisheries Biotechnology and Functinal Genomics, Biochemical and Molecular markers, Population genetics and interaction of hatchery and wild fish, Gene mapping, Quantitative trait locus mapping and marker – assisted selection, Gene transfer technology, Genotype – environment interaction, environmental risk of aquatic organisms for genetic biotechnology, Genetic conservation, gene banking and maintaining genetic quality.

ZET 319 Environmental Biology and Toxicology 40 Marks 3 Credits

1. Environmental Biology and Toxicology: general Consideration
2. Environmental impact assessment and environmental monitoring
3. Semiochemistry: Plant: animal interaction in the natural environment
4. Environmental Contamination and endocrine disruption
5. Toxin: Classification, examples
6. Xenometabolism: Phase I, phase II reaction
7. Analytical toxicology: Immunohistochemistry, FACS, fluorescence microscopy
8. Dose- response relationships

ZET 320 Entomology And Wildlife Biology 40 marks 3 credits

1. Capture, handling and rescue operations of wild animals and their management. Capture methods, handling of capture animals; transportation. Case study – Capture, collection and rescue of injured dead wildlife during oil spills.
2. Captive breeding of wild animals: Concept of captive breeding; reintroduction of captive breeds – controversies and realities; release protocol; advantages and challenges of captive breeding.
3. Special management program of wild animals in India: Origin, objectives, implementation, advantages and limitations of project tiger, project elephant, operation rhino, lion conservation project, crocodile conservation project.
4. Bio-ecology of important wildlife of India: Himalayan Salamander, Olive Ridley turtle, Great Indian Bustard, Fishing Cat.

5. Behavioral ecology of wildlife: Home Range and Territory; Animal migration with special reference to birds; Communication and Signaling (Case study: Bee Dance).
6. Man and wildlife: Causes and consequences of human-wildlife conflicts; mitigation of conflict – an overview. Case study: Human-Elephant conflict.
7. Wildlife trade & crime: Major articles in wildlife trade; underlying causes of illegal wildlife trade; *Modus Operandi*, measures against illegal trade.
8. Wildlife legislation: Administrative measures, laws and ethics; National Acts related to wildlife conservation.
9. Wildlife tools and techniques:
   a) Census- objectives/ important consideration, line transact method, pugmarks and point count
   b) Remote sensing and GIS in wildlife research
   c) Camera traps

ZET 321 Genetics of Human Diseases 40 Marks 3 Credits

1. Effect of the environment on phenotype development- Penetrance and expressivity, phenocopy; Gene interactions and modifying genes; Pleiotropy
2. Monogenic and polygenic diseases
3. Mitochondrial inheritance and diseases
4. Genetics polymorphism; DNA markers and populations differences
5. Genetic counseling; Role of population genetics in genetic counseling
6. Genetics of embryonic development; the development of structure and birth defects in humans
7. Genetics of psychiatric disorders and Schizophrenia
8. Genetic analysis of: Type 2 Diabetes Mellitus; Kidney stone disease; Hearing Loss; endocrine disorders
9. Cancer genetics
10. Concept of genomics; genetic associations of diseases and functional studies
11. Applications of Medical genetics for the diagnosis and treatment
12. Pharmacogenetics, Pharmacogenomics and personalized medicine
13. Concept and applications of bioinformatics

ZET 322 Biodiversity and Ecosystem Functioning 40 marks 3 credits

1. Biodiversity Monitoring

a. Measuring global biodiversity and its decline with special reference to mammals, birds, herpetofauna, fish and insects.

b. Local and regional biodiversity-niche assembly theories, Unified Neutral theory

c. Threats to species diversity:

i. Habitat loss, Habitat fragmentation and species extinction
ii. Endemism and biodiversity
iii. Population bottleneck, Genetic drift, inbreeding depression
iv. Risks to biodiversity extinction, Extinction vortex

2. Biodiversity and Ecosystem function

a) Theories on relation between biodiversity and ecosystem function
   i. Species Complementarity
   ii. Sampling effect
   iii. Redundancy
b) Decline of global biodiversity and loss of ecosystem function.
c) Functional diversity and ecosystem functioning.
d) Insurance Hypothesis: The effect of habitat fragmentation and dispersal on ecosystem functioning.
e) Biodiversity and stability in soil ecosystem: pattern processes and the effect of disturbance.
f) Global pollinator loss and their effect on crop production and non-crop plant reproduction.
g) Multi-trophic dynamics and ecosystem processes.
h) The economics of biodiversity and ecosystem function.

3. Landscape Ecology:

a) Theories in landscape ecology.
- Hierarchy theory and the structure of the landscape
- Percolation theory
- Metapopulation theory
- The systems source sink

b) Scale and landscape
- Scaling the landscape
- Change of scale perception
- Importance of parameters at different scales

c) Processes in the landscape
- Disturbance
- Fragmentation
- Landscape connectivity
- Corridors

d) Methods in landscape ecology
- Spatial data processing
- fractal geometry approach
- Remote sensing in landscape ecology
- Geographic Information System
- Spatially explicit population models (SEPM)

ZET 323 Resource Ecology 40 Marks 3 Credits

1. Community structure and function – organization, ordination, niche concept and community development; theories of community development and applications in ecological management – eutrophication and biomanipulation; soil microbes and organization of the drillosphere and the rhizosphere
2. Population - growth models, regulations, metapopulation, demographic analysis including life table, fecundity schedule and competitive interactions; census techniques

3. Resource-consumer interactions; food web and species interactions direct and indirect; microbes and plants; Modelling species interactions – apparent competition, intraguild predation, succession, bipartite network and applications
4. Natural resources and sustainable development – principles and models; environmental worldviews; wild life resources, aquatic living resources, forest resources; ecosystem services valuation, links with biodiversity; ecological footprint analysis; ecosystem health;
5. Natural resources and technologies related to bioremediation, bioindicators, biosensors, biomarkers, biomanipulation of lakes, biomimetics, biosubstitution
6. Quantitative methods in biodiversity assessment; resource harvest; modelling diversity and distribution of species in time and space; population growth assessment;
7. Statistical methods and research design – exploratory data analysis, non-parametric methods, sampling methods and the principles of replicates

ZET 324 Applied Insect Science 0 Marks 3 Credits

1. Crop pests, principles and applications of integrated pest management, conventional, non-conventional insecticides, and nano-insecticides, application success and limitations
2. Insect eusocialism concepts, principals, algorithms and applications to human societies
3. Insect-plant interaction, resistant insect, insect prasitoides, Crop health and protection
4. Ecological surveillance, monitoring and bio-indicator aspect applications through insect models
5. Agricultural entomology: insect/pest survey, methods and techniques, crop feeding potential, reproductive potential assays, scope, limitations and crop-yield prediction
6. Mechanism of insect flight, luminescence, acoustics and their applications
7. Neural, endocrinal and immunological modulations on insect behaviors, defense, kin selection, migration and aggression.
8. Commercial, forensic and medical applications of insects and it various products/forms

ZET 325 Molecular Cell Biology 40 Marks 3 Credits

1. Integration of cellular macromolecules and protein sorting
   a) Transport of macromolecules between the nucleus and cytosol
   b) Transport of macromolecules between the cytosol and mitochondria
   c) Transport from ER to Golgi
   d) Post-translational modifications of proteins (folding, etc), and destruction mechanisms

2. Cell-to-cell communication
   a) Gap junctions, tight junctions and cell signaling
   b) Role of calcium and NO in signal transduction
   c) Fate of cells with regard to morphogen gradients
   d) Crosstalk mechanisms and integrative pathways

3. Stem Cell Biology
   a) Concept, types, self-renewal, pluripotency, differentiation
   b) Isolation and characterization of stem cells
   c) Use of stem cells in tissue repair

4. Cell Cycle, Cell Death and Cell Renewal

a) Mechanisms of cell cycle regulation
b) Programmed cell death
c) Autophagy
d) Cellular senescence

5. Cancer and oncogenesis

a) Classification through gene expression profiling
b) Initiation, promotion, progression, cell behavior
c) Benign versus malignant, EMT
d) Role of niche and angiogenesis
e) Cancer immunology
f) Cancer-critical genes and epigenetic mechanisms
g) Treatment strategies

6. Methods in Molecular Cell Biology

a) Cell culture techniques, transfection and infection of cells
b) Protein purification, characterization and detection
c) Nucleic acids, miRNAs and RNA interference
d) RNA isolation and real-time RT-PCR
e) Immunohistochemistry / Immunocytochemistry
f) Microscopy and imaging (light, fluorescence/confocal, SEM)
g) Fluorescence-activated cell sorting
h) Isolation and characterization of cancer stem cells
i) Transgenics and Knock-outs
j) Drug-loaded functionalized nanoformulations for targeting cells

ZET 326 Disease Biology 40 Marks 3 Credits

1. Communicable and non-communicable human diseases - brief outline and pathophysiology of diseases caused by bacteria, viruses and salient metabolic disorders
2. Recombinant DNA technology and creation of recombinant molecules
   Role of genes within cells, genetic elements that control gene expression, restriction and modifying enzymes, safety guidelines of recombinant DNA research. Restriction mapping, design of linkers and adaptors. Characteristics of plasmid and phage vectors, prokaryotic and eukaryotic expression vectors. Screening of libraries with DNA probes and with antisera. Transgenesis and knockout animals
3. Polymerase Chain Reaction as a tool for disease biology
   Nested PCR, Taqman assay, RACE PCR, RAPD, site directed mutagenesis
4. Omics technology to address genetic basis of human diseases
5. Gene therapy in disease biology
6. Stem cells as tool to repair damaged tissue
7. Nanotechnology and targeted tissue engineering

ZET 327 Cytogenetics and Genomics 40 Marks 3 Credits

1. **Human Genome Organization**
2. **Mapping of Human genome**
   Genetic Mapping and Physical mapping process; Human Genome project and its ethical and social implications.
3. **Identification of human disease genes and etiology of selected genetic disorders in human.**
4. **Genes in Pedigree and Population**
   Monogenic vs Multifactorial inheritance; Mendelian Pedigree and complications to basic Mendelian pedigree; Genetic counseling.
5. **Techniques for studying Eukaryotic genome and Gene Function**
   Isolation of X linked and autosomal conditional mutations in Drosophila, P-mediated mutagenesis, Enhancer Trap and UAS-GAL4 in Drosophila; FLP-FRT system, Cre-LoxP system, GWAS; Chromatin immunoprecipitation, Yeast two hybrid system, Human karyotyping.
6. **Genetic testing**
7. **Genome Evolution:**
   Comparative genomics; concerted events of X-chromosome evolution and dosage compensation in the genus Drosophila and related molecular changes. Y-chromosome evolution in Human.

ZET 328 Translational Biology 40 Marks 3 Credits

1. Drug discovery school- in vitro pharmacology
2. Drug discovery school- in vivo pharmacology including ADMET
3. Preclinical to clinical transition in drug discovery and development
4. Experimental immunology-
   - Transplantation Immunology
   - Tracing lymphopoiesis
   - Animal models in Immunology
   - Mucosal immunity
5. Immunotherapy in diseases- Rheumatoid arthritis, Asthma
6. Regenerative Biology-
   - Animal models in research and development
   - Animal models in Development and Regeneration
7. Regenerative Medicine
   - Regenerative therapy
   - Tissue engineering and scaffolds
8. Nutrition and nutraceuticals-
   - Micronutrients
   - Functional food
9. Clinical pharmacology
   - General pharmacology- terms, definitions, representations
   - Classes of drugs
   - Bioassay of drugs

10. Functional and systems approach to experimental molecular cell biology-
    - Emphasis on molecular approaches to understand
      (i) Cell structure, function, and regulation
      (ii) Analyses of experimental design and data interpretation
    - Systems Biology

ZET 329 Applied Immunology 40 Marks 3 Credits

I. **Infection and Immunity**
1.1 Immune response to the bacteria
1.2 Immune response to the Virus
1.3 Immune response to the Parasites

2. **Hypersensitivity**
2.1 Type I
2.2 Type II
2.3 Type III
2.4 Type IV

3. **Tolerance and Autoimmunity**
3.1 General features and mechanisms of immunologic tolerance
Regulation of immunity and tolerance by dendritic cells
3.2 Malfunction and different autoimmune disease.

4. **Tumor Immunology**
4.1 Strategies of tumor cell to evade Immune system
4.2 Anti-tumor Immune response
4.3 Modern Immunotherapy of Cancer

5. **Transplantation Immunology**
5.1 Basis of Transplantation
5.2 Acute, Hyperacute and chronic Graft rejection
5.3 Modern techniques of transplantation (e.g BMT, liver, cornea, etc)

6. **Immunodeficiencies**
6.1 Congenital Immunodeficiencies
6.2 Acquired Immunodeficiencies

7. **Immunoprophylaxis**
7.1 Principles and Significance
7.2 Types of Vaccines (subunit, killed, attenuated etc.)

ZET 330 Reproductive Endocrinology 40 Marks 3 Credits

1. Evolution of gonads: phylogeny and ontogeny of testis and ovary.
2. Sex determination and sex differentiation: from genes to gender (Fish and Human).
3. Female reproductive system: Hormonal regulation of ovulation, gestation, parturition and lactation.
4. Male reproductive system: Hormonal regulation of spermatogenesis
5. Prostaglandins: Source, chemical nature, structure, functions, physiological significance and clinical implications.
6. Clinical uses of steroid receptors and defects of receptors.
7. Endocrinology of photosexual activity: Extra-retinal photoreceptors, photorefractoriness, role of melatonin in reproduction (Model system – Fish).
8. Endocrine disruption of reproduction: (Model system – Fish).

ZET-331 Human Evolutionary Genetics 40 Marks 3 Credits

1. Humans as apes
- 1.1. Evidence from molecules
- 1.2. Genetic diversity among the great Apes

2. Origin of modern humans
- 2.1. Evidence from fossils and morphology
- 2.2. Evidence from archeology and linguistics
- 2.3. Evidence from genetics of present-day populations
- 2.4. Evidence from ancient DNA

3. Human genome variation
- 3.1. Single nucleotide polymorphisms (SNPs) in the nuclear genome
- 3.2. Sequence variation in mitochondrial (mt) DNA
- 3.3. Y chromosome markers
- 3.4. Variation in the tandemly repeated DNA sequences
- 3.5. Structural variations in the genome.
- 3.6. Effect of recombination on genome variation

4. Estimating genome diversity
- 1.1. Sanger sequencing
- 1.2. Next generation sequencing
- 1.3. SNP typing-low, medium and high throughput methods for assaying variation
- 1.4. Databases of sequence variations
- 1.5. Studying genetic variation in ancient samples

5. Making inferences from diversity
- 5.1. Summarizing genetic variations
- 5.2. Measuring genetic distance
- 5.3. Coalescent approaches to reconstructing population history
- 5.4. Dating evolutionary events using genetic data

6. Populations admixture
- 6.1. Genetic admixture
- 6.2. Impact of admixture
- 6.3. Detecting admixture

4th Semester			
Code	**Subject**	**Marks**	**Credits**
ZCT 432	Applied Ecology – PB/GA/SHC	40	3
ZCT 433	Evolution – PB/GA/RT	40	3
ZCT 434	Comparative Animal Physiology – SR/SBC/AB	40	3
ZCP 435	Laboratory Course for Core Subjects	30	3
ZLI 436-449	Lab Internship*	20+30+30	6.5
ZCT 450	Grand Viva	20	1.5

ZCT 432 Applied Ecology 40 Marks 3 Credits

1. Ecology of invasive species
2. Bioremediation and environmental biotechnology
3. Ecosystem services, biodiversity and ecological economics
4. Biological control-theory and application
5. Harvesting populations- theory and applications
6. Ecological restoration including succession

ZCT 433 Evolution 40 Marks 3 Credits

1. Natural Selection and Adaptation
- 1.1 Ascent of Darwinism and Synthetic Darwinism
- 1.2 Methods of studying natural selection and Models of selection
- 1.3 Recognizing adaptation
- 1.4 Punctuated equilibrium and stasis

2. Evolutionary Process
- 2.1 Mechanisms producing genetic diversity (mutation, migration and genetic drift)
- 2.2 Phenotypic variation and plasticity
- 2.3 Molecular evolution
- 2.4 Speciation

3. Gene Frequencies in Population
- 3.1 The Hardy-Weinberg principle and analysis of gene frequencies in natural population.
- 3.2 Major factors influencing gene frequencies (migration, inbreeding), effects of selection and mutation on gene frequencies.

4. Patterns and trends in evolution
- 4.1 Constructing evolutionary trees, measures of genetic relationship among organisms
- 4.2 Tools of studying human evolution
- 4.3 Cultural evolution

5. Species and Speciation
- 5.1 Genetic basis of species difference and reproductive barriers
- 5.2 Evolution of interaction among species

ZCT 434 Comparative Animal Physiology 40 Marks 3 Credits

1. **Principles of animal physiology :**
   Mechanistic and evolutionary approaches. Size and scaling of animals
2. **Physiological homeostasis:**
   Positive and negative feedback, Controlled variable, Set point
3. **Thermal physiology :**
   Heat transfer mechanism between animal and environment. Supercooling, Anti freeze compound, Behavioural thermoregulation, Pejus and Critical temperature, adaptational trend in subzero condition
4. **Physiology of excretion**
   Physiology of ultrafiltration, reabsorption, tubular secretion
   Counter current theory of urine concentration, Regulation of urine formation
   Method of urine formation, Nitrogenous wastes
   Renal regulation of acid- base balance
5. **Physiology of Circulation and Respiration**
   Comparative structure of cells in circulation of invertebrates and vertebrates
   Composition of blood, plasma and blood Corpuscles, in vertebrates, Functions
6. **Physiology of behaviour**
   Pheromones in colonial interactions, foraging and mating
   Allelo-chemicals in Plant-Insect interaction

ZCP 435 Laboratory Course for Core Subjects 30 Marks 3 Credits

1. Trait analyses of an invasive species
2. Pollen transport by any common insect pollinator
3. Water quality assessment for determination of trophic state of a pond
4. Construction of phylogenetic tree from supplied data
5. Enzymatic Method for Determining Amylase Activity (Comparative)
6. Sessional (Internal Assessment)
7. Viva-voce

Choice Based Credit Courses

The students will have to choose one course each from the offered groups.
No student is allowed to choose the course offered by his/her parent department.
Each course is of 50 marks and carries 4 credits.

THE CBCC syllabus offered by the Department of Zoology, University of Calcutta entitled "Concepts in Zoological Science" is as follows:

Concepts in Zoological Science

1. Outline of animal classification

1.1 Linnaean Hierarchy and species concept
1.2 Phylogenetic reconstruction, characters and character states, cladistic and phenetic methods
1.3 Molecular taxonomy and evolutionary theories

2. Ecological principles and Biodiversity

2.1 Population and community ecology revisited: basis for conservation
2.2 Conceptual framework of biological diversity including threats and management options
2.3 Biodiversity indicators: Taxon based indicators, Surrogate species and global pattern of diversity endemism and megadiversity centers
2.3 Global pattern of biological diversity endemism and megadiversity centres
2.4 Wild life resources of India: conservation framework and status of threatened taxa

3. Evolutionary Biology

3.1 Methods of studying natural selection and adaptation; Models of selection
3.2 Gene flow (Hardy Weinberg equilibrium), genetic drift and Neutral Theory of Evolution
3.3 Molecular clock of evolution

4. Principles of Developmental Biology

4.1 Determination and differentiation; morphogenetic gradients; cell fate and cell lineages
4.2 Production of gametes, prerequisites of fertilization
4.3 Zygote formation, cleavage, blastula formation, embryonic fields,
4.4 Gastrulation and formation of germ layers in animals; embryogenesis

5. Metamorphosis and Organogenesis in model animal systems

5.1 Axes, compartment formation and pattern formation in *Drosophila*.
5.2 Vulva formation in *Caenorhabditis elegan*
5.3 Organizer formation and Mesoderm specification in *Xenopus*
5.4 Development of heart and circulatory systems in vertebrate
5.5 Development and maturation of the immune system
5.6 Limb development and regeneration in vertebrates

6. Animal Physiology

6.1 Size and scaling of organisms
6.2 Physiological adjustments to extreme environmental conditions;
6.3 Thermal and sensory physiology; chemical communications

7. Animal Behaviour

6.5 Animal behaviour study: proximate and ultimate causes
6.6 Sociobiology of social insects and vertebrates: theory and empirical studies
6.7 Optimal foraging theory and parent offspring conflict

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

UNIVERSITY OF CALCUTTA

DEPARTMENT OF ARABIC

ChoiceBasedCreditSystem(CBCS)

UNDERGRADUATE PROGRAMME

(CourseseffectivefromAcademicYear2018-19)

Syllabus for B.A. Honours in Arabic

SYLLABUSOFCOURSESTOBEOFFERED

Core Courses, Elective Courses & Ability EnhancementCourses

❖ Preamble

TheUniversity GrantsCommission(UGC)hasinitiated severalmeasurestobringequity, efficiencyandexcellenceinthe HigherEducationSystemofcountry.Theimportant measurestakentoenhanceacademicstandardsand qualityinhighereducationinclude innovationand improvementsincurriculum,teaching-learning process,examinationand evaluation systems,besides governance andothermatters.

TheUGChasformulatedvariousregulationsandguidelinesfromtimetotimetoimprove thehighereducation systemand maintainminimumstandardsandqualityacrossthe HigherEducationalInstitutions(HEIs)inIndia.Theacademicreformsrecommendedby theUGC intherecentpasthaveled tooverall improvementinthehigher educationsystem. However, due to lot ofdiversityinthesystemofhighereducation, therearemultiple approachesfollowedbyuniversitiestowardsexamination,evaluationand gradingsystem. WhiletheHEIsmusthavetheflexibility and freedomindesigningtheexaminationand evaluationmethodsthatbest fitsthecurriculum,syllabiand teaching–learningmethods, thereisaneedtodeviseasensiblesystemforawarding thegradesbased onthe performanceofstudents.Presently theperformanceofthestudentsisreported usingthe conventional systemof markssecured intheexaminationsorgradesor both. The conversionfrommarkstolettergradesand thelettergradesused vary widely acrossthe HEIsinthecountry.Thiscreatesdifficultyfor theacademiaand theemployersto understand and infer the performance of the students graduating from different universities andcolleges basedon grades.

Thegrading systemisconsidered tobebetterthantheconventionalmarkssystemand henceithasbeenfollowedinthetopinstitutionsinIndiaand abroad.Soitisdesirableto introduceuniform grading system.Thiswillfacilitatestudentmobility acrossinstitutions withinand acrosscountriesand alsoenablepotentialemployerstoassesstheperformance of students. To bring in the desired uniformity, in grading system and method for computingthecumulativegradepointaverage(CGPA)basedon theperformanceof students in the examinations,the UGChas formulatedtheseguidelines.

❖ Choice Based Credit System(CBCS):

TheCBCSprovides an opportunityforthe students to choose coursesfromthe prescribed courses comprisingcore, elective/minor orskillbased courses.The courses can beevaluated followingthe gradingsystem, which is considered to be better than the conventional marks system. Therefore, itis necessaryto introduceuniform gradingsystem in the entirehigher education inIndia. This willbenefit the students to move across

institutions within Indiato begin with and across countries. Theuniform gradingsystem will also enable potential employers in assessingthe performanceof thecandidates.In order to bringuniformityin evaluation systemandcomputation ofthe Cumulative GradePoint Average(CGPA)basedon student's performancein examinations, theUGC has formulated the guidelines to befollowed.

❖ OutlineofChoiceBasedCredit System:

1. **CoreCourse:**Acourse,whichshouldcompulsorilybestudiedbyacandidateasacorerequirement is termed as aCore course.

2. **ElectiveCourse:**Generallyacoursewhichcanbechosenfromapoolofcoursesandwhich may beveryspecificorspecializedoradvancedorsupportivetothediscipline/subjectofstudy orwhich providesanextendedscopeorwhichenablesanexposure tosomeother discipline/subject/domain or nurtures thecandidate's proficiency/skillis called an ElectiveCourse.

   2.1 **DisciplineSpecificElective(DSE)Course**:Electivecoursesmaybeofferedbythemain discipline/subjectofstudyisreferredtoasDisciplineSpecificElective.TheUniversity/ Institute mayalsoofferdisciplinerelatedElectivecoursesofinterdisciplinary nature(tobeofferedby main discipline/subject of study).

   2.2 **Dissertation/Project**:Anelectivecoursedesignedtoacquirespecial/advancedknowledge, suchassupplementstudy/supportstudytoaprojectwork,andacandidatestudiessuchacourse onhisownwithanadvisorysupportbyateacher/facultymemberiscalleddissertation/project.

   2.3 **GenericElective(GE) Course**: An elective coursechosen generallyfrom an unrelated discipline/subject, with an intention to seek exposureis calledaGenericElective.

   P.S.:Acorecourseofferedinadiscipline/subjectmaybetreatedasanelectivebyother discipline/subjectandviceversaandsuchelectivesmayalsobereferredtoasGenericElective.

3. **AbilityEnhancementCourses(AEC)/CompetencyImprovementCourses/SkillDevelopment Courses/FoundationCourse:**TheAbility Enhancement(AE)Coursesmay beoftwokinds:AE Compulsory Course(AECC)andAEElectiveCourse(AEEC)."AECC"coursesarethecourses baseduponthecontentthatleadstoKnowledgeenhancement.They(i)EnvironmentalScience,(ii) English/MIL

Communication)aremandatoryforalldisciplines.AEECcoursesarevalue-based and/or skill-based andare aimed at providinghands-on-training, competencies, skills, etc.

3.1 AE Compulsory Course (AECC): Environmental Science, English Communication/MIL Communication.

3.2 AEElectiveCourse(AEEC):These coursesmaybechosen from apoolof coursesdesignedto providevalue-based and/or skill-based instruct

Project work/Dissertationisconsideredasaspecialcourseinvolving applicationofknowledgein solving/analyzing/exploringareallifesituation/difficultproblem.AProject/Dissertationwork would be of 6 credits. A Project/Dissertation work.

❖ Common Course Structure for B.A/B.Sc. (Honours and General)

Course Component	B.Sc		B.A.	
	Honours	General	Honours	General
Core Course (CC)	14	12*	14	8**
Language Core Course (LCC)	0	0	0	4 (2English courses+ 2MIL courses)
Generic Elective (GE) (From two inter disciplinary subjects)	4**	0	4**	2
Discipline Specific Elective (DSE)	4	6*	4	4**
Ability Enhancemant Compulsory Course (AECC)	2	2	2	2
Skill Enhancement Elective Course (SEC)	2	4*	2	4
Total Number of Courses	**26**	**24**	**26**	**24**

*****covering three subjects.

**covering two subjects.

❖ Credit Structure for B.A./B.Sc. (Honours) Coureses:

Course Type	Number of courses (Having practical)		Number of courses (Having Tutorial)		Number of Credits (Having practical)		Number of Credits (Having Tutorial)	
	Theory	Practical	Theory	Tutorial	Theory	Practical	Theory	Tutorial
Core Course (CC)	14 x 4	14 x 2	14 x 5	14 x 1	56	28	70	14
Elective Courses:								
i)Generic Elective (GE)	4 x 4	4 x 2	4 x 5	4 x 1	16	8	20	4
ii)discipline Specific	4 x 4	4 x 2	4 x 5	4 x 1	16	8	20	4

Elective (DSE)								
Ability Enhancement Compulsory Course (AECC)	2 x 2	0	2 x 2	0	4	0	4	0
Skill Enhancement Elective (SEC)	2 x 2	0	2 x 2	0	4	0	4	0
Total	**26**	**22**	**26**	**22**	**96**	**44**	**118**	**22**

Total Courses=48 (26Th+22P/TU) **Total Credits**=140(96Th+44P)/(118Th+22TU)

❖ Semester wise Courses for B.Sc./B.A. (Honours):

	Sem-1	**Sem-2**	**Sem-3**	**Sem-4**	**Sem-5**	**Sem-6**
Core Course (CC)	2Th+2P/TU	2Th+2P/TU	3Th+3P/TU	3Th+3P/TU	2Th+2P/TU	2Th+2P/TU
Elective Courses:						
i)Generic Elective (GE)	1Th+1P/TU	1Th+1P/TU	1Th+1P/TU	1Th+1P/TU		
ii) discipline Specific Elective (DSE)					2Th+2P/TU DSE-A(1) B(1)	2Th+2P/TU DSE-A(2) B(2)
AbilityEnhancement Compulsory Course (AECC)	1Th+0P/TU AECC-1	1Th+0P/TU AECC-2				
Skill Enhancement Elective (SEC)			1Th+0P/TU SEC-A(1)	1Th+0P/TU SEC-B(2)		
Total No. of Courses and Marks	**4x100 =400**	**4x100 =400**	**5x100 =500**	**5x100 =500**	**4x100 =400**	**4x100 =400**
Total Credits	**20**	**20**	**26**	**26**	**24**	**24**

Th=Theory P=Practical TU=Tutorial

- For Core Courses – Each Theory and Practical Course have 4 and 2 Credits respectively/ Each Theory and Tutorial Course have 5 and 1 Credits respectively.
- For Elective Courses –Each Theory and Practical Course have 4and 2 Credits Respectively/ Each Theory and Tutorial Course have 5 and 1 Credits respectively
- For Ability/ Skill Enhancement Courses- Each Course has 2 Credits
- CC of Gen.courses will be treated as GE for the candidates taking honours.

Details Semester wise Courses for B.A. Honours in Arabic

❖ B. A. Honours in Arabic :

➢ Semester : I

Course Code	Course Title	Course wise Class	Credit
ARBH-CC-1	**History of Arabic Literature.(from Pre-Islamic to Umayyad period)** **Grammar & Translation**	Core (60Th+15TU)	6 (5Th+1TU)
ARBH-CC-2	**Arabic Prose (Islamic & Medieval Period)**	Core (60Th+15T)	6 (5Th+1TU)
GE-1	**From Interdisciplinary subject (Other than Arabic**)	Core (60Th+15TU)	6 (5Th+1TU)
AECC-1	**Communicative English /MIL**	AECC	2 (2Th)
Total	**4 Courses**	**Total**	**20**

➢ Semester: II

Course Code	Course Title	Course wise Class	Credit
ARBH-CC-3	**History of Arabic Literature (Abbasid period& Indian Arabic Literature)** **Grammar & Translation**	Core (60 Th +15TU)	6 (5 Th+1TU)

ARBH-CC-4	**Arabic Prose (Islamic & Medieval)**	Core (60 Th +15TU)	6 (5 Th+1TU)
GE-2	**From Interdisciplinary subject (Other than Arabic**)	GE (60 Th +15TU)	6 (5 Th+1TU)
AECC-2	**Environmental Studies.**	AECC	2 (2 Th)
Total	**4 Courses**	**Total**	**20**

- **Semester : III**

Course Code	Course Title	Course Wise Class	Credit
ARBH-CC-5	**Poetry (Pre-Islamic , Islamic & Umayyad period)**	Core (60 Th +15TU)	6 (5 Th+1TU)
ARBH-CC-6	**History of Arabic Literature (Spain)** **Grammar and Translation**	Core (60 Th +15TU)	6 (5 Th+1TU)
ARBH-CC-7	**History of Arabic Literature (Egypt)**	Core (60 Th +15T)	6 (5 Th+1TU)
GE-3	**From Interdisciplinary subject (Other than Arabic**)	GE (60 Th +15TU)	6 (5 Th+1TU)
ARBH-SEC-(A)1	**Translation and Composition**	SEC (2 Th)	2 (2 Th)
Total	**5 Courses**	**Total**	**26**

- **Semester : IV**

Course Code	Course Title	Course wise Class	Credit
ARBH-CC-8	**Poetry (Abbasid and Fatimid Period)**	Core (60 Th +15TU)	6 (5 Th+1TU)
ARBH-CC-9	**History of Arabic Literature (North and South America)**	Core (60 Th +15T)	6 (5 Th +1TU)

ARBH-CC-10	**Development of Modern Arabic Novel, Short Story, Drama and formation of Literary Groups)**	Core (60 Th +15T)	6 (5 Th +1TU)
GE-4	**From Interdisciplinary subject (Other than Arabic**)	GE (60 Th +15TU)	6 (5L+1TU)
ARBH-SEC-B(2)	**Translation, Interpretation (from English – Arabic News papers& Communicative Skill)**	SEC (2 Th)	2 (2TU)
Total	**5 Courses**	**Total**	**26**

- **Semester : V**

Course Code	Course Title	Course Wise Class	Credit
ARBH-CC-11	**Prose (Modern Period)**	Core (60 Th +15TU)	6 (5 Th +1TU)
ARBH-CC-12	**Poetry (Modern Period)**	Core (60 Th +15TU)	6 (5 Th +1TU)
ARBH-DSE-A(1)	**History of Islam**	DSE (60 Th +15TU)	6 (5 Th +1TU)
ARBH-DSE-B(1)	**Translation, Essay Writing, Terminology and Vocabulary**		6 (5 Th +1TU)
Total	**4 Courses**	**Total**	**24**

- **Semester : VI**

Course Code	Course Title	Course Wise Class	Credit
ARBH-CC-13	**Prose (Modern Period)**	Core (60Th+15TU)	6 (5Th+1TU)
ARBH-CC-14	**Poetry (Modern Period)**	Core (60 Th +15T)	6 (5 Th+1TU)

ARBH-DSE-A(2)	**History of Modern Arab World**	DSE (60 Th +15TU)	6 (5 Th+1TU)
ARBH-DSE-B(2)	**Rhetoric, Prosody and Philology**		6 (5 Th+1TU)
Total	**4 Courses**		**24**
Total (Semesters)	**26 Courses**		**140**

❖ B. A. Honours in Arabic

Semester-I

CC-1: History of Arabic Literature(from Pre-Islamic to Umayyad Period):

A. Pre-Islamic Period (500 -622 A. D.)

i) Brief history of Pre-Islamic literature

ii) Al-Muallaqat and its poets: ImaraulQais, Zuhair b. Abi Sulma, Labid b. Rabia, Amar b. Kulthum, Tarafah b. Abd.

B. Islamic Period & Umayyad Period (622-750 A.D.)

i) Al-Quran

ii) Al-Hadith

iii) Poetry with special reference to: Al-Khansa, Hassan bin Thabit, Umar bin abiRabiah, Al-Akhtal, Al- Farazdaq, Jarir.

- **Grammar: The following topics:**

(ا) الكلمة وأقسامها : الاسم والفعل والحرف (د) حروف الاستفهام

(ب)العدد : واحد، تثنية ، جمع وأقسامه

(ت) الأداة : النكرة والمعرفة

(ث) الجنس : المذكروالمؤنث

(ج) اسم الإشارة

(ح) الضميروأقسامه

(خ) حروف الجر

(ذ) أقسام الفعل: الماضي، المضارع ،الأمر، النهي

(ر) الفعل الثلاثي المجرد وأبوابه

(ز) المضاف والمضاف اليه

(س) الموصوف والصفة

(ش) المبتدأ والخبر

Translation: Based on the above mentioned Grammar

CC-2:Prose (Islamic and Medieval)

The following topics:

أ. سورة بني إسرائيل (الركوع-2،3،4) القرآن الكريم

ب. سورة الحجرات القرآن الكريم

ج. الصحيح (أحاديث منتخبة) الإمام مسلم ابن الحجاج القشيري

د. خطبة النبي صلى الله عليه و أله وسلم في حجة الوداع سيرة ابن هشام

هـ. سلمان الفارسي د.عبد الرحمان رافت باشا

و. قصة أهل البصرة من المسجديين الجاحظ

GE-1: From inter disciplinary subject.

AECC-1:Communicative English /MIL

Semester-II

CC-3: History of Arabic Literature (Abbasid Period & Indian Arabic Literature):

Grammar and Translation:

- **History of Arabic Literature (Abbasid Period-750-1258)**

(a) Brief history of the prose Literature with special reference to -
عبد الله بن المقفع، الجاحظ ، قاضي الفاضل، ابن العميد ، الهمذاني، الحريري، أبو الفرج الأصفهاني

(b) Brief history of poetry with special reference to the following poets:

بشار بن برد ، أبو العتاهية ، أبو نواس ، أبو تمام ، المتنبي ، المعري

- **Indian Arabic Literature**

Life and works of the following Indian Arabic Scholars:

ا) غلام علي آزاد البلغرامي **ث) السيد عبد الحي الحسني**

ب) شاه ولي الله المحدث الدهلوي **ج) الشيخ أبو الحسن علي الندوي**

ت) نواب صديق حسن خان **ح) أبو محفوظ الكريم المعصومي**

- **Grammar:**

The following topics:

أ. الفعل اللازم و المتعدي **ج . الحال: الرفع ، النصب، الجر (اعراب المثنى، إعراب جمع السالم)**

ب. نواصب الفعل المضارع **ح . الحروف المشبهة بالفعل**

ت. جوازم الفعل المضارع **خ . الأفعال الناقصة**

ث. المصدر و الأسماء المشتقة : اسم الفاعل ،اسم المفعول ،اسم الظرف ،اسم الآلة

Translation: Based on the above mentioned grammar

CC-4:Arabic Prose (Islamic & Medieval)

The following topics:

أ. خطة عمر(رض) في الحكم

ب. مؤامرة قريش ابن هشام

ج. القضاء و القدر عبد الله بن المقفع

د. بين قاض وقور وذباب جسور الجاحظ

هـ. أشعب والبخيل أبو الفرج الأصفهاني

و. القميص الأحمر ابن عبد ربه

ز. إن حملة العلم في الإسلام أكثرهم العجم ابن خلدون

GE-2: From inter disciplinary subject.

AECC-2: Environmental Studies.

Semester- III

CC-5: Poetry (Pre-Islamic, Islamic and Umayyad period)

1 – امرؤ القيس من معلقته(60 بيتا)

2 –لبيد بن ربيعة من معلقته (43 بيتا)

3 – حسان بن ثابت (1) قال يرثى النبي صلى الله عليه و آله وسلم

(2) قال في يوم بدر

4- الحماسة (1)العباس بن مرداس السلمي ،

(2) سالم بن وابصة الأسدي

5 – الفرزدق قال يمدح سيدنا عليا زين العابدين

6 – جرير قال يرجو قضاء حاجة من عمر بن عبد العزيز

CC-6: History of Arabic Literature in Spain:

a) **Prose:** withspecialreferenceto: IbnAbdRabbihi,IbnKhaldun,Lisanuddin Ibn Khatib and Ibn al Hazm.
b) **Poetry:** withspecialreferenceto: Muashsha, IbnZaidun, Ibn Hani al-Andalusi and Ibn al-Arabi.
c)

- **Grammar:**
  The following topics:

1) الفعل المزيد
2) خاصيات الأبواب : إفعال ، تفعيل ، افتعال ، استفعال ،مفاعلة، تفعّل
3) الأفعال المقترنة بالمضارع : المقاربة – الرجاء – الشروع
4) الاستفهامية والخبرية
5) الجمع واقسامه
6) المفاعيل الخمسة وإعرابها
7) الإسم الموصول

Translation: Based on the above mentioned grammar

CC-7: History of Arabic Literature in Egypt:

a) CausesofArabRenaissance (Napoleon’sinvasion-1798A.D.)
b) DevelopmentofModernArabicProsewithspecialreferenceto:RefaahRafeTahtawi,MuhammadAbduhu,Al-Manfaluti,TahaHussain,MohammadHussainHaikal,NajibMahfuz, TaufiqAl-HakimAnd Al-Mazini.
c) DevelopmentofModernArabicpoetry:Barudi,Shauqi,HafizIbrahim,

AndKhalilMutran, Ismail Sabri.

GE-3: From inter disciplinary subject.

SEC-A(1):Translation and Composition (basedonthe following Grammar):

الإنشاء والترجمة على أساس المواد التالية:

1) **أقسام الجملة : الاسمية , الفعلية, الشرطية, الإنشائية ، المبتدأ والخبر، مواضيع تقديم المبتدأعلى الخبر، مواضيع تقديم الخبرعلى المبتدأ**
2) **التمرين بكتابة الرسائل في عناوين مختلفة وكتابة الطلب (Application) باللغة العربي**

Semester-IV

CC-8:Poetry (Abbasid and Fatimid period)

ابن الرومي	**الزهاد (41 بيتا)**
المتنبي	**نعد المشرفية والعوالي**
ابو العلا المعري	**(1) ألا في سبيل المجد ما أنا فاعل**
	(2) وإني وإن كنت الأخير

ابن الفارض شربنا علي ذكر الحبيب (41 بيتا)

CC-9History of Arabic Literature (North and South America/AdabulMahjar)

GrammarandTranslation

1- History of Mahjariteliterature in North and South America (Adab al-Mahjar)
   A. A brief history of Mahjariteliteraturewithspecialreferenceto:Rabitaal-Qalamiya (The Pen Association – New York), JibranKhalilJibran, Mikhail NuaimaandIliaAbuMadi,
   B. Al- Usbaal-Andalusiya (Spaniard Association – Brazil) RashidSalimAl-khouri&FauziMaluf

2.Grammar:

Thefollowing topics:

1) **الحال وذو الحال**
2) **التمييز**
3) **المعرب والمبني**
4) **الممنوع من الصرف**
5) **حروف الشرط والجزاء**
6) **"لا" لنفي الجنس**

N.B. Grammar Based Translations on the Prescribed Items are Compulsory (ArabictoEnglish Andviceversa.)

CC- 10: DevelopmentofModernArabicNovel, short-story,Drama and Formation of Literary Groups:

A. IntroductiontotheDiwangroup,Apollo group and their founders.
B. DevelopmentofModernArabicshort-story,Novel,Drama with special reference to Mahmud Taimur, Mohammad Hussain Haikal, Taufiq Al-Hakim

GE-4: From inter disciplinary subject.

SEC-B (2): Translation and Interpretation(from English into Arabic & vice versa from News Papers)

Communicative Skill:

ا) الترجمة من الصحيفة العربية والإنجليزية:المواد العلمية , السياسية , الاجتماعية ، التجارية ، والتكنولوجيا

ب) المحادثة والخطابة باللغة العربية حول أي عنوان علمي

Semester-V

CC-11: Prose (Modern Period)

1) أول عهد بيثرب	**محمد حسين هيكل**
2) مرتا البانية	**جبران خليل جبران**
3) حنان أب	**محمد الحبيب معلى التونسي**
4) تجارة رابحة	**د. طه حسين**
5) منهج الأنبياء في الإصلاح والتغيير	**السيد أبو الحسن علي الندوي**

CC- 12:Poetry (Modern Period)

1) أين أيام لذتي وشبابي	**محمود سامي البارودي**
2) (أ) صدى الحرب (ب) الهمزية النبوية	**أحمد شوقي**

3) إلى الأستاذ محمد عبده — حافظ ابراهيم
4) جميل وبثين — الزهاوي

DSE-A(1):History of Islam,

1) سيرة النبي صلى الله عليهوآله وسلم من مولده إلى وفاته -
2) تاريخ الخلفاء الراشدين
3) خلافة بني أمية : معاوية ، واقعة كربلاء ،
4) خلافة بني العباس: أبو جعفر المنصور ، هارون الرشيد ، المأمون الرشيد، النهضة العلمية وتطور العلوم المختلفة في العهد العباسي

DSE-B (1):Translation:

Essay Writing:

Vocabulary:

Terminology:

Semester-VI

CC-13:Prose (Modern Period)

1) الدفين الصغير — مصطفى لطفي المنفلوطي
2) حادثة (دنيا الله) — نجيب محفوظ
3) الثقافة الهندية — أحمد أمين
4) بين الأمس واليوم — علي الطنطاوي

5) المدنية الإسلامية — شكيب أرسلان
6) أبو أيوب الأنصاري — عبد الرحمان رافت باشا

CC-14 :Poetry (Modern Period)

1) سكران — عباس محمود العقاد
2) عصفور الجنة — عبد الرحمن الشكري
3) حضن الأم — رشيد سليم الخوري
4) صلوات في هيكل الحب — أبو القاسم الشابي

DSE-A (2):History of Modern Arab World:

(The Following Countries)

1. Saudi Arabia
2. Kuwait
3. Yemen
4. Jordan
5. Iraq
6. UAE
7. Syria
8. Bahrain
9. Oman
10. Lebanon
11. Egypt
12. Palestine

DSE-B (2):Rhetoric/البلاغة

التشبيه وأقسامه – المجاز المرسل والعقلي – الاستعارة وأقسامها – الكناية – الجناس – التورية – الإطناب –الإيجاز

علم العروض/ Prosody

تعريف العلم العروض – المقطع – الأركان – الزحاف – العلة – القافية - البحر الكامل – البحر الوافر – البحر البسيط – التقطيع

Philology / فقه اللغة

Semitic Language: Its chief characteristics, Hebrew, Aramaic, Arabic andSyriac

❖ Books Recommended forB.A Honours in Arabic (All Courses)

A. Arabic Prose & Poetry

ArabicSelection- for B. A. Honors(under I+I+I system, New Regulation - 2011) Published by University of Calcutta

B. History of Arabic Literature:

تاريخ آداب اللغة العربية	**جرجي زيدان**
تاريخ الأدب العربي	**أحمد حسن الزيات**
تاريخ الأدب العربي	**شوقي ضيف**
تاريخ الأدب العربي	**عمر فروخ**
A Literary History of Arabs	**R.A. Nicholson**

C. Arabic Grammar and Translation:

1. النحو الواضح (المراحل الابتدائية والثانوية)	**علي الجارم و مصطفي أمين**
2. شرح قطر الندي وبل الصدي	**أبو محمد عبد الله جمال الدين بن هشام الأنصاري**
3. ما يلزم من العربية	**رفيع العماد فينان**
4. اللغة العربية للمبتدئين	**سيد علي مدراس**
5. تعليم اللغة العربية :طريقة عملية	**ولي أختر الندوي**

6. معلم الانشاء (1- 2- 3)	عبد الماجد الندوي و محمد رابع الحسني الندوي
7. Teach Yourself Arabic	S. A. Rahman
8. A Grammar of Arabic Laguage	Obaidullah Al-UbaidiShuharwardi

D. Indian Writers, Modern Arab World, Rhetoric & Prosody

1نزهة الخواطر و بهجة المسامع و النواظر	السيد عبد الحي الحسني
2سبحة المرجان في آثار هندوستان	السيد غلام علي آزاد البلغرامي
3البلاغة الواضحة	علي الجارم ومصطفى أمين
I. Muslim Jahan4	Suhrabuddin Ahmad
II. The Arabs	Peter Mansfield

E) History of Islam:

1) سيرة خاتم النبيين صلى الله عليه وآله وسلم	سميع عاطف الزين
2) حياة محمد صلى الله عليه وآله وسلم	محمد حسين هيكل
3) الفاروق	شبلى النعمانى
4) المرتضى	السيد أبو الحسن علي الندوي
5) تاريخ الإسلام	أكبر نجيب آبادي
III. History of Arabs	P. K. Hitti
IV. A Short History of the Saracens	Syed Amir Ali

UNIVERSITY OF CALCUTTA

DEPARTMENT OF ARABIC

ChoiceBasedCreditSystem(CBCS)

UNDERGRADUATE PROGRAMME

(CourseseffectivefromAcademicYear2018-19)

Syllabus for B.A. General in Arabic

SYLLABUSOFCOURSESTOBEOFFERED

Core Courses, Elective Courses & Ability Enhancement Course

❖ Preamble

TheUniversity GrantsCommission(UGC)hasinitiated severalmeasurestobringequity, efficiencyandexcellenceinthe HigherEducationSystemofcountry.Theimportant measurestakentoenhanceacademicstandardsand qualityinhighereducationinclude innovationand improvementsincurriculum,teaching-learning process,examinationand evaluation systems,besides governance andothermatters.

TheUGChasformulatedvariousregulationsandguidelinesfromtimetotimetoimprove thehighereducation systemand maintainminimumstandardsandqualityacrossthe HigherEducationalInstitutions(HEIs)inIndia.Theacademicreformsrecommendedby theUGC intherecentpasthaveled tooverall improvementinthehigher educationsystem. However, due to lot ofdiversityinthesystemofhighereducation, therearemultiple approachesfollowedbyuniversitiestowardsexamination,evaluationand gradingsystem. WhiletheHEIsmusthavetheflexibility and freedomindesigningtheexaminationand evaluationmethodsthatbest fitsthecurriculum,syllabiand teaching–learningmethods, thereisaneedtodeviseasensiblesystemforawarding thegradesbased onthe performanceofstudents.Presently theperformanceofthestudentsisreported usingthe conventional systemof markssecured intheexaminationsorgradesor both. The conversionfrommarkstolettergradesand thelettergradesused vary widely acrossthe HEIsinthecountry.Thiscreatesdifficultyfor theacademiaand theemployersto understand and infer the performance of the students graduating from different universities andcolleges basedon grades.

Thegrading systemisconsidered tobebetterthantheconventionalmarkssystemand henceithasbeenfollowedinthetopinstitutionsinIndiaand abroad.Soitisdesirableto introduceuniform grading system.Thiswillfacilitatestudentmobility acrossinstitutions withinand acrosscountriesand alsoenablepotentialemployerstoassesstheperformance of students. To bring in the desired uniformity, in grading system and method for computingthecumulativegradepointaverage(CGPA)basedon theperformanceof students in the examinations,the UGChas formulatedtheseguidelines.

❖ Choice Based Credit System(CBCS):

TheCBCSprovides an opportunityforthe students to choose coursesfromthe prescribed courses comprisingcore, elective/minor orskillbased courses.The courses can beevaluated followingthe gradingsystem, which is considered to be better than the conventional marks system. Therefore, itis necessaryto introduceuniform gradingsystem in the entirehigher education inIndia. This willbenefit the students to move across institutions within Indiato begin with and across countries. Theuniform gradingsystem will also enable potential

employers in assessingthe performanceof thecandidates.In order to bringuniformityin evaluation systemandcomputation ofthe Cumulative GradePoint Average(CGPA)basedon student's performancein examinations, theUGC has formulated the guidelines to befollowed.

❖ OutlineofChoiceBasedCredit System:

1.

CoreCourse: Acourse,whichshouldcompulsorilybestudiedbyacandidateasacorerequirement is termed as aCore course.

2.

ElectiveCourse: Generallyacoursewhichcanbechosenfromapoolofcoursesandwhichmay beveryspecificorspecializedoradvancedorsupportivetothediscipline/subjectofstudyorwhich providesanextendedscopeorwhichenablesanexposure tosomeother discipline/subject/domain or nurtures thecandidate's proficiency/skillis called an ElectiveCourse.

2.1

DisciplineSpecificElective(DSE)Course:Electivecoursesmaybeofferedbythemain discipline/subjectofstudyisreferredtoasDisciplineSpecificElective.TheUniversity/Institute mayalsoofferdisciplinerelatedElectivecoursesofinterdisciplinary nature(tobeofferedby main discipline/subject of study).

2.2

Dissertation/Project:Anelectivecoursedesignedtoacquirespecial/advancedknowledge, suchassupplementstudy/supportstudytoaprojectwork,andacandidatestudiessuchacourse onhisownwithanadvisorysupportbyateacher/facultymemberiscalleddissertation/project.

2.3 GenericElective(GE) Course: An electivecoursechosen generallyfrom an unrelated discipline/subject, with an intention to seek exposureis calledaGenericElective.

P.S.:Acorecourseofferedinadiscipline/subjectmaybetreatedasanelectivebyother discipline/subjectandviceversaandsuchelectivesmayalsobereferredtoasGenericElective.

3.

AbilityEnhancementCourses(AEC)/CompetencyImprovementCourses/SkillDevelopment Courses/FoundationCourse: TheAbility Enhancement(AE)Coursesmay beoftwokinds:AE Compulsory Course(AECC)andAEElectiveCourse(AEEC)."AECC"coursesarethecourses

baseduponthecontentthatleadstoKnowledgeenhancement.They(i)EnvironmentalScience,(ii) English/MIL Communication)aremandatoryforalldisciplines.AEECcoursesarevalue-based and/or skill-based andare aimed at providinghands-on-training, competencies, skills, etc.

3.1 AE Compulsory Course (AECC): Environmental Science, English Communication/MIL Communication.

3.2 AEElectiveCourse(AEEC):These coursesmaybechosen from apoolof coursesdesignedto providevalue-based and/or skill-based instruct

Project work/Dissertationisconsideredasaspecialcourseinvolving applicationofknowledgein solving/analyzing/exploringareallifesituation/difficultproblem.AProject/Dissertationwork would be of 6 credits. A Project/Dissertation work.

❖ Common Course Structure for B.A/B.Sc. (Honours and General)

Course Component	B.Sc		B.A.	
	Honours	General	Honours	General
Core Course (CC)	14	12*	14	8**
Language Core Course (LCC)	0	0	0	4(2English courses+ 2MIL courses)
Generic Elective (GE) (From two inter disciplinary subjects)	4**	0	4**	2
Discipline Specific Elective (DSE)	4	6*	4	4**
Ability Enhancement Compulsory Course (AECC)	2	2	2	2
Skill Enhancement Elective Course (SEC)	2	4*	2	4
Total Number of Courses	**26**	**24**	**26**	**24**

*****covering three subjects.

**covering two subjects.

❖ Credit Structure for B.A.(General) Courses:

Course Type		Number of courses (Having practical)		Number of courses (Having Tutorial)		Number of Credits (Having practical)		Number of Credits (Having Tutorial)	
		Theory	Practical	Theory	Tutorial	Theory	Practical	Theory	Tutorial
Core Course	(CC)	8 x 4	8 x 2	8 x 5	8 x 1	32	16	40	8
	Language(LCC)	4 x 4	4 x 2	4 x 5	4 x 1	16	8	20	4
Elective Courses:									
i)Generic Elective (GE)		2 x 4	2 x 2	2 x 5	2 x 1	8	4	10	2
ii) discipline Specific Elective (DSE)		4 x 4	4 x 2	4 x 5	4 x 1	16	8	20	4
Ability Enhancement Compulsory Course (AECC)		2 x 2	0	2 x 2	0	4	0	4	0
Skill Enhancement Elective (SEC)		4 x 2	0	4 x 2	0	8	0	8	0
Totals		**24**	**18**	**24**	**18**	**84**	**36**	**102**	**18**

Total Courses=42 (24Th+18P/TU) **Total Credits**=120(84Th+36P)/(120Th+18TU)

❖ Semester wise Courses for B.A. (General):

	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6
	1	**2**	**3**	**4**	**5**	**6**
Core Course (CC)	2Th+2P/TU **CC-1**	2Th+2P/TU **CC-2**	2Th+2P/TU **CC-3**	2Th+2P/TU **CC-4**		
Language(LCC)			**L1(1)** 1Th+1P/TU	**L2(1)** 1Th+1P/TU	**L1(2)** 1Th+1P/TU	**L2(2)** 1Th+1P/TU
Elective Courses:						
i)Generic Elective (GE)	1Th+1P/TU **GE-1**	1Th+1P/TU **GE-2**				
ii) discipline Specific Elective (DSE)					2Th+2P/TU **DSE-A** (1A+2A)	2Th+2P/TU **DSE-B** (1B+2B)
Ability Enhancement Compulsory Course (AECC)	1Th+0P/TU **AECC-1**	1Th+0P/TU **AECC-2**				
Skill Enhancement Elective (SEC)			1Th+0P/TU **SEC-A(1)**	1Th+0P/TU **SEC-B(1)**	1Th+0P/TU **SEC-A(2)**	1Th+0P/TU **SEC-B(2)**
Total No. of Courses and Marks	**4x100 =400**	**4x100 =400**	**4x100 =400**	**4x100 =400**	**4x100 =400**	**4x100 =400**
Total Credits	**20**	**20**	**20**	**20**	**20**	**20**

Th=Theory P=Practical TU=Tutorial

- For Core Courses- 4 Courses each from 2 disciplines + 2English courses + 2MILcourses
- CC of general Course will be treated as GE for the candidates taking honours in other disciplines (other than Arabic.)
- For Elective Courses -2DSE courses is from same to disciplines+ 2GE from other subjects
- 1 Theory (Th) =4 credits +1 Practical (P)= credits o 1 Theory (Th) =5 credits +1 Tutorial (TU) = 1 credits
- For Ability/ Skill Enhancement Courses- Each Course has 2 Credits
- **L1** = English courses ; **L2** = MIL courses

Details Semester wise Courses for B.A. General in Arabic:

❖ B. A. General in Arabic :

➢ Semester: I

Course Code	Course	Course Wise Class	Credit
ARBG-CC 1	History of Arabic Literature-(Pre-Islamic Period 500-622 A.D., Islamic and Umayyad Period (622-750 A. D.) Grammar and Translation.	Core (60Th+15TU)	6 (5Th+1TU)
GE -1	From Interdisciplinary subject (Other than Arabic)	GE (60Th+15TU)	6 (5Th+1TU)
AECC-1	Communicative English /MIL	AECC	2 (2L)
Total	**4 Courses**	**Total**	**20**

➢ Semester: II

Course Code	Course	Course Wise Class	Credit
ARBG-CC- 2	History of Arabic Literature-(Abbasid Period, 750- 1258A.D.) Prose,Poetry,Grammar and Translation	Core (60Th+15T TU)	6 (5Th+1TU)
GE -2	From Interdisciplinary subject (Other than Arabic)	GE (60Th+15TU)	6 (5Th+1TU)
AECC-2	Environmental Studies.	AECC	2 (2Th)
Total	**4 Courses**	**Total**	**20**

➢ Semester: III

Course Code	Course	Course Wise Class	Credit
ARBG-CC- 3	Prose : Islamic,medieval andModernPeriod	Core (60Th+15TU)	6 (5Th+1TU)
LCC - L1(1)	Language (L1-1) English Courses	Core (60Th+15T)	6 (5Th+1TU)
SEC-A (1) SEC –A(2) To be Opted any one (either in semester III or in semester V)	Grammar , Translation & Letter Writing SEC: Specific literary feature of Modern Arabic Literature	SEC (25Th)	2 (2Th)
Total	**4 Courses**	**Total**	**20**

➢ Semester: IV

Course Code	Course	Course Wise Class	Credit
ARBG-CC -4	Poetry : Islamic, medieval and Modern Period	Core (60Th+15TU)	6 (5Th+1TU)
LCC- L2(1)	Language (L2-1)	Core (60Th+15TU)	6 (5Th+1TU)
SEC- B(1) SEC –B(2) To be Opted any one (either in semester IV or in semester VI)	SEC: Grammar, Translation & Essay Writing SEC: Specific literary feature of Modern Arabic Literature in Exile	SEC (25Th)	2 (2Th)
Total	**4 Courses**	**Total**	**20**

- **Semester: V**

Course Code	Course	Course Wise Class	Credit
LCC-(L1-2)	Language (L1-2) English Courses	Core (60Th+15TU)	6 (5Th+1TU)
DSE-A(1) DSE-A(2) (To be Opted any one)	Rhetoric Prosody	Core (60Th+15TU)	6 (5Th+1TU)
SEC-A (1) SEC –A(2) To be Opted any one (either in semester III or in semester V)	Grammar , Translation & Letter Writing SEC: Specific literary feature of Modern Arabic Literature	SEC (25Th)	2 (2Th)
Total	**4 Courses**	**Total**	**20**

- **Semester: VI**

Course Code	Course	Course Wise Class	Credit
LCC(L2-2)	Language (L2-2)	Core (60L+15T)	6 (5Th+1TU)
DSE-B(1) DES-B(2) To be Opted any one	History of Modern Arab World History of Modern Arab World	Core (60Th+15TU)	6 (5Th+1TU)
SEC- B(1) SEC –B(2) To be Opted any one (either in semester IV or in semester VI)	SEC:Grammar, Translation & Essay Writing SEC: Specific literary feature of Modern Arabic Literature in Exile	SEC (25Th)	2 (2Th)
Total	**4 Courses**	**Total**	**20**

❖ B.A. General Course in Arabic

Semester- I

CC- 1: History of Arabic Literature

(Pre- Islamic Period 500-622 A. D.)

Introduction of Pre-Islamic Period, Al-Muallaqatwith special reference to:ImraulQais, Zuhair bin AbiSulma and Labid bin Rabia.

(Islamic and Umayyad Period (622 -750 A.D.)

Al-Quran (b) Al-Hadith (c) Poetry with special reference to-Al-Khansa , Hassan bin Thabit,

Al-Akhtal , Al-Farazdaq, Jarir.

- **Grammar and Translation:**

The following topics-

(1) الكلمة و أقسامها: اسم ، فعل ، حرف

(2) الأداة : النكرة و المعرفة

(3) الجنس: المذكروالمؤنث

(4) العدد : الواحد، التثنية ، الجمع وأقسامه

(5) الفعل : الماضي ، المضارع ، الأمر،النهي

(6) جمع التكسير

(7) أدوات الاستفهام

(8)الفعل الثلاثي المجرد و أبواب والمزيد فيه

(9) الضميروأقسامه

(10) المضاف و المضاف اليه

(11) المبتدأ والخبر

(12) الموصوف والصفة

N.B.- Translation (Arabic to English & vice versa) should be exercised on the prescribed Grammatical topics pointed out wherever in the whole syllabus. This type of exercises of the grammar-based-translation should be strictly followed.

GE-1:From Interdisciplinary subject (Other than Arabic)

AECC-1: Communicative English /MIL

Semester- II

CC- 2: History of Arabic Literature

(Abbasid Period, 750- 1258 A. D.)

- **Prose**
  Prose with special reference to: Ibn-ul-Muqaffa, Al-Jahiz, Ibnul Amid, Qadi Al-Fadil, Al-Hariri and Al Hamazani.

- **Poetry**

Poetry with Special Reference to:Al-Mutanabbi, Al Maari, Bashar bin Burd, Abu Nuas,AbulAtahiah and Abu Tammam,

- **Grammar and Translation:**
  The following topics:

(1) نواصب المضارع

(2) جوازم المضارع

(3) اسم الإشارة

(4) اسم الموصول

(5) اسم الفاعل واسم المفعول من الثلاثي المجرد

(6) الفعل اللازم والمتعدي

(7)الحال: رفع ، نصب ، جر

(8) حروف الجر

(9) حروف الاستفهام

(10) حروف الشرط

(11) المعرب والمبني

GE2:FromInterdisciplinarysubject(Otherthan Arabic)

AECC-2:Environmental Studies.

Semester- III

CC-3: Prose: (Islamic, medieval and Modern Period)

1) سورة الحجرات	القرآن الكريم
2) الجامع الصحيح (أحاديث منتخبة)	الإمام مسلم بن الحجاج
3) سلمان الفارسي	عبد الرحمن رأفت الباشا
4) خطبة النبى فى حجة الوداع	محمد صلى الله عليه و أله وسلم
5) أصحاب الفيل	سيرة ابن هشام
6) الدين الصناعي	أحمد أمين

LCC - L1(1) Language1: English Courses

SEC-A (1):Grammar, Translation and Letter Writing:

- **Grammar and Translation** :

The following topics:

قواعد النحو والترجمة على أساس المواد التالية:الجملة الاسمية , الجملة الفعلية,الجملة الشرطية, حروف المشبه بالفعل ، الأفعال الناقصة , الحال وذو الحال والتميز، أفعال المقاربة

- **Letter Writing:**

Letter Writing: Official, Educational, Personal etc

SEC- A (2): Specific literary feature of Modern Arabic Literature

تاريخ النهضة العربية ، أسباب النهضة ، مدرسة الديوان ومؤسسوها عباس محمود العقاد ،،إبراهيم المازني وعبد الرحمن شكري، مدرسة أبولو ومؤسسوها أحمد زكي أبو شادي ، إبراهيم ناجي ، أبو القاسم الشابي

Semester- IV

CC- 4: Poetry: (Islamicand MedievalPeriod)

1) حسان بن ثابت	**(أ) قال يرثي النبي صلى الله عليه و أله وسلم**
	(ب) قال في يوم بدر
2) الحماسة	**(أ) العباس بن مرداس السلمي،**
	(ب) سالم بن وابصة الأسدي
3) المتنبي	**نعد المشرفية والعوالي**
4) أبو العتاهية	**وله في الوعظ**
5) أبو العلاء المعري	**ألا في سبيل المجد**
6) حافظ ابراهيم	**حال لسان اللغة العربية**
7) أحمد شوقي	**(أ)أيا صوفيا**
	(ب) صدى الحرب

LCC- L2(1) =MIL Course

SEC-B(1): Grammar, Translation& Essay Writing:

- **Grammar and Translation**:

The following topics**:**

الفعل المزيد فيه : إسم الفاعل والمفعول من المزيد فيه، المفاعيل الخمسة

- **Essay Writing** :

كتابة المقال (Essay Writing):

المدن، المكتبات، زيارة حديقة الحيوانات ، شخصية تحبها كثيرا (الأدب العربي)

SEC-B (2): Specific literary feature of Modern Arabic Literature in Exile

تاريخ أدب المهجر، الرابطة القلمية ومؤسسوها جبران خليل جبران ، إيليا أبو ماضي وميخائيل نعيمة و العصبة الأندلسية ومؤسسوها ميشال معلوف ، رشيد سليم الخوري و الياس فرحات

Semester- V

LCC-(L1-2) Language: English Courses

DSE-A (1): Rhetoric, the Following Items:

1) **التشبيه وأقسامه ، المجاز، الاستعارة ، الكناية ، الجناس ، والتورية**

DSE-A (2): Prosody, the Following Items

2) **تعريف علم العروض ، سبب ، وتد ، فاصلة ، أركان ، البحر الكامل ، البحر الطويل والتقطيع**

SEC-A (1): Grammar, Translation and Letter Writing:

- **Grammar and Translation** :

The following topics:

قواعد النحو والترجمة على أساس المواد التالية:الجملة الاسمية , الجملة الفعلية,الجملة الشرطية, حروف المشبه بالفعل ، الأفعال الناقصة , الحال وذو الحال والتميز، أفعال المقاربة

- **Letter Writing:**

Letter Writing: Official, Educational, Personal etc

SEC- A (2): Specific literary feature of Modern Arabic Literature

تاريخ النهضة العربية ، أسباب النهضة ، مدرسة الديوان ومؤسسوها عباس محمود العقاد ، إبراهيم المازني وعبد الرحمن شكري، مدرسة أبولو ومؤسسوها أحمد زكي أبو شادي ، إبراهيم ناجي ، أبو القاسم الشابي

Semester- VI

LCC-L2 (2): MIL Course

DSE-B (1): History of Modern Arab World. The Following Countries:

Saudi Arabia, Iraq, Syria, Jordan, UAE.

DSE-B (2): History of Modern Arab World. The Following Countries:

Qatar, Kuwait, Oman, Egypt and Palestine

SEC-B (1): Grammar, Translation& Essay Writing:

- **Grammar and Translation**:

The following topics**:**

الفعل المزيد فيه : إسم الفاعل والمفعول من المزيد فيه، المفاعيل الخمسة

- **Essay Writing** :

كتابة المقال (Essay Writing):

المدن، المكتبات، زيارة حديقة الحيوانات ، شخصية تحبها كثيرا (الأدب العربي)

SEC-B (2): Specific literary feature of Modern Arabic Literature in Exile

تاريخ أدب المهجر، الرابطة القلمية ومؤسسوها جبران خليل جبران ، إيليا أبو ماضي وميخائيل نعيمة و العصبة الأندلسية ومؤسسوها ميشال معلوف ، رشيد سليم الخوري و الياس فرحات

❖ Books Recommended for B.A. General

A. Arabic Prose & Poetry

Arabic Selection- for B. A. General (under I+I+I system, New Regulation - 2011)

Published by University of Calcutta

B. History of Arabic Literature:

1.	تاريخ آداب اللغة العربية	جرجي زيدان
2.	تاريخ الأدب العربي	أحمد حسن الزيات
3.	تاريخ الأدب العربي	شوقي ضيف
4.	تاريخ الأدب العربي	عمر فروخ
5.	A Literary History of Arabs	R.A. Nicholson

C. Arabic Grammar & Translation:

1.	النحو الواضح (المراحل الابتدائية والثانوية)	علي الجارم و مصطفي أمين
2.	شرح قطر الندي وبل الصدي	أبو محمد عبد الله جمال الدين بن هشام الأنصاري
3.	ما يلزم من العربية	رفيع العماد فينان
4.	اللغة العربية للمبتدئين	سيد علي مدراس
5.	تعليم اللغة العربية :طريقة عملية	ولي أختر الندوي
6.	معلم الانشاء (1,2,3)	عبد الماجد الندوي و محمد رابع الحسني الندوي
7.	Teach Yourself Arabic	S. A. Rahman
8.	A Grammar of Arabic Language	Obaidullah Al-UbaidiShuharwardi
9.	Muslim jahan	Suharabuddin Ahmad
10.	The Arabs	Peter Mansfield

D. Indian Writers, Arab World, Rhetoric andProsody

1. نزهة الخواطر	السيد عبد الحي الحسني
2. سبحة المرجان في آثارهندستان	السيد غلام علي آزاد البلغرامي
3. البلاغة الواضحة	علي الجارم ومصطفى أمين
4. Muslim Jahan	Suhrabuddin Ahmad
5. The Arabs	Peter Mansfield
6. History of Arabs	P. K. Hitti

E. Skill Enhancement Courses (SEC)

1. محمد محبوب الرحمان- دروس الأشياء (من الدرس الأول إلى الدرس السابع)
2. ف. س. عبد الرحيم- دروس اللغة العربية (Easy Arabic Course)
3. قواعد اللغة العربية لغير الناطقين بالضاد- (لجنة العلماء)
4. أحمد حسن الزيات : تاريخ الأدب العربي
5. جرجي زيدان : تاريخ آداب اللغة العربية
6. د. طه حسين : من حديث الشعروالنثر
7. د. شوقي ضيف : تاريخ الأدب العربي
8. واضح رشيد الندوى: تاريخ الأدب العربي فى العصر الجاهلى
9. د. عبد الحليم الندوي : عربي أدب كي تاريخ
10. د. مقتدى حسن الأزهري : مختصرتاريخ أدب عربي
11. د. سيد احتشام أحمد ندوي : عربي أدب كا ارتقا

(i) R.A Nicholson- A Literary of the Arabs
(ii) H. A. R. Gibb- History of Arabs
(iii) J. A. Hayood- The History of Modern Arabc Literature
(iv) Dr. K.A. Fariq– History of Arabic Literature (2 Volumes)

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 24 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 13.07.2018 (vide Item No.18) approved the corrected version of the Bengali (Honours / General / LCC2 / AECC1) syllabus replacing the existing Bengali (Honours / General / LCC2 / AECC1) syllabus (as notified in Notification No.CSR/ 12/18 dated 04.06.2018) , laid down in the accompanying pamphlet.

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 6th August, 2018

(Debabrata Manna)
Deputy Registrar (Acting)

কলিকাতা বিশ্ববিদ্যালয়

২০১৮

স্নাতক বাংলা পাঠক্রম

সাম্মানিক

সাধারণ

ও

AECC-1

ইউ.জি.সি নির্দেশিত সিবিসিএস অনুসারে

(উত্তর লেখার ক্ষেত্রে পরীক্ষার্থীদের পশ্চিমবঙ্গ বাংলা আকাদেমি-র বানানবিধি অনুসরণ করতে হবে)

কলিকাতা বিশ্ববিদ্যালয়

২০১৮

স্নাতক বাংলা পাঠক্রম

সাম্মানিক

ইউ.জি.সি নির্দেশিত সিবিসিএস অনুসারে

(উত্তর লেখার ক্ষেত্রে পরীক্ষার্থীদের পশ্চিমবঙ্গ বাংলা আকাদেমি-র বানানবিধি অনুসরণ করতে হবে)

স্নাতক সাম্মানিক বাংলা— 140 (114 + 26) Credits

A) Discipline Centric Core Course (CC)–6 Credit Each

BNG-A-CC-1-1-Th-Tu	বাংলা সাহিত্যের ইতিহাস (১৮০০ খ্রিঃ পর্যন্ত)
BNG-A-CC-1-2-Th-Tu	বর্ণনামূলক ভাষাবিজ্ঞান ও বাংলা ভাষা
BNG-A-CC-2-3-Th-Tu	বাংলা সাহিত্যের ইতিহাস (উনিশ শতক)
BNG-A-CC-2-4-Th-Tu	বাংলা সাহিত্য : প্রবেশক পাঠ
BNG-A-CC-3-5-Th-Tu	বাংলা সাহিত্যের ইতিহাস (বিশ শতক)
BNG-A-CC-3-6-Th-Tu	ঐতিহাসিক ভাষাবিজ্ঞান
BNG-A-CC-3-7-Th-Tu	কথাসাহিত্য
BNG-A-CC-4-8-Th-Tu	প্রাগাধুনিক সাহিত্য
BNG-A-CC-4-9-Th-Tu	ছন্দ, অলঙ্কার ও কাব্যতত্ত্ব
BNG-A-CC-4-10-Th-Tu	প্রবন্ধ ও বিবিধ রচনা
BNG-A-CC-5-11-Th-Tu	সাহিত্যের রূপ ও রীতি
BNG-A-CC-5-12-Th-Tu	নাটক ও নাট্যমঞ্চ
BNG-A-CC-6-13-Th-Tu	আধুনিক বাংলা কাব্য-কবিতা
BNG-A-CC-6-14-Th-Tu	সংস্কৃত, ইংরেজি ও প্রতিবেশী (হিন্দী) সাহিত্যের ইতিহাস

B) Discipline Specific Elective (DSE)– 6 Credits Each

BNG-A-DSE-A-5-1-Th-Tu	বাংলার সমাজ ও সংস্কৃতির ইতিহাস
BNG-A-DSE-A-5-2-Th-Tu	বাংলাদেশের সাহিত্য
BNG-A-DSE-A-6-3-Th-Tu	বাংলা গোয়েন্দা সাহিত্য, কল্পবিজ্ঞান আশ্রয়ী রচনা এবং অলৌকিক কাহিনি
BNG-A-DSE-A-6-4-Th-Tu	তুলনামূলক সাহিত্য
BNG-A-DSE-B-5-1-Th-Tu	বাংলা শিশু-কিশোর সাহিত্য
BNG-A-DSE-B-5-2-Th-Tu	দেশভাগ ও বাংলা সাহিত্য
BNG-A-DSE-B-6-3-Th-Tu	চরিত সাহিত্য, আত্মচরিত ও ভ্রমণ সাহিত্য
BNG-A-DSE-B-6-4-Th-Tu	লোকসংস্কৃতি ও লোকসাহিত্য

C) Skill Enhancement Couse (SEC)–2 Credit Each

BNG-A-SEC-A-3-1-Th	মুদ্রণ ও প্রকাশনা
BNG-A-SEC-A-3-2-Th	ব্যবহারিক বাংলা-১
BNG-A-SEC-B-4-1-Th	ব্যবহারিক বাংলা ও সাহিত্য গবেষণার পদ্ধতিবিজ্ঞান
BNG-A-SEC-B-4-2-Th	ব্যবহারিক বাংলা-২

D) Ability Enhancement Compulsory Course (AECC)–2 Credits

BNG-AECC-1-1Th

স্নাতক বাংলা (সাম্মানিক) পাঠক্রমের সেমেস্টার ভিত্তিক বিভাজন

	SEM-1	SEM-2	SEM-3	SEM-4	SEM-5	SEM-6
A) Core Course 6 Credits each (5TH + 1TU)	● BNG-A-CC-1-1-TH-TU ● BNG-A-CC-1-2-TH-TU	● BNG-A-CC-2-3-TH-TU ● BNG-A-CC-2-4-TH-TU	● BNG-A-CC-3-5-TH-TU ● BNG-A-CC-3-6-TH-TU ● BNG-A-CC-3-7-TH-TU	● BNG-A-CC-4-8-TH-TU ● BNG-A-CC-4-9-TH-TU ● BNG-A-CC-4-10-TH-TU	● BNG-A-CC-5-11-TH-TU ● BNG-A-CC-5-12-TH-TU	● BNG-A-CC-6-13-TH-TU ● BNG-A-CC-6-14-TH-TU
B) Elective Courses 6 Credits each (5TH + 1TU)						
i) Generic Elective (GE)	☒	☒	☒	☒		
ii) Discipline Specific Elective (DSE)					DSE-A- বর্গের প্রথম দুটি কোর্স (অর্থাৎ কোর্স 1 ও 2) থেকে **একটি** এবং DSE-B- বর্গের প্রথম দুটি কোর্স (অর্থাৎ কোর্স 1 ও 2) থেকে **একটি** নিয়ে মোট **দুটি** কোর্স নির্বাচন করতে হবে।	DSE-A- বর্গের শেষ দুটি কোর্স (অর্থাৎ কোর্স 3 ও 4) থেকে **একটি** এবং DSE-B- বর্গের শেষ দুটি কোর্স (অর্থাৎ কোর্স 3 ও 4) থেকে **একটি** নিয়ে মোট **দুটি** কোর্স নির্বাচন করতে হবে।
C) Skill Enhancement Course (SEC) 2 Credits Each (2TH)			যে-কোনো একটি ● BNG-A-SEC-A-3-1-TH ● BNG-A-SEC-A-3-2-TH	যে-কোনো একটি ● BNG-A-SEC-B-4-1-TH ● BNG-A-SEC-B-4-2-TH		
D) Ability Enhancement Compulsory Course (AECC) 2 Credits (2TH)	● BNG-AECC-1-1-TH	☒				
Total Marks/ Credits	400/20	400/20	500/26	500/26	400/24	400/24

Note : বাংলা ছাড়া পাঠ্য অন্য কোর্স বোঝাতে ☒ চিহ্নটি ব্যবহার করা হয়েছে।

Discipline Centric Core Course (CC)
(সাম্মানিক বাংলা)

- স্নাতক সাম্মানিক বাংলা পাঠক্রমে 'Discipline Centric Core Course' স্তরে ৮৪ ক্রেডিট-এর মোট ১৪টি কোর্স ছয় (৬)টি সেমেস্টারে পড়তে হবে।
- ৬ (৫ + ১) ক্রেডিট-এর প্রতিটি কোর্সের পূর্ণমান ১০০। এর মধ্যে ১০ নম্বর সংশ্লিষ্ট CC-র ক্লাসে পড়ুয়ার উপস্থিতির জন্য বরাদ্দ। ১০ নম্বর কোর্সভিত্তিক ধারাবাহিক মূল্যায়ন বা ইন্টারন্যাল অ্যাসেসমেট-এর জন্য এবং ১৫ নম্বর কোর্সভিত্তিক টিউটোরিয়াল-এর জন্য বরাদ্দ। বাকি ৬৫ নম্বরের জন্য বিশ্ববিদ্যালয়ের সংশ্লিষ্ট কর্তৃপক্ষের তত্ত্বাবধানে লিখিত পরীক্ষা নেওয়া হবে। প্রতিটি সেমেস্টারে পনেরো সপ্তাহ করে ক্লাস হবে ধরে নিয়ে Class Hours/Teaching Hours-এর হিসেব দেওয়া হয়েছে।
- ৬৫ নম্বরের লিখিত পরীক্ষায় ১০ নম্বরের তিনটি ব্যাখ্যামূলক, ৫ নম্বরের ৪টি বোধমূলক এবং ১ নম্বরের ১৫টি সংক্ষিপ্ত উত্তরভিত্তিক/তথ্যমূলক প্রশ্নের উত্তর দিতে হবে। নিচের তালিকায় প্রশ্নপত্রের ধারণা পাওয়া যাবে।

প্রশ্ন নং	প্রশ্নের ধরন ও বিকল্প সংক্রান্ত নিয়ম	প্রশ্নের মান
১	মডিউল-১ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
২	মডিউল-২ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
৩	মডিউল-৩ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
৪	মডিউল-১ থেকে একটি বোধমূলক প্রশ্ন। একটি বিকল্প থাকবে।	৫
৫	মডিউল-২ থেকে একটি বোধমূলক প্রশ্ন। একটি বিকল্প থাকবে।	৫
৬	মডিউল-৩ থেকে একটি বোধমূলক প্রশ্ন। একটি বিকল্প থাকবে।	৫
৭	মডিউল-১, মডিউল-২ এবং মডিউল-৩ থেকে একটি করে প্রসঙ্গ/বিষয় নিয়ে টীকা-ধর্মী প্রশ্ন হবে। তিনটির মধ্যে যে-কোনো একটি লিখতে হবে।	৫
৮	প্রত্যেকটি মডিউল থেকে কমপক্ষে **তিনটি** করে প্রশ্ন নিয়ে মোট **পনেরটি** সংক্ষিপ্ত উত্তরভিত্তিক/তথ্যমূলক প্রশ্ন দেওয়া হবে। এক্ষেত্রে কোনো বিকল্প থাকবে না।	১ × ১৫

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বাংলা সাহিত্যের ইতিহাস (১৮০০ খ্রিঃ পর্যন্ত)

উদ্দেশ্য : বাংলা ভাষা ও সাহিত্যের উদ্ভবের সময়কাল থেকে ১৮০০ খ্রিস্টাব্দ পর্যন্ত বাংলা সাহিত্যের বিভিন্ন ধারার সঙ্গে শিক্ষার্থীদের পরিচিতি ঘটানো এই পাঠের উদ্দেশ্য।

মডিউল-১

	Class Hours		
	Th	**Tu**	**IA Exam**
বাংলা ভাষা ও সাহিত্যের ইতিহাস সম্পর্কিত সাধারণ ধারণা	২৩	৬	১
বাংলা সাহিত্যের যুগবিভাগ— প্রসঙ্গ ও বিতর্ক			
বাংলা ভাষা ও সাহিত্যের আদি পর্বের গতিপ্রকৃতি ও নিদর্শন সমূহ			
চর্যাপদ			
শ্রীকৃষ্ণকীর্তন			

মডিউল -২

অনুবাদ সাহিত্য-ভাগবত, রামায়ণ ও মহাভারত	২৩	৬	১
বৈষ্ণব পদাবলী— বিদ্যাপতি, চণ্ডীদাস, জ্ঞানদাস, গোবিন্দদাস			
চৈতন্য-চরিত সাহিত্য— চৈতন্যভাগবত, শ্রীচৈতন্যচরিতামৃত			

মডিউল-৩

মঙ্গলকাব্যের উদ্ভব ও বিকাশ	২৩	৬	১
মনসামঙ্গল, ধর্মমঙ্গল, চণ্ডীমঙ্গল ও অন্নদামঙ্গল			
প্রণয়োপাখ্যান— শাহ মহম্মদ সগীর, দৌলত কাজী ও আলাওল			
শাক্ত পদাবলী— রামপ্রসাদ সেন ও কমলাকান্ত ভট্টাচার্য			

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ বাঙ্গালা সাহিত্যের ইতিহাস (১-২)— সুকুমার সেন
- ❑ বাংলা সাহিত্যের রূপরেখা (১-২)— গোপাল হালদার
- ❑ বাংলা সাহিত্যের ইতিবৃত্ত (১-৫)— অসিতকুমার বন্দ্যোপাধ্যায়
- ❑ বাংলা সাহিত্যের ইতিকথা (১-২)— ভূদেব চৌধুরী
- ❑ বাঙালি জাতি ও বাংলা সাহিত্য (১-২)— আহমেদ শরীফ
- ❑ মধ্যযুগের বাংলা সাহিত্যের তথ্য ও কালক্রম — সুখময় মুখোপাধ্যায়
- ❑ বাংলা মঙ্গলকাব্যের ইতিহাস— আশুতোষ ভট্টাচার্য
- ❑ বাংলা সাহিত্যের ইতিহাস (আদি ও মধ্যযুগ)— দেবেশকুমার আচার্য

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বর্ণনামূলক ভাষাবিজ্ঞান ও বাংলাভাষা

উদ্দেশ্য : সাহিত্যের সাম্মানিক পর্যায়ের ছাত্র হিসেবে বাংলা ভাষাতত্ত্ব ও শব্দতত্ত্ব সম্পর্কে ধারণা থাকা অত্যন্ত গুরুত্বপূর্ণ। সেই লক্ষ্যপূরণে এই কোর্সটি তৈরি করা হয়েছে।

মডিউল-১

	Class Hours		
	Th	**Tu**	**IA Exam**
ধ্বনি, বর্ণ, অক্ষর— সংজ্ঞার্থ ও পারস্পরিক সম্পর্ক	২৩	৬	১
উচ্চারণস্থান ও উচ্চারণপ্রকৃতি অনুযায়ী বাংলা স্বর ও ব্যঞ্জনধ্বনিগুলির পরিচয়			
মৌলিক স্বরধ্বনি ও স্বনিমের ধারণা			
বাংলা ভাষার শব্দ ভাণ্ডার			

মডিউল-২

শব্দ বিবর্তন, বাংলা ভাষার ধ্বনি পরিবর্তনের রীতি ও প্রকৃতি	২৩	৬	১
বাংলা শব্দার্থ পরিবর্তনের ধারা, বাংলা ভাষার উপভাষা			

মডিউল-৩

বাংলা ভাষার রূপতাত্ত্বিক আলোচনা— বচন, লিঙ্গ, পুরুষ, সমাস, বিভক্তি, কারক, প্রত্যয়, ক্রিয়ার কাল ও অব্যয়	২৩	৬	১

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ সাধারণ ভাষাবিজ্ঞান ও বাঙলা ভাষা— রামেশ্বর শ'
- ❑ ভাষার ইতিবৃত্ত— সুকুমার সেন
- ❑ ভাষাবিদ্যা পরিচয়— পরেশচন্দ্র ভট্টাচার্য
- ❑ বাংলা ভাষা পরিক্রমা (১-২)— পরেশচন্দ্র মজুমদার
- ❑ উপভাষা চর্চার ভূমিকা— মণিরুজ্জামান
- ❑ ভাষাতত্ত্ব অনুশীলন— মণিরুজ্জামান
- ❑ বাংলা ভাষার ব্যাকরণ ও তার ক্রমবিকাশ— নির্মল দাশ

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বাংলা সাহিত্যের ইতিহাস (উনিশ শতক)

উদ্দেশ্য : ঔপনিবেশিক আধুনিকতার সংস্পর্শে এসে আমাদের চিন্তা-চেতনা, জীবনমান ও সাহিত্যে যে আধুনিকতার সঞ্চার ঘটেছিল তার সঙ্গে শিক্ষার্থীদের পরিচিত করানোই এই কোর্সের উদ্দেশ্য।

মডিউল-১ : কাব্য-কবিতা ও নাটক-প্রহসন

		Class Hours		
		Th	Tu	IA Exam
ক.	বাংলা কাব্যে আধুনিকতার সঞ্চার— প্রেক্ষাপট ও স্বরূপ	১৩	৬	১
	ঈশ্বরচন্দ্র গুপ্ত, রঙ্গলাল বন্দ্যোপাধ্যায়			
	মধুসূদন দত্ত, হেমচন্দ্র বন্দ্যোপাধ্যায়, নবীনচন্দ্র সেন			
	বিহারীলাল চক্রবর্তী, রবীন্দ্রনাথ ঠাকুর, গিরীন্দ্রমোহিনী দাসী			
খ.	আধুনিক বাংলা নাটকের উদ্ভব ও বিকাশ	১০		
	মধুসূদন দত্ত, দীনবন্ধু মিত্র			
	অমৃতলাল বসু, গিরিশচন্দ্র ঘোষ, রবীন্দ্রনাথ ঠাকুর			

মডিউল-২ : কথাসাহিত্য ও সাময়িক পত্র

ক.	নকশা-কথাগদ্য থেকে উপন্যাস— বাংলা উপন্যাসের উদ্ভব ও বিকাশ	১৩	৬	১
	ভবানীচরণ বন্দ্যোপাধ্যায়, প্যারীচাঁদ মিত্র, কালীপ্রসন্ন সিংহ			
	বঙ্কিমচন্দ্র চট্টোপাধ্যায়, তারকনাথ গঙ্গোপাধ্যায়			
	রমেশচন্দ্র দত্ত, স্বর্ণকুমারী দেবী			
	বাংলা ছোটগল্পের উদ্ভবের প্রেক্ষাপট ও রবীন্দ্রনাথ			
খ.	বাংলা সাময়িক পত্রের উদ্ভব ও বিকাশ	১০		
	সংবাদ প্রভাকর, তত্ত্ববোধিনী পত্রিকা, বিবিধার্থ সংগ্রহ, মাসিক পত্রিকা, সোমপ্রকাশ, বঙ্গদর্শন, ভারতী			

মডিউল-৩ : গদ্য ও প্রবন্ধ

বাংলা সাহিত্যে গদ্য রীতি গৃহীত হওয়ার পটভূমি	২৩	৬	১
বাংলা গদ্যের চর্চা ও বিকাশে শ্রীরামপুর মিশন ও ফোর্ট উইলিয়ম কলেজের ভূমিকা			
বাংলা গদ্যের বিকাশে বিভিন্ন সাময়িক পত্রের অবদান			
বাংলা গদ্য ও প্রবন্ধ সাহিত্যের বিকাশে রামমোহন রায়, ঈশ্বরচন্দ্র বিদ্যাসাগর, অক্ষয়কুমার দত্ত, প্যারীচাঁদ মিত্র, কালীপ্রসন্ন সিংহ, বঙ্কিমচন্দ্র চট্টোপাধ্যায়, মীর মশাররফ হোসেন ও বিবেকানন্দের অবদান			

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ বাঙ্গালা সাহিত্যের ইতিহাস (৩-৪ খণ্ড)— সুকুমার সেন
- ❑ বাংলা গদ্য সাহিত্যের ইতিহাস— সজনীকান্ত দাস
- ❑ বাংলা সাহিত্যে গদ্য— সুকুমার সেন
- ❑ বাংলা সাহিত্যের ইতিবৃত্ত (৬-৮)— অসিতকুমার বন্দ্যোপাধ্যায়
- ❑ বাংলা সাহিত্যের ইতিকথা (৩-৪)— ভূদেব চৌধুরী
- ❑ আধুনিক বাংলা কাব্য— তারাপদ মুখোপাধ্যায়
- ❑ উনিশ শতকের গীতিকাব্য— অরুণকুমার মুখোপাধ্যায়

- বাংলা সাময়িক পত্রের ইতিবৃত্ত (১ম খণ্ড)— সন্দীপ দত্ত
- Bengali Literature in the Nineteenth Century– Sushil Kr. De
- বাংলা সাময়িক পত্র— ব্রজেন্দ্রলাল বন্দ্যোপাধ্যায়
- বাংলা নাটকের ইতিহাস— অজিতকুমার ঘোষ
- গদ্যরীতি পদ্যরীতি— পবিত্র সরকার

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বাংলা সাহিত্য : প্রবেশক পাঠ

উদ্দেশ্য : বাংলা ভাষা ও সাহিত্যের ইতিহাস সম্পর্কে প্রাথমিক জ্ঞানার্জনের পর এখানে শিক্ষার্থীরা সাহিত্যের রসাস্বাদনের সুযোগ পাবে। সাহিত্যের পাঠকে যতটা সম্ভব আনন্দদায়ক করে তোলাই এক্ষেত্রে লক্ষ্য।

মডিউল-১ : কবিতা

	Class Hours		
	Th	**Tu**	**IA Exam**
লুই পা— চর্যাপদ-১ বড়ু চণ্ডীদাস— কে না বাঁশী বাএ বড়ায়ি কালিনী নই কূলে বিদ্যাপতি— এ সখি হামারি দুখের নাহি ওর চণ্ডীদাস— সই কেবা শুনাইল জ্ঞানদাস— সুখের লাগিয়া এ ঘর বাঁধিনু রামপ্রসাদ সেন— মা নিম খাওয়ালে চিনি বলে লালন ফকির— সব লোকে কয় লালন কি জাত মধুসূদন দত্ত— হে বঙ্গ ভাণ্ডারে তব রবীন্দ্রনাথ ঠাকুর— বলাকা কাজী নজরুল ইসলাম— কাণ্ডারী হুঁশিয়ার জীবনানন্দ দাশ— সুচেতনা নীরেন্দ্রনাথ চক্রবর্তী— দেশ দেখাচ্ছ অন্ধকারে শামসুর রাহমান— আমার ভালবাসা শঙ্খ ঘোষ— বাবরের প্রার্থনা শক্তি চট্টোপাধ্যায়— অবনী বাড়ি আছো জয় গোস্বামী— রয় যে কাঙাল শূন্য হাতে	২৩	৬	১

মডিউল ২ : কথাসাহিত্য

ক	বঙ্কিমচন্দ্র চট্টোপাধ্যায়— কপালকুণ্ডলা	১৫	৬	১
খ	শরৎচন্দ্র চট্টোপাধ্যায়— অভাগীর স্বর্গ পরশুরাম— লম্বকর্ণ সতীনাথ ভাদুড়ী— চরণদাস এম. এল. এ সমরেশ বসু— আদাব	৮		

মডিউল-৩ : নাটক ও গদ্য প্রবন্ধ

ক	দীনবন্ধু মিত্র — নীলদর্পণ	১৩	৬	১
খ	রবীন্দ্রনাথ ঠাকুর— বাজেকথা	১০		
	প্রমথ চৌধুরী— বইপড়া			
	অবনীন্দ্রনাথ ঠাকুর— সৌন্দর্যের সন্ধান			
	সোফিয়া খাতুন— উনবিংশ শতাব্দীর নারীবিপ্লব			

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ চর্যাগীতি পরিক্রমা— নির্মল দাশ
- ❑ শ্রীকৃষ্ণকীর্তন— অমিত্রসূদন ভট্টাচার্য (সম্পাদিত)
- ❑ মধ্যযুগের কবি ও কাব্য— শঙ্করীপ্রসাদ বসু
- ❑ রবিরশ্মি— চারুচন্দ্র ভট্টাচার্য
- ❑ বঙ্গ সাহিত্যে উপন্যাসের ধারা— শ্রীকুমার বন্দ্যোপাধ্যায়
- ❑ বাংলা উপন্যাসের ইতিহাস— ক্ষেত্র গুপ্ত
- ❑ বঙ্কিমচন্দ্র— সুবোধচন্দ্র সেনগুপ্ত
- ❑ বঙ্কিম সরণী— প্রথমনাথ বিশী
- ❑ বাংলা উপন্যাসের কালান্তর— সরোজ বন্দ্যোপাধ্যায়
- ❑ সাহিত্যে ছোটগল্প— নারায়ণ গঙ্গোপাধ্যায়
- ❑ বাংলা সাহিত্যের ছোটগল্প ও গল্পকার— ভূদেব চৌধুরী
- ❑ কালের পুত্তলিকা— অরুণকুমার মুখোপাধ্যায়
- ❑ একালের গদ্য-পদ্য আন্দোলনের দলিল— সত্য গুহ
- ❑ বাংলা ছোটগল্প : প্রসঙ্গ ও প্রকরণ— বীরেন্দ্র দত্ত
- ❑ বাংলা গদ্যরীতির ইতিহাস— অরুণকুমার মুখোপাধ্যায়
- ❑ বাংলা সাহিত্যে নবযুগ— শশিভূষণ দাশগুপ্ত
- ❑ আধুনিক বাংলা সাহিত্য— মোহিতলাল মজুমদার
- ❑ বঙ্কিমচন্দ্রের উপন্যাস : শিল্পরীতি— ক্ষেত্র গুপ্ত।

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বাংলা সাহিত্যের ইতিহাস (বিংশ শতক)

উদ্দেশ্য : এই কোর্সের মাধ্যমে বিশ শতকের বাংলা সাহিত্যের গতিপ্রকৃতি এবং স্বরূপ সম্পর্কে জ্ঞানার্জন করবে পড়ুয়ারা।

মডিউল-১ : কাব্য-কবিতা ও নাটক

		Class Hours		
		Th	**Tu**	**IA Exam**
ক.	রবীন্দ্রনাথ ঠাকুর	১৫	৩	১
	সত্যেন্দ্রনাথ দত্ত, যতীন্দ্রনাথ সেনগুপ্ত, মোহিতলাল মজুমদার, কাজী নজরুল ইসলাম			
	জীবনানন্দ দাশ, সুধীন্দ্রনাথ দত্ত, বুদ্ধদেব বসু, বিষ্ণু দে			
	সমর সেন, সুভাষ মুখোপাধ্যায়, সুকান্ত ভট্টাচার্য, বীরেন্দ্র চট্টোপাধ্যায়,			
	সুনীল গঙ্গোপাধ্যায়, শক্তি চট্টোপাধ্যায়, কবিতা সিংহ			
খ.	রবীন্দ্রনাথ ঠাকুর, দ্বিজেন্দ্রলাল রায়	৮	৩	
	বিজন ভট্টাচার্য, তুলসী লাহিড়ী			
	মন্মথ রায়, উৎপল দত্ত, বাদল সরকার			

মডিউল-২ : কথাসাহিত্য

রবীন্দ্রনাথ ঠাকুর	২৩	৬	১
শরৎচন্দ্র চট্টোপাধ্যায় (ঔপন্যাসিক)			
জগদীশ গুপ্ত (গল্পকার), পরশুরাম (গল্পকার)			
প্রেমেন্দ্র মিত্র (গল্পকার), মানিক বন্দ্যোপাধ্যায়			
বিভূতিভূষণ বন্দ্যোপাধ্যায়, তারাশঙ্কর বন্দ্যোপাধ্যায়			
সতীনাথ ভাদুড়ী, সুবোধ ঘোষ (গল্পকার)			
সোমেন চন্দ (গল্পকার), সমরেশ বসু (গল্পকার)			
আশাপূর্ণা দেবী, সৈয়দ ওয়ালিউল্লাহ			

মডিউল-৩ : গদ্য-প্রবন্ধ ও সাময়িকপত্র

ক.	রবীন্দ্রনাথ ঠাকুর	১৩	৩	১
	রামেন্দ্রসুন্দর ত্রিবেদী			
	প্রমথ চৌধুরী			
	মোহিতলাল মজুমদার			
	বুদ্ধদেব বসু			
	গোপাল হালদার			
	সৈয়দ মুজতবা আলী			
খ.	ভারতী, সবুজপত্র, নারায়ণ	১০	৩	
	কল্লোল, কালিকলম, প্রগতি			
	প্রবাসী, ভারতবর্ষ, শনিবারের চিঠি			
	পরিচয়, কবিতা, কৃত্তিবাস,			

সহায়ক গ্রন্থ (নির্বাচিত)

- বাঙ্গালা সাহিত্যের ইতিহাস (৫ম খণ্ড)— সুকুমার সেন
- বাংলা সাহিত্যের ইতিকথা (৩-৪)— ভূদেব চৌধুরী
- রবীন্দ্রানুসারী কবিসমাজ— অরুণকুমার মুখোপাধ্যায়
- আমার কালের কয়েকজন কবি— জগদীশ ভট্টাচার্য
- রবীন্দ্রনাট্য পরিক্রমা— উপেন্দ্রনাথ ভট্টাচার্য
- রবীন্দ্রনাট্য প্রবাহ— প্রমথনাথ বিশী
- বাংলা নাটকের ইতিহাস— অজিতকুমার ঘোষ
- বঙ্গসাহিত্যে উপন্যাসের ধারা— শ্রীকুমার বন্দ্যোপাধ্যায়
- আধুনিকতা ও রবীন্দ্রনাথ— আবু সয়ীদ আইয়ুব
- সাহিত্য টীকা— সনৎকুমার মিত্র
- বাংলা সাময়িকপত্রের ইতিবৃত্ত (২য় খণ্ড) সন্দীপ দত্ত
- বাংলা প্রবন্ধ সাহিত্যের ধারা (১, ২ খণ্ড)— অধীর দে
- কল্লোলের কাল— জীবেন্দ্র সিংহ রায়

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ঐতিহাসিক ভাষাবিজ্ঞান

উদ্দেশ্য : প্রাচীন ভারতীয় আর্যভাষা থেকে আধুনিক ভারতীয় আর্যভাষা হিসেবে বাংলা ভাষার উদ্ভব ও বিকাশের প্রতিটি পর্যায়ের সাহিত্যিক নিদর্শনের সহায়তায় সেই সেই পর্যায়ের ভাষাগত বৈশিষ্ট্য সম্পর্কে শিক্ষার্থীদের ধারণা দেওয়া।

মডিউল-১

	Class Hours		
	Th	**Tu**	**IA Exam**
ভাষা, ভাষাপরিবার প্রাচীন ভারতীয় আর্যভাষা থেকে আধুনিক ভারতীয় আর্যভাষা হিসেবে বাংলা ভাষার উদ্ভবের গতিরেখা	২৩	৬	১

মডিউল-২

প্রাচীন বাংলা ভাষার ভাষাতাত্ত্বিক লক্ষণ—প্রেক্ষিত চর্যাপদ আদি-মধ্য বাংলা ভাষার ভাষাতাত্ত্বিক লক্ষণ— প্রেক্ষিত শ্রীকৃষ্ণকীর্তন	২৩	৬	১

মডিউল -৩

অন্ত-মধ্য বাংলা ভাষার ভাষাতাত্ত্বিক লক্ষণ— প্রেক্ষিত অন্নদামঙ্গল আধুনিক বাংলা ভাষার ভাষাতাত্ত্বিক লক্ষণ— প্রেক্ষিত পরিব্রাজক (স্বামী বিবেকানন্দ)	২৩	৬	১

সহায়ক গ্রন্থ (নির্বাচিত)

- ভাষা-প্রকাশ বাঙ্গালা ব্যাকরণ— সুনীতিকুমার চট্টোপাধ্যায়
- সংস্কৃত ও প্রাকৃত ভাষার ক্রমবিকাশ (১-২ খণ্ড)— পরেশচন্দ্র মজুমদার
- বাংলা ভাষা পরিক্রমা— পরেশচন্দ্র মজুমদার
- ভাষা-জিজ্ঞাসা— শিশিরকুমার দাশ
- ভাষার ইতিবৃত্ত— সুকুমার সেন
- সাধারণ ভাষাবিজ্ঞান ও বাংলা ভাষা— রামেশ্বর শ'
- আধুনিক ভাষাতত্ত্ব— আবদুল কালাম মনজুর মোরশেদ
- বাঙ্গালা ভাষার ইতিবৃত্ত— মুহম্মদ শহীদুল্লাহ
- বাংলা ভাষা— পার্বতীচরণ ভট্টাচার্য

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কথাসাহিত্য

উদ্দেশ্য : তৃতীয় সেমেস্টারে বাংলা সাহিত্যের আধুনিক পর্যায়ের ইতিহাস এবং ভাষাবিজ্ঞান বিষয়ে জ্ঞানার্জনের পাশাপাশি শিক্ষার্থীরা এই কোর্সটি পড়বে। আধুনিক সময়ের জটিলতা, ব্যষ্টি ও সমষ্টির দ্বন্দ্ব, বাঙালির পারিবারিক জীবনে নারীর অবস্থান, পরিবেশ সম্পর্কিত ভাবনা এবং মানুষের লড়াই-সংগ্রামের নানা প্রবণতাকে পড়ুয়াদের চেনানোর চেষ্টা করা হবে এই কোর্সের মাধ্যমে।

মডিউল-১ : উপন্যাস (যে-কোনো একটি)

	Class Hours		
	Th	**Tu**	**IA Exam**
যোগাযোগ— রবীন্দ্রনাথ ঠাকুর দেনাপাওনা— শরৎচন্দ্র চট্টোপাধ্যায়	২৩	৬	১

মডিউল -২ : উপন্যাস (যে-কোনো একটি)

পদ্মানদীর মাঝি— মানিক বন্দ্যোপাধ্যায় অরণ্যের অধিকার— মহাশ্বেতা দেবী	২৩	৬	১

মডিউল-৩ : ছোটগল্প

ক.	রবীন্দ্রনাথ ঠাকুরের ছোটগল্প : নিশীথে, একরাত্রি, সুভা, অতিথি, ল্যাবরেটরী	১১	৩	১
খ	একালের ছোটগল্প সঞ্চয়ন (কলিকাতা বিশ্ববিদ্যালয় প্রকাশিত) পাঠ্য : পয়োমুখম : জগদীশ গুপ্ত মহানগর : প্রেমেন্দ্র মিত্র ফসিল : সুবোধ ঘোষ এখন প্রেম : তপোবিজয় ঘোষ প্লাবনকাল : সুচিত্রা ভট্টাচার্য	১২	৩	

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ বঙ্গ সাহিত্যে উপন্যাসের ধারা— শ্রীকুমার বন্দ্যোপাধ্যায়
- ❑ রবীন্দ্রনাথের উপন্যাস চেতনালোক ও শিল্পরূপ— সৈয়দ আকরম হোসেন
- ❑ বাংলা উপন্যাসের কালান্তর— সরোজ বন্দ্যোপাধ্যায়
- ❑ রবীন্দ্রনাথ— সুবোধচন্দ্র সেনগুপ্ত
- ❑ শরৎচন্দ্র— সুবোধচন্দ্র সেনগুপ্ত
- ❑ শরৎচন্দ্র : পুনর্বিচার— অরুণকুমার মুখোপাধ্যায়
- ❑ রবীন্দ্র ছোটগল্পের শিল্পরূপ— তপোব্রত ঘোষ
- ❑ রবীন্দ্র উপন্যাসের নির্মাণশিল্প— গোপিকানাথ রায়চৌধুরী
- ❑ রবীন্দ্রনাথের ছোটগল্প ও উপন্যাস— উপেন্দ্রনাথ ভট্টাচার্য
- ❑ বাংলা ছোটগল্প : প্রসঙ্গ ও প্রকরণ— বীরেন্দ্র দত্ত
- ❑ কথা ও সাহিত্যে রবীন্দ্রনাথ— বিশ্বপতি চৌধুরী
- ❑ রবীন্দ্র সাহিত্যের নরনারী (১ম খণ্ড)— গোপীমোহন সিংহ রায়
- ❑ ঔপন্যাসিক মানিক বন্দ্যোপাধ্যায়— সরোজমোহন মিত্র
- ❑ রবীন্দ্র সাহিত্যের ভূমিকা— নীহাররঞ্জন রায়
- ❑ রবীন্দ্রনাথ/রাজনৈতিক ব্যক্তিত্ব— অরবিন্দ পোদ্দার
- ❑ রবীন্দ্র-মানস— অরবিন্দ পোদ্দার

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প্রাগাধুনিক সাহিত্য

উদ্দেশ্য : প্রাগাধুনিক সাহিত্যের এই কোর্সটির মাধ্যমে শিক্ষার্থীরা সাহিত্যের রসাস্বাদনের পাশাপাশি যাতে বাঙালির সমাজ ও ধর্ম-সংস্কৃতির বিবর্তনের গতিরেখাটিকেও অনুধাবন করতে পারে সেদিকে লক্ষ্য রাখা হয়েছে।

মডিউল-১ বৈষ্ণব পদাবলী (কলিকাতা বিশ্ববিদ্যালয় সংস্করণ)

	Class Hours		
	Th	**Tu**	**IA Exam**
প্রারম্ভিক আলোচনা নীরদনয়নে নীর ঘন সিঞ্চনে আজু হাম কি পেখলুঁ নবদ্বীপ চন্দ দাঁড়াইয়া নন্দের আগে গোপাল কান্দে অনুরাগে ঘরের বাহিরে দণ্ডে শতবার রূপ লাগি আঁখি ঝুরে গুণে মন ভোর এমন পিরীতি কভু নাহি দেখি শুনি সখি কি পুছসি অনুভব মোয় কণ্টক গাড়ি কমল সম পদতল মন্দির বাহির কঠিন কপাট কি মোহিনী জান বধুঁ কি মোহিনী জান বধুঁ তুমি যে আমার প্রাণ অঙ্কুর তপন তাপে যদি জারব বহুদিন পরে বধুঁয়া এলে তাতল সৈকত বারি-বিন্দুসম	২৩	৬	১

মডিউল-২

চণ্ডীমঙ্গল (১-ম খণ্ড)— মুকুন্দ চক্রবর্তী (**কলিকাতা বিশ্ববিদ্যালয় সংস্করণ**)	২৩	৬	১

মডিউল-৩ : শাক্ত পদাবলী (কলিকাতা বিশ্ববিদ্যালয় সংস্করণ)

প্রারম্ভিক আলোচনা গিরিবর, আর আমি পারিনে হে, প্রবোধ দিতে উমারে (বাল্যলীলা) গিরি, এবার আমার উমা এলে (আগমনী) কবে যাবে বল গিরিরাজ (ঐ) বারে বারে কহ রাণি, গৌরী আনিবারে (ঐ) ওহে হর গঙ্গাধর, কর অঙ্গীকার (ঐ) গিরিরাণি, এই নাও তোমার উমারে (ঐ) ওরে নবমী নিশি, না হইও রে (বিজয়া) ওহে প্রাণনাথ গিরিবর হে (ঐ) কেবল আসার আশা, ভবে আসা (ভক্তের আকুতি) মাগো তারা ও শঙ্করি (ঐ) মা আমায় ঘুরাবে কত (ঐ) আমি কি দুখেরে ডরাই? (ঐ) আমায় দেও মা তবিলদারী (ঐ) এমন দিন কি হবে তারা (ঐ)	২৩	৬	১

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ মধ্যযুগের কবি ও কাব্য— শঙ্করীপ্রসাদ বসু
- ❑ চন্ডীদাস ও বিদ্যাপতি— শঙ্করীপ্রসাদ বসু
- ❑ শ্রীরাধার ক্রমবিকাশ— শশিভূষণ দাশগুপ্ত
- ❑ বৈষ্ণব রস প্রকাশ— ক্ষুদিরাম দাস
- ❑ বঙ্গে বৈষ্ণবধর্ম— রমাকান্ত চক্রবর্তী
- ❑ শাক্ত পদাবলী— জাহ্নবীকুমার চক্রবর্তী
- ❑ শাক্তগীতি পদাবলী— অরুণকুমার বসু
- ❑ বাংলা মঙ্গলকাব্যের ইতিহাস— আশুতোষ ভট্টাচার্য
- ❑ চন্ডীমঙ্গল— সুকুমার সেন সম্পাদিত
- ❑ চন্ডীমঙ্গল— ক্ষুদিরাম দাস সম্পাদিত
- ❑ ভারতের শক্তি সাধনা ও শক্তি সাহিত্য— শ্রীশশিভূষণ দাশগুপ্ত
- ❑ বাংলার কাব্য— হুমায়ুন কবির
- ❑ কবিকঙ্কণ মুকুন্দের চণ্ডীমঙ্গল বীক্ষা ও সমীক্ষা— বিশ্বনাথ রায়
- ❑ চন্ডীমঙ্গল— সনৎকুমার নস্কর

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ছন্দ, অলঙ্কার ও কাব্যতত্ত্ব

উদ্দেশ্য : সাহিত্যের শিক্ষার্থীদের ছন্দ, অলঙ্কার ও কাব্যতত্ত্ব বিষয়ে তত্ত্বজ্ঞান থাকা প্রয়োজন। এই কোর্স শিক্ষার্থীদের কাব্য-কবিতা পাঠকে গভীরতর করবে।

মডিউল-১ : ছন্দ

	Class Hours		
	Th	**Tu**	**IA Exam**
কবিতা ও ছন্দ— সাধারণ আলোচনা	২৩	৬	১
দল/অক্ষর, কলা/মাত্রা, যতি, যতিলোপ, পর্ব, পঙ্‌ক্তি/চরণ, ছত্র, পদ			
বাংলা ছন্দের ত্রিধারা			
মিশ্রবৃত্ত/তানপ্রধান/অক্ষরবৃত্ত— উদাহরণসহ বৈশিষ্ট্য			
সরল কলাবৃত্ত/কলাবৃত্ত/ধ্বনি প্রধান/মাত্রাবৃত্ত— উদাহরণসহ বৈশিষ্ট্য			
দলবৃত্ত/শ্বাসাঘাত প্রধান/বলবৃত্ত/স্বরবৃত্ত/ছড়ার ছন্দ/লৌকিক ছন্দ— উদাহরণসহ বৈশিষ্ট্য			
বাংলা ছন্দের কয়েকটি রূপবন্ধের পরিচয় ও উদাহরণসহ আলোচনা— পয়ার, সনেট, অমিত্রাক্ষর, মুক্তক, গদ্যছন্দ			
ছন্দোলিপি প্রণয়ন (পর্ব, পদ, পঙ্‌ক্তি, লয়, মাত্রা ও রীতির উল্লেখ বাঞ্ছনীয়)			

মডিউল-২ : অলংকার

কবিতা ও অলঙ্কার— সাধারণ আলোচনা	২৩	৬	১
উদাহরণসহ সংজ্ঞা— অনুপ্রাস, শ্লেষ, যমক, বক্রোক্তি			
উদাহরণসহ সংজ্ঞা— উপমা, রূপক, সমাসোক্তি, উৎপ্রেক্ষা অপহ্নুতি, দৃষ্টান্ত, ব্যতিরেক, বিরোধ, অর্থান্তরন্যাস, ব্যাজস্তুতি			
অলংকার নির্ণয়			

মডিউল-৩ : কাব্যতত্ত্ব

কাব্য জিজ্ঞাসা— অতুলচন্দ্র গুপ্ত (পাঠ্য— ধ্বনি ও রস)	১৫	৩	১
অনুকরণতত্ত্ব	৮	৩	

সহায়ক গ্রন্থ (নির্বাচিত)

- বাংলা ছন্দের মূলসূত্র— অমূল্যধন মুখোপাধ্যায়
- নূতন ছন্দ পরিক্রমা— প্রবোধচন্দ্র সেন
- বাংলা ছন্দ পরিচয়— নীলরতন সেন
- অলংকার চন্দ্রিকা— শ্যামাপদ চক্রবর্তী
- বাঙলা ছন্দ— জীবেন্দ্র সিংহ রায়
- বাঙলা অলংকার— জীবেন্দ্র সিংহ রায়
- কাব্যবিচার— সুরেন্দ্রনাথ দাশগুপ্ত
- কাব্যতত্ত্ব বিচার— দুর্গাশঙ্কর মুখোপাধ্যায়
- সাহিত্য বিবেক— বিমলকুমার মুখোপাধ্যায়
- ছন্দতত্ত্ব ছন্দরূপ— পবিত্র সরকার
- কাব্যতত্ত্ব— অ্যারিস্টটল (শিশিরকুমার দাশ অনূদিত)
- অ্যারিস্টটলের পোয়েটিক ও সাহিত্যতত্ত্ব— সাধনকুমার ভট্টাচার্য

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প্রবন্ধ ও বিবিধ রচনা

উদ্দেশ্য : বাংলা প্রবন্ধে দার্শনিকতা বা চিন্তার প্রসার ঘটেছে উনিশ শতকের মধ্যভাগ থেকেই। সমাজ, রাষ্ট্র, শিক্ষা, বিজ্ঞান, ভাষা, সাহিত্য, ধর্ম, দর্শন— নানা বিষয়েই বাঙালি চিন্তকগণ প্রবন্ধের মাধ্যমে তাঁদের ভাবনাকে ব্যক্ত করেছেন। রবীন্দ্রনাথের ছিন্নপত্রেও বিশ্ববোধের এক অনন্য রূপ ব্যক্ত হয়েছে। এই কোর্সটির মাধ্যমে শিক্ষার্থীরা সমাজ ও সাহিত্য সম্পর্কিত বিচিত্র বিষয়ে সমৃদ্ধ হতে পারবে।

মডিউল-১

		Class Hours		
		Th	**Tu**	**IA Exam**
ক	কমলাকান্তের দপ্তর— বঙ্কিমচন্দ্র চট্টোপাধ্যায় পাঠ্য : একা-কে গায় ওই, আমার মন, পতঙ্গ, বিড়াল	১১	৩	১
খ	একালের প্রবন্ধ সঞ্চয়ন (কলিকাতা বিশ্ববিদ্যালয় প্রকাশিত) পাঠ্য প্রবন্ধ : সংস্কৃতির সামাজিক দূরত্ব— বিনয় ঘোষ, শিক্ষা ও বিজ্ঞান— সতেন্দ্রনাথ বসু যে দেশে বহু ধর্ম বহু ভাষা— অন্নদাশঙ্কর রায় সাহিত্যের রাজনীতি— সরোজ আচার্য	১২	৩	

মডিউল-২

ক	সাহিত্য— রবীন্দ্রনাথ ঠাকুর পাঠ্য : সাহিত্যের তাৎপর্য, সাহিত্যের বিচারক, সৌন্দর্যবোধ	১১	৩	১
খ	একালের সমালোচনা সঞ্চয়ন (কলিকাতা বিশ্ববিদ্যালয় প্রকাশিত) পাঠ্য প্রবন্ধ : আধুনিক সাহিত্য— গোপাল হালদার রবীন্দ্রনাথ ও উত্তরসাধক— বুদ্ধদেব বসু পাশ্চাত্য ও প্রাচ্য সমালোচনার ধারা— সুবোধচন্দ্র সেনগুপ্ত উপন্যাস ও সমাজবাস্তবতা— আখতারুজ্জামান ইলিয়াস	১২	৩	

মডিউল-৩

ছিন্নপত্র— রবীন্দ্রনাথ ঠাকুর পত্রসংখ্যা— ১০, ১৮, ৩০, ৬৪, ৬৭, ৭৭, ৮১, ১০২, ১০৬, ১০৮	২৩	৬	১

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ চিন্তানায়ক বঙ্কিমচন্দ্র— ভবতোষ দত্ত
- ❑ বঙ্কিমচন্দ্রের সাহিত্য জিজ্ঞাসা— বিষ্ণুপদ ভট্টাচার্য
- ❑ রবীন্দ্রসাহিত্য পাঠ— হরপ্রসাদ মিত্র
- ❑ রবীন্দ্রচর্যা— দেবীপদ ভট্টাচার্য
- ❑ রবীন্দ্রনন্দন তত্ত্ব— বিমলকুমার মুখ্যোপাধ্যায়
- ❑ বঙ্কিমচন্দ্র— মোহিতলাল মজুমদার
- ❑ বঙ্কিমমানস— অরবিন্দ পোদ্দার
- ❑ বাংলা প্রবন্ধ সাহিত্যের ধারা (১, ২ খণ্ড)— অধীর দে
- ❑ সমালোচনা-সাহিত্য পরিচয়— কলিকাতা বিশ্ববিদ্যালয় প্রকাশিত

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সাহিত্যের রূপ ও রীতি

উদ্দেশ্য : সাহিত্যের রূপবৈচিত্র ও গঠনরীতি সম্পর্কে এই কোর্সে ধারণা প্রদান করা হবে। সাহিত্যের বিভিন্ন সংরূপের রূপ ও আঙ্গিক সম্পর্কে জ্ঞানার্জনের পাশাপাশি শিক্ষার্থীরা সাহিত্যের বিবর্তন সম্পর্কেও ধারণা লাভ করতে পারবে।

মডিউল-১ কাব্য-কবিতা ও নাটক

		Class Hours		
		Th	**Tu**	**IA Exam**
ক	কবিতার বিভিন্ন রূপকল্প— মহাকাব্য, গীতিকবিতা, কবিগান, সনেট, হাইকু, রুবাই ও লিমেরিক	১০	৩	১
খ	নাটকের বিভিন্ন রূপকল্প— ট্র্যাজেডি, কমেডি, প্রহসন, কাব্যনাটক, নৃত্যনাট্য, সামাজিক নাটক, পৌরাণিক নাটক, অ্যাবসার্ড নাটক ও একাঙ্ক নাটক	১৩	৩	

মডিউল-২ : উপন্যাস ও ছোটগল্প

উপন্যাসের রূপকল্প ও শ্রেণিকরণ— নকশাধর্মী উপন্যাস, রোমান্সধর্মী উপন্যাস, সামাজিক উপন্যাস, ঐতিহাসিক উপন্যাস, রাজনৈতিক উপন্যাস, আঞ্চলিক উপন্যাস, মনস্তাত্ত্বিক উপন্যাস, চেতনাপ্রবাহরীতির উপন্যাস	২৩	৬	১
ছোটগল্পের প্রকৃতি			
ছোটগল্প ও রূপকথা			
অনুগল্প			
উপন্যাস ও ছোটগল্পের তুলনা			

মডিউল-৩ প্রবন্ধ, সমালোচনা ও অন্যান্য সংরূপ

প্রবন্ধের প্রকার— বস্তুনিষ্ঠ, ব্যক্তিনিষ্ঠ, লঘু প্রবন্ধ ও গবেষণা-প্রবন্ধ	২৩	৬	১
সমালোচনা সাহিত্য			
ভ্রমণ সাহিত্য, ডায়েরি, পত্রসাহিত্য, রম্যরচনা, জীবনী ও আত্মজীবনী/স্মৃতিকথা			

সহায়ক গ্রন্থ (নির্বাচিত)

- সাহিত্য সন্দর্শন— শ্রীশচন্দ্র দাস
- সাহিত্য ও সমালোচনার রূপরীতি— উজ্জ্বলকুমার মজুমদার
- সাহিত্য : রূপ-বিচিত্রা— অপূর্বকুমার রায়
- সাহিত্যের রূপরীতি ও অন্যান্য প্রসঙ্গ— কুন্তল চট্টোপাধ্যায়
- বাংলা সাহিত্যের রূপরীতি— শুদ্ধসত্ত্ব বসু
- সাহিত্যকোষ : কথাসাহিত্য— অলোক রায়
- সাহিত্য বিচার : তত্ত্ব ও প্রয়োগ— বিমলকুমার মুখোপাধ্যায়
- A Glossary of Literary Terms— M.H. Abrams

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নাটক ও নাট্যমঞ্চ

উদ্দেশ্য : নাট্যমঞ্চ ও নাটকের বিকাশ পরস্পরের সাপেক্ষ ও পরিপূরক। সামাজিক বাস্তবতার দর্পণ হিসেবে নাট্যসাহিত্য পাঠের পাশাপাশি পড়ুয়ারা নাট্যমঞ্চের বিকাশকেও বিবেচনার মধ্যে রাখবে এই উদ্দেশ্যে কোর্সটি করা হয়েছে।

মডিউল-১

	Class Hours		
	Th	**Tu**	**IA Exam**
বুড় সালিকের ঘাড়ে রোঁ— মধুসূদন দত্ত	৮	২	১
মুক্তধারা— রবীন্দ্রনাথ ঠাকুর	১৫	৪	

মডিউল-২

কারাগার— মন্মথ রায়	৮	২	১
টিনের তলোয়ার— উৎপল দত্ত	১৫	৪	

মডিউল-৩ : রঙ্গমঞ্চের ইতিহাস

লেবেডফ ও বেঙ্গলি থিয়েটার, নবীন বসুর শ্যামবাজার থিয়েটার, বেলগাছিয়া নাট্যশালা, জোড়াসাঁকো নাট্যশালা, বাগবাজার অ্যামেচার থিয়েটার (শ্যামবাজার নাট্যসমাজ)	২৩	৬	১
ন্যাশানাল থিয়েটার (প্রথম ও দ্বিতীয় পর্ব),			
নাট্যনিয়ন্ত্রণ বিল			
গণনাট্য ও নবনাট্য আন্দোলনের কাল			

সহায়ক গ্রন্থ (নির্বাচিত)

- নাটকের কথা— অজিতকুমার ঘোষ
- বাংলা নাট্যমঞ্চের ইতিহাস— ব্রজেন্দ্রনাথ বন্দ্যোপাধ্যায়
- রবীন্দ্রনাট্য সমীক্ষা : রূপক-সাংকেতিক— দুর্গাশঙ্কর মুখোপাধ্যায়
- কালের মাত্রা ও রবীন্দ্রনাটক— শঙ্খ ঘোষ
- বাংলা থিয়েটারের ইতিহাস— দর্শন চৌধুরী
- রবীন্দ্রসাহিত্যের নরনারী (৩য় খণ্ড) — গোপীমোহন সিংহ রায়
- কবি শ্রীমধুসূদন— মোহিতলাল মজুমদার
- গণনাট্য আন্দোলন— দর্শন চৌধুরী
- বাংলা নাট্যমঞ্চের রূপরেখা— দুর্গাশঙ্কর মুখোপাধ্যায়
- নাট্যমঞ্চ নাট্যরূপ— পবিত্র সরকার
- রঙ্গমঞ্চে বাংলা নাটকের প্রয়োগ— অজিতকুমার ঘোষ
- নাট্যতত্ত্ব ও নাট্যমঞ্চ— অজিতকুমার ঘোষ

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আধুনিক বাংলা কাব্য-কবিতা

উদ্দেশ্য : ঔপনিবেশিক আধুনিকতার সংস্পর্শে এসে আমাদের কাব্যে যে নবযুগের সঞ্চার হয়েছিল, তার বিভিন্ন পর্বকে পড়ুয়ারা অনুধাবন করতে পারবে এই কোর্সটির মাধ্যমে।

মডিউল-১

	Class Hours		
	Th	**Tu**	**IA Exam**
বীরাঙ্গনা কাব্য— মধুসূদন দত্ত পাঠ্য : দুষ্মন্তের প্রতি শকুন্তলা, সোমের প্রতি তারা, দ্বারকানাথের প্রতি রুক্মিনী, দশরথের প্রতি কেকয়ী, লক্ষ্মণের প্রতি শূর্পনখা এবং নীলধ্বজের প্রতি জনা	২৩	৬	১

মডিউল-২

ক.	সোনার তরী— রবীন্দ্রনাথ ঠাকুর পাঠ্য : সোনার তরী, বৈষ্ণব কবিতা, বসুন্ধরা, নিরুদ্দেশ যাত্রা	১৩	৩	১
খ.	সঞ্চিতা— কাজী নজরুল ইসলাম পাঠ্য— বিদ্রোহী, অভিশাপ, দারিদ্র্য, নারী	১০	৩	

মডিউল-৩

একালের কবিতা সঞ্চয়ন (কলিকাতা বিশ্ববিদ্যালয় সংস্করণ) পাঠ্য : ক) রাত্রি— জীবনানন্দ দাশ, সোহংবাদ— সুধীন্দ্রনাথ দত্ত সংগতি— অমিয় চক্রবর্তী, রবীন্দ্রনাথের প্রতি— বুদ্ধদেব বসু প্রচ্ছন্ন স্বদেশ— বিষ্ণু দে	১২	৩	১
খ) বধূ— সুভাষ মুখোপাধ্যায়, বোধন— সুকান্ত ভট্টাচার্য বৃক্ষ— কবিতা সিংহ, স্মৃতির শহরে— সুনীল গঙ্গোপাধ্যায় আমার নাম ভারতবর্ষ— অমিতাভ দাশগুপ্ত	১১	৩	

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ কবি শ্রীমধুসূদন— মোহিতলাল মজুমদার
- ❑ মধুসূদন কবি আত্মা ও কাব্যশিল্প— ক্ষেত্র গুপ্ত
- ❑ মধুসূদন : কবি ও নাট্যকার— সুবোধচন্দ্র সেনগুপ্ত
- ❑ রবীন্দ্র সরণী— প্রমথনাথ বিশী
- ❑ রবীন্দ্রকাব্য পরিক্রমা— উপেন্দ্রনাথ ভট্টাচার্য
- ❑ আধুনিক বাংলা কাব্য পরিচয়— দীপ্তি ত্রিপাঠী
- ❑ আধুনিক কবিতার দিগ্‌বলয়—অশ্রুকুমার শিকদার
- ❑ আমার কালের কয়েকজন কবি— জগদীশ ভট্টাচার্য
- ❑ আধুনিক বাংলা কবিতায় ইউরোপীয় প্রভাব— মঞ্জুভাষ মিত্র
- ❑ বাংলা কবিতার চালচিত্র— সুমিতা চক্রবর্তী
- ❑ নজরুলের কবিতা : অসংযমের শিল্প— ক্ষেত্র গুপ্ত

- ❑ জনগণের কবি কাজী নজরুল ইসলাম— কল্পতরু সেনগুপ্ত
- ❑ নিঃশব্দের তর্জনী— শঙ্খ ঘোষ
- ❑ আধুনিক কবিতার ইতিহাস— অলোকরঞ্জন দাশগুপ্ত ও দেবীপ্রসাদ বন্দ্যোপাধ্যায়
- ❑ কবিতার মিল ও অমিল— শিশিরকুমার দাশ
- ❑ এই কাব্য এই হাতছানি— শক্তি চট্টোপাধ্যায়
- ❑ বাংলা কবিতার কালান্তর — সরোজ বন্দ্যোপাধ্যায়

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সংস্কৃত, ইংরেজি ও প্রতিবেশী (হিন্দী) সাহিত্যের ইতিহাস

উদ্দেশ্য : বাংলা সাহিত্যের সামগ্রিক পরিচয় পাওয়ার পর শিক্ষার্থী সংস্কৃত, ইংরেজি এবং প্রতিবেশী (হিন্দী) সাহিত্যের ইতিহাস সম্পর্কে প্রাথমিক পরিচয় লাভ করবে এবং সেই আলোকে বাংলা সাহিত্য সম্পর্কেও তার মূল্যায়ন আরো স্বচ্ছ হয়ে উঠবে।

মডিউল-১ সংস্কৃত সাহিত্যের সংক্ষিপ্ত ইতিহাস

	Class Hours		
	Th	**Tu**	**IA Exam**
কালিদাস (কবি ও নাট্যকার)	২৩	৬	১
ভবভূতি			
বাণভট্ট			
শূদ্রক			
জয়দেব			

মডিউল-২ : ইংরেজি সাহিত্যের সংক্ষিপ্ত ইতিহাস

নাটক— উইলিয়ম শেক্সপিয়র, জর্জ বার্নার্ড শ', স্যামুয়েল বেকেট	২৩	৬	১
কাব্য— উইলিয়ম ওয়ার্ডসওয়ার্থ, পি.বি. শেলি, জন কীটস, টি.এস এলিয়ট			
কথাসাহিত্য—ওয়াল্টার স্কট, চার্লস ডিকেন্স, ভার্জিনিয়া উলফ্			

মডিউল-৩ : প্রতিবেশী সাহিত্যের সংক্ষিপ্ত ইতিহাস : হিন্দী (পঠন-পাঠন হবে বাংলায়)

ভারতেন্দু হরিশচন্দ্র, মুন্সী প্রেমচাঁদ	২৩	৬	১
মহাদেবী বর্মা, সূর্যকান্ত ত্রিপাঠী নিরালা, ফণীশ্বরনাথ রেণু			

সহায়কগ্রন্থ (নির্বাচিত)

- ❑ সংস্কৃত সাহিত্যের রূপরেখা— বিমানচন্দ্র ভট্টাচার্য
- ❑ সংস্কৃত সাহিত্য পরিক্রমা— করুণাসিন্ধু দাস
- ❑ সংস্কৃত সাহিত্যের দশরত্ন— সুখেন্দুসুন্দর গঙ্গোপাধ্যায়
- ❑ সংস্কৃত সাহিত্যের ইতিহাস— ধীরেন্দ্রনাথ বন্দ্যোপাধ্যায়
- ❑ ইংরাজী সাহিত্যের ইতিহাস— শ্রীকুমার বন্দ্যোপাধ্যায়
- ❑ ইংরাজী সাহিত্যের সংক্ষিপ্ত ইতিহাস— সত্যপ্রসাদ সেনগুপ্ত
- ❑ ইংরাজী সাহিত্যের রূপরেখা— গোপাল হালদার
- ❑ ইংরেজী সাহিত্য পরিচয় — অরবিন্দ পোদ্দার
- ❑ ইংরেজী সাহিত্যের ইতিহাস— কুন্তল চট্টোপাধ্যায়
- ❑ হিন্দী সাহিত্যের ইতিহাস— বিজয়েন্দ্র স্নাতক (অনুবাদ—জ্যোতির্ময় দাশ)
- ❑ হিন্দী সাহিত্যের ইতিহাস— রামবহাল তেওয়ারী
- ❑ আধুনিক হিন্দী সাহিত্য : গতি ও প্রকৃতি— বিপ্লব চক্রবর্তী

Discipline Specific Elective (DSE)– 6 Credit each
(সাম্মানিক বাংলা)

- সাম্মানিক স্নাতক (বাংলা) পাঠক্রমে 'Discipline Specific Elective (DSE)' স্তরে ২৪ ক্রেডিট-এর মোট ৪টি কোর্স পড়তে হবে। প্রদত্ত আটটি কোর্সকে দুটি বর্গে (A এবং B) বিভক্ত করা হয়েছে। A- বর্গের প্রথম দুটি কোর্স (অর্থাৎ কোর্স 1 এবং 2) থেকে যে-কোনো একটি কোর্স এবং B-বর্গের প্রথম দুটি কোর্স (অর্থাৎ কোর্স 1 এবং 2) থেকে যে-কোন একটি কোর্স নিয়ে মোট দুটি কোর্স পড়ুয়ারা পঞ্চম সেমেস্টারে পাঠ্য হিসেবে নির্বাচন করবে। ষষ্ঠ সেমেস্টারেও A- বর্গের শেষের দুটি কোর্স (অর্থাৎ কোর্স 3 এবং 4) থেকে একটি এবং B- বর্গের শেষের দুটি কোর্স (অর্থাৎ কোর্স 3 এবং 4) থেকে একটি নিয়ে মোট দুটি কোর্স পাঠ্য হিসেবে পড়ুয়ারা নির্বাচন করবে।
- ৬ ক্রেডিট-এর প্রতিটি কোর্সের পূর্ণমান ১০০। এর মধ্যে ১০ নম্বর সংশ্লিষ্ট DSE-র ক্লাসে পড়ুয়ার উপস্থিতির জন্য বরাদ্দ। ১০ নম্বর কোর্সভিত্তিক ধারাবাহিক মূল্যায়ন বা ইন্টারন্যাল অ্যাসেসমেন্ট-এর জন্য এবং ১৫ নম্বর কোর্সভিত্তিক টিউটোরিয়াল-এর জন্য বরাদ্দ। বাকি ৬৫ নম্বরের জন্য বিশ্ববিদ্যালয়ের সংশ্লিষ্ট কর্তৃপক্ষের তত্ত্বাবধানে লিখিত পরীক্ষা নেওয়া হবে। প্রতিটি সেমেস্টারে পনেরো সপ্তাহ করে ক্লাস হবে এটা ধরে নিয়ে Class Hours/Teaching Hours-এর হিসেব দেওয়া হয়েছে।
- ৬৫ নম্বরের লিখিত পরীক্ষায় ১০ নম্বরের তিনটি ব্যাখ্যামূলক, ৫ নম্বরের ৪টি বোধমূলক এবং ১ নম্বরের ১৫টি সংক্ষিপ্ত উত্তরভিত্তিক/তথ্যমূলক প্রশ্নের উত্তর দিতে হবে। নিচের তালিকায় প্রশ্নপত্রের ধারণা পাওয়া যাবে।

প্রশ্ন নং	প্রশ্নের ধরন ও বিকল্প সংক্রান্ত নিয়ম	প্রশ্নের মান
১	মডিউল-১ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
২	মডিউল-২ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
৩	মডিউল-৩ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
৪	মডিউল-১ থেকে একটি বোধমূলক প্রশ্ন। একটি বিকল্প থাকবে।	৫
৫	মডিউল-২ থেকে একটি বোধমূলক প্রশ্ন। একটি বিকল্প থাকবে।	৫
৬	মডিউল-৩ থেকে একটি বোধমূলক প্রশ্ন। একটি বিকল্প থাকবে।	৫
৭	মডিউল-১, মডিউল-২ এবং মডিউল-৩ থেকে একটি করে প্রসঙ্গ/বিষয় নিয়ে টীকা-ধর্মী প্রশ্ন হবে। তিনটির মধ্যে যে-কোনো একটি লিখতে হবে।	৫
৮	প্রত্যেকটি মডিউল থেকে কমপক্ষে **তিনটি** করে প্রশ্ন নিয়ে মোট **পনেরটি** সংক্ষিপ্ত উত্তরভিত্তিক/তথ্যমূলক প্রশ্ন দেওয়া হবে। এক্ষেত্রে কোনো বিকল্প থাকবে না।	১ × ১৫

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বাংলার সমাজ ও সংস্কৃতির ইতিহাস

উদ্দেশ্য : বাংলা ভাষার উদ্ভবের সময়কাল থেকে আধুনিক কাল পর্যন্ত বাঙালি জাতির সাংস্কৃতিক বিকাশের গতিরেখার সঙ্গে শিক্ষার্থীদের পরিচয় ঘটানোই এই কোর্সের উদ্দেশ্য।

মডিউল-১ :

	Class Hours		
	Th	**Tu**	**IA Exam**
বাংলা ও বাঙালি জাতির ভৌগোলিক ও নৃতাত্ত্বিক পরিচয়	২৩	৬	১
বাংলার সমাজ কাঠামো ও অর্থনৈতিক ভিত্তি			
বাংলার রাজনৈতিক ইতিহাস			
বাংলার ধর্ম			
চৈতন্য-সংস্কৃতি			
বাঙালির সাংস্কৃতিক স্বরূপ			

মডিউল-২

ঔপনিবেশিক আধুনিকতার অভিঘাত— শিক্ষায়, ধর্ম সংস্কারে ও মুক্ত চিন্তায়	২৩	৬	১
কৃষক আন্দোলন, নীল বিদ্রোহ, ফকির আন্দোলন			
ধর্ম, সমাজ ও শিক্ষা সংস্কারের উদ্দেশ্যে গঠিত সভা-সমিতি (১৯ শতক)			

মডিউল-৩

বঙ্গভঙ্গ ও বয়কট-স্বদেশী আন্দোলন,	২৩	৬	১
প্রান্তবর্গ/দলিত জনগোষ্ঠীর জাগরণ			
বাঙালি মুসলমানের স্বতন্ত্র জাতিসত্তার সন্ধান			
দেশভাগ, উদ্বাস্তু সমস্যা ও ভাষা আন্দোলন			
খাদ্য আন্দোলন ও নকশাল আন্দোলন			

সহায়ক গ্রন্থ (নির্বাচিত)

- বাঙ্গালীর ইতিহাস— নীহাররঞ্জন রায়
- History of Medieval Bengal — রমেশচন্দ্র মজুমদার
- বাংলা দেশের ইতিহাস— রমেশচন্দ্র মজুমদার
- বাঙ্গালার ইতিহাস (অখণ্ড)— রাখালদাস বন্দ্যোপাধ্যায়
- বাঙ্গালীর সংস্কৃতি— সুনীতিকুমার চট্টোপাধ্যায়
- রামতনু লাহিড়ী ও তৎকালীন বঙ্গসমাজ— শিবনাথ শাস্ত্রী
- বাংলার ইতিহাস— সুভাষ মুখোপাধ্যায়
- সংস্কৃতির বিশ্বরূপ— গোপাল হালদার
- বাঙলা ও বাঙালীর বিবর্তন— অতুল সুর
- সংস্কৃতির রূপান্তর— গোপাল হালদার
- চৈতন্য-প্রসঙ্গ— বঙ্গীয় সাহিত্য পরিষদ প্রকাশিত
- বাংলার কাব্য— হুমায়ুন কবির
- ঔপনিবেশিক বাংলার সমাজ চিত্র— চিত্তব্রত পালিত
- দেশ বিভাগ : পশ্চাৎ ও নেপথ্য কাহিনী— ভবানীপ্রসাদ চট্টোপাধ্যায়
- যুক্ত বাংলার শেষ অধ্যায়— কালীপদ বিশ্বাস
- পলাশি থেকে পার্টিশান— শেখর বন্দ্যোপাধ্যায়
- নীল বিদ্রোহ— পুলক চন্দ্র
- বাঙালির দর্শন— আমিনুল ইসলাম
- স্বাধীন ভারতের সাম্যবাদী আন্দোলন : রাজনীতি ও গতিপ্রকৃতি— শোভনলাল দত্তগুপ্ত
- সাহিত্য সমাজ ইতিহাস— পশ্চিমবঙ্গ ইতিহাস সংসদ প্রকাশিত
- বাংলার রেনেশাঁস— সুশোভন সরকার
- বাংলার নবজাগৃতি— বিনয় ঘোষ
- কলকাতা : ইতিহাসের দিনলিপি— নীরদবরণ হাজরা
- সংস্কৃতির ভাঙা সেতু— আখতারুজ্জামান ইলিয়াস
- শতাব্দীর প্রতিধ্বনি— অতুল সুর
- উত্তাল চল্লিশ : অসমাপ্ত বিপ্লব— অমলেন্দু সেনগুপ্ত
- জোয়ারভাটায় ষাট-সত্তর— অমলেন্দু সেনগুপ্ত
- হাজার বছরের বাঙালির সংস্কৃতি— গোলাম মুরশিদ

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বাংলাদেশের সাহিত্য

উদ্দেশ্য : দেশভাগের পর পূর্ববঙ্গ তথা বাংলাদেশে বাংলা সাহিত্যের এক সমৃদ্ধ ধারা গড়ে উঠেছে। বাংলা সাহিত্যের পাঠ বাংলাদেশের সাহিত্য ব্যতিরেকে সম্পূর্ণতা লাভ করতে পারে না, এই বিবেচনাতেই কোর্সটির পরিকল্পনা করা হয়েছে।

মডিউল-১ : কথাসাহিত্য

		Class Hours		
		Th	Tu	IA Exam
ক.	সূর্য দীঘল বাড়ী— আবু ইসহাক	১৩	৩	১
খ.	প্যাপিরাস প্রকাশিত **বাংলাদেশের গল্প** গ্রন্থ থেকে নিচের গল্পগুলি পাঠ্য : আত্মজা ও একটি করবী গাছ —হাসান আজিজুল হক খোয়াই নদীর বাঁক বদল— সেলিনা হোসেন সুন্দর মানুষ— বিপ্রদাস বড়ুয়া যুগলবন্দি— আখতারুজ্জামান ইলিয়াস মহাকালের খাঁড়া— কায়েস আহমেদ	১০	৩	

মডিউল-২ : কবিতা ও নাটক

ক.	সপ্তর্ষি প্রকাশিত **বাংলাদেশের শ্রেষ্ঠ কবিতা** — রণজিৎ দাশ ও সাজ্জাদ শরীফ সম্পাদিত। পাঠ্য কবিতা : স্বাধীনতা তুমি— শামসুর রাহমান আমি কিংবদন্তীর কথা বলছি (অংশ)— আবু জাফর ওবাইদুল্লাহ সোনালী কাবিন ১৩— আল মাহমুদ তোমাকে অভিবাদন, প্রিয়তমা— শহীদ কাদরী নগর ধ্বংসের আগে— রফিক আজাদ জুই ফুলের চেয়ে শাদা ভাতই অধিক সুন্দর— মহাদেব সাহা মানুষ— নির্মলেন্দু গুণ এবাদত নামা ১৩— ফরহাদ মজহার তোমার দূরত্ব নিত্য আমার ক্রোধের দিনে— দাউদ হায়দার বাতাসে লাশের গন্ধ— রুদ্র মুহম্মদ শহিদুল্লাহ	১৩	৩	১
খ.	কবর— মুনীর চৌধুরী	১০	৩	

মডিউল -৩ : প্রবন্ধ

অরুণ সেন ও আবুল হাসনাত সম্পাদিত ***বাঙালি ও বাংলাদেশ*** (নয়াউদ্যোগ) গ্রন্থ থেকে নিম্নলিখিত প্রবন্ধগুলি পাঠ্য : অভিভাষণ— মুহম্মদ শহীদুল্লাহ ❑ বাঙালির আত্মপরিচয়ের সূত্রপাত— আবু জাফর শামসুদ্দীন ❑ ভাষা সংস্কার ও বাঙালি চেতনার বিকৃতি— আহমদ শরীফ ❑ মুসলমানদের স্বদেশ প্রত্যাবর্তন— বদরুদ্দীন উমর ❑ দ্বি-জাতিতত্ত্বের সত্যমিথ্যা— সিরাজুল ইসলাম চৌধুরী ❑ স্বরূপের সন্ধানে— আনিসুজ্জামান ❑ বাংলাদেশ : পালিয়ে বেড়ায় দৃষ্টি এড়ায়— হাসান আজিজুল হক ❑ মার্চের স্বপ্ন— মুনতাসীর মামুন	২৩	৬	১

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ বাংলাদেশের সাহিত্য ও সংস্কৃতি— বিশ্বজিৎ ঘোষ
- ❑ বাংলা দেশের প্রবন্ধ সাহিত্য— আবুল কাসেম ফজলুল হক
- ❑ বাংলাদেশের উপন্যাস : বিষয় ও শিল্পরূপ— রফিকুল্লাহ খান

- ❑ বাংলাদেশের থিয়েটার— নৃপেন্দ্র সাহা (সম্পাদিত)
- ❑ বাংলাদেশের কবিতা :সমবায়ী স্বরতন্ত্র— রফিকুল্লাহ খান
- ❑ বাংলাদেশের ছোটগল্পের শিল্পরূপ— চঞ্চলকুমার বোস
- ❑ সংস্কৃতির ভাঙা সেতু— আখতারুজ্জামান ইলিয়াস
- ❑ ভাষা আন্দোলনের দলিলপত্র— রতনলাল চক্রবর্তী (সম্পাদিত)
- ❑ রাজনৈতিক চেতনা : বাংলাদেশের কবিতা— আমিনুর রহমান সুলতান
- ❑ বাংলাদেশের আধুনিক কাব্য পরিচয়— দীপ্তি ত্রিপাঠী
- ❑ পূর্ববাংলার রাজনীতি-সংস্কৃতি ও কবিতা— সাঈদ-উর রহমান
- ❑ বাংলাদেশের কবিতায় ব্যক্তি ও সমাজ— দিলারা হাফিজ
- ❑ বাঙালি মুসলমানের সামাজিক ইতিহাস : কতিপয় প্রসঙ্গ— হাবির রহমান

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বাংলা গোয়েন্দা সাহিত্য, কল্পবিজ্ঞান আশ্রয়ী রচনা এবং অলৌকিক কাহিনি

উদ্দেশ্য : সাহিত্যের পাঠ এবং আস্বাদনে কিশোরদের অভ্যাস তৈরি হয়ে ওঠে গোয়েন্দা গল্প, কল্পবিজ্ঞানের কাহিনি অথবা ভূতের গল্পের মধ্য দিয়ে। তাদের চেনা ক্ষেত্রকেই পড়ুয়ারা এখানে বিদ্যায়তনিক পাঠ শৃঙ্খলায় অধ্যয়ন করতে শিখবে।

মডিউল-১

	Class Hour		
	Th	**Tu**	**IA Exam**
শজারুর কাঁটা— শরদিন্দু বন্দ্যোপাধ্যায়	২৩	৬	১

মডিউল-২

শঙ্কু সমগ্র (আনন্দ পাব.)— সত্যজিৎ রায় পাঠ্য সমূহ : ব্যোমযাত্রীর ডায়রি, প্রফেসর শঙ্কু ও ম্যাকাও, প্রফেসর শঙ্কু ও গোলক-রহস্য, প্রফেসর শঙ্কু ও রোবু, হিপনোজেন, মহাকাশের দূত, শঙ্কু ও আদিম মানুষ, শঙ্কু ও ফ্র্যাঙ্কেনস্টাইন	২৩	৬	১

মডিউল-৩

সব ভুতুড়ে— লীলা মজুমদার	২৩	৬	১

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ সত্যজিৎ রায়— পশ্চিমবঙ্গ বাংলা আকাদেমি
- ❑ এক দুর্লভ মানিক— অমিত্রসূদন ভট্টাচার্য
- ❑ ক্রাইম কাহিনীর কালক্রান্তি— সুকুমার সেন

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তুলনামূলক সাহিত্য

উদ্দেশ্য : এই কোর্সে ধ্রুপদি সাহিত্যের সঙ্গে আধুনিক সাহিত্যের অথবা এই পর্যায়েরই বিভিন্ন ভাষায় লেখা সাহিত্যের তুলনামূলক পাঠ করা হবে। এর মধ্য দিয়ে পড়ুয়াদের সাহিত্য সংক্রান্ত চেতনার প্রসার ঘটনোই উদ্দেশ্য।

মডিউল-১

	Class Hours		
	Th	**Tu**	**IA Exam**
কালিদাস ও রবীন্দ্রনাথ	১২	৩	১
জয়দেব ও বাংলা সাহিত্য	১১	৩	

মডিউল-২

শেক্সপীয়র ও বাংলা সাহিত্য	১২	৩	১
এলিয়ট ও বাংলা কবিতা	১১	৩	

মডিউল-৩

রবীন্দ্রনাথ ও ভারতীয় সাহিত্য	১৫	৩	১
শরৎচন্দ্র ও মুন্সী প্রেমচাঁদ	৮	৩	

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ সংস্কৃতানুশীলনে রবীন্দ্রনাথ— সুখময় ভট্টাচার্য
- ❑ কালিদাস ও রবীন্দ্রনাথ— বিষ্ণুপদ ভট্টাচার্য
- ❑ কালিদাস ও রবীন্দ্রনাথ— নরেশচন্দ্র জানা
- ❑ বাংলা কাব্যে পাশ্চাত্য প্রভাব— উজ্জ্বলকুমার মজুমদার
- ❑ বাংলা কাব্যে ইউরোপীয় প্রভাব— মঞ্জুভাষ মিত্র
- ❑ কবি জয়দেব ও গীতগোবিন্দ— হরেকৃষ্ণ মুখোপাধ্যায়
- ❑ অলৌকিক সংলাপ— শিশিরকুমার দাশ
- ❑ রবীন্দ্রনন্দন তত্ত্ব— বিমলকুমার মুখোপাধ্যায়
- ❑ ত্রয়ী : বাল্মীকি কালিদাস রবীন্দ্রনাথ— শশিভূষণ দাশগুপ্ত
- ❑ বাঙালির ইংরেজি সাহিত্যচর্চা; স্বপন চক্রবর্তী
- ❑ ঘুমের দরজা ঠেলে— চিন্ময় গুহ
- ❑ এলিয়ট বিষ্ণু দে ও আধুনিক বাংলা কবিতা— বিনয়কুমার মাহাতা

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বাংলা শিশু-কিশোর সাহিত্য

উদ্দেশ্য : বাংলা শিশু-কিশোর সাহিত্যের সুগভীর ঐতিহ্য রয়েছে। সেখান থেকে কিছু নির্বাচিত পাঠকে এখানে পড়ুয়ারা বিদ্যায়তনিক পাঠ-শৃঙ্খলায় অধ্যয়ন করতে শিখবে।

মডিউল-১

	Class Hour		
	Th	**Tu**	**IA Exam**
ক্ষীরের পুতুল— অবনীন্দ্রনাথ ঠাকুর	১৩	৩	১
ঠাকুরমার ঝুলি—দক্ষিণারঞ্জন মিত্র মজুমদার পাঠ্যসমূহ— কিরণমালা ● সাতভাই চম্পা ● সুখু আর দুখু	১০	৩	

মডিউল-২

আবোল তাবোল— সুকুমার রায় পাঠ্যসমূহ— আবোল তাবোল ● খিচুড়ি ● সৎপাত্র ● একুশে আইন ● নারদ! নারদ! ● গন্ধ বিচার	১১	৩	১
ছড়াসমগ্র — অন্নদাশঙ্কর রায় পাঠ্যসমূহ : লন্ডনের শীত ● খুকু ও খোকা ● পক্ষিরাজ ● কাটাকুটি খেলা ● অবাক চা পান ● ঢাকাই ছড়া ● সোনার হরিণ	১২	৩	

মডিউল-৩

বাদশাহী আংটি —সত্যজিৎ রায়	১১	৩	১
সবুজ দ্বীপের রাজা — সুনীল গঙ্গোপাধ্যায়	১২	৩	

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ বাংলার শিশুসাহিত্য— বুদ্ধদেব বসু
- ❑ শতাব্দীর শিশুসাহিত্য— খগেন্দ্রনাথ মিত্র
- ❑ বাংলা শিশুসাহিত্যের ক্রমবিকাশ— আশা গঙ্গোপাধ্যায়
- ❑ প্রসঙ্গ : অন্নদাশঙ্কর রায়— কলকাতা পৌরসংস্থা প্রকাশিত

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দেশভাগ ও বাংলা সাহিত্য

উদ্দেশ্য : বাঙালি জাতির ইতিহাসে দেশভাগের একটি গভীরমূল এবং সুদূরপ্রসারী অভিঘাত রয়েছে। দেশভাগকে ঘিরে বাঙালির সামূহিক এবং ব্যক্তিক বিপন্নতা, বিপর্যয় এবং অসহায়ত্বের সাক্ষ্যবাহী নির্বাচিত কিছু সাহিত্যকে এখানে পাঠ্য করা হয়েছে।

মডিউল-১ : উপন্যাস

	Class Hours		
	Th	**Tu**	**IA Exam**
নীলকণ্ঠ পাখির খোঁজে— অতীন বন্দ্যোপাধ্যায়	২৩	৬	১

মডিউল-২ : ছোটগল্প

এপার গঙ্গা ওপার গঙ্গা— জ্যোতির্ময়ী দেবী গণনায়ক— সতীনাথ ভাদুড়ী ছেলেমানুষী— মানিক বন্দ্যোপাধ্যায় পালঙ্ক— নরেন্দ্রনাথ মিত্র ড্রেসিং টেবিল— সলিল চৌধুরী করুণকন্যা— রমাপদ চৌধুরী রাজা আসে রাজা যায়— প্রফুল্ল রায় জটায়ু— দীপেন্দ্রনাথ বন্দ্যোপাধ্যায়	২৩	৬	১

মডিউল-৩ : কবিতা

পুব-পশ্চিম— অচিন্ত্যকুমার সেনগুপ্ত খুকু ও খোকা— অন্নদাশঙ্কর রায় ১৫ই আগস্ট ১৯৪৭—দীনেশ দাস জল দাও— বিষ্ণু দে পারাপার— সুভাষ মুখোপাধ্যায় বাংলা, হায় বাংলা— মঙ্গলাচরণ চট্টোপাধ্যায় তোমাকে বলেছিলাম— নীরেন্দ্রনাথ চক্রবর্তী দেশহীন — শঙ্খ ঘোষ ধাত্রী—সুনীল গঙ্গোপাধ্যায় সমরেন্দ্র সেনগুপ্ত —ভাষাদেশ	২৩	৬	১

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ বাংলা ছোটগল্পে দেশবিভাগ— সানজিদা আখতার
- ❑ ভূমিকা (রক্তমণির হারে গ্রন্থ)— দেবেশ রায়
- ❑ ভূমিকা (ভেদ-বিভেদ গ্রন্থ)— মানবেন্দ্র বন্দ্যোপাধ্যায়
- ❑ যুক্তবঙ্গের স্মৃতি— অন্নদাশঙ্কর রায়
- ❑ আমার জন্মভূমি/স্মৃতিময় বাংলাদেশ— ধনঞ্জয় দাশ
- ❑ ভাঙা বাংলা ও বাংলা সাহিত্য— অশ্রুকুমার শিকদার
- ❑ বাংলা উপন্যাসে দেশভাগ ও দেশত্যাগ— তারক সরকার
- ❑ দেশভাগ দেশত্যাগ— সন্দীপ বন্দ্যোপাধ্যায়
- ❑ যুক্ত বাংলার শেষ অধ্যায়— কালীপদ বিশ্বাস
- ❑ দেশ বিভাগ : পশ্চাৎ ও নেপথ্য কাহিনী— ভবানী প্রসাদ চট্টোপাধ্যায়
- ❑ বাংলা মধ্যবিত্তের আত্মবিকাশ— কামরুদ্দিন আহমেদ

- ❑ পূর্ব বাংলার সমাজ ও রাজনীতি— কামরুদ্দিন আহমেদ
- ❑ আমার দেখা রাজনীতির পঞ্চাশ বছর— আবুল মনসুর আহমেদ
- ❑ আমার জীবন ও বিভাগ পূর্ব বাংলার রাজনীতি— আবুল হাসিম
- ❑ কালের পুত্তলিকা— অরুণকুমার মুখোপাধ্যায়
- ❑ দেশভাগ : নির্বাসিতের আখ্যান— তপোধীর ভট্টাচার্য
- ❑ বিষাদবৃক্ষ— মিহির সেনগুপ্ত

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চরিত সাহিত্য, আত্মচরিত ও ভ্রমণ সাহিত্য

উদ্দেশ্য : চরিত সাহিত্য ও আত্মচরিত পাঠের মধ্য দিয়ে পড়ুয়ারা ব্যক্তি চৈতন্যদেব কিংবা ব্যক্তি রবীন্দ্রনাথকে যেমন চিনবে তেমনি তাঁদের সময়কালের ধারণাটিকেও আয়ত্ত করতে পারবে। সুখপাঠ্য দেশে-বিদেশে পাঠের মধ্য দিয়েও ব্যক্তি মুজতবা এবং তাঁর বিচিত্র জীবন অভিজ্ঞতার সঙ্গে পরিচিত হবে পড়ুয়ারা।

মডিউল ১

	Class Hours		
	Th	**Tu**	**IA Exam**
চৈতন্যভাগবত (আদ্যলীলা)— বৃন্দাবন দাস	২৩	১	১

মডিউল-২

জীবনস্মৃতি— রবীন্দ্রনাথ ঠাকুর	১৫	৬	১

মডিউল-৩

দেশে-বিদেশে— সৈয়দ মজুতবা আলী	১৫	৬	১

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ চৈতন্য-প্রসঙ্গ— বঙ্গীয় সাহিত্য পরিষৎ প্রকাশিত
- ❑ জীবনী, আত্মজীবনী ও রবীন্দ্রনাথ— শিশিরকুমার দাশ
- ❑ জীবনের স্বরলিপি : পশ্চিমের মুখর জানালা— বিজয়কুমার দত্ত

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লোকসংস্কৃতি ও লোকসাহিত্য

উদ্দেশ্য : বাঙালি এবং তার সংস্কৃতিকে জানতে গেলে আমাদের লোকসংস্কৃতি ও লোকসাহিত্যের পাঠ নেওয়া খুবই জরুরি। বাংলার সমৃদ্ধ লোক-ঐতিহ্যের থেকে নির্বাচিত কয়েকটি প্রসঙ্গই এখানে পড়ুয়াদের চর্চার জন্য রাখা হচ্ছে।

মডিউল-১

	Class Hour		
	Th	**Tu**	**IA Exam**
লোকসংস্কৃতি ও লোকসাহিত্যের সাধারণ পরিচয়	২৩	৬	১
টাইপ ও মোটিফ ইনডেক্স (বৈশিষ্ট্য ও প্রয়োগ শিক্ষার প্রাথমিক পাঠ)			
বাংলার ব্রত ও পার্বন (বিশেষ পাঠ : পুণ্যিপুকুর, মাঘমন্ডল, সেঁজুতি)			

মডিউল-২

লোকছড়া	২৩	৬	১
লোকনৃত্য (বিশেষ পাঠ : ছৌ, রায়বেশে, গম্ভীরা)			
ধাঁধা			

মডিউল-২

বাংলা প্রবাদ	২৩	৬	১
লোকগান (বিশেষ পাঠ : বাউল, ভাটিয়ালী, ভাওয়াইয়া)			
লোককথা			

সহায়ক গ্রন্থ (নির্বাচিত) :

- বাংলার ব্রত— অবনীন্দ্রনাথ ঠাকুর
- বাংলার লোক সাহিত্য— আশুতোষ ভট্টাচার্য
- লোকসংস্কৃতির সীমানা ও স্বরূপ— পল্লব সেনগুপ্ত
- ফোকলোর পরিচিতি ও পঠন-পাঠন— মযহারুল ইসলাম
- বাংলা প্রবাদ— সুশীলকুমার দে
- বাংলার ধাঁধার ভূমিকা— নির্মলেন্দু ভৌমিক
- বাংলা ছড়ার ভূমিকা— নির্মলেন্দু ভৌমিক
- বাংলা লোককথার টাইপ ও মোটিফ ইনডেক্স— দিব্যজ্যোতি মজুমদার
- লোক সংস্কৃতি পাঠের ভূমিকা— তুষার চট্টোপাধ্যায়
- বঙ্গীয় লোকসংস্কৃতিকোষ— বরুণ চক্রবর্তী
- বাংলা লোকসঙ্গীত : ভাটিয়ালি গান— ওয়াকিল আহমেদ
- বাউল ফকির কথা— সুধীর চক্রবর্তী

Skill Enhancement Course (SEC)– 2 Credits each

(সাম্মানিক বাংলা)

- স্নাতক (বাংলা) সাম্মানিক পাঠক্রমের শিক্ষার্থীদের 'Skill Enhancement Course (SEC)' স্তরে ৪ (২ × ২) ক্রেডিট-এর মোট ২টি কোর্স পড়তে হবে। এখানে প্রদত্ত ৪টি কোর্সকে দুটি বর্গে (A এবং B) বিভক্ত করা হয়েছে। A- বর্গের যে-কোনো একটি কোর্স তৃতীয় সেমেস্টারে এবং B- বর্গের যে-কোনো একটি কোর্স চতুর্থ সেমেস্টারে পড়ুয়ারা নির্বাচন করবে।
- প্রতিটি সেমেস্টারে পনেরো সপ্তাহ করে ক্লাস হবে এটা ধরে নিয়ে Class Hours/Teaching Hours-এর হিসেব দেওয়া হয়েছে।
- ২ ক্রেডিট-এর প্রতিটি কোর্সের পূর্ণমান ১০০। এর মধ্যে ১০ নম্বর সংশ্লিষ্ট SEC-র ক্লাসে পড়ুয়ার উপস্থিতির জন্য এবং ১০ নম্বর কোর্সভিত্তিক ধারাবাহিক মূল্যায়ন বা ইন্টারন্যাল অ্যাসেসমেন্ট-এর জন্য বরাদ্দ। বাকি ৮০ নম্বরের জন্য বিশ্ববিদ্যালয়ের সংশ্লিষ্ট কর্তৃপক্ষের তত্ত্বাবধানে লিখিত পরীক্ষা নেওয়া হবে।
- ৮০ নম্বরের লিখিত পরীক্ষায় ১০ নম্বরের তিনটি ব্যাখ্যামূলক, ৫ নম্বরের ৬টি বোধমূলক এবং ১ নম্বরের ২০টি সংক্ষিপ্ত উত্তরভিত্তিক/তথ্যমূলক প্রশ্নের উত্তর দিতে হবে। নিচের তালিকায় প্রশ্নপত্রের ধারণা পাওয়া যাবে

প্রশ্ন নং	প্রশ্নের ধরন ও বিকল্প ও সংক্রান্ত নিয়ম	প্রশ্নের মান
১	মডিউল-১ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
২	মডিউল-২ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
৩	মডিউল-৩ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
৪	প্রত্যেকটি মডিউল থেকে কমপক্ষে **একটি** করে প্রশ্ন নিয়ে মোট **আটটি** প্রশ্ন দেওয়া হবে। পরীক্ষার্থীকে যে-কোনো **ছয়টি** প্রশ্নের উত্তর দিতে হবে।	৫ × ৬
৫.	প্রত্যেকটি মডিউল থেকে কমপক্ষে **চারটি** করে প্রশ্ন নিয়ে মোট **কুড়িটি** সংক্ষিপ্ত উত্তরভিত্তিক/তথ্যমূলক প্রশ্ন দেওয়া হবে। এক্ষেত্রে কোনো বিকল্প থাকবে না।	১ × ২০

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মুদ্রণ ও প্রকাশনা

উদ্দেশ্য : বাংলা মুদ্রণ ও প্রকাশনা সংক্রান্ত সাধারণ জ্ঞানার্জন করবে পড়ুয়ারা।

মডিউল-১

	Class Hours	
	Th	**IA Exam**
পাণ্ডুলিপি প্রস্তুতি	১০	১
বাংলা যুক্তাক্ষরের ধারণা		
সংগ্রহ-সম্পাদনা ও সংকলন সম্পর্কে ধারণা		
কভার, টাইটেল পেজ, গ্রন্থ/পত্রিকার পঞ্জিকরণ সংক্রান্ত ধারণা		

মডিউল-২

এম. এস. ওয়ার্ড, পেজ মেকার	১০	১
কোরেল ড্র, ইনডিজাইন		

মডিউল-৩

প্রুফ সংশোধন (দৃষ্টিহীন পড়ুয়াদের জন্য অশুদ্ধি সংশোধন থাকবে)	১০	১
ছাপার প্রযুক্তি, স্টিচিং, বাইন্ডিং, মার্কেটিং সম্পর্কিত সাধারণ ধারণা		

সহায়ক গ্রন্থ (নির্বাচিত)

- যখন ছাপাখানা এলো— শ্রীপান্থ
- দুই শতকের বাংলা মুদ্রণ ও প্রকাশন— চিত্তরঞ্জন বন্দ্যোপাধ্যায় (সম্পাদিত)
- বাংলা পাণ্ডুলিপি পাঠ ও পরিক্রমা— ত্রিপুরা বসু
- মুদ্রণের সংস্কৃতি ও বাংলা বই— স্বপন চক্রবর্তী (সম্পাদিত)
- উনিশ শতকের বাংলা ছাপাখানা— আশিস খাস্তগীর
- গবেষণাপত্র : অনুসন্ধান ও রচনা— জগমোহন মুখোপাধ্যায়
- লেখক ও সম্পাদকের অভিধান— সুভাষ ভট্টাচার্য (সম্পাদিত)
- মাষ্টারিং Micorsoft Office Power Point — বাপ্পি আশরাফ
- ডায়নামিক মেমরি কম্পিউটার কোর্স— দেবেন্দ্র সিং মিনহাস

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ব্যবহারিক বাংলা-১

উদ্দেশ্য : পরবর্তী জীবনে পেশা হিসেবে যে-সব পড়ুয়া নাটক অথবা সিনেমা-সিরিয়ালকে কিংবা আবৃত্তি শিল্পকে গ্রহণ করতে চাইবে, তারা ঐ সব বিষয়ের প্রাথমিক ধ্যানধারণা পাবে এই কোর্স থেকে।

মডিউল-১

	Class Hours	
	Th	**IA Exam**
গল্পসূত্র থেকে কাহিনি নির্মাণ	১০	১
গল্প/উপন্যাস থেকে নাট্যরূপ/ চিত্রনাট্য নির্মাণ		

মডিউল-২

বাংলা ভাষার/শব্দের সঠিক উচ্চারণ	১০	১
ছন্দ সম্পর্কিত জ্ঞান, আবৃত্তিচর্চা		

মডিউল-৩

সাহিত্য ও চলচ্চিত্র— পারস্পরিক সম্পর্ক	১০	১
বাংলা সাহিত্যের চলচ্চিত্রায়ণ বিশেষ পাঠ : ক্ষুধিত পাষাণ, পথের পাঁচালী, বাড়ি থেকে পালিয়ে		

সহায়ক গ্রন্থ (নির্বাচিত) :

- চলচ্চিত্রের অভিধান— ধীমান দাশগুপ্ত
- বিষয় চলচ্চিত্র— সত্যজিৎ রায়
- বাংলা চলচ্চিত্রের ইতিহাস— নির্মাল্য আচার্য ও দিব্যেন্দু পালিত (সম্পাদিত)
- রবীন্দ্রনাথের সিনেমা সিনেমার রবীন্দ্রনাথ— চণ্ডী মুখোপাধ্যায়
- মৃণাল সেনের ফিল্মযাত্রা— শিলাদিত্য সেন
- কবিতার ক্লাস— নীরেন্দ্রনাথ চক্রবর্তী
- বিষয় আবৃত্তি— অমিয় চট্টোপাধ্যায়, দেবদুলাল বন্দ্যোপাধ্যায়
- বাংলা সিনেমার ইতিকথা : দুই বাংলার চলচ্চিত্র (১৯০৩-২০১৪)— চণ্ডী মুখোপাধ্যায়
- চলচ্চিত্র : চিন্তাবীজ রবের ব্রেসঁ (ভাষান্তর : সন্দীপন ভট্টাচার্য)
- চলচ্চিত্র মানুষ এবং আরো কিছু— ঋত্বিককুমার ঘটক
- সিনেমার ইতিবৃত্তান্ত— পার্থ রাহা
- বাংলা বলো— পবিত্র সরকার
- কি লিখি কেন লিখি— নীরেন্দ্রনাথ চক্রবর্তী

BNG-A-SEC-B-4-1-TH

ব্যবহারিক বাংলা ও সাহিত্য গবেষণার পদ্ধতিবিজ্ঞান

উদ্দেশ্য : শিক্ষার্থীদের জীবনের নানা প্রয়োজনকে সুষ্ঠভাবে এবং নিয়মমাফিক সমাধা করতে সহায়তা করবে এই কোর্সটি।

মডিউল-১

	Class Hours	
	Th	**IA Exam**
সংবাদপত্রে অথবা ব্যক্তিগতভাবে প্রচারের লক্ষ্যে প্রতিবেদন রচনা	১০	১
চিঠিপত্র রচনা—বিভিন্ন প্রকার সহ		
কাল্পনিক সাক্ষাৎকার রচনা		

মডিউল-২

ছাপা মাধ্যম এবং বৈদ্যুতিন মাধ্যমের জন্য বিজ্ঞাপন রচনা	১০	১
অনুবাদের ভাষা ও শৈলী		
ইংরেজি থেকে বাংলা অনুবাদ		

মডিউল-৩

গবেষণার রীতি ও নির্মাণ পদ্ধতি, গবেষণার আদর্শ বিন্যাসক্রম	১০	১
তথ্য সংগ্রহ, উদ্ধৃতির প্রয়োগ, কপিরাইট আইন		
পাদটীকা/প্রান্তটীকা/সূত্র নির্দেশ, গ্রন্থপঞ্জি ও নির্ঘন্ট প্রণয়ন বিধি		

সহায়ক গ্রন্থ (নির্বাচিত)

- গণজ্ঞাপন : তত্ত্ব ও প্রয়োগে— পার্থ চট্টোপাধ্যায়
- সেকাল একালের সংবাদ পরিবেশনের ধারা ও বিচিত্র সংবাদ— বৈদ্যনাথ বন্দ্যোপাধ্যায়
- গবেষণাপত্র : অনুসন্ধান ও রচনা— জগমোহন মুখোপাধ্যায়

BNG-A-SEC-B-4-2-TH

ব্যবহারিক বাংলা-২

উদ্দেশ্য : যে-সব সাহিত্যরূপ পড়ুয়ারা পড়ছে/পড়েছে তা কীভাবে তৈরি হয়ে ওঠে, তার কলাকৌশলগুলি সম্পর্কে এখানে হাতে কলমে তাদের ধারণা দেওয়া হবে। তার সঙ্গে বানান এবং IPA ও রোমীয় লিপি সংক্রান্ত ব্যবহারিক জ্ঞানও দিতে চাওয়া হয়েছে এই কোর্সে।

মডিউল-১ : সৃজনশীল রচনা

	Class Hours	
	Th	**IA Exam**
গল্প রচনা (সামাজিক/পারিবারিক/ব্যক্তিক কোনো প্রসঙ্গ/বিষয় অবলম্বনে কমবেশি ৩০০ শব্দে গল্প লিখতে দেওয়া হবে)	১০	১
প্রবন্ধ রচনা (সামাজিক/পারিবারিক/ব্যক্তিক অথবা সাহিত্য বিষয়ক কোনো প্রসঙ্গ/বিষয় অবলম্বনে কমবেশি ৩০০ শব্দে প্রবন্ধ লিখতে দেওয়া হবে)		

মডিউল-২

বাংলা বানানের বিবর্তন সম্পর্কে সাধারণ ধারণা	১০	১
পশ্চিমবঙ্গ বাংলা আকাদেমির বানান বিধি		

মডিউল-৩

আন্তর্জাতিক ধ্বনিমূলক বর্ণমালা (IPA)	১০	১
রোমীয় লিপি		

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ সাধারণ ভাষাবিজ্ঞান ও বাংলাভাষা— রামেশ্বর শ'
- ❑ কি লিখি কেন লিখি— নীরেন্দ্রনাথ চক্রবর্তী
- ❑ বাংলা বানান বিধি— পরেশচন্দ্র মজুমদার
- ❑ বাংলা বানান সংস্কার, সমস্যা ও সম্ভাবনা— পবিত্র সরকার

কলিকাতা বিশ্ববিদ্যালয়

২০১৮

স্নাতক বাংলা পাঠক্রম

সাধারণ

ইউ.জি.সি নির্দেশিত সিবিসিএস অনুসারে

(উত্তর লেখার ক্ষেত্রে পরীক্ষার্থীদের পশ্চিমবঙ্গ বাংলা আকাদেমি-র বানানবিধি অনুসরণ করতে হবে)

স্নাতক সাধারণ বাংলা

A)i) Discipline Centric Core Course (CC)/Generic Elective (GE)*– 6 Credits Each

BNG-G-CC/GE-1-1-Th-Tu	বাংলা সাহিত্যের ইতিহাস (আধুনিক যুগ)
BNG-G-CC/GE-2-2-Th-Tu	ঐতিহাসিক ভাষাবিজ্ঞান, ছন্দ ও অলঙ্কার
BNG-G-CC/GE-3-3-Th-Tu	বাংলা কাব্যকবিতা ও নাটক
BNG-G-CC/GE-4-4-Th-Tu	বাংলা কথাসাহিত্য ও প্রবন্ধ

*** এই চারটি কোর্স থেকেই দুটি কোর্স সাম্মানিক বাংলা ছাড়া অন্য বিষয়ের সাম্মানিক প্রোগ্রামের পড়ুয়ারা Generic Elective (GE)-পর্যায়ের পাঠ্য হিসেবে গ্রহণ করবে/করতে পারে।**

***কলা বিভাগের সাধারণ (General) প্রোগ্রামের যে-সমস্ত শিক্ষার্থী Discipline Centric Core Course (CC) পর্যায়ের পাঠ্য হিসেবে বাংলা গ্রহণ করেনি এবং LCC(2) পর্যায়েও পাঠ্য হিসেবে বাংলা বিকল্পটি (MIL গুলির মধ্যে) গ্রহণ করেনি— শুধুমাত্র তারাই Generic Elective (GE)-পর্যায়ে এখান থেকে প্রথম দুটি কোর্স পাঠ্য হিসেবে নির্বাচন করতে পারে।**

A)ii) Language Core Course [LCC(2)] – 6 Credits Each

BNG-G-LCC(2)-4-1-Th-Tu	বাংলা ভাষাবিজ্ঞান ও সাহিত্যের রূপভেদ ও কাব্য
BNG-G-LCC(2)6-2-Th-Tu	সাময়িকপত্র ও কথাসাহিত্য

B) Discipline Specific Elective (DSE) – 6 Credits Each

BNG-G-DSE-A-5-1-Th-Tu	বাংলার সমাজ ও সংস্কৃতির ইতিহাস
BNG-G-DSE-A-5-2-Th-Tu	বাংলা গোয়েন্দা সাহিত্য, কল্পবিজ্ঞান আশ্রয়ী রচনা এবং অলৌকিক কাহিনি
BNG-G-DSE-B-6-1-Th-Tu	দেশভাগ ও বাংলা সাহিত্য
BNG-G-DSE-B-6-2-Th-Tu	লোকসংস্কৃতি ও লোকসাহিত্য

C) Skill Enhancement Course (SEC) – 2 Credits Each

BNG-G-SEC-A-3/5-1-Th	মুদ্রণ ও প্রকাশন
BNG-G-SEC-A-3/5-2-Th	ব্যবহারিক বাংলা-১
BNG-G-SEC-B-4/6-1-Th	ব্যবহারিক বাংলা ও সাহিত্য গবেষণার পদ্ধতিবিজ্ঞান
BNG-G-SEC-B-4/6-2-Th	ব্যবহারিক বাংলা-২

D) Ability Enhancement Compulsory Course (AECC)– 2 Credits

BNG-AECC-1-1-Th

স্নাতক বাংলা (সাধারণ) পাঠক্রমের সেমেস্টার ভিত্তিক বিভাজন

	SEM-1	SEM-2	SEM-3	SEM-4	SEM-5	SEM-6
A) Core Course (CC) 6 Credits each	● BNG-G-CC-1-1-TH-TU + ☒	● BNG-G-CC-2-2-TH-TU + ☒	● BNG-G-CC-3-3-TH-TU + ☒	● BNG-G-CC-4-4-TH-TU + ☒		
Language (LCC)			☒	● BNG-G-LCC(2)-4-1-TH-TU	☒	● BNG-G-LCC(2)-6-2-TH-TU
B) Elective Courses 6 Credits each						
i) Generic Elective (GE)	☒	☒				
ii) Discipline Specific Elective (DSE)					যে-কোনো একটি ● BNG-G-DSE-A-5-1-TH-TU ● BNG-G-DSE-A-5-2-TH-TU ● + ☒	যে-কোনো একটি ● BNG-G-DSE-B-6-1-TH-TU/ ● BNG-G-DSE-B-6-2-TH-TU ● + ☒
C) Skill Enhancement Course (SEC) 2 Credits Each			যে-কোনো একটি (এখানে অথবা পঞ্চম সেমেস্টারে) ● BNG-G-SEC-A-3/5-1-TH ● BNG-G-SEC-A-3/5-2-TH //// + ☒	যে-কোনো একটি (এখানে অথবা ষষ্ঠ সেমেস্টারে) ● BNG-G-SEC-B-4/6-1-TH ● BNG-G-SEC-B-4/6-2-TH //// + ☒	যে-কোনো একটি (এখানে অথবা তৃতীয় সেমেস্টারে) ● BNG-G-SEC-A-3/5-1-TH ● BNG-G-SEC-A-3/5-2-TH //// + ☒	যে-কোনো একটি (এখানে অথবা চতুর্থ সেমেস্টারে) ● BNG-G-SEC-B-4/6-1-TH ● BNG-G-SEC-B-4/6-2-TH //// + ☒
D) Ability Enhancement Compulsory Course (AECC) 2 Credits	● BNG-AECC-1-1-TH	☒				
Total Marks/ Credits	400/20	400/20	400/20	400/20	400/20	400/20

Note : বাংলা ছাড়া পাঠ্য অন্য কোর্স বোঝাতে ☒ চিহ্নটি ব্যবহার করা হয়েছে।

Discipline Centric Core Course (CC)/ Generic Elective (GE) [For Honours students other than Bengali(H)] – 6 Credits Each
(সাধারণ বাংলা)

- স্নাতক সাধারণ (বাংলা) পাঠক্রমে 'Discipline Centric Core Course' স্তরে ২৪ ক্রেডিট-এর মোট ৪টি কোর্স প্রথম ৪টি সেমেস্টারে পড়তে হবে।
- এই চারটি কোর্স থেকেই দুটি কোর্স সাম্মানিক বাংলা ছাড়া অন্য বিষয়ের সাম্মানিক প্রোগ্রামের পড়ুয়ারা Generic Elective (GE)-পর্যায়ের পাঠ্য হিসেবে গ্রহণ করবে/করতে পারে।
- কলা বিভাগের সাধারণ (General) প্রোগ্রামের যে-সমস্ত শিক্ষার্থী Discipline Centric Core Course (CC) পর্যায়ের পাঠ্য হিসেবে বাংলা গ্রহণ করেনি এবং LCC(2) পর্যায়েও পাঠ্য হিসেবে বাংলা বিকল্পটি (MIL গুলির মধ্যে) গ্রহণ করেনি— শুধুমাত্র তারাই Generic Elective (GE)-পর্যায়ে এখান থেকে প্রথম দুটি কোর্স পাঠ্য হিসেবে নির্বাচন করতে পারে।
- ৬ (৫ + ১) ক্রেডিট-এর প্রতিটি কোর্সের পূর্ণমান ১০০। এর মধ্যে ১০ নম্বর সংশ্লিষ্ট CC-র ক্লাসে পড়ুয়ার উপস্থিতির জন্য বরাদ্দ। ১০ নম্বর কোর্সভিত্তিক ধারাবাহিক মূল্যায়ন বা ইন্টারন্যাল অ্যাসেসমেট-এর জন্য এবং ১৫ নম্বর কোর্সভিত্তিক টিউটোরিয়াল-এর জন্য বরাদ্দ। বাকি ৬৫ নম্বরের জন্য বিশ্ববিদ্যালয়ের সংশ্লিষ্ট কর্তৃপক্ষের তত্ত্বাবধানে লিখিত পরীক্ষা নেওয়া হবে। প্রতিটি সেমেস্টারে পনেরো সপ্তাহ করে ক্লাস হবে ধরে নিয়ে Class Hours/Teaching Hours-এর হিসেব দেওয়া হয়েছে।
- ৬৫ নম্বরের লিখিত পরীক্ষায় ১০ নম্বরের তিনটি ব্যাখ্যামূলক, ৫ নম্বরের ৪টি বোধমূলক এবং ১ নম্বরের ১৫টি সংক্ষিপ্ত উত্তরভিত্তিক/তথ্যমূলক প্রশ্নের উত্তর দিতে হবে। নিচের তালিকায় প্রশ্নপত্রের ধারণা পাওয়া যাবে।

প্রশ্ন নং	প্রশ্নের ধরন ও বিকল্প সংক্রান্ত নিয়ম	প্রশ্নের মান
১	মডিউল-১ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
২	মডিউল-২ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
৩	মডিউল-৩ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
৪	মডিউল-১ থেকে একটি বোধমূলক প্রশ্ন। একটি বিকল্প থাকবে।	৫
৫	মডিউল-২ থেকে একটি বোধমূলক প্রশ্ন। একটি বিকল্প থাকবে।	৫
৬	মডিউল-৩ থেকে একটি বোধমূলক প্রশ্ন। একটি বিকল্প থাকবে।	৫
৭	মডিউল-১, মডিউল-২ এবং মডিউল-৩ থেকে একটি করে প্রসঙ্গ/বিষয় নিয়ে টীকা-ধর্মী প্রশ্ন হবে। তিনটির মধ্যে যে-কোনো একটি লিখতে হবে।	৫
৮	প্রত্যেকটি মডিউল থেকে কমপক্ষে **তিনটি** করে প্রশ্ন নিয়ে মোট **পনেরটি** সংক্ষিপ্ত উত্তরভিত্তিক/তথ্যমূলক প্রশ্ন দেওয়া হবে। এক্ষেত্রে কোনো বিকল্প থাকবে না।	১ × ১৫

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বাংলা সাহিত্যের ইতিহাস (আধুনিক যুগ)

উদ্দেশ্য : ১৮০০ খ্রিস্টাব্দ পরবর্তী সময়কালে বাংলা সাহিত্যের বিভিন্ন ধারার বিবর্তনের গতিরেখার সঙ্গে শিক্ষার্থীদের পরিচিতি ঘটানো এই কোর্সের উদ্দেশ্য।

মডিউল-১ : গদ্য ও প্রবন্ধ

	Class Hours		
	Th	**Tu**	**IA Exam**
শ্রীরামপুর মিশন, ফোর্ট উইলিয়ম কলেজ	২৩	৬	১
রাজা রামমোহন রায়, ঈশ্বরচন্দ্র বিদ্যাসাগর, অক্ষয়কুমার দত্ত			
প্যারীচাঁদ মিত্র, কালীপ্রসন্ন সিংহ			
বঙ্কিমচন্দ্র চট্টোপাধ্যায়, রবীন্দ্রনাথ ঠাকুর			
প্রমথ চৌধুরী, বুদ্ধদেব বসু			

মডিউল-২ : কাব্য-কবিতা ও নাটক

ক.	ঈশ্বরচন্দ্র গুপ্ত, রঙ্গলাল বন্দ্যোপাধ্যায়	১৩	৩	১
	মধুসূদন দত্ত, বিহারীলাল চক্রবর্তী			
	রবীন্দ্রনাথ ঠাকুর, কাজী নজরুল ইসলাম			
	যতীন্দ্রনাথ সেনগুপ্ত, জীবনানন্দ দাশ, সুভাষ মুখোপাধ্যায়			
খ.	মধুসূদন দত্ত, দীনবন্ধু মিত্র	১০	৩	
	গিরিশচন্দ্র ঘোষ, রবীন্দ্রনাথ ঠাকুর			
	দ্বিজেন্দ্রলাল রায়, বিজন ভট্টাচার্য			

মডিউল-৩ : উপন্যাস ও ছোটগল্প

বাংলা উপন্যাসের উদ্ভব ও বিকাশ	২৩	৬	১
বঙ্কিমচন্দ্র চট্টোপাধ্যায়, রবীন্দ্রনাথ ঠাকুর, শরৎচন্দ্র চট্টোপাধ্যায়			
বিভূতিভূষণ বন্দ্যোপাধ্যায়, তারাশঙ্কর বন্দ্যোপাধ্যায়, মানিক বন্দ্যোপাধ্যায়			

সহায়ক গ্রন্থ (নির্বাচিত)

- বাঙ্গালা সাহিত্যের ইতিহাস (৩-৫ খণ্ড)— সুকুমার সেন
- বাংলা গদ্য সাহিত্যের ইতিহাস— সজনীকান্ত দাস
- বাংলা সাহিত্যে গদ্য— সুকুমার সেন
- বাংলা সাহিত্যের ইতিবৃত্ত (৬-৯)— অসিতকুমার বন্দ্যোপাধ্যায়
- বাংলা সাহিত্যের ইতিকথা (৩-৪)— ভূদেব চৌধুরী
- আধুনিক বাংলা কাব্য— তারাপদ মুখোপাধ্যায়
- উনিশ শতকের গীতিকাব্য— অরুণকুমার মুখোপাধ্যায়
- বাংলা সাময়িক পত্র— ব্রজেন্দ্রনাথ বন্দ্যোপাধ্যায়
- বাংলা নাটকের ইতিহাস— অজিতকুমার ঘোষ
- গদ্যরীতি পদ্যরীতি— পবিত্র সরকার
- রবীন্দ্রানুসারী কবিসমাজ— অরুণকুমার মুখোপাধ্যায়
- আমার কালের কয়েকজন কবি— জগদীশ ভট্টাচার্য
- রবীন্দ্রনাট্য পরিক্রমা— উপেন্দ্রনাথ ভট্টাচার্য
- রবীন্দ্রনাট্য প্রবাহ— প্রমথনাথ বিশী
- বাংলা নাটকের ইতিহাস— অজিত কুমার ঘোষ
- বঙ্গসাহিত্যে উপন্যাসের ধারা— শ্রীকুমার বন্দ্যোপাধ্যায়
- সাহিত্য টীকা— সনৎকুমার মিত্র
- বাংলা প্রবন্ধ সাহিত্যের ধারা (১, ২ খণ্ড)— অধীর দে
- বাংলা সাহিত্যের ইতিহাস (আধুনিক যুগ)— দেবেশকুমার আচার্য

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ঐতিহাসিক ভাষাবিজ্ঞান, ছন্দ ও অলঙ্কার

উদ্দেশ্য : বাংলা ভাষার উদ্ভব ও বিকাশ সম্পর্কে শিক্ষার্থীকে ধারণা দেওয়া হবে। কাব্য নির্মানের অন্যতম উপাদান হিসেবে ছন্দ ও অলঙ্কারের সংক্ষিপ্ত পাঠও এই কোর্স থেকে গ্রহণ করবে পড়ুয়ারা।

মডিউল-১ : ঐতিহাসিক ভাষাবিজ্ঞান

	Class Hours		
	Th	**Tu**	**IA Exam**
প্রাচীন ভারতীয় আর্যভাষা থেকে আধুনিক ভারতীয় আর্যভাষা হিসেবে বাংলা ভাষার উদ্ভবের গতিরেখা	২৩	৬	১
আদি-মধ্য বাংলা ভাষার ভাষাতাত্ত্বিক লক্ষণ— প্রেক্ষিত শ্রীকৃষ্ণকীর্তন			

মডিউল-২ : ছন্দ

অক্ষর, দল, কলা, মাত্রা, যতি, পর্ব, পদ, পঙ্‌ক্তি/চরণ— সংজ্ঞা ও উদাহরণসহ প্রতিটির ধারণা	২৩	৬	১
বাংলা ছন্দের ত্রিধারা— সংজ্ঞা, বৈশিষ্ট্য ও উদাহরণ			
ছন্দোলিপি প্রণয়ন (পর্ব, পদ, পঙ্‌ক্তি, লয়, মাত্রা ও রীতির উল্লেখ বাঞ্ছনীয়)			

মডিউল-৩ : অলংকার

অলংকার সম্পর্কে সাধারণ ধারণা	২৩	৬	১
অনুপ্রাস, যমক, শ্লেষ, বক্রোক্তি, উপমা, রূপক, উৎপ্রেক্ষা, সমাসোক্তি, ব্যাজস্তুতি, ব্যতিরেক— সংজ্ঞা ও উদাহরণ			
অলংকার নির্ণয়			

সহায়ক গ্রন্থ (নির্বাচিত)

- ভাষা-প্রকাশ বাঙ্গালা ব্যাকরণ— সুনীতিকুমার চট্টোপাধ্যায়
- সংস্কৃত ও প্রাকৃত ভাষার ক্রমবিকাশ (১-২ খণ্ড)— পরেশচন্দ্র মজুমদার
- বাংলা ভাষা পরিক্রমা— পরেশচন্দ্র মজুমদার
- ভাষা-জিজ্ঞাসা— শিশিরকুমার দাশ
- ভাষার ইতিবৃত্ত— সুকুমার সেন
- সাধারণ ভাষাবিজ্ঞান ও বাংলা ভাষা— রামেশ্বর শ'
- আধুনিক ভাষাতত্ত্ব— আবদুল কালাম মনজুর মোরশেদ
- বাংলা ছন্দের মূলসূত্র— অমূল্যধন মুখোপাধ্যায়
- নূতন ছন্দ পরিক্রমা— প্রবোধচন্দ্র সেন
- বাংলা ছন্দ পরিচয়— নীলরতন সেন
- অলংকার চন্দ্রিকা— শ্যামাপদ চক্রবর্তী
- বাঙলা ছন্দ— জীবেন্দ্র সিংহ রায়
- বাঙলা অলংকার— জীবেন্দ্র সিংহ রায়
- ছন্দতত্ত্ব ছন্দরূপ— পবিত্র সরকার

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বাংলা কাব্য-কবিতা ও নাটক

উদ্দেশ্য : বাংলা ভাষা ও সাহিত্যের ইতিহাস এবং ছন্দ অলঙ্কার সম্পর্কে পাঠ গ্রহণের পর শিক্ষার্থীরা এই কোর্সে সাহিত্যের আস্বাদন করবে। বাংলা কাব্যের বিবর্তনের ধারাটিও তাদের কাছে স্পষ্ট হবে।

মডিউল-১ : প্রাগাধুনিক কবিতা

	Class Hours		
	Th	**Tu**	**IA Exam**
বৈষ্ণব পদাবলী (কলিকাতা বিশ্ববিদ্যালয় সংস্করণ) নির্বাচিত পদসমূহ : নীরদনয়নে নীর ঘন সিঞ্চনে আজু হাম কি পেখলুঁ নবদ্বীপ চন্দ দাঁড়াইয়া নন্দের আগে গোপাল কান্দে অনুরাগে ঘরের বাহিরে দন্ডে শতবার রূপ লাগি আঁখি ঝুরে গুণে মন ভোর এমন পিরীতি কভু নাহি দেখি শুনি সখি কি পুছসি অনুভব মোয় কণ্টক গাড়ি কমল সম পদতল মন্দির বাহির কঠিন কপাট কি মোহিনী জান বধুঁ কি মোহিনী জান বধুঁ তুমি যে আমার প্রাণ অঙ্কুর তপন তাপে যদি জারব বহুদিন পরে বধুঁয়া এলে তাতল সৈকত বারি-বিন্দুসম	২৩	৬	১

মডিউল-২ : আধুনিক কবিতা

ক.	**পুনশ্চ**— রবীন্দ্রনাথ ঠাকুর নির্বাচিত কবিতা— ছেলেটা, সাধারণ মেয়ে, বাঁশি, প্রথম পূজা	১০	৩	১
খ.	**একালের কবিতা সঞ্চয়ন (কলিকাতা বিশ্ববিদ্যালয় সংস্করণ)** নির্বাচিত কবিতা : নষ্টনীড়— সমর সেন, আমার ভারতবর্ষ—বীরেন্দ্র চট্টোপাধ্যায় দেশ দেখাচ্ছ অন্ধকারে—নীরেন্দ্রনাথ চক্রবর্তী, কেউ কথা রাখেনি—সুনীল গঙ্গোপাধ্যায়	১৩	৩	

মডিউল-৩ : বাংলা নাটক

রাজা ও রানী— রবীন্দ্রনাথ ঠাকুর	২৩	৬	১

সহায়ক গ্রন্থ (নির্বাচিত)

- মধ্যযুগের কবি ও কাব্য— শঙ্করীপ্রসাদ বসু
- চণ্ডীদাস ও বিদ্যাপতি— শঙ্করীপ্রসাদ বসু
- শ্রীরাধার ক্রমবিকাশ : দর্শনে ও সাহিত্যে— শশিভূষণ দাশগুপ্ত
- বৈষ্ণব রস প্রকাশ— ক্ষুদিরাম দাস
- রবীন্দ্র কাব্য পরিক্রমা— উপেন্দ্রনাথ ভট্টাচার্য
- রবীন্দ্র নাট্য পরিক্রমা— উপেন্দ্রনাথ ভট্টাচার্য
- রবীন্দ্র নাট্য প্রবাহ— প্রমথনাথ বিশী
- আধুনিক বাংলা কাব্য পরিচয়— দীপ্তি ত্রিপাঠী
- আমার কালের কয়েকজন কবি— জগদীশ ভট্টাচার্য

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বাংলা কথাসাহিত্য ও প্রবন্ধ

উদ্দেশ্য : এই কোর্সে বাংলা কথাসাহিত্য এবং প্রবন্ধ সাহিত্যের পাঠ দেওয়া হবে।

মডিউল-১ : উপন্যাস

	Class Hours		
	Th	**Tu**	**IA Exam**
পল্লীসমাজ— শরৎচন্দ্র চট্টোপাধ্যায়	২৩	৬	১

মডিউল-২ : ছোটগল্প

একালের ছোটগল্প সঞ্চয়ন (কলিকাতা বিশ্ববিদ্যালয় সংস্করণ) পাঠ্য : পুঁই মাচা— বিভূতিভূষণ বন্দ্যোপাধ্যায় না— তারাশঙ্কর বন্দ্যোপাধ্যায় হারানের নাতজামাই— মানিক বন্দ্যোপাধ্যায় অশ্বমেধের ঘোড়া—দীপেন্দ্রনাথ বন্দ্যোপাধ্যায় মতিলাল পাদরী— কমলকুমার মজুমদার ছিন্নমস্তা— আশাপূর্ণা দেবী	২৩	৬	১

মডিউল-৩ : প্রবন্ধ

সংকলন— রবীন্দ্রনাথ ঠাকুর পাঠ্য প্রবন্ধ সমূহ— শিক্ষার মিলন, পূর্ব ও পশ্চিম, মেঘদূত, কেকাধ্বনি	২৩	৬	১

সহায়ক গ্রন্থ (নির্বাচিত)

- বঙ্গ সাহিত্যে উপন্যাসের ধারা— শ্রীকুমার বন্দ্যোপাধ্যায়
- শরৎচন্দ্র— সুবোধচন্দ্র সেনগুপ্ত
- রবীন্দ্র সৃষ্টি সমীক্ষা— শ্রীকুমার বন্দ্যোপাধ্যায়
- বাংলা ছোটগল্প— শিশিরকুমার দাশ
- মানিক বন্দ্যোপাধ্যায় : জীবনদৃষ্টি ও শিল্পরীতি— গোপিকানাথ রায়চৌধুরী
- কালের পুত্তলিকা— অরুণকুমার মুখোপাধ্যায়
- রবীন্দ্র সৃষ্টি সমীক্ষা— শ্রীকুমার বন্দ্যোপাধ্যায়
- সাহিত্যে ছোটগল্প— নারায়ণ গঙ্গোপাধ্যায়
- বাংলা উপন্যাসের কালান্তর— সরোজ বন্দ্যোপাধ্যায়
- বাংলা ছোটগল্প : প্রসঙ্গ ও প্রকরণ— বীরেন্দ্র দত্ত

LCC(2)– BENGALI

(সাধারণ)

স্নাতক (কলা) সাধারণ বিভাগের সমস্ত শিক্ষার্থীকেই LCC(2) [MIL/Alternative English]- স্তরে ৬ ক্রেডিট করে মোট ১২ ক্রেডিটের দুটি কোর্স নির্বাচন করতে হবে

(যে সমস্ত স্নাতক (সাধারণ) পড়ুয়ারা Core Course হিসেবে বাংলা গ্রহণ করেছে তারাও LCC(2) পর্যায়ে MIL গুলির মধ্যে বাংলা বিকল্পটি গ্রহণ করতে পারে— সেই দিকটি বিবেচনার মধ্যে রেখেই নিচের কোর্স দুটি তৈরি করা হয়েছে।)

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বাংলা ভাষা বিজ্ঞান, সাহিত্যের রূপভেদ ও কাব্য

উদ্দেশ্য : বি.এ. সাধারণ বিভাগের পড়ুয়াদের জন্য এই কোর্সটিতে বাংলা ভাষাতত্ত্ব, সাহিত্যের রূপভেদের পাশাপাশি মধুসূদন দত্তের কাব্যপাঠের মধ্য দিয়ে শিক্ষার্থীদের ভাষা এবং সাহিত্য সম্পর্কে প্রাথমিক ধারণা তৈরি হবে।

মডিউল -১ : বাংলা ভাষাবিজ্ঞান

	Class Hours		
	Th	**Tu**	**IA Exam**
বাংলা ভাষার শব্দভাণ্ডার	২৩	৬	১
বাংলা শব্দার্থ পরিবর্তনের ধারা			
বাংলাভাষার ধ্বনি পরিবর্তনের রীতি ও প্রকৃতি			

মডিউল-২ : সাহিত্যের রূপভেদ

মহাকাব্য, গীতিকবিতা	২৩	৬	১
ট্রাজেডি, কমেডি			
পৌরাণিক নাটক, ঐতিহাসিক নাটক ও সামাজিক নাটক			
রোমান্স ও উপন্যাস			
সামাজিক উপন্যাস ও ঐতিহাসিক উপন্যাস			
ছোটগল্পের সঙ্গে উপন্যাসের তুলনা			
প্রবন্ধ ও সাহিত্য সমালোচনা			

মডিউল-৩ : কাব্য

মেঘনাদবধ কাব্য— মাইকেল মধুসূদন দত্ত (প্রথম সর্গ)	২৩	৬	১

সহায়ক গ্রন্থ (নির্বাচিত

- ❑ সাধারণ ভাষাবিজ্ঞান ও বাংলা ভাষা— রামেশ্বর শ'
- ❑ বাংলা ভাষার ব্যাকরণ ও তার ক্রমবিকাশ— নির্মল দাশ
- ❑ উচ্চতর বাংলা ব্যাকরণ— বামনদেব চক্রবর্তী
- ❑ মধুসূদনের কবি আত্মা ও কাব্যশিল্প— ক্ষেত্র গুপ্ত
- ❑ সাহিত্য সন্দর্শন— শ্রীশচন্দ্র দাস
- ❑ সাহিত্য ও সমালোচনার রূপরীতি— উজ্জ্বলকুমার মজুমদার
- ❑ সাহিত্য : রূপ-বিচিত্রা— অপূর্বকুমার রায়
- ❑ সাহিত্যের রূপরীতি ও অন্যান্য প্রসঙ্গ— কুন্তল চট্টোপাধ্যায়
- ❑ বাংলা সাহিত্যের রূপরীতি— শুদ্ধসত্ত্ব বসু
- ❑ সাহিত্যকোষ : কথাসাহিত্য— অলোক রায়
- ❑ সাহিত্য বিচার : তত্ত্ব ও প্রয়োগ— বিমলকুমার মুখোপাধ্যায়

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সাময়িক পত্র ও কথাসাহিত্য

উদ্দেশ্য : এই কোর্সে আধুনিক বাঙালির চিন্তা চেতনার বাহক হিসেবে বাংলা সাময়িক পত্রের ভূমিকার কথা জানার পাশাপাশি পড়ুয়ারা উপন্যাস ও ছোটগল্পের রসাস্বাদন করতে পারবে।

মডিউল-১ : সাময়িক পত্র

	Class Hours		
	Th	**Tu**	**IA Exam**
দিগদর্শন, সমাচার দর্পন সংবাদ প্রভাকর, তত্ত্ববোধিনী পত্রিকা বঙ্গদর্শন, ভারতী সবুজপত্র কল্লোল, কালিকলম, প্রগতি পরিচয়, কবিতা	২৩	৬	১

মডিউল-২ : উপন্যাস

রজনী— বঙ্কিমচন্দ্র চট্টোপাধ্যায়	২৩	৬	১

মডিউল-৩ : ছোটগল্প

একালের গল্প সঞ্চয়ন (কলিকাতা বিশ্ববিদ্যালয় সংস্করণ) পাঠ্য গল্প : ছোটলোক— বনফুল চোর— জ্যোতিরিন্দ্র নন্দী রেকর্ড— নারায়ণ গঙ্গোপাধ্যায় অন্তঃসলিলা— সাবিত্রী রায় আদাব— সমরেশ বসু টোবাটেক সিং— সাদাত হোসেন মন্টো	২৩	৬	১

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ বাংলা সাময়িক পত্র— ব্রজেন্দ্রনাথ বন্দ্যোপাধ্যায়
- ❑ বাংলা সাময়িকপত্রের ইতিবৃত্ত (১, ২)— সন্দীপ দত্ত
- ❑ বঙ্কিমচন্দ্র— সুবোধচন্দ্র সেনগুপ্ত
- ❑ বঙ্কিম সরণী— প্রমথনাথ বিশী
- ❑ বাংলা ছোটগল্প : প্রসঙ্গ ও প্রকরণ— বীরেন্দ্র দত্ত

Discipline Specific Elective (DSE)– 6 Credit Each
(সাধারণ বাংলা)

- স্নাতক (কলা) সাধারণ বিভাগের শিক্ষার্থীরা **(যারা CC হিসেবে বাংলা গ্রহণ করবে)** Discipline Specific Elective (DSE)-স্তরে পাঠ্য হিসেবে A- বর্গ থেকে যে-কোনো একটি পঞ্চম সেমেস্টারে এবং B- বর্গ থেকে যে-কোনো একটি ষষ্ঠ সেমেস্টারে নির্বাচন করবে।
- ৬ ক্রেডিট-এর প্রতিটি কোর্সের পূর্ণমান ১০০। এর মধ্যে ১০ নম্বর সংশ্লিষ্ট DSE-র ক্লাসে পড়ুয়ার উপস্থিতির জন্য বরাদ্দ। ১০ নম্বর কোর্সভিত্তিক ধারাবাহিক মূল্যায়ন বা ইন্টারন্যাল অ্যাসেসমেন্ট-এর জন্য এবং ১৫ নম্বর কোর্সভিত্তিক টিউটোরিয়াল-এর জন্য বরাদ্দ। বাকি ৬৫ নম্বরের জন্য বিশ্ববিদ্যালয়ের সংশ্লিষ্ট কর্তৃপক্ষের তত্ত্বাবধানে লিখিত পরীক্ষা নেওয়া হবে। প্রতিটি সেমেস্টারে পনেরো সপ্তাহ করে ক্লাস হবে ধরে নিয়ে Class Hours/Teaching Hours-এর হিসেব দেওয়া হয়েছে।
- ৬৫ নম্বরের লিখিত পরীক্ষায় ১০ নম্বরের তিনটি ব্যাখ্যামূলক, ৫ নম্বরের ৪টি বোধমূলক এবং ১ নম্বরের ১৫টি সংক্ষিপ্ত উত্তরভিত্তিক/তথ্যমূলক প্রশ্নের উত্তর দিতে হবে। নিচের তালিকায় প্রশ্নপত্রের ধারণা পাওয়া যাবে।

প্রশ্ন নং	প্রশ্নের ধরন ও বিকল্প সংক্রান্ত নিয়ম	প্রশ্নের মান
১	মডিউল-১ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
২	মডিউল-২ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
৩	মডিউল-৩ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
৪	মডিউল-১ থেকে একটি বোধমূলক প্রশ্ন। একটি বিকল্প থাকবে।	৫
৫	মডিউল-২ থেকে একটি বোধমূলক প্রশ্ন। একটি বিকল্প থাকবে।	৫
৬	মডিউল-৩ থেকে একটি বোধমূলক প্রশ্ন। একটি বিকল্প থাকবে।	৫
৭	মডিউল-১, মডিউল-২ এবং মডিউল-৩ থেকে একটি করে প্রসঙ্গ/বিষয় নিয়ে টীকা-ধর্মী প্রশ্ন হবে। তিনটির মধ্যে যে-কোনো একটি লিখতে হবে।	৫
৮	প্রত্যেকটি মডিউল থেকে কমপক্ষে **তিনটি** করে প্রশ্ন নিয়ে মোট **পনেরটি** সংক্ষিপ্ত উত্তরভিত্তিক/তথ্যমূলক প্রশ্ন দেওয়া হবে। এক্ষেত্রে কোনো বিকল্প থাকবে না।	১ × ১৫

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বাংলার সমাজ ও সংস্কৃতির ইতিহাস

উদ্দেশ্য : বাংলা ভাষার উদ্ভবের সময়কাল থেকে আধুনিক কাল পর্যন্ত বাঙালি জাতির সাংস্কৃতিক বিকাশের গতিরেখার সঙ্গে শিক্ষার্থীদের পরিচয় ঘটানোই এই কোর্সের উদ্দেশ্য।

মডিউল-১ :

	Class Hours		
	Th	**Tu**	**IA Exam**
বাংলা ও বাঙালি জাতির ভৌগোলিক ও নৃতাত্ত্বিক পরিচয়	২৩	৬	১
বাংলার সমাজ কাঠামো ও অর্থনৈতিক ভিত্তি			
বাংলার রাজনৈতিক ইতিহাস			
বাংলার ধর্ম			
চৈতন্য-সংস্কৃতি			
বাঙালির সাংস্কৃতিক স্বরূপ			

মডিউল-২

ঔপনিবেশিক আধুনিকতার অভিঘাত— শিক্ষায়, ধর্ম সংস্কারে ও মুক্ত চিন্তায়	২৩	৬	১
কৃষক আন্দোলন, নীল বিদ্রোহ, ফকির আন্দোলন			
ধর্ম, সমাজ ও শিক্ষা সংস্কারের উদ্দেশ্যে গঠিত সভা-সমিতি (১৯ শতক)			

মডিউল-৩

বঙ্গভঙ্গ ও বয়কট-স্বদেশী আন্দোলন,	২৩	৬	১
প্রান্তবর্গ/দলিত জনগোষ্ঠীর জাগরণ			
বাঙালি মুসলমানের স্বতন্ত্র জাতিসত্তার সন্ধান			
দেশভাগ, উদ্বাস্তু সমস্যা ও ভাষা আন্দোলন			
খাদ্য আন্দোলন ও নকশাল আন্দোলন			

সহায়ক গ্রন্থ (নির্বাচিত)

- বাঙ্গালীর ইতিহাস— নীহাররঞ্জন রায়
- History of Medieval Bengal — রমেশচন্দ্র মজুমদার
- বাংলা দেশের ইতিহাস— রমেশচন্দ্র মজুমদার
- বাঙ্গালার ইতিহাস (অখণ্ড)— রাখালদাস বন্দ্যোপাধ্যায়
- বাঙ্গালীর সংস্কৃতি— সুনীতিকুমার চট্টোপাধ্যায়
- রামতনু লাহিড়ী ও তৎকালীন বঙ্গসমাজ— শিবনাথ শাস্ত্রী
- বাংলার ইতিহাস— সুভাষ মুখোপাধ্যায়
- সংস্কৃতির বিশ্বরূপ— গোপাল হালদার
- বাঙলা ও বাঙালীর বিবর্তন— অতুল সুর
- সংস্কৃতির রূপান্তর— গোপাল হালদার
- চৈতন্য-প্রসঙ্গ— বঙ্গীয় সাহিত্য পরিষদ প্রকাশিত
- বাংলার কাব্য— হুমায়ুন কবির
- ঔপনিবেশিক বাংলার সমাজ চিত্র— চিত্তব্রত পালিত
- দেশ বিভাগ : পশ্চাৎ ও নেপথ্য কাহিনী— ভবানীপ্রসাদ চট্টোপাধ্যায়
- যুক্ত বাংলার শেষ অধ্যায়— কালীপদ বিশ্বাস
- পলাশি থেকে পার্টিশান— শেখর বন্দ্যোপাধ্যায়
- নীল বিদ্রোহ— পুলক চন্দ্র
- বাঙালির দর্শন— আমিনুল ইসলাম
- স্বাধীন ভারতের সাম্যবাদী আন্দোলন : রাজনীতি ও গতিপ্রকৃতি— শোভনলাল দত্তগুপ্ত
- সাহিত্য সমাজ ইতিহাস— পশ্চিমবঙ্গ ইতিহাস সংসদ প্রকাশিত
- বাংলার রেনেশাঁস— সুশোভন সরকার
- বাংলার নবজাগৃতি— বিনয় ঘোষ
- কলকাতা : ইতিহাসের দিনলিপি— নীরদবরণ হাজরা
- সংস্কৃতির ভাঙা সেতু— আখতারুজ্জামান ইলিয়াস
- শতাব্দীর প্রতিধ্বনি— অতুল সুর
- উত্তাল চল্লিশ : অসমাপ্ত বিপ্লব— অমলেন্দু সেনগুপ্ত
- জোয়ারভাটায় ষাট-সত্তর— অমলেন্দু সেনগুপ্ত
- হাজার বছরের বাঙালির সংস্কৃতি— গোলাম মুরশিদ

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বাংলা গোয়েন্দা সাহিত্য, কল্পবিজ্ঞান আশ্রয়ী রচনা এবং অলৌকিক কাহিনি

উদ্দেশ্য : সাহিত্যের পাঠ এবং আস্বাদনে কিশোরদের অভ্যাস তৈরি হয়ে ওঠে গোয়েন্দা গল্প, কল্পবিজ্ঞানের কাহিনি অথবা ভূতের গল্পের মধ্য দিয়ে। তাদের চেনা ক্ষেত্রকেই পড়ুয়ারা এখানে বিদ্যায়তনিক পাঠ শৃঙ্খলায় অধ্যয়ন করতে শিখবে।

মডিউল-১

	Class Hour		
	Th	**Tu**	**IA Exam**
শজারুর কাঁটা— শরদিন্দু বন্দ্যোপাধ্যায়	২৩	৬	১

মডিউল-২

শঙ্কু সমগ্র (আনন্দ পাব.)— সত্যজিৎ রায় পাঠ্য সমূহ : ব্যোমযাত্রীর ডায়রি, প্রফেসর শঙ্কু ও ম্যাকাও, প্রফেসর শঙ্কু ও গোলক-রহস্য, প্রফেসর শঙ্কু ও রোবু, হিপনোজেন, মহাকাশের দূত, শঙ্কু ও আদিম মানুষ, শঙ্কু ও ফ্র্যাঙ্কেনস্টাইন	২৩	৬	১

মডিউল-৩

সব ভুতুড়ে— লীলা মজুমদার	২৩	৬	১

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ সত্যজিৎ রায়— পশ্চিমবঙ্গ বাংলা আকাদেমি
- ❑ এক দুর্লভ মানিক— অমিত্রসূদন ভট্টাচার্য
- ❑ ক্রাইম কাহিনীর কালক্রান্তি— সুকুমার সেন

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দেশভাগ ও বাংলা সাহিত্য

উদ্দেশ্য : বাঙালি জাতির ইতিহাসে দেশভাগের একটি গভীরমূল এবং সুদূরপ্রসারী অভিঘাত রয়েছে। দেশভাগকে ঘিরে বাঙালির সামূহিক এবং ব্যক্তিক বিপন্নতা, বিপর্যয় এবং অসহায়ত্বের সাক্ষ্যবাহী নির্বাচিত কিছু সাহিত্যকে এখানে পাঠ্য করা হয়েছে।

মডিউল-১ : উপন্যাস

	Class Hours		
	Th	**Tu**	**IA Exam**
নীলকণ্ঠ পাখির খোঁজে— অতীন বন্দ্যোপাধ্যায়	২৩	৬	১

মডিউল-২ : ছোটগল্প

এপার গঙ্গা ওপার গঙ্গা— জ্যোতির্ময়ী দেবী গণনায়ক— সতীনাথ ভাদুড়ী ছেলেমানুষী— মানিক বন্দ্যোপাধ্যায় পালঙ্ক— নরেন্দ্রনাথ মিত্র ড্রেসিং টেবিল— সলিল চৌধুরী করুণকন্যা— রমাপদ চৌধুরী রাজা আসে রাজা যায়— প্রফুল্ল রায় জটায়ু— দীপেন্দ্রনাথ বন্দ্যোপাধ্যায়	২৩	৬	১

মডিউল-৩ : কবিতা

পুব-পশ্চিম— অচিন্ত্যকুমার সেনগুপ্ত খুকু ও খোকা— অন্নদাশঙ্কর রায় ১৫ই আগস্ট ১৯৪৭—দীনেশ দাস জল দাও— বিষ্ণু দে পারাপার— সুভাষ মুখোপাধ্যায় বাংলা, হায় বাংলা— মঙ্গলাচরণ চট্টোপাধ্যায় তোমাকে বলেছিলাম— নীরেন্দ্রনাথ চক্রবর্তী দেশহীন — শঙ্খ ঘোষ ধাত্রী—সুনীল গঙ্গোপাধ্যায় সমরেন্দ্র সেনগুপ্ত —ভাষাদেশ	২৩	৬	১

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ বাংলা ছোটগল্পে দেশবিভাগ— সানজিদা আখতার
- ❑ ভূমিকা (রক্তমণির হারে গ্রন্থ)— দেবেশ রায়
- ❑ ভূমিকা (ভেদ-বিভেদ গ্রন্থ)— মানবেন্দ্র বন্দ্যোপাধ্যায়
- ❑ যুক্তবঙ্গের স্মৃতি— অন্নদাশঙ্কর রায়
- ❑ আমার জন্মভূমি /স্মৃতিময় বাংলাদেশ— ধনঞ্জয় দাশ
- ❑ ভাঙা বাংলা ও বাংলা সাহিত্য— অশ্রুকুমার শিকদার
- ❑ বাংলা উপন্যাসে দেশভাগ ও দেশত্যাগ— তারক সরকার
- ❑ দেশভাগ দেশত্যাগ— সন্দীপ বন্দ্যোপাধ্যায়
- ❑ যুক্ত বাংলার শেষ অধ্যায়— কালীপদ বিশ্বাস
- ❑ দেশ বিভাগ : পশ্চাৎ ও নেপথ্য কাহিনী— ভবানী প্রসাদ চট্টোপাধ্যায়
- ❑ বাংলা মধ্যবিত্তের আত্মবিকাশ— কামরুদ্দিন আহমেদ

- ❑ পূর্ব বাংলার সমাজ ও রাজনীতি— কামরুদ্দিন আহমেদ
- ❑ আমার দেখা রাজনীতির পঞ্চাশ বছর— আবুল মনসুর আহমেদ
- ❑ আমার জীবন ও বিভাগ পূর্ব বাংলার রাজনীতি— আবুল হাসিম
- ❑ কালের পুত্তলিকা— অরুণকুমার মুখোপাধ্যায়
- ❑ দেশভাগ : নির্বাসিতের আখ্যান— তপোধীর ভট্টাচার্য
- ❑ বিষাদবৃক্ষ— মিহির সেনগুপ্ত

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লোকসংস্কৃতি ও লোকসাহিত্য

উদ্দেশ্য : বাঙালি এবং তার সংস্কৃতিকে জানতে গেলে আমাদের লোকসংস্কৃতি ও লোকসাহিত্যের পাঠ নেওয়া খুবই জরুরি। বাংলার সমৃদ্ধ লোক-ঐতিহ্যের থেকে নির্বাচিত কয়েকটি প্রসঙ্গই এখানে পড়ুয়াদের চর্চার জন্য রাখা হচ্ছে।

মডিউল-১

	Class Hour		
	Th	**Tu**	**IA Exam**
লোকসংস্কৃতি ও লোকসাহিত্যের সাধারণ পরিচয়	২৩	৬	১
টাইপ ও মোটিফ ইনডেক্স (বৈশিষ্ট্য ও প্রয়োগ শিক্ষার প্রাথমিক পাঠ)			
বাংলার ব্রত ও পার্বন (বিশেষ পাঠ : পুণ্যিপুকুর, মাঘমন্ডল, সেঁজুতি)			

মডিউল-২

লোকছড়া	২৩	৬	১
লোকনৃত্য (বিশেষ পাঠ : ছৌ, রায়বেশে, গম্ভীরা)			
ধাঁধা			

মডিউল-২

বাংলা প্রবাদ	২৩	৬	১
লোকগান (বিশেষ পাঠ : বাউল, ভাটিয়ালী, ভাওয়াইয়া)			
লোককথা			

সহায়ক গ্রন্থ (নির্বাচিত) :

- ❑ বাংলার ব্রত— অবনীন্দ্রনাথ ঠাকুর
- ❑ বাংলার লোক সাহিত্য— আশুতোষ ভট্টাচার্য
- ❑ লোকসংস্কৃতির সীমানা ও স্বরূপ— পল্লব সেনগুপ্ত
- ❑ ফোকলোর পরিচিতি ও পঠন-পাঠন— মযহারুল ইসলাম
- ❑ বাংলা প্রবাদ— সুশীলকুমার দে
- ❑ বাংলার ধাঁধার ভূমিকা— নির্মলেন্দু ভৌমিক
- ❑ বাংলা ছড়ার ভূমিকা— নির্মলেন্দু ভৌমিক
- ❑ বাংলা লোককথার টাইপ ও মোটিফ ইনডেক্স— দিব্যজ্যোতি মজুমদার
- ❑ লোক সংস্কৃতি পাঠের ভূমিকা— তুষার চট্টোপাধ্যায়
- ❑ বঙ্গীয় লোকসংস্কৃতিকোষ— বরুণ চক্রবর্তী
- ❑ বাংলা লোকসঙ্গীত : ভাটিয়ালি গান— ওয়াকিল আহমেদ
- ❑ বাউল ফকির কথা— সুধীর চক্রবর্তী

Skill Enhancement Course (SEC)– 2 Credits Each

(সাধারণ বাংলা)

- স্নাতক সাধারণ পাঠক্রমের শিক্ষার্থীরা (যারা CC হিসেবে বাংলা গ্রহণ করবে) 'Skill Enhancement Course (SEC)' স্তরে ৪ (২ × ২) ক্রেডিট-এর মোট ২টি কোর্স পড়বে। প্রদত্ত A- বর্গ থেকে যে-কোনো একটি কোর্স তৃতীয় অথবা পঞ্চম সেমেস্টারে এবং B- বর্গ থেকে যে-কোনো একটি কোর্স চতুর্থ অথবা ষষ্ঠ সেমেস্টারে পড়তে হবে। প্রতিটি সেমেস্টারে পনেরো সপ্তাহ করে ক্লাস হবে ধরে নিয়ে Class Hours/Teaching Hours-এর হিসেব দেওয়া হয়েছে।
- ২ ক্রেডিট-এর প্রতিটি কোর্সের পূর্ণমান ১০০। এর মধ্যে ১০ নম্বর সংশ্লিষ্ট SEC-র ক্লাসে পড়ুয়ার উপস্থিতির জন্য এবং ১০ নম্বর কোর্সভিত্তিক ধারাবাহিক মূল্যায়ন বা ইন্টারন্যাল অ্যাসেসমেন্ট-এর জন্য বরাদ্দ। বাকি ৮০ নম্বরের জন্য বিশ্ববিদ্যালয়ের সংশ্লিষ্ট কর্তৃপক্ষের তত্ত্বাবধানে লিখিত পরীক্ষা নেওয়া হবে।
- ৮০ নম্বরের লিখিত পরীক্ষায় ১০ নম্বরের তিনটি ব্যাখ্যামূলক, ৫ নম্বরের ৬টি বোধমূলক এবং ১ নম্বরের ২০টি সংক্ষিপ্ত উত্তরভিত্তিক/তথ্যমূলক প্রশ্নের উত্তর দিতে হবে। নিচের তালিকায় প্রশ্নপত্রের ধারণা পাওয়া যাবে

প্রশ্ন নং	প্রশ্নের ধরন ও বিকল্প ও সংক্রান্ত নিয়ম	প্রশ্নের মান
১	মডিউল-১ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
২	মডিউল-২ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
৩	মডিউল-৩ থেকে একটি ব্যাখ্যামূলক প্রশ্ন। একটি বিকল্প থাকবে।	১০
৪	প্রত্যেকটি মডিউল থেকে কমপক্ষে **একটি** করে প্রশ্ন নিয়ে মোট **আটটি** প্রশ্ন দেওয়া হবে। পরীক্ষার্থীকে যে-কোনো **ছয়টি** প্রশ্নের উত্তর দিতে হবে।	৫ × ৬
৫.	প্রত্যেকটি মডিউল থেকে কমপক্ষে **চারটি** করে প্রশ্ন নিয়ে মোট **কুড়িটি** সংক্ষিপ্ত উত্তরভিত্তিক/তথ্যমূলক প্রশ্ন দেওয়া হবে। এক্ষেত্রে কোনো বিকল্প থাকবে না।	১ × ২০

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মুদ্রণ ও প্রকাশনা

উদ্দেশ্য : বাংলা মুদ্রণ ও প্রকাশনা সংক্রান্ত সাধারণ জ্ঞানার্জন করবে পড়ুয়ারা।

মডিউল-১

	Class Hours	
	Th	**IA Exam**
পাণ্ডুলিপি প্রস্তুতি	১০	১
বাংলা যুক্তাক্ষরের ধারণা		
সংগ্রহ-সম্পাদনা ও সংকলন সম্পর্কে ধারণা		
কভার, টাইটেল পেজ, গ্রন্থ/পত্রিকার পঞ্জিকরণ সংক্রান্ত ধারণা		

মডিউল-২

এম. এস. ওয়ার্ড, পেজ মেকার	১০	১
কোরেল ড্র, ইনডিজাইন		

মডিউল-৩

প্রুফ সংশোধন (দৃষ্টিহীন পড়ুয়াদের জন্য অশুদ্ধি সংশোধন থাকবে)	১০	১
ছাপার প্রযুক্তি, স্টিচিং, বাইন্ডিং, মার্কেটিং সম্পর্কিত সাধারণ ধারণা		

সহায়ক গ্রন্থ (নির্বাচিত)

- যখন ছাপাখানা এলো— শ্রীপান্থ
- দুই শতকের বাংলা মুদ্রণ ও প্রকাশন— চিত্তরঞ্জন বন্দ্যোপাধ্যায় (সম্পাদিত)
- বাংলা পাণ্ডুলিপি পাঠ ও পরিক্রমা— ত্রিপুরা বসু
- মুদ্রণের সংস্কৃতি ও বাংলা বই— স্বপন চক্রবর্তী (সম্পাদিত)
- উনিশ শতকের বাংলা ছাপাখানা— আশিস খাস্তগীর
- গবেষণাপত্র : অনুসন্ধান ও রচনা— জগমোহন মুখোপাধ্যায়
- লেখক ও সম্পাদকের অভিধান— সুভাষ ভট্টাচার্য (সম্পাদিত)
- মাষ্টারিং Micorsoft Office Power Point — বাপ্পি আশরাফ
- ডায়নামিক মেমরি কম্পিউটার কোর্স— দেবেন্দ্র সিং মিনহাস

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ব্যবহারিক বাংলা-১

উদ্দেশ্য : পরবর্তী জীবনে পেশা হিসেবে যে-সব পড়ুয়া নাটক অথবা সিনেমা-সিরিয়ালকে কিংবা আবৃত্তি শিল্পকে গ্রহণ করতে চাইবে, তারা ঐ সব বিষয়ের প্রাথমিক ধ্যানধারণা পাবে এই কোর্স থেকে।

মডিউল-১

	Class Hours	
	Th	**IA Exam**
গল্পসূত্র থেকে কাহিনি নির্মাণ	১০	১
গল্প/উপন্যাস থেকে নাট্যরূপ/ চিত্রনাট্য নির্মাণ		

মডিউল-২

বাংলা ভাষার/শব্দের সঠিক উচ্চারণ	১০	১
ছন্দ সম্পর্কিত জ্ঞান		
আবৃত্তিচর্চা		

মডিউল-৩

সাহিত্য ও চলচ্চিত্র— পারস্পরিক সম্পর্ক	১০	১
বাংলা সাহিত্যের চলচ্চিত্রায়ণ বিশেষ পাঠ : ক্ষুধিত পাষাণ, পথের পাঁচালী, বাড়ি থেকে পালিয়ে		

সহায়ক গ্রন্থ (নির্বাচিত) :

- চলচ্চিত্রের অভিধান— ধীমান দাশগুপ্ত
- বিষয় চলচ্চিত্র— সত্যজিৎ রায়
- বাংলা চলচ্চিত্রের ইতিহাস— নির্মাল্য আচার্য ও দিব্যেন্দু পালিত (সম্পাদিত)
- রবীন্দ্রনাথের সিনেমা সিনেমার রবীন্দ্রনাথ— চণ্ডী মুখোপাধ্যায়
- মৃণাল সেনের ফিল্মযাত্রা— শিলাদিত্য সেন
- কবিতার ক্লাস— নীরেন্দ্রনাথ চক্রবর্তী
- বিষয় আবৃত্তি— অমিয় চট্টোপাধ্যায়, দেবদুলাল বন্দ্যোপাধ্যায়
- বাংলা সিনেমার ইতিকথা : দুই বাংলার চলচ্চিত্র (১৯০৩-২০১৪)— চণ্ডী মুখোপাধ্যায়
- চলচ্চিত্র : চিন্তাবীজ রবের ব্রেসঁ (ভাষান্তর : সন্দীপন ভট্টাচার্য)
- চলচ্চিত্র মানুষ এবং আরো কিছু— ঋত্বিককুমার ঘটক
- সিনেমার ইতিবৃত্তান্ত— পার্থ রাহা
- বাংলা বলো— পবিত্র সরকার
- কি লিখি কেন লিখি— নীরেন্দ্রনাথ চক্রবর্তী

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ব্যবহারিক বাংলা ও সাহিত্য গবেষণার পদ্ধতিবিজ্ঞান

উদ্দেশ্য : শিক্ষার্থীদের জীবনের নানা প্রয়োজনকে সুষ্ঠভাবে এবং নিয়মমাফিক সমাধা করতে সহায়তা করবে এই কোর্সটি।

মডিউল-১

	Class Hours	
	Th	**IA Exam**
সংবাদপত্রে অথবা ব্যক্তিগতভাবে প্রচারের লক্ষ্যে প্রতিবেদন রচনা	১০	১
চিঠিপত্র রচনা—বিভিন্ন প্রকার সহ		
কাল্পনিক সাক্ষাৎকার রচনা		

মডিউল-২

ছাপা মাধ্যম এবং বৈদ্যুতিন মাধ্যমের জন্য বিজ্ঞাপন রচনা	১০	১
অনুবাদের ভাষা ও শৈলী		
ইংরেজি থেকে বাংলা অনুবাদ		

মডিউল-৩

গবেষণার রীতি ও নির্মাণ পদ্ধতি, গবেষণার আদর্শ বিন্যাসক্রম	১০	১
তথ্য সংগ্রহ, উদ্ধৃতির প্রয়োগ, কপিরাইট আইন		
পাদটীকা/প্রান্তটীকা/সূত্র নির্দেশ, গ্রন্থপঞ্জি ও নির্ঘন্ট প্রণয়ন বিধি		

সহায়ক গ্রন্থ (নির্বাচিত)

- গণজ্ঞাপন : তত্ত্ব ও প্রয়োগে— পার্থ চট্টোপাধ্যায়
- সেকাল একালের সংবাদ পরিবেশনের ধারা ও বিচিত্র সংবাদ— বৈদ্যনাথ বন্দ্যোপাধ্যায়
- গবেষণাপত্র : অনুসন্ধান ও রচনা— জগমোহন মুখোপাধ্যায়

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ব্যবহারিক বাংলা-২

উদ্দেশ্য : যে-সব সাহিত্যরূপ পড়ুয়ারা পড়ছে/পড়েছে তা কীভাবে তৈরি হয়ে ওঠে, তার কলাকৌশলগুলি সম্পর্কে এখানে হাতে কলমে তাদের ধারণা দেওয়া হবে। তার সঙ্গে বানান এবং IPA ও রোমীয় লিপি সংক্রান্ত ব্যবহারিক জ্ঞানও দিতে চাওয়া হয়েছে এই কোর্সে।

মডিউল-১ : সৃজনশীল রচনা

	Class Hours	
	Th	**IA Exam**
গল্প রচনা (সামাজিক/পারিবারিক/ব্যক্তিক কোনো প্রসঙ্গ/বিষয় অবলম্বনে কমবেশি ৩০০ শব্দে গল্প লিখতে দেওয়া হবে)	১০	১
প্রবন্ধ রচনা (সামাজিক/পারিবারিক/ব্যক্তিক অথবা সাহিত্য বিষয়ক কোনো প্রসঙ্গ/বিষয় অবলম্বনে কমবেশি ৩০০ শব্দে প্রবন্ধ লিখতে দেওয়া হবে)		

মডিউল-২

বাংলা বানানের বিবর্তন সম্পর্কে সাধারণ ধারণা	১০	১
পশ্চিমবঙ্গ বাংলা আকাদেমির বানান বিধি		

মডিউল-৩

আন্তর্জাতিক ধ্বনিমূলক বর্ণমালা (IPA)	১০	১
রোমীয় লিপি		

সহায়ক গ্রন্থ (নির্বাচিত)

- ❑ সাধারণ ভাষাবিজ্ঞান ও বাংলাভাষা— রামেশ্বর শ'
- ❑ কি লিখি কেন লিখি— নীরেন্দ্রনাথ চক্রবর্তী
- ❑ বাংলা বানান বিধি— পরেশচন্দ্র মজুমদার
- ❑ বাংলা বানান সংস্কার, সমস্যা ও সম্ভাবনা— পবিত্র সরকার

কলিকাতা বিশ্ববিদ্যালয়

২০১৮

স্নাতক পাঠক্রম

(কলা, বিজ্ঞান ও বাণিজ্যসহ সমস্ত বিভাগের পড়ুয়াদের জন্য)

Ability Enhancement Compulsory Course (AECC-1) MIL (Bengali)

ইউ.জি.সি নির্দেশিত সিবিসিএস অনুসারে

(উত্তর লেখার ক্ষেত্রে পরীক্ষার্থীদের পশ্চিমবঙ্গ বাংলা আকাদেমি-র বানানবিধি অনুসরণ করতে হবে)

AECC-1 [MIL (Bengali)]–2 Credits

BNG-AECC-1-1-TH

- স্নাতক কলা, বাণিজ্য, বিজ্ঞান বিভাগের যে-সমস্ত পড়ুয়া AECC-1 স্তরে MIL হিসেবে বাংলা বিকল্পটি গ্রহণ করবে তাদের জন্য প্রথম সেমেস্টারে ২ ক্রেডিটের এই কোর্সটি পাঠ্য।
- সেমেস্টারে মোট পনেরো সপ্তাহ ক্লাস হবে ধরে নিয়ে Class Hour/Teaching Hours-এর হিসেব দেওয়া হয়েছে।
- এই কোর্সটি ১০০ নম্বরের। এর মধ্যে ১০ নম্বর সংশ্লিষ্ট ক্লাসে পড়ুয়ার উপস্থিতির জন্য এবং ১০ নম্বর কোর্সভিত্তিক আভ্যন্তর মূল্যায়নের জন্য বরাদ্দ থাকবে।
- অবশিষ্ট ৮০ নম্বরের জন্য বিশ্ববিদ্যালয়ের সংশ্লিষ্ট দপ্তর পরীক্ষা নেবে। **৪টি মডিউল থেকে ১০টি করে ২ নম্বরের মোট ৪০টি MCQ ধর্মী প্রশ্ন হবে।**

মডিউল-১ : প্রবন্ধ (কলিকাতা বিশ্ববিদ্যালয় প্রকাশিত *ভাষাপাঠ সঞ্চয়ন-এ সংকলিত*)

	Class Hours
পাঠ্য প্রবন্ধ : স্বদেশী সমাজ— রবীন্দ্রনাথ ঠাকুর বাঙ্গালা ভাষা— স্বামী বিবেকানন্দ স্ত্রী জাতির অবনতি— বেগম রোকেয়া অপবিজ্ঞান— রাজশেখর বসু	৯

মডিউল-২ : ছোটগল্প (কলিকাতা বিশ্ববিদ্যালয় প্রকাশিত *ভাষাপাঠ সঞ্চয়ন-এ সংকলিত*)

পাঠ্যগল্প : রবীন্দ্রনাথ ঠাকুর লিখিত পোস্টমাস্টার, ছুটি, জীবিত ও মৃত এবং বলাই	৯

মডিউল-৩ : কবিতা (কলিকাতা বিশ্ববিদ্যালয় প্রকাশিত *ভাষাপাঠ সঞ্চয়ন-এ সংকলিত*)

নৈবেদ্য— রবীন্দ্রনাথ ঠাকুর পাঠ্য : বৈরাগ্য সাধনে মুক্তি সে আমার নয় (৩০), শতাব্দীর সূর্য আজি রক্ত মেঘ-মাঝে (৬৪), স্বার্থের সমাপ্তি অপঘাতে (৬৫), তোমার ন্যায়ের দণ্ড প্রত্যেকের করে (৭০), চিত্ত যেথা ভয় শূন্য উচ্চ যেথা শির (৭২), শক্তিদম্ভ স্বার্থলোভ মারীর মতন (৯২)	৬

মডিউল-৪ : পরিভাষা

কলিকাতা বিশ্ববিদ্যালয় প্রকাশিত ভাষাপাঠ সঞ্চয়ন-এ নির্ধারিত ২৫০টি পরিভাষা	৬

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 83 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 30.07.2018 (vide Item No.08) approved some amendments in the syllabus of three-year B.A. (Honours) course of study in English under Choice Base Credit System (CBCS), (as notified in Notification No.CSR/12/18 dated 04.06.2018), under this University, as laid down in the accompanying pamphlet.

The above shall be effective from the academic session 2018-2019.

29/08/18

(Debabrata Manna)
Deputy Registrar (Acting)

SENATE HOUSE
KOLKATA-700073
The 29th August, 2018

CORRIGENDUM

The following is the corrigendum to the Syllabus of English (Hons) under CBCS introduced from 2018-19 vide CSR/12/18 dated 4 June 2018:

Name of the Course	What is Written	Should be Read As
CC2	(i) End Semester Question Pattern: Objective – 5 marks (from Group B and Group C) Two questions of 15 marks (one from each text) from Group B (out of four, two from each text) Two questions of 15 marks (one from each text) from Group B (out of four, two from each text) (ii) Ovid, Selections from *Metamorphosis*, 'Bacchus' (Book III)	(i) End Semester Question Pattern: Objective – 5 marks (from Group B and Group C) Two questions of 15 marks (one from each text) from Group B (out of four, two from each text) Two questions of 15 marks (one from each text) from Group C (out of four, two from each text) (ii) Ovid, Selections from *Metamorphoses*, 'Bacchus' (Book III)
CC7	End Semester Question Pattern: Objective – 5 marks Two questions of 15 marks each (one from each) from poetry (out of four, two from each) Two questions of 15 marks each (one from each) from poetry (out of four, two from each)	End Semester Question Pattern: Objective – 5 marks Two questions of 15 marks each (one from each) from poetry (out of four, two from each) Two questions of 15 marks each (one from each) from drama (out of four, two from each)
DSE-A4	End Semester Question Pattern: Questions on Mass Communication (Theory) – 20 marks Report /Pamphlet Writing – 20 marks Advertisement / Poster Writing – 15 marks Pamphlet Writing – 10 marks	End Semester Question Pattern: Questions on Mass Communication (Theory) – 20 marks Report Writing – 20 marks Advertisement / Poster Writing – 15 marks Pamphlet Writing – 10 marks
DSE-B1	In Suggested Readings: Allerdyce Nicoll, *The Theory of Drama*	In Suggested Readings: Allardyce Nicoll, *The Theory of Drama*

For DSE-B1, an addition to Suggested Readings: M.H. Abrams & G.G. Harpham, *A Glossary of Literary Terms*

For CC6, an addition to Suggested Readings: Sukumar Ray, *Abol Tabol* ('The Select Nonsense of Sukumar Ray', translated Sukanta Chaudhuri, OUP, 1997)

Note: The specific editions suggested / recommended in the syllabus are only indicative and students may use any other standard edition(s).

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

UNIVERSITY OF CALCUTTA
CBCS SYLLABUS FOR UG ENGLISH (HONS)

CORE COURSES (CC) – 14 COURSES, 6 CREDITS PER COURSE
DISCIPLINE SPECIFIC ELECTIVE (DSE) –4 COURSES (out of 8), 6 CREDITS PER COURSE
ABILITY ENHANCEMENT COMPULSORY COURSE (AECC) – 2 COURSES, 2 CREDITS PER COURSE
SKILL ENHANCEMENT COURSE (SEC) – 2 COURSES (out of 4), 2 CREDITS PER COURSE

COURSE NAMES:

CC1 – HISTORY OF LITERATURE AND PHILOLOGY
CC2 –EUROPEAN CLASSICAL LITERATURE
CC3 –INDIAN WRITING IN ENGLISH
CC4 –BRITISH POETRY AND DRAMA (14TH – 17TH CENTURY)
CC5 –AMERICAN LITERATURE
CC6 –POPULAR LITERATURE
CC7 –BRITISH POETRY AND DRAMA (17TH – 18TH CENTURY)
CC8 –BRITISH LITERATURE (18TH CENTURY)
CC9 –BRITISH ROMANTIC LITERATURE
CC10 –19TH CENTURY BRITISH LITERATURE
CC11 – WOMEN'S WRITING
CC12 – EARLY 20TH CENTURY BRITISH LITERATURE
CC13 –MODERN EUROPEAN DRAMA
CC14 –POSTCOLONIAL LITERATURE

DSE (ANY TWO FROM DSE-A AND ANY TWO FROM DSE-B)
DSE-A1 –MODERN INDIAN WRITING IN ENGLISH TRANSLATION
DSE-A2 –LITERARY THEORY AND LITERARY CRITICISM
DSE-A3–PARTITION LITERATURE
DSE-A4 –MEDIA AND COMMUNICATION STUDIES
DSE-B1– LITERARY TYPES, RHETORIC AND PROSODY
DSE-B2–CONTEMPORARY INDIA: WOMEN AND EMPOWERMENT
DSE-B3–AUTOBIOGRAPHY
DSE-B4 – TEXT AND PERFORMANCES

AECC1 – COMMUNICATIVE ENGLISH OR MIL
AECC2 – ENVIRONMENT STUDY

SEC (ANY ONE FROM SEC-A AND ANY ONE FROM SEC-B)
SEC-A1 – TRANSLATION STUDIES
SEC-A2 –BUSINESS COMMUNICATION
SEC-B1 – CREATIVE WRITING
SEC-B2 - ACADEMIC WRITING AND COMPOSITION

COURSE STRUCTURE

SEMESTER 1: CC1, CC2, AECC1 (Communicative English/MIL), GE1 (FROM OTHER SUBJECT)

SEMESTER 2: CC3, CC4, AECC2 (ENVS), GE2 (FROM OTHER SUBJECT)

SEMESTER 3: CC5, CC6, CC7, SEC-A, GE3 (FROM OTHER SUBJECT)

SEMESTER 4: CC8, CC9, CC10,SEC-B, GE4 (FROM OTHER SUBJECT)

SEMESTER 5: CC11, CC12, DSE-A(1 or 2), DSE-B(1 or 2)

SEMESTER 6: CC13, CC14, DSE-A(3 or 4), DSE-B(3 or 4)

COURSE DETAILS

FOR ALL 14 CORE COURSES, THE MARKS DIVISION IS AS FOLLOWS:

End Semester – 65
Tutorial – 15
Internal – 10
Attendance – 10

CC1 (SEMESTER 1, CODE –ENG-A-CC-1-1-TH/TU)
HISTORY OF LITERATURE AND PHILOLOGY - 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Group A: History of Literature

Section 1:

Unit A –Old English Heroic Poetry, Old English Prose and Chaucer
Unit B – Elizabethan Sonnets, University Wits and Ben Jonson
Unit C–Restoration Comedy of Manners and Eighteenth Century Novels

Section 2:

Unit D – Pre-Romantic Poetry and Romantic Non-fiction Prose
Unit E–Victorian Novel and the Pre-Raphaelites
Unit F–Modern Novel: Joseph Conrad, Virginia Woolf, James Joyce
Modern Poetry: T.S. Eliot, W.B. Yeats, Dylan Thomas
Modern Drama: Samuel Beckett, Harold Pinter, John Osborne

End Semester Question Pattern:

Objective 5 marks from Section 1
One question of 10 marks from Section 1 (out of 3, 1 from each unit)
One question of 5 marks from Section 1 (out of 3, 1 from each unit)
Objective 5 marks from Section 2
One question of 10 marks from Section 2 (out of 3, 1 from each unit)
One question of 5 marks from Section 2 (out of 3, 1 from each unit)

Suggested Readings:

1. Andrew Sanders: *The Short Oxford History of English Literature*
2. Edward Albert: *History of English Literature*
3. Michael Alexander: *A History of English Literature*
4. G.M. Trevelyan: *English Social History*
5. Bibhash Choudhury: *English Social and Cultural History*

Group B: Philology

Section 1: Latin Influence, Scandinavian Influence, French Influence, Americanism
Section 2: Consonant Shift and Word Formation Processes (Shortening, Back-formation, Derivations), Short Notes (Hybridism, Monosyllabism, Free & Fixed Compounds, Malapropism, ing-formation, Johnsonese)

End Semester Question Pattern:

One question of 10 marks from Section 1 (out of three)
One question of 10 marks out of two, and one question of 5 marks out of two from Section 2

Suggested Readings:

1. Otto Jespersen: *Growth and Structure of the English Language* (Chapters 4, 5, 6, 8, 10)
2. C.L. Wren: *The English Language* (Chapters 6 & 7)
3. A.C. Baugh: *A History of English Language*
4. C.L. Barber: *The Story of Language*

CC2 (SEMESTER 1, CODE – ENG-A-CC-1-2-TH/TU)
EUROPEAN CLASSICAL LITERATURE: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Group A: Social and intellectual background

Group B:

Homer, *The Iliad* (Books I and II) translated byE.V. Rieu
Sophocles, *Oedipus the King*, in *The Three Theban Plays*, translated by Robert Fagles

Group C:

Ovid, Selections from *Metamorphosis*, 'Bacchus' (Book III)
Plautus, *Pot of Gold*, translated byE.F. Watling OR
Horace, *Satires*, I: IV in Horace: Satires and Epistles and Persius, translated Niall Rudd, Penguin, 2005.

End Semester Question Pattern:

Objective – 5 marks (from Group B and Group C)
Two questions of 15 marks (one from each text) from Group B (out of four, two from each text)
Two questions of 15 marks (one from each text) from Group B (out of four, two from each text)

Suggested Readings:

1. S.H. Butcher, *Aristotle's Theory of Poetry and Fine Art*, New Delhi: Kalyani Publishers
2. *Aristotle/Horace/Longinus: Classical Literary Criticism*, Translated with an Introduction by T.S. Dorsch, London: Penguin Books

CC3 (SEMESTER 2, CODE – ENG-A-CC-2-3-TH/TU)
INDIAN WRITING IN ENGLISH: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Poetry

Henry Louis Vivian Derozio, 'To India, My Native Land'
Toru Dutt, 'Our Casuarina Tree'
Kamala Das, 'Introduction'
A.K. Ramanujan, 'River'
Nissim Ezekiel, 'Enterprise'
JayantaMahapatra, 'Dawn at Puri'

Novel

Bankimchandra Chattopadhyay: *Rajmohan's Wife*

Drama

Mahesh Dattani, *Bravely Fought the Queen*

End Semester Question Pattern:

Objective – 5 marks
Two questions of 15 marks each from poetry (out of four)

One question of 15 marks from novel (out of two)
One question of 15 marks from drama (out of two)

Suggested Readings:

1. Raja Rao, Foreword to *Kanthapura* (New Delhi: OUP, 1989) pp. v–vi.
2. Salman Rushdie, 'Commonwealth Literature does not exist', in *Imaginary Homelands* (London: Granta Books, 1991) pp. 61–70.
3. Meenakshi Mukherjee, 'Divided by a Common Language', in *The Perishable Empire* (New Delhi: OUP, 2000) pp.187–203.
4. Bruce King, 'Introduction', in Modern Indian Poetry in English (New Delhi: OUP, 2nd edn, 2005) pp. 1–10
5. Arvind Krishna Mehrotra, *A Concise History of Indian Writing in English*, Ranikhet: Permanent Black

CC4 (SEMESTER 2, CODE – ENG-A-CC-2-4-TH/TU)
BRITISH POETRY AND DRAMA (14TH – 17TH CENTURY): 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Social and Intellectual Background

Poetry

Geoffrey Chaucer, 'Wife of Bath's Prologue'
Edmund Spenser, 'One Day I Wrote Her Name'
William Shakespeare, Sonnets 18 & 130
John Donne, 'The Good Morrow'
Andrew Marvell, 'To His Coy Mistress'

Drama

Christopher Marlowe, *Edward II* OR William Shakespeare, *Macbeth*
William Shakespeare, *Twelfth Night* OR *As You Like It*

End Semester Question Pattern:

Objective – 5 marks
Two questions of 15 marks each from poetry (out of three)
Two questions of 15 marks each (one from each) from drama (out of four, two from each)

Suggested Readings:

1. Pico Della Mirandola, excerpts from the Oration on the Dignity of Man, in *The Portable Renaissance Reader*, ed. James Bruce Ross and Mary Martin McLaughlin (New York: Penguin Books, 1953) pp. 476–9.
2. John Calvin, 'Predestination and Free Will', in *The Portable Renaissance Reader*, ed. James Bruce Ross and Mary Martin McLaughlin (New York: Penguin Books, 1953) pp. 704–11.
3. Baldassare Castiglione, 'Longing for Beauty' and 'Invocation of Love', in Book 4 of *The Courtier*, 'Love and Beauty', tr. George Bull (Harmondsworth: Penguin, rpt. 1983) pp. 324–8, 330–5.

4. Philip Sidney, *An Apology for Poetry*, in D.J. Enright and Ernst D. Chickera eds. *English Critical Texts*, Delhi: OUP

CC5 (SEMESTER 3, CODE – ENG-A-CC-3-5-TH/TU)
AMERICAN LITERATURE: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Poetry

Robert Frost, 'After Apple Picking'
Walt Whitman, 'O Captain, My Captain'
Sylvia Plath, 'Daddy'
Langston Hughes, 'Harlem to be Answered'
Edgar Allan Poe, 'To Helen'

Novel

Ernest Hemingway, *The Old Man and the Sea*

Stories

Edgar Allan Poe, 'The Purloined Letter'
F. Scott Fitzgerald, 'The Crack-up'
William Faulkner, 'Dry September'

Drama

Arthur Miller, *Death of A Salesman*

End Semester Question Pattern:

Objective – 5 marks
One question of 15 marks from poetry (out of three)
One question of 15 marks from novel (out of two)
One question of 15 marks from stories (out of two)
One question of 15 marks from drama (out of two)

Suggested Readings:

1. Hector St John Crevecouer, 'What is an American', (Letter III) in *Letters from an American Farmer* (Harmondsworth: Penguin, 1982) pp. 66–105.
2. Frederick Douglass, *A Narrative of the life of Frederick Douglass* (Harmondsworth: Penguin, 1982) chaps. 1–7, pp. 47–87.
3. Henry David Thoreau, 'Battle of the Ants' excerpt from 'Brute Neighbours', in Walden (Oxford: OUP, 1997) chap. 12.
4. Ralph Waldo Emerson,'Self Reliance', in *The Selected Writings of Ralph Waldo Emerson*, ed. with a biographical introduction by Brooks Atkinson (New York: The Modern Library, 1964).
5. Toni Morrison, 'Romancing the Shadow', in *Playing in the Dark: Whiteness and Literary Imagination* (London: Picador, 1993) pp. 29–39.

CC6 (SEMESTER 3, CODE – ENG-A-CC-3-6-TH/TU)
POPULAR LITERATURE: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Lewis Carroll, *Through the Looking Glass*
Agatha Christie, *The Murder of Roger Ackroyd*
Sukumar Ray, *Abol Tabol* ('Nonsense Rhymes', translated Satyajit Ray), Kolkata: Writers' Workshop
Herge, *Tintin in Tibet*

End Semester Question Pattern:
Objective – 5 marks
One question of 15 marks from each of the four texts (out of two from each text)

Suggested Readings:

1. Chelva Kanaganayakam, 'Dancing in the Rarefied Air: Reading Contemporary Sri Lankan Literature' (ARIEL, Jan. 1998) rpt, Malashri Lal, Alamgir Hashmi, and Victor J. Ramraj, eds., *Post Independence Voices in South Asian Writings* (Delhi: Doaba Publications, 2001) pp. 51–65.
2. Sumathi Ramaswamy, 'Introduction', in *Beyond Appearances?: Visual Practices and Ideologies in Modern India* (Sage: Delhi, 2003) pp. xiii–xxix.
3. Leslie Fiedler, 'Towards a Definition of Popular Literature', in *Super Culture: American Popular Culture and Europe*, ed. C.W.E. Bigsby (Ohio: Bowling Green University Press, 1975) pp. 29–38.
4. Felicity Hughes, 'Children's Literature: Theory and Practice', *English Literary History*, vol. 45, 1978, pp. 542–61.

CC7 (SEMESTER 3, CODE – ENG-A-CC-3-7-TH/TU)
BRITISH POETRY AND DRAMA (17TH – 18TH CENTURY): 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Social and Intellectual Background

Poetry

John Milton, *Paradise Lost*, Book I
Alexander Pope, *The Rape of the Lock*, Cantos I-III

Drama

John Webster, *The Duchess of Malfi*
Aphra Behn, *The Rover*

End Semester Question Pattern:
Objective – 5 marks
Two questions of 15 marks each (one from each) from poetry (out of four, two from each)

Two questions of 15 marks each (one from each) from poetry (out of four, two from each)

Suggested Readings:

1. The Holy Bible, Genesis, chaps. 1–4, The Gospel according to St. Luke, chaps. 1–7 and 22–4.
2. Niccolo Machiavelli, *The Prince*, ed. and tr. Robert M. Adams (New York: Norton, 1992) chaps. 15, 16, 18, and 25.
3. Thomas Hobbes, selections from *The Leviathan*, pt. I (New York: Norton, 2006) chaps. 8, 11, and 13.
4. John Dryden, 'A Discourse Concerning the Origin and Progress of Satire', in *The Norton Anthology of English Literature*, vol. 1, 9th edn, ed. Stephen Greenblatt (New York: Norton 2012) pp. 1767–8.

CC8 (SEMESTER 4, CODE – ENG-A-CC-4-8-TH/TU)
18TH CENTURY BRITISH LITERATURE: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Social and Intellectual Background

Poetry

Samuel Johnson, 'London'
Thomas Gray, *Elegy Written in a Country Churchyard*

Drama

William Congreve, *The Way of the World*

Prose (Fiction & Non-Fiction)

Daniel Defoe, *Robinson Crusoe*
Joseph Addison, 'Sir Roger at Home' and 'Sir Roger at Church'

End Semester Question Pattern:

Objective – 5 marks
One question of 15 marks from poetry (out of two)
One question of 15 marks from drama (out of two)
Two questions of 15 marks each (one from each) from prose (out of four, two from each)

Suggested Readings:

1. Jeremy Collier, *A Short View of the Immorality and Profaneness of the English Stage* (London: Routledge, 1996).
2. Daniel Defoe, 'The Complete English Tradesman' (Letter XXII), 'The Great Law of Subordination Considered' (Letter IV), and 'The Complete English Gentleman', in *Literature and Social Order in Eighteenth-Century England*, ed. Stephen Copley (London: Croom Helm, 1984).

3. Samuel Johnson, 'Essay 156', in *The Rambler*, in *Selected Writings: Samuel Johnson*, ed. Peter Martin (Cambridge, Mass.: Harvard University Press, 2009) pp. 194–7; *Rasselas* Chapter 10; 'Pope's Intellectual Character: Pope and Dryden Compared', from *The Life of Pope*, in *The Norton Anthology of English Literature*, vol. 1, ed. Stephen Greenblatt, 8th edn (New York: Norton, 2006) pp. 2693–4, 2774–7.

CC9 (SEMESTER 4, CODE – ENG-A-CC-4-9-TH/TU)
BRITISH ROMANTIC LITERATURE: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Social and Intellectual Background

Poetry

William Blake, 'The Lamb' and 'The Tyger'
William Wordsworth, 'Tintern Abbey'
Samuel Taylor Coleridge, 'Kubla Khan'
Percy Bysshe Shelley, 'Ode to the West Wind' and 'To a Skylark'
John Keats, 'Ode to a Nightingale' and 'Ode to Autumn'

Prose (Fiction & Non-Fiction)

Charles Lamb, 'Dream Children', 'The Superannuated Man'
Mary Shelley, *Frankenstein*

End Semester Question Pattern:

Objective – 5 marks
2 questions of 15 marks each from poetry (out of four)
2 questions of 15 marks each (one from each) from prose (out of four, two from each)

Suggested Readings:

1. William Wordsworth, 'Preface to Lyrical Ballads', in D.J. Enright and Ernst D. Chickera eds. *English Critical Texts*, Delhi: OUP
2. John Keats, 'From the Letters', in D.J. Enright and Ernst D. Chickera eds. *English Critical Texts*, Delhi: OUP
3. Jean-Jacques Rousseau, 'Preface' to *Emile or Education*, tr. Allan Bloom (Harmondsworth: Penguin, 1991).
4. Samuel Taylor Coleridge, *BiographiaLiteraria*, Chapters XIV and XVII, in D.J. Enright and Ernst D. Chickera eds. *English Critical Texts*, Delhi: OUP

CC10 (SEMESTER 4, CODE – ENG-A-CC-4-10-TH/TU)
19TH CENTURY BRITISH LITERATURE: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Social and Intellectual Background

Poetry

Lord Tennyson, 'Ulysses'
Robert Browning, 'My Last Duchess'
Christina Rossetti, 'The Goblin Market'
Matthew Arnold, 'Dover Beach'

Novel

Jane Austen, *Pride and Prejudice* OR Charlotte Bronte, *Jane Eyre*
Charles Dickens, *Oliver Twist* OR Thomas Hardy, *The Mayor of Casterbridge*

End Semester Question Pattern:

Objective – 5 marks
Two questions of 15marks each from poetry (out of three)
Two questions of 15 marks each (one from each) from novels (out of four, two from each)

Suggested Readings:

1. Karl Marx and Friedrich Engels, 'Mode of Production: The Basis of Social Life', 'The Social Nature of Consciousness', and 'Classes and Ideology', in *A Reader in Marxist Philosophy*, ed. Howard Selsam and Harry Martel (New York: International Publishers,1963) pp. 186–8, 190–1, 199–201.
2. Charles Darwin, 'Natural Selection and Sexual Selection', in *The Descent of Man* in The Norton Anthology of English Literature, 8th edn, vol. 2, ed. Stephen Greenblatt (New York: Northon, 2006) pp. 1545–9.
3. John Stuart Mill, 'The Subjection of Women' in *Norton Anthology of English Literature*, 8th edn, vol. 2, ed. Stephen Greenblatt (New York: Norton, 2006) chap. 1, pp. 1061–9.

CC11 (SEMESTER 5, CODE – ENG-A-CC-5-11-TH/TU)
WOMEN'S WRITINGS: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Poetry

Emily Dickinson, 'I cannot live with you'
Elizabeth Barrett Browning, 'How do I love thee'
Eunice De Souza, 'Advice to Women'

Fiction

Alice Walker, *Color Purple* OR Emily Bronte, *Wuthering Heights*
Mahasweta Devi, 'Draupadi', translated Gayatri Chakravorty Spivak
Katherine Mansfield, 'Bliss'

Non-Fiction

Mary Wollstonecraft, *A Vindication of the Rights of Woman*, Chapters I & II (New York: Norton, 1988)

Rassundari Devi, *Amar Jiban*, translated Enakshi Chatterjee, Writers' Workshop.

End Semester Question Pattern:

Objective – 5 marks
One question of 15 marks from poetry (out of two)
Two questions of 15 marks each from fiction (out of three, one from each)
One question of 15 marks from non-fiction (out of two, one from each)

Suggested Readings:

1. Virginia Woolf, *A Room of One's Own* (New York: Harcourt, 1957) chaps. 1 and 6.
2. Simone de Beauvoir, 'Introduction', in *The Second Sex*, tr. Constance Borde and Shiela Malovany-Chevallier (London: Vintage, 2010) pp. 3–18.
3. Kumkum Sangari and Sudesh Vaid, eds., 'Introduction', in *Recasting Women: Essays in Colonial History* (New Delhi: Kali for Women, 1989) pp. 1–25.
4. Chandra Talapade Mohanty,'Under Western Eyes: Feminist Scholarship and Colonial Discourses', in *Contemporary Postcolonial Theory: A Reader*, ed. Padmini Mongia (New York: Arnold, 1996) pp. 172–97
5. 'Feminist Criticism' in Peter Barry, *Beginning Theory*, Chennai: T.R. Publications

CC12 (SEMESTER 5, CODE – ENG-A-CC-5-12-TH/TU)
EARLY 20TH CENTURY BRITISH LITERATURE: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Social and Intellectual Background

Poetry

T.S. Eliot, 'The Love Song of J. Alfred Prufrock' and 'Preludes'
W.B. Yeats, 'The Second Coming' and 'No Second Troy'
Wilfred Owen, 'Spring Offensive'

Fiction

Joseph Conrad, *Heart of Darkness*
D.H. Lawrence, *Sons and Lovers*

Drama

George Bernard Shaw, *Pygmalion*

End Semester Question Pattern:

Objective – 5 marks
One question of 15 marks from poetry (out of two)
Two questions of 15 marks each (one from each) from fiction (out of four, two from each)

One question of 15 marks from drama (out of two)

Suggested Readings:

1. Sigmund Freud, 'Theory of Dreams', 'Oedipus Complex', and 'The Structure of the Unconscious', in *The Modern Tradition*, ed. Richard Ellman et. al. (Oxford: OUP, 1965) pp. 571, 578–80, 559–63.
2. T.S. Eliot, 'Tradition and the Individual Talent', in D.J. Enright and Ernst D. Chickera eds. *English Critical Texts*, Delhi: OUP
3. Raymond Williams, 'Introduction', in *The English Novel from Dickens to Lawrence* (London: Hogarth Press, 1984) pp. 9–27.
4. Raymond Williams, 'Introduction', in *Drama from Ibsen to Brecht*, Penguin, 1973

CC13 (SEMESTER 6, CODE – ENG-A-CC-6-13-TH/TU)
MODERN EUROPEAN DRAMA: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Henrik Ibsen, *Ghosts* OR *A Doll's House*
Bertolt Brecht, *The Good Woman of Szechuan*
Samuel Beckett, *Waiting for Godot*

End Semester Question Pattern:
Objective – 5 marks
One question of 20 marks out of two from each of the three plays

Suggested Readings:

1. Constantin Stanislavski, *An Actor Prepares*, chap. 8, 'Faith and the Sense of Truth', tr. Elizabeth Reynolds Hapgood (Harmondsworth: Penguin, 1967) sections 1, 2, 7, 8, 9, pp. 121–5, 137–46.
2. Bertolt Brecht, 'The Street Scene', 'Theatre for Pleasure or Theatre for Instruction', and 'Dramatic Theatre vs Epic Theatre', in *Brecht on Theatre: The Development of an Aesthetic*, ed. and tr. John Willet (London: Methuen, 1992) pp. 68–76, 121–8.
3. George Steiner, 'On Modern Tragedy', in *The Death of Tragedy* (London: Faber, 1995) pp. 303–24.

CC14 (SEMESTER 6, CODE – ENG-A-CC-6-14-TH/TU)
POSTCOLONIAL LITERATURES: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

<u>Poetry</u>

Pablo Neruda, 'Tonight I Can Write'
Derek Walcott, 'A Far Cry from Africa'
David Malouf, 'Revolving Days'

Mamang Dai, 'The Voice of the Mountain'

Novel

Chinua Achebe, *Things Fall Apart*
Gabriel Garcia Marquez, *Chronicle of a Death Foretold*

End Semester Question Pattern:

Objective – 5 marks
Two questions of 15 marks each from poetry (out of three)
Two questions of 15 marks each (one from each) from novel (out of four, two from each)

Suggested Readings:

1. Frantz Fanon, 'The Negro and Language', in *Black Skin, White Masks*, tr. Charles Lam Markmann (London: Pluto Press, 2008) pp. 8–27.
2. Ngugiwa Thiong'o, 'The Language of African Literature', in *Decolonising the Mind* (London: James Curry, 1986) chap. 1, sections 4–6.
3. Gabriel Garcia Marquez, the Nobel Prize Acceptance Speech, in *Gabriel Garcia Marquez: New Readings*, ed. Bernard McGuirk and Richard Cardwell (Cambridge: Cambridge University Press, 1987)
4. 'Postcolonial Criticism' in Peter Barry, *Beginning Theory*, Chennai: T.R. Publications
5. Ania Loomba, *Colonialism/Postcolonialism*, London and New York: Routledge

FOR ALL DSECOURSES, THE MARKS DIVISION IS AS FOLLOWS:

End Semester – 65
Tutorial – 15
Internal – 10
Attendance – 10

Semester 5 – DSE-A1 OR DSE-A2 and DSE-B1 OR DSE-B2

Semester 6 – DSE-A3 OR DSE-A4 and DSE-B3 OR DSE-B4

DSE-A1 (SEMESTER 5, CODE –ENG-A-DSE-A-5-1-TH/TU)
MODERN INDIAN WRITING IN ENGLISH TRANSLATION: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Stories

Munshi Prem Chand, 'The Shroud'
Ismat Chugtai, 'The Quilt'
Fakir Mohan Senapati, 'Rebati'

Poetry

Rabindranath Tagore, 'Light, oh where is the light?' (*Gitanjali* XXVII) and 'When my play was with thee' (*Gitanjali* XCVII)
G.M. Muktibodh, 'The Void'
Amrita Pritam, 'I say unto Waris Shah'

Novel

Rabindranath Tagore, *The Home and the World*

Drama

Vijay Tendulkar, *Silence! The Court is in Session*

End Semester Question Pattern:

Objective – 5 marks
One question of 15 marks from story (out of two)
One question of 15 marks from poetry (out of two)
One question of 15 marks from novel (out of two)
One question of 15 marks from drama (out of two)

Suggested Readings:

1. Namwar Singh, 'Decolonising the Indian Mind', tr. Harish Trivedi, *Indian Literature*, no. 151 (Sept./Oct. 1992).
2. B.R. Ambedkar, 'Annihilation of Caste' in *Dr. Babasaheb Ambedkar: Writings and Speeches*, vol. 1 (Maharashtra: Education Department, Government of Maharashtra, 1979) chaps. 4, 6, and 14.
3. Sujit Mukherjee, 'A Link Literature for India', in *Translation as Discovery* (Hyderabad: Orient Longman, 1994) pp. 34–45.
4. G.N. Devy, 'Introduction', from *After Amnesia* in The G.N. Devy Reader (New Delhi: Orient BlackSwan,2009) pp. 1–5.

DSE-A2 (SEMESTER 5, CODE – ENG-A-DSE-A-5-2-TH/TU)
LITERARY THEORY AND CRITICISM: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Literary Theory

Antonio Gramsci, 'The Formation of the Intellectuals' from *The Prison Notebooks*
Virginia Woolf: 'A Room of One's Own'
Rabindranath Tagore, 'Nationalism in India', in *Nationalism*, with an Introduction by Ramachandra Guha, New Delhi: Penguin Books

Literary Criticism

William Wordsworth, 'Preface' to the *Lyrical Ballads*
S.T. Coleridge, *Biographia Literaria*, Chapters XIII and XIV
T.S. Eliot, 'Tradition and the Individual Talent'

End Semester Question Pattern:

Objective – 5 marks

Two questions of 15 marks from Literary Theory (out of three, one from each text)
Two questions of 15 marks from Literary Criticism (out of three, one from each text)

Suggested Readings:

1. Terry Eagleton, *Literary Theory: An Introduction* (Oxford: Blackwell, 2008).
2. Peter Barry, Beginning Theory, Chennai: T.R. Publications, 1999.
3. Peter Barry (ed), *Issues in Contemporary Critical Theory: A Selection of Critical Essays, A Casebook*, Macmillan, 1987
4. Raman Selden and Peter Widdowson, *A Reader's Guide to Contemporary Literary Theory*, Pearson India, 2006
5. C.S. Lewis: *Introduction in An Experiment in Criticism*, Cambridge University Press 1992
6. M.H. Abrams: *The Mirror and the Lamp*, Oxford University Press,1971
7. Rene Wellek, Stephen G. Nicholas: *Concepts of Criticism*, Connecticut, Yale University 1963
8. Taylor and Francis Eds. *An Introduction to Literature*, Criticism and Theory, Routledge, 1996

DSE-B1 (SEMESTER 5, CODE – ENG-A-DSE-B-5-1-TH/TU)
LITERARY TYPES, RHETORIC AND PROSODY: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Group – A: Literary Types

Tragedy (Tragic Hero, Catharsis, Heroic Tragedy, Chorus)
Comedy (Romantic Comedy, Comedy of Humours, Comedy of Manners, Sentimental Comedy)
Short Story

Group – B: Rhetoric

Group – C: Prosody

End Semester Question Pattern:
Objective – 5 marks
Two questions of 20 marks from Group A (out of three)
One question of 10 marks from Group B (out of two)
One question of 10 marks from Group C (out of two)

Suggested Readings:

1. K.R.S. Iyengar and Prema Nandakumar, *Introduction to the Study of English Literature*
2. S.H. Butcher, *Aristotle's Theory of Poetry and Fine Art*, New Delhi: Kalyani Publishers
3. Allerdyce Nicoll, *The Theory of Drama*

4. Bose and Sterling, *Elements of English Rhetoric and Prosody*

DSE-B2 (SEMESTER 5, CODE – ENG-A-DSE-B-5-2-TH/TU)
CONTEMPORARY INDIA: WOMEN AND EMPOWERMENT: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Social Construction of Gender
History of Women's Movement in India (pre-independence and post-independence)
Women and Law: Domestic Violence, Female Foeticide, Sexual Harassment
Dalit Women and Double Marginalisation

End Semester Question Pattern:
Objective – 5 marks
Society, Sex and Gender – 20 marks
History of Women's Movement in India – 15 marks
Women and Law – 15 marks
Dalit Women – 10 marks

Recommended Readings:

1. Rinita Mazumdar, *A Short Introduction to Feminist Theory*, Kolkata: Anustup, 2010.
2. 'Feminist Criticism' in Peter Barry, *Beginning Theory*, Chennai: T.R. Publications, 1999.
3. V. Geetha, *Gender*, Calcutta: Stree, 2002.
4. Kate Millet, *Sexual Politics*, New York: Doubleday, 1970.
5. Ann Oakley, *Sex, Gender and Society*, London: Temple Smith, 1972.
6. Ray Raka, *Fields of Protest: Women's Movements in India*, New Delhi: Kali for Women, 2000.
7. *The Sexual Harassment of Women at Workplace*, *(Prevention, Prohibition and Redressal)* Bare Act, New Delhi: Universal, 2014.
8. Sharmila Rege, *Against the Madness of Manu, B.R. Ambedkar's Writings on Brahmanical Patriarchy*, New Delhi: Navayana, 2013.
9. Sandra Gilbert and Susan Gubar, *The Madwoman in the Attic: The Woman Writer and the Nineteenth Century Literary Imagination*

DSE-A3 (SEMESTER 6, CODE – ENG-A-DSE-A-6-3-TH/TU)
PARTITION LITERATURE: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Novel

Amitav Ghosh, *The Shadow Lines*

Short Stories

Protiva Basu, 'The Marooned', translated Subhasree Tagore, in *The Other Voice*, eds. Tapati Gupta and Anil Acharya, Kolkata: Anustup
Manik Bandyopadhyay, 'The Final Solution', translated Rani Ray, in Debjani Sengupta ed. *Mapmaking: Partition Stories from Two Bengals*, New Delhi: Srishti
Sadat Hasan Manto, 'Toba Tek Singh', in *Black Margins:Manto*, New Delhi: Manohar

Poetry

Sahir Ludhianvi, 'Twentysixth January',
Birendra Chattopadhyay, 'After Death: Twenty Years'
Sankha Ghosh, 'Rehabilitation', in RakhshandaJalil, Tarun Saint and Debjani Sengupta eds. *Looking Back: The 1947 Partition of India 70 Years On*, New Delhi: Orient Blackswan, 2017

End Semester Question Pattern:

Objective – 5 marks
One question of 15 marks from novel (out of two)
Two questions of 15 marks each from short stories (out of three, one from each)
One question of 15 marks from poetry (out of two)

Suggested Readings:

1. Ritu Menon and Kamla Bhasin, 'Introduction', in *Borders and Boundaries* (New Delhi: Kali for Women, 1998).
2. Sukrita P. Kumar, *Narrating Partition* (Delhi: Indialog, 2004).
3. Urvashi Butalia, *The Other Side of Silence: Voices from the Partition of India* (Delhi: Kali for Women, 2000).
4. Sigmund Freud, 'Mourning and Melancholia', in *The Complete Psychological Works of Sigmund Freud*, tr. James Strachey (London: Hogarth Press, 1953) pp. 3041–53.

DSE-A4 (SEMESTER 6, CODE – ENG-A-DSE-A-6-4-TH/TU)
MEDIA AND COMMUNICATION STUDIES: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Introduction to Mass Communication
Mass Communication and Globalisation
Writing Pamphlets, Posters etc
Advertisements and Creating Advertisements

End Semester Question Pattern:

Questions on Mass Communication (Theory) – 20 marks
Report /Pamphlet Writing – 20 marks
Advertisement / Poster Writing – 15 marks

Pamphlet Writing – 10 marks

Recommended Readings:

1. M.V. Kamath, *Professional Journalism*, New Delhi: Vikas Publishing House, 1980.
2. Ambrish Saxena, *Fundamentals of Reporting and Editing*, New Delhi: Kanishka Publishers, 2007.
3. Uma Narula, *Handbook of Communication Models*, *Perspectives, Strategies*, New Delhi: Atlantic Publishers, 2006.
4. Stephen Cushion, *Television Journalism*, New Delhi: Sage Publications, 2012.
5. Tony Feldman, *An Introduction to Digital Media*, Taylor and Francis, 2004.

DSE-B3 (SEMESTER 6, CODE – ENG-A-DSE-B-6-3-TH/TU)
AUTOBIOGRAPHY - 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Rabindranath Tagore, *My Reminiscences,* Chapters 1-15, New Delhi: Rupa & Co.
Mahatma Gandhi, *Autobiography or the Story of My Experiments with Truth*, Part I, Chapters 1 to 8
Binodini Dasi, *My Story and Life as an Actress*, pp 61-83, New Delhi: Kali for Women
Nirad C. Chaudhuri, *Autobiography of an Unknown Indian*, Book I, Mumbai: Jaico Publishing House

End Semester Question Pattern:
Objective – 5 marks
One question of 15 marks out of two from each of the texts

Suggested Readings:

1. James Olney, 'A Theory of Autobiography' in *Metaphors of Self: The Meaning of Autobiography* (Princeton: Princeton University Press, 1972) pp. 3-50.
2. Laura Marcus, 'The Law of Genre' in *Auto/biographical Discourses* (Manchester: Manchester University Press, 1994) pp. 229-72.
3. Linda Anderson, 'Introduction' in *Autobiography* (London: Routledge, 2001) pp.1-17.
4. Mary G. Mason, 'The Other Voice: Autobiographies of women Writers' in *Life/Lines: Theorizing Women's Autobiography*, Edited by Bella Brodzki and Celeste Schenck (Ithaca: Cornell University Press, 1988) pp. 19-44.

DSE-B4 (SEMESTER 6, CODE – ENG-A-DSE-B-6-4-TH/TU)
TEXT AND PERFORMANCE: 6 CREDITS

(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Historical Overview of Indian and Western Theatre
Classical, Modern and Contemporary Theatres
Historical Developments of Theatrical Forms
Folk Traditions

End Semester Question Pattern:

History of Theatre and Traditions of Theatre (in India and the West) – 20 marks
Contribution of Eminent Individuals – 10 marks
Folk Traditions – 20 marks
Tagore as Theatrician – 15 marks

Recommended Readings:

Kamalesh Datta Tripathi, 'Rasa' in *Theatres of India: A Concise Companion*, New Delhi: OUP, 2009.
Kamalesh Datta Tripathi, 'Natyasastra' in *Theatres of India: A Concise Companion*, New Delhi: OUP, 2009.
Ananda Lal, 'Tagore as Theatrician' in Rabindranath Tagore, *Three Plays*, Translated and with an introduction by Ananda Lal, New Delhi: OUP, 2001.
Prasanna, *Indian Method in Acting*, New Delhi: National School of Drama, 2013.
Walter Benjamin, 'What is Epic Theatre', *Understanding Brecht*, London and New York, Verso, 1973.
Robert Leach: *Theatre Studies: The Basics*, Routledge, 2015.
Sonia Moore, *The Stanislavsky System: The Professional Training of an Actor*, Penguin, 1984.

AECC1 – COMMUNICATIVE ENGLISH: 2 CREDITS (SEMESTER 1)

- Correction of sentences
- Transformation (Simple, Complex and Compound Sentences; Degrees of Comparison; Affirmative and Negative Sentences; Interrogative and Assertive Sentences; Exclamatory and Assertive Sentences)
- Identifying True/False Statements from Given Passages

Internal – 10 marks
Attendance – 10 marks
End Semester Questions – MCQ 80 marks

End Semester Question Patterns:
Correction of Sentences: 20 (2 x 10)
Transformation of Sentences: 20 (2 x 10)
True/False Statements from Given Passage One: 20 (4 x 5)
True/False Statements from Given Passage Two: 20 (4 x 5)

SEC-A1 (SEMESTER 3, CODE –ENG-A-SEC-A-3-1-TH)
TRANSLATION STUDIES: 2 CREDITS

Unit 1 – Importance of translation in a multi-linguistic and multi-cultural society
Unit 2 – Literal translation
Unit 3 – Free translation
Unit 4 – Transcreation

Internal – 10 marks
Attendance – 10 marks
End Semester Question Pattern (80 marks, no tutorial):

Questions may include (1) translation from one language to another (2) critical comments on a translated passage (3) differences between literal translation and free translation (4) why translation is necessary into other Indian languages and also to foreign languages

Recommended Readings

1. Jyoti Bhattacharya, *Transcreations: Some Experiments on Tagore Songs*, Kolkata: Gangchil
2. Mona Baker, *In Other Words: A Coursebook on Translation*, Routledge, 2001.
3. I.C. Catford, *A Linguistic Theory of Translation*, London: OUP, 1965.
4. Ravinder Gargesh and Krishna Kumar Goswami eds. *Translation and Interpreting: Reader and Workbook*, New Delhi: Orient Longman, 2007.
5. Sukanta Chaudhuri, *Translation and Understanding*, New Delhi: OUP
6. Lawrence Venuti (ed), *The Translation Studies Reader*, London and New York: Routledge, 2012

SEC-A2 (SEMESTER 3, CODE – ENG-A-SEC-A-3-2-TH)
BUSINESS COMMUNICATION: 2 CREDITS

What is business communication
Writing reports, letters, curriculum vitae
Writing meeting minutes
E-correspondence

Internal – 10 marks
Attendance – 10 marks
End Semester Question Pattern (80 marks, no tutorial):

Writing Business Letters – 15 marks
Writing CV – 15 marks
Writing e-mail – 15 marks
Writing Report – 15 marks
Writing Meeting Minutes – 20 marks

Recommended Readings:

1. O. Scot, *Contemporary Business Communication*, New Delhi: Biztantra
2. R. Ludlow and F. Panton, *The Essence of Effective Communications*, New Delhi: Prentice Hall of India Pvt Ltd

3. R.C. Bhatia, *Business Communication*, New Delhi: Ane Books Private Limited

SEC-B1 (SEMESTER 4, CODE – ENG-A-SEC-B-4-1-TH)
CREATIVE WRITING: 2 CREDITS

What is creative writing
Modes of creative writing
Writing Short Story / Poetry
Preparing for publication

Internal – 10 marks
Attendance – 10 marks
End Semester Question Pattern (80 marks, no tutorial):

Questions may include (1) the importance of creative writing in development of personality and creativity (2) actual creative writing – poem or short story (3) different modes of publishing – viz. books, articles in newspapers, articles in magazines and periodicals, social media – and differences of impact

Recommended Readings:

1. Anjana Neira Dev *et al*, *Creative Writing: A Beginner's Manual*, New Delhi: Pearson, 2009.
2. David Morley and Philip Neilsen eds., *The Cambridge Companion to Creative Writing*

SEC-B2 (SEMESTER 4, CODE – ENG-A-SEC-B-4-2-TH)
ACADEMIC WRITING AND COMPOSITION: 2 CREDITS

Introduction to the writing process
Introduction to academic writing
Summarising and paraphrasing
Citing Sources

Internal – 10 marks
Attendance – 10 marks
End Semester Question Pattern (80 marks, no tutorial):

Citing Sources – 10 marks
Writing Critical Appreciation – 20 marks
Writing Summary/Substance with a Critical Note – 12 + 8 marks
Writing Essay – 30 marks

Recommended Readings:

1. Liz Hamp-Lyons and Ben Heasley, *Study writing: A Course in Writing Skills for Academic Purposes* (Cambridge: CUP, 2006).
2. Renu Gupta, *A Course in Academic Writing* (New Delhi: Orient Blackswan, 2010).

3. Ilona Leki, *Academic Writing: Exploring Processes and Strategies* (New York: CUP, 2nd edn, 1998).
4. Gerald Graff and Cathy Birkenstein, *They Say/I Say: The Moves That Matter in Academic Writing* (New York: Norton, 2009).
5. Hacker, D. & Sommers, N. (2011). *A writer's reference* (7th ed.). Boston, MA: Bedford/St, Martin's. PE1408.H2778 2011

University of Calcutta

CBCS Syllabus for BA General Programme in English

COURSE STRUCTURE

SEMESTER	COURSE TYPE
SEMESTER I	CC1/GE1 AECC1
SEMESTER II	CC2/GE2
SEMESTER III	CC3/GE3 L1-1 SECA
SEMESTER IV	CC4/GE4 SECB L2-1
SEMESTER V	L1-2 DSEA SECA
SEMESTER VI	DSEB SECB L2-2

CORECOURSE(CC)

CC1/GE1:Poetry&ShortStory
CC2/GE2:Essay,Drama&Novel
CC3/GE3:Women's Writing
CC4/GE4:AcademicWritingandComposition

LCC COURSE

LCC-1 (L1-1): Language, Variety and Stylistics
LCC-1 (L1-2): Language, Imagination & Creativity
LCC-2 (Alternative English) (L2-1): Language, Society and Personality
LCC-2 (Alternative English) (L2-2): Language, Creativity and Analysis

DISCIPLINE SPECIFIC ELECTIVE(DSE)

ONE TO BE CHOSEN FROM DSEA AND ONE TO BE CHOSEN FROM DSEB

DSEA1:British Literature
DSEA2:Modern Indian Writing in English Translation
DSEB1: Partition Literature
DSEB2: Translation Studies

ABILITY ENANCEMENT COMPULSORY COURSE (AECC)

AECC-1**:** Communicative English/MIL
AECC-2: Environmental Studies

SKILL ENHANCEMENT COURSE (SEC]

ONE TO BE CHOSEN FROM SECA AND ONE TO BE CHOSEN FROM SECB

SECA1: English Language Teaching
SECA2: Business Communication
SECB1: Spoken English
SECB2: Creative Writing

COURSE DETAILS

FOR ALL CC/GECOURSES, THE MARKS DIVISION IS AS FOLLOWS:

End Semester – 65
Tutorial – 15
Internal – 10
Attendance – 10

CC1/GE1 (SEMESTER 1, CODE –ENG-G-CC-1-1-TH/TU) – 6 CREDITS
(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

POETRY AND SHORT STORY

Poetry

William Shakespeare: Sonnet 18
William Wordsworth: 'Strange fits of passion'
P.B. Shelley: 'To a Skylark'
John Keats: 'To Autumn'

Short Story

James Joyce: 'Araby'
Katherine Mansfield: 'The Fly'
Joseph Conrad: 'The Lagoon'

End Semester Question Pattern:

Objective – 5 marks
Two question of 15 marks out of four from poetry (one from each poem)
Two questions of 15 marks out of three from short story (one from each)

CC2/GE2 (SEMESTER 2, CODE – ENG-G-CC-2-2-TH/TU) - 6 CREDITS
(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

ESSAY, DRAMA AND NOVEL

Essay

Charles Lamb: 'Dream Children: A Reverie'
George Orwell: 'Shooting an Elephant'

Drama

William Shakespeare: *As You Like It*
George Bernard Shaw: *Arms and the Man*

Novel

Thomas Hardy: *The Mayor of Casterbridge*

End Semester Question Pattern:
Objective – 5 marks
One question of 15 marks out of two from essay (one from each)
Two questions of 15 marks (one from each) out of four from drama (two from each)
One question of 15 marks out of two from novel

CC3/GE3 (SEMESTER 3, CODE – ENG-G-CC-3-3-TH/TU) - 6 CREDITS
(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

WOMEN'S WRITING AND WOMEN'S EMPOWERMENT

Poetry

Elizabeth Barret Browning: 'How Do I Love Thee'
Christina Rossetti: 'Uphill'
Emily Dickinson: 'I cannot live with you'
Sarojini Naidu: 'Palanquin Bearers'

Prose

Rassundari Devi: *Amar Jiban*, translated Enakshi Chatterjee, Writers' Workshop.
Rokeya Sakhawat Hussain: *Sultana's Dream*

End Semester Question Pattern:
Objective – 5 marks
Two questions of 15 marks out of three from poetry
Two questions of 15 marks (one from each) out of four from prose (two from each)

CC4/GE4 (SEMESTER 4, CODE – ENG-G-CC-4-4-TH/TU) - 6 CREDITS
(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

ACADEMIC WRITING

Introduction to the writing process
Introduction to academic writing
Summarising and paraphrasing
Writing Essay
Citing Sources

End Semester Question Pattern:
Citing Sources – 5 marks
Writing Critical Appreciation – 15 marks
Writing Summary/Substance with a Critical Note – 12 + 8 marks
Writing Essay – 25 marks

Suggested Readings:

1. Liz Hamp-Lyons and Ben Heasley, *Study writing: A Course in Writing Skills for Academic Purposes* (Cambridge: CUP, 2006).
2. Renu Gupta, *A Course in Academic Writing* (New Delhi: Orient Blackswan, 2010).
3. Ilona Leki, *Academic Writing: Exploring Processes and Strategies* (New York: CUP, 2nd edn, 1998).
4. Gerald Graff and Cathy Birkenstein, *They Say/I Say: The Moves That Matter in Academic Writing* (New York: Norton, 2009).
5. Hacker, D. & Sommers, N. (2011). *A writer's reference* (7th ed.). Boston, MA: Bedford/St, Martin's. PE1408.H2778 2011

FOR ALL LCC COURSES, THE MARKS DIVISION IS AS FOLLOWS:

End Semester – 65
Tutorial – 15
Internal – 10
Attendance – 10

LCC (L1)-1 (SEMESTER 3, CODE – ENG-G-LCC-1-3-1-TH/TU) - 6 CREDITS
(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

LANGUAGE, VARIETY AND STYLISTICS

Language and Communication: Official and Personal
Language Varieties: Formal & Informal, Correct and Incorrect
Differences between British English and American English

End Semester Question Pattern:

Writing Letter (Personal or Business) – 15 marks
Writing Report – 15 marks
Writing e-mail – 15 marks
Correction – 10 marks
British English to American English and vice versa (objective) – 10 marks

Suggested Readings:

Rajend Mesthrie and Rakesh M. Bhatt, *World Englishes: The Study of New Linguistic Varieties*, Cambridge: CUP, 2008
George Bernard Shaw, 'Spoken English and Broken English'
H.G. Widdowson, *Stylistics and the Teaching of Literature*

LCC (L1)-2 (SEMESTER 5, CODE – ENG-G-LCC-1-5-2-TH/TU) - 6 CREDITS
(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

LANGUAGE, IMAGINATION AND CREATIVITY

Plain Language and Figurative Language (Use of Figures of Speech)

Language of Poetry with reference to select poems:
William Wordsworth: 'Three Years She Grew',
Lord Tennyson: 'Break Break Break',
Henry Louis Vivian Derozio: 'To India, My Native Land',
Rabindranath Tagore: 'Gitanjali 50',

Creative use of Language: Writing Story, Travelogues and Advertisement Matters

End Semester Question Pattern:

Identifying Figures of Speech – 10 marks
Two questions of 15 marks from poetry (out of three)
Writing Story – 10 marks
Writing Travelogue – 10 marks
Writing Advertisement Matters – 5 marks

Suggested Reading:

Geoffrey N. Leech, *A Linguistic Guide to English Poetry*
Bose and Sterling, *Rhetoric and Prosody*

LCC (L2) – 1 (Alternative English)

LANGUAGE, SOCIETY AND PERSONALITY
(SEMESTER 4, CODE – ENG-G-LCC-2-4-1-TH/TU) - 6 CREDITS
(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

1. Language and Society:

a. Shashi Tharoor, 'The Idea of India: India's Mosaic of Multiplicities'
b. Ismat Chugtai, 'Roots'
c. Ramachandra Guha, 'A Gandhian in Garhwal'

[from B. Keralavarma (ed), *Understanding India: Reflections on Indian Polity, Secularism and Sustainable Environment*, Kottayam, Kerala: Macmillan Publishers India Ltd and Mahatma Gandhi University, Kerala, 2010]

2 . Language and Personality

a. Louis Fischer, 'Gandhi and the Western World', from B. Keralavarma (ed), *Understanding India: Reflections on Indian Polity, Secularism and Sustainable Environment*, Kottayam, Kerala: Macmillan Publishers India Ltd and Mahatma Gandhi University, Kerala, 2010.
b. Sisirkumar Ghosh, *Makers of Indian Literature: Rabindranath Tagore*, New Delhi: Sahitya Akademi, 2012 (first chapter, viz. 'Life')
c. Subal Chandra Mitra, *Isvar Chandra Vidyasagar: A Story of His Life and Work*, New Delhi: Rupa and Co., 2008 (the first two chapters, viz. 'Birth and Ancestry' and 'Childhood and Early Instruction')

End Semester Question Pattern:

Objective – 5 marks
Two questions of 15 marks each out of three from Section 1.
Two questions of 15 marks each out of three from Section 2.

LCC (L2)-2(Alternative English)
LANGUAGE, CREATIVITY AND ANALYSIS

(SEMESTER 6, CODE – ENG-G-LCC-2-6-2-TH/TU) - 6 CREDITS
(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

Prose

R.K. Narayan, 'Out of Business'
Bhisham Sahni, 'The Boss Came to Dinner'
Ruskin Bond, 'The Thief's Story'
Prem Chand, 'The Child'

Poetry

Rabindranath Tagore, 'Gitanjali: XVIII'
Purushottam Lal, 'Life'
Nissim Ezekeil, 'In a Country Cottage'
Gauri Deshpande, 'The Female of the Species'

[from UG Board of Studies in English, University of Calcutta (ed), *Golden Leaves: A Textbook for College Students*, New Delhi: Macmillan Publishers India Ltd and University of Calcutta, 2011]

End Semester Question Pattern:

Objective – 5 marks
Two question of 15 marks out of three from Prose
Two questions of 15 marks each out of three from Poetry

FOR ALL DSE COURSES, THE MARKS DIVISION IS AS FOLLOWS:

End Semester – 65
Tutorial – 15
Internal – 10
Attendance – 10

DSEA1 (SEMESTER 5, CODE – ENG-G-DSEA-5-1-TH/TU) - 6 CREDITS
(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

BRITISH LITERATURE

Poetry

Group – A

William Wordsworth, 'Tintern Abbey'
Percy Bysshe Shelley, 'Ode to the West Wind'
John Keats, 'Ode to a Nightingale'

Group – B

Lord Tennyson, 'Ulysses'
Matthew Arnold, 'Dover Beach'
W.B. Yeats, 'The Second Coming'

Drama

William Shakespeare, *Macbeth*

Fiction

Robert Louis Stevenson, *The Strange Case of Dr Jekyll and Mr Hyde*

End Semester Question Pattern:

Objective – 5 marks
Two questions of 15 marks from poetry (one from each group)out of four, two from each group
One question of 15 marks out of two from drama
One question of 15 marks out of two from fiction

DSEA2 (SEMESTER 5, CODE – ENG-G-DSEA-5-2-TH/TU) - 6 CREDITS
(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

MODERN INDIAN WRITING IN ENGLISH TRANSLATION

Novel

Rabindranath Tagore, *The Home and the World*

Poetry

Rabindranath Tagore, 'Light, oh where is the light?' (*Gitanjali* XXVII) and 'When my play was with thee' (*Gitanjali* XCVII)
G.M. Muktibodh, 'The Void'
Amrita Pritam, 'I say unto Waris Shah'

Drama

Vijay Tendulkar, *Silence! The Court is in Session*
Habib Tanveer, *Charandas Chor*

End Semester Question Pattern:

Objective – 5 marks
One question of 15 marks out of two from novel
One question of 15 marks out of three from poetry
Two questions of 15 marks each (one from each)out of four from drama (two from each drama)

DSEB1 (SEMESTER 6, CODE – ENG-G-DSEB-6-1-TH/TU) - 6 CREDITS
(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

PARTITION LITERATURE

Novel

Amitav Ghosh, *The Shadow Lines*

Short Stories

Protiva Basu, 'The Marooned', translated Subhasree Tagore, in *The Other Voice*, eds. Tapati Gupta and Anil Acharya, Kolkata: Anustup
Manik Bandyopadhyay, 'The Final Solution', translated Rani Ray, in Debjani Sengupta ed. *Mapmaking: Partition Stories from Two Bengals*, New Delhi: Srishti
Sadat Hasan Manto, 'Toba Tek Singh', in *Black Margins:Manto*, New Delhi: Manohar

Poetry

Sahir Ludhianvi, 'Twentysixth January'
Birendra Chattopadhyay, 'After Death: Twenty Years' and
Sankha Ghosh, 'Rehabilitation', in Rakhshanda Jalil, Tarun Saint and Debjani Sengupta (eds) *Looking Back: The 1947 Partition of India 70 Years On*, New Delhi: Orient Blackswan, 2017

End Semester Question Pattern:

Objective – 5 marks
One question of 15 marks from novel (out of two)
Two questions of 15 marks each from short stories (out of three)
One question of 15 marks from poetry (out of two)

DSEB2 (SEMESTER 6, CODE – ENG-G-DSEB-6-2-TH/TU) - 6 CREDITS
(5 CREDITS THEORY AND 1 CREDIT TUTORIAL)

TRANSLATION STUDIES

Unit 1 – Importance of translation in a multi-linguistic and multi-cultural society
Unit 2 – Literal translation

Unit 3 – Free translation
Unit 4 – Transcreation

End Semester Question Pattern:

Questions may include (1) translation from one language to another (2) critical comments on a translated passage/poem (3) differences between literal translation and free translation (4) why translation is necessary into other Indian languages and also to foreign languages

Suggested Readings

1. Jyoti Bhattacharya, *Transcreations: Some Experiments on Tagore Songs*, Kolkata: Gangchil
2. Mona Baker, *In Other Words: A Coursebook on Translation*, Routledge, 2001.
3. I.C. Catford, *A Linguistic Theory of Translation*, London: OUP, 1965.
4. Ravinder Gargesh and Krishna Kumar Goswami eds. *Translation and Interpreting: Reader and Workbook*, New Delhi: Orient Longman, 2007.
5. Sukanta Chaudhuri, *Translation and Understanding*, New Delhi: OUP
6. Lawrence Venuti (ed), *The Translation Studies Reader*, London and New York: Routledge, 2012

AECC1 – COMMUNICATIVE ENGLISH (SEMESTER 1) – 2 CREDITS

- Correction of sentences
- Transformation (Simple, Complex and Compound Sentences; Degrees of Comparison; Affirmative and Negative Sentences; Interrogative and Assertive Sentences; Exclamatory and Assertive Sentences)
- Identifying True/False Statements from Given Passages

Internal – 10 marks
Attendance – 10 marks
End Semester Questions – MCQ 80 marks

End Semester Question Patterns:
Correction of Sentences: 20 (2 x 10)
Transformation of Sentences: 20 (2 x 10)
True/False Statements from Given Passage One: 20 (4 x 5)
True/False Statements from Given Passage Two: 20 (4 x 5)

SECA1 – ENGLISH LANGUAGE TEACHING (SEMESTER 3/5, CODE –ENG-G-SEC-A-3/5-1-TH) – 2 CREDITS

Language Perspectives: First Language Second Language and Foreign Language – Acquisition and Learning
Knowing the Learner: Features of a good language learner
Structure of the English Language
Methods of Teaching English Language
Assessing Language Skills

Materials for Language Teaching

End Semester Question Pattern: To be finalised later

Suggested Readings:

1. Penny Ur, *A Course in Language Teaching: Practice and Theory*, Cambridge: CUP, 1996
2. Marianne Celce-Murcia, Donna M. Brinton and Marguerite Ann Snow, *Teaching English as a Second or Foreign Language*, Delhi: Cengage Learning, 2014.
3. Mohammad Aslam, *Teaching of English*, New Delhi: CUP, 2013.
4. Daine Larsen-Freeman, *Techniques and Principles in Language Teaching*: Oxford: OUP, 1986
5. Geetha Nagaraj, *English Language Teaching*, New Delhi: Orient BlackSwan, 2010
6. J.C. Richards and T.S. Rodgers, *Approaches and Methods in Language Teaching*, Cambridge: CUP, 2001

SECA2– BUSINESS COMMUNICATION
(SEMESTER 3/5, CODE – ENG-G-SEC-A-3/5-1-TH) - 2 CREDITS

What is business communication
Writing reports, letters, curriculum vitae
Writing meeting minutes
E-correspondence

End Semester Question Pattern:

Writing Business Letters – 15 marks
Writing CV – 15 marks
Writing e-mail – 15 marks
Writing Report – 15 marks
Writing Meeting Minutes – 20

Suggested Readings:

1. O. Scot, *Contemporary Business Communication*, New Delhi: Biztantra
2. R. Ludlow and F. Panton, *The Essence of Effective Communications*, New Delhi: Prentice Hall of India Pvt Ltd
3. R.C. Bhatia, *Business Communication*, New Delhi: Ane Books Private Limited

SECB1– SPOKEN ENGLISH
(SEMESTER 4/6, CODE – ENG-G-SEC-B-4/6-1-TH) – 2 CREDITS

Differences between Speech and Writing
Features of Oral Communication
Essentials of Good Communication
Stress, Intonation, Voice Modulation, Rules of Interruption in Civil Discourses

Greeting, Leave-taking, Making and Granting/Refusing Requests, Queries and Giving Information, Narrating Events
Complaints and Apologies, Alerting and Warning
Interview, Debate, Anchoring, Public Address

End Semester Question Pattern: To be finalised later

Suggested Readings:

1. W.S. Allen, *Lining English Speech*, London: Orient Longman, 1968
2. R.K. Bansal and J.B. Harrison, *Spoken English for India*, Madras: Orient Longman, 1972
3. Leena Sen, *Communication Skills*, New Delhi: Prentice Hall of India

SECB2– CREATIVE WRITING
(SEMESTER 4/6, CODE – ENG-G-SEC-B-4/6-1-TH) – 2 CREDITS

What is creative writing
Modes of creative writing
Writing Short Story / Poetry
Preparing for publication

End Semester Question Pattern:

Questions may include (1) the importance of creative writing in development of personality and creativity (2) actual creative writing – poem or short story (3) different modes of publishing – viz. books, articles in newspapers, articles in magazines and periodicals, social media – and differences of impact

Suggested Readings:

1. Anjana Neira Dev *et al*, *Creative Writing: A Beginner's Manual*, New Delhi: Pearson, 2009.
2. David Morley and Philip Neilsen eds., *The Cambridge Companion to Creative Writing*

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Spaul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

CBCS SYLLABUS

IN

HISTORY (HONOURS)

CALCUTTA UNIVERSITY

2018

University of Calcutta

HIS – A

The Three - year B.A. Honours in History will comprise 6 Semesters. The curriculum will consist of 14 Core Courses (CC), 4 Discipline Specific Elective (DSE) courses, 2 Ability Enhancement Compulsory Courses (AECC), 2 Skill Enhancement Courses (SEC) Each course will be of 100 Marks. Attendance: 10 marks per Paper, Internal Assessment: 10 marks per paper.

➢ Core Courses CC

[Fourteen courses. Each course: 6 credits (5 theoretical segments TH+ 1 for tutorial related segment TU). Total: 84 credits.

- Each course carries 80 marks. Teaching time: 6x14 = 84 hrs Minimum 60 classes
- 65 marks for theoretical segment.
- Question Pattern for subjective/descriptive segment of 65 marks: 3 questions out of 6 (within 500 words) (10 x3 = 30) + 4 questions out of 8 within 250 words; 5x4 =20) + 15 objective type questions carrying 1 mark each (15 x 1 = 15).
- 15 marks for tutorial - related segments as suggested below (any one from each mode):
- Any one of the following modes: upto 1000 words for one Term Paper/upto 500 words for each of the two Term Papers/ equivalent Book Review/ --based on syllabus -related and/or current topics .[The modes and themes and/or topics are be decided by the concerned faculty of respective colleges.]
- Core courses: 2 each in Semesters 1 and 2; three each in Semesters 3 and 4; 2 each in Semesters 5 and 6.

- IMPORTANT NOTES:

  The Readings provided below include many of those of the UGC Model CBCS Syllabus in History. For further details of Course Objectives and additional references it is advised that the UGC model CBCS syllabus concerning relevant courses and topics should be given due importance and primarily consulted.
- Cited advanced texts in Bengali are not necessarily substitutes, but supplementary to the English books.

- The format is subject to the common structural CBCS format of the University.

➢ Discipline- specific Elective Courses DSE

Each course: 6 credits 5 for theoretical segment + 1 for tutorial-related segment. **(TH -5 TU-1)**

DSE-A for Semester -5/6, DSE-B for Semester 5/6

- Each course carries 80 marks. Minimum 60 classes.
- 65 marks for theoretical segment.
- Question Pattern for subjective/descriptive segment of 65 marks: 3 questions out of 6 (within 500 words; (10 x3 = 30) + 4 questions out of 8 (within 250 words; 5x4=20) and 15 objective type questions carrying 1 mark each (15 x 1 = 15).
- 15 marks for tutorial-related segments as suggested below (any one from each mode): Any one of the following modes: upto 1000 words for one Term Paper/upto 500 words for each of the two Term Papers/ equivalent Book Review/ based on syllabus related and/or current topics [The modes and themes and/or topics of a. and b. to be decided by the concerned faculty of respective colleges.]

- **HIS-A: Skill Enhancement/Skill-based Courses SEC** Each Course: 2 credits . (**Only theoretical**.)

  SEC –A in Semester 3, SEC –B in Semester 4.
  - Each course carries 80 marks. Teaching time: 2 hrs per week or 2x14 =28 hrs
  - 80 marks for theoretical segment.
  - Question Pattern for subjective/descriptive segment of 80 marks: 4 questions out of 8 (within 500 words; (10 x4 = 40) + 5 questions out of 10(within 250 words; 5x5=25) and 15 objective type questions carrying 1 mark each (15 x 1 = 15).
- **HIS-A: Ability Enhancement Compulsory Courses (** AECC) Each Course 2 credits

  AECC -1 : Communicative English/ MIL

  AECC-2 **:** Environmental Studies

  AECC -1 in Semester 1, AECC -2 in Semester 2

IMPORTANT NOTES:

LIST OF COURSES FOR HISTORY HONOURS PROGRAMME

- The Readings provided below include many of those of the UGC Model CBCS Syllabus in History. For Course Objectives and references it is advised that the UGC model CBCS syllabus concerning relevant courses and topics should be given due importance and primarily consulted.

*Website: BA History (Honours):

- Cited advanced texts in Bengali are not necessarily substitutes, but supplementary to the English books.
- The format is subject to the common structural CBCS format of the University.

HIS-A COURSES SEMESTER WISE

	SEM-1	**SEM-2**	**SEM-3**	**SEM-4**	**SEM-5**	**SEM-6**
CC	CC- 2TH/ 2TU **1& 2**	CC- 2TH/2TU **3&4**	CC- 3TH/3TU **5,6&7**	CC- 3TH/3TU **8,9&10**	CC-2TH/2TU **11,&12**	CC- 2TH/2TU **13&14**
DSE					DSE-A* DSE-B 2TH/2TU	DSE-A* DSE-B 2TH/2TU
****GE**	GE-1 1TH/ 1TU	GE-2 1TH/ 1TU	GE-3 1TH/ 1TU	GE-4 1TH/ 1TU		
AECC	AECC-1 1TH/0 TU	AECC-2 1TH/ 0TU				
SEC			SEC-A 1TH/0 TU	SEC-B 1TH/0 TU		
Total No. of Courses and Marks	4x100= 400	4x100= 400	5x100= 500	5x100= 500	4x100= 400	4x100= 400
Total Credits	20	20	26	26	24	24

***HIS-A- DSE** – Candidates can choose any one paper in Semester -5 and another in Semester 6 taking one from Group –A and the other from Group –B

****HIS-A Generic Elective (GE):** The four Generic Elective papers (courses) for History (Honours) students will be from any subject other than History. Similarly History as Generic Elective will be offered to students having Honours in any subject other than History. The Generic Elective papers in History, for Honours students (for students having Honours in any subject other than History.) will be treated as Core Papers in History, for General students (for BA General Students having History. as a General paper)

COURSE CODE	(6 Credits per Core Course)
Subject-Hon-Core-Semester-Paper-TH&TU	**CORE COURSES**
HIS-A-CC -1-1-TH&TU	
HIS-A-CC -1-2-TH&TU	
HIS-A-CC -2-3-TH&TU	
HIS-A-CC -2-4-TH&TU	
HIS-A-CC -3-5-TH&TU	
HIS-A-CC -3-6-TH&TU	
HIS-A-CC -3-7-TH&TU	
HIS-A-CC -4-8-TH&TU	
HIS-A-CC -4-9-TH&TU	
HIS-A-CC -4-10-TH&TU	
HIS-A-CC -5-11-TH&TU	
HIS-A-CC -5-12-TH&TU	
HIS-A-CC -6-13-TH&TU	
HIS-A-CC -6-14-TH&TU	
Skill Enhancement Course (2 Credits per Course)	
GROUP-A	**HIS-G-SEC-3-A(1) or A(2)-TH**
SEC-A-(1)	
SEC-A-(2)	
GROUP-B	**HIS-G-SEC-4-B(1) or B(2)-TH**
SEC-B-(1)	
SEC-B-(2)	
DISCIPLINE SPECIFIC ELECTIVE (6 Credits per Course)	
GROUP-A	**Semester 5: DSE A-1/ A-2 & Semester-6: DSE A-3/A4TH&TU**
DSE-A-(1)	HIS-A-DSE-A-1-5 TH&TU
DSE-A-(2)	HIS-A-DSE-A-2 -5TH&TU
	HIS-A-DSE-A-3-6 TH&TU
DSE-A-(3)	HIS-A-DSE-A-4 -6 TH&TU
DSE-A-(4)	
GROUP-B	**Semester 5: DSE B-1/ B-2 & Semester-6: DSE A3/A4 TH&TU**
DSE-B-(1)	HIS-A-DSE-B--1 -5TH&TU
DSE-B-(2)	HIS-A-DSE-B-2 -5TH&TU
DSE-B-(3)	HIS-A-DSE-B-3-6 TH&TU
DSE-B-(4)	HIS-A-DSE-B-4-6 TH&TU
➢ **DISCIPLINE SPECIFIC ELECTIVE**	
➢ Note: Choose any one paper in Semester -5 and another in Semester 6 taking one from Group –A and the other from Group –B	
GENERIC ELECTIVE (6 Credits per Course)	
➢ Note: Core Courses Designed for General Programme will be offered as Generic Elective courses for students of other Disciplines.	

Structure of B.A (Hons.) History Course under CBCS
HIS-A-CC-1-14- TH &TU

Paper 1 **SEM -1**: History of India (From the Earliest times to C 300 BCE)

Paper 2 **SEM-1**: Social Formations and Cultural Patterns of the Ancient World other than India

Paper 3 **SEM-2**: History of India (c 300 BCE to c.750 CE)

Paper 4 **SEM-2**: Social Formations and Cultural Patterns of the Medieval World other than India

Paper 5 **SEM-3**: History of India (c.750 – 1206)

Paper 6 **SEM-3**: Rise of the Modern West –I

Paper 7 **SEM-3**: History of India (c.1206 – 1526)

Paper 8 **SEM-4**: Rise of the Modern West – 11

Paper 9 **SEM-4**: History of India (c.1526-1605)

Paper 10 **SEM-4** History of India (c.1605 – 1750s)

Paper 11 **SEM-5:** History of Modern Europe (c.1780-1939)

Paper 12 **SEM-5**: History of India (c.1750s– 1857)

Paper 13 **SEM-6**: History of India (c. 1857 – 1964)

Paper 14 **SEM-6** : History of World Politics: (1945-1994)

HIS-A- DSE TH &TU

Discipline Specific Elective DSE (Any Four) Choosing any one paper in Semester -5 and another in Semester 6 taking one from Group –A and the other from Group –B

Paper 1 **DSE-A-1 SEM -5**: History of Bengal (c.1757-1905)

Paper 2 **DSE-A-3 SEM -6**: History of Bengal (c.1905-1947)

Paper 3 **DSE-B-2 SEM -5**: History of Southeast Asia – The 19th Century

Paper 4 **DSE-B-4 SEM -6**: History of Southeast Asia – The 20th Century

Paper 5 **DSE-B-1 SEM -5**: History of Modern East Asia – I China (c.1840 – 1949)

Paper 6 **DSE-B-3 SEM -6**: History of Modern East Asia – II Japan (c.1868 – 1945)

Paper 7 **DSE-A-2** SEM **-5**: History of United States of America – I (c.1776 – 1945)

Paper 8 **DSE-A-4 SEM -6**: History of United States of America – II (c.1776-1945)

Skill Enhancement Courses SEC –A & B (Any Two) Choosing one from group-A and one from group-B) in Semester 3 and 4

SEC -A 1: **SEM-3** Archives and museums
SEC -B 1: **SEM-4** Understanding Popular Culture
SEC-A 2: **SEM-3** Understanding Heritage
SEC-B 2: **SEM-4** Art Appreciation: an Introduction to Indian Art

*Generic Elective Courses (GE) - Same as Core courses (CC) offered in the BA General Syllabus.

Detailed Syllabus History Honours
HIS-A CC –1- 14 TH&TU
CC 1 : History of India From the earliest times to C 300 BCE

I. Reconstructing Ancient Indian History:
a) Early Indian notions of History
b) Sources and tools of historical reconstruction.
c) Historical interpretations (with special reference to gender, environment, technology and regions)

II. Hunter-gatherers and the advent of food products
a)Paleolithic cultures- sequence and distribution; stone industries and other technological developments.
b) Mesolithic cultures – regional and chronological distribution; new developments in technology and economy; rock art.
c) Neolithic and Chalcolithic cultures: distribution and subsistence pattern

III. The Harappan civilization:
Origins; settlement patterns and town planning; agrarian base; craft productions and trade; social and political organization; religious beliefs and practices; art; the problem of urban decline and the late/post-Harappan traditions.

IV. Cultures in transition
Settlement patterns, technological and economic developments; social stratification; political relations; religion and philosophy; the Aryan problem.
a) North India (circa 1500 BCE – 300 BCE)
b) Central India and the Deccan (circa 1000 BCE – circa 300 BCE)

Essential Readings
Agarwal D.P, The Archaeology of India, London, 1982.
Basham A.L, The Wonder That Was India, London, 1954.
Chakrabarti Dilip Kumar, An Oxford Companion to Indian Archaeology, New Delhi, 2006.
Chakrabarti Dilip Kumar, India, An Archaeological History, Delhi, 1999
Sharma R.S, Looking for the Aryans, 1995.
Sharma R.S, Material Cultures and Social Formations in Ancient India, New Delhi, 1983.
Thapar Romila, Early India: From the Origins to AD 1300, London, 2002

Suggested Readings
Basham A.L ed. A Cultural History of India, New Delhi, 1975.
Ghosh Amalananda, The City in Early Historic India, Shimla, 1973.
Altekar A.S, The Position of Women in Hindu Civilization from Pre-historic times to the Present Day, New Delhi, 1962.
Chattopadhyaya B.D, Studying Early India: Archaeology, Texts and Historical Issues. New Delhi, 2003.
Sircar D.C, Indian Epigraphy, New Delhi, 1965.
Kosambi D.D, An Introduction to the Study of Indian History, Bombay, 1956
Kosambi D.D, Combined Methods in Indology and Other Writings, Edited and Introduced By B.D Chattopadhyaya
Jha D.N, Ancient India: An Introduction, New Delhi, 1998
Chattopadhyay D.P, Science and Society in Ancient India, Calcutta, 1977.
Erdosy George, Urbanization in Early Historic India, Oxford, 1988.

Allchin F.R. (ed). The Archaeology of Early Historic South Asia: The Emergence of Cities and States, Cambridge, 1995.
Staal Frits, Discovering the Vedas : Origins, Mantras, Rituals Insights, New Delhi, 2008.
Possehl G.L, ed. Harappan Civilization- A Recent Perspective, Delhi, 1993 (second edition).
Michell George, The Penguin Guide to the Monuments of India. London, 1989.
Raychaudhuri H.C, Political History of Ancient India with a commentary by B.N.Mukherjee, New Delhi, 1996 (8th edition)
Habib Irfan (General Editor), A People's History of India (Volume 1,2,3), New Delhi.
Shastri K.A Nilakantha, A History of South India, Madras, 1974 (4th Edition)
Lahiri Nayanjyot, The Decline and Fall of the Indus Civilization, New Delhi, 2000.
Ray Nihar Ranjan, Brajadulal Chattopadhyaya, V.R. Mani and Ranabii Chakravarti eds. A Source Book of Indian Civilization, Kolkata, 2000.
Sahu Bhairabi Prasad (ed.). Iron and Social Change in Early India. New Delhi: Oxford University Press, 2006.
Chakraborty Ranabir, Exploring early India, upto circa AD 1300
Kochar R., The Vedic People, New Delhi. 2000.
Majumdar R.C (General Editor), The History & Culture of the Indian People, Volumes I – III, Bombay, 1951,1968, 1970
Sharma R.S, Advent of the Aryans, Manohar, 1999.
Sharma R.S, Aspects of Political Ideas and Institutions in Ancient India. New Delhi, 2005 (reprint).
Sharma R.S, India's Ancient Past, New Delhi, 2005.
Sharma R.S, Perspectives in the Social and Economic History of Early India, New Delhi, 1983.
Sharma R.S, Sudras in Ancient India.
Salomon Richard, Indian Epigraphy: A Guide to the Study of Inscriptions in Sanskrit, Prakrit, and Other Indo-Aryan Languages. New York, 1998.
Thapar Romila (et al). India: Historical Beginnings and the Concept of the Aryan, New Delhi, 2006
Thapar Romila, From Lineage to State, Delhi, 1996 (2nd Edition)
Ratnagar Shireen, (ed), Women in Early Indian Societies. New Delhi, 1999.
Ratnagar Shireen, The End of the Great Harappan Tradition, Delhi, 2000
Roy Kumkum, The Emergence of Monarchy in North India: eighth to fourth centuries BC, NewDelhi, 1994
Ratnagar Shireen, Understanding Harappa, Delhi 2001
Saraswati S.K, A Survey of Indian Sculpture, New Delhi, 1975 (second edition)
Bhattacharji Sukumar, Women and Society in Ancient India. Calcutta, 1994.
Singh Upinder, A History of Ancient and Early Medieval India. Delhi, 2008.
বাশাম এ এল, অতীতের উজ্জ্বল ভারত, (The Wonder That Was India), প্রগ্রেসিভ পাবলিশার্স, কলকাতা, ২০০৫
চক্রবর্তী রণবীর, ভারত ইতিহাসের আদি পর্ব, কলকাতা, ২০০৭
হাবিব ইরফান, ভারতবর্ষের সাধারণ মানুষের ইতিহাস
প্রথম খন্ড – প্রাক–ইতিহাস, (Pre-history) এন বি এ, কলকাতা, ২০০২
দ্বিতীয় খন্ড: সিন্ধু সভ্যতা, (The Indus Civilisation) এন বি এ, কলকাতা, ২০০২
তৃতীয় খন্ড – বৈদিক সভ্যতা, (The Vedic Age) এন বি এ, কলকাতা, ২০০২
ঝা ডি এন, আদি ভারত – একটি সংক্ষিপ্ত ইতিহাস, (Ancient India: An Introduction), প্রগ্রেসিভ পাবলিশার্স, কলকাতা
কোশাম্বী ডি ডি, ভারত ইতিহাস চর্চার ভূমিকা (An Introduction to the Study of Indian History) বাগচি কে পি এন্ড কোং, কলকাতা, ২০০২

রত্নাগর শিরিণ, হরপ্পা সভ্যতার সন্ধানে (Understanding Harappa) এন বি এ, কলকাতা, ২০০৩
রায়চৌধুরী হেমচন্দ্র, প্রাচীন ভারতের রাজনৈতিক ইতিহাস, (Political History of Ancient India), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, কলকাতা
থাপার রোমিলা, ভারতবর্ষের ইতিহাস, ওরিয়েন্ট লংম্যান, কলকাতা
ভট্টাচার্য নরেন্দ্রনাথ, প্রাচীন ভারতে ধর্ম, কলকাতা, ১৯৮৮
ভট্টাচার্য নরেন্দ্রনাথ, প্রাচীন ভারতীয় সমাজ, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, কলকাতা
ভট্টাচার্য সুকুমারী, ইতিহাসের আলোকে বৈদিক সাহিত্য, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, কলকাতা
ভট্টাচার্য সুকুমারী, প্রাচীন ভারত- সমাজ ও সাহিত্য, আনন্দ পাবলিশার্স, কলকাতা
চক্রবর্তী দিলীপ কুমার - ভারতবর্ষের প্রাক্ ইতিহাস আনন্দ পাবলিশার্স, কলকাতা, ১৯৯৯
গঙ্গোপাধ্যায় দিলীপ কুমার - ভারত ইতিহাসের সন্ধানে, (২ খন্ডে), ২০০৭
চক্রবর্তী রণবীর, প্রাচীন ভারতের অর্থনৈতিক ইতিহাসের সন্ধানে, আনন্দ পাবলিশার্স, কলকাতা ২০০২ (সংশোধিত সংস্করণ)
চানানা দেবরাজ, প্রাচীন ভারতে দাস প্রথা, (Slavery in Ancient India as depicted in Pali and Sanskrit Texts), কে পি বাগচি এন্ড কোং, কলকাতা ১৯৯৫
রায় নীহাররঞ্জন, বাঙালির ইতিহাস, কলকাতা, ১৯৮০ (দ্বিতীয় সংস্করণ)
শর্মা রামশরণ, প্রাচীন ভারতে বস্তুগত সংস্কৃতি ও সমাজ সংগঠন, (Material Cultures and Social Formations in Ancient India), ওরিয়েন্ট লংম্যান, ১৯৯৮
শর্মা রামশরণ, আদি মধ্যযুগের ভারতীয় সমাজ : সমস্ত-প্রক্রিয়া বিষয়ে এক সমীক্ষা (Early Medieval Indian Society : A Study in Feudalism) ওরিয়েন্ট লংম্যান, ২০০৩
শর্মা রামশরণ, ভারতের সমাজতন্ত্র, (Indian Feudalism), কে পি বাগচি এন্ড কোং, কলকাতা
শর্মা রামশরণ, আর্যদের অনুসন্ধান, (Looking for the Aryans), প্রগ্রেসিভ পাবলিশার্স, কলকাতা
শর্মা রামশরণ, আর্যদের ভারতে আগমন, (Advent of the Aryans), ওরিয়েন্ট লংম্যান, ২০০১
শর্মা রামশরণ, প্রাচীন ভারতে শূদ্র, (Sudras in Ancient India), কে পি বাগচি এন্ড কোং, কলকাতা
থাপার রোমিলা, অশোক ও মৌর্যদের পতন, (Asoka and the Decline of the Mauryas), কে পি বাগচি এন্ড কোং, কলকাতা
চট্টোপাধ্যায় সুনীল, প্রাচীন ভারতের ইতিহাস (১ম খন্ড), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, একাদশ মুদ্রণ, এপ্রিল ২০০৪
চট্টোপাধ্যায় সুনীল, প্রাচীন ভারতের ইতিহাস (২য় খন্ড), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ৮ম মুদ্রণ, ফেব্রুয়ারি ২০০৪
মুখোপাধ্যায় হীরেন্দ্রনাথ, ভারতবর্ষের ইতিহাস (১ম খন্ড) (প্রাচীন ও মধ্যযুগ), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, প্রথম মুদ্রণ নভেম্বর ১৯৯৭

CC-2 : Social Formations and Cultural Patterns of the ancient world other than India

I. Evolution of human kind: Paleolithic and Mesolithic cultures – Role of kinship social institutions in the development of early societies.

II. Food production : beginnings of agriculture and animal husbandry.

III. Bronze Age civilizations, with reference to any one of the following : i)Egypt (Old Kingdom); ii)China(Shang), economy, social stratification, state structure, religion.

IV. Nomadic groups in Central and West Asia; Debate on the advent of iron and its implications.

V. Slave society in ancient Greece & Rome: agrarian economy, urbanization, trade.

VI. Polis in ancient Greece: Athens and Sparta; Greek culture.

Essential Readings

Farooqui Amar, Early Social Formations. Manak Publications Pvt. Ltd. 2002

B.Fagan, People of the Earth. : an introduction to world prehistory

New York, NY HarperCollins College Publishers 1977

B.Trigger, Ancient Egypt : A Social History. Cambridge University Press, 1983

Bai Shaoyi, An Outline History of China. Beijing : Foreign Languages Press, 1982.

Burns and Ralph, World Civilisations.

Cambridge History of Africa, Vol.I. Cambridge University Press ,1982

G.Clark, World Prehistory: A New Perspective Cambridge University Press, 1977.

Jacquetta Hawkes, First Civilisations**.** life in Mesopotamia, the Indus Valley and Egypt. The history of human society. New York: Knopf, 1973.

M.I.Finley, The Ancient Economy. University of California Press 1999.

R.J.Wenke, Patterns in Prehistory Oxford University Press, USA; 5th edition 2006

UNESCO Series: History of Mankind, Vols. I –III/ or New ed. History of Humanity.1963

V.Gordon Childe, What happened in History. Peregrine Books 1985

Suggested Readings

A.Hauser, A Social History of Art, Vol I. Routledge, 1999.

Glyn Daniel, First Civilisations. New. York: Thomas Y. Crowell (Apollo. Editions), 1968

J.D. Bernal, Science in History, Vol.I. Cambridge: The MIT Press, Massachusetts Institute of Technology, 1971

Salia Ikram, Death & Burial in Ancient Egypt (American University in Cairo Press, 2015)

V.Gordon Childe, Social Evolution.

Martin Bernal, Black Athena; the Afro Asiatic Roots of Classical Civilization Brunswick: Rutgers University Press, 1991.

গর্ডন চাইল্ড, সোশ্যাল ইভলিউশন, অসিত চৌধুরী (ভাষান্তর), দীপায়ন, কলকাতা, ১৪০৫ বঙ্গাব্দ।

গর্ডন চাইল্ড, ম্যান মেক্‌স হিমসেলফ, মগন দাস (ভাষান্তর), দীপায়ন, কলকাতা, ১৯৯৯।

গর্ডন চাইল্ড,হোয়াট হ্যাপেনড ইন হিস্ট্রি, দীপায়ন, কলকাতা।

জন ডেসমন্ড বার্নাল, ইতিহাসে বিজ্ঞান, আনন্দ, কলকাতা।

কুণাল চট্টোপাধ্যায় ও সুজাত ভদ্র, প্রাচীন গ্রীসের সমাজ ও সভ্যতা, প্রগ্রেসিভ, কলকাতা ।

সুপ্রতিম দাস, গ্রীস অনুসন্ধান, প্রগ্রেসিভ, কলকাতা ।

CC-3 : History of India C 300 BCE to C 750 CE

I. Economy and Society (circa 300 BCE to circa CE 300)
a)Expansion of agrarian economy : production relations
b)Urban growth: north India, central India and the Deccan; craft Production: trade and trade routes; coinage
c)Social stratification: class, Varna, Jati, untouchability; gender; marriage and property relations.

II. Changing political formations (circa 300 BCE to circa CE 300) :
a)The Mauryan Empire
b)Post-Mauryan Poliities with special reference to the Kushanas and the Satavahanas; Gana-Sanghas

III. Towards early medieval India (circa CE fourth century to CE 750):
a) Agrarian expansion: land grants, changing production relations; graded land rights and peasantry.
b)The problem of urban decline: patterns of trade, currency, and urban settlements.
c)Varna, proliferation of Jatis: changing norms of marriage and property
d) The nature of polities: the Gupta empire and its contemporaries: post-Gupta polities- Pallavas, Chalukyas, and Vardhanas.

IV. Religion, philosophy and society (circa 300 BCE – CE 750)
a)Consolidation of the Brahmanical tradition : dharma, Varnashram, Purushastras, Samskaras.
b)Theistic cults (from circa second century BC): Mahayana; the Puranic tradition.
c) The beginnings of Tantricism.

V. Cultural developments (circa 300 BCE to circa CE 750):
a)A brief survey of Sanskrit, Pali, Prakrit and Tamil literature. Scientific and technical treatises.
b)Art and architecture and forms and patronage; Mauryan , Post-Mauryan, Gupta , Post-Gupta

Essential Readings
Chattopadhyaya B.D, The making of early Medieval India, 1994.
Chattopadhyaya B.D, Bharatvarsha and other Essays, Permanent Black, Delhi, 2017.
Chattopadhyaya D.P, History of Science and Technology in Ancient India, 1986.
Chakravarti Ranabir, Exploring Early India upto AD 1300, Primus, Delhi, 2016.
Huntington Susan, The Art of Ancient India: Buddhist, Hindu, and Jain, New York, 1985.
Kosambi D.D, An Introduction to the Study of Indian History, 1975.
Maity S.K, Economic Life in Northern India in the Gupta Period, 1970.
Sahu B.P (ed.), Land System and Rural Society in Early India, 1997.
Sastri K.A.N, A History of South India.
Sharma R.S, Indian Feudalism, 1980.
Sharma R.S, Urban Decay in India, c.300- c1000, Delhi, Munshiram Manohar Lal, 1987
Singh Upinder, A history of Ancient and early Medieval India, 2008.
Thapar Romila, Asoka and the Decline of the Mauryas, 1997

Suggested Readings
Agarwal Asvini, The Rise and Fall of the Imperial Guptas, New Delhi,1988.
Bhattacharya N.N, Ancient Indian Rituals ad Their Social Contents, 2nd ed., 1996.
Bhattacharya N.N, History of Tantric Religion, 1982

Chakravarti Uma, The Social Dimensions of Buddhism. New Delhi: Oxford University Press, 1987.
Chakravarti Uma, Trade and Traders in Early Indian Society, New Delhi, 2007 (revised edition)
Champakalakshmi R, Trade, Ideology and Urbanization: South India: 300BC to AD 1300, Delhi, 1996.
Chanana D., Slavery in Ancient India as Depicted in Pali and Sanskrit Texts, Delhi, 1960.
Gupta P.L, Coins, 4th ed., 1996.
Harle J.C, The Art and Architecture of the Indian Subcontinent, 1987.
Lahiri Nayanjot, Ashoka in Ancient India, 2015
Majumdar R.C and Altekar A.S eds. The Vakataka Gupta Age, Varanasi, 1955.
Mukherjee B.N, Kushana Studies, New Perspectives, Kolkata, 2004
Mukherjee B.N, The Character of the Maurya Empire, Kolkata, 2000
Mukherjee B.N, The Rise and Fall of the Kushana Empire, Calcutta, 1989.
Pollock Sheldon, The Language of the Gods in the World of Men. Sanskrit, Culture and Power in Pre-modern India. New Delhi, 2006.
Ray H.P, Winds of Change, 1994.
Ray Nihar Ranjan, Maurya and Post Maurya Art, New Delhi, 1975.
Sharma R.S, Perspectives in the Social and Economic History of Early India, New Delhi, 1983.
Shastri A.M ed. The Age of the Vakatakas, Delhi, 1992.
Singh Upinder, A History of Ancient and Early Medieval India. Delhi, 2008.
Smith Bardwell ed., Essays in Gupta Culture, New Delhi, 1983.
Thapar Romila, Asoka and the Decline of the Mauryas, New Delhi, 2000
Thapar Romila, Early India: From the origins to 1300, London, 2002
Thapar Romila, The Mauryas Revisited, Calcutta,1987.
Veluthat Kesavan, The Early Medieval in South India, New Delhi, 2009

রোমিলা থাপার, অশোক ও মৌর্যদের পতন, (Asoka and the Decline of the Mauryas), কে পি বাগচি এন্ড কোং, কলকাতা
সুনীল চট্টোপাধ্যায়, প্রাচীন ভারতের ইতিহাস (১ম খন্ড), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, একাদশ মুদ্রণ, এপ্রিল ২০০৪
সুনীল চট্টোপাধ্যায়, প্রাচীন ভারতের ইতিহাস (২য় খন্ড), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ৮ম মুদ্রণ, ফেব্রুয়ারি ২০০৪
হীরেন্দ্রনাথ মুখোপাধ্যায়, ভারতবর্ষের ইতিহাস (১ম খন্ড) (প্রাচীন ও মধ্যযুগ), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, প্রথম মুদ্রণ নভেম্বর ১৯৯৭

CC-4 : Social Formations and Cultural patters of the Medieval World other than India

- **CANDIDATES CAN CHOOSE EITHER GROUP- A OR B, GROUP –C IS COMPULSORY**

GROUP- A

I. Arabia: Bedouin Society:

a) Tribal Organization (families and clans)
b) System of Alliances
c) Economic Structure
d) Language and poetry

II. The Steppes:

a) A brief outline of Central Asia (Geography and History)
b) Mongols :
(i) The strategic location of Mongolia;
(ii) Mongol Society: Tribal organization, different tribal formations, unification of the tribes under Chenghiz Khan
(iii) Brief outlines of the Mongol Empire: Case Study: The Golden Horde, Tatar rule in Russia
c) The Turks:
(i) Conversion of the Turks to Islam from Buddhism
(ii) Brief history of the Seljuks and the Ottomans
(iii) The rise of the Ottoman Empire
(iv) Ottoman Society and Administration.

GROUP- B

III. Crisis of the Roman Empire and its principal causes: Historiography

IV. Religion and Culture in Medieval Europe: Society, Religious organizations (Church and Monastery), Carolingian renaissance 12th century renaissance, Position of Women in Medieval Europe, Witchcraft and Magic, Urbanization, Rise of University, Medieval art and architecture.

V. The feudal society its origins and its crisis: Historiography

GROUP- C

VI. Judaism and Christianity under Islam

Essential Reading:

Ali, Syed Ameer, A Short History of the Saracens, Macmillan, 1900.
Allsen, Thomas T., Culture and Conquest in Mongol Eurasia (Cambridge), Cambridge University Press, March 2004.
Baker, Simon, Ancient Rome The Rise and Fall of an Empire, Ebury Publishing, 2006.
Barthold, V., A Secret History of the Mongols, Cheng & Tsui Co, June 1999.
Biran Michael, The Empire of the Qara Khitai in Eurasian History Between China and the Islamic World, Cambridge University Press, June 2008.
Bloch, Marc, Feudal Society (2 Vols), Aakar Books, Revised Edition, July, 2017.
Brundage (ed.), The Crusades, Marquette University Press, 1962.
Burke, Edmund, III & Ira M. Lapidus, Islam, Politics and Social Movements, University of California Press, 1988.
Burke, Peter, Popular Culture, Ashgate Publishing Ltd, 2009.

Cohen, Mark, Under Crescent and Cross The Jews in the Middle Ages, Princeton University Press, 2008.
Deansley, Margaret, A History of Early Medieval Europe, 476 to 911, Methuen, 1956.
Dobb, Maurice Dobb, Studies in the Development of Capitalism, Routledge, First Edition, March, 1965.
Goff, Le, Medieval Civilizations (400-1500), Blackwell Publishing, August 1991.
Hitti, Philip K., History of the Arabs, Macmillan Education Ltd., First Edition, 1937.
Inalcik, Halil, The Ottoman Empire, Phoenix, December 2001.
Lewis, Bernard, The Arabs in History, Oxford University Press, 6th Edition, May 2002.
Lewis, Bernard, The Jews of Islam, 1984.
Man, John, The Mongol Empire, Penguin Random House, May 2015.
Pirenne, Heim, Medieval Cities, Princeton University Press, 1969.
Smith, Leslie and Leyser, Conrad; Motherhood, Women and Society in Medieval Europe (400-1400), Ashgate Publishing Ltd, 2011.
Stuard, Susan Mosher (Ed.), Women in Medieval History and Historiography, University of Pennsylvania Press; New edition, December, 1988.

CC-5 : History of India (CE 750 – 1206)

I. Studying Early Medieval India:
Historical geography sources: texts, epigraphic and numismatic data. Debates on Indian Feudalism, rise of the Rajputs and the nature of the state.

II. Political Structures:
a) Evolution of political structures: Rashtrakutas, Palas, Pratiharas, Rajputs and Cholas.
b) Legitimization of kingship; Brahmanas and temples; royal genealogies and rituals
c)Arab conquest of Sindh : nature and impact of the new set-up; Ismaili Dawah
d) Cause and consequences of early Turkish invasions : Mamud of Ghazna; Shahab-ud-Din of Ghur.

III. Agrarian structure and social change:
a) Agricultural expansion; crops
b)Landlords and peasants
c)Proliferation of castes: status of untouchables
d) Tribes as peasants and their place in the Varna order

IV. Trade and Commerce
a) Inter-regional trade
b) Maritime trade
c) Forms of exchange
d)Process of urbanization
e)Merchant guilds of South India

V. Religious and Cultural developments:
a)Bhakti, Tantrism, Puranic traditions; Buddhism and Jainism; Popular religious cults.
b) Islamic intellectual traditions: Al-Biruni; Al-Hujwiri
c)Regional languages and literature

d)Art and architecture: Evolution of regional styles.

Essential Readings

Chattopadhyaya, B.D, The Making of Early Medieval India, 1994.
Karashima, N., South Indian History and Society (Studies from Inscriptions, AD 850 – 1800)
Kulke, Hermann, ed., The State in India (AD 1000 – AD 1700)
Sharma, R.S and Shrimali, K.M eds., Comprehensive History of India, Vol. IV (A & B)
Sharma, R.S. Indian Feudalism (circa 300 – 1200)
Singh,Vipul Interpreting Medieval India, Volume-I, Early Medieval, Delhi Sultanate and Regions (circa 750 – 1550), 2009.

Suggested Readings :

Basham, A.L., (ed.), A Cultural History of India
Basham, A.L., The Wonder that was India
Bose Mandakranta (ed.), Faces of Feminine in Ancient Medieval and Modern India, New York, 2000
Chakravarti Ranabir, Exploring Early India upto Circa AD 1300
Chakravarti, R(ed.), Trade in Early India, Delhi
Champalakshmi, R, Trade, Ideology and Urbanisation :South India 300 BC – AD 1300, Delhi, 1966
Chandra, S, History of Medieval India (800 -1700)
Chattopadhyay, B.D, Aspects of Rural settlements and Rural Society in Early Medieval India
Chattopadhyay, B.D, Science and Society in Ancient India, Calcutta, 1977
Chattopadhyay, B.D, Studying Early India: Arcchaeology, Texts and Historical Issues , New Delhi, 2003
Chaudhuri, K.N, Trade and Civilisation in the Indian Ocean : An Economic History from the Rise of Islam to 1750
Gopal Lalanji, The Economic Life of Northern India ,Varanasi, 1965
Habib, Irfan, Economic History of Medieval India: A Survey, New Delhi, 2001
Habib, Irfan, Medieval India: The Study of a Civilisation ,New Delhi, 2008
Habib, Md. And Nizami KA (eds), A Comprehensive History of India Vol. V
Habibullah, A.B.M, The Foundation of Muslim Rule in India
Jackson, Peter, The Delhi Sultanate: A Political & Military History, Cambridge, 1999
Jha D.N (ed), The Feudal Order, New Delhi, 2000
Kulke, H., The State in India (1000- 1700)
Majumdar R.C and Dasgupta K.K.(eds), A Comprehensive History of India Vol.Ill
Majumdar R.C. et al (eds), History and Culture of the Indian People Vol. IV and Vol. V
Meister M.M & Dhaky MA, Indian Temple Architecture, Delhi, 1983
Mukherjee B.N, Post-Gupta Coinages of Bengal, Calcutta, 1989
Mukhia, H., The Feudalism Debate
Rakaswami Vijaya, Walking Naked: Women,Society, Spirituality in South India (Simla, 1997)
Ray H.C, Dynastic History of Northern India (New Delhi, 1973)
Ray Nihar Ranjan et al ed., A Source Book of Indian Civilisation (Kolkata, 2000)
Rizvi, S.A.A, The Wonder that was India, Vol. II
Roy Kumkum (ed), Women in Early Indian Societies (New Delhi, 1999)
Sastri , K.A. Nilkanta, A History of South India from Prehistoric Times to the Fall of Vijaynagar,
Sastri K.A. Nilkantha, The Cholas (Madras, 1975 [reprint])
Sastri, K.A. Nilkanta (ed), A Comprehensive History of India Vol. II
Sharma R.S, Early Medieval Indian Society: A Study in Feudalisation, Delhi, 2001.
Sharma R.S, Indian Feudalism, University of Calcutta, 1965.

Sharma R.S, Perspectives in the Social and Economic History of Early India, New Delhi, 1983.
Sharma, R.S, Early Medieval Indian Society: A Study in Feudalisation (Delhi, 2001)
Sharma, R.S, Indian Feudalism
Singh Upinder ed., Rethinking Early Medieval India : A Reader, 2011
Singh Upinder, A History of Ancient and Early Medieval India. Delhi, 2008.
Thapar Romila, Early India: From the Origins to AD 1300, London, 2002
Thapar, R; Early India
Veluthat, K; The Political Structure of Early Medieval South India
India and the Expansion of Islam 7-11 century, 1990
Yadava, B.N.S, Society & Culture in North India in the 12th century
Yazdani, G., (ed), The Early History of the Deccan

বাশাম এ এল, অতীতের উজ্জ্বল ভারত, (The Wonder That Was India), প্রগ্রেসিভ পাবলিশার্স, কলকাতা, ২০০৫
মুখোপাধ্যায় হীরেন্দ্রনাথ, ভারতবর্ষের ইতিহাস (১ম খন্ড) (প্রাচীন ও মধ্যযুগ), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, প্রথম মুদ্রণ নভেম্বর ১৯৯৭
ভট্টাচার্য, নরেন্দ্রনাথ, ধর্ম ও সংস্কৃতিক: প্রাচীন ভারতীয় প্রেক্ষাপট
চক্রবর্তী রণবীর, প্রাচীন ভারতের অর্থনৈতিক ইতিহাসের সন্ধানে, আনন্দ পাবলিশার্স, কলকাতা ২০০২
চক্রবর্তী রণবীর, ভারত ইতিহাসের আদি পর্ব, ওরিয়েন্ট লংম্যান,কলকাতা, ২০০৭
সেন সমরেন্দ্রনাথ, বিজ্ঞানের ইতিহাস, শৈব্যা প্রকাশন, ১৯৯৬
শর্মা রামশরণ, ভারতের সামন্ততন্ত্র, (Indian Feudalism), কে পি বাগচি এন্ড কোং, কলকাতা
শর্মা রামশরণ, আদি মধ্যযুগের ভারতীয় সমাজ: সামন্ত-প্রক্রিয়া বিষয়ে এক সমীক্ষা(Early Medieval Indian Society: A Study in Feudalisation), ওরিয়েন্ট লংম্যান, ২০০৩

CC-6 : Rise of the Modern West - I

I. Transition Debate on transition from feudalism to capitalism: problems and theories.

II a) The exploration of the new world: motives.
b.) Portugese and Spanish voyages.

III. a) Renaissance : its social roots
b.) Renaissance humanism
c.) Rediscovery of classics
d.) Italian renaissance and its impact on art, culture, education and political thought.
e.) Its spread in Europe

IV. a) Reformation movements: Origins & courses
b.) Martin Luther & Lutheranism
c.) John Calvin & Calvinism
d.) Radical reformation: Anabapists and Huguenots
e.) English reformation and the role of the state
f.) Counter Reformation

V. a) Economic developments
b.) Shift of economic balance from the Mediterranean to the Atlantic
c.) Commercial Revolution
d.) Price Revolution
e.) Agricultural Revolution and the Enclosure Movement

VI. a) Development of national monarchy
b.) Emergence of European state system

Essential Readings

Butterfield H., The Origins of Modern Science. The Macmillan Company. 1959
Cipolla Carlo M., Fontana Economic History of Europe, Vols. II and III Collins/ Fontana Books; 1978
Cipolla Carlo M., Before the Industrial Revolution, European Society and Economy, 1000-1700, W. W. Norton & Company; 3rd edition 1994
Coleman D.C (ed.), Revisions in Mercantilism Methuen & Co, 1969.
Davis Ralph, The Rise of the Atlantic Economics. Cornell University Press, 1973
Dobb Maurice, Studies in the Development of Capitalism, International Publishers, 1947
Parker G., Europe in Crisis, 1598-1648 Ithaca, N.Y. : Cornell University Press. 1980
Parry, J.H., The Age of Reconnaissance University of California Press, 1981
Phukan Meenaxi, Rise of the Modern West: Social and Economic History of Early Modern Europe. Laxmi Publications 2013
Poliensky.V, war and Society in Europe, 1618-48 Cambridge University Press, 2008
Rabb Theodore K., The Struggle for Stability in Early Modern Europe. Oxford University Press, 1975
Scammell V., The First Imperial Age: European Overseas expansion, 1400-1715. Routledge, 2003

Vries Jan de, Economy of Europe in an Age of Crisis 1600-1750. New York: Cambridge University Press, 1976

Suggested Readings :

Anderson M.S, Europe in the Eighteenth Century Holt, Rinehart and Winston, 1961
Anderson, Perry, The lineages of the Absolutist States. Verso, 1979
Aston, T.H and Philipin C.H.E (eds.), The Brenner Debate: Agrarian Class Structure and Economic Development in Pre-Industrial Europe, Cambridge University Press, 2005.
Bernal J.D, Science in History Cambridge: The MIT Press, 1954
Burke, Peter, The Renaissance . Humanities Press International, 1987
Camerson, Euan (ed.), Early Modern Europe: An Oxford History, Oxford University Press 2001.
Dunn Rechard S., The Age of Religious Wars, 1559-1715, W.W.Norton & Company, 2004
Elton, G.R., Reformation Europe, 1517-1559 Wiley, 1999
Gilmore, M.P., The World of Humanism, 1453-1517 New York, Harper 1952
Hall, R., From Galileo to Newton Courier Corporation, 1981
Hill, Christopher, A century of Revolutions. Psychology Press, 2002
Hilton, Rodney, Transition from feudalism to Capitalism, Aakar Books, 2006
Koenigsberger, H.G and Mosse, G.L., Europe in the Sixteenth Century. Longmans, 1961

Lee, Stephen J., Aspects of European History, 1494-1789 Routledge, 1982
Parker, G. and Smith, L.M., General Crisis of the Seventeenth Century. Boston : Routledge & Kegan Paul, 1978.
Pennington, D.H., Seventeenth Century Europe. Longman, 1972
Rabb, Theodore K., The Struggle for Stability in Early Modern Europe. Oxford University Press, 1975
Rice, Eugene F. and Grafton, Anthony, The Foundations of Early Modern Europe, 1460-1559, W.W.Norton & Company, 2004.
The Cambridge Economic History of Europe, Vol.I, IV Cambridge University Press 1944
The New Cambridge Economic History of Europe, Vol.I, VII.

ত্রিপাঠী অমলেশ, ইতালির রেনেসাঁস বাঙালির সংস্কৃতি, আনন্দ পাবলিশার্স, কলকাতা ১৯৯৪
দাশগুপ্ত অশীন, ভারত মহাসাগরে বাণিজ্য ও রাজনীতি ১৫০০–১৮০০, আনন্দ পাবলিশার্স, কলকাতা, ১৯৯৯
বার্নাল জে ডি, ইতিহাসে বিজ্ঞান, (Science in History**)**, আনন্দ পাবলিশার্স, কলকাতা, ২০০৫
সেন সমরেন্দ্র, বিজ্ঞানের ইতিহাস, শৈব্যা প্রকাশন, কলকাতা, ১৯৯৬
ভট্টাচার্য স্নেহাদ্রি, ইংলন্ডের ইতিহাস (টিউডর যুগ), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, কলকাতা, ১৯৯৫
চক্রবর্তী ভাস্কর, চক্রবর্তী সুভাষ রঞ্জন এবং চট্টোপাধ্যায় কিংশুক, ইউরোপে যুগান্তর, নবভারতী প্রকাশনী, কলকাতা, ২০০৫
মুখার্জী রীলা, রূপান্তরিত ইউরোপ(৯০০ - ১৮০০), প্রগ্রেসিভ পাবলিশার্স, কলকাতা, ২০০৪

CC-7 : HISTORY OF INDIA (c.1206-1526)

I. Interpreting the Delhi Sultanate:
Survey of sources: Persian tarikh tradition; vernacular histories; epigraphy

II. Sultanate Political Structures:
a. Foundation, expansion and consolidation of the Sultanate of Delhi; the Khaljis and the Tughluqs; Mongol threat and Timur's invasion; Rise and fall of Syed dynasty; The Lodis; Conquest of Bahlul and Sikandar; Ibrahim Lodi and the battle of Panipat;
b. Theories of Kingship; Ruling elites; Sufis, Ulama and the political authority; imperial monuments and coinage
c. Emergence of provincial dynasties: Bahamanis, Vijayanagar, Gujarat, Malwa, Jaunpur and Bengal
d. Consolidation of regional identities: regional art, architecture and literature

III. Society and Economy:
a. Iqta and the revenue-free grants
b. Agriculture production; technology
c. Changes in rural society; revenue systems
d. Monetization; market regulations; growth of urban centres; trade and commerce; Indian Ocean trade

IV. Religion and Culture:
a. Sufi silsilas: Chishtis and Suhrawardis; doctrines and practices; social roles.
b. Bhakti movements and monotheistic traditions in South and North India; Women Bhaktas;
Nathpanthis; Kabir, Nanak and the Sant tradition
c. Sufi literature; Malfuzat; Premakhayans
d. Architecture of the Delhi Sultanate

ESSENTIAL READINGS:
Asher, Catherine and Talbot Cynthia, India before Europe, Cambridge University Press, March 2006.
Chandra Satish, Medieval India I, Har Anand Publication, New Delhi, July 2007.
Habib Mohammad and Nizami K.A., eds, Comprehensive History of India, Vol. V, The Delhi Sultanate, People's Publishing House, 2nd Edition, 1992.
Hasan Mohibul, Historians of Medieval India, Meenakshi Prakashan, 1968.
Jackson Peter, The Delhi Sultanate, Cambridge University Press, Revised Edition, 2003.
Schomer, Karine, and McLeod W.H., (Eds), The Sants Studies in A Devotional Tradition of India, Motilal Banarsidas, Delhi, 1987.
Nizami K.A., Some Aspects of Religion and Politics in India During the 13th Century, Aligarh, 1961.
Raychaudhuri Tapan and Habib Irfan, (Eds), Cambridge Economic History of India, Vol. I: c. 1200 – c. 1750, Cambridge University Press, Cambridge, 1982, 1987 (reprint).
Rizvi S.A.A., A History of Sufism in India, Vol. I, Munshiram Manoharlal, New Delhi, 1978.

Suggested Readings
Ashraf K.M, Life and Conditions of the People of Hindusthan (1250 – 1550), Gyan Publishing House, 2000.

Eaton, R.M, The Rise of Islam and the Bengal Frontier (1204- 1760), University of California Press, July 1996.
Habib, Irfan, Medieval India: The Study of a Civilization, National Book Trust, July 2008.
Karashima, Noboru, South Indian History and Society: studies from inscriptions, A.D. 850 - 1800, Oxford, 1984.
Karashima, Noboru, Towards a New Formation: South Indian Society under Vijayanagara, Oxford University Press, 1992.
Kumar Sunil, The Emergence of the Sultanate of Delhi, Permanent Black, Delhi, First edition, 2010.
Stein, Burton, Peasant State and Society in Medieval South India, Oxford University Press, Oxford, February 1995.
Sherwani, H.K., Joshi, P.M. (eds), The History of Medieval Deccan (1295 - 1724), Government of Andhra Pradesh, Hyderabad, 1973-74.
Singh,Vipul, Interpreting Medieval India, Volume-I, Early Medieval, Delhi Sultanate and Regions (circa 750 – 1550), Macmillan Publishers India Ltd, 2009.
Tripathi, R.P; Some Aspects of Muslim Administration, The Indian Press Ltd., 1936.
Wink, Andre, Al Hind; The Making of the Indo Islamic World, Volume I – Early Medieval, Brill Academic Publishers, 2nd Edition, 1991.

রায় মিহিরকুমার, ভারতের ইতিহাস (তুরক-আফগান যুগ), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, দ্বিতীয় মুদ্রণ, ফেব্রুয়ারী ১৯৯২
হাবিব ইরফান, মধ্যযুগের ভারতের অর্থনৈতিক ইতিহাস, (Economic History of Medieval India: A Survey), প্রগ্রেসিভ পাবলিশার্স
হাবিব ইরফান, মধ্যকালীন ভারত ১-৪ খন্ড (Medieval India)কে পি বাগচি এন্ড কোং, কলকাতা
হাবিবুল্লাহ এ বি এম, ভারতে মুসলিম শাসনের প্রতিষ্ঠা ১২০৬-১২৯০, (The Foundation of Muslim Rule in India), প্রগ্রেসিভ পাবলিশার্স, কলকাতা
রায় অনিরুদ্ধ ও চট্টোপাধ্যায় রত্নাবলী, মধ্যযুগে বাংলার সমাজ ও সংস্কৃতি, কে পি বাগচি এন্ড কোং, কলকাতা ১৯৯২
রায় অনিরুদ্ধ, মধ্যযুগের ভারতের ইতিহাস : সুলতানি আমল, ওরিয়েন্ট লংম্যান, কলকাতা
করিম আব্দুল, বাংলার ইতিহাস : সুলতানি আমল, ঢাকা

CC-8 : Rise of the Modern West - II

I. **a)** Printing Revolution.
b) Revolution in war techniques

II . a.) Crisis in Europe in the 17th century
b.) Its economic, social and political dimensions

III. a.) The English Revolution : major issues
b.) Political and intellectual issues

IV. **a**.) Scientific Revolution
b.) Emergence of scientific academies
c.) Origins of Enlightenment

Va.) Mercantilism and European economics
b.) Preludes to the Industrial Revolution

VI. a). European Politics in the 17th & 18th Century
b.) Parliamentary monarchy
c.) patterns of Absolutism in Europe

Essential Readings

Butterfield H., The Origins of Modern Science. The Macmillan Company. 1959
Cipolla Carlo M., Fontana Economic History of Europe, Vols. II and III Collins/ Fontana Books; 1978
Cipolla Carlo M., Before the Industrial Revolution, European Society and Economy, 1000-1700, W. W. Norton & Company; 3rd edition 1994
Coleman D.C (ed.), Revisions in Mercantilism Methuen & Co, 1969.
Davis Ralph, The Rise of the Atlantic Economics. Cornell University Press, 1973
Dobb Maurice, Studies in the Development of Capitalism, International Publishers, 1947
Parker G., Europe in Crisis, 1598-1648 Ithaca, N.Y. : Cornell University Press. 1980
Parry, J.H., The Age of Reconnaissance University of California Press, 1981
Phukan Meenaxi, Rise of the Modern West: Social and Economic History of Early Modern Europe. Laxmi Publications 2013
Poliensky.V, war and Society in Europe, 1618-48 Cambridge University Press, 2008
Rabb Theodore K., The Struggle for Stability in Early Modern Europe. Oxford University Press, 1975
Scammell V., The First Imperial Age: European Overseas expansion, 1400-1715. Routledge, 2003
Vries Jan de, Economy of Europe in an Age of Crisis 1600-1750. New York: Cambridge University Press, 1976

Suggested Readings :

Anderson M.S, Europe in the Eighteenth Century Holt, Rinehart and Winston, 1961
Anderson, Perry, The lineages of the Absolutist States. Verso, 1979
Aston, T.H and Philipin C.H.E (eds.), The Brenner Debate: Agrarian Class Structure and Economic Development in Pre-Industrial Europe, Cambridge University Press, 2005.

Bernal J.D, Science in History Cambridge: The MIT Press, 1954
Burke, Peter, The Renaissance . Humanities Press International, 1987
Camerson, Euan (ed.), Early Modern Europe: An Oxford History, Oxford University Press 2001.
Dunn Rechard S., The Age of Religious Wars, 1559-1715, W.W.Norton & Company, 2004
Elton, G.R., Reformation Europe, 1517-1559 Wiley, 1999
Gilmore, M.P., The World of Humanism, 1453-1517 New York, Harper 1952
Hall, R., From Galileo to Newton Courier Corporation, 1981
Hill, Christopher, A century of Revolutions. Psychology Press, 2002
Hilton, Rodney, Transition from feudalism to Capitalism, Aakar Books, 2006
Koenigsberger, H.G and Mosse, G.L., Europe in the Sixteenth Century. Longmans, 1961

Lee, Stephen J., Aspects of European History, 1494-1789 Routledge, 1982
Parker, G. and Smith, L.M., General Crisis of the Seventeenth Century. Boston : Routledge & Kegan Paul, 1978.
Pennington, D.H., Seventeenth Century Europe. Longman, 1972
Rabb, Theodore K., The Struggle for Stability in Early Modern Europe. Oxford University Press, 1975
Rice, Eugene F. and Grafton, Anthony, The Foundations of Early Modern Europe, 1460-1559, W.W.Norton & Company, 2004.
The Cambridge Economic History of Europe, Vol.I, IV Cambridge University Press 1944
The New Cambridge Economic History of Europe, Vol.I, VII.

ত্রিপাঠী অমলেশ, ইতালির রেনেসাঁস বাঙালির সংস্কৃতি, আনন্দ পাবলিশার্স, কলকাতা ১৯৯৪
দাশগুপ্ত অশীন, ভারত মহাসাগরে বাণিজ্য ও রাজনীতি ১৫০০–১৮০০, আনন্দ পাবলিশার্স, কলকাতা, ১৯৯৯
বার্নাল জে ডি, ইতিহাসে বিজ্ঞান, (Science in History**)**, আনন্দ পাবলিশার্স, কলকাতা, ২০০৫
সেন সমরেন্দ্র, বিজ্ঞানের ইতিহাস, শৈব্যা প্রকাশন, কলকাতা, ১৯৯৬
ভট্টাচার্য স্নেহাদ্রি, ইংলন্ডের ইতিহাস (টিউডর যুগ), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, কলকাতা, ১৯৯৫
চক্রবর্তী ভাস্কর, চক্রবর্তী সুভাষ রঞ্জন এবং চট্টোপাধ্যায় কিংশুক, ইউরোপে যুগান্তর, নবভারতী প্রকাশনী, কলকাতা, ২০০৫
মুখার্জী রীলা, রূপান্তরিত ইউরোপ(৯০০ - ১৮০০), প্রগ্রেসিভ পাবলিশার্স, কলকাতা, ২০০৪

CC-9 : History of India (c 1526 – 1605)

I. Sources and Historiography:
a) Persian literary culture; translations; Vernacular literary traditions.
b)Modern Interpretations

II. Establishment of Mughal rule:
a) India on the eve of Babur's Invasion
b) Fire arms, military technology and warfare
c) Humayun's struggle for empire
d) Sher Shah and his administrative and revenue reforms

III. Consolidation of Mughal rule under Akbar:
a) Campaigns and conquests: tactics and technology
b) Evolution of administrative institutions : Zabt, Masnab, Jagir, Madad-I-Maash
c) Revolts and resistance

IV. Expansion and Integration:
a)Incorporation of Rajputs and other indigenous groups in Mughal nobility.
b)North-West frontier, Gujarat and the Deccan
c) Conquest of Bengal

V. Rural Society and Economy:
a)Land rights and revenue system; Zamindars and Peasants; rural tensions
b)Extension of agriculture; agricultural production; crop patterns
c) Trade routes and patterns of internal commerce; overseas trade; rise of Surat

VI. Political and religious ideals:
a)Inclusive political ideas: theory and practice
b) Religious tolerance and Sulh-i-kul; Sufi mystical and intellectual interventions
c)Pressure from the Ulama

Readings

For readings – see the listing given in Paper -10

CC-10: History of India (c 1605 – 1750s)

I. Sources: Persian and vernacular literary cultures, histories, memoirs and travelogues
II. Political Culture under Jahangir and Shah Jahan
a) Extension of Mughal rule; changes in Mansab and Jagir systems; imperial culture
b) Orthodoxy and syncretism – Naqshbandi Sufis, Miyan Mir, Dara Shukoh, Samrad

III. Mughal Empire under Aurangzeb
a) State and religion under Aurangzeb; issues in the war of succession; policies regarding religious groups and institutions
b) Conquests and limits of expansion
c) Beginning of the crisis: contemporary perceptions; agrarian and Jagir crises; revolts.

IV. Visual Culture: Paintings and Architecture
V. Patterns of Regional Politics:
a) Rajput political culture and state formation
b) Deccan kingdoms; emergence of the Marathas; Shiva; expansion under the Peshwas
c) Mughal decline; emergence of successor states
d) Interpreting eighteenth century India: recent debates

V. Trade and Commerce
a)Crafts and technologies; Monetary system
b) Markets, transportation, urban centres
c) Indian Ocean trade network

Essential Readings

Alam Muzaffar and Subramaniam Sanjay , eds., The Mughal state, 1526-1750
Ali Athar M., The Mughal Nobility under Aurangzeb
Chandra Satish, Essays on Medieval Indian History
Dasgupta Ashin, Indian Merchants and the Decline of Surat, 1700 – 1750
Gordon Stewart, The Marathas 1600 – 1818
Habib Irfan, Agrarian System of Mughal India, 1526 – 1701
Koch Ebba, Mughal Art and Imperial Ideology
Qanungo, K.R, Dara Shukoh
Richards, J.F, The Mughal Empire
Rizvi, S.A.A, Muslim Revivalist Movements in Northern India.

Suggested Readings

Alam, Muzaffar-The Crisis of Empire in Mughal North India: Awadh and Punjab-1707-1748.
Alavi,Seema (ed.),The Eighteenth Century in India
Ali, M. Athar, Mughal India: Studies in Polity, Ideas, society and Culture.
Arasaratnam S., Maritime India in the Seventeenth Century
Asher Catherine, Architecture of Mughal India
Bandyopadhya S, From Plassey to Partition
Barnett,R.B, North India between Empires: Awadh, the Mughals and the British.
Bashir, Ahmed, Akbar, the Mughal Emperor.
Bayly, Susan, Caste, Society and Politics in India from the 18th century to the modern age.
Bayly,C.A., Indian Society and the Making of the British Empire;
Beach Milo, Mughal and Rajpur Paintings

Bernier, F, Travels in Mughal India.
Chandra Satish, Parties and Politics at the Mughal Court
Chandra, Satish, A History of Medieval India (Part II)
Chandra, Satish, Historiography, Religion and State in Medieval India
Chandra, Satish, Mughal Religious Policies, the Rajputs and the Deccan.
Chandra, Satish, The 18th century in India: Its economy and the Role of the Marathas, the jats and the Sikhs and the Afghans and Supplement (K.P.Bagchi)
Chaudhuri, K.N.,Trade & Civilization: An Economic History from the Rise of Islam to 1750.
Eaton, R.M., The Rise of Islam and the Bengal Frontier 1204-1760;
Eaton, R.M., The Sufis of Bijapur
Fukuzawa,H., The Medieval Deccan: Peasants, Social systems and States 16th to 18th centuries.
Gordon S.,The Marathas 16oo-1818
Grewal J.S.,The Sikhs of the Punjab
Habib Irfan(ed.), Medieval India
Habib Irfan (ed), Resistance and Modernization under Haider Ali and Tipu Sultan
Hasan S., Nurul,Thoughts on Agrarian Relations in Mughal India
Hasan S.Nurul, Reliogn, State, and Society in Medieval India
Husain Iqbal, Ruhela Chieftancies in 18th Century India
Kulke, H.(ed.),The State in India 1000-1700.
Malik, Z.U, The Reign of Muhammad Shah
Marshall P J., (Edited) , The Eighteenth century in Indian history: Evolution or revolution
Marshall P J.,East Indian Fortunes: the British in Bengal in the 18th Cent,
Mukhia Harbans, The Mughals of India
Nizami K.A., (ed.) Politics and society during the early Medieval Period : The collected Works of Prof. Md. Habib (2 vols.)
Raychoudhuri T.K. & Habib I. (eds.)-The Cambridge Economic History of India Vol.l
Richards J.F.,The Mughal Empire
Richards, J.F, Mughal Administration in Golconda
Rizvi S.A.A., A History of Sufism in India
Rizvi S.A.A., The Wonder that was India (vol.2);
Sarkar, Sir J.N., History of Aurangzeb 5 vols.
Sarkar, Sir J.N.,The Fall of the Mughal Empire, 4 vols.
Siddiqi. N.A., Land Revenue Administration Under the Mughals (1700- 1750)
Stein, Burton, Eighteenth Century in India: Another view (Studies in History, No.I, 1989)
Stein, Burton, Peasant, State and Society in Medieval South India (Oxford University Press)
Streusand D.F., The Formation of the Mughal Empire
Tripathi R.P., Some Aspects of Muslim Administration
Tripathi R.P.,The Rise & Fall of the Mughal Empire
Wink, Andre, Land and Sovereignty in India: Agrarian society and politics under the eighteenth century Maratha Swarajya.

আলি এম আথার, আওরঙ্গজেবের সময়ে মুঘল অভিজাত শ্রেণী(The Mughal Nobility under Aurangzeb) কে পি বাগচি এন্ড কোং, কলকাতা
বন্দ্যোপাধ্যায় শেখর, অষ্টাদশ শতকের মুঘল সংকট ও আধুনিক ইতিহাস চিন্তা, কলকাতা,১৯৮৩
ভদ্র গৌতম, মুঘল যুগে কৃষি অর্থনীতি ও কৃষক বিদ্রোহ, সুবর্ণরেখা, কলকাতা, ১৯৮৩
চন্দ্র সতীশ, মুঘল দরবারে দল ও রাজনীতি, (Parties and politics at the Mughal Court 1707-1740) কে পি বাগচি এন্ড কোং, কলকাতা

চৌধুরী বিনয় ভূষণ ও অন্যান্যরা, বাংলার কৃষি সমাজের গঠন, কে পি বাগচি এন্ড কোং, কলকাতা
হাবিব ইরফান, মধ্যকালীন ভারত, খন্ড ১-৪, কে পি বাগচি এন্ড কোং, কলকাতা
হাবিব ইরফান, মুঘল সাম্রাজ্য ও তার পতন- একটি সমীক্ষা, পশ্চিমবঙ্গ ইতিহাস সংসদ,২০০০
হাবিব ইরফান, মুঘল ভারতের কৃষি ব্যবস্থা, (The Agrarian System of Mughal India (1556-1707)), কে পি বাগচি এন্ড কোং, কলকাতা
হাবিব ইরফান, মধ্যযুগের ভারতের অর্থনৈতিক ইতিহাস, (Economic History of Medieval India: A Survey), প্রগ্রেসিভ পাবলিশার্স, কলকাতা, ২০০৯
হাবিব ইরফান, ভারতের ইতিহাস প্রসঙ্গঃ মার্কসীয় চেতনার আলোকে (Essays in Indian History: Towards a Marxist Perception), ন্যাশনাল বুক এজেন্সি, কলকাতা, ১৯৯৯
রায় অনিরুদ্ধ, মধ্যযুগের ভারতের অর্থনৈতিক ইতিহাস, ১২০০-১৭৫৭, প্রগ্রেসিভ পাবলিশার্স, কলকাতা
রায় অনিরুদ্ধ, মুঘল যুগের অর্থনৈতিক ইতিহাস, কে পি বাগচি এন্ড কোং, কলকাতা
সরকার জগদীশ নারায়ণ, মুঘল অর্থনীতিঃ সংগঠন এবং কার্যক্রম, (Mughal Economy : Organisation and Working) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, কলকাতা ১৯৯১
সিদ্দিকী নোমান আহমেদ, মোঘল রাজত্বে ভুমিরাজস্ব পরিচালন ব্যবস্থা (১৭০০ – ১৭৫০) (Land Administration Under the Mughals (1700 -1750) পার্ল পাবলিশার্স, কলকাতা, ১৯৮০
মুখোপাধ্যায় হীরেন্দ্রনাথ, ভারতবর্ষের ইতিহাস (২য় খন্ড)
(মুঘল ও ব্রিটিশ ভারত,পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ,কলকাতা ১৯৯৮
চট্টোপাধ্যায় রত্নাবলী, মুঘল যুগের দরবারি চিত্রকলা, থীমা, কলকাতা

CC-11: History of Modern Europe (c.1780 – 1939)

I. The French Revolution and its European repercussions:
a) Crisis of *ancien regime*
b) Intellectual currents
c) Social classes and emerging gender relations.
d) Phases of the French Revolution
e)Art and Culture of French Revolution
f)Napoleonic consolidation – reform and empire.

II. Restoration and Revolution: c.1815 - 1848
a) Forces of conservatism and restoration of old hierarchies.
b) Social, Political and intellectual currents.
c) Revolutionary and Radical movements, 1830 -1848

III. Capitalist Industrialization and Social and Economic Transformation (Late 18th century to AD 1914)
a) Process of capitalist development in industry and agriculture: case studies of Britain, France, the German States and Russia.
b) Evolution and Differentiation of social classes : Bourgeoisie, proletariat, Land Owning classes and peasantry.
c) Changing trends in demography and urban patterns
d)Family, gender and process of industrialization.

IV. Varieties of Nationalism and the Remaking of States in the 19th and 20th centuries.
a)Intellectual currents, popular movements and the formation of National identities in Germany, Italy, Ireland and the Balkans.
b) Specifications of economic development, political and administrative Reorganization – Italy; Germany.
c) Revolutions of 1905; the Bolshevik Revolution of 1917
d) Programme of Socialist Construction and the Soviet Union during the inter-war period 1918-39.

V. Imperialism, War and Crisis: c.1880 - 1918
a) Theories and mechanisms of imperialism;
b) Growth of Militarism;
c) Power blocks and alliances;
d) Expansion of European empires
e) War of 1914 - 1918

VI. Europe between Two World Wars:
a) Post War Europe: A Diplomatic History
b) The Great Depression
c) Rise of Fascism in Italy and Nazism in Germany
d) The Spanish Civil War
e) Policy of Appeasement and Russo German Non-Aggression Pact
f) Origins and Course of the Second World War

Essential Readings

Brennan Gerald, The Spanish Labyrinth: An Account of the Social and Political Background of the Civil War.
Cipolla C.M, Fontana Economic History of Europe, Volume III: The Industrial Revolution
Davies Norman, Europe
Evans J., The Foundations of a Modern State in 19th Century Europe
Hamerow T.S, Restoration, Revolution and Reaction : Economics and Politics in Germany [1815 – 1871]
Hobsbawn, E.J, The Age of Revolution
Hunt Lynn, Politics, Culture and Class in the French Revolution
Joll James, Europe Since 1870
Landes David; Prometheus Unbound
Lefebvre George, Coming of the French Revolution
Lichteim, A Short History of Socialism
Mathias Peter, First Industrial Revolution
Nove, Alec; An Economic History of the USSR
Porter Andrew, European Imperialism, 1876 – 1914
Wood Anthony, History of Europe, 1815 – 1960
Woolf Stuart, History of Italy, 1700 to 1860

Suggested Readings

Barraclough G., An Introduction to Contemporary History
Blanning, T.C.W, The French Revolution: Class War or Culture Clash
Braudel Fernand, History and the Social Science in M. Aymard and Mukhia H. ed., French Studies in History, Vol.I (1989)
Briggs Asa and Clavin Patricia, Modern Europe: 1789 – Present
Calleo D, German Problem Reconsidered
Carr E.H, International Relations between the Two World Wars
Carr E.H, The Bolshevik Revolution (Vol. I, II, III)
Cobban, Alfred, History of Modern France, Volume I – III
Dobb Maurice, Soviet Economic Development since 1917
Doyle, William, Origins of the French Revolution
Droz. Jacques, Europe Between Revolutions
Ellis G., The Napoleonic Empire
Evans, J., The Foundations of a Modern State in 19th Century Europe
Hamerow, T.S, Restoration, Revolution and Reaction : Economics and Politics in Germany (1815 – 1871)
Hanham H.J, Nineteenth Century Constitution, 1815-1914
Hobsbawm, E.J, Age of Capital
Hobsbawm, E.J, Age of Empire
Hobsbawm, E.J, Age of Revolution
Hobsbawm, E.J, Nation and Nationalism
Hufton, Olwen, Europe: Privilege and Protest
Jelavich Charles and Jelavich Barbara, Establishment of the Balkan National States, 1840 – 1920
Joll James, Europe Since 1870
Joll James, Origins of the First World War, 1989
Landes Jaon B., Women and the Public Sphere in the Age of the French Revolution
Lee Stephen J., Aspects of European History 1789 – 1980
Licas Colin, The French Revolution and the Making of Modern Political Culture

Lowenthal David, The Past is a Foreign Country
Lyon Martin, Napoleon Bonaparte & the Legacy of the French Revolution
Mansergh Nicholas, The Irish Question, 1840 – 1921
Morgan K.O, Oxford Illustrated History of Britain, Volume 3 (1789-1983)
Morgan R.P, German Social Democracy and the First International
Perrot M. and Duby G. [eds.], A History of Women in the West, Volumes 4 and 5
Renton Dave, Fascism: Theory and Practice
Riasanovsky N.V, A History of Russia
Robert J.M, Europe 1880 to 1985
Roth J.J (ed), World War I: A Turning Point in Modern History
Rude, George, Revolutionary Europe
Schamma Simon , Citizens: A chronicle of the French Revolution
Soboul Albert, History of the French Revolution (in two Volumes)
Stone Lawrence, History and the Social Sciences in the twentieth Century, The Past and the Present, 1981
Taylor A.J.P, Europe: Grandeur and Decline
Taylor A.J.P, The Course of German History
Taylor A.J.P, The Origin of the Second World War
Taylor, A.J.P, The Struggle for Mastery in Europe
Thompson Dorothy; Chartists: Popular Politics in the Industrial Revolution
Thompson, E.P, Making of the English Working Class
Thomson, David, Europe Since Napoleon
Vovelle Michael, Fall of the French Monarchy, 1984.
Watson H. Seton, The Russian Empire
Watson, Seton, The Russian Empire
Williams Raymond, Culture and Society

গৌতম চট্টোপাধ্যায় সম্পাদিত: দু'শো বছরের আলোকে, পশ্চিমবঙ্গ ইতিহাস সংসদ, ১৯৮৯
চক্রবর্তী সুভাষ রঞ্জন, ফরাসী বিপ্লব, পশ্চিমবঙ্গ পুস্তক পর্ষদ, কলকাতা
চক্রবর্তী সুভাষ রঞ্জন, ইউরোপের ইতিহাস, পশ্চিমবঙ্গ পুস্তক পর্ষদ, কলকাতা, ১৯৮৬
জ্যাকসন টি এ, ফরাসী বিপ্লব - দশ দিগন্ত, কে পি বাগচি এন্ড কোং, কলকাতা ২০০৪
টমসসন ডেভিড, বিশ্ব ইতিহাসের প্রেক্ষাপটে ইউরোপ, ১ম খন্ড (১৭৮৯-১৮৫০), ২য় খন্ড (১৮৫১-১৯১৪) প্রগ্রেসিভ পাবলিশার্স, কলকাতা ২০০২ ও ২০০৩
রায় সিদ্ধার্থ গুহ, আধুনিক ইউরোপঃ ফরাসী বিপ্লব থেকে দ্বিতীয় বিশ্বযুদ্ধ, প্রগতিশীল প্রকাশক, কলকাতা, ২০১৩

CC-12: History of India (c 1750s – 1857)

I. India in the mid 18th Century; Society, Economy, Polity

II. Expansion and Consolidation of Colonial Power :

a) Mercantilism, foreign trade and early forms of exactions from Bengal

b) Dynamics of expansion, with special reference to Bengal, Mysore, Western India, Awadh, Punjab and Sindh.

III. Colonial State and Ideology:

a) Arms of the colonial state : army, police, law

b) Ideologies of the Raj and racial attitudes.

c) Education : indigenous and modern.

IV. Rural Economy and Society:

a) Land revenue systems and forest policy

b) Commercialization and indebtedness

c) Rural society : change and continuity.

d) Famines

e)Pastoral economy and shifting cultivation.

V. Trade and Industry

a)De industrialization

b)Trade and fiscal policy

c) Drain of Wealth

d) Growth of modern industry

VI. Popular Resistance:

a) Santhal uprising (1857); Indigo rebellion (1860); Pabna Agrarian Leagues(1873); Deccan riots (1875)

b) Uprising of 1857

Essential Readings

Bayly C.A, Indian Society and the Making of the British Empire, New Cambridge History of India.

Bhattacharya, Sabyasachi.ed., Rethinking 1857, Delhi, Orient Longman, 2007

Chakravarty Suhash, The Raj Syndrome: A study in Imperial Perceptions, 1989

Chandra Bipan, Rise and Growth of Economic Nationalism in India

Choudhury, Sushil, Prelude to Empire Plassey Revolution of 1757, Delhi: Manohar, 2000

Cohn, B., Colonialism and its Forms of Knowledge, Princeton, New Jersey, Princeton University Press, 2001

Dirks, Nicholas B., Castes of Mind, Princeton, New Jersey, Princeton University Press, 1996

Ghosh Suresh Chandra, The History of Education in Modern India 1757-2012, Delhi, Orient Blackswan, 4th Edition, 2013

Grewal, J.S, The Sikhs of the Punjab, New Cambridge History of India

Guha Ranajit, ed., A Subaltern Studies Reader

Guha, Ranajit, Elementary Aspects of Peasant Insurgency in Colonial India, New Delhi, Oxford University Press, 1983

Kumar Dharma and Raychaudhuri Tapan, eds., The Cambridge Economic History of India, Vol.II

Majumdar, R.C,ed., History and Culture of Indian People, Vols. IX and X, British Paramountcy and Indian Renaissance.
Marshall, P.J, Bengal: The British Bridgehead, New Cambridge History of India
Metcalfe, Thomas, Ideologies of the Raj, Cambridge, Cambridge University Press, 1995
Ray, Rajat K., ed., Entrepreneurship and Industry in India, 1800-1947, Oxford In India Readings.
Sinha, N.K.ed, The history of Bengal 1757-1905, Calcutta, Calcutta University Press, 1967
Stokes, Eric, English Utilitarians and India
Stokes, Eric, The Peasant Armed: The Indian Rebellion of 1857, ed. Bayly, C.A, New Delhi, Oxford University Press, 1986

Suggested Readings

Arnold David and Guha Ramchandra , eds., Nature, Culture and Imperialism
Bagchi, Amiya, Private Investment in India
Chandra Bipan, Panikkar, K.K, Mukherjee Mridula, Mahajan Sucheta and Mukherjee Aditya, India's Struggles for Independence.
Dadabhai Naroji, Poverty and Un-British Rule in India.
Desai, A.R, Peasant Struggles in India
Dutt, R.P, India today
Fisher, M.J, ed., Politics of Annexation (Oxford in India Readings).
Guha Ranajit, Elementary Aspects of Peasant Insurgency in Colonial India(1983)
Krishnamurti, J., Women in Colonial India.

বন্দ্যোপাধ্যায় শেখর, অষ্টাদশ শতকের মুঘল সংকট ও আধুনিক ইতিহাস চিন্তা, কলকাতা,১৯৮৩
বন্দ্যোপাধ্যায় শেখর, পলাশী থেকে পার্টিশন: আধুনিক ভারতের ইতিহাস, ওরিয়েন্ট লংম্যান, ২০০৪
ভট্টাচার্য সব্যসাচী, ঔপনিবেশিক ভারতের অর্থনীতি, কলকাতা, ২০০০
সুনীল সেন, ভারতে কৃষিকার্য ১৭৯৩-১৯৪৭, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৮৫
চৌধুরী বিনয় ভূষণ, ঔপনিবেশিক আমলে বাংলার কৃষি ইতিহাস, কে পি বাগচি এন্ড কোং, কলকাতা
ইসলাম, সিরাজুল, বাংলার ইতিহাস ঔপনিবেশিক শাসনকাঠামো, চয়নিকা, ঢাকা, ২০০২
চক্রবর্তী মৃণাল, সিরাজ-উদ্-দৌলা, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ,কলকাতা, ১৯৮১
রায় রজতকান্ত, পলাশীর ষড়যন্ত্র ও সেকালের সমাজ, আনন্দ পাবলিশার্স, কলকাতা
চৌধুরী সুশীল, পলাশীর অজানা কাহিনী, আনন্দ পাবলিসার্স,কলকাতা

CC-13 : History of India (c. 1857 – 1964)

I. Cultural changes and Social and Religious Reform Movements:
a) Growth of a new intelligentsia – the Press and Public Opinion
b) Reform and Revival : Brahmo Samaj, Prarthna Samaj, and Ramakrishna and Vivekananda, Arya Samaj, Wahabi, Deoband, Aligarh and Singh Sabha Movements.
c)Debates around gender
d)Making of religious and linguistic identities
e)Caste : Sanskritising and anti Brahminical trends

II. Nationalism : Trends up to 1919
a)Formation of early political organizations
b) Moderates and extremists
c)Swadeshi movement
d)Revolutionaries

III. Gandhian nationalism after 1919 : Ideas and Movements:
a)Mahatma Gandhi : his Perspectives and Methods
b)i) Impact of the First World War
ii) Rowlatt Satyagraha and Jalianwala Bagh
iii)Non-Cooperative and Civil Disobedience
iv)Provincial Autonomy, Quit India and INA
c)Left wing movements
d)Princely India : States people movements

IV. Nationalism and Social Groups : Interfaces:
a) Landlords, Professionals and Middle Classes
b)Peasants
c)Tribals
d)labours
e)Dalits
f)Women
g)Business groups

V.Communalism : Ideologies and practices, RSS , Hindu Maha Sabha, Muslim League

VI. Independence and Partition
a)Negotiations for independence and partition
b)Popular movements
c)Partition riots

VII. Emergence of a New State:
a)Making of the Constitution
b)Integration of princely states
c) Land reform and beginnings of planning
d) The Nehru years.

Essential Readings

Bandyopadhyay Sekhar, From Plassey to Partition and After
Brass Paul, The Politics of India since Independence, OUP, 1990
Brown Judith, Gandhi's rise to power, 1915-22
Brown Judith, Gandhi and Civil Disobedience
Brown Judith,Nehru : A political Life. New Delhi: Oxford University Press 2003
Chandra Bipan, et Al., India's Struggle for Independence
Chandra Bipan, et Al. India after Independence
Chandra Bipan, Communalism in Modern India (2nd Ed., 1987)
Chandra Bipan, Nationalism and Colonialism in Modern India (1979)
Chandra Bipan, Rise and Growth of Economic Nationalism in India
Chatterjee Joya, Bengal Divided : Hindu Communalism and Partition 1932 – 1947, O.U.P, 1994
Desai, A.R, Social Background to Indian Nationalism
Desai, A.R Peasant Struggles in India
Dutta, R.P, India Today
Gallagher J., Johnson, G. Seal, A Locality, Province and Nation
Hardy Peter, Muslims of British India
Heimsath Charles, Indian Nationalism and Hindu Social Reform
Hassan Mushirul ed., India's Partition, Oxford in India Readings
Hutchins F., Illusion of Permanence
Kumar Ravinder, Social History of Modern India
Krishnamurty J., Women in Colonial India
Low D.A (ed.) Congress and the Raj
McLane J.R, Indian Nationalism and Early Congress
Pandey Gyanendra, The Construction of Communalism in Colonial North India
Sarkar Sumit , Swadeshi Movement in Bengal
Sarkar Sumit, Modern India, 1885-1947
Sarkar Susobhan, Notes on Bengal Renaissance
Seal Anil, Emergence of Indian Nationalism
Sen S.N, An Advanced History of Modern India, Kolkata, 2010
Stokes Eric, Peasants and the Raj : Studies in Agrarian Society and Peasant Rebellion in Colonial India
Tripathi Amales, The Extremist Challenge
Zelliot Elleanor, From Untouchables to Dalit : Essays on the Ambedkar Movement

বন্দ্যোপাধ্যায় শেখর, পলাশি থেকে পার্টিশান ও তারপর (From Plassey to Partition and after), ওরিয়েন্ট লংম্যান
চন্দ্র বিপান এবং অন্যান্য, ভারতের স্বাধীনতা সংগ্রাম, (India's Struggle for Independence) কে পি বাগচি এন্ড কোং, কলকাতা
চন্দ্র বিপান এবং অন্যান্য, ভারতবর্ষ - স্বাধীনতার পরে, (India after Independence), আনন্দ পাবলিশার্স, কলকাতা
দেশাই এ আর, ভারতীয় জাতীয়তাবাদের সামাজিক পটভূমি, (Social Background to Indian Nationalism) কে পি বাগচি এন্ড কোং, কলকাতা
জয়া চ্যাটার্জী, বাংলা ভাগ হলঃ হিন্দু সাম্প্রদায়িকতা ও দেশ-বিভাগ, ১৯৩২-১৯৪৭ (Bengal Divided : Hindu Communalism and Partition 1932 – 1947) এল আলমা পাবলিকেশনস, কলকাতা, ২০০৩

দত্ত রজনী পাম, আজিকার ভারত (India Today)
সরকার সুশোভন, বাংলার রেনেসাঁস, (Notes on Bengal Renaissance), দীপায়ন, কলকাতা
ত্রিপাঠী অমলেশ, ভারতের মুক্তিসংগ্রামে চরমপন্থী পর্ব, (The Extremist Challenge) আনন্দ পাবলিশার্স, কলকাতা
মুখোপাধ্যায় হীরেন্দ্রনাথ, ভারতবর্ষের ইতিহাস(২য় খন্ড) (মুঘল ও ব্রিটিশ ভারত) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ৪র্থ মুদ্রণ, ১৯৯৮
সুর নিখিল, ভারতীয় জাতীয়তাবাদী আন্দোলনের পটভূমি, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৮৯
চট্টোপাধ্যায় প্রণবকুমার, আধুনিক ভারত (১৮৫৮-১৯২০) (১ম খন্ড) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৯৮
চট্টোপাধ্যায় প্রণবকুমার, আধুনিক ভারত (১৯২০-১৯৪৭) (২য় খন্ড) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৯৯
সেন সুনীল, ভারতে কৃষিসম্পর্ক(১৭৯৩-১৯৪৭)(Agrarian Relations in India (1793-1847) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৮৫
ত্রিপাঠী অমলেশ, স্বাধীনতা সংগ্রামে ভারতের জাতীয় কংগ্রেস, আনন্দ পাবলিশার্স, কলকাতা
চন্দ্র বিপান, আধুনিক ভারতঃ ঔপনিবেশিকতাবাদ ও জাতীয়তাবাদ (Nationalism and Colonialism), কে পি বাগচি এন্ড কোং, কলকাতা

CC-14 : History of World Politics: 1945-1994

I. The Cold War: Weakening of European balance of power: Origins of The Cold War: Yalta and Potsdam Conferences; End of wartime alliance.

II. The USA in World Politics: Truman Doctrine, Marshall Plan, NATO.

III. The USSR in World Politics: Molotov Plan, COMECON and Cominform; Sovietisation of Eastern Europe; Berlin Blockade; Warsaw Pact.

IV. Manifestation of Cold War: The Korean Crisis- End of French Colonial rule in Indo-China and the Vietnam War – Cuban Crisis.

V. De-Stalinisation; Thaw in Cold War; Détente and road to the ending of Cold War.

VI. Disintegration and Decline of the Soviet Union – Glasnost and Perestroika – Crisis of Socialist regimes in other East European Countries: Poland, Germany, Czechoslovakia, Hungary – Response of the USA; Rise of a Unipolar World system, Globalization.

VII. Emergence of the People's Republic of China – China and the USA – Sino-Soviet rift.

VIII. West Asian Crisis – Palestine and Western Powers – Birth of Israel – Arab-Israel Conflict –The Suez Crisis (1956); Origin and Formation of PLO; Yom Kippur War(1973) ; Camp David Accord(1979); Oslo Peace Accord(1993).

IX. Decolonization: The African Case Study: Ghana, Algeria, Congo, Kenya.

X. Protest Politics: Civil Rights Movement, Anti-Apartheid Movement and the end of Apartheid (1994), Second Wave Feminist Movement.

Selected Readings

Asa Briggs and Patricia Clavin, Modern Europe 1789 – Present, Delhi, 2009.

Peter Calvocoressi, World Politics 1945 – 2000, New Delhi, 2006.

Edward Crankshaw, The New Cold War : Moscow vs. Peking, Penguin Books, 1963.

Issac Dentscher, Russia, China, and the West, Penguin Books, 1949.

Eric Hobsbawm, The Age of Extremes : The Short Twentieth Century, London, 1994.

Eric Hobsbawm, Globalisation, Democracy and Terrorism, London, 2007.

Henry Heller, The Cold War and the New Imperialism, New York, 2007.

Wayne C. Mcwilliam and Harry Piotrowsky, The World since 1945: A History of International Relations, New Delhi, 2018.

Andreas Wenger and Doron Zimmermann, International Relations From the Cold War to the Globalized World, New Delhi, 2010.

John Merriman, A History of Modern Europe From Renaissance to the Present, London, 1996.

Norman Lowe, Mastering Modern World History, Hampshire, Palgrave Macmillan 2013.

Kathleen A. Laughlin and Jacqueline L. Castledine, Breaking the wave : women, their organizations, and feminism, 1945-1985 New York : Routledge, 2011.

Wini Breines, Trouble Between Us: an Uneasy History of White and Black Women in the Feminist Movement New York : Oxford University Press, 2006.

Gail Collins, When Everything Changed: the Amazing Journey of American Women from 1960 to the Present, New York : Little, Brown and Co., 2009.

P. Eric Louw , The Rise, Fall, and Legacy of Apartheid, Praeger, 2004

Ryan M. Irwin Gordian Knot: Apartheid and the Unmaking of the Liberal World Order, Oxford University Press, 2012

Mark Newman , The Civil Rights Movement , Edinburgh University Press, 2004

চক্রবর্তী রাধারমণ ও চক্রবর্তী সুকল্পা, সমসাময়িক আন্তর্জাতিক সম্পর্ক , প্রগ্রেসিভ পাবলিশার্স, কলিকাতা।

চট্টোপাধ্যায় প্রণবকুমার, আন্তর্জাতিক সম্পর্কের ইতিহাস, কলিকাতা ১৯৯৪।

Discipline Specific Elective: DSE TH&TU

Paper 1 DSE-A-1 SEM -5: History of Bengal (c.1757-1905)

I. Political history of Bengal under the Nawabs: Rise of British power in Bengal from the battle of Plassey to Buxar.
II. .Administrative history: 1765--1833
III. Colonial economy: - Agriculture, trade and industry.
IV. Cultural changes and Social and Religious Reform Movements:
Christian missionaries- The advent of printing and its implications, education: Indigenous and western - Hindu and Muslim religious revivalist movements.
V. Social Reforms and the women's question.
VI. Protest movements and insurgencies against the Raj: The Fakir and Sannyasi revolts, Indigo Revolt (1859-1860), Pabna Peasant Uprisings (1873-76)
VII. Partition of Bengal 1905: Curzon and the administrative blueprint.

Select Readings:

Bandyopadhyay, Sekhar. From Plassey to Partition: A History of Modern India. New Delhi: Orient Blackswan , 2004

Banerjee Dube, Ishita. A History of Modern India. Cambridge University Press, 2015

Bayly C.A., Indian Society and the Making of the British Empire Cambridge University Press, 1995

Choudhary Sushil, Prelude to Empire: Plassey Revolution of 1757. Delhi: Manohar, 2000.

Ghosh, Suresh Chandra. The History of Education in Modern India, 1757 - 2012 Delhi: Orient Blackswan , Edition4, 2013

Guha, Ranajit . Elementary Aspects of Peasant Insurgency in Colonial India. New Delhi: Oxford University Press, 1983.

Islam, Sirajul ed. History of Bangladesh 1704-1971 (Vols. I,II & III) Dhaka: Asiatic Society of Bangladesh, 1997

Khan Abdul Majed, Muhammad Reza Khan and the Transition in Bengal . Cambridge University Press, 1969

Kopf David, British Orientalism and the Bengal Renaissance: The Dynamics of Indian Modernization, 1773-1835 University of California Press, 1969

Kopf David, The Brahmo Samaj and the Shaping of the Modern Indian Mind. Atlantic Publishers 1979.

Marshall P.J, Bengal the British Bridgehead Bengal: The British Bridgehead: Eastern India 1740-1828. Cambridge University Press. 1987

Metcalfe, Thomas, Ideologies of the Raj. Cambridge: Cambridge University Press, 1995.
Sinha , N.K. ed. The history of Bengal 1757- 1905 Calcutta: Calcutta University Press, 1967

বন্দ্যোপাধ্যায় শেখর, পলাশি থেকে পার্টিশান, ওরিয়েন্ট লংম্যান
চন্দ্র বিপান এবং অন্যান্য, ভারতের স্বাধীনতা সংগ্রাম, কে পি বাগচি এন্ড কোং, কলকাতা
চন্দ্র বিপান এবং অন্যান্য, ভারতবর্ষ – স্বাধীনতার পরে, , আনন্দ পাবলিশার্স, কলকাতা
চন্দ্র বিপান, আধুনিক ভারতঃ ঔপনিবেশিকতাবাদ ও জাতীয়তাবাদ, কে পি বাগচি এন্ড কোং, কলকাতা
চ্যাটার্জী জয়া, বাংলা ভাগ হোলঃ হিন্দু সাম্প্রদায়িকতা ও দেশ-বিভাগ, ১৯৩২-১৯৪৭। এল আলমা পাবলিকেশনস, কলকাতা, ২০০৩

দেশাই এ আর, ভারতীয় জাতীয়তাবাদের সামাজিক পটভূমি, কে পি বাগচি এন্ড কোং, কলকাতা

দত্ত রজনী পাম, আজিকার ভারত সরকার সুশোভন, বাংলার রেনেসাঁস, দীপায়ন, কলকাতা
ত্রিপাঠী অমলেশ, স্বাধীনতা সংগ্রামে ভারতের জাতীয় কংগ্রেস ১৮৮৫-১৯৪৭। কলকাতা আনন্দ পাবলিশার্স, ২০১২।
ত্রিপাঠী অমলেশ, ভারতের মুক্তিসংরামে চরমপন্থী পর্ব, আনন্দ পাবলিশার্স, কলকাতা
মুখোপাধ্যায় হীরেন্দ্রনাথ, ভারতবর্ষের ইতিহাস(২য় খন্ড) (মুঘল ও ব্রিটিশ ভারত) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ৪র্থ মুদ্রণ, ১৯৯৮
সুর নিখিল, ভারতীয় জাতীয়তাবাদী আন্দোলনের পটভূমি, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৮৯
চট্টোপাধ্যায় প্রণবকুমার, আধুনিক ভারত (১৮৫৮-১৯২০) (১ম খন্ড) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৯৮
চট্টোপাধ্যায় প্রণবকুমার, আধুনিক ভারত (১৯২০-১৯৪৭) (২য় খন্ড) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৯৯
সেন সুনীল, ভারতে কৃষিসম্পর্ক(১৭৯৩-১৯৪৭) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৮৫
ত্রিপাঠী অমলেশ, স্বাধীনতা সংগ্রামে ভারতের জাতীয় কংগ্রেস, আনন্দ পাবলিশার্স, কলকাতা

Paper 2 DSE-A-3 SEM -6: History of Bengal (c.1905-1947)

I. Partition of Bengal and Swadeshi Movement (1905-08) Political ideology and organizations, rise of Extremism in Bengal, Swadeshi movement, Revolutionary terrorism.

II. Communal Politics: 1906- 30 Birth of Muslim League, and the Hindu response.

III. Gandhian nationalism after 1919, Non- Cooperation and Khilafat movement, Swaraj party, Civil Disobedience movement, Revolutionary Nationalists and the beginnings of Left politics in the 1920s, Rise of Krishak Praja Party, Muslim League in Bengal politics.

IV. Government of India Act 1935 and its aftermath:

V. Peasant Movements in Bengal 1920-1946, Labour Movement in Bengal 1920-1946, Caste Movement in Bengal 1920-1946, Women's Movements in Bengal 1920-1946.

VI. Subhash Chandra Bose and the Congress, Quit India Movement in Bengal, Post war upsurges in Bengal- Left wing movements.

VIII. Independence and Partition: Communal Riots, the great Calcutta killing and Noakhali riots, Hindu Mahasabha, Muslim League, freedom and Partition, Birth of West Bengal and East Pakistan.

Select Readings:

Bhattacharya Sabyasachi , The Defining Moments in Bengal 1920–1947 New Delhi: Oxford University Press, 2014.

Brown Judith, Gandhi's rise to Power, 1915-22. Cambridge University Press, 1974

Brown Judith, Gandhi: A Prisoner of Hope. Yale University Press, 1991

Chandra Bipan, Panikkar K.N., Mukherjee Mridula, Mahajan Sucheta and Mukherjee Aditya, India's, Struggles for Independence.

Hiren Chakrabarty, Political Protest In Bengal : Boycott and Terrorism 1905-1918 Papyrus,Calcutta

Das Suranjan, Communal Riots in Bengal 1905-47, Oxford University Press, OUP 1991,1993

Sarkar Sumit, Modern India, 1885-1947. Macmillan Publishers India Publication, 2000.

Sarkar Sumit , The Swadeshi Movement in Bengal 1903-1908 New Delhi: People's Publishing House, 1973

Tripathi Amalesh, The Extremist Challenge: India between 1890 and 1910 Orient Longmans, 1967.

বন্দ্যোপাধ্যায় শেখর, পলাশি থেকে পার্টিশান, ওরিয়েন্ট লংম্যান

চন্দ্র বিপান এবং অন্যান্য, ভারতের স্বাধীনতা সংগ্রাম, কে পি বাগচি এন্ড কোং, কলকাতা

চন্দ্র বিপান এবং অন্যান্য, ভারতবর্ষ – স্বাধীনতার পরে, , আনন্দ পাবলিশার্স, কলকাতা

চন্দ্র বিপান, আধুনিক ভারতঃ ঔপনিবেশিকতাবাদ ও জাতীয়তাবাদ, কে পি বাগচি এন্ড কোং, কলকাতা

চ্যাটার্জী জয়া, বাংলা ভাগ হোলঃ হিন্দু সাম্প্রদায়িকতা ও দেশ-বিভাগ, ১৯৩২-১৯৪৭। এল আলমা পাবলিকেশনস, কলকাতা, ২০০৩

দেশাই এ আর, ভারতীয় জাতীয়তাবাদের সামাজিক পটভূমি, কে পি বাগচি এন্ড কোং, কলকাত

দত্ত রজনী পাম, আজিকার ভারত সরকার সুশোভন, বাংলার রেনেসাঁস, দীপায়ন, কলকাতা
ত্রিপাঠী অমলেশ, স্বাধীনতা সংগ্রামে ভারতের জাতীয় কংগ্রেস ১৮৮৫-১৯৪৭। কলকাতা আনন্দ পাবলিশার্স, ২০১২।
ত্রিপাঠী অমলেশ, ভারতের মুক্তিসংরামে চরমপন্থী পর্ব, আনন্দ পাবলিশার্স, কলকাতা
ভট্টাচার্য সব্যসাচী, বাংলায় সন্ধিক্ষণঃ ইতিহাসের ধারা ১৯২০-৪৭। অক্সফোর্ড ইউনিভার্সিটি প্রেসঃ ২০১৮।
মুখোপাধ্যায় হীরেন্দ্রনাথ, ভারতবর্ষের ইতিহাস(২য় খন্ড) (মুঘল ও ব্রিটিশ ভারত) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ৪র্থ মুদ্রণ, ১৯৯৮
সুর নিখিল, ভারতীয় জাতীয়তাবাদী আন্দোলনের পটভূমি, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৮৯
চট্টোপাধ্যায় প্রণবকুমার, আধুনিক ভারত (১৮৫৮-১৯২০) (১ম খন্ড) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৯৮
চট্টোপাধ্যায় প্রণবকুমার, আধুনিক ভারত (১৯২০-১৯৪৭) (২য় খন্ড) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ,১৯৯৯
সেন সুনীল, ভারতে কৃষিসম্পর্ক(১৭৯৩-১৯৪৭) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৮৫
ত্রিপাঠী অমলেশ, স্বাধীনতা সংগ্রামে ভারতের জাতীয় কংগ্রেস, আনন্দ পাবলিশার্স, কলকাতা

Paper 3 DSE-B-2 SEM -5: History of Southeast Asia – The 19th Century

I. Pre-Colonial Structures of Power and Authority c.1800

II. Economy and Society in early 19th c.

a)Patterns of production in agriculture and the crafts

b) Organisation of trade and banking
c) Cultural expressions : Folk and Classical
d)Islam and popular culture

III. Colonisation and Colonial Transformations:
a)Processes of colonial controls and the Informal Empire in Thailand
b) Peasant society and agrarian transformations, plantations, forests, mining.
c) Urbanisation : Colonial cities in Plural Societies
d) Culture : i) Colonial Discourses and the Creation of National Culture
ii)Oral traditions, literacy and the case of Malay Hikayats.
iii) Creation of Perfect Natives
iv) Education

Essential Readings
Anderson B., Imagined Communities: Reflections on the Origin and Spread of Nationalism Verso 1983
Benda H., The Crescent and the Rising Sun. The Hague, W. van Hoeve , 1958.
Furnivall, Colonisation and the Plural Society Oxford University. Press, 1980
Hart G., ed., Agrarian Transformations: Local Processes and the state in South-East Asia. Berkeley : University of California Press,1989

Kemp J., ed., Peasants and Cities, Cities and Peasants : Rethinking Southeast Asian Models.
Osborne Milton, South East Asia : An Introductory History Allen & Unwin, 2016.
Tarling Nicholas, ed., Cambridge History of South-East Asia, 2 vols. Cambridge University Press . 1993
দাসগুপ্ত অরুণ, দক্ষিণ পূর্ব এশিয়ার ইতিহাস
সেন জহর, দক্ষিণ পূর্ব এশিয়ার ইতিহাস

Suggested Readings
Anderson B., Mythology and the Tolerance of the Javanese Southeast Asia Program Cornell University monograph series, Modern Indonesia Project (1985)
Dijk Van C., Trousers, Sarongs and Jubbahs
Dobblin C., Islamic Revivalism in a Changed Peasant Economy (1784 – 1847) London: Curzon Press, 1983
Keys, Charles F., The Golden Peninsula Honolulu : University of Hawaii Press, 1995.
Lev Daniel S., and McVey T., eds, Making Indonesia – Essays on Modern Indonesia. Ithaca: Cornell Southeast Asia Program, 1996
Purcell Victor, The Chinese in South-East Asia London and New York: Oxford University Press, 1951
Winichakul Tongchai, Siam Mapped : A History of the Geo-Body of a Nation University of Hawaii Press, 1994
Wyatt, David K, Thailand: Studies in Thai History, 1999

Paper 4 DSE-B-4 SEM -6: History of Southeast Asia – The 20th Century

I. Migration : Indian and Chinese Labour and Capital

II. Movements of Resistance and the making of new identities
a) Peasant resistance
b) Radicalism and the Origins of the Vietnamese Revolution, 1920-1946
c) Indonesian Revolution, 1945-1949

III. Emergence of Modern Nations and States
a) The Union of Burma (Mynamar), 1948-1962
b) Indonesia, the Sukarno Era, 1949-1965
c) Two Vietnams : 1946 - 1976

Essential Readings

Amin Mohammad and Malcolm Coldwell, ed, Malay: The Making of a Neo Colony, 1977
Anderson B., Imagined Communities Reflections on the Origin and Spread of Nationalism Verso 1983
Bandyopadhyay Sekhar, Burma Today, 1987
Benda H., The Crescent and the Rising Sun The Hague, W. van Hoeve, 1958.

Furnivall, Colonization and the Plural Society Oxford University. Press, 1980
Hart G., ed., Agrarian Transformations: Local Processes and the state in South-East Asia Berkeley : University of California Press,1989
Kemp J., ed., Peasants and Cities, Cities and Peasants : Rethinking Southeast Asian Models.
Legge John D, Indonesia (1964)
Osborne Milton, South East Asia: An Introductory History Osborne Milton, Allen & Unwin, 2016.
Ryan N. J, A History of Malaysia and Singapore, 1976
Sardesai D.R, Vietnam : Trials and tribulations of a Nation (1988)
Tarling Nicholas, ed., Cambridge History of South-East Asia, 2 vols. Cambridge University Press . 1993

সেন জহর, দক্ষিণ পূর্ব এশিয়ার ইতিহাস, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ,
মুখোপাধ্যায় সুবোধ, দক্ষিণ পূর্ব এশিয়া ,

Suggested Readings

Anderson B., Mythology and the Tolerance of the Javanese Southeast Asia Program Cornell University monograph series, Modern Indonesia Project (1985)
Dijk Van C., Trousers, Sarongs and Jubbahs
Dobblin C., Islamic Revivalism in a Changed Peasant Economy (1784 – 1847)) London: Curzon Press, 1983
Keys, Charles F., The Golden Peninsula Honolulu :University of Hawaii Press, 1995.
Lev Daniel S., and McVey T., eds, Making Indonesia – Essays on Modern Indonesia. Ithaca: Cornell Southeast Asia Program, 1996
Purcell Victor, The Chinese in South-East Asia London and New York: Oxford University Press, 1951

Winichakul Tongchai, Siam Mapped : A History of the Geo-Body of a Nation University of Hawaii Press, 1994

Wyatt, David K, Thailand: Studies in Thai History, 1999

Paper 5 DSE-B-1 SEM -5: History of Modern East Asia – I China (c.1840 – 1949)

I. Imperialism and China during the 19th and early 20th century

a) Chinese feudalism : Gentry, Bureaucracy and peasantry; the Confucian value system; Sinocentrism; the canton commercial system
b)The transformation of China into an informal colony; the Opium Wars; the Unequal Treaties; the scramble for concessions; Finance Imperialism; the Open Door policy.
c)Agrarian and Popular Movements : Taiping and Yi Ho Tuan
d)Attempts at Self-Strengthening (Tzu-Chiang): Reforms of 1860-95; 1898; and 1901-08.
ii) The Emergence of Nationalism in China
a)The Revolution of 1911: Causes , nature and significance; the social composition of the Revolution; Sun Yat-sen and his contribution; the formation of the Republic; Yuan Shih Kai; War Lordism.
b)May Fourth Movement of 1919: Nature and Significance

II. History of China (cc.1919 – 1949)

i) Nationalism and Communism in China (1921 – 1937)
a) Formation of CCP; and the
b) The First United Front
i)The Communist Movement (1938-1949)
ii)The Jiangxi Period and the rise of Mao Tse Tung

Essential Readings

Beckamann George M., Modernization of China and Japan Harper & Row, 1962
Bianco Lucien, Origins of the Chinese Revolution, 1915 -1949 Stanford University Press, 1973
Chesneaux Jean, et al, China from Opium War to 1911 Revolution to Liberation. Hassocks, Sussex : The Harvester Press, cop.1976
Chesneaux Jean, Peasant Revolts in China, 1840 – 1949 W. W. Norton ,1973
Chung Tan, China and the Brave New World : A Study of the Origins of the Opium War, 1840 - 42
Chung Tan, Triton and Dragon : Studies on the Nineteenth Century China and Imperialisms Gian Publishing House, 1986
Fairbank J.K (ed), The Cambridge History of China, Vol. X Cambridge University Press, 1978
Fairbank John K., et al, and East Asia: Modern Transformation London : Allen & Unwin,1965
Franke Wolfgang, A Century of Chinese Revolution University of South Carolina Press, 1980
Hsu Y.Immanuel, The Rise of Modern China OUP 1995
Jansen M.B., Japan and China: From War to Peace, 1894 – 1972 Chicago : Rand McNally College Pub. Co., [1975
Johnson Chalmers A, Peasant Nationalism and Communist Power: The Emergence of Red China, 1937 -1945 Stanford, 1962

Michael Franz, The Taiping Rebellion Seattle and London: University of Washington Press, 1971

Peffer Nathaniel, The Far East: A Modern History. University of Michigan Press, 1958
Purcell Victor, The Boxer Uprising: A Background Study. Cambridge University Press, 2010
Schifrin Harold Z, Sun Yat-Sen and the Origin of the Chinese Revolution. University of California Press, 1968

Schuramann Franz and Schell Orville (eds.), China Readings, 2 Volumes, (Imperial China, and Republican China) Penguin; First edition 1967
Schwartz Benjamin I., Mao and the Rise of Chinese Communism. Stanford, Stanford University Press,. 1951.
Sheng Hu, Imperialism and Chinese Politics. Foreign Languages Press, 1981
The Yi Ho Tuan Movement, The Revolution of 1911, Foreign Language Press, Beijing.
Tse Tung Chow, The May Fourth Movement: Intellectual Revolution in Modern China. Stanford University Press: Stanford, 1967
Wright Mary C., China in Revolution : The First Phase, 1900 – 1913. New Haven: Yale University Press, 1968
Yu-teng Ssu and K. Fairbank John , China's Response to the West. Cambridge: Harvard University Press, 1954

চৌধুরী দেবপ্রসাদ–আধুনিক যুগে পূর্ব এশিয়ার সংক্ষিপ্ত ইতিহাস, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ,, কলকাতা, ১৯৮৬
ভট্টাচার্য অমিত– চীনের রূপান্তরের ইতিহাস, ১৮৪০–১৯৮৯, কলকাতা, ২০০৪
চট্টোপাধ্যায় হরপ্রসাদ, চীনের ইতিহাস, কলকাতা, ১৯৮৮
সেন জহর, এ যুগের চীনকথা, কলকাতা, ২০০৭

Paper 6 DSE-B-3 SEM -6: History of Modern East Asia – II Japan (c.1868 – 1945)

I) Transition from feudalism to capitalism:
a) Crisis of Tokugawa Bakuhan system
b) Meiji Restoration : Its nature and Significance
c) Political Reorganization
d) Military Reforms

e) Social, cultural and educational reforms (Bunmeikaika)
f) Financial reforms and educational development in the 'Meiji' era
g) Meiji Constitution

II) Japanese Imperialism
a) China
b) Manchuria
c) Korea
3) Democracy and Militarism / Fascism
a) Popular/ People's Rights Movement
b) Nature of political parties
c) Rise of Militarism-Nature and significance
d) Second World War; American occupation
e) Post-War Changes

Essential Readings

Allen George, A Short Economic History of Modern Japan. Psychology Press, 2003
Beasley G., The Modern History of Japan. Weidenfeld & Nicolson, 1963
Beckman George M, Modernization of China and Japan. Joanna Cotler Books , 1962
Beckman George M, The Making of the Meiji Constitution . Praeger; New edition 1975
Fairbank John K., et al, East Asia: Modern Transformation. London : Allen & Unwin,1965
Jansen M B (ed), The Cambridge History of Japan Vols. I and II
Livingstone Jon, et al., The Japan Reader (Imperial Japan **:** 1800 **–** 1945)**,** Vol.I Pantheon, 1974
Mikiso Hane, Modern Japan: A Historical Survey. Westview Press, 4th edition 2008
Norman E.H, Japan's Emergence as a Modern State. Greenwood Press, 1973
Peffer Nathaniel, The Far East: A Modern History. University of Michigan Press, 1968 -
Pyle Kenneth B., The Making of Modern Japan. D.C. Heath, 1996
Storry Richard, A History of Modern Japan Penguin Books, 1991
Vinacke H, A History of the Far East in Modern Times 1928

চৌধুরী দেবপ্রসাদ–আধুনিক যুগে পূর্ব এশিয়ার সংক্ষিপ্ত ইতিহাস, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, কলকাতা, ১৯৮৬
ভট্টাচার্য অমিত– জাপানের রূপান্তরের ইতিহাস, ১৬০০–১৯৪৫, কলকাতা, ২০০৫
চট্টোপাধ্যায় হরপ্রসাদ, জাপানের ইতিহাস, কলকাতা, ১৯৮৬
গুহরায় সিদ্ধার্থ, – আধুনিক পূর্ব এশিয়ার ইতিহাস **:** চীন ও জাপানের ইতিহাস, কলকাতা, ১৯৯৬

Paper 7 DSE-A-2 SEM -5: History of United States of America – I (c.1776 – 1945)

I. The Background:
The land and indigenous people: settlement and colonization by Europeans; early colonial society and politics; indentured labour- White and Black.

II. Making of the Republic:
a)Revolution : Sources of conflict : Revolutionary groups, Ideology: The War of Independence and its historical interpretations

b) Processes and Features of Construction making : Debates, Historical interpretations.

III. Evolution of American Democracy:
a)Federalists: Jeffersonianism: Jacksonianism, Rise of political parties- 1840 – 1960; judiciary-role of the Supreme Court
b) Expansion of Frontier: Turner's Thesis; Marginalization, displacement and decimation of native Americans; Case histories of Tecumseh , Shawnee Prophet.
c)Limits of Democracy: Blacks and Women

IV. Early Capitalism
a) Beginnings of Industrialization
b) Immigrants and changing composition of Labour; Early Labour Movements.

V. The Agrarian South :
a)Plantation economy
b)Slave Society and Culture: Slave resistance.

VI. Ante Bellum Foreign Policy:
War of 1812: Monroe Doctrine: Manifest Destiny

VII. Civil War:
a)Abolitionism and Sectionalism
b)Issues and interpretations
c)Rise of Republicanism, Emancipation and Lincoln

Essential Readings

Bailyn Bernard, The Great Republic 1985.
Bailyn Bernard, The Ideological Origins of the American Revolution. Harvard University Press 1967
Beard Charles, An Economic Interpretation of the American Constitution. Macmillan, 1921
Brown Dee, Bury My Heart at Wounded Knee, An Indian History of the American West. Grover Gardner 1970
Carroll Peter and Noble David, Free and Unfree: A New History of the United States. Penguin Books, 1977.
Davis David B., The Problem of Slavery in the Age of Revolution *1770-1823*. New York: Oxford University Press, 1999.
Faulkner U., American Economic History . New York, Harper, 1960
Fogel Robert, Railroads and American Economic Growth Baltimore: Johns Hopkins Press, 1964.
Foner Eric, America's Black Past. Harper collins, 1970
Franklin, John Hope, From Slavery to Freedom. New York: Alfred A Knopf, 1947
Grobb Gerald N., and Billias George A., Interpretations of American History: Patterns and Perspectives, 2 Vols. New York, Free Press 1972.
Hofstadter Richard, The Age of Reform, From Bryan to FDR. Vintage Books, 1955
Kerber Linda, Women's America: Refocussing the Past. Oxford University Press, 1991
Potter David M., The Impending Crisis HarperCollins, 1977
Pratt W., A History of the United States Foreign Policy. Prentice-Hall, 1965
Randail James, The Civil War and Reconstruction. W. W. Norton & Company ,1937
Randall J.G and Donald David, The Civil War and Reconstruction. Pickle Partners Publishing, 2016

Stampp Kenneth, The Peculiar Institution, Slavery in the Antebellum South. (New York: Alfred A. Knopf, 1956
Jackson Frederick Turner, The Frontier in American History. Henry Holt, 1921
Wiebe Robert, The Search for Order. Farrar, Straus and Giroux, 1967

Suggested Readings

Benson Lee, The Concept of Jackson Democracy: New York as a Test Case Princeton Legacy Library 1961
Billington Ray A., Westward Expansion. UNM Press, 2001
Boyer Paul, Sitkoff Harvard, Woloch Nancy, The Enduring Vision : A History of the American People, Vols. 1 and 2. Houghton Mifflin; 5th Revised edition 2003
Cochran Thomas, The Inner Revolution Harper Torchbooks, The Academy Library), 1964.
Craven A.O., The Growth of Southern Nationalism, 1848 – 1861. Louisiana State University Press, 1953
Davis lance E.,(ed.), American Economic Growth. Harper & Row; First edition 1972
Degler Carl N., At Odds: Women and Family in America from the Revolution to the Present. Oxford University Press, 1980
Fogel and Engerman, Time on the Cross. Brown and Company, 1974.
Gould Lewis L., (ed.), The Progressive Era. Longman, 2001
Hicks, John D., The Federal Union : A History of USA since 1865. Houghton Mifflin, 1964
Kaushik R.P., Significant Themes in American History. Ajanta Publications, 1983
Kennedy, David M., Bailey Thomas and Piehl Mel, The Brief American Pageant. Cengage Learning, 1999.
Kristol Irving, Wood Gordon and others, America's Continuing Revolution.
Washington : American Enterprise Institute for Public Policy Research, 1975]
Leopard Richard W., The Growth of American Foreign Policy. Alfred A. Knopf 1967
Miller Perry, From Colony to Province. Harvard University Press, 1953
Nash Gary (ed.), Retracing the Past. Longman, 2000
Pelling Henry, American Labor. University of Chicago 1960
Pessen Edward, Jacksonian Panorama. Bobbs-Merrill, 1976
Sellers Charles, May Henry and McMillen Neil, A Synopsis of American History; 2 volumes. Rand McNally College Pub. Co., 1976
Tripathi Dwijendra and Tiwari S.C., Themes and Perspectives in American History American Studies Research Centre, 1978.
Weinstein James, The Corporate Ideal in the Liberal state. 1900-1918 Beacon Press, 1985

Paper 8 DSE-A-4 SEM -6: History of United States of America – II (c.1776-1945)

I. Reconstructions: Political changes and agrarian transformation:

a) Conservative and Radical phases.

b) The New South : Participants and Reactions, Carpetbaggers; Scalawags, Blacks, Ku Klux Klan.

II. Industrial America:

a)Growth of Capitalism and Big Business.
b) Business cycles; Depression..

III. Resistance and Reform:
a)Labour movements and Unionization.
b) Agrarian crisis and populism. Urban corruption and progressivism.
c) New Deal.

IV. U.S Imperialism
a) Spanish-American War
b) Expansion in the Far east and Latin America
c) World War I and Fourteen Points
d) Isolation
e) Americans in World War II: Bombing of Hiroshima and Nagasaki

V. Afro-American Movements:
Black Movements: Booker T. Washington, W.E.B Dubois, NAACP and Marcus Garvey.

VI. Women's Movements:
a) Rise of the Lowell Factory System
b) Abolitionists and Women's rights movement
c) Suffrage
d) Afro-American Women

VII. Religious, Cultural and Intellectual Trends:
a)Religious movements; Early Revivalism; Puritans, Quakers; Mormons; Temperance
b) Mass Culture (circa 1900 – 1945)
c) Major Literary trends (circa 1900 – 1945)

Essential Readings
Bailyn Bernard, The Great Republic 1985.
Bailyn Bernard, The Ideological Origins of the American Revolution. Harvard University Press 1967
Beard Charles, An Economic Interpretation of the American Constitution. Macmillan, 1921
Brown Dee, Bury My Heart at Wounded Knee, An Indian History of the American West. Grover Gardner 1970
Carroll Peter and Noble David, Free and Unfree: A New History of the United States. Penguin Books, 1977.
Davis David B., The Problem of Slavery in the Age of Revolution *1770-1823*. New York: Oxford University Press, 1999.
Faulkner U., American Economic History . New York, Harper, 1960
Fogel Robert, Railroads and American Economic Growth Baltimore: Johns Hopkins Press, 1964.
Foner Eric, America's Black Past. Harper collins, 1970
Franklin, John Hope, From Slavery to Freedom. New York: Alfred A Knopf, 1947
Grobb Gerald N., and Billias George A., Interpretations of American History: Patterns and Perspectives, 2 Vols. New York, Free Press 1972.
Hofstadter Richard, The Age of Reform, From Bryan to FDR. Vintage Books, 1955
Kerber Linda, Women's America: Refocussing the Past. Oxford University Press, 1991
Potter David M., The Impending Crisis HarperCollins, 1977
Pratt W., A History of the United States Foreign Policy. Prentice-Hall, 1965

Randail James, The Civil War and Reconstruction. W. W. Norton & Company ,1937
Randall J.G and Donald David, The Civil War and Reconstruction. Pickle Partners Publishing, 2016
Stampp Kenneth, The Peculiar Institution, Slavery in the Antebellum South. (New York: Alfred A. Knopf, 1956
Jackson Frederick Turner, The Frontier in American History. Henry Holt, 1921
Wiebe Robert, The Search for Order. Farrar, Straus and Giroux, 1967

Suggested Readings

Benson Lee, The Concept of Jackson Democracy**:** New York as a Test Case Princeton Legacy Library 1961

Billington Ray A., Westward Expansion. UNM Press, 2001
Boyer Paul, Sitkoff Harvard, Woloch Nancy, The Enduring Vision : A History of the American People, Vols. 1 and 2. Houghton Mifflin; 5th Revised edition 2003
Cochran Thomas, The Inner Revolution Harper Torchbooks, The Academy Library), 1964.
Craven A.O., The Growth of Southern Nationalism, 1848 – 1861. Louisiana State University Press, 1953
Davis lance E.,(ed.), American Economic Growth. Harper & Row; First edition 1972
Degler Carl N., At Odds: Women and Family in America from the Revolution to the Present. Oxford University Press, 1980
Fogel and Engerman, Time on the Cross. Brown and Company, 1974.
Gould Lewis L., (ed.), The Progressive Era. Longman, 2001
Hicks, John D., The Federal Union : A History of USA since 1865. Houghton Mifflin, 1964
Kaushik R.P., Significant Themes in American History. Ajanta Publications, 1983
Kennedy, David M., Bailey Thomas and Piehl Mel, The Brief American Pageant. Cengage Learning, 1999.
Kristol Irving, Wood Gordon and others, America's Continuing Revolution.
Washington : American Enterprise Institute for Public Policy Research, 1975]
Leopard Richard W., The Growth of American Foreign Policy. Alfred A. Knopf 1967
Miller Perry, From Colony to Province. Harvard University Press, 1953
Nash Gary (ed.), Retracing the Past. Longman, 2000
Pelling Henry, American Labor. University of Chicago 1960
Pessen Edward, Jacksonian Panorama. Bobbs-Merrill, 1976
Sellers Charles, May Henry and McMillen Neil, A Synopsis of American History; 2 volumes. Rand McNally College Pub. Co., 1976
Tripathi Dwijendra and Tiwari S.C., Themes and Perspectives in American History American Studies Research Centre, 1978.
Weinstein James, The Corporate Ideal in the Liberal state. 1900-1918 Beacon Press, 1985

Skill Enhancement Courses (SEC –A & B) Credits,-2 each

SEC –A (1): Archives and museums

This course introduces students to the institutions that house and maintain documentary, visual and material remains of the past. Museums and archives are among the most important such repositories and this course explains their significance and how they work. Students will be encouraged to undertake collection, documentation and exhibition of such materials in their localities and colleges. Visit to National Archives and National Museum are an integral part of the course.

I. Definition and history of development (with special reference to India)

II. **Types of archives and museums**: Understanding the traditions of preservation in India Collection policies, ethics and procedures Collection: field exploration, excavation, purchase, gift and bequests, loans and deposits, exchanges, treasure trove confiscation and others. Documentation: accessioning, indexing, cataloguing, digital documentation and de-accessioning Preservation: curatorial care, preventive conservation, chemical preservation and restoration

III. Museum Presentation and Exhibition:

IV. **IV. Museums, Archives and Society:** (Education and communication Outreach activities

Essential Readings:

Agrawal, O.P., Essentials of Conservation and Museology,Sundeep Prakashan, New *Delhi*, India, 2007.

Choudhary, R.D. Museums of India and their maladies. Calcutta: Agam Kala Prakashan, New Delhi, 1998(In Bengali).

Guha, Thakurta, Tapati, Monuments, Objects, Histories: Institution of Art in Colonial Post Colonial India, New York, 2004

Kathpalia, Y. P. Conservation and Restoration of Archive Materials. UNESCO, 1973

Mathur Saloni, India by Design: Colonial History and Cultural Display, University of California, 2007

Nair, S.M. Bio-Deterioration of Museum Materials.2011

Roychowdhury, Madhuparna. Displaying India's Heritage : Archaelogy and the Museum Movement in Colonial India. Delhi: Orient Blackswan 2015

Sengupta, S. Experiencing History Through Archives. Delhi: Munshiram Manoharlal.2004.

SEC –B (1) Understanding Popular Culture

The paper examines some popular cultures expressed in different mediums like visual, oral and cultural. In the process of theirevolution, these cultures eclectically draw from traditions, articulate anxieties, and even give rise to new traditions. The paper endeavours to equip students with understanding such phenomena historically, with special reference to India. It is imperative that the students use electronic devices to view, record, and document the subject matter.

I Introduction: Defining popular culture and understanding it historically

II Visual expressions Folk art, calendar art, photography
III. Performance: Theatre; music; folk tales/songs/swang and Nautanki:Identifying themes,functionality, anxieties
IV. The audio-visual: cinema and television:
Indian cinema: Mapping the influence of the national struggle for independence (1930s and 40s); Idealized nationalism (1950s), disillusionment and the anti-establishment mood (1970s and 80s); documentary films Expressions of popular culture in television
V. Fairs, Festivals and Rituals:
Disentangling mythological stories, patronage, regional variations
VI. Popular culture in a globalized world:
The impact of the Internet and audio-visual media
Essential Readings:
Dissanayake, W. and K. M. Gokul Singh, Indian Popular Cinema, Trentham Book, London, 2004
John Storey, Cultural Theory and Popular Culture, London, 2001
Oberoi, Patricia, Freedom and Destiny: Gender, Family and Popular Culture in India, Delhi, 2009
Christopher Princy, Camera Indica: The Social Life of Indian Photographs, Chicago, 1998
Suggested Readings:
Ramanujan, A.K. Folktales from India A Selection of Oral Tales from Twenty-two Languages (Only Introduction). New York : Pantheon Books, ©1991.
Ramaswamy, V. 'Women and the 'Domestic' in Tamil Folk Songs' in Kumkum Sangari and Uma Chakravarti, eds., From Myths to Markets: Essays on Gender, Shimla, 1999
Singh, Lata (ed.), Theatre in Colonial India: Playhouse of Power, New Delhi, 2009

SEC –A (2) Understanding Heritage

This course will enable students to understand the different facets of heritage and their significance. It highlights the legal and institutional frameworks for heritage protection in India as also the challenges facing it. The implications of the rapidly changing interface between heritage and history will also be examined. The course will be strongly project-based and will require visits to sites and monuments. At least two Projects will be based on visits to Museums/Heritage Sites.

I. Defining Heritage
Meaning of 'antiquity', 'archaeological site', 'tangible heritage', 'Intangible heritage' and 'art treasure'
II. Evolution of Heritage Legislation and the Institutional Framework:
Conventions and Acts— national and international Heritage-related government departments, museums, regulatory bodies etc.
Conservation Initiatives
III. Challenges facing Tangible and Intangible Heritage
Development, antiquity smuggling, conflict (to be examined through Specific case studies)
IV. Evolution of Heritage Legislation and the Institutional Framework:
Conventions and Acts— national and international Heritage-related government departments, museums, regulatory bodies etc.
Conservation Initiatives
V. Challenges facing Tangible and Intangible Heritage:
Development, antiquity smuggling, conflict (to be examined through specific case studies)
VI. Heritage and Travel:
Viewing Heritage Sites - The relationship between cultural heritage, Landscape and travel recent trends

Essential Readings
David Lowenthal, Possessed By The Past: The Heritage Crusade and The Spoils of History, Cambridge, 2010

Layton, R. P. Stone and J. Thomas. Destruction and Conservation of Cultural Property, London: Rutledge, 2001

Lahiri, N., Marshaling the Past - Ancient India and its Modern Histories. Ranikhet: Permanent Black. 2012. Chapters 4 and 5.

S.S. Biswas, Protecting the Cultural Heritage (National Legislations and International Conventions). New Delhi: INTACH, 1999.

Suggested Readings
Acts, Charters and Conventions are available on the UNESCO and ASI websites (www.unesco.org; www.asi.nic.in)

Agrawal, O.P., Essentials of Conservation and Museology, Delhi, 2006

Chainani, S. 2007. Heritage and Environment. Mumbai: Urban Design Research Institute, 2007

SEC –B (2): Art Appreciation: an Introduction to Indian Art

The purpose of this course is to introduce students to Indian art, from ancient to contemporary times, in order to understand and appreciate its diversity and its aesthetic richness. The course will equip students with the abilities to understand art as a medium of cultural expression. It will give students direct exposure to Indian art through visuals, and visits to sites and museums.

I. Prehistoric and protohistoric art: _Rock art; Harappan arts and crafts

II. Indian art (c. 600 BCE – 600 CE):

World Heritage Site Managers, UNESCO World Heritage Manuals
[Can be downloaded/ accessed at www.unesco.org]

Notions of art and craft Canons of Indian paintings Major developments in stupa, cave, and temple art and architecture Early Indian sculpture: style and iconography Numismatic art

III. Indian Art (c. 600 CE – 1200 CE) : Temple forms and their architectural features Early illustrated manuscripts and mural painting traditions Early medieval sculpture: style and iconography Indian bronzes or metal icons

IV. Indian art and architecture (c. 1200 CE – 1800 CE) :
Sultanate and Mughal architecture Miniature painting traditions: Mughal, Rajasthani, Pahari Introduction to fort, palace and haveli architecture

V. Modern and Contemporary Indian art and Architecture:
The Colonial Period Art movements: Bengal School of Art, Progressive Artists Group, etc. Major artists and their artworks Popular art forms (folk art traditions)

Essential Readings

Neumayer, Erwin, Lines of Stone: The pre-historic rock-art of India,
South Asia Books, 1993
Goswamy, B.N., Essence of Indian Art, Asian Art Museum of San
Francisco, 1986
Huntington, Susan, The Art of Ancient India: Hindu, Buddhist, Jain, Weatherhill, 1985
Guha-Thakurta, Tapati, The making of a new modern Indian art: Aesthetics and nationalism in Bengal, 1850-1920, Cambridge University Press, 1992

Suggested Readings:

Mitter, Partha, Indian Art, Oxford History of Art series, Oxford University Press, 2001
Dhar, Parul Pandya, ed., 2011, Indian Art History Changing Perspectives, New Delhi: D.K. Printworld and National Museum Institute (Introduction).
Beach, M.C., The New Cambridge History of India I: 3, Mughal and Rajput Painting, Cambridge University Press, 1992.
Ray, Niharranjan, An Approach to Indian Art, Calcutta, 1970

CBCS SYLLABUS

IN

HISTORY (GENERAL)

CALCUTTA UNIVERSITY

2018

University of Calcutta

HIS-G (General)-CBCS Syllabus in History, 2018

4 Core Courses. (CC.) 2 Discipline-specific Elective; (DSE-A & DSE-B) 2 Generic Elective (GE) 2 Skill Enhancement/Skill based Courses (SEC- A & SEC-B)

- Each course carries 80 marks. Minimum 60 classes.
- Each course: 6 credits (5 Theoretical + 1 Tutorial-related). Teaching time: 6 hrs per week or 6x14 =84 hrs
- Exception: Skill Enhancement/Skill-based Courses: 2 credits (no Tutorial).
- 65 marks for theoretical segment:
- Question Pattern for subjective/descriptive segment of 50 marks: 3 questions out of 6(within 500 words; 10 x3 = 30) + 4 questions out of 8 (within 250 words; one from each module 5x4=20) and 15 objective type questions carrying 1 mark each (15 x 1 = 15).
- 15 marks for tutorial-related segments as suggested below (any one from each mode):
- Any one of the following modes: upto 1000 words for one Term Paper/upto 500 words for each of the two Term Papers/ equivalent Book Review --- based on syllabus related and/or current topics [The modes and themes and/or topics are be decided by the concerned faculty of respective colleges.]
- Core Courses (CC) in Semesters 1- 4 ; Generic Elective (GE) courses in Semesters 1-4; Skill Enhancement courses (SEC-A) in Semesters 3/5 & (SEC- B) in Semesters 4/6 Discipline-specific Elective(DSE –A) in Semester 5 (DSE –B) in Semester 6
- **Skill Enhancement/Skill-based Courses: 2 credits (no Tutorial).**
- Each course carries 80 marks. Teaching time: 2hrs per week or 2x14=28hrs
- 80 marks for theoretical segment.
- Question Pattern for subjective/descriptive segment of 80 marks: 4 questions out of 8 (within 500 words; (10 x4 = 40) + 5 questions out of 10 (within 250 words; 5x5=25) and 15 objective type questions carrying 1 mark each (15 x 1 = 15).

IMPORTANT NOTES:

- The Readings provided below (except Bengali books) include those of the UGC Model CBCS Syllabus in History. For Course Objectives and references it is advised that the UGC model CBCS syllabus concerning relevant courses and topics should be given due importance and primarily consulted.
- Bengali are not necessarily substitutes, but supplementary to the English books.
- The format is subject to the CBCS Common Structural Format of the University.

LIST OF COURSES FOR GENERAL PROGRAMME	
COURSE CODE	**(6 Credits per Core Course)**
Subject-Hon-Core-Semester-Paper-Th &TU	**CORE COURSES FOR GENERAL & GENERIC ELECTIVE FOR HONOURS**
HIS-G-CC/GE-1-1-TH&TU	
HIS-G-CC/GE-2-2-TH&TU	
HIS-G-CC/GE-3-3-TH&TU	
HIS-G-CC/GE-4-4-TH&TU	
Skill Enhancement Course (2 Credits per Course)	
GROUP-A	**HIS-G-SEC- 3/5-A(1) or A (2)-TH**
SEC-A-(1)	
SEC-A-(2)	
GROUP-B	**HIS-G-SEC- 4/6-B(1) or B(2)-TH**
SEC-B-(1)	
SEC-B-(2)	
DISCIPLINE SPECIFIC ELECTIVE (6 Credits per Course)	
GROUP-A	**HIS-G-DSE- 5-A(1) or A(2)-TH&TU**
DSE-A-(1)	
DSE-A-(2)	
GROUP-B	**HIS-G-DSE-6-B(1) or B (2)-TH&TU**
DSE-B-(1)	
DSE-B-(2)	

Structure of B.A General (Programme)

HIS-G - CC -1- 4 /GE -1-4 TH&TU

1History of India from the Earliest Times upto 300 CE
2.History of India from C.300 to 1206.
3.History of India from C. 1206to1707
4.History of India from 1707to1950

Discipline Specific Elective (DSE -A &DSE- B) TH&TU Any One from DSE-A in Semester 5 & Any One from DSE-B in Semester 6

1. National liberation Movements in 20th Century World.
2. Some Aspects of European History: C.1780-1945.
3. Patterns of Capitalism in Europe: C.16TH Century to early 20th Century
4. Some Aspects of Society &Economy of Modern Europe: 15 – 18 Century

Skill Enhancement Courses SEC –A & B: Any One from SEC-A1/ SEC-A2 in Semester 3/5. Any One from SEC-B1/ SEC-B2 in Semester 4/6

SEC -A 1: Historical Tourism: Theory &Practice
SEC -B 1: Museums &Archives in India
SEC –A 2: Indian History &Culture
SEC-B 2: Orality and Oral Culture in India

Semester wise Courses for HIS-G

	SEM-1	SEM-2	SEM-3	SEM-4	SEM-5	SEM-6
CC	CC-1 2TH +2TU	CC -2 2TH +2TU	CC-3 2TH +2TU	CC-4 2TH +2TU		
GE	GE-1 TH +TU	GE-2 TH +TU				
AECC	AECC-1 TH	AECC-2 TH				
DSE			DSE-A TH +TU	DSE-B TH +TU	DSE-A TH +TU	DSE-B TH +TU
SEC			SEC-A -1 TH	SEC-B -1 TH	SEC-A 2 TH	SEC-B 2 TH

CC: 4 courses each from 2 disciplines. (One course from each subject under each semester) Each course is of 6 credits.
GE: Two courses from one subject different from the core subject. Each course is of 6 credits.

AECC:-1 Communicative English AECC-2- Environmental studies (Each course has 2 credits)
DSE: 2 courses each from 2 disciplines. Each course is of 6 credits.
SEC: 2 courses each from 2 disciplines ((Each course has 2 credits)
DSE/ SEC : Choice must be group specific to each semester

CC -1/GE-1 : History of India from Earliest Times up to 300 CE

I. Sources & Interpretation

II. A broad survey of Palaeolithic, Mesolithic and Neolithic Cultures.

III. Harappan Civilization : Origin, Extent, dominant features &decline, Chalcolithic age.

IV. The Vedic Period: Polity, Society, Economy and Religion, Iron Age with reference to PGW &Megaliths.

V. Territorial States and the rise of Magadha,
Conditions for the rise of Mahajanpadas and the Causes of Magadha's success
VI. Iranian and Macedonian Invasions, Alexander's Invasion and impact
VII. Jainism and Buddhism: Causes, Doctrines, Spread, Decline and Contributions
VIII. The Satavahanas Phase: Aspects of Political History, Material Culture, Administration, Religion

VIII. Emergence and Growth of Mauryan Empire; State Administration, Economy, Ashoka's Dhamma, Art &Architecture

IX. The Satvahana Phase: Aspects of Political History, Administration, Material Culture, & Religion

X. The Sangam Age: Sangam Literature, The three Early Kingdoms, Society & the Tamil language

XI. The age of the Indo-Greeks, Shakas: Parthians & Kushanas: Aspects of Polity, Society, Religion, Arts &Crafts, Coins, Commerce and Towns.

References:

Agrawal, D.P. The Archaeology of India. Curzon Press, 1982

Basham, A.L. The Wonder that was India: A Survey of the Culture of the Indian Sub-Continent before the Coming of the Muslims. Picador, 2004

Chakrabarti, D.K. Archaeology of Ancient Indian Cities OUP India; 1998

Jaiswal, Suvira, Caste: Origin, Function and Dimensions of Change. Manohar Publishers 1998

Subramanian, N. Sangam Polity

Thapar, Romila The Penguin History of Early India: From the Origins to AD 1300 University of California Press; 1st edition 2004

Allchin, F.R. and B Origins of a Civilization: The Prehistory and Early Archaeology of South Asia New Delhi : Viking, 1997.

Jha, D.N. Ancient India in Historical Outline .Manohar, New Delhi (1998 edn.)
Kosambi, D.D. Culture and Civilization of Ancient India World Publishing Company, 1969

Ray, H.P. Monastery and guild : commerce under the Sātavāhanas
Delhi ; New York : Oxford University Press, 1986.

Sastri, K.A.N. A History of South India **:**From Prehistoric Times to the Fall of Vijayanagar OUP India 1976

R.S Sharma, India's Ancient Past Delhi: Oxford University Press 2005

Ray, Niharranjan , Maurya and Post Maurya Art: A Study in Social and Formal Contrasts . Indian Council of Historical Research, 1975

Sharma, R.S., Aspects of Political Ideas and Institutions in Ancient India (1991 edn.)
Thapar, Romila Ashoka and the Decline of the Mauryas Oxford University Press (1997 edn)
Yazdani, G. Early History of Deccan Aspects of Political Ideas and Institutions in Ancient India (1991 edn.)

বাশাম এ এল, অতীতের উজ্জ্বল ভারত, (The Wonder That Was India), প্রগ্রেসিভ পাবলিশার্স, কলকাতা, ২০০৫
চক্রবর্তী রণবীর, ভারত ইতিহাসের আদি পর্ব, কলকাতা, ২০০৭
হাবিব ইরফান, ভারতবর্ষের সাধারণ মানুষের ইতিহাস
প্রথম খন্ড – প্রাক-ইতিহাস, (Pre-history) এন বি এ, কলকাতা, ২০০২
দ্বিতীয় খন্ড: সিন্ধু সভ্যতা, (The Indus Civilisation) এন বি এ, কলকাতা, ২০০২
তৃতীয় খন্ড – বৈদিক সভ্যতা, (The Vedic Age) এন বি এ, কলকাতা, ২০০২
ঝা ডি এন, আদি ভারত – একটি সংক্ষিপ্ত ইতিহাস, (Ancient India: An Introduction,) প্রগ্রেসিভ পাবলিশার্স, কলকাতা
কোশাম্বী ডি ডি, ভারত ইতিহাস চর্চার ভূমিকা (An Introduction to the Study of Indian History) বাগচি কে পি এন্ড কোং, কলকাতা, ২০০২
রত্নাগর শিরিণ, হরপ্পা সভ্যতার সন্ধানে (Understanding Harappa) এন বি এ, কলকাতা, ২০০৩
রায়চৌধুরী হেমচন্দ্র, প্রাচীন ভারতের রাজনৈতিক ইতিহাস, (Political History of Ancient India), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ**,** কলকাতা
থাপার রোমিলা, ভারতবর্ষের ইতিহাস, ওরিয়েন্ট লংম্যান, কলকাতা
ভট্টাচার্য নরেন্দ্রনাথ, প্রাচীন ভারতে ধর্ম, কলকাতা, ১৯৮৮

ভট্টাচার্য নরেন্দ্রনাথ, প্রাচীন ভারতীয় সমাজ, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, কলকাতা
ভট্টাচার্য সুকুমারী, ইতিহাসের আলোকে বৈদিক সাহিত্য, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, কলকাতা
ভট্টাচার্য সুকুমারী, প্রাচীন ভারত- সমাজ ও সাহিত্য, আনন্দ পাবলিশার্স, কলকাতা
চক্রবর্তী দিলীপ কুমার - ভারতবর্ষের প্রাক্ ইতিহাস আনন্দ পাবলিশার্স, কলকাতা, ১৯৯৯
গঙ্গোপাধ্যায় দিলীপ কুমার - ভারত ইতিহাসের সন্ধানে, (২ খন্ডে), ২০০৭
চক্রবর্তী রণবীর, প্রাচীন ভারতের অর্থনৈতিক ইতিহাসের সন্ধানে, আনন্দ পাবলিশার্স, কলকাতা ২০০২ (সংশোধিত সংস্করণ)
চানানা দেবরাজ, প্রাচীন ভারতে দাস প্রথা, (Slavery in Ancient India as depicted in Pali and Sanskrit Texts), কে পি বাগচি এন্ড কোং, কলকাতা ১৯৯৫
রায় নীহাররঞ্জন, বাঙালির ইতিহাস, কলকাতা, ১৯৮০(দ্বিতীয় সংস্করণ)
শর্মা রামশরণ, প্রাচীন ভারতে বস্তুগত সংস্কৃতি ও সমাজ সংগঠন, (Material Cultures and Social Formations in Ancient India), ওরিয়েন্ট লংম্যান, ১৯৯৮
শর্মা রামশরণ, আদি মধ্যযুগের ভারতীয় সমাজ : সমন্ত-প্রক্রিয়া বিষয়ে এক সমীক্ষা(Early Medieval Indian Society : A Study in Feudalism) ওরিয়েন্ট লংম্যান, ২০০৩
শর্মা রামশরণ, ভারতের সমাজতন্ত্র, (Indian Feudalism), কে পি বাগচি এন্ড কোং, কলকাতা
শর্মা রামশরণ, আর্যদের অনুসন্ধান, (Looking for the Aryans), প্রগ্রেসিভ পাবলিশার্স, কলকাতা
শর্মা রামশরণ, আর্যদের ভারতে আগমন, (Advent of the Aryans), ওরিয়েন্ট লংম্যান, ২০০১
শর্মা রামশরণ, প্রাচীন ভারতে শূদ্র, (Sudras in Ancient India), কে পি বাগচি এন্ড কোং, কলকাতা
থাপার রোমিলা, অশোক ও মৌর্যদের পতন, (Asoka and the Decline of the Mauryas), কে পি বাগচি এন্ড কোং, কলকাতা
চট্টোপাধ্যায় সুনীল, প্রাচীন ভারতের ইতিহাস (১ম খন্ড), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, একাদশ মুদ্রণ, এপ্রিল ২০০৪
চট্টোপাধ্যায় সুনীল, প্রাচীন ভারতের ইতিহাস (২য় খন্ড), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ৮ম মুদ্রণ, ফেব্রুয়ারি ২০০৪
মুখোপাধ্যায় হীরেন্দ্রনাথ, ভারতবর্ষের ইতিহাস (১ম খন্ড) (প্রাচীন ও মধ্যযুগ), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, প্রথম মুদ্রণ নভেম্বর ১৯৯৭

CC-2/GE- 2: History of India from. C.300 to1206

I. The Rise & Growth of the Guptas: Administration, Society, Economy, Religion, Art, Literature, and Science &Technology.

II. Harsha & His Times: Harsha's Kingdom, Administration,Buddhism & Nalanda

III. South India: Polity, Society, Economy & Culture

IV. Towards the Early Medieval: Changes in Society, Polity Economy and Culture with reference to the Pallavas, Chalukayas and Vardhanas.

V. Evolution of Political structures of Rashtakutas, Pala &Pratiharas.

VI. Emergence of Rajput States in Northern India: Polity,Economy &Society.

VII. Arabs in Sindh: Polity, Religion &Society.

VIII. Struggle for power in Northern India &establishment of Sultanate.

References:

R. S. Sharma: Indian Feudalism 1980.
R. S. Sharma -India's Ancient Past, New Delhi, 2005.
B. D. Chattopadhayay: Making of Early Medieval India , 1994.
Derryl N. Maclean: Religion and Society in Arab Sindh Leiden ; New York : E.J. Brill, 1989.
K. M. Ashraf: Life and Conditions of the People of Hindustan, New Delhi, 1967.
M. Habib and K.A. Nizami: A Comprehensive History of India Vol.V, Delhi, 1993.
Tapan Ray Chaudhary and Irfan Habib (ed.) : The Cambridge Economic History of India, Vol.I, Cambridge University Press .1982
Peter Jackson: Delhi Sultanate: A Political and Military History, Keele University 2003.
Tara Chand: Influence of Islam on Indian Culture, Indian Press, 1936.
Satish Chandra: A History of Medieval India, 2 Volumes Orient Black Swan 2009
Percy Brown, : Islamic Architecture, Taraporevala Sons, 1943.

রোমিলা থাপার, অশোক ও মৌর্যদের পতন, (Asoka and the Decline of the Mauryas), কে পি বাগচি এন্ড কোং, কলকাতা
সুনীল চট্টোপাধ্যায়, প্রাচীন ভারতের ইতিহাস (১ম খন্ড), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, একাদশ মুদ্রণ, এপ্রিল ২০০৪
সুনীল চট্টোপাধ্যায়, প্রাচীন ভারতের ইতিহাস (২য় খন্ড), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ৮ম মুদ্রণ, ফেব্রুয়ারি ২০০৪
হীরেন্দ্রনাথ মুখোপাধ্যায়, ভারতবর্ষের ইতিহাস (১ম খন্ড) (প্রাচীন ও মধ্যযুগ), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, প্রথম মুদ্রণ নভেম্বর ১৯৯৭
বাশাম এ এল, অতীতের উজ্জ্বল ভারত, (The Wonder That Was India), প্রগ্রেসিভ পাবলিশার্স, কলকাতা, ২০০৫

মুখোপাধ্যায় হীরেন্দ্রনাথ, ভারতবর্ষের ইতিহাস (১ম খন্ড) (প্রাচীন ও মধ্যযুগ), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, প্রথম মুদ্রণ নভেম্বর ১৯৯৭
ভট্টাচার্য, নরেন্দ্রনাথ, ধর্ম ও সংস্কৃতিক: প্রাচীন ভারতীয় প্রেক্ষাপট
চক্রবর্তী রণবীর, প্রাচীন ভারতের অর্থনৈতিক ইতিহাসের সন্ধানে, আনন্দ পাবলিশার্স, কলকাতা ২০০২
চক্রবর্তী রণবীর, ভারত ইতিহাসের আদি পর্ব, ওরিয়েন্ট লংম্যান,কলকাতা, ২০০৭
সেন সমরেন্দ্রনাথ, বিজ্ঞানের ইতিহাস, শৈব্যা প্রকাশন, ১৯৯৬
শর্মা রামশরণ, ভারতের সামন্ততন্ত্র, (Indian Feudalism), কে পি বাগচি এন্ড কোং, কলকাতা
শর্মা রামশরণ, আদি মধ্যযুগের ভারতীয় সমাজ: সামন্ত-প্রক্রিয়া বিষয়ে এক সমীক্ষা(Early Medieval Indian Society: A Study in Feudalisation), ওরিয়েন্ট লংম্যান, ২০০৩

CC-3/GE-3 : History of India from 1206 to1707

I. Foundation, Expansion &consolidation of the Delhi Sultanate; Nobility &Iqta system.

II.Miltary, administrative &economic reforms under the Khiljis &the Tughlaqs.

III. Bhakti &Sufi Movements.

IV.Provincialkingdoms: Mewar, Bengal, Vijaynagara &Bahamanis.

V. Second Afghan State.

VI. Emergence and consolidation of Mughal State, C.16th century to mid 17th century.

VII. Akbar to Aurangzeb: administrative structure-Mansab & Jagirs, State &Religion, Socio-Religious Movements.

VIII. Economy, Society &Culture under the Mughals.

IX. Emergence of Maratha Power.

References:

Irfan Habib: The Agrarian System of Mughal India 1556-1707, Oxford University Press, 1999
M. Athar Ali: Mughal Nobility under Aurangzeb, Dept. of History, Aligarh Muslim University, 1966
Shireen Moosvi: The Economy of the Mughal Empire Oxford University Press , 2015
S.A.A.Rizvi: Muslim Revivalist Movements in Northern India during 16th and 17th Centuries
R.P. Tripathi: The Rise and Fall of the Mughal Empire, 2 vol. Surjeet Publications, 2014
I. H. Siddiqui: Some Aspects of Afghan Despotism, Three Men Publication, 1969
Kesvan Veluthat: Political Structure of Early Medieval South India, Orient Blackswan; 2012
P.J. Marshall: The Eighteenth Century in Indian History. Oxford University Press 2005
Stewart Gordon, : The Marathas 1600-1818, Cambridge University Press, 1993
Percy Brown, Islamic Architecture Taraporevala Sons, 1943.

রায় মিহিরকুমার, ভারতের ইতিহাস (তুরক-আফগান যুগ), পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, দ্বিতীয় মুদ্রণ, ফেব্রুয়ারী ১৯৯২
হাবিব ইরফান, মধ্যযুগের ভারতের অর্থনৈতিক ইতিহাস, (Economic History of Medieval India: A Survey), প্রগ্রেসিভ পাবলিশার্স
হাবিব ইরফান, মধ্যকালীন ভারত ১-৪ খন্ড (Medieval India)কে পি বাগচি এন্ড কোং, কলকাতা
হাবিবুল্লাহ এ বি এম, ভারতে মুসলিম শাসনের প্রতিষ্ঠা ১২০৬-১২৯০, (The Foundation of Muslim Rule in India), প্রগ্রেসিভ পাবলিশার্স, কলকাতা
রায় অনিরুদ্ধ ও চট্টোপাধ্যায় রত্নাবলী, মধ্যযুগে বাংলার সমাজ ও সংস্কৃতি, কে পি বাগচি এন্ড কোং, কলকাতা ১৯৯২
রায় অনিরুদ্ধ, মধ্যযুগের ভারতের ইতিহাস : সুলতানি আমল, ওরিয়েন্ট লংম্যান, কলকাতা
করিম আব্দুল, বাংলার ইতিহাস : সুলতানি আমল, ঢাকা

CC-4/GE-4 History of India; 1707-1950.

I. Interpreting the 18th Century.

II. Emergence of Independent States &establishment of Colonial power.

III. Expansion &consolidation of Colonial Power upto 1857.

IV.Uprising of 1857: Causes, Nature &Aftermath.

V. Colonial economy: Agriculture, Trade & Industry.

VI.Socio-Religious Movements in the 19th century.

VII. Emergence &Growth of Nationalism with focus on Gandhian nationalism.

VIII. Communalism: Genesis, Growth and partition of India.

IX. Advent of Freedom: Constituent Assembly, establishment of Republic.

References:

Sugata Bose and Ayesha Jalal: Modern South Asia: History, Culture, Political Economy, New Delhi, 1998
Sekhar Bandyopadhyay From Plassey to Partition, Orient Longman, 2004.
Barbara D Metcalf andT.R. Metcalf A Concise History of India,Cambridge, 2002
C.A. Bayly, An Illustrated History of Modern India 1600 - 1947,London 1990
Sumit Sarkar, Modern India 1885 - 1947, Macmillan, 1983
Mushirul Hasan ,John Company to the Republic: A story of Modern India, Lotus Collection, 2001
R.P. Dutt, India Today. 1949
Thomas Metcalf Ideologies of the Raj. Cambridge University Press, 1995
R. Jeffery, J Masseloss, From Rebellion to the Republic. New Delhi : Sterling Publishers, 1990.
Bipan Chandra: Nationalism and Colonialism. Sangam Books, 1996.
Urvashi Butalia The Other side of Silence. Duke University Press, 2000
Francine Frankel Indiaís Political Economy 1947- 1977. Princeton University Press, 1978.
Paul Brass The Politics of India since Independence. Publisher: Cambridge University Press, 1994
Lloyd and Susan Rudolph In Pursuit of Laxmi: the Political Economy of the Indian State, Chicago, 1987
Bipan Chandra, Aditya Mukherjee, India After Independence, Viking, 1999.
Gail Omvedt Dalits and Democratic Revolution. Dr. Ambedkar and the Dalit Movement in Colonial India. Pakistan Institute of Development Economics, 1994
Ramachandra Guha The Fissured Land. Oxford University Press, 1992.
K.G. Subramanian The Living Tradition: Perspectives on Modern Indian Art. Calcutta : Seagull Books, 1987.
Radha Kumar A History of Doing. New Delhi: Kali for. Women, 1993.

বন্দ্যোপাধ্যায় শেখর, অষ্টাদশ শতকের মুঘল সংকট ও আধুনিক ইতিহাস চিন্তা, কলকাতা,১৯৮৩
বন্দ্যোপাধ্যায় শেখর, পলাশী থেকে পার্টিশন: আধুনিক ভারতের ইতিহাস, ওরিয়েন্ট লংম্যান, ২০০৪
ভট্টাচার্য সব্যসাচী, ঔপনিবেশিক ভারতের অর্থনীতি, কলকাতা, ২০০০
সুনীল সেন, ভারতে কৃষিকার্য ১৭৯৩-১৯৪৭, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৮৫
চৌধুরী বিনয় ভূষণ, ঔপনিবেশিক আমলে বাংলার কৃষি ইতিহাস, কে পি বাগচি এন্ড কোং, কলকাতা
ইসলাম, সিরাজুল, বাংলার ইতিহাস ঔপনিবেশিক শাসনকাঠামো, চয়নিকা, ঢাকা, ২০০২
চক্রবর্তী মৃণাল, সিরাজ-উদ্-দৌলা, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ,কলকাতা, ১৯৮১
রায় রজতকান্ত, পলাশীর ষড়যন্ত্র ও সেকালের সমাজ, আনন্দ পাবলিশার্স, কলকাতা
চৌধুরী সুশীল, পলাশীর অজানা কাহিনী, আনন্দ পাবলিসার্স,কলকাতা

আলি এম আখার, আওরঙ্গজেবের সময়ে মুঘল অভিজাত শ্রেণী(The Mughal Nobility under Aurangzeb) কে পি বাগচি এন্ড কোং, কলকাতা
বন্দ্যোপাধ্যায় শেখর, অষ্টাদশ শতকের মুঘল সংকট ও আধুনিক ইতিহাস চিন্তা, কলকাতা,১৯৮৩
ভদ্র গৌতম, মুঘল যুগে কৃষি অর্থনীতি ও কৃষক বিদ্রোহ, সুবর্ণরেখা, কলকাতা, ১৯৮৩
চন্দ্র সতীশ, মুঘল দরবারে দল ও রাজনীতি, (Parties and politics at the Mughal Court 1707-1740) কে পি বাগচি এন্ড কোং, কলকাতা
চৌধুরী বিনয় ভূষণ ও অন্যান্যরা, বাংলার কৃষি সমাজের গঠন, কে পি বাগচি এন্ড কোং, কলকাতা
হাবিব ইরফান, মধ্যকালীন ভারত, খন্ড ১-৪, কে পি বাগচি এন্ড কোং, কলকাতা
হাবিব ইরফান, মুঘল সাম্রাজ্য ও তার পতন- একটি সমীক্ষা, পশ্চিমবঙ্গ ইতিহাস সংসদ,২০০০
হাবিব ইরফান, মুঘল ভারতের কৃষি ব্যবস্থা, (The Agrarian System of Mughal India(1556-1707)), কে পি বাগচি এন্ড কোং, কলকাতা
হাবিব ইরফান, মধ্যযুগের ভারতের অর্থনৈতিক ইতিহাস, (Economic History of Medieval India: A Survey), প্রগ্রেসিভ পাবলিশার্স, কলকাতা, ২০০৯
হাবিব ইরফান, ভারতের ইতিহাস প্রসঙ্গঃ মার্কসীয় চেতনার আলোকে(Essays in Indian History: Towards a Marxist Perception), ন্যাশনাল বুক এজেন্সি, কলকাতা, ১৯৯৯
রায় অনিরুদ্ধ, মধ্যযুগের ভারতের অর্থনৈতিক ইতিহাস, ১২০০-১৭৫৭, প্রগ্রেসিভ পাবলিশার্স, কলকাতা
রায় অনিরুদ্ধ, মুঘল যুগের অর্থনৈতিক ইতিহাস, কে পি বাগচি এন্ড কোং, কলকাতা
সরকার জগদীশ নারায়ণ, মুঘল অর্থনীতিঃ সংগঠন এবং কার্যক্রম, (Mughal Economy : Organisation and Working) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, কলকাতা ১৯৯১
সিদ্দিকী নোমান আহমেদ, মোঘল রাজত্বে ভুমিরাজস্ব পরিচালন ব্যবস্থা (১৭০০ – ১৭৫০)(Land Administration Under the Mughals (1700 -1750)) পার্ল পাবলিশার্স, কলকাতা, ১৯৮০
মুখোপাধ্যায় হীরেন্দ্রনাথ, ভারতবর্ষের ইতিহাস (২য় খন্ড)
(মুঘল ও ব্রিটিশ ভারত,পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ,কলকাতা ১৯৯৮
চট্টোপাধ্যায় রত্নাবলী, মুঘল যুগের দরবারি চিত্রকলা, খীমা, কলকাত
বন্দ্যোপাধ্যায় শেখর, পলাশি থেকে পার্টিশান (From Plassey to Partition), ওরিয়েন্ট লংম্যান
দেশাই এ আর, ভারতীয় জাতীয়তাবাদের সামাজিক পটভূমি, (Social Background to Indian Nationalism) কে পি বাগচি এন্ড কোং, কলকাতা
জয়া চ্যাটার্জী, বাংলা ভাগ হলঃ হিন্দু সাম্প্রদায়িকতা ও দেশ-বিভাগ, ১৯৩২-১৯৪৭
(Bengal Divided : Hindu Communalism and Partition 1932 – 1947) এল আলমা পাবলিকেশনস, কলকাতা, ২০০৩
দত্ত রজনী পাম, আজিকার ভারত (India Today)
সরকার সুশোভন, বাংলার রেনেসাঁস, (Notes on Bengal Renaissance), দীপায়ন, কলকাতা
ত্রিপাঠী অমলেশ, ভারতের মুক্তিসংরামে চরমপন্থী পর্ব, (The Extremist Challenge) আনন্দ পাবলিশার্স, কলকাতা
মুখোপাধ্যায় হীরেন্দ্রনাথ, ভারতবর্ষের ইতিহাস(২য় খন্ড) (মুঘল ও ব্রিটিশ ভারত) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ৪র্থ মুদ্রণ, ১৯৯৮
সুর নিখিল, ভারতীয় জাতীয়তাবাদী আন্দোলনের পটভূমি, পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৮৯
চট্টোপাধ্যায় প্রণবকুমার, আধুনিক ভারত (১৮৫৮-১৯২০) (১ম খন্ড) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৯৮

চট্টোপাধ্যায় প্রণবকুমার, আধুনিক ভারত (১৯২০-১৯৪৭) (২য় খন্ড) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৯৯
সেন সুনীল, ভারতে কৃষিসম্পর্ক(১৭৯৩-১৯৪৭)(Agrarian Relations in India (1793-1847)) পশ্চিমবঙ্গ রাজ্য পুস্তক পর্ষদ, ১৯৮৫

DSE Discipline Specific Elective (Any Two):

DSE –A -1: National Liberation Movements in 20th century World

I.Nationalism: Theory and Practice.

II. Nature of Imperialism and colonialism

III. National Movements in Nigeria, Kenya, Congo, Angola &South Africa.

IV.China between 1911-1949:Revolution of 1911,May Fourth Movement and Cultural Revolution under Mao Tse Tung. Indonesian Revolution 1945-1949.
V. National Movement in India.

References:

Lucian Bianco, Origins of the Chinese Revolution, 1915-1946. Stanford University Press, 1971.
A.J.Temu & Roger Owen eds , Studies in the theory of Imperialism,1970.
E.F.Penrose, ed., European Imperialism the partition of Africa,1980.
Milton Osborne, Southeast Asia: An Introductory History. 1995
Sumit Sarkar, Modern India, Macmillan, 1984.

ত্রিপাঠী অমলেশ, স্বাধীনতা সংগ্রামে ভারতের জাতীয় কংগ্রেস, আনন্দ পাবলিশার্স, কলকাতা
চন্দ্র বিপান, আধুনিক ভারতঃ ঔপনিবেশিকতাবাদ ও জাতীয়তাবাদ(Nationalism and Colonialism), কে পি বাগচি এন্ড কোং, কলকাতা
চন্দ্র বিপান এবং অন্যান্য, ভারতের স্বাধীনতা সংগ্রাম, (India's Struggle for Independence) কে পি বাগচি এন্ড কোং, কলকাতা

চন্দ্র বিপান এবং অন্যান্য, ভারতবর্ষ – স্বাধীনতার পরে, (India after Independence), আনন্দ পাবলিশার্স, কলকাতা

DSE- A -2: Some Aspects of European History: C.1780-1945

I.The French Revolution: Genesis Nature & Consequences

II.Napoleonic Era and aftermath.

III.Revolutions of 1830 & 1848.

IV.Unification of Italy & Germany.

V.Social and economic Changes.

VI. Imperialist Conflicts: World War I

VII.Rise of Fascism and Nazism.

VIII. Origins of World War II

References:

E.J. Hobsbawn: The Age of Revolution. London : Weidenfeld & Nicolson, 1962.
Lynn Hunt: Politics, Culture and Class in the French Revolution. Berkeley: University of California Press, 1984.
Andrew Porter, European Imperialism, 18760 -1914 (1994).
E.J. Hobsbawm, The Age of Extremes, 1914 - 1991, New York: Vintage, 1996
Carter V. Findley and John Rothey, Twentieth-Century World,Boston: Houghton-Mifflin, 5th ed. 2003

DSE- B-1: Patterns of Capitalism in Europe: C.16TH Century to early 20th Century

I.Definitions & Concepts

II.Commercial Capitalism: 1500-1700

III.Industrial Revolution in England: Causes &Nature

IV.Industrial Capitalism in France: Genesis & Nature

V. Growth of Industries in Germany

VI.Impact of Industrial Revolution on European Society, Polity & Economy.

References:

Jerry Müller, The Mind &the Market, Knopf Doubleday Publishing Group, 2007
Karl Polanyi, The Great Transformation : *The Political and Economic Origins of Our Time*. Boston: Beacon Press 1944.
Joseph Schumpeter, Capitalism, Socialism &Democracy New York: Harper & Row, 1942.
Wallerstein, World System Analysis: An Introduction, 2004
Cipolla Carlo, M, Fontana Economic History of Europe, VOL I&II Collins, 1973.
Christopher Hill, From Reformation to Industrial Revolution, Weidenfeld and Nicolson, 1967
Jan De Vries, The Industrial Revolution &the Industrious Revolution, 1994

DSE-B-2: Some aspects of Society & Economy of Modern Europe: 15Tth – 18 th Century

1: Historiographical Trends

II. Feudal Crisis: Main strands

III. Renaissance: Origin, Spread &Dominant Features

IV. European Reformation: Genesis, nature & Impact

V. Beginning of the era of colonization: motives; mining and plantation; the African slaves

VI. Economic developments of the sixteenth century; Shift of economic balance from the Mediterranean to the Atlantic

VII. Transition from Feudalism to Capitalism: Industrial Revolution in England

References:

J H Plumb, The Pelican Book of the Renaissance, Penguin, 1982
G. R. Elton, Reformation Europe 1517,1559, Wiley, 1999
Ralph Davis, The Rise of the Atlantic Economies, New York, 1973
Arvind Sinha, Europe in Transition, Delhi, 2010
Rodney Hilton, The Transition from Feudalism to Capitalism, Delhi,2006.
Fernand Braudel, Civilization and Capitalism, Vols. I, II, III, California, 1992
Butterfield, Herbert. The origins of modern science. Vol. 90507. Free Press, 1997

গৌতম চট্টোপাধ্যায় সম্পাদিত: দুশো বছরের আলোকে, পশ্চিমবঙ্গ ইতিহাস সংসদ, ১৯৮৯
চক্রবর্তী, ফরাসী বিপ্লব, পশ্চিমবঙ্গ পুস্তক পর্ষদ, কলকাতা
চক্রবর্তী সুভাষ রঞ্জন, ইউরোপের ইতিহাস, পশ্চিমবঙ্গ পুস্তক পর্ষদ, কলকাতা, ১৯৮৬
জ্যাকসন টি এ, ফরাসী বিপ্লব – দশ দিগন্ত, কে পি বাগচি এন্ড কোং, কলকাতা ২০০৪
টমসসন ডেভিড, বিশ্ব ইতিহাসের প্রেক্ষাপটে ইউরোপ, ১ম খন্ড (১৭৮৯-১৮৫০), ২য় খন্ড (১৮৫১-১৯১৪)
প্রগ্রেসিভ পাবলিশার্স, কলকাতা ২০০২ ও ২০০৩
রায় সিদ্ধার্থ গুহ, আধুনিক ইউরোপঃ ফরাসী বিপ্লব থেকে দ্বিতীয় বিশ্বযুদ্ধ, প্রগতিশীল প্রকাশক, কলকাতা, ২০১৩

Skill Enhancement Elective Course (SEC) Credits,-2

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SEC-A- 1: Historical Tourism: Theory &Practice

I. Defining Heritage
Art &Architecture in India: An overview:
Field Work: Visit to historical sites &Museums
II. Understanding Built Heritage:
Stupa Architecture
Temple Architecture
Indo Persian Architecture, Forts, Palaces, Mosques
Colonial Architecture
Present day structures
III. Field Work: Visit to site &Conducting of research
IV. Modalities of conducting tourism

References:
Sunil Kumar, The Present in Delhi's Past, Delhi, Gyan Publishing House, 2002
Peter Howard, Heritage: Management, Interpretation, Identity, and London, 2003
V.S Agarwal, Indian Art, Varanasi, Prithvi Prakasahan, 1972
Percy Brown, Indian Architecture, Bombay, D.B.Taraporevala Sons &Co, 1940
James Harle, The Art & Architecture of the Indian Subcontinent, Hormonds worth, Penguin, 1988
S.K.Bhowmik, Heritage Management: Care, Understanding & Appreciation of Cultural Heritage, Jaipur, 2004.

SEC-B -1: Museums &Archives in India

I. Definitions

II. History of setting up of Museums and Archives: Some case
Studies

III. Field Work; Studying of structures & Functions

IV. Training & Employment

References:

G. Edson & Dean David, Handbook for Museum, London, Routledge,1986
John Ridener, From Folders to Post Modernism: A Concise History of Archival Theory, 2009
Roychowdhury, Madhuparna. Displaying India's Heritage : Archaelogy and the Museum Movement in Colonial India. Delhi: Orient Blackswan 2015
Sengupta, S. Experiencing History Through Archives. Delhi: Munshiram Manoharlal.2004.

SEC-A -2: Indian History &Culture

I. Environment; Culture, Tradition &Practices:
-Historical overview
-Oral &codified information on medicinal Plants
-Water & Water Bodies
-Fieldwork
II. Urbanization &Urbanism:
-Issues of settlements & Landscapes
-Social differentiations
-Communication networks
III. Social inequality &Gender:
-Status within Households: An overview
-Present context
-Issues of Violence
-Employment, distribution of resources
IV.Cultural Heritage:
-Main components
-Built Heritage
-Historical Tourism
V. Cultural Forms &Cultural Expressions:
- Performing Arts
-Fairs &Festivals
-Fieldwork
References:

Indu Banga, ed. The City in Indian History: Urban Demography, Society & Polity, Delhi, Manohar,,1991
Koch, E. Mughal Art & Imperial Ideology, New Delhi ; New York : Oxford University Press, 2001.
Radha Kumar, History of Doing: An Illustrated Account of Movements for Women's Rights &Feminism in India 1880-1990, Zubaan, 2007
V.Vasudev, Fairs &Festivals, Incredible India Series, 2007
V.Singh, The Human Footprint on Environment: Issues in India,New Delhi, and Macmillan, 2012

B. Parikh, Composite Culture in a multicultural Society, Delhi, NBT,2007
N. Mehta, Introduction: Satellite Television, Identity &Globalization in Contemporary India in N.Mehta, ED, Television in India, New York, Routledge, 2008

SEC-B- 2: Orality and Oral Culture in India

I. Defining orality

II. History &Historiography of Orality

III. Life Histories: Sociological Aspects

IV. Research Methodologies

V. Documentation: Written &Visual

References:

H. Roberts. Ed. Doing Feminist Research, London: Routledge &Kegan Paul, 1981
John Miles Foley, Oral Formulaic-Theory: An Introduction &Annotated Bibliography, New York & London: Garland, 1985
M.F.D. Knowledge & Control, London,1971

Prasad M. Mahadeva, Ideology of the Hindi Film: A Historical Construction. Delhi: OUP, 1998
Srirupa Roy,' The Post Colonial State &Visual Representations of India" Contributions to Indian Sociology, 2006, 36,1&2:233-263

Stephen Humphries: The Handbook of Oral History: recording life stories. University of Michigan : Inter-Action Inprint, 1984.

Veena Das, ed, Mirrors of Violence: Communities, Riots & Survivors in South Asia, Delhi,OUP,1990

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

CBCS SYLLABUS

IN

ISLAMIC HISTORY AND CULTURE (HONOURS)

CALCUTTA UNIVERSITY

2018

University of Calcutta
IHC – A

The Three - year B.A. Honours in IHC will comprise 6 Semesters. The curriculum will consist of 14 Core Courses (CC), 4 Discipline Specific Elective (DSE) courses, 2 Ability Enhancement Compulsory Courses (AECC), 2 Skill Enhancement Courses (SEC) Each course will be of 100 Marks. Attendance: 10 marks per Paper, Internal Assessment: 10 marks per paper.

➢ Core Courses CC

[Fourteen courses. Each course: 6 credits (5 theoretical segments TH+ 1 for tutorial related segment TU). Total: 84 credits.

- Each course carries 80 marks. Minimum 60 classes

- 65 marks for theoretical segment.
- Question Pattern for subjective/descriptive segment of 65 marks: 3 questions (within 500 words) (10 x3 = 30) + 4 questions within 250 words; 5x4 =20) + 15 objective type questions carrying 1 mark each (15 x 1 = 15).

- 15 marks for tutorial - related segments as suggested below (any one from each mode):
- Any one of the following modes: upto 1000 words for one Term Paper/upto 500 words for each of the two Term Papers/ equivalent Book Review/ --based on syllabus -related and/or current topics .[The modes and themes and/or topics are be decided by the concerned faculty of respective colleges.]
- Core courses: 2 each in Semesters 1 and 2; three each in Semesters 3 and 4; 2 each in Semesters 5 and 6.

- IMPORTANT NOTES:
  The Readings provided below include many of those of the UGC Model CBCS Syllabus in IHC. For further details of Course Objectives

and additional references it is advised that the UGC model CBCS syllabus concerning relevant courses and topics should be given due importance and primarily consulted.

- Cited advanced texts in Bengali are not necessarily substitutes, but supplementary to the English books.

- The format is subject to the common structural CBCS format of the University.

➢ Discipline- specific Elective Courses DSE

Each course: 6 credits 5 for theoretical segment + 1 for tutorial-related segment. **(TH -5 TU-1)**

DSE-A for Semester -5/6, DSE-B for Semester 5/6

- Each course carries 80 marks. Minimum 60 classes.
- 65 marks for theoretical segment.
- Question Pattern for subjective/descriptive segment of 65 marks: 3 questions (within 500 words; (10 x3 = 30) + 4 questions (within 250 words; 5x4=20) and 15 objective type questions carrying 1 mark each (15 x 1 = 15).
- 15 marks for tutorial-related segments as suggested below (any one from each mode): Any one of the following modes: upto 1000 words for one Term Paper/upto 500 words for each of the two Term Papers/ equivalent Book Review/ based on syllabus related and/or current topics [The modes and themes and/or topics of a. and b. to be decided by the concerned faculty of respective colleges.]

- **IHC-A: Skill Enhancement/Skill-based Courses SEC** Each Course: 2 credits . (Only theoretical.)
  SEC –A in Semester 3, SEC –B in Semester 4.

  - Each course carries 80 marks. Minimum 60 classes.
  - 80 marks for theoretical segment.
  - Question Pattern for subjective/descriptive segment of 80 marks: 3 questions (within 500 words; (10 x4 = 40) + 4 questions (within 250 words; 5x5=25) and 15 objective type questions carrying 1 mark each (15 x 1 = 15).

- **IHC-A: Ability Enhancement Compulsory Courses (AECC**) Each Course 2 credits
  AECC -1 : Communicative English/ MIL
  AECC-2 : Environmental Studies
  AECC -1 in Semester 1, AECC -2 in Semester 2

IMPORTANT NOTES:

- The Readings provided below include many of those of the UGC Model CBCS Syllabus in IHC. For Course Objectives and references it is advised that the UGC model CBCS syllabus concerning relevant courses and topics should be given due importance and primarily consulted.

*Website: BA IHC (Honours):

- Cited advanced texts in Bengali are not necessarily substitutes, but supplementary to the English books.
- The format is subject to the common structural CBCS format of the University.

IHC-A COURSES SEMESTER WISE

	SEM-1	**SEM-2**	**SEM-3**	**SEM-4**	**SEM-5**	**SEM-6**
CC	CC- 2TH/ 2TU **1& 2**	CC- 2TH/2TU **3&4**	CC- 3TH/3TU **5,6&7**	CC- 3TH/3TU **8,9&10**	CC- 2TH/2TU **11,&12**	CC- 2TH/2TU **13&14**
DSE					DSE-A* DSE-B 2TH/2TU	DSE-A* DSE-B 2TH/2TU
****GE**	GE-1 1TH/ 1TU	GE-2 1TH/ 1TU	GE-3 1TH/ 1TU	GE-4 1TH/ 1TU		
AECC	AECC-1 1TH/0 TU	AECC-2 1TH/ 0TU				
SEC			SEC-A 1TH/0 TU	SEC-B 1TH/0 TU		
Total No. of Courses and Marks	4x100= 400	4x100= 400	5x100= 500	5x100= 500	4x100= 400	4x100= 400
Total Credits	20	20	26	26	24	24

*__IHC-A- DSE__ – Candidates can choose any one paper in Semester -5 and another in Semester 6 taking one from Group –A and the other from Group –B

**__IHC-A Generic Elective (GE):__ The four Generic Elective papers (courses) for IHC (Honours) students will be from any subject other than IHC. Similarly History as Generic Elective will be offered to students having Honours in any subject other than IHC. The Generic Elective papers in IHC, for Honours students (for students having Honours in any subject other than IHC.) will be treated as Core Papers in IHC, for General students (for BA General Students having History. as a General paper)

LIST OF COURSES FOR IHC HONOURS PROGRAMME	
COURSE CODE	**(6 Credits per Core Course)**
Subject-Hon-Core-Semester-Paper-TH&TU	**CORE COURSES**
IHC-A-CC -1-1-TH&TU	
IHC-A-CC -1-2-TH&TU	
IHC-A-CC -2-3-TH&TU	
IHC-A-CC -2-4-TH&TU	
IHC-A-CC -3-5-TH&TU	
IHC-A-CC -3-6-TH&TU	
IHC-A-CC -3-7-TH&TU	
IHC-A-CC -4-8-TH&TU	
IHC-A-CC -4-9-TH&TU	
IHC-A-CC -4-10-TH&TU	
IHC-A-CC -5-11-TH&TU	
IHC-A-CC -5-12-TH&TU	
IHC-A-CC -6-13-TH&TU	
IHC-A-CC -6-14-TH&TU	
Skill Enhancement Course (2 Credits per Course)	
GROUP-A	**IHC-G-SEC-3-A(1) &A (2)-TH**
SEC-A-(1)	
SEC-A-(2)	
GROUP-B	**IHC-G-SEC-4-B(1) &B(2)-TH**
SEC-B-(1)	
SEC-B-(2)	
DISCIPLINE SPECIFIC ELECTIVE (6 Credits per Course)	
GROUP-A	**IHC-A-DSE-5/6-A(1/2/3/4)-TH&TU**
DSE-A-(1)	IHC-A-DSE-A-X-1 TH&TU
DSE-A-(2)	IHC-A-DSE-A-X-2 TH&TU
DSE-A-(3)	IHC-A-DSE-A-X-3 TH&TU
DSE-A-(4)	IHC-A-DSE-A-X-4 TH&TU
GROUP-B	**IHC-A-DSE-5/6-B(1/2/3/4)-TH&TU**
DSE-B-(1)	IHC-A-DSE-B-X-1 TH&TU
DSE-B-(2)	IHC-A-DSE-B-X-2 TH&TU
DSE-B-(3)	IHC-A-DSE-B-X-3 TH&TU
DSE-B-(4)	IHC-A-DSE-B-X-4 TH&TU
➢ **DISCIPLINE SPECIFIC ELECTIVE**	
➢ Note: Choose any one paper in Semester -5 and another in Semester 6 taking one from Group –A and the other from Group –B	
GENERIC ELECTIVE (6 Credits per Course)	
➢ Note: Core Courses Designed for General Programme will be offered as Generic Elective courses for students of other Disciplines.	

Structure of B.A (Hons.) Islamic History and Culture Course under CBCS
IHC-A-CC-1-14- TH &TU

Structure Of B.A. (Hons.) Islamic History & Culture Course under CBCS

IHC-A-CC-1-14

Paper 1 **SEM -1**: History Of Early Islam Till the Prophet

Paper 2 **SEM -1**: Pious Caliphate

Paper 3 **SEM -2**: History Ofislam: Umayyads

Paper 4 **SEM -2**: History Of Islam: Abbasids

Paper 5 **SEM -3**: History Of Muslim Spain (756 – 1025)

Paper 6 **SEM -3**: History Of Mongols And Timurids.

Paper 7 **SEM -3:** History Of Medieval Europe (800 – 1250)

Paper 8 **SEM -4**: Early Medieval And The Sultanate

Paper 9 **SEM -4**: The Mughals

Paper 10 **SEM -4**: Later Mughals

Paper 11 **SEM -5**: Ottoman Empire (1299-1703)

Paper 12 **SEM -5**: Safavid Iran

Paper 13: **SEM -6** History Of Sultanate Bengal (1206 – 1576)

Paper 14 **SEM -6**: History Of Mughal Bengal (1576 – 1765)

Discipline Specific Elective (DSE) (In 5th Semester <u>any one</u> from DSE-A-1 & DSE-A-2 and <u>any one</u> from DSE-B-1 & DSE-B-2. In 6th Semester <u>any one</u> from DSE-A-3 & DSE-A-4 and <u>any one</u> from DSE-B-3 & DSE-B-4)

SEM 5 Paper 1 **DSE-A-1**: History of Modern India with Special Reference to the Muslim Politics (1857-1906 AD)

SEM 5 Paper 2 **DSE-B-1**: History of Modern India with Special Reference to the Muslim Politics (1906-1947 AD)

SEM 5 Paper 3 **DSE-A-2**: Regional History: Awadh (1722-1947 AD)

SEM 5 Paper 4 **DSE-B-2**: Regional History: Hyderabad (1724-1947AD)

SEM 6 Paper 5 **DSE-A-3**: Sufism in India

SEM 6 Paper 6 **DSE-B-3**: History of Medieval Indian Architecture (13^{th} to 18^{th} Century)

SEM 6 Paper 7 **DSE-A-4**: History of Medieval Indian Painting (13^{th} to 18^{th} Century)

SEM 6 Paper 8 **DSE-B-4**: Regional History: Mysore (1720-1947 AD)

Skill Enhancement Courses SEC –A & B (Any Two) Choosing one from group-A in 3rd Semester and one from group-B in 4th Semester)

SEC -A 1: Archives and museums
SEC -B 1: Understanding Popular Culture
SEC-A 2: Understanding Heritage
SEC-B 2: Art Appreciation: an Introduction to Indian Art

*Generic Elective Courses (GE) - Same as Core courses (CC) offered in the BA General Syllabus.

Detailed Syllabus

IHC-A CC-1-14

CC 1: History of Early Islam till the Prophet

I- THE PROPHET (SAW) AT MAKKAH:

1. Arab society and culture on the eve of Islam
2. Biography of the prophet (before prophet hood)

UNIT II- AFTER PROPHET HOOD-

1. Major Events of Makkah: Beginning of Revelation, Preaching of Islam, Hostility of Quraish
2. The Hijrat: to Habsha; Hijrat to Madinah: Causes and Importance

UNIT III - THE PROPHET (SAW) AT MADINAH:

1. Major Battles
2. Treaty of Hudaibiyah
3. Conquest of Makkah
4. Charter of Madinah
5. As a Reformer

UNIT IV- ADMINSTRATION and SOCIETY

1. Political Administration
2. Revenue Administration
3. Social Reforms

Essential Reading

Ali, K, A *Study of Islamic History, Delhi, 1980*

Ali, Syed Ameer, A *Short History of the Saracens, London, 1916*

Ali, Syed Ameer, The *Life and Teaching of Muhammad, Calcutta, 1902*

Hitti, P.K, *History of Arabs, Macmillan,1937*

Suggested Reading

Arnold, T.W, *Preaching of Islam,California, 1896*

Faqih, Irfan, *Glimpses of Islamic History, Lahore, 1979*

Giullame,A, *The Life of Muhammad, London, 1978*

Hamidullah, M, Introduction to Islam, Lahore, 2009

Hasan, Masudul, History of Islam Vol-I, II, New Delhi, 2004

Husaini, S.A.Q,Arab Administration, Lahore, 1957

Imamuddin, S.M, Arab Muslim Administration(622-1258), New Delhi, 1984

Lapidus, Ira M, History of Islamic Societies, Cambridge, 1988

Lewis, Bernard, The Arab in History, Oxford University Press, 1950

Lewis, Bernard, *Islam from the Prophet Muhammad to the Capture of Constantinople, 2 vols, New York and London, 1978*

Muir, William, *Annals of Early caliphate, London, 1883*

Nabi, Gholam, *Khilafat in Theory and Practice, New Delhi, 2008*

Nadwi, Shah M, *Tarikh e Islam, Azamgarh, 1939*

Nomani, Shibli&

Nadwi, S. Sulaiman, *Sirat al Nabi, Delhi, 2009*

Nomani,Shibli, *Al-Faruq, Eng tr. Umar the great, 2 vol., Lahore, 1939*

Siddiqui, M.Y.M, *Organization of Govt. Under The Prophet, Lahore,*

Watt, W. M, *Muhammad at Mecca, Oxford, 1953*

----------*Muhammad at Medina, oxford,1956*

CC 2: Pious Caliphate

UNIT I - THE PIOUS CALIPHS

1. Concept of Caliphate/Khilafat
2. Life and Achievements of Hazrat Abu Baker
3. Life and Achievements of Hazrat Umar
4. Life and Achievements of Hazrat Uthman/Usman
5. Life and Achievements of Hazrat Ali

UNIT II- ADMINSTRATION UNDER PIOUS CALIPHS

1. Election Of Caliphs
2. Revenue Administration-Baytul Mal
3. Central And Provincial Administration
4. Army Administration

UNIT III – SOCIO - ECONOMIC & CULTURAL HISTORY

1. Nature of The Administration
2. Society and Culture- Position of Dhimmi
3. Trade and Commerce

Essential Reading

Ali, K, A *Study of Islamic History, Delhi, 1980*

Ali, Syed Ameer, A *Short History of the Saracens, London, 1916*

Ali, Syed Ameer, The *Life and Teaching of Muhammad, Calcutta, 1902*

Hitti, P.K, *History of Arabs, Macmillan, 1937*

Suggested Reading

Faqih, Irfan, *Glimpses of Islamic History, Lahore, 1979*

Hamidullah, M, *Introduction to Islam*

Hasan, Masudul, *History of Islam Vol-I, II, New Delhi, 2004*

Hossain, S. Athar, The *Glorious Caliphate,*

Husaini, S.A.Q,*Arab Administration, Lahore, 1957*

Imamuddin, S.M, *Arab Muslim Administration (622-1258), New Delhi, 1984*

Nabi, Gholam, Khilafat in Theory and Practice, New Delhi, 2008

Nadwi, Shah M, Tarikh e Islam, Azamgarh, 1939

Lewis, Bernard, The Arab in History, Oxford *University Press, 1950*

Shaban. M.A. *Islamic History: A New Interpretation,*

Zaidan, Juji, *History of Islamic civilization,*

CC 3: HISTORY OF ISLAM: UMAYYADS

UNIT I: ESTABLISHMENT OF UMAYYAD RULE: 661 – 750

1. Life And Achievements of Ameer Muawiah: As Founder Of Umayyad Rule
2. The Incident of Karbala
3. Abdul Malik: Life And Achievements
4. Al Walid I: Life And Achievements: Expansion Of Muslim Rule
5. Umar Bin Abdul Aziz: Life And Contribution

UNIT II: SOCIO-ECONOMIC CONDITION

1. Society and Economy
2. Position of Mawali, Zimmis , Women And Slave
3. Fall of The Dynasty

UNIT III: ADMINISTRATION

1. Central And Provincial Administration
2. Special Feature of The Government
3. Revenue Administration
4. Army—Navy

UNIT IV: CULTURAL DEVELOPMENT

1. Art
2. Architecture
3. Education

Essential Reading

Ali, K, A *Study of Islamic History, Delhi, 1980*

Ali, Syed Ameer, A *Short History of the Saracens, London, 1916*

Ali, Syed Ameer, The *Life and Teaching of Muhammad, Calcutta, 1902*

Hitti, P.K, *History of Arabs, Macmillan, 1937*

Suggested Reading

Faqih, Irfan, *Glimpses of Islamic History, Lahore, 1979*

Humphreys R. S, *Muawiya Bin AbiSufyan*

Hussain, M. Hadi, *Umar Bin Abd Al Aziz*

Husaini, S.A.Q,*Arab Administration, Lahore, 1957*

Imamuddin, S.M, *Arab Muslim Administration (622-1258), New Delhi, 1984*

CC 4: HISTORY OF ISLAM: ABBASIDS 756-1258

UNIT I: ESTABLISHMENT OF ABBASID RULE

1. Revolt Against Umayyads and the Foundation of Abbasid Rule
2. Life And Achievements of Jafar Al Mansur
3. Harun Al Rashid: Life And Achievement
4. Al-Mamun: The Glorious Period Of Abbasids
5. Fall of Abbasids

UNIT II: SOCIO-CULTURAL HISTORY

1. Society (Zimmis, Bermakids)
2. Education, Scientific And Literary Acheivements
3. Position of Women

UNIT III: ADMINISTRATION:

1. Central Administration
2. Provincial Admistration
3. Army and Navy

UNIT IV: STATE AND ECONOMY:

1. Trade and Commerce
2. Agriculture
3. Land Revenue System.

Essential Reading

Ali, K, A *Study of Islamic History, Delhi, 1980*

Ali, Syed Ameer, A *Short History of the Saracens, London, 1916*

Ali, Syed Ameer, The *Life and Teaching of Muhammad, Calcutta, 1902*

Hitti, P.K, *History of Arabs, Macmillan, 1937*

Suggested Reading

Faqih, Irfan, *Glimpses of Islamic History, Lahore, 1979*

Lewis, Bernard, *The Arab in History, Oxford University Press, 1950*

Grunebaum, Von, *Medieval Islam*

Hell, Joseph, *The Arab Civilization,*

Husaini, S.A.Q, *Arab Administration, Lahore, 1957*

Imamuddin, S.M, Arab *Muslim Administration (622-1258), New Delhi, 1984*

G. Le Strange, *Baghdad during Abbasid Caliphate*

CC 5: HISTORY OF MUSLIM SPAIN (756 – 1025)

UNIT I: FOUNDATION OF MUSLIM RULE IN SPAIN

1. Socio-Political And Economic Condition of Spain on The Eve of Muslim Conquest
2. Establishment Of Muslim Rule In Spain (Role Of Musa Bin Nusayr And Tarique Bin Ziyad)

UNIT II : ESTABLISHMENT OF UMAYYAD RULE (2ND PHASE)

A) Abdul Rahman I as Founder
B) Abdul Rahman II
C) Abdul Rahman III;
D) Hakam II and Hajib Al Mansur

UNIT III: SOCIETY AND ADMINISTRATION

1. Social Structure
2. Economic Condition
3. Civil And Military Administration

UNIT IV: INTELLECTUAL AND ARTISTIC ACTIVITIES

1. Scientific Literary And Academic Progress
2. Arts (Music, Painting, Calligraphy And Industrial Art)
3. Muslim – Spainish Architecture (Mosque Of Cordova, Madina – Al – Zahra & Al Hambra)

Essential reading:

Ali, K, A *Study of Islamic History, Delhi, 1980*

Ali, Syed Ameer, *A Short History of the Saracens, London, 1916*

Ali, Riyasat, *The Tarikh I Andalus, vol I, Azamgarh, 1950*

Dozy, Renault, *Spanish Islam, London,1913*

Imamuddin, S. M, *A Political History of Muslim Spain,, Dacca, 1908*

Imamuddin, S. M, *Muslim Spain: A Sociological Study*

Imamuddin, S. M, *Some Aspects of the socio-economic & Cultural history of Muslim Spain, London,1965*

Lane Pole, S, *The Moorish Spain, London, 1912*

Suggested readings:

Arnold, Sir Thomas(Ed): The Legacy of Islam

Bernard, Louis, *The History of Spain, London, 1956*

Hitti, P.K, *History of Arabs, Macmillan, 1937*

Reilly, Bernard F, *The Medieval Spain*

Rahman, Azizur, *History of Islamic Spain*

Scott, S.P, *History of Moorish Empire in Europe*

Watt, M.W, *A History of Islamic Spain, Edinburgh, 1975*

CC 6: HISTORY OF MONGOLS AND TIMURIDS

UNIT I: Rise of Mongols

a) Chengiz Khan
b) School of Chengiz Khan
c) Later Mongols
d) Importance of Kublai Khan.

UNIT II: Military Organization of Mongols

a) Chengiz Khan
b) Later Mongols
c) Kublai Khan.

UNIT III: Rise of Timur

a) Timur and his expansion
b) School of Timur.

UNIT IV: Spread of Islam

a) Under the Mongols.
b) Under the Timurids

UNIT V: Medieval Central Asian Culture

a) Architecture
b) Painting
c) Growth of Science
d) Society and Language.

e) Barthold, V. V. (1968). *Turkestan Down to the Mongol Invasion.* London.

f) Dani, A. H. (1992). *UNESCO History of Civilizations of Central Asia.* Paris.

g) Hildinger, E. (2001). *Warriors of the Steppe: A Military History of Central Asia, 500 BC. to 1700 AD.* Cambridge: Da Capo.

h) Timothy, M. (2008). *The Mongol Empire in World History*. University of Illinois.

i) Ward, S. (2009). *Immortal: A Military History of Iran and Its Armed Forces.* George Town University Press.

j) Burgan, Michael (2005). *Empire of the Mongols*. New York: Infobase Publishing
k) Finlay, Robert (2010). *The Pilgrim Art: Cultures of Porcelain In World History*. Berkeley: University of California Press.
l) Howorth, Henry H. (1965). *History of the Mongols from the 9th to 19th Century: Part: The Mongols Proper and the kalmuks*. New York: Burt Frankin.
m) Jackson, Peter. (2003). *The Mongols and the West: 1221-1410*. New York: Longman.
n) Man, John. (2004). *Genghis Khan: Life, Death and Resurrection*. New York: Thomas Dunne.
o) Brent, Peter. (1976). *The Mongol Empire: Genghis Khan: His Triumph and his Legacy*, London: Book Club Associates.
p) Subtelny, Maria. (2007). *Timurids in Tradition: Turko Persian Politics and Acculturation in Medieval Iran*, Brill.
q) Beatrice, Forbes Manz. (1999). *The Rise and rule of Tamerlane*, Cambridge: Cambridge University press.
r) Ismail, Aka. (1996). "*The Agricultural and Commercial Activities of the Timurids in the First half of the 15th Century*" in Jstor

s) Suggested Readings

t) Roxburgh, David J. (2005). *The Persian Album, 1400-1600: From the Dispersal to Collection*, Yale University Press.
u) May, Timothy. (2007). *The Mongol Art of War*, Yardley: Westholme Publishing.
v) Rossabi, Morris. (2012). *The Mongols: A Very Short Introduction*, Oxford: Oxford University Press.

CC 7- HISTORY OF MEDIEVAL EUROPE (c.800-1453)

I. Breakup of the Roman Empire- Historiography.

II. Political Structures in Medieval Europe:

a) Rise of the Frankish House.
b) Charles the Great: Coronation and its Significance, Administration and Dissolution of Charlemagne's Empire.
c) The Partition of Verdun and its Significance.
d) The Empire and its Revival.
e) The House of the Hohenstaufen's.

III. Agrarian Structure, Social Change and Economy:

a) Feudalism: Growth, Features and Decline.
b) Manorialism, the Institution of Chivalry and the role of Feudal Knights, Women in Medieval Europe.
c) Europe at the end of the 9th Century- An economic Survey, Trade and Commerce and its Revival, Hanseatic League and the Guild System.
d) The Urban Revolution: Growth and Contribution of Towns, Merchants and Fairs: Effect on Society.

IV. Religion and State:

a) Development of the Church organization: Growth of Papacy, Monasticism and its Contribution, Role of the Friars.
b) Medieval Reformation: Reforms of Cluny and its Impact.
c) Struggle between the Church and the State: Investiture Contest and the Triumph of the Church.
d) Albegensians and Waldensians: Role and Significance.
e) Western Europe encroaches on Islam: The Crusades.

V. Changing Political Formations:

a) France under Capetian Kings (987-1328)
b) Development of English State (1272-1485)
c) The Norsemen or Vikings.
d) The Lombards and the Lombard League.
e) Rise of the Ottoman Turks: Fall of Constantinople, completion of the conquest of Balkan.

VI. Art, Architecture and Culture:

a) The Carolingian and the 12th Century Renaissances- Impact on Philosophy, Science, Education, Literature, Art and Music.
b) Forms and Style of Architecture- Merovingian, Carolingian, Romanesque and Gothic.
c) Beginning of Sculpture and Painting.
d) Medieval Universities- Origin, Growth and Impact on Medieval European Life.

Essential Reading-

Adams, George Burton, Civilisation during the Middle Ages.

Bloch, Marc, Feudal Society (2 Vols).

Brundage (ed.), The Crusades.

Bryce, James, The Holy Roman Empire.

Deansley, Margaret, A History of the Medieval Church 590-1500 A.D, Routledge, Abingdon, 1969.

Dobb, Maurice Dobb, Studies in the Development of Capitalism,

Goff, Le, Medieval Civilizations (400-1500).

Hallam, Henry, History of Europe during the Middle Ages, New York, 1900.

Heer, Friedrich, The Medieval World 1100-1350.

Orton, Previte, Outlines of Medieval History, Cambridge University Press, Cambridge, 1916.

Pirenne, Henri, Medieval Cities, University of Michigan, 1957.

Stuard, Susan Mosher (Ed.), Women in Medieval History and Historiography.

Thompson and Johnson, An Introduction to Medieval Europe 300-1500, New York, 1937.

Tout, Thomas Frederick, The Empire and the Papacy 918-1273, London, 1909.

Suggested Readings-

Barraclough, Geoffrey, The Origins of Modern Germany.

Bemont and Monod, Medieval Europe 395-1270.

Bennet, Judith, Medieval Europe: A Short History.

Hodgkin, Thomas, Italy and her Invaders Vol. III and IV.

Leff, Gordon, Medieval Thought: St. Augustine to Ockham.

Masterman, Howard, The Dawn of Medieval Europe.

Oman, Charles, Dark Ages 476-918.

Orton, Previte, The Shorter Cambridge Medieval History (Vol. I& II)

Smith, Leslie and Leyser, Conrad; Motherhood: Women and Society in Medieval Europe (400-1400).

Southern, Richard William, The Making of the Middle Ages.

Stephenson, Carl, Mediaeval History.

Thatcher, Oliver, A Source Book for Medieval History.

Thatcher and Schwill, Europe in the Middle Age.

CC 8 - HISTORY OF INDIA (c.600-1526) (Early Modern India and Delhi Sultanate)

I. Studying Early Medieval India:

a) Historical geography sources: texts, epigraphic and numismatic data

b) Debates on Indian

c) Feudalism, rise of the Rajputs and the nature of the state

II. Political Structures:

a) Evolution of political structures: Rashtrakutas, Palas, Pratiharas, Rajputs and Cholas

c) Arab conquest of Sindh: nature and impact

d) Cause and consequences of early Turkish invasions: Mahmud of Ghazna; Shahab-ud-Din of Ghur

III. Agrarian structure and Trade and Commerce:

a) Agricultural expansion; crops

b) Landlords and peasants

c) Proliferation of castes: status of untouchables

d) Inter-regional trade

e) Maritime trade

f) Process of urbanization

IV. Religious and Cultural developments:

a) Bhakti, Tantrism, Puranic traditions; Buddhism and Jainism; Popular religious cults

b) Islamic intellectual traditions: Al-Biruni; Al-Hujwiri

c) Regional languages and literature

d) Art and architecture: Evolution of regional styles

V. Interpreting the Delhi Sultanate:

A. Survey of sources: Persian *Tarikh* tradition; vernacular histories; epigraphy

VI. Sultanate Political Structures:

A. Foundation, expansion and consolidation of the Sultanate of Delhi; the Khaljis and the Tughluqs; Mongol threat and Timur's invasion; Rise and fall of Syed dynasty; The Lodis; Conquest of Bahlul and Sikandar; Ibrahim Lodi and the battle of Panipat;
B. Theories of Kingship; Ruling elites; Sufis, Ulama and the political authority; imperial monuments and coinage
C. Emergence of provincial dynasties: Bahamanis, Vijayanagar, Gujarat, Malwa, Jaunpur and Bengal
D. Consolidation of regional identities: regional art, architecture and literature

VII. Society and Economy:

A. Iqta and the revenue-free grants
B. Agriculture production; technology
C. Changes in rural society; revenue systems
D. Monetization; market regulations; growth of urban centres; trade and commerce; Indian Ocean trade

VIII. Religion and Culture:

A. Sufi silsilas: Chishtis and Suhrawardis; doctrines and practices; social roles
B. Bhakti movements and monotheistic traditions in South and North India; Women Bhaktas; Nathpanthis; Kabir, Nanak and the Sant tradition C. Sufi literature; Malfuzat; Premakhayans
D. Architecture of the Delhi Sultanate

ESSENTIAL READINGS:

Early Medieval India-

Chattopadhyaya, B.D, The Making of Early Medieval India, New Delhi, 1994.

Karashima, N., South Indian History and Society (Studies from Inscriptions, AD 850 – 1800)

Kulke, Hermann, ed., The State in India (AD 1000 – AD 1700)

Sharma, R.S and Shrimali, K.M eds., Comprehensive History of India, Vol. IV (A & B)

Sharma, R.S. Indian Feudalism (circa 300 – 1200)

Singh,Vipul Interpreting Medieval India, Volume-I, Early Medieval, Delhi Sultanate and Regions (circa 750 – 1550), 2009.

Delhi Sultanate-

Asher, Catherine and Talbot Cynthia, India before Europe, Cambridge University Press, March 2006.

Chandra Satish, Medieval India I, Har Anand Publication, New Delhi, July 2007.

Habib Mohammad and Nizami K.A., eds, Comprehensive History of India, Vol. V, The Delhi Sultanate, People's Publishing House, 2nd Edition, 1992.

Hasan Mohibul, Historians of Medieval India, Meenakshi Prakashan, 1968.

Jackson Peter, The Delhi Sultanate, Cambridge University Press, Revised Edition, 2003.

Schomer, Karine, and McLeod W.H., (Eds), The Sants Studies in A Devotional Tradition of India, Motilal Banarsidas, Delhi, 1987.

Nizami K.A., Some Aspects of Religion and Politics in India During the 13th Century, Aligarh, 1961.

Raychaudhuri Tapan and Habib Irfan, (Eds), Cambridge Economic History of India, Vol. I: c. 1200 – c. 1750, Cambridge University Press, Cambridge, 1982, 1987 (reprint).

Rizvi S.A.A., A History of Sufism in India, Vol. I, Munshiram Manoharlal, New Delhi, 1978.

Suggested Readings-

Early Medieval India-

Basham, A.L., The Wonder that was India

Bose Mandakranta (ed.) Faces of Feminine in Ancient Medieval and Modern India, New York, 2000.

Chakravarti Ranabir, Exploring Early India up to Circa AD 1300

Mukhia, H., The Feudalism Debate

Rizvi, S.A.A, The Wonder that was India, Vol. II

Roy Kumkum (ed), Women in Early Indian Societies (New Delhi, 1999)

Delhi Sultanate-

Ashraf K.M, Life and Conditions of the People of Hindusthan (1250 – 1550), Gyan Publishing House, 2000.

Eaton, R.M, The Rise of Islam and the Bengal Frontier (1204- 1760), University of California Press, July 1996.

Habib, Irfan, Medieval India: The Study of a Civilization, National Book Trust, July 2008.

Karashima, Noboru, Towards a New Formation: South Indian Society under Vijayanagara , Oxford University Press, 1992.

Kumar Sunil, The Emergence of the Sultanate of Delhi, Permanent Black, Delhi, First edition, 2010.

Stein, Burton, Peasant State and Society in Medieval South India, Oxford University Press, Oxford, February 1995.

Sherwani, H.K., Joshi, P.M. (eds), The History of Medieval Deccan (1295 - 1724), Government of Andhra Pradesh, Hyderabad, 1973-74.

Singh,Vipul, Interpreting Medieval India, Volume-I, Early Medieval, Delhi Sultanate and Regions (circa 750 – 1550), Macmillan Publishers India Ltd, 2009.

Tripathi, R.P; Some Aspects of Muslim Administration, The Indian Press Ltd., 1936. Wink, Andre, Al Hind; The Making of the Indo Islamic World, Volume I – Early Medieval, Brill Academic Publishers, 2nd Edition, 1991.

CC 9 : History of Mughal India (c.1526 – 1707)

I. Sources and Historiography:

a) Persian literary culture; translations; Vernacular literary traditions.

b) Modern Interpretations

II. Establishment of Mughal rule:

a) India on the eve of Babur's Invasion

b) Fire arms, military technology and warfare

c) Humayun's struggle for empire

d) Sher Shah and his administrative and revenue reforms

III. Consolidation of Mughal rule under Akbar:

a) Incorporation of Rajputs and other indigenous groups in Mughal nobility.

b) North-West frontier, Gujarat and the Deccan

c) Conquest of Bengal

d) Evolution of administrative institutions: Zabt, Masnab, Jagir, Madad-I-Maash

e) Inclusive political ideas: theory and practice

f) Religious tolerance and Sulh-i-kul; Sufi mystical and intellectual interventions

g) Pressure from the Ulama

IV. Political Culture under Jahangir, Shah Jahan and Aurangzeb

a) Extension of Mughal rule; changes in Mansab and Jagir systems; imperial culture

b) State and religion under Aurangzeb; issues in the war of succession; policies regarding Religious groups and institutions

c) Conquests and limits of expansion

d) Beginning of the crisis: contemporary perceptions; agrarian and Jagirdari crises; revolts.

V. Rural Society and Economy:

a) Land rights and Revenue system; Zamindars and Peasants; rural tensions

b) Extension of agriculture; agricultural production; crop patterns

c) Trade routes and patterns of internal commerce; overseas trade.

d) Crafts and technologies; Monetary system.

IV. Culture:

a) Paintings and Architecture

Essential Readings-

Chandra, Satish, A History of Medieval India (Part II)

Chandra, Satish, Historiography, Religion and State in Medieval India

Chandra, Satish, Mughal Religious Policies, the Rajputs and the Deccan.

Habib, Irfan(ed.), Medieval India

Hasan S.Nurul, Religion, State, and Society in Medieval India

Mukhia Harbans, The Mughals of India.

Raychoudhuri T.K. & Habib I. (eds.)-The Cambridge Economic History of India Vol. I Cambridge University Press, Cambridge, 1982, 1987 (reprint).

Richards J.F.,The Mughal Empire

Rizvi S.A.A., The Wonder that was India (vol.2)

Tripathi R.P., Some Aspects of Muslim Administration

Suggested Readings-

Alam Muzaffar and Subramaniam Sanjay, eds., The Mughal state, 1526-1750

Ali Athar M., The Mughal Nobility under Aurangzeb

Ali, M. Athar, Mughal India: Studies in Polity, Ideas, society and Culture.

Arsaratnam S., Maritime India in the Seventeenth Century

Asher Catherine, Architecture of Mughal India

Beach Milo, Mughal and Rajput Paintings.

Chandra Satish, Essays on Medieval Indian History

Chaudhuri, K.N.,Trade & Civilization: An Economic History from the Rise of Islam to 1750.

Eaton, R.M., The Rise of Islam and the Bengal Frontier 1204-1760;

Eaton, R.M., The Sufis of Bijapur

Habib Irfan, Agrarian System of Mughal India, 1526 – 1707

Hasan S., Nurul,Thoughts on Agrarian Relations in Mughal India.

Koch Ebba, Mughal Art and Imperial Ideology

Richards, J.F, Mughal Administration in Golconda

Rizvi S.A.A., A History of Sufism in India

Sarkar, Sir J.N., History of Aurangzeb 5 vols.

Sarkar, Sir J.N., Fall of the Mughal Empire, 4 vols.

Siddiqi. N.A., Land Revenue Administration under the Mughals (1700- 1750)

Streusand D.F., The Formation of the Mughal Empire

CC 10- Later Mughals (1707-1857)

I. Patterns of Politics:

a) History of the later Mughals
b) Mughal decline; emergence of successor states
c) Deccan kingdoms; emergence of the Marathas; Shiva; expansion under the Peshwas
d) Interpreting eighteenth century India: recent debates

II. Rise of the British power:

a) Dynamics of British expansion, with special reference to Bengal, Mysore, Western India, Awadh, Punjab and Sindh
b) Arms of the colonial state : army, police, law
c) Ideologies of the Raj and racial attitudes
d) Education: indigenous and modern

III. Society, Economy and Trade and Commerce:

a) Land revenue systems and forest policy
b) Commercialization of Agriculture and Rural Indebtedness
c) Rural society: change and continuity, Famines
d) De industrialization and Drain of Wealth
e) Trade and fiscal policy and Growth of Modern Industry

IV. Early Resistance to British Rule-

a) Peasant and Tribal Uprising
b) Revolt of 1857

Essential Readings-

Alam Muzaffar and Subramaniam Sanjay, eds., The Mughal state, 1526-1750

Alam, Muzaffar-The Crisis of Empire in Mughal North India: Awadh and Punjab-1707-1748

Alavi,Seema (ed.),The Eighteenth Century in India

Bandyopadhya S, From Plassey to Partition

Barnett, R.B, North India between Empires: Awadh, the Mughals and the British

Bhattacharya, Sabyasachi.ed. Rethinking 1857, Delhi, 2007

Chandra Satish, Parties and Politics at the Mughal Court 1707-40.

Dasgupta Ashin, Indian Merchants and the Decline of Surat, 1700 – 1750

Gordon Stewart, The Marathas 1600 – 1818

Grewal J.S.,The Sikhs of the Punjab

Irvine, Later Mughals 1707-40.

Kumar Dharma and Raychaudhuri Tapan, eds., The Cambridge Economic History of India, Vol.II.

Suggested Readings-

Bayly, Susan, Caste, Society and Politics in India from the 18th century to the modern age.

Bayly,C.A., Indian Society and the Making of the British Empire.

Chandra Bipan, Rise and Growth of Economic Nationalism in India

Chandra, Satish, The 18th century in India: Its economy and the Role of the Marathas, the Jats and the Sikhs and the Afghans.

Ghosh Suresh Chandra, The History of Education in Modern India 1757-2012, Delhi, 2013.

Guha, Ranajit, Elementary Aspects of Peasant Insurgency in Colonial India, New Delhi, 1983.

Habib Irfan (ed), Resistance and Modernization under Haider Ali and Tipu Sultan

Husain Iqbal, Ruhela Chieftancies in 18th Century India

Malik, Z.U, The Reign of Muhammad Shah

Marshall, P.J, Bengal: The British Bridgehead, New Cambridge History of India

Marshall P J., (Edited), The Eighteenth century in Indian history: Evolution or revolution

Marshall P J.,East Indian Fortunes: the British in Bengal in the 18th Cent,

Metcalfe, Thomas, Ideologies of the Raj.

Ray, Rajat K., ed., Entrepreneurship and Industry in India, 1800-1947.

Sinha, N.K.ed, The history of Bengal 1757-1905.

Stein, Burton, Peasant, State and Society in Medieval

CC 11: OTTOMAN EMPIRE

UNIT I: Rise of the Ottoman Empire

UNIT II: Growth, Political Development and Expansion

a) Classical Age 1453-1566.
b) Growth of Ottoman Empire- Political Relations.

UNIT III: Transformation:

a) Political changes 1566-1703.
b) Relation with Europe.

UNIT IV: Society and Culture:

a) Art and Architecture
b) Religion
c) Society.

Essential Reading:

d) Finkel, C. *Osman's Dream: The Story of the Ottoman Empire, 1300-1923.* Basic Books.

e) Hamish, S. (2015). *The Oxford Handbook of Early Modern European History, 1350-1750, vol 2.* London: Oxford University Press.

f) Hathaway, J. (2008). *The Arab lands under the Ottoman Rule, 1516-1800.* Pearson Education Limited.

g) Howard, D. A. (2016). *A History of the Ottoman Empire.* London: Cambridge University Press.

h) Imber, C. (2002). *The Ottoman Empire, 1300-1650.* Palgrave Macmillam.

i) Karpat, K. H. (1974). *The Ottoman State and Its Place in World History.* Leiden: Brill.

j) Lambton, A. a. (1995). *The Cambridge History of Islam: The Indian Sub Continent, South East Asia, Africa and the Muslim west, vol 2.* Cambridge: Cambridge University Press.

k) Lowry, H. (2003). *The Nature of the Early Ottoman State.* SUNY Press.

l) Mesut, U. a. (2009). *A Military History of the Ottomans: From Osman to Ataturk.*

m) Quataert, D. (2005). *The Ottoman Empire, 1700-1922.* London: Cambridge University Press.

n) Soucek, S. (2015). *Ottoman Maritime Wars, 1416-1700.* Istanbul: The Isis Press.

o) Standford, S. (1976). *History of the Ottoman Empire and Modern Turkey, vol 1.* Cambridge: Cambridge University Press.

Suggested Reading:

p) Ozgundenli, O. 'Persian Manuscripts in Ottoman and Modern Turkish Libraries' in *Encyclopaedia Iranica*

q) Eli, Shah. *The Ottoman Artistic Legacy*: Israel Ministry of Foreign Affairs

r) Faroqhi, Suraiya. (2005). *Subjects of the Sultan: Culture and Daily Life in Ottoman Empire*. London: I.B. Tauris.

s) Kafadar, Cemal. (1995). Between Two Worlds: The Construction of the Ottoman State: University of California Press.

CC 12: SAFAVID IRAN

UNIT I: Foundation and Growth-

a) Shah Ismail I
b) Clashes with the Ottomans
c) Shah Tahmasp
d) Shah Abbas

UNIT II: Decline of the Safavids

UNIT III: Society and Culture

a) Safavid Sufi Orders.
b) Importance Of Painting Culture- School of Safavid Painting
c) Architecture.

Essential Reading

d) Babayan, K. (2002). *Mystics, Manarchs and Messiahs: Cultural landscapes of Early Modern Iran.* London: Harvard University Press.

e) Cyril, G. e. (2003). *The New Encyclopaedia of Islam.* Maryland: Rowman and Littlefield Publishers.

f) Esposito, J. L. (1999). *The Oxford History of Islam.* Oxford University Press.

g) Ferrier, R. W. (1989). *The Arts of Persia.* Yale University Press.

h) Ingvild, F. (2010). *Visualizing Belief and Piety in Iranian Shiism.* Continuum International Publishing.

i) Islam, R. (1970). *Indo Persian Relations: A Study of the Political and Diplomatic Relations between the Mughal empire and Iran.* Tehran: Iranian Cultural Foundation.

j) Lapidus, I. M. (2002). *A History of islamic Societies.* Cambridge University Press.

k) Mazzaoui, M. B. (2002). *Islamic Culture and Literature Iran and Central Asia in the Early Modern Period.* Cambridge : Cambridge University Press.

l) Mitchell, C. P. (2011). *New Prespective on Safavid Iran: Empire and Society.* Taylor and Francis.

m) Roemer, H. R. (1986). The Safavid Period. In *The Cambridge History of Iran* (Vol. 6). Cambridge: Cambridge University Press.

n) Savory, R. (2007). *The Safavid State and Polity.* Iranian Studies.

o) Scherberger, M. (2011). The Confrontation between Sunni and Shii Empires: Ottoman Safavid Relations between the Fourteenth and the Seventeenth Centuries. In O. B. Litvak, *The Sunna and the Shia History: Division and Ecumenism in the Muslim Middle East.* New York: Palgrave Macmillan.

p) Streusand, D. E. (2011). *Islamic Gunpowder Empires: Ottomans, Safavids and Mughals.* Westview Press.

Suggested Reading

q) Khanbaghi, Aptin. (2006). *The Fire, the star and the Cross: Minority Religions in Medieval and Early Modern Iran*. I. B. Tauris.
r) Savory, Roger. (2007). *Iran Under the Safavids*. Cambridge University Press.
s) Sicker, Martin.(2001). *The Islamic World in Decline: From the Treaty of Karlowitz to the Disintegration of the Ottoman Empire*. Green Wood Publishing Group.
t) Yarshater, Ehsan. (2001). *Encyclopaedia Iranica*. Routledge and Kegan Paul

CC 13: HISTORY OF THE SULTANATE BENGAL (1204-1576 AD)

Unit 1: Bengal Before Muslim Conquest

1.1 Geographical setting
1.2 Political Condition in pre-Islamic Bengal
1.3 Socio-economic and cultural history

Unit 2: Muslim Conquest in Bengal – Period of the Delhi Governors (1205- 1338 AD)

1.1 The Khaljis
1.2 The Turks
1.3 The Balbans and Tughlaqs
1.4 Expansion of the territory

Unit 3: Consolidation of Sultanate: Period of Independent Sultans (1338-1576 AD)

3.1 Independent kingdom in Sonargaon and Ilyas Shahi Period

3.3 Raja Ganesh and his dynasty

3.4 Restored Ilyas Shahi Rule and Habshi Interregnum

3.5 Hussain Shahi Dynasty

3.6 Afghans and the Kararanis

Unit 4: Administration and Economy

4.1 Administrative System during Independent Sultans of Bengal

4.2 Agricultural Economy and Revenue System

4.3 Trade and Industry

4.4 Urbanisation and Riverine changes

Unit 5: Society and Religion

5.1 Sources of writing History – Literature, coins and Inscriptions

5.2 Social Structure and Cultural Interaction - Hindu Muslim relation

5.3 Sufism in Bengal

5.3 Education System and Literature – Arabic, Persian and Bengali

5.5 Development of Art and Architecture

Essential Readings:

Ali, M. M. (1985). *History of the Muslims in Bengal, 1st ed.* Riyadh. Two volumes

Chowdhury, A. M. (1967). *Dynastic History of Bengal.* Dacca: Asiatic Society of Pakistan.

Haque, E. (1975). *A History of Sufism in Bengal.* Dacca: Asiatic Society of Pakistan.

Karim, A. (1960). *Corpus of the Muslim Coins of Bengal.* Dacca: Asiatic Society of Pakistan.

(1992) *Corpus of Arabic and Persian Inscriptions of Bengal, Dhaka.*

Karim, A. (1959). *Social History of Muslims in Bengal (Down to 1538).* Dacca: Asiatic Society of Pakistan.

Majumder, R. C. (1948). *History of Bengal, Vol. 1.* Dacca.

ahim, A. M. (1967). *Social and Cultural History of Bengal.* Vol. 1, 1201 - 1576. Karachi

_____ (1961), *History of the Afghans in India, A.D. 1545 - 1631,* Karachi.

Sarkar, J. N. Ed. (1948). *The History of Bengal, Vol. 2.* Dacca: University of Dacca.

Suggested Readings:

Ahmed, Samsuddin (ed.) (1960): *Inscriptions of Bengal, Vol. IV,* Rajshahi, V.R.M.

Morrison, B. M. (1970): *Political Centres and Cultural Regions in Early Bengal,* Tucson

Nath, R. (1978): *History of Sultanate Architecture,* New Delhi

Sarkar, Jagadish Narayan (1972): *Islam in Bengal (13th to 19th Century),* Calcutta

Stewart, Charles (1971): *History of Bengal: From the First Muhammadan Invasion until the Virtual Conquest of Bengal by the English in 1857*, Delhi

Sur, A. K. (1963): *History of Culture of Bengal*, Calcutta

Tarafdar, M. R. (1965): *Hussain Shahi Bengal*, Dacca, Asiatic Society of Pakistan

Dani, A. H. (1961), *Muslim Architecture in Bengal,* Dacca.

Hasan, Syed Mahmudul (1979), *Mosque Architecture of Pre-Mughal Bengal,* Dhaka.

Ali, M. M. (1985). *History of the Muslims in Bengal, 1st ed.* Riyadh. Two volumes

Chowdhury, A. M. (1967). *Dynastic History of Bengal.* Dacca: Asiatic Society of Pakistan.

Haque, E. (1975). *A History of Sufism in Bengal.* Dacca: Asiatic Society of Pakistan.

Karim, A. (1960). *Corpus of the Muslim Coins of Bengal.* Dacca: Asiatic Society of Pakistan.

(1992) *Corpus of Arabic and Persian Inscriptions of Bengal, Dhaka.*

Karim, A. (1959). *Social History of Muslims in Bengal (Down to 1538).* Dacca: Asiatic Society of Pakistan.

Majumder, R. C. (1948). *History of Bengal, Vol. 1.* Dacca.

ahim, A. M. (1967). *Social and Cultural History of Bengal.* Vol. 1, 1201 - 1576. Karachi

_____ (1961), *History of the Afghans in India, A.D. 1545 - 1631,* Karachi.

Sarkar, J. N. Ed. (1948). *The History of Bengal, Vol. 2.* Dacca: University of Dacca.

Suggested Readings:

Ahmed, Samsuddin (ed.) (1960): *Inscriptions of Bengal, Vol. IV*, Rajshahi, V.R.M.

Bhaduri, Rina (2001): *Social Formation in Medieval Bengal*, Calcutta, Bhivasha

Morrison, B. M. (1970): *Political Centres and Cultural Regions in Early Bengal*, Tucson

Nath, R. (1978): *History of Sultanate Architecture*, New Delhi

Sarkar, Jagadish Narayan (1972): *Islam in Bengal (13th to 19th Century)*, Calcutta

Stewart, Charles (1971): *History of Bengal: From the First Muhammadan Invasion until the Virtual Conquest of Bengal by the English in 1857*, Delhi

Sur, A. K. (1963): *History of Culture of Bengal*, Calcutta

Tarafdar, M. R. (1965): *Hussain Shahi Bengal*, Dacca, Asiatic Society of Pakistan

Dani, A. H. (1961), *Muslim Architecture in Bengal*, Dacca.

Hasan, Syed Mahmudul (1979), *Mosque Architecture of Pre-Mughal Bengal*, Dhaka.

করিম, আব্দুল, ১৯৮৭. বাংলার ইতিহাসঃ সুলতানি আমল, ঢাকাঃ বাংলা একাডেমী।
বন্দ্যোপাধ্যায়, রাখালদাস, ১৯৮৭. বাংলার ইতিহাস, কলিকাতা।

মুখোপাধ্যায়, সুখময়, ১৯৬২. বাংলার ইতিহাসের দুশো বছরঃ স্বাধীন সুলতানদের আমল (১৩৩৮-১৫৩৮), কলিকাতা।

মণ্ডল, সুশীলা, ১৯৬৩. বঙ্গদেশের ইতিহাসঃ মধ্যযুগ, প্রথম পর্ব, কলকাতা।

রায়, নীহাররঞ্জন, ১৩৬৬ বঙ্গাব্দ. বাঙ্গলার ইতিহাস (আদিপর্ব), কলকাতা।

রায়, অনিরুদ্ধ, ১৯৯৯. মধ্যযুগে ভারতীয় শহর, কলিকাতা।

লস্কর, আসিফ জামাল, ২০১৪. সুলতানি যুগে বাংলার নগরায়ন, কলকাতা।

CC 14: BENGAL UNDER THE MUGHALS AND NAWABS (1576 – 1765 AD)

Unit 1: Bengal under Subehdars of Akbar (1576 -1605)

1.1 Mughal Invasion in Bengal and rule of Subehdars
1.2 Bara-Bhuiyas of Bhati (Coastal Bengal) and their role
1.3 Revolts of the Mughal Generals against Akbar

Unit 2: Bengal under Jahangir (up to 1627 AD)

2.1 Control of the Bara Bhuiyas
2.2 Consolidation of Mughal Rule and Role of Islam Khan Chishti
2.3 Subehdars of Bengal

Unit 3: Bengal under Shah Jahan (up to 1660 AD)

3.1 Portuguese evacuation from Hugli by Subehdar Kasim Khan Juyuni
3.2 Shah Shuja and his rule over Bengal and Orissa

Unit 4: Bengal Under Aurangzeb (up to 1712)

4.1. Subehdars of Bengal
4.1 Mir Jumla and his expeditions to Koch Behar, Kamrup and Assam
4.2 Chittagong conquest of Shayesta Khan
4.3 Relation with English East India Company

Unit 5: Bengal Under the Nawabs (1723 to 1765 AD)

5.1 Murshid Quli Khan and his Revenue System
5.2 Expansion of European Trade
5.3 Alivardi Khan and his conquest of Subeh Bangla
5.4 Sirajuddaula and Battle of Plassey
5.5 Meer Zafar, Meer Kasim and Battle of Plassey

Unit 6: Socio-Political, Economic and Cultural History

6.1 Administrative System of the Mughals and the Nawabs
6.1 Society and Social Life
6.2 Economy, Trade and Industry
6.3 Literature, Art and Architecture

Essential Reading:

Blochmann, H (1927), *Ain-i-Akbari,* Vol. I (tr.), Calcutta.

Raychaudhuri, Tapan (1953), *Bengal Under Akbar and Jahangir,* Munshiram Manoharlal, Delhi.

Rashid, Md. Harun-or ( ), *Bengal Under The Mughals 1576 -1855,*

Sarkar, Jadunath Sir (Ed.) (1948), *History of Bengal,* Vol. II, University of Dacca, Dacca.

Moreland, W.H. (1923) *From Akbar to Aurangzebe,* London.

Bhattacharyya, S.N. (1929), *Mughal North-East Frontier Policy,* Calcutta.

Campos, J. J. A. (1919), *History of Portuguese in Bengal,* Calcutta.

Chatterjee, Anjali (1967), *Bengal in the Reign of Aurangzeb, 1658-1707,* Calcutta.

Chaudhury, Sushil (1975), *Trade and Commercial Organization in Bengal, 1650 – 1720,* Calcutta.

Chowdury, Abdul Momin (1967), *Dynastic History of Bengal, c.750-1200 A.D.* Dacca.

Habib, Irfan (1963), *Agrarian System of Mughal India,* London.

Hasan, Syed Mahmudul (1980), *Muslim Monuments of Bangladesh,* 2nd ed. Dacca.

Karim, Abdul (1964), *Dacca the Mughal Capital,* Dacca.

_____ (1985), *Social History of the Muslims in Bengal,* Dhaka.

_____ (1963), *Murshid Quli Khan and his Times,* Dhaka.

Sarkar, Jagadish Narayan (1985), *Hindu-Muslim Relations in Bengal (Medieval Period),* Delhi.

Majumder R.C. (1963) (Ed.) *History of Bengal,* 2nd Ed. Dacca.

Dutta, Kali Kinkar (1936), *Studies in the History of the Bengal Subah, 1740-1770*¸ Calcutta.

_____(1939), *Alivardi and His Times,* Calcutta.

_____ (1948), *The Dutch in Bengal and Bihar, 1740 – 1825,* Patna.

Sinha, N. K. (1956), *Economic History of Bengal from Plassey to Permanent Settlement,* Vol.1, Calcutta.

Chaudhuri, Sushil (2000), *The Prelude to Empire, Plassey Revolution of 1757,* Delhi.

Discipline Specific Elective (DSE) (In 5th Semester <u>any one</u> from DSE-A-1 & DSE-A-2 and <u>any one</u> from DSE-B-1 & DSE-B-2. In 6th Semester <u>any one</u> from DSE-A-3 & DSE-A-4 and <u>any one</u> from DSE-B-3 & DSE-B-4)

SEM 5 Paper 1 **DSE-A-1**: History of Modern India with Special Reference to the Muslim Politics (1857-1906 AD)

SEM 5 Paper 2 **DSE-B-1**: History of Modern India with Special Reference to the Muslim Politics (1906-1947 AD)

SEM 5 Paper 3 **DSE-A-2**: Regional History: Awadh (1722-1947 AD)

SEM 5 Paper 4 **DSE-B-2**: Regional History: Hyderabad (1724-1947AD)

SEM 6 Paper 5 **DSE-A-3**: Sufism in India

SEM 6 Paper 6 **DSE-B-3**: History of Medieval Indian Architecture (13^{th} to 18^{th} Century)

SEM 6 Paper 7 **DSE-A-4**: History of Medieval Indian Painting (13^{th} to 18^{th} Century)

SEM 6 Paper 8 **DSE-B-4**: Regional History: Mysore (1720-1947 AD)

Discipline Specific Elective: DSE (Detail)

SEM 5 Paper 1 **DSE-A-1**:

History of Modern India with Special Reference to the Muslim Politics (1857-1906 AD)

UNIT I- Establishment of British Rule and Muslims

a) The East India Company and the various sections of Muslims.
b) The Muslim Revivalist Reaction- Wahabi and Faraizi.
c) Revolt of 1857 and Muslim Involvement.
d) British Treatment of Muslims.

UNIT II- Muslim Reformist Movements

a) Role of Sir Sayyid Ahmed Khan
b) Other Muslim Bridge-Builders- Nawab Abdul Latif and Sayyed Amir Ali.
c) Role of Muhammadan Literary Society

UNIT III- Emergence of Political Consciousness among Muslims

a) Sayyid Ahmed's Political Ideology
b) Growth of Bengali Muslim Identity
c) Growth of Identity among U.P. Muslims
d) Partition of Bengal and Muslim Politics.
e) Foundation of Muslim League.

Essential Readings-

Ahmad Aziz, Islamic Modernism in India and Pakistan 1857-1964.

Ahmed Qeyamuddin, The Wahabi Movement in India, Calcutta, 1966.

Bandyopadhyay Sekhar, From Plassey to Partition.

Chandra Bipan, et Al., India's Struggle for Independence

Chandra Bipan, Communalism in Modern India (2nd Ed., 1987)

Chandra Bipan, Nationalism and Colonialism in Modern India (1979)

Chatterjee Joya, Bengal Divided: Hindu Communalism and Partition 1932-47. O.U.P, 1994

Hardy Peter, Muslims of British India

Hassan Mushirul ed., India's Partition, Oxford in India Readings

Pandey Gyanendra, The Construction of Communalism in Colonial North India

Sarkar Sumit , Swadeshi Movement in Bengal

Sarkar Sunit, Modern India, 1885-1947

Sen S.N, An Advanced History of Modern India, Kolkata, 2010

SEM 5 Paper 2 **DSE-B-1**:

History of Modern India with Special Reference to the Muslim Politics (1906-1947 AD)

UNIT I- Religion and Politics -

a) Role of Ulema and Politics- Deoband and Firangi Mahal
b) Rise of Pan- Islamism

UNIT II- Political Movements

a. Non-Cooperation and Khilafat Movement
b. Regional Movements- Moplah.

UNIT III- Towards Communal Politics-

a) Communalism and Politics of Dyarchy
b) Muslim Politics and Simon Commission.

UNIT IV- The Final Demand

a. Muslim League and the Demand for Pakistan.
b. Towards Independence and Partition.

Essential Readings-

Ahmad Aziz, Islamic Modernism in India and Pakistan 1857-1964.

Ahmed Qeyamuddin, The Wahabi Movement in India, Calcutta, 1966.

Bandyopadhyay Sekhar, From Plassey to Partition.

Chandra Bipan, et Al., India's Struggle for Independence

Chandra Bipan, Communalism in Modern India (2nd Ed., 1987)

Chandra Bipan, Nationalism and Colonialism in Modern India (1979)

Chatterjee Joya, Bengal Divided: Hindu Communalism and Partition 1932-47. O.U.P, 1994

Hardy Peter, Muslims of British India

Hassan Mushirul ed., India's Partition, Oxford in India Readings

Pandey Gyanendra, The Construction of Communalism in Colonial North India

Sarkar Sumit , Swadeshi Movement in Bengal

Sarkar Sunit, Modern India, 1885-1947

Sen S.N, An Advanced History of Modern India, Kolkata, 2010

SEM 5 Paper 3 **DSE-A-2**:

Regional History: Awadh (1722-1947 AD)

UNIT I: Awadh under the Mughals and independent Nawabs:

a) Later Mughals and Awadh.
b) Independent Nawabs of Awadh.

UNIT II: Expansion of British Rule:

a) Anglo-Awadh Treaties.
b) Usurpation of Awadh's Independence.

UNIT III- Administration-

a) Under the Mughals
b) Independent Nawabs
c) Under the British.

Essential Reading

Mahmud, Aslam. (2017). *Awadh Symphony: Notes On a Cultural Interlude. Rupa Publication*.
Bhatnagar, Sangeeta and R. K. Saxena.(1997).*Daslarkhwan-e-Awadh*.
Parveen, Nikat. (2008). *Socio-Economic Condition of Awadh*
Qureshi, Hamid Afaq. (2004). *Sources on Awadh: From 1722 AD. To 1856 AD*
Trivedi, Madhu. (2010). *The Making of the Awadh Culture*
Singh, S. N. (2003). *The Kingdom of Awadh*
Swarup, Sushma. (2013). *Costumes and Textiles of Awadh: From the Era of Nawabs to Modern Times*
'Oudh'. The Imperial Gazetteer of India. 1909

SEM 5 Paper 4 **DSE-B-2**:

Regional History: Hyderabad (1724-1947AD)

UNIT I- Rise of the State of Hyderabad:

a) Life and times of Asaf Jah I
b) Rule of Nasir Jung
c) Rule of Muzaffar Jung
d) Rule of Salabat Jung

UNIT II- Economy under the Nizam of Hyderabad:

a) Agriculture
b) Trade and Commerce.

UNIT III- Relation with European Powers-

a) French East India Company
b) English East India Company
c) Carnatic wars

UNIT IV- End of the Dynasty-

a) Removal of the Last Nizam.

UNIT V- Cultural Facets-

a) Art
b) Architecture
c) Society

Essential Reading

Luther, Narendra, (2012), *Hyderabad: A Biography*

McAuliffe, R Paton, (2018), *The Nizam: Origin and Future of the Hyderabad State*

Zubrzycki, John, (2015), Last Nizam: The Rise and Fall of Indias Greatest Princely State

Regani, Sarojini, (1988), *Nizam-British Relations, 1724-1857*

Lethbridge, Roper, (1893), *The Golden Book of India*

Briggs, Henry George, (1861), *The Nizam: His History and Relations with the British Government*

Farooqui, Salma Ahmed, (2011), *A Comprehensive History of Medieval India: Twelth to Mid Eighteenth Century.*

SEM 6 Paper 5 **DSE-A-3**:

Sufism in India

UNIT I: ORIGIN AND DEVELOPMENT OF SUFISM

1. ORIGIN OF SUFISM: MEANING AND DEFINITION
2. HISTORICAL DEVELOPMENT
3. EARLY SUFIS: HASAN BASRI, RABIA BASRI, ZUNNUN MISRI AND JUNAID BAGHDADI
4. AL – GHAZALI
5. ABDUL QADIR JILANI

UNIT II: MAIN SUFI ORDERS IN INDIA

1. CHISHTI ORDER
2. SUHRAWARDI ORDER
3. QADRI ORDER
4. NAQSHBANDI ORDER
5. FIRDAUSI ORDER
6. SUB ORDERS(selected)

UNIT III: BRIEF INTRODUCTION TO SUFI LITERATURE

1. AKHBARUL AKHYAR
2. FAWAIDUL FAWAID
3. KASHF –UL- MAHJUB
4. MAKTUBAT – E- SADI

Essential Reading:

Khanam, Farida, *Sufism: An Introduction, New Delhi, 2006*

Nicholson, R.A, *Mysticism of Islam, Routledge, 1914*

Nicholson R.A, *Studies in Islamic Mysticism, Osmania University Press, 1921*

Rizvi,S.A.A.,*A History of Sufism In India, Delhi, 1975*

Suggested readings:

Haq, Md. Enamul,A*History of Sufism in Bengal, Dacca, 1975*

Hussain, Syed Nisar, *Ideals and Realities of Islam, London, 1975*

Shah, S. Ikbal Ali, *Islamic Sufism, S. Weiser, 1933*

Subhan, John A, *Sufism- its Saints and Shrines, 1938*

Waliuddin, Mir, *Quranic Tasawwuf, Delhi, 1966*

Wasey, Akhtarul/

Ehsas, Farhat, ed, *Sufism: Indian Mysticism, Readworthy, 2011*

SEM 6 Paper 6 **DSE-B-3**:

History of Medieval Indian Architecture (13th to 18th Century)

UNIT I: Introduction to Indo-Islamic Architecture

UNIT II: Imperial Style of Architecture: Delhi.

a) Architecture of Mameluk and Khalji Dynasty
b) Architecture of the Tughluqs
c) Architecture of the Sayyids and the Lodis.

UNIT III: Mughal Architecture.

a) Foundation of Mughal Imperial Style.
b) Development Of Architecture Under Akbar
c) Culmination Under Shah Jahan
d) Development of Sub-Imperial Schools.

Essential Reading

1. Asher, Catherine. B. The *New Cambridge History of India I:4: Architecture of Mughal India*. Cambridge University Press, Cambridge 1992
2. Brown Percy, 'Monuments of Mughal Period', in *Cambridge History of India, Cambridge*, 1937
3. Brown, Percy. *Indian Architecture, Islamic Period*.5th ed. D.B. Taraporevala, Mumbai, 1968

4. Burton-Page, John, *Indian Islamic Architecture: Forms and Typologies, Sites and Monuments*, BRILL, Leiden and Boston, 2008
5. Desai, Z.A., *Indo Islamic Architecture*, Publications Division Ministry of Information & Broadcasting, New Delhi, 1970
6. Juneja, M, ed. *Architecture in Medieval India: Forms, Context, Histories,* Permanent Black , Delhi, 2001
7. Koch Ebba*, Mughal Architecture: An Outline if its History and Development*, Oxford University Press, London, 2002
8. Merklinger, Elizabeth Schotten, *Sultanate Architecture of Pre-Mughal*, Munshiram Manoharlal, New Delhi, 2005
9. Nath R, *History of Sultanate Architecture*, Abhinav Publications, New Delhi1978
10. Nath R., *History of Mughal Architecture*, Abhinav Publication, New Delhi, 1994
11. *Rule*

Suggested Reading:

1. Blair, S.S. and J.M. Bloom, *The Art and Architecture of India 1250-1800*, New Heaven and London, London, 1994
2. Degeorge, Yves Porter Gerard, *The Glory of the Sultans : Islamic Architecture in India*, THAMES & HUDSON, London , 2009
3. Jairazbhoy, R.A., *An Outline of Islamic Architecture*, Oxford University Press London, 1961
4. Michell George and Amit Pasricha, *Mughal Architecture & Gardens*, Antique Collectors' Club, New York, 2011
5. Nath, R. and Ajay Nath, The Taj Mahal: History and Architecture, Heritage, New Delhi, 2010

SEM 6 Paper 7 **DSE-A-4**:

History of Medieval Indian Painting (13th to 18th Century)

UNIT I- Pre-Mughal Painting

a) Western Indian Painting School
b) Sultanate Painting
c) Other Painting Schools Including Eastern Indian

Unit II- Mughal Painting (upto 1605)

a) Foundation of Mughal Painting- Babu**r** and humayun.
b) Akbar

Unit III- Mughal Painting (upto 1857)

a) Jahangir
b) Shah Jahan and Later Schools.

Essential Reading

a) Brown, Percy, (1924), *Indian Painting Under the Mughals.*
b) Beach, Milo Cleveland, (1992), *Mughal and Rajput Painting*
c) Losty, Jeremiah P., (1982), *The art of the book in India*
d) Das, Asok Kumar, (1986), *Splendour of Mughal Painting*
e) Welch, Stuart Cary, (1977), *Imperial Mughal Painting*
f) Welch, Stuart Cary, (1985), *India: Art and Culture 1300-1900*
g) Skelton, Robert, (1982), *The Indian Heritage: Court Life and Arts Under Mughal Rule*

SEM 6 Paper 8 **DSE-B-4**:

Regional History: Mysore (1720-1947 AD)

UNIT I- Rise and consolidation of the State of Mysore-

a) Rise of Hyder Ali and Foundation of Mysore State.
b) Mysore under Tipu Sultan
c) Mysore as Princely State.

UNIT II- Administration-

a) Under Hyder Ali
b) Under Tipu Sultan
c) Under Princely State.
d) Military Administration

UNIT III- State and Economy-

a) Economy under Hyder Ali
b) Economy under Tipu Sultan
c) Economy under British rule.

UNIT IV- Society and Culture-

a) Literature
b) Architecture.

Essential Reading

Jain, Laxmi, (2016), *History of the Wodeyars of Mysore (1500 to 1965).*

Rao, D S Achuta, (2017), *Administrative and Social History of Mysore Under the Wodeyars (1600-1800 CE)*

Fernandes, Praxy, (1991), *The Tigers of Mysore: A Biography of Tipu Sultan and Hyder Ali*

Rao, D S Achuta, (2017), *Mysore History before 1800 CE*

Ali, B Sheik, (2012), *Cultural History of Karnataka*

Elliot, Robert H., (2009), Gold, *Sport And Coffee Planning in Mysore (Illustrated Edition).*

Skill Enhancement Courses SEC –A & B (Any Two) Choosing one from group-A in 3rd Semester and one from group-B in 4th Semester) Credits 2 each

SEC –A (1): Archives and museums

This course introduces students to the institutions that house and maintain documentary, visual and material remains of the past. Museums and archives are among the most important such repositories and this course explains their significance and how they work. Students will be encouraged to undertake collection, documentation and exhibition of such materials in their localities and colleges. Visit to National Archives and National Museum are an integral part of the course.

I. Definition and history of development (with special reference to India)

II. **Types of archives and museums**: Understanding the traditions of preservation in India Collection policies, ethics and procedures Collection: field exploration, excavation, purchase, gift and bequests, loans and deposits, exchanges, treasure trove confiscation and others. Documentation: accessioning, indexing, cataloguing, digital documentation and de-accessioning Preservation: curatorial care, preventive conservation, chemical preservation and restoration

III. Museum Presentation and Exhibition:

IV. **IV. Museums, Archives and Society:** (Education and communication Outreach activities

Essential Readings:

Agrawal, O.P., Essentials of Conservation and Museology,Sundeep Prakashan, New *Delhi*, India, 2007.

Choudhary, R.D. Museums of India and their maladies. Calcutta: Agam Kala Prakashan, New Delhi, 1998(In Bengali).

Guha, Thakurta, Tapati, Monuments, Objects, Histories: Institution of Art in Colonial Post Colonial India, New York, 2004

Kathpalia, Y. P. Conservation and Restoration of Archive Materials. UNESCO, 1973

Mathur Saloni, India by Design: Colonial History and Cultural Display, University of California, 2007

Nair, S.M. Bio-Deterioration of Museum Materials.2011

Roychowdhury, Madhuparna. Displaying India's Heritage : Archaelogy and the Museum Movement in Colonial India. Delhi: Orient Blackswan 2015

Sengupta, S. Experiencing History Through Archives. Delhi: Munshiram Manoharlal.2004.

SEC –B (1) Understanding Popular Culture

The paper examines some popular cultures expressed in different mediums like visual, oral and cultural. In the process of theirevolution, these cultures eclectically draw from traditions, articulate anxieties, and even give rise to new traditions. The paper endeavours to equip students with understanding such phenomena historically, with special reference to India. It is imperative that the students use electronic devices to view, record, and document the subject matter.

I Introduction: Defining popular culture and understanding it historically

II Visual expressions Folk art, calendar art, photography
III. Performance: Theatre; music; folk tales/songs/swang and Nautanki:Identifying themes,functionality, anxieties
IV. The audio-visual: cinema and television:
Indian cinema: Mapping the influence of the national struggle for independence (1930s and 40s); Idealized nationalism (1950s), disillusionment and the anti-establishment mood (1970s and 80s); documentary films Expressions of popular culture in television
V. Fairs, Festivals and Rituals:
Disentangling mythological stories, patronage, regional variations
VI. Popular culture in a globalized world:
The impact of the Internet and audio-visual media
Essential Readings:
Dissanayake, W. and K. M. Gokul Singh, Indian Popular Cinema, Trentham Book, London, 2004
John Storey, Cultural Theory and Popular Culture, London, 2001
Oberoi, Patricia, Freedom and Destiny: Gender, Family and Popular Culture in India, Delhi, 2009
Christopher Princy, Camera Indica: The Social Life of Indian Photographs, Chicago, 1998
Suggested Readings:
Ramanujan, A.K. Folktales from India A Selection of Oral Tales from Twenty-two Languages (Only Introduction). New York : Pantheon Books, ©1991.
Ramaswamy, V. 'Women and the 'Domestic' in Tamil Folk Songs' in Kumkum Sangari and Uma Chakravarti, eds., From Myths to Markets: Essays on Gender, Shimla, 1999
Singh, Lata (ed.), Theatre in Colonial India: Playhouse of Power, New Delhi, 2009

SEC –A (2) Understanding Heritage

This course will enable students to understand the different facets of heritage and their significance. It highlights the legal and institutional frameworks for heritage protection in India as also the challenges facing it. The implications of the rapidly changing interface between heritage and history will also be examined. The course will be strongly project-based and will require visits to sites and monuments. At least two Projects will be based on visits to Museums/Heritage Sites.

I. Defining Heritage
Meaning of ‘antiquity’, ‘archaeological site’, ‘tangible heritage’, 'Intangible heritage' and ‘art treasure’
II. Evolution of Heritage Legislation and the Institutional Framework:
Conventions and Acts— national and international Heritage-related government departments, museums, regulatory bodies etc.
Conservation Initiatives
III. Challenges facing Tangible and Intangible Heritage
Development, antiquity smuggling, conflict (to be examined through Specific case studies)
IV. Evolution of Heritage Legislation and the Institutional Framework:
Conventions and Acts— national and international Heritage-related government departments, museums, regulatory bodies etc.
Conservation Initiatives
V. Challenges facing Tangible and Intangible Heritage:
Development, antiquity smuggling, conflict (to be examined through specific case studies)
VI. Heritage and Travel:
Viewing Heritage Sites - The relationship between cultural heritage, Landscape and travel recent trends

Essential Readings
David Lowenthal, Possessed By The Past: The Heritage Crusade and The Spoils of History, Cambridge, 2010

Layton, R. P. Stone and J. Thomas. Destruction and Conservation of Cultural Property, London: Rutledge, 2001

Lahiri, N., Marshaling the Past - Ancient India and its Modern Histories. Ranikhet: Permanent Black. 2012. Chapters 4 and 5.

S.S. Biswas, Protecting the Cultural Heritage (National Legislations and International Conventions). New Delhi: INTACH, 1999.

Suggested Readings

Acts, Charters and Conventions are available on the UNESCO and ASI websites (www.unesco.org; www.asi.nic.in)

Agrawal, O.P., Essentials of Conservation and Museology, Delhi, 2006

Chainani, S. 2007. Heritage and Environment. Mumbai: Urban Design Research Institute, 2007

SEC –B (2): Art Appreciation: an Introduction to Indian Art

The purpose of this course is to introduce students to Indian art, from ancient to contemporary times, in order to understand and appreciate its diversity and its aesthetic richness. The course will equip students with the abilities to understand art as a medium of cultural expression. It will give students direct exposure to Indian art through visuals, and visits to sites and museums.

I. Prehistoric and protohistoric art: _Rock art; Harappan arts and crafts

II. Indian art (c. 600 BCE – 600 CE):

World Heritage Site Managers, UNESCO World Heritage Manuals
[Can be downloaded/ accessed at www.unesco.org]

Notions of art and craft Canons of Indian paintings Major developments in stupa, cave, and temple art and architecture Early Indian sculpture: style and iconography Numismatic art

III. Indian Art (c. 600 CE – 1200 CE) : Temple forms and their architectural features Early illustrated manuscripts and mural painting traditions Early medieval sculpture: style and iconography Indian bronzes or metal icons

IV. Indian art and architecture (c. 1200 CE – 1800 CE) :
Sultanate and Mughal architecture Miniature painting traditions: Mughal, Rajasthani, Pahari Introduction to fort, palace and haveli architecture

V. Modern and Contemporary Indian art and Architecture:
The Colonial Period Art movements: Bengal School of Art, Progressive Artists Group, etc. Major artists and their artworks Popular art forms (folk art traditions)

Essential Readings

Neumayer, Erwin, Lines of Stone: The pre-historic rock-art of India,
South Asia Books, 1993
Goswamy, B.N., Essence of Indian Art, Asian Art Museum of San
Francisco, 1986
Huntington, Susan, The Art of Ancient India: Hindu, Buddhist, Jain, Weatherhill, 1985
Guha-Thakurta, Tapati, The making of a new modern Indian art: Aesthetics and nationalism in Bengal, 1850-1920, Cambridge University Press, 1992

Suggested Readings:

Mitter, Partha, Indian Art, Oxford History of Art series, Oxford University Press, 2001
Dhar, Parul Pandya, ed., 2011, Indian Art History Changing Perspectives, New Delhi: D.K. Printworld and National Museum Institute (Introduction).
Beach, M.C., The New Cambridge History of India I: 3, Mughal and Rajput Painting, Cambridge University Press, 1992.
Ray, Niharranjan, An Approach to Indian Art, Calcutta, 1970

CBCS SYLLABUS

IN

ISLAMIC HISTORY AND CULTURE (GENERAL)

CALCUTTA UNIVERSITY

2018

University of Calcutta

IHC-G (General)-CBCS Syllabus in Islamic History and Culture, 2018

4 Core Courses. (CC.) 2 Discipline-specific Elective; (DSE-A & DSE-B) 2 Generic Elective (GE) 2 Skill Enhancement/Skill based Courses (SEC- A & SEC-B)

- Each course carries 80 marks. Minimum 60 classes.
- Each course: 6 credits (5 Theoretical + 1 Tutorial-related).
- Exception: Skill Enhancement/Skill-based Courses: 2 credits (no Tutorial).
- 65 marks for theoretical segment:
- Question Pattern for subjective/descriptive segment of 50 marks: 3 questions (within 500 words; 10 x3 = 30) + 4 questions (within 250 words; one from each module 5x4=20) and 15 objective type questions carrying 1 mark each (15 x 1 = 15).
- 15 marks for tutorial-related segments as suggested below (any one from each mode):
- Any one of the following modes: upto 1000 words for one Term Paper/upto 500 words for each of the two Term Papers/ equivalent Book Review --- based on syllabus related and/or current topics [The modes and themes and/or topics are be decided by the concerned faculty of respective colleges.]
- Core Courses (CC) in Semesters 1- 4 ; Generic Elective (GE) courses in Semesters 1-4; Skill Enhancement courses (SEC-A) in Semesters 3/5 & (SEC- B) in Semesters 4/6 Discipline-specific Elective(DSE –A) in Semester 5 (DSE –B) in Semester 6

IMPORTANT NOTES:

- The Readings provided below (except Bengali books) include those of the UGC Model CBCS Syllabus in Islamic History and Culture. For Course Objectives and references it is advised that the UGC model CBCS syllabus concerning relevant courses and topics should be given due importance and primarily consulted.
- Bengali are not necessarily substitutes, but supplementary to the English books.
- The format is subject to the CBCS Common Structural Format of the University.

LIST OF COURSES FOR GENERAL PROGRAMME	
COURSE CODE	**(6 Credits per Core Course)**
Subject-Hon-Core-Semester-Paper-Th &TU	**CORE COURSES FOR GENERAL & GENERIC ELECTIVE FOR HONOURS**
IHC-G-CC/GE-1-1-TH&TU	
IHC-G-CC/GE-2-2-TH&TU	
IHC-G-CC/GE-3-3-TH&TU	
IHC-G-CC/GE-4-4-TH&TU	
Skill Enhancement Course (2 Credits per Course)	
GROUP-A	**IHC-G-SEC- 3/5-A(1) Or A (2)-TH**
SEC-A-(1)	
SEC-A-(2)	
GROUP-B	**IHC-G-SEC- 4/6-B(1) Or B(2)-TH**
SEC-B-(1)	
SEC-B-(2)	
DISCIPLINE SPECIFIC ELECTIVE (6 Credits per Course)	
GROUP-A	**IHC-G-DSE-5-A(1 Or 2)-TH&TU**
DSE-A-(1)	
DSE-A-(2)	
GROUP-B	**IHC-G-DSE-6-B(1 Or 2)-TH&TU**
DSE-B-(1)	
DSE-B-(2)	

Structure of B.A General (Programme)

IHC-G - CC/GE -1 to 4 TH&TU

1. History of Islam : Early times, Prophet to four Pious Caliphs
2. History of Islam: Umayyad Empire
3. History of Islam: Abbasid Empire
4. History of Medieval India: Sultanate Empire and Mughal Empire

Discipline Specific Elective(DSE) (In 5th Semester Any One From DSE -A & In 6th Semester Any One From DSE- B) TH&TU

DSE-A-1: History of the Mongols and Timurids
DSE-A-2: History of Medieval Europe
DSE-B-1: History of Medieval Art, Architecture and Culture
DSE-B-2: History of Medieval Bengal : Sultanate Period and Mughal Period

Skill Enhancement Courses (SEC–A-1 or SEC-A-2 for 3rd/5th Sem & SEC–B-1 or SEC-B-2 for 4th/6th Semester) TH

SEC –A-1: Historical Tourism: Theory &Practice
SEC –B-1: Museums &Archives in India
SEC –A-2: Indian History &Culture
SEC-B-2: Orality and Oral Culture in India

Each SEC course carries 100 marks. Minimum 60 classes.

- **80 marks for theoretical segment.**
- **Question Pattern for subjective/descriptive segment of 80 marks: 4 questions (within 500 words; (10 x4 = 40) + 5 questions (within 250 words; 5x5=25) and 15 objective type questions carrying 1 mark each (15 x 1 = 15).**

Semester wise Courses for IHC-G

	SEM-1	SEM-2	SEM-3	SEM-4	SEM-5	SEM-6
CC	CC-1 2TH +2TU	CC -2 2TH +2TU	CC-3 2TH +2TU	CC-4 2TH +2TU		
GE	GE-1 TH +TU	GE-2 TH +TU				
AECC	AECC-1 TH	AECC-2 TH				
DSE			DSE-A TH +TU	DSE-B TH +TU	DSE-A TH +TU	DSE-B TH +TU
SEC			SEC-A -1 TH	SEC-B -1 TH	SEC-A 2 TH	SEC-B 2 TH

CC: 4 courses each from 2 disciplines. (One course from each subject under each semester) Each course is of 6 credits.
GE: Two courses from one subject different from the core subject. Each course is of 6 credits.
AECC:-1 Communicative English AECC-2- Environmental studies (Each course has 2 credits)
DSE: 2 courses each from 2 disciplines. Each course is of 6 credits.
SEC: 2 courses each from 2 disciplines ((Each course has 2 credits)
DSE/ SEC : Choice must be group specific to each semester

CC -1/GE-1 : History of Islam: Early times, Prophet to four Pious Caliphs

UNIT I- THE PROPHET (SAW) AT MAKKAH:

1. ARAB SOCIETY AND CULTURE ON THE EVE OF ISLAM
2. BIOGRAPHY OF THE PROPHET
3. THE HIJRAT: CAUSES AND IMPORTANCE

UNIT II - THE PROPHET (SAW) AT MADINAH:

1. MAJOR BATTLES
2. TREATY OF HUDAIBIYAH
3. CONQUEST OF MAKKAH
4. AS A REFORMER

UNIT III - THE PIOUS CALIPHS

1. LIFE AND ACHIEVEMENTS OF HAZRAT ABU BAKER
2. LIFE AND ACHIEVEMENTS OF HAZRAT UMAR
3. LIFE AND ACHIEVEMENTS OF HAZRAT UTHMAN/USMAN
4. LIFE AND ACHIEVEMENTS OF HAZRAT ALI

UNIT IV- ADMINSTRATION UNDER PIOUS CALIPHS

1. REVENUE ADMINISTRATION-BAYTUL MAL
2. CENTRAL AND PROVINCIAL ADMINISTRATION
3. ARMY ADMINISTRATION

UNIT V – SOCIO - ECONOMIC & CULTURAL HISTORY

1. NATURE OF THE ADMINISTRATION
2. SOCIETY AND CULTURE- POSITION OF DHIMMI
3. TRADE AND COMMERCE

Essential Reading

Ali, K, A *Study of Islamic History, Delhi, 1980*

Ali, Syed Ameer, *A Short History of the Saracens, London, 1916*

Ali, Syed Ameer, *The Life and Teaching of Muhammad, Calcutta, 1902*

Hitti, P.K, *History of Arabs, Macmillan, 1937*

Suggested Reading

Arnold, T.W, *Preaching of Islam, California, 1896*

Faqih, Irfan, *Glimpses of Islamic History, Lahore, 1979*

Giullame, A, *The Life of Muhammad, London, 1978*

Hamidullah, M, *Introduction to Islam, Lahore, 2009*

Hasan, Masudul, *History of Islam Vol-I, II, New Delhi, 2004*

Hossain, S. Athar, *The Glorious Caliphate,*

Husaini, S.A.Q,*Arab Administration, Lahore, 1957*

Imamuddin, S.M, *Arab Muslim Administration (622-1258), New Delhi, 1984*

Lapidus, Ira M,*History of Islamic Societies, Cambridge, 1988*

Lewis, Bernard, *The Arab in History, Oxford University Press, 1950*

Lewis, Bernard, *Islam from the Prophet Muhammad to the Capture ofConstantinople, 2 vols, New York and London, 1978*

Nomani, Shibli, *Al-Faruq, Eng tr. Umar the great, 2 vol., Lahore, 1939*

Siddiqui, M.Y.M, *Organization of Govt. Under The Prophet, Lahore,*

Watt, W. M, *Muhammad at Mecca, Oxford, 1953*

CC-2/GE- 2: History of Islam: Umayyad Empire

UNIT I: ESTABLISHMENT OF UMAYYAD RULE: 661 – 750

1. LIFE AND ACHIEVEMNT OA AMEER MUAWIAH: AS FOUNDER OF UMAYYAD RULE
2. THE INCIDENT OF KARBALA
3. ABDUL MALIK: LIFE AND ACHIEVEMENTS
4. AL WALID I: LIFE AND ACHIEVEMNETS: EXPANSION OF MUSLIM RULE
5. UMAR BIN ABDUL AZIZ: LIFE AND CONTRIBUTION

UNIT II: SOCIETY AND CULTURE

1. SOCIETY, ECONOMY AND CULTURE
2. POSITION OF MAWALI, ZIMMIS , WOMEN AND SLAVE
3. ART & ARCHITECTURE
4. FALL OF THE DYNASTY

UNIT III: ADMINISTRATION

1. CENTRAL AND PROVINCIAL ADMINISTRATION
2. SPECIAL FEATURE OF THE GOVERNMENT
3. REVENUE ADMINISTRATION
4. ARMY—NAVY

Essential Reading

Ali, K, A *Study of Islamic History, Delhi, 1980*

Ali, Syed Ameer, *A Short History of the Saracens, London, 1916*

Ali, Syed Ameer, *The Life and Teaching of Muhammad, Calcutta, 1902*

Hitti, P.K, *History of Arabs, Macmillan, 1937*

Suggested Reading

Faqih, Irfan, *Glimpses of Islamic History, Lahore, 197*9

Hell, Joseph, *The Arab Civilization,M.Ashraf, 1943*

Humphreys R. S, *Muawiya Bin AbiSufyan*

Hussain, M. Hadi, *Umar Bin Abd Al Aziz*

Husaini, S.A.Q,*Arab Administration, Lahore, 1957*

Imamuddin, S.M, *Arab Muslim Administration (622-1258), New Delhi, 1984*

Grunebaum, Von, *Medieval Islam*

G. Le Strange, *Baghdad during Abbasid Caliphate*

Lapidus, Ira M,*History of Islamic Societies, Cambridge, 1988*

Lewis, Bernard, *The Arab in History, Oxford University Press, 1950*

CC-3/GE-3 : History of Islam: Abbasid Empire

UNIT I: ESTABLISHMENT OF ABBASID RULE

1. LIFE AND ACHIEVEMENT OF JAFAR AL MANSUR
2. HARUN AL RASHID: LIFE AND ACHIEVEMENT
3. AL – MAMUN: THE GLORIOUS PERIOD OF ABBASID

UNIT II: SOCIO-CULTURAL HISTORY

1. SOCIETY(ZIMMIS, BERMAKIDS, WOMEN),
2. EDUCATION, SCIENTIFIC AND LITERARY ACTIVITIES
3. FALL OF ABBASIDS

UNIT III: ADMINISTRATION:

1. CENTRAL AND PROVINCIAL
2. ECONOMY: TRADE AND COMMERCE
3. ARMY--NAVY

Essential Reading

Ali, K, A *Study of Islamic History, Delhi, 1980*

Ali, Syed Ameer, *A Short History of the Saracens, London, 1916*

Ali, Syed Ameer, *The Life and Teaching of Muhammad, Calcutta, 1902*

Hitti, P.K, *History of Arabs, Macmillan, 1937*

Suggested Reading

Faqih, Irfan, *Glimpses of Islamic History, Lahore, 197*9

Hell, Joseph, *The Arab Civilization,M.Ashraf, 1943*

Humphreys R. S, *Muawiya Bin AbiSufyan*

Hussain, M. Hadi, *Umar Bin Abd Al Aziz*

Husaini, S.A.Q,*Arab Administration, Lahore, 1957*

Imamuddin, S.M, *Arab Muslim Administration (622-1258), New Delhi, 1984*

Grunebaum, Von, *Medieval Islam*

G. Le Strange, *Baghdad during Abbasid Caliphate*

Lapidus, Ira M,*History of Islamic Societies, Cambridge, 1988*

Lewis, Bernard, *The Arab in History, Oxford University Press, 1950*

CC-4/GE-4 History of Medieval India: Sultanate Empire and Mughal Empire

UNIT I

A. Foundation, expansion and consolidation of the Sultanate of Delhi; the Khaljis and the Tughluqs; Mongol threat and Timur's invasion; Rise and fall of Syed dynasty; The Lodis; Conquest of Bahlul and Sikandar; Ibrahim Lodi and the battle of Panipat;

B. Theories of Kingship; Ruling elites; Sufis, Ulama and the political authority; imperial monuments and coinage

UNIT II. Society and Economy:

A. Iqta and the revenue-free grants

B. Agriculture production; technology

UNIT III. Religion and Culture:

A. Sufi silsilas: Chishtis and Suhrawardis; doctrines and practices; social roles

B. Bhakti movements and monotheistic traditions in South and North India; Women Bhaktas; Nathpanthis; Kabir, Nanak and the Sant tradition C. Sufi literature; Malfuzat; Premakhayans

UNIT IV. Establishment of Mughal rule:

a) India on the eve of Babur’s Invasion

b) Humayun’s struggle for empire

c) Sher Shah and his administrative and revenue reforms

UNIT V. Consolidation of Mughal rule under Akbar:

a) Incorporation of Rajputs and other indigenous groups in Mughal nobility.
b) Evolution of administrative institutions: Zabt, Masnab, Jagir, Madad-I-Maash
c) Religious tolerance and Sulh-i-kul; Sufi mystical and intellectual interventions

UNIT VI. Jahangir, Shah Jahan and Aurangzeb

a) Extension of Mughal rule; changes in Mansab and Jagir systems; imperial culture

b) State and religion under Aurangzeb; issues in the war of succession; policies regarding Religious groups and institutions

UNIT VII. Rural Society and Economy:

a) Land rights and Revenue system; Zamindars and Peasants; rural tensions

b) Extension of agriculture; agricultural production; crop patterns

UNIT VIII. Culture:

a) Sultanate Architecture
b) Mughal Architecture
c) Mughal Painting

Essential Readings-

Chandra, Satish, A History of Medieval India (Part II)

Chandra, Satish, Historiography, Religion and State in Medieval India

Chandra, Satish, Mughal Religious Policies, the Rajputs and the Deccan.

Habib Irfan(ed.), Medieval India

Hasan S.Nurul, Religion, State, and Society in Medieval India

Mukhia Harbans, The Mughals of India.

Raychoudhuri T.K. & Habib I. (eds.)-The Cambridge Economic History of India Vol. I Cambridge University Press, Cambridge, 1982, 1987 (reprint).

Richards J.F.,The Mughal Empire

Rizvi S.A.A., The Wonder that was India (vol.2)

Tripathi R.P., Some Aspects of Muslim Administration

Suggested Readings-

Alam Muzaffar and Subramaniam Sanjay, eds., The Mughal state, 1526-1750

Ali Athar M., The Mughal Nobility under Aurangzeb

Ali, M. Athar, Mughal India: Studies in Polity, Ideas, society and Culture.

Arsaratnam S., Maritime India in the Seventeenth Century

Asher Catherine, Architecture of Mughal India

Beach Milo, Mughal and Rajput Paintings.

Chandra Satish, Essays on Medieval Indian History

Chaudhuri, K.N.,Trade & Civilization: An Economic History from the Rise of Islam to 1750.

Eaton, R.M., The Rise of Islam and the Bengal Frontier 1204-1760;

Eaton, R.M., The Sufis of Bijapur

Habib Irfan, Agrarian System of Mughal India, 1526 – 1707

Hasan S., Nurul,Thoughts on Agrarian Relations in Mughal India.

Koch Ebba, Mughal Art and Imperial Ideology

Richards, J.F, Mughal Administration in Golconda

Rizvi S.A.A., A History of Sufism in India

Sarkar, Sir J.N., History of Aurangzeb 5 vols.

Sarkar, Sir J.N., Fall of the Mughal Empire, 4 vols.

Siddiqi. N.A., Land Revenue Administration under the Mughals (1700- 1750)

Streusand D.F., The Formation of the Mughal Empire

Kulke, Hermann, ed., The State in India (AD 1000 – AD 1700)

Sharma, R.S and Shrimali, K.M eds., Comprehensive History of India, Vol. IV (A & B)

Sharma, R.S. Indian Feudalism (circa 300 – 1200)

Singh,Vipul, Interpreting Medieval India, Volume-I, Early Medieval, Delhi Sultanate and Regions (circa 750 – 1550), 2009

Asher, Catherine and Talbot Cynthia, India before Europe, Cambridge University Press, March 2006.

Chandra Satish, Medieval India I, Har Anand Publication, New Delhi, July 2007.

Habib Mohammad and Nizami K.A., eds, Comprehensive History of India, Vol. V, The Delhi Sultanate, People's Publishing House, 2nd Edition, 1992.

Hasan Mohibul, Historians of Medieval India, Meenakshi Prakashan, 1968.

Jackson Peter, The Delhi Sultanate, Cambridge University Press, Revised Edition, 2003.

Schomer, Karine, and McLeod W.H., (Eds), The Sants Studies in A Devotional Tradition of India, Motilal Banarsidas, Delhi, 1987.

Nizami K.A., Some Aspects of Religion and Politics in India During the 13th Century, Aligarh, 1961.

Raychaudhuri Tapan and Habib Irfan, (Eds), Cambridge Economic History of India, Vol. I: c. 1200 – c. 1750, Cambridge University Press, Cambridge, 1982, 1987 (reprint).

Rizvi S.A.A., A History of Sufism in India, Vol. I, Munshiram Manoharlal, New Delhi, 1978.

Chandra, Satish, A History of Medieval India (Part II)

Chandra, Satish, Historiography, Religion and State in Medieval India

Chandra, Satish, Mughal Religious Policies, the Rajputs and the Deccan.

Habib Irfan(ed.), Medieval India

Hasan S.Nurul, Religion, State, and Society in Medieval India

Mukhia Harbans, The Mughals of India.

Raychoudhuri T.K. & Habib I. (eds.)-The Cambridge Economic History of India Vol. I Cambridge University Press, Cambridge, 1982, 1987 (reprint).

Richards J.F.,The Mughal Empire

Rizvi S.A.A., The Wonder that was India (vol.2)

Tripathi R.P., Some Aspects of Muslim Administration

Ashraf K.M, Life and Conditions of the People of Hindusthan (1250 – 1550), Gyan Publishing House, 2000.

Eaton, R.M, The Rise of Islam and the Bengal Frontier (1204- 1760), University of California Press, July 1996.

Habib, Irfan, Medieval India: The Study of a Civilization, National Book Trust, July 2008.

Karashima, Noboru, Towards a New Formation: South Indian Society under Vijayanagara , Oxford University Press, 1992.

Kumar Sunil, The Emergence of the Sultanate of Delhi, Permanent Black, Delhi, First edition, 2010.

Stein, Burton, Peasant State and Society in Medieval South India, Oxford University Press, Oxford, February 1995.

Sherwani, H.K., Joshi, P.M. (eds), The History of Medieval Deccan (1295 - 1724), Government of Andhra Pradesh, Hyderabad, 1973-74.

Tripathi, R.P; Some Aspects of Muslim Administration, The Indian Press Ltd., 1936. Wink,

DSE Discipline Specific Elective (Any Two):

DSE –A -1: History of the Mongols and Timurids

UNIT I: Rise of Mongols

a) Chengiz Khan
b) School of Chengiz Khan
c) Later Mongols
d) Importance of Kublai Khan.

UNIT II: Military Organization of Mongols

a) Chengiz Khan
b) Later Mongols
c) Kublai Khan.

UNIT III: Rise of Timur

a) Timur and his expansion
b) School of Timur.

UNIT IV: Medieval Central Asian Culture

a) Architecture
b) Painting
c) Growth of Science
d) Society and Language.

Essential Reading

a. Barthold, V. V. (1968). *Turkestan Down to the Mongol Invasion.* London.
b. Dani, A. H. (1992). *UNESCO History of Civilizations of Central Asia.* Paris.

c. Hildinger, E. (2001). *Warriors of the Steppe: A Military History of Central Asia, 500 BC. to 1700 AD.* Cambridge: Da Capo.

d. Timothy, M. (2008). *The Mongol Empire in World History.* University of Illinois.

e. Ward, S. (2009). *Immortal: A Military History of Iran and Its Armed Forces.* George Town University Press.

f. Burgan, Michael (2005). *Empire of the Mongols*. New York: Infobase Publishing
g. Finlay, Robert (2010). *The Pilgrim Art: Cultures of Porcelain In World History*. Berkeley: University of California Press.
h. Howorth, Henry H. (1965). *History of the Mongols from the 9th to 19th Century: Part: The Mongols Proper and the kalmuks*. New York: Burt Frankin.
i. Jackson, Peter. (2003). *The Mongols and the West: 1221-1410*. New York: Longman.
j. Man, John. (2004). *Genghis Khan: Life, Death and Resurrection*. New York: Thomas Dunne.
k. Brent, Peter. (1976). *The Mongol Empire: Genghis Khan: His Triumph and his Legacy*, London: Book Club Associates.
l. Subtelny, Maria. (2007). *Timurids in Tradition: Turko Persian Politics and Acculturation in Medieval Iran,* Brill.
m. Beatrice, Forbes Manz. (1999). *The Rise and rule of Tamerlane,* Cambridge: Cambridge University press.
n. Ismail, Aka. (1996). "*The Agricultural and Commercial Activities of the Timurids in the First half of the 15th Century*" in Jstor

Suggested Readings

a. Roxburgh, David J. (2005). *The Persian Album, 1400-1600: From the Dispersal to Collection*, Yale University Press.
b. May, Timothy. (2007). *The Mongol Art of War*, Yardley: Westholme Publishing.
c. Rossabi, Morris. (2012). *The Mongols: A Very Short Introduction*, Oxford: Oxford University Press.

DSE- A -2: History of Medieval Europe

I. Breakup of the Roman Empire- Historiography.

II. Political Structures in Medieval Europe:

a) Rise of the Frankish House.
b) Charles the Great: Coronation and its Significance, Administration and Dissolution of Charlemagne's Empire.
c) The Partition of Verdun and its Significance.
d) The Empire and its Revival.
e) The House of the Hohenstaufen's.

III. Agrarian Structure, Social Change and Economy:

a) Feudalism: Growth, Features and Decline.
b) Manorialism, the Institution of Chivalry and the role of Feudal Knights, Women in Medieval Europe.
c) Europe at the end of the 9^{th} Century- An economic Survey, Trade and Commerce and its Revival, Hanseatic League and the Guild System.
d) The Urban Revolution: Growth and Contribution of Towns, Merchants and Fairs: Effect on Society.

IV. Religion and State:

a) Development of the Church organization: Growth of Papacy, Monasticism and its Contribution, Role of the Friars.
b) Medieval Reformation: Reforms of Cluny and its Impact.
c) Struggle between the Church and the State: Investiture Contest and the Triumph of the Church.
d) Albegensians and Waldensians: Role and Significance.

e) Western Europe encroaches on Islam: The Crusades.

V. Changing Political Formations:

a) France under Capetian Kings (987-1328)

b) Development of English State (1272-1485)

c) The Norsemen or Vikings.

d) The Lombards and the Lombard League.

e) Rise of the Ottoman Turks: Fall of Constantinople, completion of the conquest of Balkan.

VI. Art, Architecture and Culture:

a) The Carolingian and the 12^{th} Century Renaissances- Impact on Philosophy, Science, Education, Literature, Art and Music.

b) Forms and Style of Architecture- Merovingian, Carolingian, Romanesque and Gothic.

c) Beginning of Sculpture and Painting.

d) Medieval Universities- Origin, Growth and Impact on Medieval European Life.

Essential Reading-

1. Adams, George Burton, Civilisation during the Middle Ages.

2. Bloch, Marc, Feudal Society (2 Vols).

3. Brundage (ed.), The Crusades.

4. Bryce, James, The Holy Roman Empire.

5. Deansley, Margaret, A History of the Medieval Church 590-1500 A.D, Routledge, Abingdon, 1969.

6. Dobb, Maurice Dobb, Studies in the Development of Capitalism,

7. Goff, Le, Medieval Civilizations (400-1500).

8. Hallam, Henry, History of Europe during the Middle Ages, New York, 1900.

9. Heer, Friedrich, The Medieval World 1100-1350.

10. Orton, Previte, Outlines of Medieval History, Cambridge University Press, Cambridge, 1916.
11. Pirenne, Henri, Medieval Cities, University of Michigan, 1957.
12. Stuard, Susan Mosher (Ed.), Women in Medieval History and Historiography.
13. Thompson and Johnson, An Introduction to Medieval Europe 300-1500, New York, 1937.
14. Tout, Thomas Frederick, The Empire and the Papacy 918-1273, London, 1909.

Suggested Readings-

1. Barraclough, Geoffrey, The Origins of Modern Germany.
2. Bemont and Monod, Medieval Europe 395-1270.
3. Masterman, Howard, The Dawn of Medieval Europe.
4. Oman, Charles, Dark Ages 476-918.
5. Orton, Previte, The Shorter Cambridge Medieval History (Vol. I& II)
6. Smith, Leslie and Leyser, Conrad; Motherhood: Women and Society in Medieval Europe (400-1400).
7. Southern, Richard William, The Making of the Middle Ages.
8. Stephenson, Carl, Mediaeval History.
9. Thatcher, Oliver, A Source Book for Medieval History.
10. Thatcher and Schwill, Europe in the Middle Age.

DSE- B-1: HISTORY OF MEDIEVAL ART AND ARCHITECTURE

UNIT I: Introduction to Indo-Islamic Architecture

UNIT II: Imperial Style of Architecture: Delhi.

a) Architecture of Mameluk and Khalji Dynasty
b) Architecture of the Tughluqs
c) Architecture of the Sayyids and the Lodis.

UNIT III: Mughal Architecture.

a) Foundation of Mughal Imperial Style.
b) Development Of Architecture Under Akbar
c) Culmination Under Shah Jahan
d) Development of Sub-Imperial Schools.

UNIT III- Pre-Mughal Painting

a) Western Indian Painting School
b) Sultanate Painting

Unit IV- Mughal Painting

a) Foundation of Mughal Painting- Babur and humayun.
b) Akbar
c) Jahangir
d) Shah Jahan and Later Schools.

Essential reading:

1. Asher, Catherine. B. The *New Cambridge History of India I:4: Architecture of Mughal India*. Cambridge University Press, Cambridge 1992
2. Brown Percy, 'Monuments of Mughal Period', in *Cambridge History of India, Cambridge*, 1937
3. Brown, Percy. *Indian Architecture, Islamic Period*.5th ed. D.B. Taraporevala, Mumbai, 1968
4. Burton-Page, John, *Indian Islamic Architecture: Forms and Typologies, Sites and Monuments*, BRILL, Leiden and Boston, 2008
5. Desai, Z.A., *Indo Islamic Architecture*, Publications Division Ministry of Information & Broadcasting, New Delhi, 1970
6. Juneja, M, ed. *Architecture in Medieval India: Forms, Context, Histories,* Permanent Black , Delhi, 2001
7. Koch Ebba*, Mughal Architecture: An Outline if its History and Development*, Oxford University Press, London, 2002
8. Merklinger, Elizabeth Schotten, *Sultanate Architecture of Pre-Mughal*, Munshiram Manoharlal, New Delhi, 2005
9. Nath R, *History of Sultanate Architecture*, Abhinav Publications, New Delhi1978
10. Nath R., *History of Mughal Architecture*, Abhinav Publication, New Delhi, 1994
11. Brown, Percy, (1924), *Indian Painting Under the Mughals.*
12. Beach, Milo Cleveland, (1992), *Mughal and Rajput Painting*
13. Losty, Jeremiah P., (1982), *The art of the book in India*
14. Das, Asok Kumar, (1986), *Splendour of Mughal Painting*
15. Welch, Stuart Cary, (1977), *Imperial Mughal Painting*
16. Welch, Stuart Cary, (1985), *India: Art and Culture 1300-1900*
17. Skelton, Robert, (1982), *The Indian Heritage: Court Life and Arts Under Mughal Rule*

Suggested Reading:

1. Blair, S.S. and J.M. Bloom, *The Art and Architecture of India 1250-1800*, New Heaven and London, London, 1994
2. Degeorge, Yves Porter Gerard, *The Glory of the Sultans : Islamic Architecture in India*, THAMES & HUDSON, London , 2009
3. Jairazbhoy, R.A., *An Outline of Islamic Architecture*, Oxford University Press London, 1961
4. Michell George and Amit Pasricha, *Mughal Architecture & Gardens*, Antique Collectors' Club, New York, 2011
5. Nath, R. and Ajay Nath, The Taj Mahal: History and Architecture, Heritage, New Delhi, 2010

DSE-B-2: History of Medieval Bengal : Sultanate Period and Mughal Period

Unit 1: Bengal Before Muslim Conquest

a) Political Condition in pre-Islamic Bengal
b) Socio-economic and cultural history

Unit 2: Muslim Conquest in Bengal – Period of the Delhi Governors (1205- 1338 AD)

a) The Khaljis
b) The Turks
c) The Balbans and Tughlaqs
d) Expansion of the territory

Unit 3: Consolidation of Sultanate: Period of Independent Sultans (1338-1576 AD)

a. Independent kingdom in Sonargaon and Ilyas Shahi Period
b. Raja Ganesh and his dynasty
c. Restored Ilyas Shahi Rule and Habshi Interregnum
d. Hussain Shahi Dynasty

Unit 4: Administration and Economy

a. Administrative System during Independent Sultans of Bengal
b. Agricultural Economy and Revenue System
c. Trade and Industry
d. Urbanisation and Riverine changes

Unit 5: Society and Religion

a. Social Structure and Cultural Interaction - Hindu Muslim relation
b. Sufism in Bengal

Unit 6: Bengal under Mughals

a) Mughal Invasion in Bengal and rule of Subehdars

Unit 7: Bengal Under the Nawabs (1723 to 1765 AD)

a) Murshid Quli Khan

b) Alivardi Khan

c)Sirajuddaula and Battle of Plassey

Essential Readings:

Ali, M. M. (1985). *History of the Muslims in Bengal, 1st ed.* Riyadh. Two volumes

Chowdhury, A. M. (1967). *Dynastic History of Bengal.* Dacca: Asiatic Society of Pakistan.

Haque, E. (1975). *A History of Sufism in Bengal.* Dacca: Asiatic Society of Pakistan.

Karim, A. (1960). *Corpus of the Muslim Coins of Bengal.* Dacca: Asiatic Society of Pakistan.

(1992) *Corpus of Arabic and Persian Inscriptions of Bengal, Dhaka.*

Karim, A. (1959). *Social History of Muslims in Bengal (Down to 1538).* Dacca: Asiatic Society of Pakistan.

Majumder, R. C. (1948). *History of Bengal, Vol. 1.* Dacca.

ahim, A. M. (1967). *Social and Cultural History of Bengal.* Vol. 1, 1201 - 1576. Karachi

_____ (1961), *History of the Afghans in India, A.D. 1545 - 1631,* Karachi.

Sarkar, J. N. Ed. (1948). *The History of Bengal, Vol. 2.* Dacca: University of Dacca.

Suggested Readings:

Ahmed, Samsuddin (ed.) (1960): *Inscriptions of Bengal, Vol. IV*, Rajshahi, V.R.M.

Morrison, B. M. (1970): *Political Centres and Cultural Regions in Early Bengal*, Tucson

Nath, R. (1978): *History of Sultanate Architecture*, New Delhi

Sarkar, Jagadish Narayan (1972): *Islam in Bengal (13th to 19th Century)*, Calcutta

Stewart, Charles (1971): *History of Bengal: From the First Muhammadan Invasion until the Virtual Conquest of Bengal by the English in 1857*, Delhi

Sur, A. K. (1963): *History of Culture of Bengal*, Calcutta

Tarafdar, M. R. (1965): *Hussain Shahi Bengal*, Dacca, Asiatic Society of Pakistan

Dani, A. H. (1961), *Muslim Architecture in Bengal,* Dacca.

Hasan, Syed Mahmudul (1979), *Mosque Architecture of Pre-Mughal Bengal,* Dhaka.

Suggested Reading:

Blochmann, H (1927), *Ain-i-Akbari,* Vol. I (tr.)*,* Calcutta.

Raychaudhuri, Tapan (1953), *Bengal Under Akbar and Jahangir,* Munshiram Manoharlal, Delhi.

Rashid, Md. Harun-or ( ), *Bengal Under The Mughals 1576 -1855,*

Sarkar, Jadunath Sir (Ed.) (1948), *History of Bengal,* Vol. II, University of Dacca, Dacca.

Moreland, W.H. (1923) *From Akbar to Aurangzebe,* London.

Bhattacharyya, S.N. (1929), *Mughal North-East Frontier Policy,* Calcutta.

Campos, J. J. A. (1919), *History of Portuguese in Bengal,* Calcutta.

Chatterjee, Anjali (1967), *Bengal in the Reign of Aurangzeb, 1658-1707,* Calcutta.

Chaudhury, Sushil (1975), *Trade and Commercial Organization in Bengal, 1650 – 1720,* Calcutta.

Chowdury, Abdul Momin (1967), *Dynastic History of Bengal, c.750-1200 A.D.* Dacca.

Habib, Irfan (1963), *Agrarian System of Mughal India,* London.

Hasan, Syed Mahmudul (1980), *Muslim Monuments of Bangladesh,* 2nd ed. Dacca.

Karim, Abdul (1964), *Dacca the Mughal Capital,* Dacca.

_____ (1985), *Social History of the Muslims in Bengal,* Dhaka.

_____ (1963), *Murshid Quli Khan and his Times,* Dhaka.

Sarkar, Jagadish Narayan (1985), *Hindu-Muslim Relations in Bengal (Medieval Period),* Delhi.

Majumder R.C. (1963) (Ed.) *History of Bengal,* 2nd Ed. Dacca.

Dutta, Kali Kinkar (1936), *Studies in the History of the Bengal Subah, 1740-1770*¸ Calcutta.

_____(1939), *Alivardi and His Times,* Calcutta.

_____ (1948), *The Dutch in Bengal and Bihar, 1740 – 1825,* Patna.

Sinha, N. K. (1956), *Economic History of Bengal from Plassey to Permanent Settlement,* Vol.1, Calcutta.

Chaudhuri, Sushil (2000), *The Prelude to Empire, Plassey Revolution of 1757,* Delhi.

করিম, আব্দুল, ১৯৮৭. বাংলার ইতিহাসঃ সুলতানি আমল, ঢাকাঃ বাংলা একাডেমী।

বন্দ্যোপাধ্যায়, রাখালদাস, ১৯৮৭. বাংলার ইতিহাস, কলিকাতা।

মুখোপাধ্যায়, সুখময়, ১৯৬২. বাংলার ইতিহাসের দুশো বছরঃ স্বাধীন সুলতানদের আমল (১৩৩৮-১৫৩৮), কলিকাতা।

মণ্ডল, সুশীলা, ১৯৬৩. বঙ্গদেশের ইতিহাসঃ মধ্যযুগ, প্রথম পর্ব, কলকাতা।

রায়, নীহাররঞ্জন, ১৩৬৬ বঙ্গাব্দ. বাঙ্গলার ইতিহাস (আদিপর্ব), কলকাতা।

রায়, অনিরুদ্ধ, ১৯৯৯. মধ্যযুগে ভারতীয় শহর, কলিকাতা।

লস্কর, আসিফ জামাল, ২০১৪. সুলতানি যুগে বাংলার নগরায়ন, কলকাতা।

Skill Enhancement Elective Course (SEC) Credits,-2

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SEC-A- 1: Historical Tourism: Theory &Practice

I. Defining Heritage
Art &Architecture in India: An overview:
Field Work: Visit to historical sites &Museums
II. Understanding Built Heritage:
Stupa Architecture
Temple Architecture
Indo Persian Architecture, Forts, Palaces, Mosques
Colonial Architecture
Present day structures
III. Field Work: Visit to site &Conducting of research
IV. Modalities of conducting tourism

References:
Sunil Kumar, The Present in Delhi's Past, Delhi, Gyan Publishing House, 2002
Peter Howard, Heritage: Management, Interpretation, Identity, and London, 2003
V.S Agarwal, Indian Art, Varanasi, Prithvi Prakasahan, 1972
Percy Brown, Indian Architecture, Bombay, D.B.Taraporevala Sons &Co, 1940
James Harle, The Art & Architecture of the Indian Subcontinent, Hormonds worth, Penguin, 1988
S.K.Bhowmik, Heritage Management: Care, Understanding & Appreciation of Cultural Heritage, Jaipur, 2004.

SEC-B -1: Museums &Archives in India

I. Definitions

II. History of setting up of Museums and Archives: Some case
Studies

III. Field Work; Studying of structures & Functions

IV. Training & Employment

References:
G. Edson & Dean David, Handbook for Museum, London, Routledge,1986
John Ridener, From Folders to Post Modernism: A Concise History of Archival Theory, 2009
Roychowdhury, Madhuparna. Displaying India's Heritage : Archaelogy and the Museum Movement in Colonial India. Delhi: Orient Blackswan 2015
Sengupta, S. Experiencing History Through Archives. Delhi: Munshiram Manoharlal.2004.

SEC-A -2: Indian History &Culture

I. Environment; Culture, Tradition &Practices:
-Historical overview
-Oral &codified information on medicinal Plants
-Water & Water Bodies
-Fieldwork
II. Urbanization &Urbanism:
-Issues of settlements & Landscapes
-Social differentiations
-Communication networks
III. Social inequality &Gender:
-Status within Households: An overview
-Present context
-Issues of Violence
-Employment, distribution of resources
IV.Cultural Heritage:
-Main components
-Built Heritage
-Historical Tourism
V. Cultural Forms &Cultural Expressions:
- Performing Arts
-Fairs &Festivals
-Fieldwork
References:
Indu Banga, ed. The City in Indian History: Urban Demography, Society & Polity, Delhi, Manohar,,1991
Koch, E. Mughal Art & Imperial Ideology, New Delhi ; New York : Oxford University Press, 2001.
Radha Kumar, History of Doing: An Illustrated Account of Movements for Women's Rights &Feminism in India 1880-1990, Zubaan, 2007
V.Vasudev, Fairs &Festivals, Incredible India Series, 2007
V.Singh, The Human Footprint on Environment: Issues in India,New Delhi, and Macmillan, 2012
B. Parikh, Composite Culture in a multicultural Society, Delhi, NBT,2007
N. Mehta, Introduction: Satellite Television, Identity &Globalization in Contemporary India in N.Mehta, ED, Television in India, New York, Routledge, 2008

SEC-B- 2: Orality and Oral Culture in India

I. Defining orality

II. History &Historiography of Orality

III. Life Histories: Sociological Aspects

IV. Research Methodologies

V. Documentation: Written &Visual

References:

H. Roberts. Ed. Doing Feminist Research, London: Routledge &Kegan Paul, 1981
John Miles Foley, Oral Formulaic-Theory: An Introduction &Annotated Bibliography, New York & London: Garland, 1985
M.F.D. Knowledge & Control, London,1971

Prasad M. Mahadeva, Ideology of the Hindi Film: A Historical Construction. Delhi: OUP, 1998
Srirupa Roy,' The Post Colonial State &Visual Representations of India" Contributions to Indian Sociology, 2006, 36,1&2:233-263

Stephen Humphries: The Handbook of Oral History: recording life stories. University of Michigan : Inter-Action Inprint, 1984.

Veena Das, ed, Mirrors of Violence: Communities, Riots & Survivors in South Asia, Delhi,OUP,1990

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

UNIVERSITY OF CALCUTTA

DEPARTMENT OF PERSIAN

Choice Based Credit System (CBCS)

UNDERGRADUATE PROGRAMME

(Courses effective from Academic Year 2018-19)

Syllabus for B.A. Honours in Persian

SYLLABUS OF COURSES TO BE OFFERED

Core Courses, Elective Courses & Ability Enhancement Courses

❖ Preamble

The University Grants Commission (UGC) has initiated several measures to bring equity, efficiency and excellence in the Higher Education System of country. The important measures taken to enhance academic standards and quality in higher education include innovation and improvements in curriculum, teaching-learning process, examination and evaluation systems, besides governance and other matters.

The UGC has formulated various regulations and guidelines from time to time to improve the higher education system and maintain minimum standards and quality across the Higher Educational Institutions (HEIs) in India. The academic reforms recommended by the UGC in the recent past have led to overall improvement in the higher education system. However, due to lot of diversity in the system of higher education, there are multiple approaches followed by universities towards examination, evaluation and grading system. While the HEIs must have the flexibility and freedom in designing the examination and evaluation methods that best fits the curriculum, syllabi and teaching–learning methods, there is a need to devise a sensible system for awarding the grades based on the performance of students. Presently the performance of the students is reported using the conventional system of marks secured in the examinations or grades or both. The conversion from marks to letter grades and the letter grades used vary widely across the HEIs in the country. This creates difficulty for the academia and the employers to understand and infer the performance of the students graduating from different universities and colleges based on grades.

The grading system is considered to be better than the conventional marks system and hence it has been followed in the top institutions in India and abroad. So it is desirable to introduce uniform grading system. This will facilitate student mobility across institutions within and across countries and also enable potential employers to assess the performance of students. To bring in the desired uniformity, in grading system and method for computing the cumulative grade point average (CGPA) based on the performance of students in the examinations, the UGC has formulated these guidelines.

❖ Choice Based Credit System (CBCS):

The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill based courses. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. Therefore, it is necessary to introduce uniform grading system in the entire higher education in India. This will benefit the students to move across institutions within India to begin with and across countries. The uniform grading system will also enable potential employers in assessing the performance of the candidates. In order to bring uniformity in evaluation system and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations, the UGC has formulated the guidelines to be followed.

❖ Outline of Choice Based Credit System:

1. **Core Course:** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.

2. **Elective Course:** Generally a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course.

   2.1 Discipline Specific Elective (DSE) Course: Elective courses may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective. The University/Institute may also offer discipline related Elective courses of interdisciplinary nature (to be offered by main discipline/subject of study).

   2.2 Dissertation/Project: An elective course designed to acquire special/advanced knowledge, such as supplement study/support study to a project work, and a candidate studies such a course on his own with an advisory support by a teacher/faculty member is called dissertation/project.

   2.3 Generic Elective (GE) Course: An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is called a Generic Elective.

   P.S.: A core course offered in a discipline/subject may be treated as an elective by other discipline/subject and vice versa and such electives may also be referred to as Generic Elective.

3. Ability Enhancement Courses (AEC)/Competency Improvement Courses/Skill Development Courses/Foundation Course: The Ability Enhancement (AE) Courses may be of two kinds: AE Compulsory Course (AECC) and AE Elective Course (AEEC). "AECC" courses are the courses based upon the content that leads to Knowledge enhancement. They (i) Environmental Science, (ii) English/MIL Communication) are mandatory for all disciplines. AEEC courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc.

3.1 AE Compulsory Course (AECC): Environmental Science, English Communication/MIL Communication.

3.2 AE Elective Course (AEEC): These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based instruct

Project work/Dissertation is considered as a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A Project/Dissertation work would be of 6 credits. A Project/Dissertation work.

❖ Common Course Structure for B.A/B.Sc. (Honours and General)

Course Component	B.Sc		B.A.	
	Honours	General	Honours	General
Core Course (CC)	14	12*	14	8**
Language Core Course (LCC)	0	0	0	4 (2English courses+ 2MIL courses)
Generic Elective (GE) (From two inter disciplinary subjects)	4**	0	4**	2
Discipline Specific Elective (DSE)	4	6*	4	4**
Ability Enhancemant Compulsory Course (AECC)	2	2	2	2
Skill Enhancement Elective Course (SEC)	2	4*	2	4
Total Number of Courses	26	24	26	24

***covering three subjects.

**covering two subjects.

❖ Credit Structure for B.A./B.Sc. (Honours) Coureses:

Course Type	Number of courses (Having practical)		Number of courses (Having Tutorial)		Number of Credits (Having practical)		Number of Credits (Having Tutorial)	
	Theory	Practical	Theory	Tutorial	Theory	Practical	Theory	Tutorial
Core Course (CC)	14 x 4	14 x 2	14 x 5	14 x 1	56	28	70	14
Elective Courses:								
i) Generic Elective (GE)	4 x 4	4 x 2	4 x 5	4 x 1	16	8	20	4
ii)discipline Specific Elective (DSE)	4 x 4	4 x 2	4 x 5	4 x 1	16	8	20	4
Ability Enhancement Compulsory Course (AECC)	2 x 2	0	2 x 2	0	4	0	4	0
Skill Enhancement Elective (SEC)	2 x 2	0	2 x 2	0	4	0	4	0
Total	26	22	26	22	96	44	118	22

Total Courses=48 (26Th+22P/TU) **Total Credits**=140(96Th+44P)/(118Th+22TU)

Semester wise Courses for B.Sc./B.A. (Honours):

	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6
Core Course (CC)	2Th+2P/TU	2Th+2P/TU	3Th+3P/TU	3Th+3P/TU	2Th+2P/TU	2Th+2P/TU
Elective Courses:						
i)Generic Elective (GE)	1Th+1P/TU	1Th+1P/TU	1Th+1P/TU	1Th+1P/TU		
ii) discipline Specific Elective (DSE)					2Th+2P/TU DSE-A(1) B(1)	2Th+2P/TU DSE-A(2) B(2)
Ability Enhancement Compulsory Course (AECC)	1Th+0P/TU AECC-1	1Th+0P/TU AECC-2				
Skill Enhancement Elective (SEC)			1Th+0P/TU SEC-A(1)	1Th+0P/TU SEC-B(2)		
Total No. of Courses and Marks	4x100 =400	4x100 =400	5x100 =500	5x100 =500	4x100 =400	4x100 =400
Total Credits	20	20	26	26	24	24

Th=Theory P=Practical TU=Tutorial

For Core Courses – Each Theory and Practical Course have 4 and 2 Credits respectively/ Each Theory and Tutorial Course have 5 and 1 Credits respectively.

For Elective Courses –Each Theory and Practical Course have 4and 2 Credits Respectively/ Each Theory and Tutorial Course have 5 and 1 Credits respectively

For Ability/ Skill Enhancement Courses- Each Course has 2 Credits

Details Semester wise Courses for B.A. Honours in Persian:

❖ B. A. Honours in Persian:

➢ Semester: I

Course Code	Course Title	Course wise Class	Credit
PRNH-CC- I	History of Persian Literature: Pre Islamic Period (from 525 BCE to 651 A.D) And Post Islamic Period (from 652-1186 A.D) Grammer and Translation	Core (60Th+15TU)	6 (5Th+1TU)
PRNH-CC – 2	Persian Prose (Modern)	Core (60Th+15T)	6 (5Th+1TU)
GE- 1	From Interdisciplinary subject (Other than Persian)	Core (60Th+15TU)	6 (5Th+1TU)
AECC-I	Communicative English /MIL	AECC	2 (2Th)
Total	4 Courses	Total	20

➢ Semester: II

Course Code	**Course Title**	**Course wise Class**	**Credit**
PRNH-CC- 3	History of Persian Literature:- (Classical) Saljuque , Mongol. Ilkhanid &Timurid Grammar and translation	Core (60 Th +15TU)	6 (5 Th +1TU)
PRNH-CC- 4	Persian Poetry: (Classical and Modern)	Core (60 Th +15TU)	6 (5 Th +1TU)
GE- 2	**From Interdisciplinary subject (Other than Persian)**	GE (60 Th +15TU)	6 (5 Th +1TU)
AECC-2	**Environmental Studies**	AECC	2 (2 Th)
Total	**4 Courses**	**Total**	**20**

➢ Semester: III

Course Code	Course Title	Course Wise Class	Credit
PRNH-CC- 5	**History of Poetry : (from beginning to Safavid dynasty)**	Core (60 Th +15TU)	6 (5 Th +1TU)
PRNH-CC-6	**History of Persian literature in India during Delhi Sultans Grammar and Translation**:	Core (60 Th +15TU)	6 (5 Th +1TU)
PRNH-CC- 7	**History of Persian literature during Mughal Period.(Prose & Poetry)**	Core (60 Th +15T)	6 (5 Th +1TU)
PRNH –GE-3	**From Interdisciplinary subject (Other than Persian**)	GE (60 Th +15TU)	6 (5 Th +1TU)
PRNH-SEC-(A)1	**Translation and Composition**	SEC-(2 Th)	2 (2 Th)
Total	**5 Courses**	Total	26

➢ Semester: IV

Course Code	Course Title	Course wise Class	Credit
PRNH-CC- 8	**Modern Persian Poetry :**	Core (60 Th +15TU)	6 (5 Th +1TU)
PRNH-CC-9	Modern Persian Prose:	Core (60 Th +15T)	6 (5 Th +1TU)
PRNH-CC-10	Development of **Modern Persian (Short story, Novel, and** Drama **writings)** **Grammer and Composition**	Core (60 Th +15T)	6 (5 Th +1TU)
GE-4	**From Interdisciplinary subject (Other than Persian**)	GE (60 Th +15TU)	6 (5L+1TU)
PRNH-SEC-B(2)	**Translation, Interpretation (from English – Persian News papers & Communicative Skill)**	SEC-(2 Th)	2 (2TU)
Total	**5 Courses**	**Total**	**26**

➢ Semester: V

Course Code	Course Title	Course Wise Class	Credit
PRNH-CC-11	**Mystical Persian Literature**	Core (60 Th +15TU)	6 (5 Th +1TU)
PRNH-CC-12	**Ethical Persian Literature**	Core (60 Th +15TU)	6 (5 Th +1TU)
PRNH-DSE-A(1)	Rhetoric and Prosody	DSE (60 Th +15TU)	6 (5 Th +1TU)
PRNH-DSE-B(1)	Root, Parsing and Analysis		6 (5 Th +1TU)
Total	**4 Courses**	**Total**	**24**

➢ Semester: VI

Course Code	Course Title	Course Wise Class	Credit
PRNH-CC-13	Persian Literature in Bengal. (Prose)	Core (60Th+15TU)	6 (5Th+1TU)
PRNHCC-14	Persian Literature in Bengal (Poetry)	Core (60 Th +15T)	6 (5 Th +1TU)
PRNH-DSE-A(2)	History of Modern Persian World.	DSE (60 Th +15TU)	6 (5 Th +1TU)
PRNH-DSE-B (2)	Persian Linguistics		6 (5 Th +1TU)
Total	4 Courses		**24**
Total (Semesters)	26 Courses		**140**

B.A. (Honours) Persian

Semester – I

❖ PRNH-CC - I: History of Persian Literature:-

- (Pre Islamic Period from 525 BCE to 651 A.D)
  Avesta, Old Persian (rock inscription/ cuneiform) and Pahlavi or Middle Persian.
  and
- (Post Islamic Period from 652 to 1186 A.D) with special reference to Rudaki, Rabia, Daqiqi and Firdausi, Sheikh Abu Ali Ibn-e-Siena and Abu Rehan Mohammad bin Ahmad Al-Beruni.

- Grammer and Translation

(a) Grammer:
Persian Alphabets, vowel, Compound word, Infinitive & verb, Noun, Pronoun, Adjective, Possessive case, opposite, opposite numbers.
make Sentences, Correct the Sentence, words meaning, , Ism maarfa, Ism e nakra Zamana: Mazi and its kinds.

(b) Translation : Translation from Prescribed Text (Persian to English and vice versa.)

❖ PRNH-CC-2: Persian Prose (Modern)

سفرِ اول سند باد
ماجرای کبوتران
بہترین ارمغان
ابو علی سینا
ز گہوارہ تا گور
خوش مزگیها (دزدِ ہوشیار، دوستِ نادان ، شاعرِ مہمل گوی و جامی ، حقیقت گویی)

❖ AECC-1: Communicative English /MIL

Semester – II

❖ **PRNH-CC – 3: History of Persian Literature.(Classical)**
(Saljuuque , Mongol. Ilkhanid &Timurid**)**

(a) Prose:

- **Marzaban Nama (داستانِ هنبوی و ضحاک)**
- **Baharistan (1, 2, 3, and 5)**
- **Kimya-e-Saadat (only one Hikayat)**

(b) Poetry:

- Nizami Ganjavi (حِمدِ باری تعالیٰ)
- Mulana Abdur Rahman Jami (نعتِ مصطفیٰ)
- Hafiz (غزل – 1، 2، 8)
- Sheikh Saadi (1and 2 -غزل)
- Qitat-e- Ibn –e-yamin (1 , 3 and 5)

▪ **Grammar and Translation:-**

(a) Grammer:

Aorist, identify the tenses, correct the Sentence, words meaning, Zamana: Mazi, Haal, Mustaqbil Fel-e-Maaruf and Majhul, Kinds of Sentence.

(b) Translation : Translation from Prescribed Text (Persian to English and vice versa.)

❖ PRNH-CC- 4 : Persian Poetry (Classical and Modern):-

- **کرمِ کتابی ، محاورہ بینِ خدا و انسان (اقبال)**
- **چشمہ و سنگ (ملک الشعرا بہار)**
- **روباہ و زاغ (حبیب یغمایی)**
- **اشکِ یتیم (پروین اعتصامی)**

❖ GE-2: From Inter disciplinary subject (Other than Persian)

❖ AECC-2: Environmental studies.

Semester : III

❖ **PRNH-CC-5 : History of Poetry (from beginning to Safavid dynasty)**

- **Origion growth and development of**

1. **Qasida (Panegyric-قصیدہ)**
2. **Ghazal (Ode غزل)**
3. **Qita (قطعہ)**
4. **Masnavi (مثنوی)**
5. **Rubai (Quatrain رباعی)**
6. **Epic Poetry (شعرِ حماسی)**
7. **Ethical Poetry (شعرِ اخلاقی)**
8. **Mystical Poetry (شعرِ عرفانی)**

❖ PRNH-CC-6 : History of Persian literature in India during Delhi Sultans:-

Total Classes-60:[History of Persian Literature -30, Grammar + Translation -30]

- (a)Prose :
  Tabaqat-e-Nasiri (السلطان رضیۃ الدنیا و الدین ببنت السلطان)
- (b) Poetry :
  Ghazals of Amir Khusraw (1, 2 , 3 and 5)

- Grammar and Translation
  Grammer:
  Mouzaf-o-Mouzaf Alaih, Mousouf-o-Sifat, Mutaradif, Mutazad, Mufrad –Jama, Sifat-e-Nisbati,Kind of Sifat. Hurouf-o-Izafa, Shenasha.

- Translation: Translation from Prescribed Text (Persian to English and vice versa.)

❖ **PRNH-CC- 7 : History of Persian literature in India during Mughal Period:-**

- (a) Prose:
  1. Humayun Nama (**تولیدِ ھما یون)** by Gulbadan Begum.
  2. Muntakhab-ut-tawarikh (**شیخ سلیم چشتی**) Abdul Qadir Badayuni.
  3. Panj Aahung (**نامہ ای کہ از کلکتہ بہ نام میرزا علی خان بہادر رقم شد)** by Mirza Ghalib.

- (b) Poetry:
  1. Ghazliyat-e-Naziri (Ghazal -1 and 2)
  2. Qasaida –e- Urfi (**وصفِ کشمیردر**)
  3. Rubaya-t-Sarmad (1, 2, 3, 6 and 10)

❖ SEC-A (1): Translation and Composition (based on the following Grammar):-

(a) Number, Nominative Pronoun, Possessive Pronoun, Possessive case, Classification of Adjective, Infinitive, Tense, Past Indefinite, Past continuous, Present Perfect, Past Perfect, Dubious Past. Aorist, Present tense, Future tense , Preposition, conjunction.

(b) Unseen Passage for translation (with hints)
Unseen Passage for translation (without hints)

❖ PRNH-CC-8: Modern Persian Poetry:-

آ زا دی و استقلا ل از ابو القاسم لا هوتی
حا لا چرا از شهر یا ر
قلبِ مجروح از پروین اعتصامی
جا مہ مقتول ا ز نیما یو شج
نو روزِ آ وارگان از خلیل اللہ خلیلی
نا گفتہ از نادر نادر پور
حا صلِ جمع قطرہ ها از قیصر امین پور

❖ PRNH-CC-9: Modern Persian Prose:-

یحی از صادق چوبک
د و گدا از محمد حجازی
دا وٗد گوز پشت از صادق هدایت
د و گر بہ روی دیوار از صمد بهر نگی
دیکتہ (نمایشنامہ) از گوهر مراد

❖ PRNH-CC-10: Development of Modern Persian :-
(**Short story , Novel, and Drama writings**)

- Grammer and Composition :

(a) Grammer:
Verbal Noun, Adverb, Sentence, Suffixes of Noun, Suffixes of Adjective and Prefixes, Synonyms, Antonyms

(b) Composition:
(Short Essay Writings On)
اسپ ۔ کالج ۔ شیر ۔ شہرِ کولکاتا ۔ دانشگاہ کولکاتا ۔ موزہ ملی ۔ جا مع مسجد دهلی ۔ گاو ۔ تالارِ ویکتوریہ ، تاج محل ۔ قطب مینار ۔ قلعہ سرخ دہلی ۔ کتب خانہ ملی کولکاتا ۔

❖ PRNH-SEC-B(2): Translation, Interpretation:-

(from English into Persian and Vice versa from news Papers)

- Communicative skill:

  Political, Social, Economical, Commercial, Technical and Electronic based topics from news papers.

Semester- V

❖ PRNH-CC-11 : Mystical Persian Literature:-

- **(a) Prose:**
  Kashf-ul-Mahub (اول **فصلِ**) **by Ali bin Usman Al-Hujwiri, Data Bakhsh.**
  Fawaid-ul-Fawad (اول مجسِ) **by Amir Hasan Sijzi.**

- **(b) Poetry :**
  Mulana Rumi (مہ نی نا و طوطی و بقال مردِ حکایتِ)
  Muntiq ut Tayr (Hekayat-e-Miwa Dadan)

❖ PRNH-CC-12: Ethical Persian Literature: -

- **(a) Prose:**
  Gulista(1,2, 3,4 and 5) by Sheikh Saadi Shirazi
  Qabus Nama (در یاد کردن پند های نوشیروا ن) by Keikavus

- **Poetry:**
  Abu-Said Abul Khayr ( ) رباعیا ،1،7 ، 9 ، 11 ۔ ت
  Umar Khayam (ربا عیا ت 1،2،3،4 and 5)

❖ PRBNH –DSE-A(1): Rhetoric and Prosody: -

- The following topics:-

علمِ بیان :حقیقت ۔ مجاز ۔ استعارہ ۔ تشبیہ ۔ استعارہ ۔ تجنیس ۔ مراعا ت النظیر ۔ تلمیح ۔ مبالغہ ۔ حسن طلب۔

علم عروض: شعر۔ وزن۔ قافیہ۔ حرف ۔ ھجا۔ تعین وزن ۔ رکن ۔ اصول ۔ سبب ۔ وتد ۔ فاصلہ۔ اوزان شعرِ فارسی ۔

تقطیع: بحرِ ھزج ۔ بحرِ متقارب ۔ بحرِ رمل ۔ بحرِ رجز ۔

❖ PRNH-DSE-B(1) : Root words, Parsing and Analysis:-

- The following Items:

کلما ت ریشہ : انتظام ۔ حقوق ۔ علوم ۔ محبت ۔ رحیم ۔ مطلوب ۔ مدارس ۔ مکا تیب ۔ شکریہ ۔ قوال
ترکیب صرفی : ا حمد رفت ۔ شیر شاہ شیر را کشتہ بود ۔ کلا غی تشنہ در بیابان پرواز می کرد ۔ آقای سعدی بہ دبیرستان رفتند ۔ شیخ سنائی شعر گفتہ باشد۔ اکبر شاہ بادشاہِ ھند بود ۔ آ نھا بہ شکار گاہ رفتند

ترکیب نحوی: نیلوفر بیمار است ۔ خا نم آفرین دانشجو ھست ۔ احمد پسرِ یوسف است ۔ نیلوفر دختر زیبا است ۔ توانا بود ھر کہ دانا بود۔ اگر محنت کنی موفق شدی۔ نہد شاخِ پر میوہ سر بر زمین۔ دخترِ امروز مادرِ فردا است۔ خر دھقان گم شد ۔ کسی محمود را بخواب چنین دید ۔ دو طبیبِ حاذق رفتہ اند ۔

❖ PRNH-CC-13 : Persian Literature in Bengal (Classical& Modern):-

- (a) Prose:
  1. Khulasa-e-Tawarikh-e-Bangale (**پلا سی جنگ**) by Abdur Rauf Waheed)
  2. Adabiat-e-Farsi-wa-Ahad-e-Jadid by Dr. Md. Ishaque
  3. Rabindra Nath Tagore by Ata Krim Barke

❖ PRNH-CC-14: Persian Literature in Bengal :-

- (b) Poetry:
  1. Sufi Fatah Ali Waisi (1 and 2 **غزل**)
  2. Obaidi Suharwardi (**انتخا ب قلو پطرہ و انطونس مثنوی**)
  3. Raza Ali Wahshat (1 and 2 **غزل**)
  4. Abul Barakat Munir Lahuri ((**ا نتخاب از مثنوی مظھر گل (در وصف بنگالہ** **))**

❖ PRNH-DSE-A (2) : History of Modern Persian World:-

(The following Countries)

- Iran
- Afghanistan
- Tajikistan
- Uzbekistan

❖ PRNH-DSE-B (2) : Persian Linguistics:-

Linguistics, Philology, dialect, language, Indo-Iranian Family of Languages and Ancient Language of Iran, Impact of Persian on Indian Languages (Urdu, Hindi and Bengali.

Prescribed and Reference Books:

- Muntakhabat-e-Farsi (B.A. Persian Selection Vol. I&II), Published by Calcutta University
- Aamad Namah, Darul Ashaat, Colutola, Kolkata-73
- Dr. Tanwir Ahmed, A Short History of Persian Literature, Naaz Publication Kolkata
- Prof. Mujibur Rahman, Persian-Urdu Rhetoric and Prosody, M. Bashir Husan & Sons, Calcutta.
- Dr.M. Rahman Persian Translation and Re-translation; Usmania Book Dept. Kolkata-73
- E. G. Browne; A Literary History of Persia; Goodwords Publication, New Delhi
- Dr. Iftekhar Ahmad, Gulbang-e-Farsi; Farhangistan Kolkata
- Dr. Yadullah Samari, Azfa 1-3 Tehran, Iran
- let's Learn Persian, N.C.P.U. L., Ministry of HRD, New Delhi
- Sharaf-e-Alam, Prof.; Patna University, Bihar: *Iran: Ahad- e-Qadeem Ki Siyasi, Saqafati*
- Afghanistan main Jadid Dari (Farsi) Shairi; Dr. Ghulam Muhammad lal Zad & Dr. Shoaib Azmi; NCPUL, New Delhi
- Dr. Iftekhar Ahmed; Naqshha e-Rung Rung, Kitabee Dunya, New Delhi
- Dr. M. Mansoor Alam; Critical Editions of Persian Historical Text in 20th Century of Bengal; AMU, 2008
- Dr. M. Mansoor Alam; Life & Achievements of Dr. Md. Ishaque; Iran Society, Kolkata, 2013
- Dr. Gholam Sarwar; Persian Studies under the Sultan's of Bengal; Asiatic Society, Kolkata, 2017
- Dr. Gholam Sarwar Persian Linguistics, Arshia Publications, Delhi, 2011
- Shafaq, Razazadeh: Tarikh-e-Adabiyat -e- Iran, Translated in Urdu by Sayyed ubarizudd
- Tarikh-e-Hindustan Vol. 1-3; Shaikh Muhammad Ekraml;
- Chopra, Ravindra Mohan: The Rise, Growth and Decline of Indo-Persian Literature, Iran Society, Calcutta, 2012
- Hisdustan Main Ahad-e-Mughalia ka farsi adab; Dr. Muhammad Iqbal; JMI, New Delhi
- Shibli Nomani, Sher-ul-Ajam, Vol. 1-4, Darul Musannafin, Azamgarh, UP
- Waris Kirmani; Dreams Forgotten, An Anthology of Indo-Persian Poet; Kitab Khana-i-Shiraz, Allahwali Kothi, Dodhpur, Aligarh, 1986
- Prof. Nabi Hadi, Mughlon kay Malik us Shuara;
- Dr. Mansoor Alam; Essays on Persian Literature; Iran Society, 2000
- Muhammad Husain Azad, Darbar-e-Akbari, NCPUL, Delhi
- Muhammad Abdul Ghani, A History of Persian Language and Literature at the Mughal Court (Part I & II), Allahabad (U.P.), 1929-30
- Muhammad Abdul Ghani, Pre Mughal Persian in Hindustan,
- Sabahuddin, Abdur Rahman: *Bazm-e-Taimuriah*, Shibli Academy, Azamgarh, (U.P.)
- Sabahuddin, Abdur Rahman: Bazm-e-Mamlukia, Shibli Academy Azamgarh (U.P .)
- Adabyat-e-Farsi-e-Kuhan, Vol.I; Published by Iran Culture House, New Delhi
- Mutoon-e-Tarikh dar Farsi; Dr. Wasif Ahmad; Visva Bharti University, Shantiniketan, W.B

UNIVERSITY OF CALCUTTA

DEPARTMENT OF PERSIAN

Choice Based Credit System (CBCS)

UNDERGRADUATE PROGRAMME

(Courses effective from Academic Year2018-19)

Syllabus for B.A. General in PERSIAN

SYLLABOUS OF COURSES TO BE OFFERED

Core Courses, Elective Courses & Ability Enhancement Courses

❖ Preamble

The University Grants Commission (UGC) has initiated several measures to bring equity, efficiency and excellence in the Higher Education System of country. The important measures taken to enhance academic standards and quality in higher education include innovation and improvements in curriculum, teaching-learning process, examination and evaluation systems, besides governance and other matters.

The UGC has formulated various regulations and guidelines from time to time to improve the higher education system and maintain minimum standards and quality across the Higher Educational Institutions (HEIs) in India. The academic reforms recommended by the UGC in the recent past have led to overall improvement in the higher education system. However, due to lot of diversity in the system of higher education, there are multiple approaches followed by universities towards examination, evaluation and grading system. While the HEIs must have the flexibility and freedom in designing the examination and evaluation methods that best fits the curriculum, syllabi and teaching–learning methods, there is a need to devise a sensible system for awarding the grades based on the performance of students. Presently the performance of the students is reported using the conventional system of marks secured in the examinations or grades or both. The conversion from marks to letter grades and the letter grades used vary widely across the HEIs in the country. This creates difficulty for the academia and the employers to understand and infer the performance of the students graduating from different universities and colleges based on grades.

The grading system is considered to be better than the conventional marks system and hence it has been followed in the top institutions in India and abroad. So it is desirable to introduce uniform grading system. This will facilitate student mobility across institutions within and across countries and also enable potential employers to assess the performance of students. To bring in the desired uniformity, in grading system and method for computing the cumulative grade point average (CGPA) based on the performance of students in the examinations, the UGC has formulated these guidelines.

❖ Choice Based Credit System (CBCS):

The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill based courses. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. Therefore, it is necessary to introduce uniform grading system in the entire higher education in India. This will benefit the students to move across institutions within India to begin with and across countries. The uniform grading system will also enable potential employers in assessing the performance of the candidates. In order to bring uniformity in evaluation system and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations, the UGC has formulated the guidelines to be followed.

❖ Outline of Choice Based Credit System:

1. **Core Course:** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.

2. **Elective Course:** Generally a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course.

   2.1 Discipline Specific Elective (DSE) Course: Elective courses may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective. The University/Institute may also offer discipline related Elective courses of interdisciplinary nature (to be offered by main discipline/subject of study).

   2.2 Dissertation/Project: An elective course designed to acquire special/advanced knowledge, such as supplement study/support study to a project work, and a candidate studies such a course on his own with an advisory support by a teacher/faculty member is called dissertation/project.

   2.3 Generic Elective (GE) Course: An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is called a Generic Elective.

   P.S.: A core course offered in a discipline/subject may be treated as an elective by other discipline/subject and vice versa and such electives may also be referred to as Generic Elective.

3. **Ability Enhancement Courses (AEC)/Competency Improvement Courses/Skill Development Courses/Foundation Course:** The Ability Enhancement (AE) Courses may be of two kinds: AE Compulsory Course (AECC) and AE Elective Course (AEEC). "AECC" courses are the courses based upon the content that leads to Knowledge enhancement. They (i) Environmental Science, (ii) English/MIL Communication) are mandatory for all disciplines. AEEC courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc.

   3.1 AE Compulsory Course (AECC): Environmental Science, English Communication/MIL Communication.

   3.2 AE Elective Course (AEEC): These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based instruct

Project work/Dissertation is considered as a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A Project/Dissertation work would be of 6 credits. A Project/Dissertation work.

❖ Common Course Structure for B.A/B.Sc. (Honours and General)

Course Component	B.Sc		B.A.	
	Honours	General	Honours	General
Core Course (CC)	14	12*	14	8**
Language Core Course (LCC)	0	0	0	4(2English courses+ 2MIL courses)
Generic Elective (GE) (From two inter disciplinary subjects)	4**	0	4**	2
Discipline Specific Elective (DSE)	4	6*	4	4**
Ability Enhancemant Compulsory Course (AECC)	2	2	2	2
Skill Enhancement Elective Course (SEC)	2	4*	2	4
Total Number of Courses	**26**	**24**	**26**	**24**

*****covering three subjects.
**covering two subjects.

❖ Credit Structure for B.A.(General) Courses:

Course Type		**Number of courses (Having practical)**		**Number of courses (Having Tutorial)**		**Number of Credits (Having practical)**		**Number of Credits (Having Tutorial)**	
		Theory	Practical	Theory	Tutorial	Theory	Practical	Theory	Tutorial
Core Course	(CC)	8 x 4	8 x 2	8 x 5	8 x 1	32	16	40	8
	Language(LCC)	4 x 4	4 x 2	4 x 5	4 x 1	16	8	20	4
Elective Courses:									
i)Generic Elective (GE)		2 x 4	2 x 2	2 x 5	2 x 1	8	4	10	2
ii) discipline Specific Elective (DSE)		4 x 4	4 x 2	4 x 5	4 x 1	16	8	20	4
Ability Enhancement Compulsory Course (AECC)		2 x 2	0	2 x 2	0	4	0	4	0
Skill Enhancement Elective (SEC)		4 x 2	0	4 x 2	0	8	0	8	0
Totals		**24**	**18**	**24**	**18**	**84**	**36**	**102**	**18**

Total Courses=42 (24Th+18P/TU) **Total Credits**=120(84Th+36P)/(120Th+18TU)

❖ Semester wise Courses for B.A. (General):

	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6
	1	2	3	4	5	6
Core Course (CC)	2Th+2P/TU CC-1	2Th+2P/TU CC-2	2Th+2P/TU CC-3	2Th+2P/TU CC-4		
Language(LCC)			L1(1) 1Th+1P/TU	L2(1) 1Th+1P/TU	L1 (2) 1Th+1P/TU	L2(2) 1Th+1P/TU
Elective Courses:						
i)Generic Elective (GE)	1Th+1P/TU GE-1	1Th+1P/TU GE-2				
ii) discipline Specific Elective (DSE)					2Th+2P/TU DSE-A (1A+2A)	2Th+2P/TU DSE-B (1B+2B)
Ability Enhancement Compulsory Course (AECC)	1Th+0P/TU AECC-1	1Th+0P/TU AECC-2				
Skill Enhancement Elective (SEC)			1Th+0P/TU SEC-A(1)	1Th+0P/TU SEC-B(1)	1Th+0P/TU SEC-A(2)	1Th+0P/TU SEC-B(2)
Total No. of Courses and Marks	4x100 =400	4x100 =400	4x100 =400	4x100 =400	4x100 =400	4x100 =400
Total Credits	20	20	20	20	20	20

Th=Theory P=Practical TU=Tutorial

- For Core Courses- 4 Courses each from 2 disciplines + 2English courses + 2MILcourses
- CC of general Course will be treated as GE for the candidates taking honours in other disciplines (other than Persian.)
- For Elective Courses -2DSE courses is from same to disciplines+ 2GE from other subjects
- 1 Theory (Th) =4 credits +1 Practical (P)= credits o 1 Theory (Th) =5 credits +1 Tutorial (TU) = 1 credits
- For Ability/ Skill Enhancement Courses- Each Course has 2 Credits
- **L1** = English courses ; **L2** = MIL courses

Details Semester wise Courses for B.A. General in Persian:

❖ B. A. General in Persian :

➢ Semester: I

Course Code	Course	Course Wise Class	Credit
PRNG-CC 1	History of Persian Literature: Pre Islamic Period (from 525BCE to 651 A.D) and Post Islamic Period (from 652 to1020A.D) Grammer and Translation	Core (60Th+15TU)	6 (5Th+1TU)
GE-1	From Interdisciplinary subject (Other than Persian)	GE (60Th+15T)	6 (5Th+1TU)
AECC-1	Communicative English /MIL	AECC	2 (2L)
Total	4 Courses	Total	20

➢ Semester: II

Course Code	Course	Course Wise Class	Credit
PRNG-CC- 2	History of Persian Literature:- Saljuque , Mongol. Ilkhanid &Timurid Grammar, translation and composition.	Core (60Th+15T TU)	6 (5Th+1TU)
GE -2	From Interdisciplinary subject (Other than Persian)	GE (60Th+15TU)	6 (5Th+1TU)
AECC-2	Environmental Studies	AECC	2 (2Th)
Total	4 Courses	Total	20

➢ Semester: III

Course Code	Course	Course Wise Class	Credit
PRNG-CC- 3	Prose: Classical , Medieval and Modern Period	Core (60Th+15TU)	6 (5Th+1TU)
LCC –L1(1)	Language (L1-1) English Courses	Core (60Th+15TU)	6 (5Th+1TU)
SEC-A-(1) SEC-A(2) To be Opted any one (either in semester III or in Semester V)	Applied Grammar, Translation and short Paragraphs writing in Persian SEC: Specific literary Feature of Modern Persian Literature	SEC (25Th)	2 (2Th)
Total	4 Courses	Total	20

➢ Semester: IV

Course Code	Course	Course Wise Class	Credit
PRNG-CC -4	Poetry: Classical Medieval and Modern Period	Core (60Th+15TU)	6 (5Th+1TU)
LCC-L2-1	Language Course (L2-1)	Core (60Th+15TU)	6 (5Th+1TU)
SEC- B(1) SEC –B(2) To be Opted any one (either in semester IV or in semester VI)	SEC: Grammar, translation and short Paragraphs writing in Persian SEC: Specific literary feature of Modern Persian Literature in Exile	SEC (25 Th)	2 (2Th)
Total	4 Courses	Total	20

➢ Semester: V

Course Code	Course	Course Wise Class	Credit
LCC-(L1-2)	Language (L1-2) English Courses	Core (60Th+15TU)	6 (5Th+1TU)
DSE-A(1) DSE-A(2) (To be Opted any one)	Rhetoric and Prosody Parsing and Analysis	Core (60Th+15TU)	6 (5Th+1TU)
SEC-A (1) SEC –A(2) To be Opted any one (either in semester III or in semester V1)	Grammar , Translation & Letter Writing SEC: Specific literary feature of Modern Persian Literature	SEC (25Th)	2 (2Th)
Total	4 Courses	Total	20

➢ Semester: VI

Course Code	Course	Course Wise Class	Credit
LCC(L2-2)	Language (L2-2)	Core (60L+15T)	6 (5Th+1TU)
DSE-B(1) DES-B(2) To be Opted any one	History of Persian Language and Literature in India During Mughal Period History of Persian Literature in Bengal	Core (60Th+15TU)	6 (5Th+1TU)
SEC- B(1) SEC –B(2) To be Opted any one (either in semester IV or in semester VI)	SEC: Grammar, Translation & Essay Writing Persian Linguistics:-	SEC (25Th)	2 (2Th)
Total	4 Courses	Total	20

B.A. General Course in Persian

SEMESTER – I

❖ **CC-1: History of Persian Literature:-**

- Pre Islamic Period (From 525BCE to 651 A.D)
  Avesta, Old Persian (rock inscription) and Pahlavi or Middle Persian.
  And
- Post Islamic Period (From 652 to 1020A.D) with special reference to Rudaki, Rabia, Daqiqi, and Firdausi.
- Grammer and Translation:-
- Grammer:-
  The following topics:-
  Persian Alphabets, vowel, Compound word, Infinitive & verb, Noun, Pronoun, Adjective, Possessive case, opposite, opposite numbers and make Sentences.
- **Translation:-**
  (Persian to English & vice versa) should be exercised on the prescribed Grammatical topics pointed out wherever in the whole syllabus. This type of exercises of the grammar-based-translation should be strictly followed.

❖ **GE-1:**From Interdisciplinary subject (Other than Persian)

❖ **AECC-1: Communication/MIL**

SEMESTER – II

❖ **CC- 2: History of Modern Persian Literature.**
(Saljuuque , Mongol. Ilkhanid &Timurid**)**

- **Prose:**
  1. **Marzaban Nama (داستانِ هنبوی و ضحاک)**
  2. **Gulista(1,2, 3,4 and 5)**
  3. **Baharistan (1, 2, 3, and 5).**
  4. **Kimya-e-Saadat (only one Hikayat)**
- **Poetry:**
  1. Mulana Rumi (حکایتِ مردِ بقال و طوطی)
  2. Nizami Ganjavi (حِمدِ باری تعالیٰ)
  3. Hafiz (غزل-1،2)

- **Grammar and Translation:**
  The following topics:
  Aorist, identify the tenses, correct the Sentence, words meaning, Zamana: Mazi, Haal, Mustaqbil Fel-e-Maaruf and Majhul, Kinds of Sentence.

❖ **GE-2:** From Inter disciplinary subject (Other than Persian)

❖ **AECC-2: Environmental Studies.**

SEMESTER – III

❖ **CC-3: Prose: (Classical Medieval and Modern Period)**

- The following topics:
  Safare Awwale Sindbad
  Majra-e-Kabutaran
  Dastan-e-Parwaz
  Yahya

❖ **LCC - L1 (1): Language: English Courses**

❖ **SEC-A (1):** Applied Grammar, Translation and short Paragraphs writing in Persian

- The following topics:
  - Grammer: Mouzaf-o-Mouzaf Alaih, Mousouf-o-Sifat, Mutaradif, Mutazad, Mufrad – Jama, Sifat-e-Nisbati,Kind of Sifat. Hurouf-o-Izafa, Alamatha-e- Zamir-e-Faeyli or Shenasha.
  - **Short Paragraph**: اسب ، شیر ، کالج ، دانشگاہ ، شہرِ کلکتہ ، تالارِ ویکتوریہ ، تاج محل، جامع مسجد دہلی .
  - Translation from prescribed book and unseen short stories and Vice versa

❖ **SEC- A (2) : Specific literary Feature of Modern Persian Literature:-**

Origin growth and development of drama, novel and fiction writings with special reference to Zabih Bahrouz, Syed Jamal Zadah, Sadique Hidayat, Jalal Aal Ahmad, Mohammad Hijazi.

SEMESTER – IV

❖ CC- 4: Poetry: (Classical, Medieval and Modern)

1. Kirme Ketabi, (Iqbal),
2. Chashma-o-Sang
3. Rubayyat-e-Umar Khayyam (1-3)
4. Rubah-o- Zagh,
5. Ashk-e-Yatim
6. Shahnama-i-Firdausi (Pages. 163-166) (Ghuftar-Andar Zadan)
7. Ghazalyat-e-Saadi (No.1 & 5)

❖ LCC- L2(1) =MIL Course

❖ SEC-B(1): Grammar, Translation& Short Paragraphs in Persian

- The following topics:

Aorist, Identify the tenses from sentence. Correct the Sentence. Zamana: Mazi, Haal, Mustaqbil, Fel-e-Maaruf and Majhul.

- **Short Paragraphs writing in Persian:**

Indian Museum, Victoria Memorial, National Library, Asiatic Society, Tajmahal, Red Fort, Iran Society, Urdu Academy, Calcutta University, Madarsah Alia Kolkata and Delhi. Saadi, Hafiz,Jami, Rumi.

❖ SEC-B (2) : Specific literary feature of Modern Persian Literature in Exile

A critical study of Iranian Literature born in Exile with special reference to Sargozast-e- Haji Baba-ye- Ispahani. Siyahatnameh –ye-Ebrahim Beg, Yaki Bud Yaki Nabud, Buf-e-Kur.

SEMESTER - V

❖ LCC-(L1-2) Language : English Courses

❖ DSE-A (1): Rhetoric & Prosody.

- The following topics:-

علمِ بیان :-حقیقت ۔ مجاز ۔ استعارہ ۔ تشبیہ ۔ استعارہ ۔ تجنیس ۔ مراعا ت النظیر ۔ تلمیح ۔ مبالغہ

علم عروض: شعر۔ وزن۔ قافیہ۔ حرف ۔ ھجا۔ تعین وزن ۔ اوزان شعرِ فارسی ۔

تقطیع: بحرِ ھزج ۔ بحرِ متقارب ۔

❖ DSE-A(2): Parsing and Analysis.

- The following Items:

ترکیبِ صرفی : ا حمد رفت ۔ شیر شاہ شیر را کشتہ بود ۔ کلا غی تشنہ در بیابان پرواز می کرد ۔ آقای سعدی بہ دبیرستان رفتند ۔ شیخ سنائی شعر گفتہ باشد۔ اکبر شاہ بادشاہِ ھند بود ۔ آ نھا بہ شکار گاہ رفتند

ترکیب نحوی: نیلوفر بیمار است ۔ خا نم آفرین دانشجو ھست ۔ احمد پسرِ یوسف است ۔ نیلوفر دختر زیبا است ۔ دخترِ امروز مادرِ فردا است ۔ خر دھقان گم شد ۔ کسی محمود را بخواب چنین دید ۔ دو طبیبِ حاذق رفتہ اند ۔

SEC-A (1) : Grammar , Translation & Letter Writing:-

- Grammer and Translation:
  The following topics:
  Tense, Present and Past root of verbs. Imperative, Verbal Noun, Passive voice of Past Indefinite , Past Imperfect , Present Perfect, Past Perfect, Dubious Past.

- Letter Writing:
  The following topics:
  Mother to son, Son to Mother, Father to Son, Friend to Friend and Business letter.

❖ SEC-A(2): Specific literary feature of Modern Persian:-

The following topics:-

Itroduction of Modern Prose and Poetry Writers with special reference to Bahar, Parween , Iraj Mirza, Lahuti, Hijaji, Sadique Hidayat.

SEMESTER – V1

❖ LCC-L2 (2): MIL Course.

❖ DSE-B-(1) : History of Persian Language and Literature in India During Mughal Period:

- Prose:
  1. Muntakhab-ut-tawarikh (**شیخ سلیم چشتی**) Abdul Qadir Badayuni.
  2. Panj Aahung (**نامہ ای کہ از کلکتہ بہ نام میرزا علی خان بہادر رقم شد**) by Mirza Ghalib.

- (b) Poetry:
  1. Ghazliyat-e-Naziri (Ghazal -1 and 2)
  2. Rubaya-t-Sarmad (1, 2, and 10)

❖ DSE-B (2) : History of Persian Literature in Bengal:-

- (a) Prose:
  1. Khulasa-e-Tawarikh-e-Bangale (**پلا سی جنگ**) by Abdur Rauf Waheed)
  2. Rabindra Nath Tagore by Ata Krim Barke

❖ PRNH-CC-14: Persian Literature in Bengal :-

- (b) Poetry:
  1. Sufi Fatah Ali Waisi (1 and 2 **غزل**)
  2. Raza Ali Wahshat (1 and 2 **غزل**)

❖ SEC:B (1): Grammar, Translation & Essay Writing.

Sign of Azafat. Kind of Izafat. Number. Sentences . Translation from passage and vice versa.

- Short Essay Writings:
  Firdausi, Khayyam,Saadi. Hafiz. Jami. Rumi. Imam Ghazali. Khusraw. Ghalib and Iqbal.

❖ SEC-B(2) : Persian Linguistics:- Philology, dialect, language, Ancient Language of Iran and Impact of Persian on Indian Languages (Urdu, Hindi and Bengali)

➢ Prescribed and Refrence Books:

- Muntakhabat-e-Farsi (B.A. Persian Selection Vol. I&II), Published by Calcutta University
- Aamad Namah, Darul Ashaat, Colutola, Kolkata-73
- Dr. Tanwir Ahmed, A Short History of Persian Literature, Naaz Publication Kolkata
- Prof. Mujibur Rahman, Persian-Urdu Rhetoric and Prosody, M. Bashir Husan & Sons, Calcutta.
- Dr.M. Rahman Persian Translation and Re-translation; Usmania Book Dept. Kolkata-73
- E. G. Browne; A Literary History of Persia; Goodwords Publication, New Delhi
- Dr. Iftekhar Ahmad, Gulbang-e-Farsi; Farhangistan Kolkata
- Dr. Yadullah Samari, Azfa 1-3 Tehran, Iran
- let's Learn Persian, N.C.P.U. L., Ministry of HRD, New Delhi
- Sharaf-e-Alam, Prof.; Patna University, Bihar: *Iran: Ahad- e-Qadeem Ki Siyasi, Saqafati*
- Afghanistan main Jadid Dari (Farsi) Shairi; Dr. Ghulam Muhammad lal Zad & Dr. Shoaib Azmi; NCPUL, New Delhi
- Dr. Iftekhar Ahmed; Naqshha e-Rung Rung, Kitabee Dunya, New Delhi
- Dr. M. Mansoor Alam; Critical Editions of Persian Historical Text in 20th Century of Bengal; AMU, 2008
- Dr. M. Mansoor Alam; Life & Achievements of Dr. Md. Ishaque; Iran Society, Kolkata, 2
- Dr. Gholam Sarwar Persian Linguistics, Arshia Publications, Delhi, 2011
- Shafaq, Razazadeh: Tarikh-e-Adabiyat -e- Iran, Translated in Urdu by Sayyed ubarizudd
- Tarikh-e-Hindustan Vol. 1-3; Shaikh Muhammad Ekraml;
- Chopra, Ravindra Mohan: The Rise, Growth and Decline of Indo-Persian Literature, Iran Society, Calcutta, 2012
- Hisdustan Main Ahad-e-Mughalia ka farsi adab; Dr. Muhammad Iqbal; JMI, New Delhi
- Shibli Nomani, Sher-ul-Ajam, Vol. 1-4, Darul Musannafin, Azamgarh, UP
- Waris Kirmani; Dreams Forgotten, An Anthology of Indo-Persian Poet; Kitab Khana-i-Shiraz, Allahwali Kothi, Dodhpur, Aligarh, 1986
- Dr. Mansoor Alam; Essays on Persian Literature; Iran Society, 2000
- Muhammad Husain Azad, Darbar-e-Akbari, NCPUL, Delhi
- Muhammad Abdul Ghani, A History of Persian Language and Literature at the Mughal Court (Part I & II), Allahabad (U.P.), 1929-30
- Muhammad Abdul Ghani, Pre Mughal Persian in Hindustan,
- Sabahuddin, Abdur Rahman: *Bazm-e-Taimuriah*, Shibli Academy, Azamgarh, (U.P.)
- Sabahuddin, Abdur Rahman: Bazm-e-Mamlukia, Shibli Academy Azamgarh (U.P .)

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

Semester-wise Course for B.A. (Honours)

	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6
Core Course (CC)	2TH+2TU CC-1&2	2TH+2TU CC-3&4	3TH+3TU CC-5,6&7	3TH+3TU CC-8,9&10	2TH+2TU CC-11&12	2TH+2TU CC-13&14
Generic Elective (GE)	1TH+1TU GE-1	1TH+1TU GE-2	1TH+1TU GE-3	1TH+1TU GE-4		
Discipline Specific Elective (DSE)					2TH+2TU DSE-A(1) B(1)	2TH+2TU DSE-A(2) B(2)
Ability Enhancement Compulsory Course (AECC)	1TH+0TU AECC-1	1TH+0TU AECC-2				
Skill Enhancement Course (SEC)			1TH+0TU SEC-A(1)	1TH+0TU SEC-B(2)		
Total No. of Courses and Marks	4 x 100 = 400	4 x 100 = 400	5 x 100 = 500	5 x 100 = 500	4 x 100 = 400	4 x 100 = 400
Total Credits	20	20	26	26	24	24

TH = Theory T = Tutorial

- ❖ CC/GE/DSE : Each theory and Tutorial Course have 5 and 1 Credit(s) respectively
- ❖ GE : Covering two subjects with two courses each; any subject in any semester; CC of a different subject in general course is to be treated as GE for Honours Course
- ❖ DSE/SEC : Group (A&B) for specified semesters
- ❖ AECC/SEC : Each Course has 2 Credits
- ❖ AECC-1 : Communicative English / MIL; AECC-2 : Environmental Studies

University of Calcutta

BA (Honours)-CBCS Syllabus in Philosophy, 2018

A. Core Courses [Fourteen courses; Each course: 6 credits (5 theoretical segment+ 1 for tutorial-related segment). Total: 84 credits (Th 5×15weeks=75 ; Tutorial 1×15 weeks= 15)]
B. Discipline Specific Elective[Four courses; Each course: 6 credits (5 theoretical segment+ 1 for tutorial-related segment). Total: 24 credits(Th 5×15weeks=75 ; Tutorial 1×15 weeks= 15)]
C. Generic Elective [Four courses; Each course: 6 credits (5 theoretical segment+ 1 for tutorial-related segment). Total: 24 credits (Th 5×15weeks=75 ; Tutorial 1×15 weeks= 15)]
   Core courses of 'General Syllabus' will be treated as Generic Elective of 'Honours Syllabus'.
D. Skill Enhancement [Two courses; Each course: 2 credits (No Tutorial segment). Total: 04 credits (2×15weeks =30)

- Each course (CC & DSE)carries 80 marks and Minimum 80 classes.
- 65 marks for theoretical segment: 55 marks for descriptive questions + 10 marks for 1 mark questions.
- Skill Enhancement course carries 80 marks and minimum 50 classes: 80 marks for theoretical segment, there is no tutorial segment.
- Question Pattern for descriptive segment of 55 marks: 5 short questions out of 8 (5x5 = 25) + 2 questions out of 4(15 x 2 = 30).
- 15 marks for tutorial [The topics (within the syllabus) are to be decided by the concerned faculty of respective colleges.]

IMPORTANT NOTES:

- Cited advanced texts in Bengali are not necessarily substitutes, but supplementary to the English books.

- The format is subject to the common structural CBCS format of the University.

- The Skill enhancement course, based on the UGC Guidelines, have the common goal of developing specific skills of students of the discipline for better employment opportunities.

Core Course
Semester 1
PHI-A-CC-1 Indian philosophy - I
PHI-A-CC-2 History of western Philosophy - I
Semester 2
PHI-A-CC-3 Indian philosophy - II
PHI-A-CC-4 History of Western Philosophy- II
Semester 3
PHI-A-CC- 5 Philosophy of Mind
PHI-A-CC-6 Social and Political philosophy
PHI-A-CC-7 Philosophy of Religion
Semester 4
PHI-A-CC-8 Western Logic – I
PHI-A-CC-9 Western Logic – II
PHI-A-CC-10 Epistemology and Metaphysics (Western)
Semester 5
PHI-A-CC-11 Indian Logic and Epistemology – I
PHI-A-CC-12 Ethics (Indian)
Semester 6
PHI-A-CC-13 Indian Logic and Epistemology – II
PHI-A-CC-14 Ethics (Western Ethics)

Discipline Specific Elective :

Semester 5

PHI-A-DSE-A(1)(Any one from the following options)

a) Western logic – I

b) Normative and Meta Ethics

c) Philosophy of language (Indian)

PHI-A-DSE-B(1)
(Any one text from the following texts)

a) An Enquiry Concerning Human Understanding – D. Hume
b) The Problems of Philosophy – B. Russell
c) Vedāntasāra- Sadananda Yogindra Saraswati
d) Śrimadbhagabadgīta

Semester 6

PHI-A-DSE-A(2)(Any one from the following options)

a) Western Logic -II

b) Applied Ethics

c) Philosophy of Language (Western)

PHI-A-DSE-B(2)

(Any one philosophical system from four philosophical systems of contemporary Indian thought)

a) Swami Vivekananda
b) Rabindranath Tagore
c) Sri Aurobindo
d) M.K. Gandhi

Skill Enhancement Elective Course :

Semester 3

PHI-A-SEC-A (Any one from the following options)

a) Logical Reasoning and Application: Indian and Western

b) Man and Environment

Semester 4

PHI-A-SEC-B(Any one from the following options)

a) Emerging Trends of Thought

b) Philosophy of Human Rights

SEMESTER-I

Core Course

PHI-A-CC-1
Indian Philosophy – I (6 Credits per week)

a) Introduction: Division of Indian Philosophical Schools:Āstika and Nāstika.
b) Cārvāka School—Epistemology, Metaphysics, Ethics.
c) Jainism—Concept of Sat, Dravya, Paryāya, Guṇa. Anekāntavāda, Syādvāda and Saptabhanginaya.
d) Buddhism— Four noble Truths, Theory of Dependent Origination (Pratītyasamutpādavāda), Definition of Reality (Arthakriyākāritvamsattvam), Doctrine of Momentariness, (Kṣanabhangavāda), Theory of no-soul (Nairātmyavāda), Four Schools of Buddhism (Basic tenets).
e) Nyāya –Pramā and Pramāṇa, Pratyakṣa (Definition), Sannikarṣa, Classification ofPratyakṣa: Nirvikalpaka, Savikalpaka, Laukika, Alaukika.
f) Anumiti, Anumāna (Definition), vyāpti, parāmarśa, Classification of Anumāna: pūrvavat, śesavat, smānyatodṛsta, kevalānvayī, kevalavyātirekī, anvayavyātirekī, svārthānumāna, parārthānumāna, Upamāna (definition), Śabda (definition).
g) Vaiśeṣika—Seven Padārthas, dravya, guṇa, karma, sāmānya, viśeṣa, samavāya, abhāva.

Suggested Readings:
English:

• Outlines of Indian Philosophy: M. Hiriyanna
• A Critical Survey of Indian Philosophy: C.D. Sharma
• An Introduction to Indian Philosophy: D. M. Dutta & S.C. Chatterjee
• Classical Indian Philosophy: J.N. Mohanty
• History of Indian Philosophy: S.N. Dasgupta
• Indian Philosophy (Vol. I & II): S. Radhakrishnan
• Indian Philosophy (Vol. I & II): J.N. Sinha
• Studies on the Carvaka/Lokayata: Ramakrishna Bhattacharya
• The Central Philosophy of Buddhism: T.R.V. Murti
• Yogacara Idealism: A.K.Chatterjee
• An Introduction to Madhyamika Philosophy: Jaydev Singh
• Reflections on Indian Philosophy: K.P. Sinha
• Philosophy of Jainism: K.P. Sinha
• Nyaya Theory of Knowledge: S.C. Chatterjee
• Six Ways of Knowing: D.M. Dutta
• Nyaya-Vaisesika Metaphysics: Sadananda Bhaduri

Bengali:

• Bharatiya Darshan: Debabrata Sen
• Bharatiya Darshan: Nirodbaran Chakraborty
• Sayan Madhaviya Sarva Darshan Samgraha: Satyajyoti Chakraborti
• Lokayata Darshan: Debiprasad Chattopadhyay

• Carvakacarca: Ramakrisna Bhattacharya
• Carvaka Darshan: Panchanan Sastri
• Carvaka Darshan: Amit Kumar Bhattacharya
• Bauddha Dharma O Darshan: Swami Vidyaranya
• Bauddha Darshan: Panchanan Sastri
• Gautama Buddher Darshan o Dharma: Sukomol Choudhury
• Bauddha Darshan: Amit Kumar Bhattacharya
• Ksanabhangavada: Bidhubhusan Bhattacharya
• Jainadarshaner Digdarshan: Satindra Chandra Bhattacharya
• Nyaya Darshan: Phanibhushan Tarkavagisha
• Nyaya Paricaya: Phanibhushan Tarkavagisha
• Nyaya-Vaisesika Darshan: Karuna Bhattacharya
• Nyaya Tattva Parikrama: Kalikrishna Bandyopadhyaya

Core Course

PHI-A-CC-2 History of Western Philosophy – I (6 Credits per week)

a) Pre Socratic Philosophy: Thales, Heraclitus, Parmenides, Empedocles, Anaxagoras, Democritus, Protagoras.
b) Plato**:** Theory of Knowledge, Theory of Forms.
c) Aristotle **:** Critique of Plato's theory of Forms, Doctrine of four causes, Form and Matter.
d) St. Thomas Aquinas: Faith and Reason, Essence and Existence.
e) Descartes: Cartesian method of doubt, Cogito ergo sum, Criterion of truth, Types of ideas, Proofs for the existence of God, Mind- body dualism , Proofs for the existence of the external world.
f) Spinoza: Doctrine of substance, Attributes and Modes, Existence of God, Pantheism ,Three orders of knowing.
g) Leibniz: Monads, Truths of reason, Truths of facts, Innateness of ideas, Some metaphysical principles : Law of Identity of indiscernibles, Law of sufficient reason, Law of continuity, Doctrine of Pre-established harmony.

Suggested Readings:

English:

•The Greek Philosophers from Thales to Aristotle: W. K. C. Guthrie
• A History of Western Thought : G. Skirbekk & N. Gilje
A Critical History of Greek Philosophy: W.T. Stace
• Encyclopedia of Philosophy: P. Edwards (ed.)
• A History of Philosophy: F. Copleston, vols. I, II, IV, V, VI
• History of Western Philosophy: B. Russell
• History of Modern Philosophy: R. Falckenberg
• A Critical History of Modern Philosophy: Y.H. Masih

• A History of Philosophy: F. Thilly
• A History of Modern Philosophy: W.K. Wright
• A Critical History of Western Philosophy: D.J. O'Connor
• A History of Philosophy from Descartes to Wittgenstein: R. Scruton
• The Fundamental Questions of Philosophy: A.C. Ewing
• A Brief History of Western Philosophy: A. Kenny
• The Works of Descartes: Haldane & Ross (eds.)
• Descartes: The Project of Pure Enquiry: B. Williams
• Descartes: A. Kenny
• Spinoza: Leon Roth
• Leibniz:An Introduction to His Philosophy: N. Rescher
• The Rationalists: J. Cottingham

Bengali:

• Paschatya Darshaner Itihas: Tarak Candra Roy (pratham o dvitiya khanda)
• Paschatya Darshaner Itihas: Kalyan Chandra Gupta
• Paschatya Darshaner Itihas: Susanta Chakraborty
• Paschatya Darshaner Itihas: Samarendra Bhattacharya (pratham o dvitiya khanda)
• Paschatya Darshaner Itihas (Plato o Aristotle): N.B. Chakraborty
• Paschatya Darshaner Itihas (Plato o Aristotle): Debabrata Sen
• Paschatya Darshaner Itihas(Adhunik Yuga-Yuktivada (Descartes), Spinoza,Leibniz:):Chandrodaya Bhattacharya

SEMESTER 2

Core course

PHI-A-CC-3 Outlines of Indian Philosophy – II (6 Credits per week)

a) Sāmkhya—Satkāryavāda, Nature of Prakṛti , its constituents and proofs for its existence. Nature of Puruṣa and proofs for its existence, plurality of puruṣas, theory of evolution.
b) Yoga—Citta, Cittavṛtti, Cittabhūmi. Eight fold path of Yoga, God.
c) Mīmāmsā (Prābhakara and Bhātta) :Anvitāvidhānvāda and Abhihitānvayavāda, Arthāpatti and Anupalabdhi as sources of knowledge
d) Advaita Vedānta—Sankara's view of Brahman, Saguṇa and Nirguṇa Brahman, Three grades ofSattā: prātibhāsika, vyavahārika and pāramārthika, Jīva, Jagat and Māyā.
e) Viśistādvaita—Rāmānuja's view of Brahman, Jīva, Jagat. Refutation of the doctrine of Māyā.

Suggested Readings:

English:

• Outlines of Indian Philosophy: M. Hiriyanna
• A Critical Survey of Indian Philosophy: C.D. Sharma
• An Introduction to Indian Philosophy: D. M. Dutta & S.C. Chatterjee
• Classical Indian Philosophy: J.N. Mohanty
• History of Indian Philosophy: S.N. Dasgupta
• Indian Philosophy (Vol. I & II): S. Radhakrishnan
• Indian Philosophy (Vol. I & II): J.N. Sinha
• Six Ways of Knowing: D.M. Dutta
• The Doctrine of Maya: A.K. Roychoudhuri
• Self and Falsity in Advaita Vedanta: A.K. Roychoudhuri
•The Word and the world: Bimal Krishna Matilal
•Logic, Language and Reality: Bimal Krishna Matilal

Bengali:

• Bharatiya Darshan: Debabrata Sen
• Bharatiya Darshan: Nirodbaran Chakraborty
• Sayan Madhaviya Sarva Darshan Samgraha: Satyajyoti Chakraborti
• Samkhya Darshan: Bhupendranath Bhattacharya
• Samkhya Darshaner Vivarana: Bidhubhushan Bhattacharya
• Samkhyamata Samiksa: Yogendranath Bagchi
• Samkhya Tattva Kaumudi: Narayan Chandra Goswami
• Samkhya-Patanjal Darshan: Kanakprabha Bandyopadhyaya
• Patanjal Darshan: Purnachandra Vedantachanchu
• Purva Mimamsa Darshan: Sukhamoy Bhattacharya
• Vedanta Darshan: Roma Choudhury
• Vedanta Darshan: Advaitavada: Ashutosh Sastri
• Mayavada: Pramatha Nath Tarkabhushan
• Vedanta Darshan: Swami Vidyaranya

Core Course

PHI-A-CC-4 History of Western Philosophy – II (6 Credits per week)

a) Locke **:** Refutation of innate ideas, The origin and formation of ideas, Simple and Complex ideas, Substance, Modes and Relations, Nature of knowledge and its degrees, Limits of knowledge, Primary and Secondary qualities, Representative Realism.
b) Berkeley: Refutation of Abstract ideas. Criticism of Locke's distinction between Primary and Secondary qualities, Immaterialism, *Esse-est-percipi*, Role of God.
c) Hume: Impression and ideas, Association of ideas, Distinction between Judgements concerning Relations of Ideas and Judgements concerning Matters of fact, Theory of causality, Theory of Self and Personal Identity, Scepticism.

d) Kant **:** Conception of Critical Philosophy, Distinction between A priori and A posteriori Judgements, Distinction between Analytic and Synthetic Judgements. Synthetic A priori Judgements, General problem of the Critique, Copernican Revolution in Philosophy ;Transcendental Aesthetic **:** Space & Time—Metaphysical & Transcendental expositions of the Ideas of Space & Time.

Suggested Readings:

English:

•The Greek Philosophers from Thales to Aristotle: W. K. C. Guthrie
• A Critical History of Greek Philosophy: W.T. Stace
• Encyclopedia of Philosophy: P. Edwards (ed.)
• A History of Philosophy: F. Copleston, vols. I, II, IV, V, VI
• History of Western Philosophy: B. Russell
• History of Modern Philosophy: R. Falckenberg
• A Critical History of Modern Philosophy: Y.H. Masih
• A History of Philosophy: F. Thilly
• A History of Modern Philosophy: W.K. Wright
• A Critical History of Western Philosophy: D.J. O'Connor
• A History of Philosophy from Descartes to Wittgenstein: R. Scruton
• The Fundamental Questions of Philosophy: A.C. Ewing
A Brief History of Western Philosophy: A. Kenny
An Essay Concerning Human Understanding: J. Locke
• John Locke: R. Aron
• Berkeley: G. Pitcher
• The Works of George Berkeley: T.E. Jessop & A.R. Luce (eds.) 8 Vols
• An Enquiry Concerning Human Understanding-D. Hume: J. N. Mohanty (ed)
• A Treatise on Human Nature: D. Hume
• Locke, Berkeley, Hume: J. Bennett
• Locke, Berkeley, and Hume: C.R. Morris
• A Critique of Pure Reason-Immanuel Kant: N.K. Smith(tr. & ed.)
• Kant's Metaphysics of Experience: H.J. Paton Vols I & II
• The Philosophy of Kant: J. Kemp
• Kant: Paul Guyer
• A Handbook to Kant's Critique of Pure Reason: Rashvihari Das
• Kant: S. Körner
Kant: Allen W. Wood
•Lectures on Kant's Critique of Pure Reason: J.N. Mohanty

Bengali:

• Paschatya Darshaner Itihas: Tarak Candra Roy (pratham o dvitiya khanda)
• Paschatya Darshaner Itihas: Kalyan Chandra Gupta
• Paschatya Darshaner Itihas: Susanta Chakraborty

• Paschatya Darshaner Itihas: Samarendra Bhattacharya (pratham o dwitiya khanda)
• Paschatya Darshaner Itihas(Plato o Aristotle): N.B. Chakraborty
• Paschatya Darshaner Itihas(Plato o Aristotle): Debabrata Sen

•Paschatya Darshaner Itihas:Ikshanvada(Locke,Berkeley,Hume): Chandrodaya Bhattacharya
• Paschatya Darshaner Itihas:(Locke,Berkeley,Hume): N.B. Chakraborty
• Hume-er Enquiry-Ekti Upasthapana: Ramaprasad Das
• Kanter Darshan-Tattva o Prayog: Prahlad Kumar Sarkar (ed.)
• Kanter Darshan:Rasvihari Das
• Kanter Shuddha Prajnar Bichar: Mrinal Kanti Bhadra

SEMESTER -3

Core Course

PHI-A-CC-5-Philosophy of Mind (6 Credits per week)

a) Psychology: Definition, Nature and Scope.
b) Methods of Psychology: Introspection, Extrospection, Experimental Methods—variables—dependent & independent, Controls in experiment, Limitations of experimental method.
c) Sensation and perception: Nature of sensation, Nature of perception, Relation between sensation and perception, Gestalt theory of perception. Illusion and Hallucination.
d) Learning: Theories of Learning—Trial and error theory, Thorndike's laws of learning, Gestalt theory, Pavlov's theory of conditioned response, B.F. Skinner's theory of Operant Conditioning (reinforcement, extinction, punishment).
e) Philosophical Theories of Mind: Interactionism, Double-aspect theory, Philosophical Behaviorism, Materialism- mind-brain identity theory, The Person theory (Strawson).
f) Consciousness: Levels of mind—Conscious, Sub-conscious, Unconscious, Proofs for the existence of Unconscious, Freud's theory of Dream.
g) Intelligence : Measurement of intelligence, IQ, Measurement of IQ, Binet-Simon test.
h) Personality: Types, Factors and Traits of Personality.

Suggested Readings:

English:

• A Textbook of Psychology: Pareshnath Bhattacharya
• Introduction to Psychology: G.T. Morgan, R. A. King Jr.
• A Modern Introduction to Psychology: Rex Knight & M. Knight
• A Manual of Psychology: G.F. Stout

• Psychology: Woodworth & Marquis
• Science and Human Behaviour: B.F. Skinner
• About Behaviorism: B.F. Skinner
• General Psychology: G.D. Boaz
• General Psychology: G. Murphy
• Psychology: W. James
• A Textbook of Psychology: E.B. Titchener
• Principles of Psychology: W. James
• Introduction to Psychology: N.L. Muna
• A Materialist Theory of Mind: D.M. Armstrong (Ch.s 1,5,& 6)
• Philosophy of Mind: J. Heil
• Philosophy of Mind: J. Shaffer (Ch.s 2,3&4)
• An Introduction to Philosophy of Mind: C.J. Lowe (Ch.s 2&3)

Bengali:

• Monovidya: Priti Bhushan Chattopadhyay
• Monovidya: Pareshnath Bhattacharya
• Monovidya: Ira Sengupta
• Monovidya: Samarendra Bhattacharya
• Monosamiksha: M. N. Mitra O Pushpa Mishra
• Monodarshan-Sarirvada O Tar Vikalap: M. N. Mitra O P. Sarkar (Sampadito)
• Monovijñana Prasanga: Saradindu Bandyopadhyay
• Adhunik Monovijñana: Ira Sengupta
• Shikshashrayi Monovidya: Sushil Roy
• Monodarshan: Arabinda Basu O Nibedita Chakraborty

Core Course

PHI-A-CC-6-Social and Political Philosophy (6 Credits per week)

a) Nature and Scope of i) Social Philosophy ii) Political Philosophy iii)Relation between Social and Political Philosophy.
b) Primary concepts: Society, community, association, institution, family: nature, different forms of family, role of family in the society.
c) Social Class and Caste: Principles of class and caste, Marxist conception of class, Varṇāśrama dharma.
d) Theories regarding the relation between individual and society:
   i) Individualistic theory
   ii) Organic theory
   iii) Idealistic theory
e) Secularism—its nature, Secularism in India.
f) Social Change: Nature, Relation to social progress, Marx-Engles on social change, Gandhi on social change.

g) Political Ideals: Nature of Democracy and its different forms, Direct and Indirect democracy, Liberal democracy, Democracy as a political ideal, Socialism: Utopian and Scientific, Anarchism.

Suggested Readings:

English:

•Philosophy: A Guide through the subject: A.C. Grayling (Ed.)
• Individuals: An Essay in Descriptive Metaphysics: P.F. Strawson
• The Concept of Person and Other Essays: A.J. Ayer
• Fundamentals of Sociology: P. Gisbert
• Outlines of Social Philosophy: J.S. Mackenzie
• Problems of Political Philosophy: D.D. Raphael
• Society: R.M. MacIver & C.H. Page
• Sociology: M. Ginsberg
• Sociology: Tom Bottomore
• Sociology: S.N. Shankar Rao
• Sociology: D.C. Bhattacharya
• Sociology: P.B. Kar
• Guide to Modern Thought: C.E.M. Joad
• Introduction to Modern political Theory: C.E.M. Joad
• The Evolution of Political Philosophy of Gandhi: Buddhadeb Bhattacharya
• Social and Political Thought of Gandhi: Jayantanuja Bandyopadhyay
• The Philosophy of Mahatma Gandhi: D.M. Dutta
• The Philosophy of Sarvodaya: K.S. Bharathi
• Communist Manifesto: Karl Marx & Frederick Engels
• Socialism: Utopian and Scientific: F. Engels
• Open Society and Its Enemies: Karl Popper
• The Open Philosophy and the Open Society: M. Cornforth
• Religion in India: T.N. Madan (ed.)
• Religion and Society: S. Radhakrishnan
• Secularism in the Present Indian Society, Amal Kumar Mukhopadhyay in Bulletin of the Ramakrishna Mission Institute of Culture, Vol. LVII, No. 11
• Secularism and Its Critics: Rajeev Bhargava (ed.)
• Civil Society and Its Institutions: Andre Beteille
• Unraveling the Nation: Sectarian Conflict and India's Secular Identity: Kaushik Basu & Sanjay Subramaniyam (eds.)
• India as A Secular State: D.E. Smith
• Political Thought: C.L. Wayper
• Political Philosophy: An Introduction: W.T. Blackstone
• Political Philosophy: East and West: Krishna Roy
• Political Philosophy: V.P. Verma
• Essays in Social and Political Philosophy: Krishna Roy & Chhanda Gupta (eds.)
• Western Political Thought: Brian R. Nelson

• Western Political Thought: From Plato to Marx: Shefali Jha

Bengali:

• Samaj Darshan Dipika: Pritibhushan Chattopadhyay
• Samaj Tattva: Parimal Bhushan Kar
• Samaj Tattva: T. Bottomore
• Bisay Samaj Tattva: Anadi Kumar Mahapatra
• Samajdarshan O Rashtradarshaner Parichoy: A.K. Mahapatra O P. Mukherjee
• Rashtradarshaner Dhara: Amal kumar Mukhopadhyay
• Samaj O Rajnaitikdarshan: Sandip Das
• Samyabader Istehar : Marx O Engels
• Samajtantra: Kalpanik O Baijnanik: F. Engels
• Marxiya Rashtrachinta: Shovan Lal Dutta Gupta
• Sarvodaya Andoloner Itihas: Gurudas Bandyopadhyay
• Gandhi Rachanasambhar: M.K. Gandhi
• Bharater Dharmanirapekshatar Sankat, Bholanath Bandyopadhyay in Essays on Science and Society: Biplab Chakraborti
• Dharmanirapekshata Birodhi Istahar: Ashis Nandy.

Core Course
PHI-A-CC-7-Philosophy of Religion (6 Credits per week)

a) Nature and scope of Philosophy of Religion. Doctrine of karma and rebirth, doctrine of liberation, (Hindu, Bauddha and Jaina views).
b) The Philosophical teachings of the Holy Quran: God the ultimate Reality, His attributes, His relation to the world and man.
c) Some basic tenets of Christianity: The doctrine of Trinity, The theory of Redemption .
d) Religious Pluralism, Inter-religious dialogue and Possibility of Universal Religion.
e) Arguments for the existence of God: Cosmological, Telelogical and Ontological arguments, Nyāya arguments.
f) Grounds for Disbelief in God: Sociological theory (Durkheim), Freudian theory, Cārvāka, Bauddha and Jaina views .
g) The Peculiarity of Religious Language: The doctrine of analogy, Religious statements as Symbolic, Religious language as Non-Cognitive (Randal's view), the language game theory (D.Z. Phillip).

Suggested Readings:

English:

• Philosophy of Religion: J. Hick
• An Introduction to the Philosophy of Religion: Brian Davies
• Indian Philosophy of Religion: A. Sharma

• Comparative Religion: P.B. Chatterjee
• Comparative Religion: Eric J. Sharpe
• Patterns in Comparative Religion: M. Eliade (Ch I, Sec. I)
• Atheism in Indian Philosophy: D.P. Chattopadhyay
• Essays in Indian Philosophy (pp-145-169): Sukharanjan Saha (ed.)
• Studies in Nyaya-Vaisesika Theism (pp-102-137,139-159): Gopika Mohan Bhattacharya
• The Religions of the World: R.K.M. Institute of Culture
• Encyclopedia Britannica, Vol. I
• Encyclopedia of Islam, Vols. I & II
• Indian Religions: S. Radhakrishnan
• Foundations of Living Faith: H.D. Bhattacharya
• Aspects of Hindu Morality: Saral Jhingram
• A History of Muslim Philosophy (Vols.I &II): M.M. Sharif
• Islam and Secularism: Sayed Muhammad Al-Naquib Al-Attas
• The History of Philosophy in Islam-T.J. de Boer: E. Jones (tr.)
• The Holy Quran: Mohammad Yusuf Ali (tr.)
• The Spirit of Islam: Syed Amir Ali
• The Meaning of the Glorious Koran: M. Pickthall
• A History of Islamic Philosophy: M. Fakhry
• The Spirit of Islam's Message, Muhammad Qamaruddin in Religions of the People of India:S.R. Saha (ed.)
• Cultural Heritage of Islam: Osman Ghani
• Old Testament: R. Kittel (ed.)
• New Testament: Kilpatrick
• The Doctrine of the Trinity: R.S. Franks
• The Doctrine of the Trinity: Loenard Hodgson
• The Idea of the Holy: R. Otto
• A Brief Account of the Religion of the Hindus: Srilekha Dutta in Religions of the People ofIndia: S.R. Saha (ed.)
• Dharma in Hinduism: An Ideal Religion: Tapan Kumar Chakraborty in Religions of thePeople of India: S.R. Saha (ed.)
• Jainism-A Religion of Non-Theistic Humanism: Tushar Sarkar in Religions of the People ofIndia: S.R. Saha (ed.)
• Essays in Analytical Philosophy (Ch.VII): Gopinath Bhattacharya
• Buddhism in India and Abroad: Anukul Bandyopadhyay

SEMESTER 4

Core course

PHI-A-CC-8- Western Logic –I (6 Credits per week)

a) Logic and Arguments, Deductive and Inductive Arguments, Argument forms and arguments, Statement forms and statement, Truth and Validity.

Categorical propositions and classes: quality, quantity and distribution of terms, Translating categorical propositions into standard form.

b) Immediate inferences: Conversion, Obversion and Contraposition, Traditional square of opposition and Immediate Inferences based thereon; Existential Import, symbolism and Diagrams for categorical propositions.
c) Categorical Syllogism: Standard Form categorical Syllogism; The Formal nature of Syllogistic Argument, Rules and Fallacies, General Rules; To test Syllogistic Arguments for validity (by applying general rules for syllogism); To solve problems and prove theorems concerning syllogism.
d) Boolean Interpretation of categorical propositions; Review of the Traditional Laws of Logic concerning immediate inference and syllogism; Venn Diagram Technique for Testing Syllogisms, Hypothetical and Disjunctive Syllogisms, Enthymeme, The Dilemma.
e) Induction: Argument by Analogy, Appraising Analogical Arguments, Refutation by Logical Analogy.
f) Causal Connections: Cause and Effect, the meaning of "Cause"; Induction by Simple Enumeration; Mill's Method of Experimental Inquiry; Mill's Method of Agreement, Method of Difference, Joint Method of Agreement and Difference, Method of Residues, Method of Concomitant Variations; Criticism of Mills Methods, Vindication of Mill's Methods.
g) Science and Hypothesis: Explanations; Scientific and Unscientific, Evaluating Scientific Explanations; The pattern of Scientific Investigation; Crucial Experiments and Ad Hoc Hypotheses.
h) Probability: Alternative Conception of Probability; The Probability Calculus; Joint Occurrences; Alternative Occurrences.

Suggested Readings:

English:

• Introduction to Logic (13th edn.): I.M. Copi & C. Cohen
• Symbolic Logic: I.M. Copi
• Methods of Logic (Part I, Ch.s 5,7,9): W.V.O. Quine
• Introduction to Logic and Scientific Method: Cohen & Nagel
• Logic: Informal, Symbolic and Inductive: Chhanda Chakraborty
• Logic: Stan Baronett & Madhuchhanda Sen
• The Elements of Logic: Stephen Barkar
• Understanding Symbolic Logic: Virginia Klenk
• Logic- A Comprehensive Introduction; S.D. Guttenplan & M. Tamney
• Logic & Philosophy- A Modern Introduction: Howard Kahne
• Logic- A First Course: A.E. Blumberg

Bengali:

• Nabya Yuktibijnana(Pratham theke caturtha khanda): Ramaprasad Das
• Sanketik Yuktibijnana:Ramaprasad Das

• Samsad Yuktibijnana Abhidhan: Ramaprasad Das O Subirranjan Bhattacharya

Core Course
PHI-A-CC-9-Western Logic – II (6 Credits per week)

a) Symbolic Logic**:** The value of special symbols; Truth-Functions; Symbols for Negation, Conjunction, Disjunction, Conditional Statements and Material Implication; Material Equivalence and Logical Equivalence; Dagger and stroke functions; inter-definability of truth functors.
b) Tautologous, Contradictory and Contingent Statement-Forms; the Paradoxes of MaterialImplication; The Three Laws of Thought.
c) Determining the logical character of statement form and statements by
   i) The Method of Truth-table.
   ii) The Method of Resolution [dot notation excluded]
d) Testing Argument Form and Argument for validity by
   i) The Method of Truth-table.
   ii) The Method of Resolution (Fellswoop & Full Sweep)[dot notation excluded].
e) The Method of Deduction: Formal Proof of Validity: Difference between Implicational Rules and the Rules of Replacement; Construction of Formal Proof of Validity by using nineteen rules; Proof of invalidity by assignment of truth-values.
f) Quantification Theory**:** Need for Quantification Theory, Singular Propositions;Quantification; Translating Traditional subject predicate proposition into the logical notation of propositional function and quantifiers.
g) Quantification Rules and Proving Validity; Proving Invalidity for arguments involving quantifiers.

Suggested Readings:

English:

• Introduction to Logic (13th edn.): I.M. Copi & C. Cohen
• Symbolic Logic: I.M. Copi
• Methods of Logic (Part I, Ch.s 5,7,9): W.V.O. Quine
• Introduction to Logic and Scientific Method: Cohen & Nagel
• Logic: Informal, Symbolic and Inductive: Chhanda Chakraborty
• Logic: Stan Baronett & Madhuchhanda Sen
• The Elements of Logic: Stephen Barkar
• Understanding Symbolic Logic: Virginia Klenk
• Logic- A Comprehensive Introduction; S.D. Guttenplan & M. Tamney
• Logic & Philosophy- A Modern Introduction: Howard Kahne
• Logic- A First Course: A.E. Blumberg

Bengali:

• Nabya Yuktibijnana (Pratham theke caturtha khanda): Ramaprasad Das
• Sanketik Yuktibijnana: Ramaprasad Das
• Samsad Yuktibijnana Abhidhan: Ramaprasad Das O Subirranjan Bhattacharya

Core Course

PHI-A-CC-10-Epistemology and Metaphysics (Western) (6 Credits per week)

a) Concepts, Truth
b) Sources of Knowledge
c) Some Principal uses of the verb "To know", Conditions of Propositional Knowledge, Strongand weak senses of "know"
d) Analytic truth and logical possibility
e) The apriori
f) The Problem of Induction
g) Cause and Causal Principles
h) Realism, Idealism
i) Phenomenalism
j) Substance and Universal

Suggested Readings:

English:

- An Introduction to Philosophical Analysis—John Hospers
- The Problem of Knowledge: A.J. Ayer
- Language, Truth and Logic: A.J. Ayer
- Readings in Philosophical Analysis: J. Hospers
- The Central Questions of Philosophy: A.J. Ayer
- Theory of Knowledge: A.J. Woozley
- An Introduction to Philosophy: Shibapada Chakraborty

Bengali:

• Darshanik Jijnasa (Bagarthatattva): Ramaprasad Das
• Darshanik Jijnasa (Jnanatattva-Jnaner Svarup): Ramaprasad Das
• Darshanik Jijnasa (Jnanatattva): Ramaprasad Das
• Darshanik Jijnasa (Paratattva O Bhauto Jagater Jnana): Ramaprasad Das
• Darshanik Bishlesaner Ruparekha (Pratham O dvitiya khanda): Samarikanta Samanta
• Paschatya darshaner Ruparekha: Ramaprasad Das O Shibapada Chakraborty

SEMESTER 5

Core Course

PHI-A-CC-11-Nyāya Logic and Epistemology –I (6Credits per week)

a) Definition of buddhi or jñāna (cognition), its two kinds; Definition of smṛti; Two kinds of smṛti (memory); Definition of anubhava, its division into veridical (yathārtha) and non-veridical (ayathārtha);Three kinds of non-veridical anubhava; Definitions clarified in Tarkasaṁgraha Dīpikā.
b) Four-fold division of pramā and pramāṇa. Definition of "Karaṇa" (special causal condition) and "kāraṇa" (general causal condition). The concept of anyathāsiddhi (irrelevance) and its varieties.The definition of kārya (effect). Kinds of cause: samavāyi, a-samavāyi and nimitta kāraṇa (definitions and analysis).
c) Definition of pratyakṣa and its two-fold division : nirvikalpaka and savikalpaka jñāna. Evidence for the actuality of nirvikalpaka.
d) Sannikarṣa and its six varieties. Problem of transmission of sound; The claim of "anupalabdhi" as a distinctive pramāṇa examined.

Suggested Readings:

English:

• Tarkasamgraha with Dipika: Gopinath Bhattacharya
• Tarkasamgraha: M.R. Bodas & Y.V. Athalye (tr. &ed.)
• The Elements of Indian Logic and Epistemology: Chanrodaya Bhattacharya
• A Primer of Indian Logic: Kuppuswami Shastri
• Fundamental Questions of Indian Metaphysics & Logic: S.K. Maitra
• The Nyaya Theory of Knowledge: S.C. Chatterjee

Bengali:
• Tarkasamgraha with Dipika: Narayan Chandra Goswami
• Tarkasamgraha with Dipika: Indira Mukhopadhyay
• Tarkasamgraha with Dipika: Panchanan Shastri
• Tarkasamgraha with Dipika: Kanailal Poddar

Core Course
PHI-A-CC-12-Ethics (Indian) (6 Credits per week)

a) Introduction: Concerns and Presuppositions, Concept of Sthitaprañjna, Karmayoga: (Gīta) Puruṣārthas and their inter-relations.
b) Meaning of Dharma, Concept of Ṛṇa and Ṛta. Classification of Dharma: sādhāraṇadharma and Asādhārana dharma,Varnāsrama dharma.
c) Vidhi and Niṣedha.
d) Buddhist Ethics: Pañcaśīla, Brahmavihārabhāvanā (Bauddha) Anuvrata, Mahāvrata, Ahimsā.
e) Jaina Ethics: anubtrata, mahabrata.

f) Mimamsa Ethics: nittya naimittika karma and kāmya karma, the imperative in kāmya karmas and in kāmya karmas involving himsā.

Suggested Readings:

English:

• The Fundamentals of Hinduism-A Philosophical Study: S.C. Chatterjee
• The Ethics of the Hindus: S.K. Maitra
• An Outline of Hinduism: T.M.P. Mahadevan
• Classical Indian Ethical Thought: K.N. Tewari
• Ethics in the Gita-An Analytical Study (pp-119-145): Rajendra Prasad
• Ethics in the Vedas, Satya prakash Singh in Historical-Developmental Study of
ClassicalIndian Philosophy,[History of Science, Philosophy and Culture in Indian Civilisation(Vol.XII, Part 2)]: Rajendra Prasad (ed.)
• Rta, Satya, Tattva, Tathya, Samiran Chandra Chakraborty in Philosophical ConceptsRelevant to Sciences in Indian Tradition,[History of Science, Philosophy and Culture inIndian Civilisation(Vol. VIII, Part 4)]: P.K. Sen (ed.)
• Development of Moral Philosophy in India; Surama Dasgupta
• Ethical Philosophies of India: I.C. Sharma
• Studies on the Purusarthas: P.K. Mahapatra (ed.)
• A Critical Survey of Indian Philosophy: C.D. Sharma
• Indian Philosophy (Vo. I): J.N. Sinha
• Philosophy of Hindu Sadhana: N.K. Brahma

Bengali:

• Nitividya: Mrinal Kanti Bhadra
• Nitividyar Tattvakatha: Somnath Chakraborty
• Nitishastra: Dikshit Gupta
• Dharma Darshan: A. Bandyopadhyay o K.C. Gupta
• Dharma Darshan: Rabindranath Das
• Nitividya: Sibapada Chakraborty
• Pashchatya Darshaner Itihas (Pratham o dwitiya khanda): S. Radhakrishnan
• Sarvadarshanasamgraha: Satyajyoti Chakraborty (Pratham Khanda)
• Dharmadarshanser Katipoy Samasya: Dilip Kumar Mohanta
• Dharma Darshan: Sushil Kumar Chakraborty
• Bharatiya Dharmaniti: Amita Chattopadhyay (Sampadita)
• Bharatiya Darshane Nirishvarvada: B.B. Purakayastha (pp-39-50,56-66)
• Bharatiya Darshaner Drishtite Muktir Swarup: Chandana Das

SEMESTER 6

Core Course

PHI-A-CC-13-Nyaya Logic and Epistemology –II (6 Credits per week)

a) Definiton of anumāna, anumiti and parāmarśa. Analysis of pakṣatā. Definition of vyāpti;Vyāptigraha.
b) Definition of pakṣadharmatā—svārthānumiti and parārthānumiti; Analysis of pañcāvayavi Nyāya. Necessity of parāmarśa. Three kinds of linga or hetu: kevalānvayi, kevalayatirekī and anvayavyatirekī. Definiton of pakṣa, Sa-pakṣa and vipakṣa with illustrations. Marks of sat hetu.
c) Hetvābhāsa-two types of definition. Five kinds of hetvābhāsa: (1) "Savyabhicāra and its three kinds-defined and illustrated; (2) "Viruddha" defined and illustrated: (3) "Satpratipakṣa" defined and illustrated; (4) Three kinds of "Asiddha" enumerated; (a) āśrayāsiddhi (b) svarūpāsiddhi and (c) vyāpyatvāsiddhi. Vyāpyatvāsiddhi defined as"sopādhika hetu". Upādhi and its four kinds (definition and illustration) (5) "Bādhita" (definition and illustration).
d) "Upamāna pramāṇa" :Definition and analysis."Śabda pramāṇa" : Definition and analysis. "Śakti" (the direct signifying power), the padapadārtha- sambandha considered as Īśvara-saṁketa, Controversy between the Mīmāṃsakas and the Naiyāyikas regarding the nature of Śakti as universal or particular.
e) "Śaktigraha" (ascertainment of the meaning-relation), lakṣaṇa, varieties of lakṣaṇa, Analysis of "Gauṇī-vṛtti" (the secondary signifying power of a term), "Vyānjanā-vṛtti" (the suggestive power of a term) analysed as a kind of śakti or lakṣaṇā.
f) The question of lakṣanā-bīja tātparya, The concept of "yoga-rūḍhi". The three conditions of "śābda-bodha"—ākānkṣā, yogyatā and sannidhi. Two kinds of statements distinguished— Vaidika and Laukika.
g) "Arthāpatti" as a distinctive pramāṇa: Controversy between the Mīmāṃsakas and the Naiyāyikas.
h) The theory of prāmānya:the issue between svataḥ-prāmānyavāda and parataḥ-prāmānyavāda regarding utpatti and jñapti; The Prābhākara theory of akhyāti.

Suggested Readings:

English:

• Tarkasamgraha with Dipika: Gopinath Bhattacharya
• Tarkasamgraha: M.R. Bodas & Y.V. Athalye (tr. &ed.)
• The Elements of Indian Logic and Epistemology: Chanrodaya Bhattacharya
• A Primer of Indian Logic: Kuppuswami Shastri
• Fundamental Questions of Indian Metaphysics & Logic: S.K. Maitra
• The Nyaya Theory of Knowledge: S.C. Chatterjee

Bengali:

• Tarkasamgraha with Dipika: Narayan Chandra Goswami
• Tarkasamgraha with Dipika: Indira Mukhopadhyay
• Tarkasamgraha with Dipika: Panchanan Shastri
• Tarkasamgraha with Dipika: Kanailal Poddar

Core Course

PHI-A-CC-14-Ethics (Western) (6 Credits per week)

A. Nature and Scope of Ethics, Classification of Ethics: a) Prescriptive, b) Meta Ethics, c)Applied Ethics.
B. Moral and Non-moral actions, Object of Moral Judgement—Motive and Intention
C. Moral Theories: Plato and Aristotle
D. Standards of Morality: Hedonism—Ethical, Psychological. Utilitarianism: Act-utilitarianism, Rule-utilitarianism. Deontological Theories: Act-Deontological Theories, Rule-Deontological Theories—Kant's Theory
E. Theories of Punishment

Suggested Readings:

English:
• History of Philosophy-Eastern and Western: (Vol. I & II): S. Radhakrishnan
• Principles of Ethics: P.B. Chatterjee
• A Manual of Ethics: J.S. Mackenzie
• Ethics: W. Frankena
• An Introduction to Ethics: W. Lillie
• Ethics-Theory and Practice: J. Thiroux (Chs II & III)
• Ethics-Theory and Practice: Y.V. Satyanaryana
• Moral Reasons: J. Nuttal
• Human Conduct: J. Hospers
• Ethics-The Fundamentals: Julia Driver
• An Introduction to Kant's Ethics: R. Sullivan
• Nicomachean Ethics: Aristotle
• Philosophical Ethics-An Introduction to Moral Philosophy: T.L. Beauchamp (ed.)
• Virtue Ethics: Rosalind Hursthouse (Ch. III)
• Karma,Causation and Retributive Morality: Rajendra Prasad

Bengali:
• Nitividya: Mrinal Kanti Bhadra
• Nitividyar Tattvakatha: Somnath Chakraborty

• Nitishastra: Dikshit Gupta
• Nitividya: Samarendra Bhattacharya
• Nitividya: Sibapada Chakraborty
• Pashchatya Darshaner Itihas (Pratham o dwitiya khanda): S. Radhakrishnan
• Dharma Darshan: A. Bandyopadhyay o K.C. Gupta
• Dharma Darshan: Rabindranath Das
• Dharmadarshanser Katipoy Samasya: Dilip Kumar Mohanto
• Dharma Darshan: Sushil Kumar Chakraborty
• Bharatiya Dharmaniti: Amita Chattopadhyay (Sampadita)
• Bharatiya Darshane Nirishvarvada: B.B. Purakayastha (pp-39-50,56-66)
• Bharatiya Darshaner Drishtite Muktir Swarup: Chandana Das
• Sarvadarshanasamgraha: Satyajyoti Chakraborty (Pratham Khanda)

B. DISCIPLINE SPECIFIC ELECTIVE COURSE

Semester 5

PHI-A-DSE-A(1)(Any one from the following options)

a) Western Logic- I (6 Credits per week)

1) I.M. Copi: Symbolic Logic (fifth edn.) [Sections 3.4, 3.5, 3.6 and 3.7, 3.8 and Appendix B]
2) R.Jeffery: Formal Logic—Its scope and Limits (first edn.) [Ch IV and VI]
3) W.V.O. Quine: Methods of Logic (third edn.) [Ch.s 18, 19 and 21]
4) D. P. Suppes: Introduction to Logic (Indian edn.) [Ch.9,Section 9.1 to 9.7]

Suggested Readings:
English:

- Copi, I.M., Symbolic Logic

Bengali:

- Sanketik Yuktivijnan (Vakyakalan O Vidheyakalan): Ramaprasad Das
- Sabdajijnasa-Sabder Prakar o Prakriti: Ramaprasad Das
- Yukhtivaijnanik Paddhati: Ramaprasad Das

b)Normative and Meta ethics (6 Credits per week)

1) Postulates of morality
2) Virtue Ethics
3) Concept of value: Types of values, subjectivity/objectivity of values, moral skepticism
4) Distinction between normative and meta ethics

5) Meta-ethics: Nature of meta-ethics, Emotivism (A.J. Ayer's view), Intuitionism (Moore"s view), Prescriptivism (R.M. Hare's view)

Suggested Readings:
English:

• Ethics-The Fundamentals: Julia Driver
• Ethics-Theory and Practice: J. Thiroux (Chs II & III)
• Ethics-Theory and Practice: Y.V. Satyanaryana
• Moral Reasons: J. Nuttal
• Moral Reasons: James Rachels
• Philosophical Ethics-An Introduction to Moral Philosophy: T.L. Beauchamp (ed.)
• Virtue Ethics: R. Crisp & M. Stole (eds.)
• Virtue Ethics: Rosalind Hursthouse (Ch. III)
• Elements of Moral Philosophy: James Rachels
• Modern Moral Philosophy: W.D. Hudson
• Ethics Since 1900: Mary Warnock
• Introductory Ethics: Fred Feldman
• Ethics: W. Frankena
• Identity and Violence: Amartya Sen
• Twentieth Century Ethics: Roger Hancock
• Aspects of Hindu Morality: Saral Jhingram
• Practical Ethics: Peter Singer (Chs V,VII,VIII,X)
• A Companion to Ethics: Peter Singer (Chs 14,19,22)
• Man and Nature: G.F. MacLean (ed.)
• Language, Truth and Logic: A.J. Ayer
• The language of Morals: R.M. Hare

Bengali:
• Nitishastra: Dikshit Gupta
• Nitividya: Sanjib Ghosh
• Nitividyar Tattvakatha: Somnath Chakraborty
•Nitibidya- Shibapada Chakraborty

c)Philosophy of Language (Indian)(6 Credits per week)

1) Definition and classification of pada
2) Introduction of concepts of āsatti, yogyatā, tātparya, ākāṁṣā
3) Different types of lakṣaṇā
4) śābdabodha
5) anvitābhidhānvāda and avihitānvayavāda.

Suggested Readings:

English:

- Tarkasaṁgraha: Annaṁbhatta

- Tarkasamgraha: M.R. Bodas & Y.V. Athalye (tr. &ed.)
- The Elements of Indian Logic and Epistemology: Chandrodaya Bhattacharya
- A Primer of Indian Logic: Kuppuswami Shastri
- Fundamental Questions of Indian Metaphysics & Logic: S.K. Maitra
- The Nyaya Theory of Knowledge: S.C. Chatterjee

Bengali:

- Tarkasamgraha with Dipika: Narayan Chandra Goswami
- Tarkasamgraha with Dipika: Indira Mukhopadhyay
- Tarkasamgraha with Dipika: Panchanan Shastri
- Tarkasamgraha with Dipika: Kanailal Poddar

PHI-A-DSE-B(1) Classical Texts (Any one from the following options)

a) An Enquiry Concerning Human Understanding -D. Hume (6 Credits per week)

- Chapter 1—3
- Chapter 4—6
- Chapter 7- 9
- Chapter 10--- 12.

Suggested Readings:

English:

- An Enquiry Concerning Human Understanding-D. Hume: J.N. Mohanty (intr.)
- The Philosophy of David Hume: Pabitra Kumar Roy
- The Philosophy of David Hume: N.K. Smith
- Hume's Theory of Causality: Tapan Kumar Chakraborty
- Hume: V.C. Chappell (ed.)

Bengali:

- Hume-er Enquiry-Ekti Upasthapana: Ramaprasad Das
- Hume -er Darshan – Prahlad Kumar Sarkar (Ed.)

b) The Problems of Philosophy-- Bertrand Russell (6 Credits per week)

- Chapter 1—3
- Chapter 4—6
- Chapter 7- 9
- Chapter 10--- 12.

Suggested Readings:

English:

- Russell and Moore – An Analytical Heritage: A.J. Ayer
- Russell: A.J. Ayer
- Russell : Mark Sainsbury
- The Philosophy of B. Russell : Schlipp (ed)
- Russell – A Short Introduction: A.C. Grayling

Bengali:

- Darshaner Samasya: Debika Saha
- Darshan Samasya:Sushil Kumar Chakrabarty

c) Vedāntasāra: Sadananda Yogindra Saraswati(6 Credits per week)

1. Mangalācaraṇa
2. Vedānter Paricaya
3. From anubandha catuṣtaya to relation between Iśvara and Prājña
4. Origin of Sthūla Bhūta to Brahma- sākṣātkāra
5. Śravana o ṣaḍbidhalinganirupaṇa to jibanmuktir śeṣ phala

Suggested Readings:
English:

- A History of Indian Philosophy: S. N. Dasgupta

Bengali:

- Vedantasara : Upendranath Mukhopadhaya
- Vedantasara: Medha Caitanya
- Vedantasara: Kalibar Vedanta Vagish
- Vedantasara: Bipadbhanjan Pal
- Vedantasara- Advaitavada :Ashutosh Shastri
- Vedantasara: Swami Nikhilananda (Eng Version)

d) Śrimadbhagabadgīta (6 credits per week)

1. A. Karmayoga (third chapter)
2. B. Guṇatrayabibhāga (fourteenth chapter)

Suggested Readings:
English:

- Ethics in the Gita- An Analytical Study : Rajendra Prasad
- Central Theme of Gita : Swami Ranganathananda

Bengali:

- Śrimadbhagabadgīta: Madhusudan Saraswati
- Śrimadbhagabadgīta: Atul Chandra Sen
- Śrigīta: Jagadish Chandra Ghosh

- Gitanibandha: Sri Aurobindo
- Śrimadbhagabadgīta: Swami Jagadiswarananda(Tran.)
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Semester 6

PHI-A-DSE-A(2) (Any one from the following options)

a) Western Logic – II(6 Credits per week)

1) H.W.B. Joseph: An Introduction to Logic [Ch.s II & IV]
   [Terms and their principal distinctions, The Predicables]
2) H.W.B. Joseph: An Introduction to Logic [Ch. V]

[The Rules of Definition and Division:Classification and Dichotomy]

Suggested Readings:
English:

- Copi, I.M., Symbolic Logic

Bengali:

- Sanketik Yuktivijnan (Vakyakalan O Vidheyakalan): Ramaprasad Das
- Sabdajijnasa-Sabder Prakar o Prakriti: Ramaprasad Das
- Yukhtivaijnanik Paddhati: Ramaprasad Das
- Samsad Yuktivijnan Abhidhan: Ramaprasad Das o Subirranjan Bhattacharya

b)Applied ethics (6 Credits per week)

1. Nature and scope of applied ethics.
2. Killing: Suicide, Euthanasia, Animal killing.
3. Poverty, Affluence and Morality.
4. War and Violence: Terrorism.
5. Right: Nature and Value of Human Rights—Discrimination on the basis of race, caste andreligion.
6. The Ethics of Care.
7. Value beyond sentient beings, Reverence for life, Deep Ecology, Concepts of Kinship Ethics.
8. Ecological Concern in Indian thoughts: Jaina and Bauddha views.

Suggested Readings:
English:

• Ethics-The Fundamentals: Julia Driver
• Ethics-Theory and Practice: J. Thiroux (Chs II & III)
• Ethics-Theory and Practice: Y.V. Satyanaryana
• Moral Reasons: J. Nuttal
• Moral Reasons: James Rachels

• Philosophical Ethics-An Introduction to Moral Philosophy: T.L. Beauchamp (ed.)
• Elements of Moral Philosophy: James Rachels
• Theories of Rights: J. Waldron (ed.)
• Human Rights: Alan Gewirth
• Modern Moral Philosophy: W.D. Hudson
• Ethics Since 1900: Mary Warnock
• Introductory Ethics: Fred Feldman
• Ethics: W. Frankena
• Identity and Violence: Amartya Sen
• Twentieth Century Ethics: Roger Hancock
• Aspects of Hindu Morality: Saral Jhingram
• Practical Ethics: Peter Singer (Chs V,VII,VIII,X)
• Applied Ethics: Peter Singer (ed.)
• A Companion to Ethics: Peter Singer (Chs 14,19,22)
• A Companion to Bio-Ethics: Peter Singer & H. Kuhse (eds.)
• Human Rights-An Introduction: D.J. O'Byrne
• Man and Nature: G.F. MacLean (ed.)
• Human Rights, Gender and the Environment: Manisha Preya, Krishna Menon, MadhulikaBanerjee
• Gender: G. Geetha
• A Short Introduction to Feminist Theory: Rinita Mazumdar
• Feminist Thought: Shefali Moitra
• Justice and Care: Essential Readings in Feminist Ethics: Virginia Held (ed.)
• Language, Truth and Logic: A.J. Ayer
• The language of Morals: R.M. Hare

Bengali:

• Nitishastra: Dikshit Gupta
• Vyavaharik Nitivijnan: N. Nandy & M. Bal
• Nitividya: Sanjib Ghosh
• Nitividyar Tattvakatha: Somnath Chakraborty
• Tattvagata Nitividya o Vyavaharik Nitividya: Samarendra Bhattacharya
• Vyavaharik Nitividya-Peter Singer: Pardip Kumar Roy (tr.)
• Prayogik Nitividya: A.S.M. Abdul Khalek
•Nitibidya- Shibapada Chakraborty

c) Philosophy of Language (Western)(6 Credits per week)

1) Syntax, Semantics, Pragmatics.
2) Word-meaning, Definitions.
3) Vagueness.
4) Sentence-meaning.
5) Testability and Meaning.

Suggested Readings:

English:

- The Philosophy of Language **:** A.P.Martinich
- An Introduction to Philosophical Analysis : John Hospers
- The Central Questions of Philosophy: A.J. Ayer
- Theory of Knowledge: A.J. Woozley

- The Problem of Knowledge: A.J. Ayer
- Language, Truth and Logic: A.J. Ayer
- Readings in Philosophical Analysis: J. Hospers
- An Introduction to Philosophy: Shibapada Chakraborty

Bengali:

- Darshanik Jijnasa (Bagarthatattva): Ramaprasad Das
- Darshanik Jijnasa (Jnanatattva-Jnaner Svarup): Ramaprasad Das
- Darshanik Jijnasa (Jnanatattva): Ramaprasad Das
- Darshanik Jijnasa (Paratattva o Bhauto Jagater Jnana): Ramaprasad Das
- Darshanik Bishlesaner Ruparekha (Pratham O dvitiya khanda): Samarikanta Samanta
- Paschatya darshaner Ruparekha: Ramaprasad Das o Shibapada Chakraborty

PHI-A-DSE-B(2)
Contemporary Indian Philosophy (Any one from the following options)

a) Swami Vivekananda (6 Credits per week)

1. Real nature of man.
2. Nature of Religion.
3. Ideal of Universal Religion.
4. Concept of Practical Vedanta.

Suggested Readings:
English:
• Contemporary Indian Philosophy: T.M.P. Mahadevan & G.V. Saroja
• Contemporary Indian Philosophy: Basant Kumar Lal
• Contemporary Indian Philosophy: Binoy Gopal Roy
• Practical Vedanta (Vol.II,pp-291-358): Swami Vivekananda
• Swami Vivekananda as a Philosopher: J.L. Shaw
• The Philosophy of Swami Vivekananda: Pradip Kumar Sengupta
• The Complete Works of Swami Vivekananda (Vol.I,pp-333-343 & II,pp-70-87,375-396):Mayavati Memorial Edition
• The Philosophy of Vivekananda: Govinda Dev
Bengali:

- Patraboli : Swami Vivekananda

b)Rabindranath Tagore (6 Credits per week)

1. Reality and God.
2. Nature of Man.
3. Surplus in man.
4. Nature of Religion.
5. Tagore's Humanism.

Suggested Readings:

English:

- Contemporary Indian Philosophy: T.M.P. Mahadevan & G.V. Saroja
- Contemporary Indian Philosophy: Basant Kumar Lal
- Contemporary Indian Philosophy: Binoy Gopal Roy
- Religion Of Man: Rabindranath Tagore
- The Philosophy of Rabindranath Tagore : Binay Gopal Roy
- Philosophy of Rabindranath Tagore: S. Radhakrishnan

Bengali:

- Rabindra Rachanabali (Khanda 12,pp-532-545,567-614): Janmashatbarshiki Samskaran
- Rabindra Darsan: Sachindranath Gangopadhyay, Pabitra Kumar Roy, Nripendranath Bandyopadhyay

c) Sri Aurobindo (6 Credits per week)

1. Reality as Sat-Cit-Ānanda
2. Nature of Creation, the World process: Descent or involution, Maya and Lila, Ascent orevolution.
3. Integral Yoga.

Suggested Readings:

English:

• Contemporary Indian Philosophy: T.M.P. Mahadevan & G.V. Saroja
• Contemporary Indian Philosophy: Basant Kumar Lal
• Contemporary Indian Philosophy: Binoy Gopal Roy
• Life Divine: Sri Aurobindo
• Synthesis of Yoga: Sri Aurobindo
• Integral Yoga: Sri Aurobindo
• Among the Great: Dilip Kumar Roy (Chapter on Sri Auribindo)
• Towards Supermanhood-The Philosophy of Sri Aurobindo: P.B. Chatterjee
• The Philosophy of Sri Aurobindo: Ramnath Sharma
• An Introduction to the Philosophy of Sri Aurobindo: S.K. Maitra
• Guide to Sri Aurobindo's Philosophy: K.D. Acharya
• Future Evolution of Man-The Divine Life Upon Earth: Sri Aurobindo
• Sri Aurobindo-The Prophet of Life Divine: Haridas Choudhuri
• Sri Aurobindo's Concept of the Superman: Chittaranjan Goswami

Bengali:

- Visva-Vivek: Asit kumar Bandyopadhyay, Sankari Prasad Basu, Sankar
- Manavjatir Bhabiswat Bibartan: Sri Aurobindo Ghosh
- Sri Aurobindo Katha: manmatho Mukhopadhyaya
- Divya Jivan: Srimat Anirban
- Yogo-samannay: Srimat Anirban
- Sri Aurobindo Janmo Satabarshiki Smarak Grantha: Sri Aurobindo Patha Mandir

d) M.K.Gandhi(6 Credits per week)

1. God and Truth.
2. Nature of Man.
3. Non-Violence
4. Satyāgraha
5. Swaraj
6. Theory of Trusteeship

Suggested Readings:

English:

• Contemporary Indian Philosophy: T.M.P. Mahadevan & G.V. Saroja
• Contemporary Indian Philosophy: Basant Kumar Lal
• Contemporary Indian Philosophy: Binoy Gopal Roy
• Hind Swaraj: M.K. Gandhi
• Trusteeship; M.K. Gandhi
• Selections from Gandhi: N.K. Bose
• Contemporary Indian Philosophy: S,Radhakrishnan& J.H. Murihead (eds.)
• The Evolution of Political Philosophy of Gandhi: Buddhadeb Bhattacharya
• Social and Political Thought of Gandhi: Jayantanuja Bandyopadhyay
• The Philosophy of Mahatma Gandhi: D.M. Dutta
• The Philosophy of Sarvodaya: K.S. Bharathi
• Gandhi's Political Philosophy: Bhikhu Parekh

Bengali:

• Sarvodaya Andoloner Itihas: Gurudas Bandyopadhyay
• Gandhi Parikrama: Sailesh Kumar Bandyopadhyay
• Gandhi Rachanasambhar: M.K. Gandhi

SKILL ENHANCEMENT COURSE

Semester 3

PHI-A-SEC- A (any one from the following options)

a)Logical Reasoning and application : Indian and Western (2 Credits per week)

1.The main objective of logical reasoning.
2.Reasoning in practice:
(i). Fallacy of relevance, Fallacies of ambiguity, Fallacies of weak induction, Avoiding fallacies
(ii)Different kinds of Hetvābhāsa-s after Nyāya system
(iii)Logical applications of the concept of pakṣatā
(iv)Functional applications of ordinary operative relations between sense-organs and respective objects .

3.Logic and the Law:
(i) Laws, courts and arguments
(ii) Language in the law
(iii)The functions of legal Language
(iv) Fallacies in the law
(v) Definitions in the law

4.Inductive reasoning in Law
(i)The method of Inquiry in Law
(ii)Causation in Legal reasoning
(iii)Analogical Reasoning in legal argument
(iv)Probability in legal argument

5. Deductive Reasoning in Law
(i)Determining the correct rule of Law
(ii)Identifying, formulating, and applying rules of law
(iii)The law of libel
(iv)Logic is right reasoning

Suggested Readings:
English:

- Introduction to Logic (9th Edition) : I. M. Copi & C. Cohen, Prentice Hall of India Pvt. Ltd., New Delhi, 1999.
- The Elements of Logic (5th Edition): S.F.Barker, McGraw-Hill Book Company, 1988.
- Introduction to Logic : P.J. Hurley, Wadsworth, 2007.
- The Concept of Logical Fallacies: Nandita Bandyopadhaya

Bengali:

- Tarkasaṁgraha: Annaṁbhatta
- Tarkasaṁgraha: M.R. Bodas & Y.V. Athalye (tr. &ed.)
- Tarkasaṁgraha with Dipika: Narayan Chandra Goswami
- Tarkasaṁgraha with Dipika: Indira Mukhopadhyay
- Tarkasaṁgraha with Dipika: Panchanan Shastri
- Tarkasaṁgraha with Dipika: Kanailal Poddar

b)Man and Environment (2 Credits per week)

a) Classical Indian Attitude to Environment

i) The Upanisadic world-view, ii) Tagore's understanding of nature, iii) The post-Upanisadic view of nature

b)Respect for Nature

i) The attitude of respect, ii) Bio-centric outlook to nature, iii) Ethical standards and rules that follow from the attitude of respect to nature, iv) The idea of inherent worth of nature.

c)Intrinsic Value of nature

i)Moore's talk of 'intrinsic properties', ii) Chilsom's idea of intrinsic value, iii) Attfield on the intrinsic value of nature, iv) Callicott's idea of intrinsic value of nature, v) Rolston III on intrinsic value of nature, vi) intrinsic value and objective value

d)Deep Ecology and its Third World Critique

i)Arne Naess on Deep Ecology, ii) Ramchandra Guha's critique of Deep Ecology

e)Eco-feminism

i)Understanding nature and the feminine, ii) Dualisms in Western tradition, iii) Masculinity, humanity and nature.

Suggested Readings

English:

1. 'Attitudes to Nature' John Passmore , Environmental Ethics (ed.) Robert Elliot, Oxford University Press, Oxford, 1998

2.Sadhana (first Chapter), Rabindranath Tagore, Macmillan, New York, 1915

3.Respect for Nature: A Theory of Environmental Ethics (Select Parts), Paul Taylor, Princeton University Press, Princeton, 1986

4. 'Intrinsic value, Environmental Obligation and Naturalness', Robert Elliot, Monist, 1975
5. 'The Shallow and the Deep, Long-Range Ecology Movements: A Summary', Arne Naess, Inquiry, 1973

6.Nature, Self and Gender: Feminism, Environmental Philosophy and the Critique of Rationalism, Val Plumwood, Environmental Ethics (ed.) Robert Elliot, Oxford University Press, Oxford, 1998

Bengali:

7.Paribesh o Naitikata, Nirmalya Narayan Chakraborty, Progressive Book Forum, Kolkata, 2002

Semester 4

PHI-A-SEC- B(any one from the following options)

a) Emerging trends of thought(2 Credits per week)
(any two from the following)

A. Business Ethics

B.Environmental Philosophy

C.Feminist Philosophy

D. Peace Studies

E.Recent trends in ethics

A. Business Ethics

1. Why Study Business Ethics?
   i)Ethical Issues in business
   ii) Ethical principles in business
2. Environment and Business Ethics
   i)Business ethics and environmental values
   ii)Ethics of conserving depletable resources
3. Ethics in Management
   i)Management by Value Programmes: a qualitative appraisal
   ii) Ethical vision of Management : A Vedantic outline

Suggested Reading:

English:

- Business Ethics(7^{th} edition) : Manuel G. Velasquez (Chapter 1,2&5)

- Ethics in Management : S. K. Chakraborty (Chapter 1&5)
- Management by Values -towards cultural congruence : S.K.Chakraborty
- Management Ethics-integrity at work: J.A.Patrick & John F. Quinn
- Business Ethics and Corporate Governance, Pearson Education India
- Business Ethics-an introduction to the ethics of values:Lucjan Klimsza

B. Environmental Philosophy

Suggested Readings:
English :

1. 'Attitudes to Nature'John Passmore,, Environmental Ethics (ed.) Robert Elliot, Oxford University Press, Oxford, 1998
2. Respect for Nature: A Theory of Environmental Ethics (Select Parts),Paul Taylor, Princeton University Press, Princeton, 1986
3. 'Intrinsic value, Environmental Obligation and Naturalness', Robert ElliotMonist, 1975
4. 'The Shallow and the Deep, Long-Range Ecology Movements: A Summary',Arne Naess, Inquiry, 1973
5. Nature, Self and Gender: Feminism, Environmental Philosophy and the Critique of Rationalism, Val Plumwood, Environmental Ethics (ed.) Robert Elliot, Oxford University Press, Oxford, 1998

Bengali:

6. Paribesh o Naitikata,Nirmalya Narayan Chakraborty, Progressive Book Forum, Kolkata, 2002

C.Feminist Philosophy
Suggested Readings:
English:

1) Feminist Thought: A Comprehensive Introduction, Rosemarie Tong ,Vol 1&2, Third Edition, Westview Press, 2009

2) Feminist Thought, Shefali Moitra, Munshiram Manoharlal Publishers Pvt .Ltd in association with Centre of Advanced Study in Philosophy, Jadavpur University, Kolkata, 2002

3) The Second Sex, Simone De Beauvoir, Vintage Books, London, 2001

4) A Companion to Feminist Philosophy (ed. Alison, M, Jaggar and Iris Marion Young), Willey-Blackwell, 1999

5) Feminist Knowledge (RLE Feminist Theory) Critique and Construct,(ed.Sneja Gunew),Routledge Library Editions,2014

6) Representing Reason: Feminist Theory and Formal Logic, (in ed.Rachel Jaffe Falmange and Marjorie Hans), Rowman and Littlefield Publisher, 2002

Bengali:

7) Narivad,Rajasree Basu, Paschimbanga Rajya Pustak Parshad,Kolkata,2012.(Bengali)

8) Naitikata o Narivad, Shefali moitra ,New age Publishers Pvt Ltd,Kolkata,2003.(Bengali)

D. Peace Studies

Suggested Readings:
English:

1) Introduction to Peace Studies, David P. Barash , Belmont: Wadsworth, 1991.

2) 'International Relations', in The English Writings of RabindranathTagore: A Miscellany, (ed) Sisir Kumar Das, New Delhi: Sahitya Akademi, reprint 2006.

3) Handbook of Peace and Conflict Studies, Charles Webel and Johan Galtung(eds.): Routledge, London and New York, 2007

E.Recent Trends in Ethics

Suggested Readings:
English:

1. John F. Fitzgibbon: Ethics: Fundamental Principles of Moral philosophy, University Press of America, 1983

2. Moral Dilemmas, Christopher W. Gowans (ed): Oxford University Press, Oxford, 1987

3. Walter Sinnott-Armstrong: Moral Dilemma, Basil Blackwell, U.S.A., 1988

4. Daniel Statman (ed.): Moral Luck, State University of New York Press, New York, 1993

5. Bernard Williams: Moral Luck Philosophical Papers 1973-1980, CambridgeUniversityPress, Cambridge, 1981

6. Justine D'Arms & Daniel Jacobson (ed): Moral Psychology & Human Agency Philosophical Essays on the Science of Ethics, Oxford University Press, Oxford, 2014

7. Paul Katsafanas: Agency and the Foundations of Ethics—Netzschean Constitutivism, Oxford University Press, Oxford, 2013

8. John Matin Fischer and Mark Ravizza (ed): Perspectives on Moral Responsibility, Cornell University Press, Ithaca and Landon, 1993.

b) Philosophy of Human Rights (2 Credits per week)

1. A Definition and Nature of Human Rights
2. The Idea of Human Rights: Its Origins and Historical Developments during Ancient period, Modern period and Contemporary period
3. The Idea of Natural Law and Natural Rights: Thomas Hobbes and John Locke.
4. The Natural Rights Tradition: Some Reactions from Jeremy Bentham, Edmund Burke and Thomas Paine
5. Natural Right, Fundamental Right and Human Right
6. Preamble, Fundamental Rights and Duties (Indian Constitution)
7. Contemporary Perspectives: Joel Feinberg—Basic Rights

Suggested Readings:
English:

- Patrick Hayden (ed.): The Philosophy of Human Rights, Paragon House, St. Paul, First Edition, 2001.
- Morton E. Winston (ed.): The Philosophy of Human Rights, Wadsworth Publishing Co. Belmont, California, 1989.
- Jeremy Waldron (ed.): Theories of Rights, Oxford University Press, Oxford, 1984
- Ashwani Peetush and Jay Drydyk: Human Rights*: India and West*, Oxford University Press, New Delhi, 2015.
- James Nickel: Making Sense of Human Rights, Blackwell Publishing, Oxford, 2007.
- Henry Shue: Basic Rights: Subsistence, Affluence and U. S. Foreign Policy, Princeton University Press, Princeton, 1980.
- Gary, B. Herbert: Philosophical History of Human rights, Transaction Publishers, New Jersey, 2002.
- Michael Freeden: Rights, Worldview Publications, New Delhi, 1998.

- Lynn Hunt: Inventing Human Rights: A History, Norton & Company, New York, 2007.
- Jack Donnelly: Universal Human rights in Theory and Practice, Manas Publications, New Delhi, 2013.

Semester-wise Course for B.A.(General)

	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6
Core Course (CC)	2TH+2TU CC-1	2TH+2TU CC-2	2TH+2TU CC-3	2TH+2TU CC-4		
Language (LCC)			1TH+1TU LCC1(1)	1TH+1TU LCC2(1)	1TH+1TU LCC1(2)	1TH+1TU LCC2(2)
Generic Elective (GE)	1TH+1TU GE-1	1TH+1TU GE-2				
Discipline Specific Elective (DSE)					2TH+2TU DSE-A (1A+2A)	2TH+2TU DSE-B (1B+2B)
Ability Enhancement Compulsory Course (AECC)	1TH+0TU AECC-1	1TH+0TU AECC-2				
Skill Enhancement Course (SEC)			1TH+0TU SEC-A	1TH+0TU SEC-B	1TH+0TU SEC-A	1TH+0TU SEC-B
Total No. of Courses and Marks	4 x 100 = 400	4 x 100 = 400	4 x 100 = 400	4 x 100 = 400	4 x 100 = 400	4 x 100 = 400
Total Credits	20	20	20	20	20	20

TH = Theory T = Tutorial

- ❖ CC/LCC/GE/DSE : Each Theory and Tutorial Course have 5 and 1 Credit(s) respectively
- ❖ CC : 4 Courses each form 2 subjects (one course from each subject under each semester)
- ❖ LCC : LCC1-English courses; LCC2-MIL/Alternative English
- ❖ GE : Two courses from one subject different from core subjects including LCC
- ❖ DSE : 2 Courses each from 2 subjects
- ❖ AECC/SEC : Each Course has 2 Credits
- ❖ AECC-1 : Communicative English / MIL; AECC-2 : Environmental Studies

University of Calcutta

BA (General)-CBCS Syllabus in Philosophy, 2018

A. Core Courses [Four courses; Each course: 6 credits (5 theoretical segment+ 1 for tutorial-related segment). Total: 24 credits (Th 5×15weeks=75 ; Tutorial 1×15 weeks= 15)]
B. Discipline Specific Elective [Four courses; Each course: 6 credits (5 theoretical segment+ 1 for tutorial-related segment). Total: 24 credits (Th 5×15weeks=75 ; Tutorial 1×15 weeks= 15)]
C. Generic Elective [Two courses; Each course: 6 credits (5 theoretical segment+ 1 for tutorial-related segment). Total: 12 credits (Th 5×15weeks=75 ; Tutorial 1×15 weeks= 15)]
   Core couses of 'General syllabus' will be treated as Generic Elective (GE) of 'Honours Syllabus'.
D. Skill Enhancement [Two courses from each subject; Each course: 2 credits (No Tutorial segment). Total: 04 credits (2×15weeks =30)

- Each course (CC& DSE) carries 80 marks and Minimum 80 classes (SEC-60).
- 65 marks for theoretical segment: 55 marks for descriptive questions + 10 marks for 1 mark questions.
- Skill Enhancement course carries 80 marks and minimum 50 classes: 80 marks for theoretical segment, there is no tutorial segment.
- Question Pattern for descriptive segment of 55 marks: 5 short questions out of 8 (5x5 = 25) + 2 questions out of 4(15 x 2 = 30).
- 15 marks for tutorial [The topics (within the syllabus) are to be decided by the concerned faculty of respective colleges.]

IMPORTANT NOTES:

- Cited advanced texts in Bengali are not necessarily substitutes, but supplementary to the English books.

- The format is subject to the common structural CBCS format of the University.

- The Skill enhancement course, based on the UGC Guidelines, have the common goal of developing specific skills of students of the discipline for better employment opportunities.

Semester 1
PHI-G-CC-1 Indian Epistemology and Metaphysics
Semester 2
PHI-G-CC-2 Western Epistemology and Metaphysics
Semester 3
PHI-G-CC-3 Western Logic
Semester 4
PHI-G-CC-4 Philosophy of Mind

Discipline Specific Elective
Semester 5
PHI-G-DSE-A(Any one from the following options)
a)Ethics : Indian and Western
b)Social and Political Philosophy

Semester 6
PHI-G-DSE-B (Any one from the following optoions)
a)Applied Ethics and Philosophy of Religion.
b)Contemporary Indian Thought

Skill Enhancement Elective course:

PHI-G-SEC-A(Any one from the following options either in Semester 3 or in Semester 5)
a)Logical Reasoning and Application
b)Business Ethics

PHI-G-SEC-B (Any one from the following options either in Semester 4 or in Semester 6)
a)Man and Environment
b)Value Education

Semester 1

PHI-G-CC-1Indian Epistemology and Metaphysics (6 Credits per week)

A. Cārvāka Epistemology: Perception as the only source of knowledge; Refutation of Inference and Testimony as source of knowledge.

B. Nyāya Epistemology: The nature of perception; laukikasannikarṣa; Determinate (savikalpaka) and Indeterminate (nirvikalpaka): anumāna; sādhya, pakṣa, hetu,vyāpti, parāmarśa and vyāptigraha. Svārthānumitiand parārthānumiti, pañcāvayavīnyāya.

C. Vaiśeṣika Metaphysics: Categories – dravya, guna, karma, sāmānya, viśeṣa, samavāya and abhāva.

D. Advaita Metaphysics: Brahman, māyā, The relation between jīva and Brahman.

Suggested Readings:

English:

•A Critical Survey of Indian Philosophy: C.D. Sharma

•An Introduction to Indian Philosophy: D. M. Dutta & S.C. Chatterjee

Bengali:

•Bharatiya Darshan: Nirodbaran Chakraborty

•Lokayata Darshan: Debiprasad Chatoopadhyay

•Nyaya-Vaisesika Darshan: Karuna Bhattacharya

•Bharatiya Darshan: Samarendra Bhattacharya

Semester 2

PHI-G-CC-2 Western Epistemology and Metaphysics (6 Credits per week)

A. Different senses of 'Know'. Conditions of Propositional Knowledge, Origin of Concepts. Concept Rationalism-Views of Descartes and Leibniz, Concept Empiricism –Views of Locke, Berkeley and Hume.

B. Theories of the origin of Knowledge:Rationalism, Empiricism, Kant's Critical Theory.
C. Realism: Naive Realism, Locke's Representative, Realism, Subjective Idealism (Berkeley).
D. Causality: Entailment Theory, RegularityTheory.
E. Mind- Body Problem: Interactionism, Parallelism and the Identity Theory.

Suggested Readings:

English:

- An Introduction to Philosophical Analysis: J. Hospers
- An Introduction to Philosophy: Shibapada Chakraborty

Bengali:

- Paschatya Darshan O Yuktivijnan: Ramaprasad Das
- Pashchatya Darshaner Ruparekha: Ramaprasad das o Sibapada Chakrabarty
- Paschatya Darshan O Yuktivijnan: Samir Kumar Chakrabarty
- Paschatya Darshan: Samarendra Bhattacharyya

Semester 3

PHI-G-CC-3Western Logic (6 Credits per week)

A. Introductory topics: Sentence, proposition, argument, truth and validity.
B. Aristotelian classification of categorical propositions, distribution of terms. ExistentialImport, Booleaninterpretation of categorical propositions. Immediate inference. Immediate inference based on the square of opposition, conversion, obversion and contraposition.
C. Categorical syllogism: Figure, mood, rules for validity, Venn Diagram method of testing validity, fallacies.
D. Symbolic Logic: Use of symbols, Truth-functions: Negation, Conjunction, disjunction, implication, equivalence.
E. Tautology, Contradiction, Contingent statement forms. Construction of truth-table, using truth-tables for testing the validity of arguments and statement forms.

F. Mill's methods of experimental inquiry.

Suggested Readings

English:

- Introduction to Logic (13th edn): I.M. Copi and C. Cohen

Bengali:

- Paschatya Darshan O Yuktivijnan: Ramaprasad Das
- Paschatya Darsan O Yuktivijnan: Samir Kumar Chakrabarty

Semester 4

PHI-G-CC-4Philosophy of Mind. (6 Credits per week)

A. Sensation: What is sensation? Attributes of sensation. Perception: What is perception? Relation between sensation and perception, Gestalt theory of perception, illusion and hallucination.
B. Consciousness: Conscious, Subconscious,Unconscious,Evidence for the existence of the Unconscious, Freud's theory of dream.
C. Memory: Factors of memory, Laws of association, Forgetfulness. Learning: The trialand Error theory, Pavlov's Conditioned Responsetheory, Gestalt theory.
D. Intelligence: Measurement of Intelligence, I.Q.,Testof Intelligence, Binnet-Simon test.

Suggested Readings

English:

- A Textbook of Psychology: Pareshnath Bhattacharya
- Introduction to Psychology: G.T.Morgan
- A Modern Introduction to Psychology: Rex Knight & M. Knight

Bengali:

- Manovidya: Priti Bhusan Chattopadhyay
- Manividya: Paresh Nath Bhattacharya
- Manovidya: Ira Sengupta

Semester 5

PHI-G-DSE-A

Any one from the following options

a)Ethics: Indian and Western(6Credits per week)

A. Four Purusarthās – dharma, artha, kāma and mokṣa and their interrelation. Karma (Sakāma&Niṣkāma), CārvākaEthics.
B. Buddhist Ethics: The Four Noble Truths and theEight-FoldPath.
C. Moral and Non-Moral Actions, Object of Moral Judgement.
D. Teleological Ethics: Utilitarianism (Bentham and Mill) Deontological Ethics: Kant's Moral Theory.
E. Theories of Punishment.

Suggested Readings:
English:

- The Fundamentals of Hinduism- A Philosophical Study:S. C. Chatterjee
- The Ethics of Hindus: S.K. Maitra
- Principles of Ethics: P.B. Chatterjee
- A Mannual of Ethics: J. S. Mackenzie
- Ethics: W. Frankena
- An Introduction to Ethics: W. Lillie

Bengali:

- Nitishastra: Dikshit Gupta
- Nitividya: Somnath Chakraborty
- Nitividya: Samarendra Bhattacharya
- Nitividyar Tattvakatha: Somnath Chakraborty
- Nitividya: Sanjib Ghosh

b)Social and Political Philosophy (6 Credits per week)

A. Relation between Social Philosophy and Political Philosophy
B. Primary Concepts: Society, Community, Association, Institution, Family.
C. Social Class and Caste: Principles of Class and Caste; Marxist conception of class; ClassAttitudes and Class consciousness
D. Social Codes and Sanctions; Custom and Law; Culture and Civilisation.
E. Social Changes: Marx and Gandhi.
F. Political Ideals: Democracy: Its Different Forms. Socialism: Utopian and Scientific Socialism.

Suggested Readings:
English:

- Fundamentals of Sociology : P. Gisbert
- Outlines of Social Philosophy : J. S. Mackenzie
- Problems of Political Philosophy : D. D. Raphael

- Society : R. M. MacIver & C. H. Page
- Sociology : M. Ginsberg
- Sociology : Tom Bottomore
- Sociology : S. N. Shankara Rao
- Sociology : D. C. Bhattacharya
- Sociology : P.B. Kar
- Guide to Modern Thought : C. E. M. Joad
- Introduction to Modern Political Theory: C.E.M. Joad
- The Evolution of Political Philosophy of Gandhi: Buddhadeb Bhattacharya
- Social and Political Thought of Gandhi: Jayantanuja Bandyopadhyay
- Religion in India: T.N.Madan(ed.)
- Religion and society: S. Radhakrishnan
- Secularisim in the present Indian Society: Amal Kumar Mukherjee
- Secularism and its Critics: Rajeev Bhargava(ed.)
- Unravelling the Nation-Secular conflict and india's Secular Identity: Kaushil Basu & Sanjay Subramaniyam (ed.)
- India as a Secular State: D.E. Smith
- The Philosophy of Mahatma Gandhi: D. M. Dutta
- The Philosophy of Sarvodaya: K. S. Bharathi
- Communist Manifesto: Karl Marx & Frederick Engels
- Socialism- Utopian and Scientific: F. Engels
- Open Society and Its Enemies: Karl Popper
- The Open Philosophy and The Open Society: M. Cornforth
- Political Thought: C. L. Wayper
- Political Philosophy- An introduction W. T. Blackstone
- Western Political Thought: Brian R. Nelson

Bengali:

- Samaj Darshan Dipika: Pritibhusan Chattopadhyay
- Samaj Tattva: Parimal Bhusan Kar
- Samaj Tattve: T. Bottomore
- Bisay Samaj Darshan: Anadi Kumar Mahapatra
- Samjdarshan O Rashtradarshaner Parichoy: A. K. MahapatraO P.Mukherjee
- Rashtradarshaner Dhara: Amal Kumar Mukhopadhyay
- Samyabader Istehar: Marx O Engels
- Samajtantra-Kalponik O Baijnanik: F. Engels
- Marxiya Rashtrachinta: Shovan Lal Dutta Gupta
- Sarvodaya Andoloner Itihas: Gurudas Bandyopadhyay
- Gandhi Rachanasambhar: M.K.Gandhi

Semester 6

PHI-G-DSE-B
Any one from the following optoions
a)Applied Ethics and Philosophy of Religion. (6 Credits per week)

A. Concepts of Applied Ethics.
B. Killing: Suicide, Euthanasia.
C. Famine, Affluence and Morality.
D. Environmental Ethics: Value Beyond Sentient Beings, Reverence for life, Deep Ecology.
E. Nature & Concerns of Philosophy of Religion. Argument for the existence of God: Cosmological argument, Ontological argument and Teleological argument.
F. Problem of Evil and Suffering.
G. Grounds for disbelief in God: Sociological theory of Durkheim, Freudian Theory, CārvākaView.

Suggested Readings:
English:

- Practical Ethics: Peter Singer
- Applied Ethics: Peter Singer (ed)
- Philosophy of Religion: M. Edwards
- The Idea of God: Pringle Patison
- Atheism in Indian Philosophy: D. P. Chatterjee
- Philosophy of Religion: J. Hick
- An Introduction to the Philosophy of Religion: Brian Davies
- Indian Philosophy of Religion: A. Sharma

Bengali:

- Vyavaharik Nitivijnan: N. Nandy & M. Bal
- Dharma Darshan: A. Bandyopadhyay O K.C. Gupta
- Dharma Darshan : Rabindranath Das
- Dharma Darshan: Sushil Kumar Chakraborty
- Bharatiya Dharmaniti: Amita Chattopadhyay (Sampadita)
- Bharatiya Darshane Nirishvarvada: B. B. Purakayastha (pp39-50,56-66)

b)Contemporary Indian Thought (6 Credits per week)

i)Swami Vivekananda: Nature of Man, Nature of Religion, Ideal of

universal religion, Practical Vedānta

ii)M.K. Gandhi : Nature of man, non-violence, satyāgraha, theory of trusteeship

iii)B.R. Ambedkar: Critique of social evils, Dalit movement

Suggested Readings:

English:

- Practical Vedanta(Vol II, pp. 291—358): Swami Vivekananda
- Swami Vivekananda as a Philosopher: J.L. Shaw
- The Philosophy of Swami Vivekananda : Pradip Kumar Sengupta
- The Philosophy of Mahatma Gandhi: D.M.Dutta
- The Philosophy of Sarvodaya: K.S. Bharati
- Gandhi's Political Philosophy: Bhikhu Parekh
- Dr.Ambedkar –Life & Mission: Dhananjoy Keer
- Social Philosophy of B. R. Ambedkar: D.R. Jatava

Bengali:

- Chintanayak Vivekananda:Swami Lokeshwarananda(ed)
- Visva—Vivek: Asit Kr Bandyopadhyay, Shankari Prasad Basu, Shankar.
- Sarvodaya Andoloner Itihas: Gurudas Bandyopadhyay
- Gandhi Parikrama: Sailesh Kumar Bandyopadhyay

Skill Enhancement Elective course

PHI-G-SEC-A(Any one from the following options either in Semester 3 or in Semester 5)

a)Logical Reasoning and Application (2 Credits per week)

1.The main objective of logical reasoning.

2. Definitions: Pakṣa, sādhya, hetu, sapakṣa and Vipakṣa.

3.Construction of kevalānvayī, kevalavyātirekī anvayvyātirekī anumiti.

4.Hetvābhāsa and its different kinds, detection of hetvābhāsa.

5.Reasoning in practice:

i)Fallacy of relevance, Fallacies of ambiguity, Fallacies of weak induction, Avoiding fallacies

ii)Logical applications of the concept of pakṣatā

iii)Functional applications of ordinary operative relations between sense-organs and respective objects.

6.Inductive reasoning in Law

(i) The method of Inquiry in Law

(ii) Causation in Legal reasoning
(iii) Analogical Reasoning in legal argument
(iv) Probability in legal argument.

7.Deductive Reasoning in Law
(i) Determining the correct rule of Law
(ii) Identifying, formulating, and applying rules of law.
(iii) The law of libel
(iv) Logic is right reasoning

Suggested Readings:
English:

- Introduction to Logic (9th Edition) : I. M. Copi & C. Cohen, Prentice Hall of India Pvt. Ltd., New Delhi, 1999.
- The Elements of Logic (5th Edition): S.F.Barker, McGraw-Hill Book Company, 1988.
- Introduction to Logic : P.J. Hurley, Wadsworth, 2007.
- Tarkasaṁgraha: Annaṁbhatta
- Word and the World: B.K. Matilal
- Tarkasaṁgraha: M.R. Bodas & Y.V. Athalye (tr. &ed.)
- The Concept of Logical Fallacies: Nandita Bandyopadhaya

Bengali:

- Tarkasaṁgraha with Dipika: Narayan Chandra Goswami
- Tarkasaṁgraha with Dipika: Indira Mukhopadhyay
- Tarkasaṁgraha with Dipika: Panchanan Shastri
- Tarkasaṁgraha with Dipika: Kanailal Poddar

b)Business Ethics

1.Why Study Business Ethics?
i)Ethical Issues in business
ii) Ethical principles in business
2.Environment and Business Ethics
i)Business ethics and environmental values
ii)Ethics of conserving depletable resources
3.Ethics in Management
i)Management by Value Programmes: a qualitative appraisal
ii) Ethical vision of Management : A Vedantic outline

Suggested Reading:
English:
1.Business Ethics(7th edition) : Manuel G. Velasquez (Chapter 1,2&5)
2.Ethics in Management : S. K. Chakraborty (Chapter 1&5)
3.Management by Values -towards cultural congruence : S.K.Chakraborty

4.Management Ethics-integrity at work: J.A.Patrick & John F. Quinn
5.Business Ethics and Corporate Governance, Pearson Education India
6.Business Ethics-an introduction to the ethics of values:Lucjan Klimsza

PHI-G-SEC-B (Any one from the following options either in Semester 4 or in Semester 6)

a)Man and Environment (2 Credits per week)

A. Classical Indian Attitude to Environment

i) The Upanisadic world-view, ii) Tagore's understanding of nature, iii) The post-Upanisadic view of nature

B. Respect for Nature

i) The attitude of respect, ii) Bio-centric outlook to nature, iii) Ethical standards and rules that follow from the attitude of respect to nature, iv) The idea of inherent worth of nature.

C. Intrinsic Value of nature

B. Moore's talk of 'intrinsic properties', ii) Chilsom's idea of intrinsic value, iii) Attfield on the intrinsic value of nature, iv) Callicott's idea of intrinsic value of nature, v) Rolston III on intrinsic value of nature, vi) intrinsic value and objective value

D. Deep Ecology and its Third World Critique

i)Arne Naess on Deep Ecology, ii) Ramchandra Guha's critique of Deep Ecology

E. Eco-feminism

i) Understanding nature and the feminine, ii) Dualisms in Western tradition, iii) Masculinity, humanity and nature.

Suggested Readings
English:

1. 'Attitudes to Nature'John Passmore , Environmental Ethics (ed.) Robert Elliot, Oxford University Press, Oxford, 1998
2. Sadhana (first Chapter), Rabindranath Tagore, Macmillan, New York, 1915

3. Respect for Nature: A Theory of Environmental Ethics (Select Parts),Paul Taylor, Princeton University Press, Princeton, 1986
4. 'Intrinsic value, Environmental Obligation and Naturalness',Robert Elliot, Monist, 1975
5. 'The Shallow and the Deep, Long-Range Ecology Movements: A Summary',Arne Naess, Inquiry, 1973
6. Nature, Self and Gender: Feminism, Environmental Philosophy and the Critique of Rationalism,Val Plumwood, Environmental Ethics (ed.) Robert Elliot, Oxford University Press, Oxford, 1998

Bengali:

7. Paribesh o Naitikata,Nirmalya Narayan Chakraborty, Progressive Book Forum, Kolkata, 2002

b)Value Education (2 Credits per week)

a) Meaning, Characteristics, significance and objectives of Value education
b) Values in different contexts: Individual, Social, Cultural, Moral and Global and Spiritual.
c) Meaning and Characteristics of Peace education
d) Aims and Objectives of Peace Education
e) Types of peace education
f) Peace and Value Education in Global Perspective.

Suggested Readings:

English:

- Introduction to Peace Studies: David P. Barash Belmont
- 'International Relations', in The English Writings of Rabindranath Tagore: A Miscellany, (ed) Sisir Kumar Das: Rabindra Nath Tagore.
- Handbook of Peace and Conflict Studies: Charles Webel and Johan Galtung(eds.).
- Peace and Value Education: Babu Muthuja.
- Philosophy of Value: Aditya Mohanty

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

University of Calcutta

Final Draft BA (Honours)-CBCS Syllabus in Political Science, 2018 (Section I)

Core Courses

[Fourteen courses; Each course: 6 credits (5 theoretical segment+ 1 for tutorial-related segment). Total: 84 credits (1400 marks).

- Each course carries 80 marks^ ^^ (plus 10 marks each for Attendance and Internal Assessment).
- Minimum 30 classes for Theory and 15 contact hours for Tutorial per module.

^End Semester Assessment for each course--- 65 marks for theoretical segment: 50 marks for subjective/descriptive questions + 15 marks for category of 1 mark-questions. Question Pattern for subjective/descriptive segment of 50 marks: 2 questions (within 100 words; one from each module) out of 4 (10 x2 = 20) + 2 questions (within 500 words; one from each module) out of 4 (15 x 2 = 30).

^^15 marks for tutorial-related segments as suggested below (any one item from each mode):

i) Written mode: upto 1000 words for one Term Paper/upto 500 words for each of the two Term Papers/ equivalent Book Review/equivalent Comprehension/equivalent Quotation or Excerpt Elaboration.

ii) Presentation Mode: Report Presentation/Poster Presentation/Field work--- based on syllabus-related and/or current topics (May be done in groups)[The modes and themes and/or topics are be decided by the concerned faculty members of respective colleges.]

- Core courses: First 2 each in Semesters 1 and 2;Next 3 each in Semesters 3 and 4; 2 each in Semesters 5 and 6. [Sequentially arranged]

IMPORTANT NOTES:

- The Readings provided below include many of those of the UGC Model CBCS Syllabus in Political Science. For further details of Course Objectives and additional references it is advised that the UGC model CBCS syllabus* concerning relevant courses and topics be provided due importance and primarily consulted.
  *Website: BA Political Science (Honours): https://www.ugc.ac.in/pdfnews/2085906_B.A-Hons.-Pol-Science.pdf
- Cited advanced texts in Bengali are not necessarily substitutes, but supplementary to the English books.
- Paper Code Format: Subject-Course-Semester-Paper Number-Paper Component.
- The format isstrictly subject to the parameters of the common structural CBCS format of the University.

List of Core Courses

1 – Understanding Political Theory: Concepts

2 - Understanding Political Theory: Approaches and Debates

3 - Constitutional Government in India

4 – Politics in India: Structures and Processes

5 – Indian Political Thought – I

6 - Comparative Government and Politics

7 – Perspectives on International Relations

8 - Indian Political Thought – II

9 – Global Politics since 1945

10 – Western Political Thought & Theory I

11 – Western Political Thought & Theory II

12 - Political Sociology

13 – Public Administration: Concepts and Perspectives

14 – Administration and Public Policy in India

[Semester-level break-up provided below]

Semester I

Understanding Political Theory: Concepts Code: PLS-A-CC-1-1-TH+TU

Module I:

1.Conceptualising politics: meaning of *political*.
2.Key concepts I: State; Nation; Sovereignty (evolution); Power and Authority--- types and linkages;
3.Key concepts II: Law. Liberty, Equality--- interrelationships.

Module II:

4. Key concepts III: Rights; Justice (with special reference to Rawls); Freedom.
5. Key concepts IV: Democracy (with special reference to David Held); Authoritarianism.
6. Key concepts V: Citizenship.

Readings:

Bhargava, R. (2008) 'What is Political Theory' in Bhargava, R and Acharya, A. (eds.) PoliticalTheory: An Introduction.pp. 2-16.
Bellamy, R. (1993) 'Introduction: The Demise and Rise of Political Theory', in Bellamy, R. (ed.) Theories and Concepts of Politics. New York: Manchester University Press, pp. 1-14.
Glaser, D. (1995) 'Normative Theory', in Marsh, D. and Stoker, G. (eds.) Theory and Methodsin Political Science. London: Macmillan, pp. 21-40.
D. Held: Political Theory Today.
D. Held: Models of Democracy.
N. Daniels: Reading Rawls.
Andrew Heywood: The Basic Political Concepts.
S. Ramaswamy: Political Theory--- Ideas and Concepts.
S.P. Verma: Modern Political Theory.
T. Ball and R. Bellamy: Twentieth Century Political Thought.
R. Bellamy: Theories and Concepts in Politics: An Introduction.
C. McKinnan: Issues in Political Theory.
Menon, Krishna. (2008) 'Justice', in Bhargava, Rajeev and Acharya, Ashok. (eds.) PoliticalTheory: An Introduction, pp. 74-86.

Understanding Political Theory: Approachesand Debates Code: PLS-A-CC-1-2-TH+TU

Module I:

1.Approaches I: Normative; Legal-Institutional; Empirical-Behavioual---Systems Analysis; Structural Functionalism.
2. Approaches II: Liberalism; Social Welfarism; Neo-Liberalism.
3. Approaches III: Postcolonial; Feminist.

Module II:

4.Marxian approach--- Dialectical Materialism and Historical Materialism.
5. Key ideas: State (focus on Relative Autonomy); Class and Class Struggle; Surplus Value; Alienation.
6. Party--- Democratic Centralism; Lenin-Rosa Luxemburg debate; Revolution--- Lenin and Mao. Hegemony and Civil Society: Gramsci.

Readings:

K. Marx and F. Engels: The Communist Manifesto.
V. I. Lenin: The State.
John Gray: Liberalism.
David McLellan: The Thought of Karl Marx.
David McLellan: Marxism after Marx.
Tom Bottomore ed.: A Dictionary of Marxist Thought.
D. Riaznov ed.: The Communist Manifesto of Marx and Engels.
M Cornforth: Dialectical Materialism.
R. Miliband: Marxism and Politics.
Laszek Kolakowski: Main Currents of Marxism (3 volumes).
Ravi Kumar: Contemporary Readings in Marxism.
Kymlicka: Multiculturalism.
Marxist Internet Archive: www.marxist.org
Gurpreet Mahajan: The Multicultural Path.
R. Young: Postcolonialism: A Very Short Introduction.
Richard Bellamy: Citizenship: A Very Short Introduction.
Margaret Walters: Feminism: A Very Short Introduction.
Arpita Mukhopadhyay: Feminisms.

For Courses I and II:
কার্ল মার্ক্স ও ফ্রিডরিশ এঙ্গেলস রচনা সংকলন
লেনিন নির্বাচিত রচনাবলী (বড়ো খণ্ড)
টম বটমোরঃ মার্ক্সীয় সমাজতত্ব (অনুবাদঃ হিমাংশু ঘোষ)
দীপক কুমার দাস (সম্পাদিত): রাজনীতির তত্বকথা (২ খণ্ড)
শোভনলাল দত্তগুপ্ত : মার্কসীয় রাষ্ট্রচিন্তা (২০০৬ সং)
ভোলানাথ বন্দ্যোপাধ্যায় : মরিস কর্নফোর্থ:দ্বন্দ্বমূলক বস্তুবাদ (অনুবাদ)
চৈতালি বসু: রাজনীতিশাস্ত্র ও অভিজ্ঞতাবাদী রাষ্ট্রতন্ত্র
রাজশ্রী বসু ও বাসবী চক্রবর্তী (সম্পা): প্রসঙ্গ মানবীবিদ্যা
অশোক সরকার: রাষ্ট্রবিজ্ঞান অভিধান
শোভনলাল দত্তগুপ্ত, রতন খাসনবিশ, সৌরীন ভট্টাচার্য: উত্তর-উপনিবেশবাদ ও মার্কসবাদ
দেবারতি সেনগুপ্ত ও পারমিতা ব্যানার্জি: পিতৃতন্ত্র কাহাকে বলে (কমলা ভাসিনের What is Patriarchy-র অনুবাদ)

Semester II

Constitutional Government in India

Code: PLS-A-CC-2-3-TH+TU

Module I:

1.Evolution of the Indian Constitution. Role of the Constituent Assembly--- debates (overview). The Preamble.
2.Citizenship. Fundamental Rights and Duties. Directive Principles.
3.Nature of Indian Federalism: Union-State Relations.
4.Union Executive: President, Vice-President: election, position, functions (focus on Emergency Powers), Prime Minister, Council of Ministers, relationship of Prime Minister and President.

Module II:

5.Union Legislature: Rajya Sabha, Lok Sabha: Organisation, Functions – Lawmaking procedure, Parliamentary procedure, Privileges, Committee system. Speaker.
6.Government in states: Governor, Chief Minister and Council of Ministers: position and functions – State Legislature: composition and functions.
7.Judiciary: Supreme Court and the High Courts: composition and functions – Judicial activism.
8.Constitutional amendment. Major recommendations of National Commission to Review the Working of the Constitution.

Readings:

Constitution of India: Government of India.
G. Austin: The Indian Constitution.
G. Austin: Working a Democratic Constitution
S.K. Chaube: The Constituent Assembly--- Springboard of a Revolution (latest edition).
M.V. Pylee: India's Constitution.
S.L. Sikri: Indian Government and Politics.
S.C. Kashyap ed.: Perspectives on the Constitution.
A.G. Noorani: Constitutional Question in India.
G. Austin, (2010) 'The Constituent Assembly: Microcosm in Action', in The IndianConstitution: Cornerstone of a Nation, New Delhi: Oxford University Press, 15th print, pp.1-25.
R. Bhargava, (2008) 'Introduction: Outline of a Political Theory of the Indian Constitution', in R. Bhargava (ed.) Politics and Ethics of the Indian Constitution, New Delhi: Oxford University Press, pp. 1-40.
D. Basu, (2012) Introduction to the Constitution of India, New Delhi: Lexis Nexis.
S. K. Chaube, (2009) The Making and Working of the Indian Constitution, Delhi: National Book Trust.
G. Austin, (2000) 'The Social Revolution and the First Amendment', in Working a DemocraticConstitution, New Delhi: Oxford University Press, pp. 69-98.
B. Shankar and V. Rodrigues, (2011) 'The Changing Conception of Representation: Issues, Concerns and Institutions', in The Indian Parliament: A Democracy at Work, New Delhi: Oxford University Press, pp. 105-173.
V. Hewitt and S. Rai, (2010) 'Parliament', in P. Mehta and N. Jayal (eds.) The OxfordCompanion to Politics in India, New Delhi: Oxford University Press, pp. 28-42.
J. Manor, (2005) 'The Presidency', in D. Kapur and P. Mehta P. (eds.) Public Institutions inIndia, New Delhi: Oxford University Press, pp.105-127.
J. Manor, (1994) 'The Prime Minister and the President', in B. Dua and J. Manor (eds.) Nehruto the Nineties: The

Changing Office of the Prime Minister in India, Vancouver: University ofBritish Columbia Press, pp. 20-47.
H. Khare, (2003) 'Prime Minister and the Parliament: Redefining Accountability in the Age of Coalition Government', in A. Mehra and G. Kueck (eds.) The Indian Parliament: AComparative Perspective, New Delhi: Konark, pp. 350-368.
U. Baxi, (2010) 'The Judiciary as a Resource for Indian Democracy', Seminar, Issue 615, pp. 61-67.
R. Ramachandran, (2006) 'The Supreme Court and the Basic Structure Doctrine' in B. Kirpal et.al (eds.) Supreme but not Infallible: Essays in Honour of the Supreme Court of India, New Delhi: Oxford University Press, pp. 107-133.
M. Singh, and R. Saxena (eds.), (2011) 'Towards Greater Federalization,' in Indian Politics:Constitutional Foundations and Institutional Functioning, Delhi: PHI Learning Private Ltd., pp.166-195.
V. Marwah, (1995) 'Use and Abuse of Emergency Powers: The Indian Experience', in B. Arora and D. Verney (eds.) Multiple Identities in a Single State: Indian Federalism in a ComparativePerspective, Delhi: Konark, pp. 136-159.
Additional Reading:
The Constitution of India: Bare Act with Short Notes, (2011) New Delhi: Universal, pp. 4-16.

ভারতীয় সংবিধান (বাংলা সংস্করণ)
দূর্গাদাস বসু – ভারতের সংবিধান পরিচয়
সুভাষ সি কাশ্যপ – আমাদের সংবিধান (অনুবাদঃ পার্থ সরকার)
অমল কুমার মুখোপাধ্যায় – ভারতীয় সংবিধানের সহজ পাঠ

Politics in India:Structures and Processes Code: PLS-A-CC-2-4-TH+TU

Module I:

1.Party system: features and trends – major national political parties in India: ideologies and programmes. Coalition politics in India: nature and trends. Political parties in West Bengal: Overview.
2.Electoral process: Election Commission: composition, functions, role. Electoral reforms.
3. Role of business groups, working class, peasants in Indian politics.

Module IV:

4.Role of (a) religion (b) language (c) caste (d) tribe.
5. Regionalism in Indian politics.
6. New Social Movements since the 1970s: (a) environmental movements (b) women's movements (c) human rights movements.

Readings:

R. Kothari, (2002) 'The Congress System', in Z. Hasan (ed.) Parties and Party Politics in India, New Delhi: Oxford University Press, pp 39-55.
E. Sridharan, (2012) 'Introduction: Theorizing Democratic Consolidation, Parties and Coalitions', in Coalition Politics and Democratic Consolidation in Asia, New Delhi: Oxford University Press.
Y. Yadav and S. Palshikar, (2006) 'Party System and Electoral Politics in the Indian States, 1952-2002: From Hegemony to Convergence', in P. deSouza and E. Sridharan (eds.) India'sPolitical Parties, New Delhi: Sage Publications, pp. 73-115.
R. Hardgrave and S. Kochanek: India: Government and Politics in a Developing Nation (Latest edition).
S. Palshikar, (2008) 'The Indian State: Constitution and Beyond', in R. Bhargava (ed.) Politicsand Ethics of the Indian Constitution, New Delhi: Oxford University Press, pp. 143-163.
Partha Chatterjee: State and Politics in India.
Sudipta Kaviraj ed.: Politics in India.

R. Kothari, (1970) 'Introduction', in Caste in Indian Politics, Delhi: Orient Longman, pp.3-25. M. Weiner, (2001) 'The Struggle for Equality: Caste in Indian Politics', in Atul Kohli (ed.) TheSuccess of India's Democracy, New Delhi: Cambridge University Press, pp. 193-225.
C. J. Nirmal ed.: Human Rights in India.
Y. Yadav, (2000) 'Understanding the Second Democratic Upsurge', in F. Frankel, Z. Hasan, and R. Bhargava (eds.) Transforming India: Social and Political Dynamics in Democracy, New Delhi: Oxford University Press, pp. 120-145.
C. Jaffrelot, (2008) 'Why Should We Vote? The Indian Middle Class and the Functioning of World's Largest Democracy', in Religion, Caste and Politics in India, Delhi: Primus, pp. 604-619.
Deshpande, (2004) 'How Gendered was Women's Participation in Elections 2004?', Economic and Political Weekly, Vol. 39, No. 51, pp. 5431-5436.
Siddhartha Guha Roy: Human Rights, Democratic Rights and Popular Protest.
G. Shah: Social Movements in India.Raka Ray and M.F. Katzenstein eds.: Social Movements in India.
S. Corbridge and J. Harris: Reinventing India: Liberalization, Hindu nationalism and Popular Democracy.
Bipan Chandra et al.: India after Independence (1947-2000).
Rajni Kothari ed.: Caste in Indian Politics.
Bharati Ray and Aparna Basu eds.: From Independence to Freedom--- Indian Women since 1947.
Fields of Protest: Women's Movement in India.
D.N. Sen: From Raj to Swaraj.
R. Chatterjee ed.: Politics India--- State-Society Interface.
Sumit Ganguly et al. eds.: The State of India's Democracy.
Z. Hasan: Politics and Party Politics in India.
B.L. Shankar and V. Rodrigues: The Indian Parliament: A Democracy at Work.
Ashutosh Varshney: India and the Politics of Developing Countries.
Achin Vanaik and Rajiv Bhargava: Understanding Contemporary India: Critical Perspectives.
A. Kohli and P. Singh eds.: The Routledge Handbook of India Politics.
N.G. Jayal and P.B. Mehta eds.: The Oxford Companion to Politics in India.
Anil Jana ed., Decentralizing Rural Governance and Development.
Z. Hasan et al eds.: India's Living Constitution.

বিপান চন্দ্রঃ সমসাময়িক ভারত বিষয়ক নিবন্ধ (অনুবাদঃ দিলীপ ভট্টাচার্য্য)
বিপান চন্দ্র, মৃদুলা মুখার্জী, আদিত্য মুখার্জীঃ ভারতবর্ষ স্বাধীনতার পরে ১৯৪৭-২০০০ (অনুবাদঃ আশীষ লাহিড়ি)
সত্যব্রত দত্ত: বাংলা বিধানসভার একশো বছর
শাশ্বতী ঘোষ: সমতার দিকে আন্দোলনে নারী
শুভেন্দু দাশগুপ্ত (সম্পা): প্রসঙ্গ মানবাধিকার
ভারতীয় সংবিধান (বাংলা সংস্করণ)

Semester III

Indian Political Thought– I Code: PLS-A-CC-3-5-TH+TU

Module I:

1 Ancient Indian Political ideas: overview.
2. Kautilya: Saptanga theory, Dandaniti, Diplomacy.
3. Medieval political thought in India: overview (with reference to Barani and Abul Fazal). Legitimacy of kingship.
4. Principle of Syncretism.

Module II:

5. Modern Indian thought: Rammohun Roy as pioneer of Indian liberalism – his views on rule of law, freedom of thought and social justice.
6. Bankim Chandra Chattopadhyay, Vivekananda and Rabindranath Tagore: views on nationalism.
7. M.K. Gandhi: views on State, Swaraj, Satyagraha.

Readings:

R.S. Sharma: Aspects of Political Ideas and Institutions in Ancient India.
Saiyid Athar Abbas Rizvi – A History of Sufism in India (Vol.2)
Amit Dey – Sufism in India
V.R. Mehta: Foundation of Indian Political Thought.
T. Pantham, and K. Deutsch (eds.), Political Thought in Modern India.
A. Altekar, (1958) 'The Kingship', in State and Government in Ancient India, 3rd edition
Advaita Ashram: Complete Works of Swami Vivekananda.
U.N. Ghosal: The History of Hindu Political Theories.
J. Bandopadhyay: Social and Political Thought of Gandhi
D.D. Kosambi: Ancient India.
Romila Thapar: From Lineages to State.
K.A. Nizami ed.: Politics and Society during the Early Medieval Period.
B. Bhattacharya: Evolution of the Political Philosophy of Gandhi.
B.R. Nanda: Gandhi and His Critics.
Partha Chatterjee: Nationalist Thought and the Colonial World.
Rabindranath Tagore: Nationalism.
Sudipta Kaviraj: The Unhappy Consciousness: Bankimchandra Chattopadhyay and the Formation of Nationalist Discourse in India.
Bidyut Chakrabarty and R.K. Pandey: Modern Indian Political Thought--- Text and Context.

সুধীন্দ্রনাথ ভৌমিক: নব্যবঙ্গে রাষ্ট্রচিন্তার ধারা
ভারতী মুখার্জী: প্রাচীন ভারতের রাষ্ট্রনৈতিক চিন্তা
নৃসিংহ প্রসাদ ভাদুড়ি: দণ্ডনীতি
সত্যব্রত চক্রবর্তী (সম্পা): ভারতবর্ষ: রাষ্ট্রভাবনা
সুমিত সরকার: আধুনিক ভারত
সরল চট্টোপাধ্যায়: ভারতীয় স্বাধীনতা সংগ্রামের ক্রমবিকাশ
মনস্বিতা সান্যাল (অনু.): ভারতীয় জাতীয়তাবাদের সামাজিক পটভূমি (A R Desai: Social Background of Indian Nationalism–র অনুবাদ)
দিলীপ কুমার বিশ্বাস: রামমোহন সমীক্ষা
তরুণ কুমার বন্দ্যোপাধ্যায়: নেতাজী সুভাষচন্দ্রের রাষ্ট্রদর্শন
দেবজ্যোতি বন্দ্যোপাধ্যায়: রবীন্দ্রনাথের জাতীয়তাবাদ-বিরোধী স্বদেশপ্রেম

Comparative Government and Politics Code: PLS-A-CC-3-6- TH+TU

Module I:

1. Evolution of Comparative Politics. Scope, purposes and methods of comparison.
Distinction between Comparative Government and Comparative Politics.
2. Major approaches to the study of comparative politics---Institutional approach (dominant schools: Systems approach and Structural Functional approach)---limitations; New Institutionalism, Political Economy--- origin and key features.
3. Development and democratization: S.P. Huntington.
4. Classification of political systems. Nature of liberal and socialist political systems; distinguishing features---conventions, rule of law (UK), separation of powers, checks and balances, judicial review (USA), democratic centralism (PRC), referendum, initiative (Switzerland).
5. Political Parties: Typology, features and roles (UK, USA, PRC and Bangladesh). Interest groups: roles (UK and USA).

Module II:

6. Unitary system: UK, Bangladesh. Federal system: USA, Russia.
7. Legislature in UK, USA and PRC: composition and functions of legislative chambers; Committee System in UK and USA
8. Executive in UK, USA, France and Russia: A comparative study of (i) Russian, French and American Presidency; (ii) British and French cabinet systems.
9. Judiciary in UK, USA and PRC (with focus on the Procuratorate): comparative study.
10. Rights of the citizens of UK, USA and PRC: A comparative study.

Readings:

Gabriel Almond et al eds.: Comparative Politics Today: A World View (latest edition).
J. Kopstein and M. Lichbach (eds.) Comparative Politics:Interest, Identities and Institutions in a Changing Global Order.
Subrata Mukherjee and S. Ramaswamy: Theoretical Foundations of Comparative Politics.
J. Bara and M Pennington eds.: Comparative Politics.
J. Kopstein and H. Lichbach eds. : Comparative Politics.
J. Harvey and S. Bather: The British Constitution.
J. Wilson: American Government.
S.E. Finer: Comparative Government.
J. Blondel: An Introduction to Comparative Politics.
The Constitution of People's Republic of China.
J. Gittings: China Changes Face: The Road from Revolution 1949-89.
S. Boyron: The Constitution of France: A Contextual Analysis.
M. Burgess: Comparative Federalism: Theory and Practice.
J. McCormick, Jr.: Comparative Politics in Transition.
R. Chatterjee: Introduction to Comparative Political Analysis.
N.K. Singh: Bangladesh--- Constitution, Law and Justice.
J. Henderson: Constitution of the Russian Federation: A Contextual Analysis.
S. P. Huntington: The Third Wave: Democratization in the Late Twentieth Century.
M. Duverger: Political Parties.

রাখহরি চ্যাটার্জীঃ তুলনামূলক রাজনীতিপরিচয়
অমিতাভ রায় (সম্পা): তুলনামুলক রাজনীতি
রাজশ্রী বসু (সম্পাদিত)–তুলনামূলক শাসনব্যবস্থা ও রাজনীতি
পঞ্চানন চট্টোপাধ্যায়: ফ্রান্সের সাধারণতন্ত্র

Perspectives on International Relations Code: PLS-A-CC-3-7-TH+TU

Module I:

1. Understanding International Relations: outline of its evolution as academic discipline.
2. Major theories: (a) Classical Realism and Neo-Realism (b) Dependency (c) World Systems theory.
3. Emergent issues: (a) Development (b) Environment (c) Terrorism (d) Migration.

Module II:

4. Making of foreign policy.
5. Indian foreign policy: major phases: 1947-1962; 1962-1991; 1991-till date.
6. Sino-Indian relations; Indo-US relations.

Readings:

M. Nicholson, International Relations: A Concise Introduction, New York: Palgrave.
Jackson and G. Sorensen, Introduction to International Relations: Theories and Approaches, 3rd Edition.
Joshua. Goldstein and J. Pevehouse, (2007) International Relations.
C. Brown and K. Ainley, (2009) Understanding International Relations
H.J. Morgenthau: Politics among Nations.
K. Booth and S. Smith, (eds), International Relations Theory Today
S.H. Hoffman: Essays in Theory and Politics of International Relations.
K.J. Holsti: International Politics: A Framework for Analysis.
J. Frankel: The Making of Foreign Policy.
J. Frankel: Contemporary International Theory and Behaviour of States.
J. Bennett: International Organizations.
J. Bandopadhyay: The Making of India's Foreign Policy.
D.A. Baldwin ed.: Neo-realism and Neo-liberalism.
M. Smith and R. Little: Perspectives on World Politics.
P.R. Viotti and M.V. Kauppi: International Relations and World Politics.
Muchkund Dubey: India's Foreign Policy: Coping with the Changing World.
Peu Ghosh: International Relations.
S.D. Muni: Indian Foreign Policy: The Democracy Dimension.
K.P. Bajpai and H.V. Panth: India's Foreign Policy--- A Reader.
Sumit Ganguly: India's Foreign Policy: Retrospect and Prospect.
V. P. Dutt: India's Foreign Policy since Independence.
V.P. Dutt: Indian Foreign Policy in a Changing World.

পুরুষোত্তম ভট্টাচার্য ও অনিন্দ্যজ্যোতি মজুমদার (সম্পা.): আন্তর্জাতিক সম্পর্কের রূপরেখা
গৌতম বসু: আন্তর্জাতিক সম্পর্ক: তত্ব ও বিবর্তন

Semester IV

Indian Political Thought IICode: PLS-A-CC-4-8-TH+TU

Module I:

1. M.N. Roy: Radical Humanism.
2. Narendra Deva, Ram Manohar Lohia, Jayaprakash Narayan: Socialist ideas
3. Syed Ahmed Khan and Iqbal: views on colonialism and nationalism.

Module II:

4. Nehru: views on Socialism and Democracy. Subhas Chandra Bose: views on Socialism and Fascism.
5. Contested notions of 'nation'--- Savarkar, Jinnah.
6. Jyotiba Phule and Ambedkar on caste system and untouchability. Pandita Ramabai's views on social justice

Readings:

V. R. Mehta and T. Pantham (eds.), 'A Thematic Introduction to Political Ideas in ModernIndia: Thematic Explorations, History of Science, Philosophy and Culture in Indian civilization, Vol. 10, Part: 7, pp. xxvii-ixi.
V. Mehta and Th. Pantham (eds.), Political ideas in modern India: Thematic Explorations
S. Hay (ed.), Sources of Indian Tradition, Vol. 2.Second Edition.
T. Pantham and K.L. Deutsch: Political Thought in Modern India.
Sumit Sarkar: Modern India.
Bipan Chandra: Nationalism and Colonialism in Modern India.
A. Parel, (ed.), 'Introduction', in Gandhi, freedom and Self Rule
D. Dalton, (1982) 'Continuity of Innovation', in Indian Idea of Freedom: Political Thought ofSwami Vivekananda, Aurobindo Ghose, Rabindranath Tagore and Mahatma Gandhi.
J. Nehru: Discovery of India.
B. Zachariah, Nehru.
S. Thorat and Aryana eds.: Ambedkar in Retrospect.
J. Sharma, (2003) Hindutva: Exploring the Idea of Hindu Nationalism
Y. Meherally ed.: Narendra Deva: Socialism and National Revolution.
Ramchandra Guha: India after Gandhi.
Uma Chakrabarti: Rewriting History: The Life and Times of Pandita Ramabai.
B. K. Bhattacharya ed., Salient Ideas of Rammonohar Lohia.
Bidyut Chakrabarty and R.K. Pandey: Modern Indian Political Thought--- Text and Context.

Global Politics since 1945Code: PLS-A-CC-4-9-TH+TU

Module I:

1. Cold War and its evolution: outline.Emergence of Third World: NAM; Pan Africanism. Post-Cold War world: overview. Globalization: conceptions and perspectives.
2. Europe in transition: European Union, Brexit (overview).
3. Major institutions of global governance: World Bank, IMF, WTO--- overview. Major regional organizations: ASEAN, OPEC, SAFTA, SAARC and BRICS. West Asia and the Palestine question.

Module II:

4.India and her neighbours I: Pakistan; Bangladesh.

5. India and her neighbours II: Nepal; Bhutan; Sri Lanka.

6. UNO: background; Major organs--- General Assembly, Security Council and Secretariat (with focus on Secretary General). Role of UNO in peace-keeping, human rights, and development (Millennium Development Goals and Sustainable Development Goals).

Readings:

P. Calvocoressi: World Politics since 1945 (latest edition).
R. Mansbach and K. Taylor, (2012) Introduction to Global Politics
J. Baylis and S. Smith (eds), The Globalization ofWorld Politics: An Introduction to International Relations.
G. Ritzer: Globalization--- A Basic Text.
J.A. Moore, Jr. and J. Pubantz: The New United Nations.
S. Juyal and B. Ramesh Babu: The United Nations and World Peace.
K. Bajpai and H.C. Shukul eds.: Interpreting World Politics.
J. Baylis and S. Smith: The Globalization of World Politics.
L.M. Goodriche: The UN in Changing World.
M.S. Rajan: Essays in Non-Alignment and UN.
Alvin Y. So: Development and Social Change.
J. Haynes: Third World Politics.
Ankie Hoogvelt: Globalization and the Postcolonial World
N.O. Sullivan ed.: Terrorism, Ideology and Revolution.
D. Nayyar: Governing Globalization.
G. Ritzer: Globalization--- A Basic Text.
S.D. Muni: Responding to Terrorism in South Asia.
Peter Burnel: Politics in the Developing World.
B.C. Smith: Understanding Third World Politics.
Björn Hettne: Development Theory and the Three Worlds.

রাধারমণ চক্রবর্তী ও সুকল্পা চক্রবর্তী: সমসাময়িক আন্তর্জাতিক সম্পর্ক
পুরুষোত্তম ভট্টাচার্য ও অনিন্দ্যজ্যোতি মজুমদার (সম্পা.):আন্তর্জাতিক সম্পর্কের রূপরেখা
গৌতম বসু: আন্তর্জাতিক সম্পর্ক: তত্ত্ব ও বিবর্তন
অনীক চট্টোপাধ্যায়: ঠাণ্ডাযুদ্ধের পর আন্তর্জাতিক সম্পর্ক

WESTERN POLITICAL THOUGHT AND THEORY I

Code: PLS-A-CC-4-10-TH+TU

Module I:

1. Greek political thought: main features – Plato: justice, communism – Aristotle: state, classifications of constitutions.
2. Roman political thought: theories of Law and Citizenship – contributions of Roman thought.
3. Medieval political thought in Europe: major features.
4. Contribution of Machiavelli. Significance of Renaissance. Political thought of Reformation.

Module II:

5. Bodin: Idea of Sovereignty.
6. Hobbes: founder of science of materialist politics.

7. Locke: founder of Liberalism. views on natural rights, property and consent.
8. Rousseau: views on freedom and democracy.

Readings:

A.Skoble and T. Machan: Political Philosophy: Essential Selections.
D. Boucher and P. Kelly, (eds) Political Thinkers: From Socrates tothe Present
G. H. Sabine and T.I. Thorson: A History of Political Theory.
D. Boucher and P. Kelly: Political Thinkers: From Socrates to the Present.
S. Mukherjee and S. Ramaswamy: A history of Political Thought: From Plato to Marx.
R.G. Gettell: History of Political Thought.
B. Barker: The Political Thought of Plato and Aristotle.
Q. Skinner: Machaivelli: A Very Short Introduction.
A.K. Mukhopadhyay: Western Political Thought: from Plato to Marx.

Semester V

WESTERN POLITICAL THOUGHT AND THEORY II

Code: PLS-A-CC-5-11-TH+TU

Module I:

1. Bentham: Utilitarianism. John Stuart Mill: views on liberty and representative government.
2. Hegel: Civil Society and State.
3. T. H. Green: Freedom, Obligation.

Module II:

4. Utopian and Scientific Socialism: basic characteristics.
5. Varieties of non-Marxist socialism: Fabianism, Syndicalism, Guild Socialism.
6. Anarchism: overview.
7. Cultural Marxism: Frankfurt School (overview). Post-Marxism: emergence and basic contentions.

Readings:

A.Skoble and T. Machan: Political Philosophy: Essential Selections.
D. Boucher and P. Kelly, (eds) Political Thinkers: From Socrates tothe Present
G. H. Sabine and T.I. Thorson: A History of Political Theory.
D. Boucher and P. Kelly: Political Thinkers: From Socrates to the Present.
S. Mukherjee and S. Ramaswamy: A history of political Thought: From Plato to Marx.
R.G. Gettell: History of Political Thought.
Q. Skinner: The Foundations of Modern Political Thought (2 Volumes).
A.K. Mukhopadhyay: Western Political Thought: from Plato to Marx.
C.E.M. Joad: Political Theory.
L. Kolakowski: Main Currents of Marxism (3 Volumes).
D.K. Das and T. Chattopadhyay: Varieties of Socialism.
D. McLellan: The Thought of Karl Marx.
D. McLellan: Marxism after Marx.

S. Mukherjee and S. Ramaswamy: A History of Socialist Thought.
Frankfurt School: Internet Encyclopedia of Philosophy, http://www.iep.utm.edu/frankfur/

শোভনলাল দত্তগুপ্ত (সম্পা.:পাশ্চাত্য রাষ্ট্রভাবনা)
অমল কুমার মুখোপাধ্যায়: রাষ্ট্রদর্শনের ধারা
রামকৃষ্ণ ভট্টাচার্য: মার্কসবাদ জিজ্ঞাসা
অমৃতাভ বন্দ্যোপাধ্যায়: পাশ্চাত্য রাষ্ট্রচিন্তার ইতিহাস
সুদীপ্ত দে: গণরাজ্য (প্লেটোর Republic র অনুবাদ)
নির্মলকান্তি মজুমদার: এ্যারিস্টটলের Politics –র অনুবাদ
সুনীল বরণ বিশ্বাস: ম্যাকিয়াভেলীর Prince –র অনুবাদ
হিমাংশু ঘোষ: রাজনৈতিক তত্ত্বের ইতিহাস (J H Sabine র ভাষান্তর)
শোভনলাল দত্তগুপ্ত: মার্কসীয় রাষ্ট্রচিন্তা–মার্কস থেকে মাও সে তুং

Political Sociology Code: PLS-A-CC-5-12-TH+TU

Module I:

1. Social bases of politics. Emergence of Political Sociology.
2. Political culture and Political socialization: nature, types and agencies.
3. Political participation: concept and types.
4. Political development and social change.
5. Political Communication: Concept and structures.

Module II:

6. Social stratification and politics: caste, tribe, class, elite.
7. Gender and politics: basic issues.
8. Religion and politics: varying perspectives.
9. Military and politics: conditions and modes of intervention.
10. Electorate and electoral behaviour (with special reference to the Indian context).

Readings:

Michael Rush: Politics and Sociology.
B. Axford et al.: Politics--- An Introduction.
Tom Bottomore: Political Sociology.
Amal K. Mukhopadhyay: Political Sociology.
S. Chakraborty ed.: Political Sociology.
Tom Bottomore: Classes in Modern Society.
R. Chatterjee ed.: Religion, Politics and Communalism.
B. Lindenfeld ed.: Reader in Political Sociology.
Pradip Basu (ed.) – Political Sociology
J. Forbes: Women in Modern India.
M. Evans ed.: The Women Question.
P. Worsley: The Three Worlds: Culture and World Development.
Samuel Huntington: Political Order in a Changing Society.
G.A. Almond and J.S. Coleman eds.: The Politics of Developing Areas.

J. Manor: Rethinking Third World Politics.
J. Kantola et al eds.: The Oxford Handbook of Gender Politics.
J. Blondel: Comparative Government.
G.A. Almond and G.B. Powell, Jr.: Comparative Politics: A Developmental Approach.
S. Oates: Introduction to Media and Politics.

টম বটমোরঃ মার্ক্সীয় সমাজতত্ত্ব (অনুবাদঃ হিমাংশু ঘোষ); সত্যব্রত চক্রবর্তীঃ রাষ্ট্র, সমাজ ও রাজনীতি

Semester VI

Public Administration-- Concepts and Perspectives Code: PLS-A-CC-6-13-TH+TU

Module I:

1. Nature, Scope and Evolution of Public Administration – Private and Public Administration. Principles of Socialist Management.
2. Challenges to discipline of Public Administration and responses: New Public Administration, Comparative Public Administration, Development Administration (Indian context).
3. Major concepts of administration: (a) Hierarchy (b) Unity of Command (c) Span of Control (d) Authority (e) Centralization, Decentralization and Delegation (f) Line and Staff.
4. Public Administration in the era of globalization, liberalization and privatization. Governance: conceptual emergence--- distinction with government. e-governance: features and significance.

Module II:

5. Bureaucracy: views of Marx and Weber.
6. Ecological approach to Public Administration: Riggsian Model.
7. Administrative Processes: (a) Decision making (b) Communication and Control (c) Leadership
(d) Coordination.
8. Public Policy: definition, characteristics. Models. Policy implementation.

Readings:

Nicholas Henry: Public Administration and the State.
W. Wilson, (2004) 'The Study of Administration', in B. Chakrabarty and M. Bhattacharya (eds), Administrative Change and Innovation: a Reader, New Delhi: Oxford University Press, pp. 85-101
Mohit Bhattacharya: Public Administration: Structure, Process and Behaviour.
M. Bhattacharya, Public Administration: Issues and Perspectives.
A. Avasthi and S. Avasthi: Pubic Administration.
M. Bhattacharya: Restructuring Public Administration.
B. Chakrabarty: Public Administration: From Government to Governance.
B. Chakrabarty and M. Bhattacharya eds.: Pubic Administration: A Reader.
B. Chakrabarty and M. Bhattacharya eds.: The Governance Discourse.
Shivani Singh: Governance: Issues and Challenges.
M.P. Sharma: Public Administration in Theory and Practice.
Rumki Basu: Public Administration: Concepts and Theories.
G.H. Frederickson: New Public Administration.
R. Prasad et al. eds.: Administrative Thinkers.

S.R. Maheswari: Administrative Theory.
Ramesh Arora: Comparative Public Administration.
R.K. Sapru: Development Administration.
M. Bhattacharya: New Horizons of Public Administration.
T. Dye, (1984) Understanding Public Policy, 5th Edition.
Xun Wu, M.Ramesh, Michael Howlett and Scott Fritzen, The Public Policy Primer: ManagingThe Policy Process.
Prabir Kumar De, *Public Policy and Systems*,
B. Chakrabarty and P. Chand: Public Administration in a Globalizing World: Theories and Practices.
U. Medury, Public administration in the Globalisation Era.
Additional Reading: The Oxford Handbook of Public Policy.

Administration and Public Policy in India Code: PLS-A-CC-6-14-TH+TU

Module I

1. Continuity and change in Indian administration: brief historical overview.
2. Civil Service in India (Bureaucracy): recruitment (role of UPSC, SPSC), training.
3. Organization of Union Government: Secretariat Administration: PMO, Cabinet Secretariat.
4. Organization of State Government: Chief Secretary – relations between Secretariat and Directorate.
5. District Administration: role of District Magistrate, SDO, BDO.

Module II:

6.Local Self Government: Corporations, Municipalities and Panchayats in West Bengal, structure and functions. 73rd and 74th Amendment: overview.
7. Planning: Planning Commission, National Development Council. District Planning. Changing nature of planning: NITI Ayog. Budget--- concept and significance.
8. Financial Administration: Public Accounts Committee, Estimates Committee – role of CAG.
9. Citizen and administration: functions of Lokpal and Lokayukt. Right to Information--- Citizen Charter.
10. Citizen and social welfare policies: MGNREGA; Sarva Shiksha Abhiyan (SSA); National Health Mission (NRHM).

Readings:

Bidyut Chakrabarty, Reinventing Public Administration: The Indian Experience.
S. R. Maheswari: Indian Administration.
R.B. Jain: Contemporary Issues in Indian Administration.
B. Chakrabarty and P. Chand: Indian Administration.
Noorjahan Bava, Development Policies and Administration in India.
Satyajit Singh and Pradeep K. Sharma [eds.] Decentralisation: Institutions and Politics inRural India.
Basu Rumki: Public Administration in India Mandates, Performance and FuturePerspectives.
A.Celestine: How to Read the Union Budget PRS, Centre for Policy Research, New Delhi, Available at http://www.prsindia.org/parliamenttrack/primers/how-to-read-the-union-budget-1023/
Primer on the Budget Process published by PRS, Available athttp://www.prsindia.org/parliamenttrack/primers/the-budget-process-484/
R.V. Vaidyanatha Ayyar, Public Policy Making In India, Pearson.

B. Chakrabarty and P. Chand: Public Policy: Concepts, Theory and Practice.
S. Singh and P. Sharma: Decentralization: Institutions and Politics in Rural India.
Anil Jana ed.: Decentralizing Rural Governance and Development.
P. Datta: Panchayats, Rural Development and Local Autonomy: the West Bengal Experience.
A. Mukhopadhyay: Panchayat Administration in West Bengal.

For both Courses 13 and 14:

মোহিত ভট্টাচার্য ও বিশ্বনাথ ঘোষ: জনপ্রশাসন ও পরিকল্পনা
সোমা ঘোষ: জনপ্রশাসন: তত্ত্ব ও প্রয়োগ
রাজশ্রী বসু: জনপ্রশাসন
পদ্মা রামচন্দ্রনঃ ভারতে সরকারী প্রশাসন (অনুবাদঃ সন্তোষ কুমার অধিকারী)
অসিত বসু: পশ্চিমবঙ্গে পঞ্চায়েত ব্যবস্থা
প্রভাত দত্ত: প্রসঙ্গ পঞ্চায়েত

Guidelines:

i) For very contemporary topics, such as, NITI Ayog and MGNREGA, the respective official websites may be consulted.

ii) For supplementary readings, relevant reputed websites of recognized academic credential may be legally accessed.

iii) Bengali books cited in a particular course may be used in another *related* course, if found relevant.

University of Calcutta

Final Draft BA (Honours)-CBCS Syllabus in Political Science, 2018
(Section II)

Discipline- specific Elective Category: 4 courses (8 courses provided). One from Group A and one from Group B in Semesters 5 and one from Group A and one from Group B in Semester 6.

Generic Elective Category: 4 courses(Core Courses of the General Syllabus from a subject other than Political Science. Not provided here.)

Each DSE and GE course: 6 credits (5 theoretical segment+ 1 for tutorial-related segment).

Skill Enhancement/Skill-based Category: 2 courses(4 courses provided). Each Course: 2 credits. Theoretical only (no Tutorial). Any one course from Group A in Semester 3 and any one course from Group B in Semester 4.

Ability Enhancement Compulsory Category:2 courses: Common for all. Not provided here.

- Each course carries 80 marks ^combining theoretical and tutorial segments (plus 10 marks each for Attendance and Continuous Internal Assessment).
- 6 credit course: Minimum 30 classes for Theory and 15 contact hours for Tutorial per module. 2 credit course: 30 teaching/lecture hours in total.

^End Semester Assessment--- 65 marks for theoretical segment: 50 marks for subjective/descriptive questions + 15 marks for 1 mark-questions. Question Pattern for subjective/descriptive segment of 50 marks: 2 questions (within 100 words; one from each module) out of 4 (10 x2 = 20) + 2 questions (within 500 words; one from each module) out of 4 (15 x 2 = 30).>>For Skill Enhancement Courses the last component would carry 6 questions--- 15 marks each--- out of which 3 (at least one from each module) to be attempted because such courses have no Tutorial.

- 15 marks for tutorial-related segments as suggested below (any one item from each mode): i) Written mode: upto 1000 words for one Term Paper/upto 500 words for each of the two Term Papers/ equivalent Book Review/equivalent Comprehension/equivalent Quotation or Excerpt Elaboration. ii) Presentation Mode: Report Presentation/Poster Presentation/Field work--- based on syllabus-related and/or current topics (May be done in groups) [The modes and themes and/or topics are be decided by the concerned faculty members of respective colleges.]
- Discipline-specific: 2 each (one from Group A and one from Group B) in Semesters 5 and 6.
- Generic Elective: 1 each in Semesters 1-4.**<>**Skill Enhancement: 1 each in Semesters 3 and 4.

IMPORTANT NOTES:

- The Readings provided below include many of those of the UGC Model CBCS Syllabus in Political Science. For Course Objectives and references it is advised that the UGC model CBCS syllabus* concerning relevant courses and topics be provided due importance and primarily consulted.

*Website: BA Political Science (Honours): https://www.ugc.ac.in/pdfnews/2085906_B.A-Hons.-Pol-Science.pdf

- Cited advanced texts in Bengali are not necessarily substitutes, but supplementary to English books.
- Paper Code Format: Subject Code-Course Code-Semester Code-Paper Number-Paper Component.
- The format is strictly subject to the parameters of the common structural format of CU CBCS.

Honours in Political Science

List of Discipline-specific Elective Courses:

- Gender and Politics
- Understanding South Asia
- Indian Foreign Policy in a Globalising World
- Development Process and Social Movements in Contemporary India
- Public Policy in India
- Understanding Global Politics
- Citizenship in a Globalising World
- Human Rights in a Comparative Perspective

List of Skill Enhancement Courses:

- Democratic Awareness through Legal Literacy
- Understanding the Legal System
- Legislative Practices and Procedures
- Elementary Aspects of Social Research

Discipline-specific Electives:

Gender and Politics

Code: PLS-A-DSE-5-A(1)-TH+TU

Module I

I. Groundings
1. Patriarchy
a. Sex-Gender Debates
b. Public and Private
c. Power
2. Feminism
3. Family, Community, State
a. Family
b. Community
c. State

Module II

II. Movements and Issues
1. History of the Women's Movement in India
2. Violence against women
3. Work and Labour
a. Visible and Invisible work
b. Reproductive and care work
c. Sex work

Readings:

I. Groundings
1. Patriarchy
T. Shinde, (1993) 'Stree Purusha Tulna', in K. Lalitha and Susie Tharu (eds), *Women Writingin India,* New Delhi, Oxford University Press, pp. 221-234.
a. Sex Gender Debates
Readings:
V Geetha, (2002) *Gender,* Kolkata, Stree, pp. 1-20
b. Public and Private
Readings:
M. Kosambi, (2007) *Crossing the Threshold,* New Delhi, Permanent Black, pp. 3-10; 40-46
c. Power
Readings:
N. Menon, (2008) 'Power', in R. Bhargava and A. Acharya (eds), *Political Theory: AnIntroduction,* Delhi: Pearson, pp.148-157
2. Feminism
Readings:
B. Hooks, (2010) 'Feminism: A Movement to End Sexism', in C. Mc Cann and S. Kim (eds), *The Feminist Reader: Local and Global Perspectives,* New York: Routledge, pp. 51-57
R. Delmar, (2005) 'What is Feminism?', in W. Kolmar & F. Bartkowski (eds) *Feminist Theory: A Reader,* pp. 27-37
3.Family, Community and State

a.Family

Readings:

R. Palriwala, (2008) 'Economics and Patriliny: Consumption and Authority within the Household' in M. John. (ed) *Women's Studies in India,* New Delhi: Penguin, pp. 414-423

b. Community

Readings:

U. Chakravarti, (2003) *Gendering Caste through a Feminist Len,* Kolkata, Stree, pp. 139-159.

c. State

C. MacKinnon, 'The Liberal State' from *Towards a Feminist Theory of State,* Available at http://fair-use.org/catharine-mackinnon/toward-a-feminist-theory-of-the-state/chapter-8, Accessed: 19.04.2013.

Additional Readings:

K. Millet, (1968) *Sexual Politics,* Available at http://www.marxists.org/subject/women/authors/millett-kate/sexual-politics.htm, Accessed: 19.04.2013.

N. Menon (2008) 'Gender', in R. Bhargava and A. Acharya (eds), *Political Theory: AnIntroduction,* New Delhi: Pearson, pp. 224-233

R. Hussain, (1988) 'Sultana's Dream', in *Sultana's Dream and Selections from the SecludedOnes – translated by Roushan Jahan,* New York: The Feminist Press

S. Ray 'Understanding Patriarchy', Available at http://www.du.ac.in/fileadmin/DU/Academics/course_material/hrge_06.pdf, Accessed: 19.04.2013.

S. de Beauvoir (1997) *Second Sex,* London: Vintage.

Saheli Women's Centre, (2007) *Talking Marriage, Caste and Community: Women's Voicesfrom Within,* New Delhi: monograph

II. Movements and Issues

1. History of Women's Movement in India

Readings:

I. Agnihotri and V. Mazumdar, (1997) 'Changing the Terms of Political Discourse: Women'sMovement in India, 1970s-1990s', *Economic and Political Weekly*, 30 (29), pp. 1869-1878.

R. Kapur, (2012) 'Hecklers to Power? The Waning of Liberal Rights and Challenges toFeminism in India', in A. Loomba *South Asian Feminisms,* Durham and London: DukeUniversity Press, pp. 333-355

2. Violence against Women

Readings:

N. Menon, (2004) 'Sexual Violence: Escaping the Body', in *Recovering Subversion,* New Delhi:Permanent Black, pp. 106-165

3. Work and Labour

a. Visible and Invisible work

Readings:

P. Swaminathan, (2012) 'Introduction', in *Women and Work,* Hyderabad: Orient Blackswan,pp.1-17

b. Reproductive and care work

Reading:

J. Tronto, (1996) 'Care as a Political Concept', in N. Hirschmann and C. Stephano, *Revisioningthe Political*, Boulder: Westview Press, pp. 139-156

c. Sex work

Readings:

Darbar Mahila Samanwaya Committee, Kolkata (2011) 'Why the so-called Immoral Traffic(Preventive) Act of India Should be Repealed', in P. Kotiswaran, *Sex Work,* New Delhi,Women Unlimited, pp. 259-262

N. Jameela, (2011) 'Autobiography of a Sex Worker', in P. Kotiswaran, *Sex Work,* New Delhi:Women Unlimited, pp. 225-241

Additional Readings:

C. Zetkin, 'Proletarian Woman', Available at
http://www.marxists.org/archive/zetkin/1896/10/women.htm, Accessed: 19.04.2013.
F. Engles, *Family, Private Property and State*, Available at
http://readingfromtheleft.com/PDF/EngelsOrigin.pdf, Accessed: 19.04.2013.
J. Ghosh, (2009) *Never Done and Poorly Paid: Women's Work in Globalising India,* Delhi:Women Unlimited
Justice Verma Committee Report, Available at http://nlrd.org/womens-rightsinitiative/
justice-verma-committee-report-download-full-report, Accessed: 19.04.2013.
N. Gandhi and N. Shah, (1992) *Issues at Stake – Theory and Practice in the Women'sMovement,* New Delhi:
Kali for Women.
V. Bryson, (1992) *Feminist Political Theory,* London*:* Palgrave-MacMillan, pp. 175-180; 196-200.
M. Mies, (1986) 'Colonisation and Housewifisation', in *Patriarchy and Accumulation on a*
World Scale London: Zed, pp. 74-111, Available at
http://caringlabor.wordpress.com/2010/12/29/maria-mies-colonization-andhousewifization/,
R. Ghadially, (2007) *Urban Women in Contemporary India,* Delhi: Sage Publications.
S. Brownmiller, (1975) *Against our Wills,* New York: Ballantine.
Saheli Women's Centre (2001) 'Reproductive Health and Women's Rights, Sex Selection and
feminist response' in S Arya, N. Menon, J. Lokneeta (eds), *Nariwadi Rajneeti,* Delhi, pp. 284-306.
V. Bryson (2007) *Gender and the Politics of Time,* Bristol: Polity Press.

Understanding South Asia

Code: PLS-A-DSE-5-A(2)-TH+TU

Module I

I. South Asia- Understanding South Asia as a Region
(a) Historical and Colonial Legacies
(b) Geopolitics of South Asia
II. Politics and Governance
Regime types: democracy, authoritarianism, monarchy
(b) Emerging constitutional practices: forms of government in India, Nepal, Bhutan, Sri Lanka and Pakistan

Module II

III. Socio-Economic Issues
(a) Identity politics: challenges and impacts (case studies of
India, Nepal, Sri Lanka)
IV. Regional Issues and Challenges
(a) South Asian Association for Regional Cooperation (SAARC): problems and prospects
(b)Terrorism: Political and Social Consequences in South Asia;
(c) Refugee crisis.

Readings:

Hewitt, V. (1992) 'Introduction', in The International Politics of South Asia. Manchester:
Manchester University Press, pp.1-10.
Hewitt, V. (2010) 'International Politics of South Asia' in Brass, P. (ed.) Routledge Handbook
of South Asian Politics. London: Routledge, pp.399-418.
Muni, S.D. (2003) 'South Asia as a Region', South Asian Journal, 1(1), August-September, pp.

1-6

Baxter, C. (ed.) (1986) The Government and Politics of South Asia. London: Oxford University Press, pp.376-394.
Baxter, C. (2010) 'Introduction', Brass, P. (ed.) Routledge Handbook of South Asian Politics. London: Routledge, pp.1-24

II. Politics and Governance

De Silva, K.M. (2001)'The Working of Democracy in South Asia', in Panandikar, V.A (ed.) Problems of Governance in South Asia. New Delhi: Centre for Policy Research & Konark Publishing House, pp. 46-88.
Wilson, J. (2003) 'Sri Lanka: Ethnic Strife and the Politics of Space', in Coakley, J. (ed.) The Territorial Management of Ethnic Conflict. Oregon: Frank Cass, pp. 173-193.
Mendis, D. (2008) 'South Asian Democracies in Transition', in Mendis, D. (ed.) Electoral Processes and Governance in South Asia. New Delhi: Sage, pp.15-52.
Subramanyam, K. (2001) 'Military and Governance in South Asia', in V.A (ed.) Problems of Governance in South Asia. New Delhi: Centre for Policy Research & Konark Publishing House, pp.201-208.
Hachethi, K. and Gellner, D.N.(2010) 'Nepal : Trajectories of Democracy and Restructuring of the State', in Brass, P. (ed.) Routledge Handbook of South Asian Politics. London: Routledge, pp. 131-146.
Kukreja, V. 2011. 'Federalism in Pakistan', in Saxena R. (ed.) Varieties of Federal Governance. New Delhi: Foundation Books, pp. 104-130.
Jha, N.K. (2008) 'Domestic Turbulence in Nepal: Origin, Dimensions and India's Policy Options', in Kukreja, V. and Singh, M.P. (eds.) Democracy, Development and Discontent in South Asia. New Delhi: Sage, pp. 264-281.
Burki, S.J. (2010) 'Pakistan's Politics and its Economy', in Brass, P. (ed.) Routledge Handbook of South Asian Politics. London: Routledge, pp. 83-97.
Kaul, N. (2008)'Bearing Better Witness in Bhutan', Economic and Political Weekly, 13 September, pp. 67-69.

III. Socio-Economic Issues

Phadnis, U.(1986) 'Ethnic Conflicts in South Asian States', in Muni, S.D. et.al. (eds.) Domestic Conflicts in South Asia : Political, Economic and Ethnic Dimensions. Vol. 2. New Delhi: South Asian Publishers, pp.100-119.
Kukreja, V. (2003) Contemporary Pakistan. New Delhi: Sage, pp. 75-111 and 112-153.

IV. Regional Issues and Challenges

Narayan, S. (2010) 'SAARC and South Asia Economic Integration', in Muni, S.D. (ed.) Emerging dimensions of SAARC. New Delhi: Foundation Books, pp. 32-50.
Muni, S.D. and Jetley, R. (2010) 'SAARC prospects: the Changing Dimensions', in Muni, S.D. (ed.) Emerging dimensions of SAARC. New Delhi: Foundation Books, pp. 1-31.
Baral, L.R. (2006) 'Responding to Terrorism: Political and Social Consequences in South Asia', in Muni, S.D. (ed.) Responding to terrorism in South Asia. New Delhi: Manohar, pp.301-332.
Muni, S.D. (2006) 'Responding to Terrorism: An Overview', in Muni, S.D. (ed.) Responding to terrorism in South Asia. New Delhi: Manohar, pp.453-469.
Hoyt, T.D. (2005) 'The War on Terrorism: Implications for South Asia', in Hagerty, D.T. (ed.) South Asia in World Politics. Lanham: Roman and Littlefield Publishers, pp.281-295.
Lama, M. (2003) 'Poverty, Migration and Conflict: Challenges to Human Security in South Asia', in Chari, P.R. and Gupta, S. (eds.) Human Security in South Asia: Gender, Energy, Migration and Globalisation. New Delhi: Social Science Press, pp. 124-144
Acharya, J. and Bose, T.K. (2001) 'The New Search for a Durable Solution for Refugees: South Asia', in Samaddar, S. and Reifeld, H. (eds.) Peace as Process: Reconciliation and Conflict Resolution in South Asia. New Delhi: Vedams ,pp-137-157

Additional Readings

Baxter, C. (ed.) (1986) The Government and Politics of South Asia. London: Oxford University Press.
Rizvi, G. (1993) South Asia in a Changing International Order. New Delhi: Sage.
Thakur, R. and Wiggin, O.(ed.) (2005) South Asia and the world. New Delhi: Bookwell.
Hagerty, D.T.(ed.) (2005) South Asia in World Politics, Oxford: Rowman and Littlefield.
Samaddar, R. (2002) 'Protecting the Victims of Forced Migration: Mixed Flows and Massive Flows', in Makenkemp, M. Tongern, P.V. and Van De Veen, H. (eds.) Searching for Peace in Central and South Asia. London: Lynne Reinner.
Kukreja, V. and Singh, M.P. (eds) (2008) Democracy, Development and Discontent in SouthAsia. New Delhi: Sage.

Indian Foreign Policy in a Globalising World

Code: PLS-A-DSE-5-B (1)-TH+TU

Module I

I. India's Foreign Policy: From a Postcolonial State to an Aspiring Global Power
2. India's Relations with the USA and USSR/Russia
3. India's Engagements with China

Module II

4. India in South Asia: Debating Regional Strategies
5. India's Negotiating Style and Strategies: Trade, Environment and Security Regimes
6. India in the Contemporary Multipolar World

Readings:

I. India's Foreign Policy: From a Postcolonial State to an Aspiring Global Power

S. Ganguly and M. Pardesi, (2009) 'Explaining Sixty Years of India's Foreign Policy', in India Review, Vol. 8 (1), pp. 4–19.
Ch. Ogden, (2011) 'International 'Aspirations' of a Rising Power', in David Scott (ed.), Handbook of India's International Relations, London: Routeledge, pp.3-31
W. Anderson, (2011) 'Domestic Roots of Indian Foreign Policy', in W. Anderson, Trysts with Democracy: Political Practice in South Asia, Anthem Press: University Publishing Online.
J. Bandhopadhyaya, (1970) The Making of India's Foreign Policy, New Delhi: Allied Publishers.

II: India's Relations with the USA and USSR/Russia

S. Mehrotra, (1990) 'Indo-Soviet Economic Relations: Geopolitical and Ideological Factors', in India and the Soviet Union: Trade and Technology Transfer, Cambridge University Press: Cambridge, pp. 8-28.
R. Hathaway, (2003) 'The US-India Courtship: From Clinton to Bush', in S. Ganguly (ed.), India as an Emerging Power, Frank Cass: Portland.
A. Singh, (1995) 'India's Relations with Russia and Central Asia', in International Affairs, Vol. 71 (1): 69-81.
M. Zafar, (1984), 'Chapter 1', in India and the Superpowers: India's Political Relations with the Superpowers in the 1970s, Dhaka, University Press.
H. Pant, (2008) 'The U.S.-India Entente: From Estrangement to Engagement', in H. Pant, Contemporary Debates in Indian Foreign and Security Policy: India Negotiates Its Rise in the International System, Palgrave Macmillan: London.
D. Mistry, (2006) 'Diplomacy, Domestic Politics, and the U.S.-India Nuclear Agreement', in Asian Survey, Vol. 46 (5), pp. 675-698.

III: India's Engagements with China

H. Pant, (2011) 'India's Relations with China', in D. Scott (ed.), Handbook of India's International Relations, London: Routeledge, pp. 233-242.
A. Tellis and S. Mirski, (2013) 'Introduction', in A. Tellis and S. Mirski (eds.), Crux of Asia: China, India, and the Emerging Global Order, Carnegie Endowment for International Peace: Washington.
S. Raghavan, (2013) 'Stability in Southern Asia: India's Perspective', in A. Tellis and S. Mirski (eds.), Crux of Asia: China, India, and the Emerging Global Order, Carnegie Endowment for International Peace: Washington.
Li Li, (2013) 'Stability in Southern Asia: China's Perspective', in A. Tellis and S. Mirski (eds.), Crux of Asia: China, India, and the Emerging Global Order, Carnegie Endowment for International Peace: Washington.
IV: India in South Asia: Debating Regional Strategies
S. Muni, (2003) 'Problem Areas in India's Neighbourhood Policy', in South Asian Survey, Vol. 10 (2), pp. 185-196.
S. Cohen, (2002) India: Emerging Power, Brookings Institution Press.V. Sood, (2009) 'India and regional security interests', in Alyssa Ayres and C. Raja Mohan (eds), Power realignments in Asia: China, India, and the United States, New Delhi: Sage.
M. Pardesi, (2005) 'Deducing India's Grand Strategy of Regional Hegemony from Historical and Conceptual Perspectives', IDSS Working Paper, 76,
D. Scott, (2009) 'India's "Extended Neighbourhood" Concept: Power Projection for a Rising Power', in India Review, Vol. 8 (2), pp. 107-143 112
V: India's Negotiating Style and Strategies: Trade, Environment and Security Regimes
S. Cohen, (2002) 'The World View of India's Strategic Elite', in S. Cohen, India: Emerging Power, Brookings Institution Press, pp. 36-65.
A. Narlikar, (2007) 'All that Glitters is not Gold: India's Rise to Power', in Third World Quarterly, Vol. 28 (5) pp. 983 – 996.
N. Dubash, (2012) 'The Politics of Climate Change in India: Narratives of Enquiry and Cobenefits', Working Paper, New Delhi: Centre for Policy Research. N. Jayaprakash, (2000) 'Nuclear Disarmament and India', in Economic and Political Weekly, Vol. 35 (7), pp. 525-533.
P. Bidwai, (2005) 'A Deplorable Nuclear Bargain', in Economic and Political Weekly, Vol. 40 (31), pp. 3362-3364.
A. Anant, (2011) 'India and International Terrorism', in D. Scott (ed.), Handbook of India's International Relations, London: Routledge, pp. 266-277.

VI: India in the Contemporary Multipolar World
R. Rajgopalan and V. Sahni (2008), 'India and the Great Powers: Strategic Imperatives, Normative Necessities', in South Asian Survey, Vol. 15 (1), pp. 5–32.
C. Mohan, (2013) 'Changing Global Order: India's Perspective', in A. Tellis and S. Mirski (eds.), Crux of Asia: China, India, and the Emerging Global Order, Carnegie Endowment for International Peace: Washington.
A. Narlikar, (2006) 'Peculiar Chauvinism or Strategic Calculation? Explaining the Negotiating Strategy of a Rising India', in International Affairs, Vol. 82 (1), pp. 59-76.
P. Mehta, (2009) 'Still Under Nehru's Shadow? The Absence of Foreign Policy Frameworks in India', in India Review, Vol. 8 (3), pp. 209–233.

Development Process and Social Movements in Contemporary India

Code: PLS-A-DSE-5-B(2)-TH+TU

Module I

I. Development Process since Independence
a. State and planning
b. Liberalization and reforms
II. Industrial Development Strategy and its Impact on the Social Structure

a. Mixed economy, privatization, the impact on organized and unorganized labour
b. Emergence of the new middle class
III. Agrarian Development Strategy and its Impact on the Social Structure
a. Land Reforms, Green Revolution
b. Agrarian crisis since the 1990s and its impact on farmers

Module II

IV. Social Movements
Social movements and New Social movements
Approaches to the study of social movements: Marxist theory, Gandhian theory, Resource Mobilisation theory, Relative Deprivation theory
V. Globalisation and Social Movements in India (18classes)
Environmental movements
Tribal movements
Women's movements
Civil rights movements

Readings:

I. The Development Process since Independence

A. Mozoomdar, (1994) 'The Rise and Decline of Development Planning in India', in T. Byres(ed.) *The State and Development Planning in India*. Delhi: Oxford University Press, pp. 73-108.

A. Varshney, (2010) 'Mass Politics or Elite Politics? Understanding the Politics of India'sEconomic Reforms' in R. Mukherji (ed.) *India's Economic Transition: The Politics of Reforms*,Delhi: Oxford University Press, pp 146-169.

P. Chatterjee, (2000) 'Development Planning and the Indian State', in Zoya Hasan (ed.), *Politics and the State in India*, New Delhi: Sage, pp.116-140.

P. Patnaik and C. Chandrasekhar, (2007) 'India: Dirigisme, Structural Adjustment, and theRadical Alternative', in B. Nayar (ed.), *Globalization and Politics in India*. Delhi: OxfordUniversity Press, pp. 218-240.

P. Bardhan, (2005) 'Epilogue on the Political Economy of Reform in India', in *The PoliticalEconomy of Development in India*. 6th impression, Delhi: Oxford University Press.

T. Singh, (1979) 'The Planning Process and Public Process: a Reassessment', *R. R. KaleMemorial Lecture*, Pune: Gokhale Institute of Politics and Economics.

II. Industrial development strategy and its impact on social structure

Readings:

A. Aggarwal, (2006) 'Special Economic Zones: Revisiting the Policy Debate', in *Economic and Political Weekly*, XLI (43-44), pp.4533-36.

B. Nayar (1989) *India's Mixed Economy: The Role of Ideology and its Development*, Bombay:Popular Prakashan.

F. Frankel, (2005) 'Crisis of National Economic Planning', in *India's Political Economy (1947-2004): The Gradual Revolution*, Delhi: Oxford University Press, pp. 93-340.

L. Fernandes, (2007) *India's New Middle Class: Democratic Politics in an Era of EconomicReform*, Delhi: Oxford University Press.

S. Shyam, (2003) 'Organizing the Unorganized', in *Seminar*, [Footloose Labour: A Symposiumon Livelihood Struggles of the Informal Workforce, 531] pp. 47-53.

S. Chowdhury, (2007) 'Globalization and Labour', in B. Nayar (ed.) *Globalization and Politicsin India*, Delhi: Oxford University Press, pp.516-526.

V. Chibber, (2005) 'From Class Compromise to Class Accommodation: Labor's Incorporationinto the Indian Political Economy' in R. Ray, and M.F. Katzenstein (eds.) *SocialMovements inIndia*, Delhi: Oxford University Press, pp 32-60.

III. Agrarian development strategy and its impact on social structure

Readings:

A. Desai, (ed.), (1986) *Agrarian Struggles in India after Independence*, Delhi: OxfordUniversity Press, pp. xi-xxxvi.
F. Frankel, (1971) *India's Green Revolution: Economic Gains and Political Costs*, Princetonand New Jersey: Princeton University Press.
F. Frankel, (2009) *Harvesting Despair: Agrarian Crisis in India*, Delhi: Perspectives, pp. 161-169.
J. Harriss, (2006) 'Local Power and the Agrarian Political Economy' in Harriss, J. (ed) *Power Matters: Essays on Institutions, Politics, and Society in India*, Delhi. Oxford University Press,pp. 29-32.
K. Suri, (2006) 'Political economy of Agrarian Distress', in *Economic and Political Weekly*,XLI(16) pp. 1523-1529.
P. Joshi, (1979) *Land Reforms in India: Trends and Perspectives*, New Delhi: Allied publishers.
P. Appu, (1974) 'Agrarian Structure and Rural Development', in *Economic and PoliticalWeekly*, IX (39), pp.70 – 75.
P. Sainath, (2010) 'Agrarian Crisis and Farmers', Suicide', *Occasional Publication*22, NewDelhi: India International Centre (IIC).
M. Sidhu, (2010) 'Globalisation vis-à-vis Agrarian Crisis in India', in R. Deshpande and S.Arora, (eds.) *Agrarian Crises and Farmer Suicides (Land Reforms in India Series),* New Delhi:Sage, pp. 149-174.
V. Sridhar, (2006) 'Why Do Farmers Commit Suicide? The Case Study of Andhra Pradesh', in *Economic and Political Weekly*, XLI (16).

IV. Social Movements

G. Shah, (ed.), (2002) *Social Movements and the State*. New Delhi: Sage Publications.
R. Singh (2001), *Social Movements, Old and New:A Post-Modernist Critique*, New Delhi: Sage
P. Wignaraja (ed.), (1993), *New Social Movements in the South:Empowering the People*, New Delhi: Vistar
V. Globalisation and Social Movements in India

Readings:

G. Haragopal, and K. Balagopal, (1998) 'Civil Liberties Movement and the State in India', in M. Mohanty, P. Mukherji and O. Tornquist, (eds.) *People's Rights*: *Social Movements and the State in the Third World* New Delhi: Sage, pp. 353-371.
M. Mohanty, (2002) 'The Changing Definition of Rights in India', in S. Patel, J. Bagchi, and K. Raj (eds.) *Thinking Social Sciences in India: Essays in Honour of Alice Thorner* Patel, NewDelhi: Sage.
G. Omvedt, (2012) 'The Anti-caste Movement and the Discourse of Power', in N. Jayal (ed.) *Democracy in India*, New Delhi: Oxford India Paperbacks, sixth impression, pp.481-508.
P. Ramana, (2011) 'India's Maoist Insurgency: Evolution, Current Trends and Responses', in M. Kugelman (ed.) *India's Contemporary Security Challenges*, Woodrow Wilson International Centre for Scholars Asia Programme, Washington D.C., pp.29-47.
A. Ray, (1996) 'Civil Rights Movement and Social Struggle in India', in *Economic and Political Weekly*, XXI (28). pp. 1202-1205.
A. Roy, (2010) 'The Women's Movement', in N.Jayal and P. Mehta (eds.) *The OxfordCompanion to Politics in India*, New Delhi: Oxford University Press, pp.409-422.
N. Sundar, (2011) 'At War with Oneself: Constructing Naxalism as India's Biggest SecurityThreat', in M. Kugelman (ed.) *India's Contemporary Security Challenges*, Woodrow WilsonInternational Centre for Scholars Asia Programme, Washington D.C., pp.46-68.
M. Weiner, (2001) 'The Struggle for Equality: Caste in Indian Politics', in A.Kohli. (ed.) *TheSuccess of India's Democracy*, Cambridge: CUP, pp.193-225.

S. Sinha, (2002) 'Tribal Solidarity Movements in India: A Review', in G. Shah. (ed.) *SocialMovements and the State*, New Delhi: Sage, pp. 251-266.

Additional Readings:

S. Banerjee, (1986) 'Naxalbari in Desai', in A.R. (ed.) *Agrarian Struggles in India AfterIndependence*. Delhi: Oxford University Press, pp.566-588.
B. Nayar, (ed.), (2007) *Globalization and Politics in India*. Delhi: Oxford University Press.S. Roy and K. Debal, (2004) *Peasant Movements in Post-Colonial India: Dynamics ofMobilization and Identity*, Delhi: Sage.
G. Omvedt, (1983) *Reinventing Revolution, New Social Movements and the SocialistTradition in India*, New York: Sharpe.
G. Shah, (ed.), (2002) *Social Movements and the State*. New Delhi: Sage Publications.
G. Shah, (2004) *Social Movements in India: A Review of Literature*, New Delhi: SagePublications.
G. Rath, (ed.), (2006) *Tribal development in India: The Contemporary Debate*, New Delhi:Sage Publications.
J. Harris, (2009) *Power Matters: Essays on Institutions, Politics, and Society in India*. Delhi:Oxford University press.
K. Suresh, (ed.), (1982) *Tribal Movements in India*, Vol I and II, New Delhi: Manohar(emphasis on the introductory chapter).
M. Mohanty, P. Mukherji and O.Tornquist, (1998) *People's Rights: Social Movements andthe State in the Third World*. New Delhi: Sage Publications.
M. Rao, (ed.), (1978) *Social Movements in India*, Vol. 2, Delhi: Manohar.
N. Jayal, and P. Mehta, (eds.), (2010) *The Oxford Companion to Politics in India*, Delhi:OxfordUniversity Press.
P. Bardhan, (2005) *The Political Economy of Development in India*, 6th impression, Delhi:Oxford University Press.
R. Mukherji, (ed.), (2007) *India's Economic Transition: The Politics of Reforms*, Delhi: OxfordUniversity Press.
R, Ray and M. Katzenstein, (eds.), (2005) *Social Movements in India*, Delhi: Oxford UniversityPress.
S. Chakravarty, (1987) *Development Planning: The Indian Experience*, Delhi: OxfordUniversity Press.

Public Policy in India

Code: PLS-A-DSE-6-A(3)-TH+TU

Module I

1.Introduction to Policy Analysis
2. The Analysis of Policy vis-à-vis the Theories of State

Module II

3. Political Economy and Policy: Interest Groups and Social Movements.
4. Ideology and Policy: Nehruvian Vision, Economic Liberalisation and recent developments

Readings:

I Introduction to Policy Analysis

Jenkins, B. (1997) 'Policy Analysis: Models and Approaches' in Hill, M. (1997) *The PolicyProcess: A Reader* (2nd Edition). London: Prentice Hall, pp. 30-40.
Dye, T.R. (2002) *Understanding Public Policy*. Tenth Edition. Delhi: Pearson, pp.1-9, 32-56 and 312-329.
Sapru, R.K.(1996) *Public Policy : Formulation, Implementation and Evaluation*. New Delhi: Sterling Publishers, pp. 26-46.
Wildavsky, A.(2004), ' Rescuing Policy Analysis from PPBS' in Shafritz, J.M. & Hyde, A.C. (eds.) *Classics of Public Administration*. 5th Edition. Belmont: Wadsworth, pp.271-284.

II. The Analysis of Policy in the Context of Theories of State

Dunleavy, P. and O'Leary, B. (1987) *Theories of the State*. London: Routledge.

McClennan, G. (1997) 'The Evolution of Pluralist Theory' in Hill, M. (ed.) *The Policy Process:A Reader.* 2nd Edition. London: Prentice Hall, pp. 53-61.
Simmie, J. & King, R. (eds.) (1990) *The State in Action: Public Policy and Politics.* London: Printer Publication, pp.3-21 and 171-184.
Skocpol, T. et al (eds.) (1985) *Bringing the State Back In.* Cambridge: Cambridge University Press, pp. 3-43 and 343-366.
Dye, T.R. (2002) *Understanding Public Policy*. 10th Edition. Delhi: Pearson, pp.11-31.

III. Political Economy and Policy: Interest Groups and Social Movements.

Lukes, S. (1986) *Power.* Basil: Oxford, pp. 28-36.
Lukes, S. (1997) 'Three Distinctive Views of Power Compared', in Hill, M. (ed.), *The Policy Process: A Reader.* 2nd Edition. London: Prentice Hall, pp. 45-52.
Giddens, A. (1998) *The Third Way: The Renewal of Social Democracy.* Cambridge: Polity Press, pp. 27-64 and 99-118.

IV. Ideology and Policy: Nehruvian Vision, Economic Liberalisation and recent developments

Basu Rumki (2015) Public Administration in India Handates, Performance and Future Perspectives, New Delhi, Sterling Publishers
Self, P. (1993) *Government by the Market? The Politics of Public Choice*. Basingstoke: MacMillan, pp. 1-20,70-105,113-146,198-231 and 262-277.
Girden,E.J.(1987) 'Economic Liberalisation in India: The New Electronics Policy' in *AsianSurvey*. California University Press. Volume 27, No.11. Available at -www.jstor.org/stable/2644722.

Understanding Global Politics

Code: PLS-A-DSE-6-A(4)-TH+TU

Module I

I. What Makes the World What it is
a. The Sovereign State System

i Evolution of the state system
ii The concept of Sovereignty

b. The Global Economy
i Discussing the Bretton Woods Institutions and WTO
ii Ideological underpinnings
iii Transnational Economic Actors

c. Identity and Culture

ii. What Drives the World Apart
a.Global Inequalities
b.Violence: Conflict, War and Terrorism

III. Why We Need to Bring the World Together

a.Global Environment b. Global Civil Society

Readings:

I. What Makes the World What it is? a. The Sovereign State System

S. Elden, (2009) 'Why Is The World Divided Territorially?', in J. Edkins and M. Zehfuss (eds.) *Global Politics: A New Introduction*, New York: Routledge, pp. 192-219.

M. Shapiro, (2009) 'How Does The Nation- State Work?', in J. Edkins and M. Zehfuss (eds.) *Global Politics: A New Introduction*, New York: Routledge, pp. 220-243.

R. Mansbach and K.Taylor, (2012) 'The Evolution of the Interstate System and Alternative Global Political Systems', *Introduction to Global Politics*, 2nd edition, New York: Routledge, pp. 34-68.

D. Armstrong, (2008) 'The Evolution of International Society', in J. Baylis, S. Smith, and P. Owens (ed.) *The Globalization of World Politics: An Introduction to International Relations,* New York: Oxford University Press, pp. 36-52.

N. Inayatullah and D. Blaney, (2012) 'Sovereignty' in B. Chimni and S. Mallavarapu (ed.) *International Relations: Perspectives For the Global South*, New Delhi: Pearson, pp. 124-134.

b. The Global Economy

Readings:

V. Peterson**,** (2009) 'How Is The World Organized Economically?', in J. Edkins and M. Zehfuss (eds.) *Global Politics: A New Introduction*, New York: Routledge, pp. 271- 293.

Bourke, (2009) 'Why Does Politics Turn Into Violence?', in J. Edkins And M. Zehfuss (eds.), *Global Politics: A New Introduction*, New York: Routledge, pp. 370-396.

Bajpai, (2012) 'Global Terrorism', in B. Chimni and S. Mallavarapu (ed.), *InternationalRelations: Perspectives For the Global South*, New Delhi: Pearson, pp. 312-327.

R. Mansbach, and K. Taylor, (2012) 'The Causes of War and the Changing Nature Of Global Politics', in *Introduction to Global Politics,* 2nd edition, New York: Routledge, pp. 248-283.

R. Collin and P. Martin, 'Kinds Of Conflict: The World When Things Go Wrong', in *AnIntroduction To World Politics: Conflict And Consensus On A Small Planet*, London: Rowman& Littlefield Publishers, pp. 267-425.

III. Why We Need to Bring the World Together? a. Global Environment

Readings:

S. Dalby, (2009) 'What Happens If We Do not Think In Human Terms?', in J. Edkins and M. Zehfuss (eds.), *Global Politics: A New Introduction*, New York: Routledge, pp. 45-69.

R. Collin and P. Martin, (2013) 'The Greening of A Blue Planet', in *An Introduction To WorldPolitics: Conflict And Consensus On A Small Planet*, Maryland: The Rowman & LittlefieldPublication Group, pp. 527-570.

A. Heywood, (2011) 'Global Environmental Issues', in *Global Politics,* London: Palgrave, 2011, pp. 383-411.

N. Carter, (2007) *The Politics of Environment: Ideas, Activism, Policy*, 2nd edition, Cambridge: Cambridge University Press, pp 13-81.

b. Global Civil Society

Readings:

Zehfuss, (2009) 'What Can We Do To Change The World?', in J. Edkins and M. Zehfuss (eds.), *Global Politics: A New Introduction* , New York: Routledge, pp. 483-501.

N. Chandhoke, (2011) 'The Limits of Global Civil Society,' Available at www.gcsknowledgebase.org/wp-content/uploads/2002chapter2.pdf, Accessed: 19.04.2013.

K. Mingst and J. Snyder (eds.), (2011) 'Transnational Issues', in *Essential Readings In WorldPolitics,* 4th Edition, New York: W. W. Norton And Company, pp. 574-626.

M. Keck and K. Sikkink, (2007) 'Transnational Activist Networks,' in Robert J. Art and R. Jervis (eds.) *International Politics: Enduring Concepts and Contemporary Issues,* 8th Edition, London: Pearson, pp. 532-538.

M. Naim, (2007) 'The Five Wars Of Globalization', in R. Art and R. Jervis (eds.) *InternationalPolitics: Enduring Concepts And Contemporary Issues,* 8th Edition, London: Pearson, pp. 558-566.

S. Mallaby, (2007) 'NGOs: Fighting Poverty, Hurting the Poor', in R. Art and R. Jervis (eds.)

International Politics: Enduring Concepts and Contemporary Issues, 8th edition, New York:Pearson, pp. 539-545.
G. Lexter and S. Halperin (eds.), (2003) *Global Civil Society and Its Limits,* New York: Palgrave, pp. 1-21.

Citizenship in a Globalising World

Code: PLS-A-DSE-6-B(3)-TH+TU

This course will explore theories of citizenship, the historical development of the concept and its practice of in an increasingly globalizing world.

Module I

1. Classical conceptions of citizenship
2. The Evolution of Citizenship and the Modern State

Module II

3. Citizenship and Diversity
4. Citizenship beyond the Nation-state: Globalization and global justice
5. The idea of cosmopolitan citizenship

Essential Readings

- Acharya, Ashok. (2012) *Citizenship in a Globalising World.* New Delhi: Pearson.
- Beiner, R. (1995) *Theorising Citizenship*. Albany: State University of New York Press.
- Held, David (1995), *Democracy and the Global Order: From the Modern State toCosmopolitan Governance* (Stanford: Stanford University Press).
- Kymlicka, Will (1999), "Citizenship in an Era of Globalization: A Response to Held," in Ian Shapiro and Casiano Hacker-Cordon (eds.), *Democracy's Edges* (Cambridge, UK: Cambridge University Press).
- Oliver, D. and D. Heater (1994). *The Foundations of Citizenship*. London, Harvester Wheatsheaf.
- Scholte, Jan Aart (2000), *Globalization: A Critical Introduction* (New York: St. Martin's).
- Zolo, Danilo (1997), *Cosmopolis: Prospects for World Government* (Cambridge, UK: Polity Press).

Human Rights in a Comparative Perspective

Code: PLS-A-DSE-6-B(4)-TH+TU

Module I

Human Rights: Theory and Institutionalization

Understanding Human Rights: Three Generations of Rights
Institutionalization: Universal Declaration of Human Rights
Rights in National Constitutions: South Africa and India

Issues:

Torture: USA and India; Surveillance and Censorship: China and India; Terrorism and Insecurity of Minorities: USA and India

Module II

Structural Violence:

Caste and Race: South Africa and India

Gender and Violence: India and Pakistan
Adivasis/Aboriginals and the Land Question: Australia and India

READING LIST

Human Rights: Theory and Institutionalization

Essential Readings:

I. Hoffman and P. Graham, (2006) 'Human Rights', *Introduction to Political Theory*, Delhi, Pearson, pp. 436-458.

SAHRDC (2006) 'Introduction to Human Rights'; 'Classification of Human Rights: An Overview of the First, Second, and Third Generational Rights', in *Introducing Human Rights*, New Delhi: Oxford University Press.

The Constitution of the Republic of South Africa, Chapter 2: Bill of Rights.

The Constitution of India, Chapter 3: Fundamental Rights

Issues

Torture: USA and India

Essential Readings:

M. Lippman, (1979) 'The Protection of Universal Human Rights: The Problem of Torture' *Universal Human Rights*, Vol. 1(4), pp. 25-55

J. Lokaneeta, (2011) 'Torture in the TV Show 24: Circulation of Meanings'; 'Jurisprudence on Torture and Interrogations in India', in *Transnational Torture Law, Violence, and State Powerin the United States and India,* Delhi: Orient Blackswan,

D. O'Byrne, (2007) 'Torture', in *Human Rights: An Introduction***,** Delhi: Pearson, pp. 164-197.

Surveillance and Censorship: China and India

Essential Readings:

D. O'Byrne, (2007) 'Censorship', in *Human Rights: An Introduction***,** Delhi: Pearson, pp. 106-138.

D. Lyon, (2008) Surveillance Society, Talk for Festival del Diritto, Piacenza, Italia, September 28, pp.1-7.

Fu Hualing, (2012) 'Politicized Challenges, Depoliticized Responses: Political Monitoring in China's Transitions', paper presented at a conference on States of Surveillance: Counter-Terrorism and Comparative Constitutionalism, at the University of New South Wales, Sydney, 13-14 December.

U. Singh, (2012) 'Surveillance Regimes in India', paper presented at a conference on States of Surveillance: Counter-Terrorism and Comparative Constitutionalism, at the University of New South Wales, Sydney, 13-14 December.

Terrorism and Insecurity of Minorities: USA and India

Essential Readings:

E. Scarry, (2010) 'Resolving to Resist', in *Rule of Law, Misrule of Men***,** Cambridge: Boston Review Books**,** MIT, pp.1-53.

M. Ahmad, (2002) 'Homeland Insecurities: Racial Violence the Day after September 11', *Social Text*, 72, Vol. 20(3), pp. 101-116.

U. Singh, (2007) 'The Unfolding of Extraordinariness: POTA and the Construction of Suspect Communities', in *The State, Democracy and Anti-terror Laws in India***,** Delhi: Sage Publications, pp.165-219

Structural Conflicts

Caste and Race: South Africa and India

Essential Readings:

A. Pinto, (2001) 'UN Conference against Racism: Is Caste Race?', in *Economic and PoliticalWeekly*, Vol. 36(30)

D. O'Byrne, (2007) 'Apartheid', in *Human Rights: An Introduction,* Delhi: Pearson, pp. 241-262.

R. Wasserstorm, (2006), 'Racism, Sexism, and Preferential Treatment: An approach to the Topics', in R.

Goodin and P. Pettit, *Contemporary Political Philosophy: an Anthology*, Oxford: Blackwell, pp-549-574
R. Wolfrum, (1998) 'Discrimination, Xenophobia and Racism' in J. Symonides, *Human Rights:New Dimensions and Challenges*, Aldershot, Ashgate/UNESCO, pp.181-198.

Gender and Violence: India and Pakistan

Essential Readings:

A. Khan and R. Hussain, (2008), 'Violence Against Women in Pakistan: Perceptions and Experiences of Domestic Violence', *Asian Studies Review*, Vol. 32, pp. 239 – 253

K. Kannabiran (2012) 'Rethinking the Constitutional Category of Sex', in *Tools of Justice:Non-Discrimination and the Indian Constitution*,New Delhi, Routledge, pp.425-443

Adivasis/Aboriginals and the Land Question: Australia and India

Essential Readings:

H. Goodall, (2011) 'International Indigenous Community Study: Adivasi Indigenous People in India', in A. Cadzow and J. Maynard (eds.),*Aboriginal Studies,* Melbourne: Nelson Cengage Learning, pp.254-259.
K. Kannabiran, (2012) 'Adivasi Homelands and the Question of Liberty', in *Tools of Justice:Non-Discrimination and the Indian Constitution*, New Delhi: Routledge, pp.242-271.
N. Watson (2011) 'Aboriginal and Torres Strait Islander Identities' in A. Cadzow and J. Maynard (eds.),*Aboriginal Studies*, Melbourne: Nelson Cengage Learning, pp.43-52.
W. Fernandes (2008) 'India's Forced Displacement Policy and Practice. Is Compensation up to its Functions?', in M. Cernea and H. Mathus (eds), *Can Compensation PreventImpoverishment? Reforming Resettlement through Investments and Benefit-Sharing*,pp.181-207, New Delhi: Oxford University Press.

Additional Readings:

A. Laws and V. Iacopino, (2002) 'Police Torture in Punjab, India: An Extended Survey', in *Health and Human Rights,* Vol. 6(1), pp. 195-210
D. O'Byrne, (2007) 'Theorizing Human Rights', in *Human Rights: An Introduction,* Delhi, Pearson, pp.26-70.
J. Morsink, (1999) *The Universal Declaration of Human Rights: Origins, Drafting and Intent*, Philadelphia: University of Pensylvania Press, pp. ix-xiv
J. Nickel, (1987) *Making Sense of Human Rights: Philosophical Reflections on the UniversalDeclaration of Human Rights*,Berkeley: University of California Press.
J. Goldman, (2005) 'Of Treaties and Torture: How the Supreme Court Can Restrain the Executive', in *Duke Law Journal*, Vol. 55(3), pp. 609-640.
J. Tsutsui and C. Wotipka, (2004) Global Civil Society and the International Human Rights Movement: Citizen Participation in Human Rights International Nongovernmental Organizations, in *Social Forces*, Vol. 83(2), pp. 587-620.
J. Rabben, (2001) Amnesty International: Myth and Reality, in *Agni*, No. 54, Amnesty International Fortieth Anniversary pp. 8-28

K. Mohanty, (2010) 'In Pursuit of People's Rights: An Introduction', in M. Mohanty et al., *Weapon of the Oppressed: Inventory of People's Rights in India*, New Delhi: Danish Books,pp.1-11
M. Cranston, (1973) *What are Human Rights?* New York: Taplinger
M. Ishay, (2004) *The History of Human Rights: From Ancient Times to the Globalization Era*, Delhi: Orient Blackswan.
R. Sharan, (2009) 'Alienation and Restoration of Tribal Land in Jharkhand in N Sundar (ed.) *Legal Grounds*, New Delhi: Oxford University Press, pp. 82-112
Text of UDHR available at http://www.un.org/en/documents/udhr/index.shtml
U. Baxi, (1989) 'From Human Rights to the Right to be Human: Some Heresies', in S. Kothari and H. Sethi (eds.), *Rethinking Human Rights*, Delhi: Lokayan, pp.181-166.

Skill Enhancement Courses

Democratic Awareness through Legal Literacy

Code: PLS-A-SEC-3-A(1)-TH

Module I

1. Laws relating to Criminal jurisdiction-provisions relating to filing an FIR, arrest, bail, search and seizure and some understanding of the questions of evidence and procedure in the Criminal Procedure Code.
2. Offences under IPC.
3. India: Personal laws. Customary Laws
4. Laws relating to Dowry, sexual harassment and violence against women.

Module II

5. Laws relating to consumer rights.
6. Right to Information.
7. Laws relating to Cybercrimes.
8. Anti-terrorist laws: Implications for security and human rights.

Readings:

Pandey, (2008) 'Laws Relating to Criminal Justice: Challenges and Prospects', in K. Sankaran and U. Singh, *Towards Legal Literacy,* New Delhi: Oxford University Press, pp.61-77.SAHRDC, (2006)'Reporting a Crime: First Information Report', in *Oxford Handbook of Human Rights and Criminal Justice in India - The system and Procedure*, New Delhi:Oxford University Press, pp.16-26.

SAHRDC, (2006) 'Bail', in *Oxford Handbook of Human Rights and Criminal Justice in India - The system and Procedure*, New Delhi: Oxford University Press, pp.59-71.

SAHRDC, (2006) 'Detention', in *Oxford Handbook of Human Rights and Criminal Justice in India - The system and Procedure*. New Delhi: Oxford University Press, pp.72-84.
P. Mathew, (2003) *Your Rights if you are Arrested,* New Delhi. Indian Social Institute.
P. Mathew, (2002) *The Law on Atrocities Against Scheduled Castes and Scheduled Tribes,* New Delhi: Indian Social Institute.
K. Saxena, (2011) 'Dalits', in M. Mohanty et al., *Weapon of the Oppressed, Inventory of People's Rights in India*. Delhi: Danish Books, Pp.15-38
K. Saxena, (2011) 'Adivasis', in M. Mohanty et al., *Weapon of the Oppressed, Inventory of People's Rights in India*, Delhi: Danish Books, Pp.39-65.
S. Durrany, (2006) *The Protection of Women From Domestic Violence Act 2005*, New Delhi: Indian Social Institute.
V. Kumari, (2008) 'Offences against Women', in K, Sankaran and U. Singh (eds.) *Towards Legal Literacy,* New Delhi: Oxford University Press.
P. D. Mathew (2004)*The Measure to Prevent Sexual Harassment of Women in Work Place.* New Delhi: Indian Social Institute.
D. Srivastva, (2007) 'Sexual Harassment and Violence against Women in India: Constitutional and Legal Perspectives', in C. Kumar and K. Chockalingam (eds) *HumanRights, Justice, and Constitutional Empowerment*, Delhi: Oxford University Press.
S. Naib, (2013) 'Right to Information Act 2005', in *The Right to Information in India,* New Delhi: Oxford University Press, Available at

http://www.humanrightsinitiative.org/publications/rti/guide_to_use_rti_act_2005_English2012_light_Aspire.pdf.

Bare Acts**:**
Consumer Protection Act, 1986, Available at http://chdslsa.gov.in/right_menu/act/pdf/consumer.pdf.
Criminal law Amendment Act, 2013, Available at http://egazette.nic.in/WriteReadData/2013/E_17_2013_212.pdf , Accessed: 10.04.2013.
Protection of Women Against Domestic Violence Act, 2005, Available at http://wcd.nic.in/wdvact.pdf.
Right to Information Act, 2005, Available at http://righttoinformation.gov.in/rti-act.pdf.
Scheduled Castes and Scheduled Tribes Prevention of Atrocities Act, 1989, Available at http://tribal.nic.in/writereaddata/linkimages/poaact989E4227472861.pdf.
Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006, Available at http://tribal.gov.in/writereaddata/mainlinkFile/File1033.pdf.
The Persons with Disabilities (Equal Opportunities, Protection of Rights, Full Participation) Act, 1995, Available at http://bhind.nic.in/Sparsh_disability%20act%201995.pdf.
The Right of Children to Free and Compulsory Education Act, 2009, Available at http://www.delta.org.in/form/rte.pdf.
The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Bill, 2012**,** Available at http://164.100.24.219/BillsTexts/LSBillTexts/PassedLoksabha/144C_2010_LS_Eng.pdf.
Criminal Law Amendment Act, 2013**,** Available at mha.nic.in/pdfs/TheCrimnalLaw030413.pdfFile Format: PDF/Adobe Acrobat – Quick View.

Understanding the Legal System

Code: PLS-A-SEC-3-A(2)-TH

Module I

1) Outline of the legal system in India
2) System of Courts/tribunals and their jurisdiction in India-Criminal and civil courts, writ jurisdiction.
3) Specialized Courts such as juvenile courts, mahila courts and tribunals.

Module II

4) Role of the police and executive in criminal law administration.
5) Alternate dispute mechanisms such as Lok Adalats, non-formal mechanisms.

Readings:
Creating Legal Awareness, edited by Kamala Sankaran and Ujjwal Singh (Delhi: OUP, 2007)
S..K. Agarwala, *Public Interest Litigation in India*, K.M. Munshi Memorial Lecture, Second Series, Indian Law Institute, Delhi, 1985.
Asha Bajpai, *Child Rights in India : Law, Policy, and Practice*, Oxford University Press, New Delhi,2003
B.L. Wadhera, *Public Interest Litigation - A Handbook*, Universal, Delhi, 2003.
P.C. Rao and William Sheffiled *Alternate Dispute Resolution: What it is and How it Works*, Universal Law Books and Publishers, Delhi, 2002
V.N. Shukla's *Constitution of India* by Mahendra P. Singh, Eastern Book Co. 10th edition.

Parmanand Singh, *'Access to Justice and the Indian Supreme Court'*, 10 & 11 Delhi Law Review 156, 1981-82.
J. Kothari, (2005) 'Criminal Law on Domestic Violence', *Economic and Political Weekly,* Vol. 40(46), pp. 4843-4849.
H. Mander, and A. Joshi, *The Movement for Right to Information in India, People's Power for the Control of Corruption*. Available at http://www.rtigateway.org.in/Documents/References/English/Reports/12.%20An%20article%20on%20RTI%20by%20Harsh%20Mander.pdf.
P. Mathew, and P. Bakshi, (2005) '*Indian Legal System'*, New Delhi: Indian Social Institute.
P. Mathew, and P. Bakshi, (2005) '*Women and the Constitution'*, New Delhi: Indian Social Institute.
N. Menon, (2012) 'Sexual Violence', in *Seeing Like a Feminist* New Delhi: Zubaan and Penguin, pp. 113-146.
M, Mohanty et al. (2011) *Weapon of the Oppressed, Inventory of People's Rights in India*. Delhi: Danish Books.
Centre for Good Governance, (2008) *Right to Information Act, 2005: A Citizen's Guide*, Available at http://www.rtigateway.org.in/Documents/Publications/A%20CITIZEN'S%20GUIDE.pdf,
Pandey, (2004) *Rights of the Consumer*. New Delhi: Indian Social Institute.
Pandey, (2008) 'Laws Relating to Criminal Justice: Challenges and Prospects', in K. Sankaran and U. Singh, *Towards Legal Literacy,* New Delhi: Oxford University Press, pp.61-77.
SAHRDC, (2006)'Reporting a Crime: First Information Report', in *Oxford Handbook of Human Rights and Criminal Justice in India - The system and Procedure*, New Delhi: Oxford University Press, pp.16-26.
SAHRDC, (2006) 'Bail', in *Oxford Handbook of Human Rights and Criminal Justice in India- The system and Procedure*, New Delhi: Oxford University Press, pp.59-71.
SAHRDC, (2006) 'Detention', in *Oxford Handbook of Human Rights and Criminal Justice in India- The system and Procedure*. New Delhi: Oxford University Press, Pp.72-84.
P. Mathew, (2003) *Your Rights if you are Arrested,* New Delhi. Indian Social Institute

Legislative Practices and Procedures

Code: PLS-A-SEC-4-B(1)-TH

Module I

1) Members of Parliament: Powers and Privileges-Constituency Work.
2) State legislative Assemblies: Powers and functions.
3) Functionaries of rural and urban local self-government from Zila Parishad, Municipal Corporation to Panchayat/ Ward.

Module II

4) How a bill becomes a law, role of standing committees in reviewing a bill, legislative consultants, the framing of rules and regulations.
5) Types of committees.
6) Role of committees in reviewing government finances, policy, programmes and legislation.
7) Powers and functions of people's representative at different tiers of governance

Readings:

M. Madhavan, and N. Wahi, (2008) Financing of Election Campaigns PRS, Centre for Policy Research, New Delhi, Available at: http://www.prsindia.org/uploads/media/conference/Campaign_finance_brief.pdf, Accessed: 19.04.2013 S.

Vanka, (2008) Primer on MPLADS, Centre for Policy Research, New Delhi, Available at http://www.prsindia.org/parliamenttrack/primers/mplads-487/, Accessed: 19.04.2013 129 H. Kalra, (2011) Public Engagement with the Legislative Process PRS, Centre for Policy Research, New Delhi, Available at: http://www.prsindia.org/administrator/uploads/media/Conference%202011/Public%20Eng agement%20with%20the%20Legislative%20Process.pdf, Accessed: 19.04.2013. Government of India (Lok Sabha Secretariat), (2009) Parliamentary Procedures (Abstract Series), Available at http://164.100.47.132/LssNew/abstract/index.aspx, Accessed: 19.04.2013

The legislative process

Readings:

Government of India, (Ministry of Parliamentary Affairs), (2009) Legislation, Parliamentary Procedure, Available at http://mpa.nic.in/Manual/Manual_English/Chapter/chapter- 09.htm, Accessed: 19.04.2013 Government of India, (Ministry of Parliamentary Affairs) (2009), Subordinate Legislation, Parliamentary Procedure, Available at: http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-11.htm Accessed: 19.04.2013 D. Kapur and P. Mehta, (2006) 'The Indian Parliament as an Institution of Accountability', Democracy, Governance and Human Rights, Programme Paper Number 23, United Nations Research Institute for Social Development, Available at: http://www.unrisd.org/UNRISD/website/document.nsf/240da49ca467a53f80256b4f005ef2 45/8e6fc72d6b546696c1257123002fcceb/$FILE/KapMeht.pdf, Accessed: 19.04.2013 O. Agarwal and T. Somanathan, (2005) 'Public Policy Making in India: Issues and Remedies', Available at: http://www.cprindia.org/admin/paper/Public_Policy_Making_in_India_14205_TV_SOMANA THAN.pdf, Accessed: 19.04.2013 B. Debroy, (2001) 'Why we need law reform' Seminar January.

Legislative Committees

Readings:

P. Mehta, 'India's Unlikely Democracy: The Rise of Judicial Sovereignty', Journal of Democracy, Vol. 18(2), pp.70-83. Government link: http://loksabha.nic.in/; http://rajyasabha.nic.in/; http://mpa.nic.in/ K. Sanyal, (2011) Strengthening Parliamentary Committees PRS, Centre for Policy Research, New Delhi, Available at: http://www.prsindia.org/administrator/uploads/media/Conference%202011/Strengthening %20Parliamentary%20Committees.pdf, Accessed: 19.04.2013

Elementary Aspects of Social Research

Code: PLS-A-SEC-4-B(2)-TH

Module I

1. Fundamental issues in Research Methodology: concepts, variables, proposition and hypotheses; hypothesis construction and verification; measurement – scales; ethics in social research.

2. Research design: definition, purpose of research, unit of analysis, fallacy (ecological fallacy and fallacy of reductionism), factors affecting research design.

3. Sources and techniques of data collection -- qualitative and quantitative; Sampling –different types; Basic statistical methods – types of statistics; measures of central tendencies and measures of dispersion; graphic representation of data.

Module II

4. Participatory field research: Modes and methods of participant observation; advantages and limitations; Case study: definition; types; steps involved in the method; uses. Focus group method: nature and uses; role of the researcher.

5. Survey method: Definition, types; techniques of survey research: Pilot survey; interviewing – techniques; different types; qualities of a good interviewer; questionnaire – framing a questionnaire; problem of non-response; advantages and disadvantages of survey method.

6. Aggregate data analysis: Sources of aggregate data; uses of aggregate data; advantages of aggregate data; fallacy of inference. Experimental design: key concepts in experimental design; steps and planning the research; issues of equivalence and validity; classical experimental design.

[The Course may be supplemented with the use of computers though it is not obligatory].

Readings:

R. Kumar, Research Methodology: A Step-by-Step Guide for Beginners, Sage, 2010.
W.L. Neuman, Social Research Methods: Qualitative and Quantitative Approaches, Pearson.
D. E. McNabb, (2004) Research Methods for Political Science- Quantitative and Qualitative Methods, New Delhi: Prentice-Hall of India Pvt. Ltd.
R. Chatterjee, (1979) Methods of Political Enquiry, Calcutta: The World Press Pvt. Ltd., 1979.

University of Calcutta

Final Draft BA (General)-CBCS Syllabus in Political Science, 2018

Core Courses* (4 courses provided). Discipline-specific Elective (4 courses provided); Skill Enhancement(4 courses provided).[Students will also have to take courses from other subject/s]

*Core Courses mentioned hereunder are to be treated as the Generic Elective Courses of students pursuing Honours in a subject *other than Political Science*.

- ^Each coursecarries 80 marks--- theoretical and tutorial (plus 10 marks each for Attendance and Internal Assessment).
- 6 credit course:Minimum 30 classes for Theory and 15 contact hours for Tutorial per module. 2 credit course: 30 teaching/lecture hours in total.
- Core, DSE (and GE) Course: 6 credits (5 Theoretical + 1 Tutorial-related).
- Skill Enhancement/Skill-based Courses: 2 credits (no Tutorial).

^End SemesterAssessment--- 65 marks for theoretical segment: 50 marks for subjective/descriptive questions + 15 marks for the category of 1 mark-questions.Question Pattern for subjective/descriptive segment of 50 marks: 2 questions (within 100 words; one from each module) out of 4 (10 x2 = 20) + 2 questions (within 500 words; one from each module) out of 4 (15 x 2 = 30).>>For Skill Enhancement Courses the last component would carry 6 questions--- 15 marks each--- out of which 3 (at least one from each module) to be attempted because such courses have no Tutorial.

15 marks for tutorial-related segments as suggested below (any one item from each mode):

Any one of the following modes: i) Written mode: upto 1000 words for one Term Paper/upto 500 words for each of the two Term Papers/ equivalent Book Review/equivalent Comprehension/equivalent Quotation or Excerpt Elaboration. ii) Presentation Mode: Report Presentation/Poster Presentation/Field work--- based on syllabus-related and/or current topics (May be done in groups)[The modes and themes and/or topics are be decided by the concerned faculty of respective colleges.]

- **Core Courses in Semesters I-IV; Discipline-specific courses in Semesters V and VI; Skill Enhancement courses in Semesters III-VI.**

IMPORTANT NOTES:

- The Readings provided below (except Bengali books) include those of the UGC Model CBCS Syllabus in Political Science. For Course Objectives and references it is advised that the UGC model CBCS syllabus* concerning relevant courses and topics be provided due importance and primarily consulted.

*BA General https://www.ugc.ac.in/pdfnews/0693504_BA-with-Pol-Science-.pdf

- Bengali books are not necessarily substitutes, but supplementary to the English books.
- The format isstrictly subject to the parameters of the Common Structural Format of the University.

General (Political Science) Courses

Core:

Introduction to Political Theory

Comparative Government and Politics

Government and Politics in India

International Relations

DSE:

Public Administration

Indian Foreign Policy

Feminism: Theory and Practice

Human Rights: Theory and Indian Context

SEC:

Legal Literacy

Elementary Dimensions of Research

Understanding the Legal System

Basic Research Methods

Core Courses

Introduction to Political Theory Code: PLS-G-CC-1-1-TH+TU

Module I

1. Political Science: nature and scope; Different approaches--- Normative, Behavioural, Post-Behavioural, Marxist, Feminist.
2. State: Contract theory; Idealist theory; Liberal theory; Marxist theory; Gandhian theory. Sovereignty of the State: Monistic and Pluralist theories. Doctrine of Popular Sovereignty.
3. Foundational concepts: Law; Right; Liberty; Equality--- meanings, sources, interrelationships.
4. Key concepts: Nationalism and Internationalism—meanings and features; Democracy--- meaning and nature.

Module II

5. Marxism: Dialectical and Historical Materialism; Class and Class Struggle; Theory of Revolution; Lenin's Theory of Imperialism.
6. Fascism: meaning, features, significance.
7. Political parties and interest groups: functions and role; Methods of representation: territorial, functional, proportional.

Readings:

R. Bhargava and A. Acharya eds., Political Theory: An Introduction.
Mohit Bhattacharya and Amal Roy: Political Theory: Ideas and Institutions.
S. Ramasway: Political Theory: Ideas and Concepts.
O. P Gauba: An Introduction to Political Theory.
J. C. Johari: Political Theory
S.P. Verma: Modern Political Theory.
Maurice Cornforth: Dialectical Materialism.
Robin Goodfellow: Marxism in a Nutshell.
Tom Bottomore ed.: A Dictionary of Marxist Thought.
V. I. Lenin: Imperialism--- The Highest Stage of Capitalism.
Margaret Walters: Feminism: A Very Short Introduction.

মোহিত ভট্টাচার্য, বিশ্বনাথ ঘোষঃ আধুনিক রাষ্ট্রবিজ্ঞান
অনাদি কুমার মহাপাত্রঃ রাষ্ট্রবিজ্ঞান
হিমাচল চক্রবর্তীঃ রাষ্ট্রবিজ্ঞান
সত্যসাধন চক্রবর্তী, নির্মলকান্তি ঘোষঃ রাষ্ট্রবিজ্ঞান
দেবাশীষ চক্রবর্তীঃ রাষ্ট্রতত্ব ও প্রতিষ্ঠান
এমিল বার্নসঃ মার্কসবাদ(What is Marxism-এরঅনুবাদ)
ভোলানাথ বন্দ্যোপাধ্যায়ঃ দ্বন্দ্বমূলক বস্তুবাদ(মরিস কর্নফোর্থের Dialectical Materialism-এর অনুবাদ)
রাজশ্রী বসু ও বাসবী চক্রবর্তী (সম্পা): প্রসঙ্গ মানবীবিদ্যা

Comparative Government and Politics Code: PLS-G-CC-2-2-TH+TU

Module I

1 Political System: Liberal-democratic, Authoritarian .Socialist – forms of Political Systems: Unitary and Federal, Parliamentary and Presidential.

2. U.K.: (a) Basic features with major focus on Conventions and rule of Law.
(b) Legislature: composition and functions with major focus on the concept of parliamentary sovereignty. (c) Executive: composition and functions of the Cabinet with major focus on the role of the Prime Minister – the concept of Cabinet Dictatorship; (d) Role of the Crown;(e) Party system – role of the Opposition.

3. U.S.A.: (a) Basic features (b) US federalism (c) Bill of rights (d) Legislature: composition and functions with major focus on the Presiding Officers and Committee System; (e) The Executive: The President: election, powers and functions. US Cabinet: composition and functions; (f) Supreme Court: composition and functions; (g) Party system.

Module II

4. PRC (1982 Constitution):(a) Significance of the Revolution (b) Basic features with special reference to General Principles(c) Communist Party: structure, functions, role (d) Rights and Duties of Citizen (e) The National Government: i) The Executive: President, Premier, State Council, ii) The Legislature: National People' Congress ,Standing Committee iii) The Judiciary.
5. Salient features of the Constitutions of Bangladesh,France,Switzerland.

Readings:

S. A. Palekar: Comparative Government and Politics.
J. C. Johari: Major Modern Political Systems.
The Constitution of the People's Republic of China (1982)
D.C. Bhattacharya: Modern Political Constitutions.
A.C. Kapoor and K.K. Misra: Select Constitutions.

নিমাই প্রামাণিকঃ নির্বাচিত আধুনিক শাসন ব্যবস্থার রূপরেখা
হিমাচল চক্রবর্তীঃ তুলনামূলক রাজনীতি ও শাসন ব্যবস্থা
অনাদি কুমার মহাপাত্রঃ নির্বাচিত শাসন ব্যবস্থা ও রাজনীতি
নির্মলকান্তি ঘোষঃ নির্বাচিত তুলনামূলক শাসন ব্যবস্থা ও রাজনীতি
দিনেশচন্দ্র ভট্টাচার্যঃ তুলনামূলক রাজনীতি ও বিদেশের শাসন ব্যবস্থা

Government and Politics in India Code: PLS-G-CC-3-3-TH+TU

Module I

1. Evolution of the Constitution (brief). The Preamble; Fundamental Rights. Directive Principles;
2. Union-State Relations – nature of federalism.
3. Union Executive: President, Vice-President, Prime Minister, Council of Ministers.
4. Union Legislature: Lok Sabha and Rajya Sabha--- organisation, functions, law Making procedure, Privileges, Committee System, Speaker.

5. The Judiciary: Supreme Court and High Courts--- composition and functions; Judicial Activism in India.
6. Constitutional amendment procedure.

Module II

7. Government in States: Governor; Council of Ministers and the Chief Minister; State Legislature: composition and functions.
8. Local Government: rural and urban. Significance of 73rd and 74th Amendments.
9. Election Commission and election reforms.
10. Party System in India: national political parties: Ideologies and programmes. Recent trends in India: rise of regional political parties; coalition politics.
11. Regionalism: Nature, roots, types.
12. Varieties of social and political movements: a) caste; tribe; b) religion; c) environment;
d) women's movements.

Readings:

B. Chakrabarty and K. P. Pandey: Indian Government and Politics.
H. Abbas et al.: Indian Government and Politics.
D. Basu: Introduction to the Constitution of India.
M. V. Pylee: India's Constitution.
Subhas Kashyap: Our Constitution.
M.P. Singh and R. Saxena: Indian Politics: Contemporary Issues
J. C. Johari: Indian Government and Politics (2 Vols.)
Rajinder Singh: Social Movements in India.
Devki Jain Ed., Indian Women.

অমল কুমার মুখোপাধ্যায় ও ভোলানাথ বন্দ্যোপাধ্যায়ঃ সাম্প্রতিক ভারতীয় রাজনীতি ও প্রশাসন
নিমাই প্রামাণিকঃ ভারতের শাসন ব্যবস্থা ও রাজনীতি
অনাদি কুমার মহাপাত্রঃ ভারতের শাসন ব্যবস্থা ও রাজনীতি
নির্মলকান্তি ঘোষঃ ভারতের শাসন ব্যবস্থা ও রাজনীতি
অনাদি কুমার মহাপাত্রঃ ভারতের রাজনীতিক ব্যবস্থা প্রকৃতি ও প্রয়োগ
প্রভাত দত্তঃ প্রসঙ্গ পঞ্চায়েত
হিমাংশু ঘোষঃ সমকালীন ভারতীয় রাজনীতি ও প্রশাসন
শাশ্বতী ঘোষ: সমতার দিকে আন্দোলনে নারী

International Relations Code: PLS-G-CC-4-4-TH+TU

Module I

1. International Relations as a field of study. Approaches:
(a) Classical Realism (Hans Morgenthau) and Neo-Realism (Kenneth Waltz)
(b) Neo-Liberalism: Complex Interdependence (Robert O. Keohane and Joseph Nye)
(c) Structural Approaches: World Systems Approach (Immanuel Wallerstein) and Dependency School (Andre Gunder Frank)
(d) Feminist Perspective (J. Ann Tickner)
2. Cold War:(a) Second World War & Origins of Cold War; (b) Phases of Cold War: First Cold War; Rise and Fall of Detente Second Cold War.

Module II

3. End of Cold War and Collapse of the Soviet Union

(b) Post Cold- War Era and Emerging Centers of Power (European Union, China, Russia and Japan)

4. India's Foreign Policy

(a) Basic Determinants (Historical, Geo-Political, Economic, Domestic and Strategic); (b) India's Policy of Non-Alignment; (c) India as emerging Power

Readings:

William, P., Goldstein, D. M. and Shafritz, J. M. (eds.): Classic Readings of InternationalRelations.
Goldstein, J. and Pevehouse, J.C.: International Relations.
Art, R. J. and Jervis, R. (eds.): International Politics: Enduring Concepts andContemporary Issues.
Jackson, R. and Sorenson, G.: Introduction to International Relations: Theories andApproaches.
Tickner, J. A.: Gendering World Politics: Issues and Approaches in the Post-Cold WarEra.
Baylis, J. and Smith, S. (eds.): The Globalization of World Politics: An Introduction toInternational Relations.
Wenger, A. and Zimmermann, D. (eds.): International Relations: From the Cold WorldWar to the Globalized World.
Vanaik, A.: India in a Changing World: Problems, Limits and Successes of Its ForeignPolicy. .
Basu, Rumki (ed.): International Politics: Concepts theories and Issues, New Delhi.
Mewmillians, W.C. and Piotrowski, H.: The World since 1945: A History ofInternational Relations.
Smith, M., Little, R. and Shackleton, M. (eds.): Perspectives on World Politics.
Ganguly, S. (ed.): India's Foreign Policy: Retrospect and Prospect.

গৌতম বসু: আন্তর্জাতিক সম্পর্ক: তত্ব ও বিবর্তন
রাধারমণ চক্রবর্তী ও সুকল্পা চক্রবর্তী: সমসাময়িক আন্তর্জাতিক সম্পর্ক
পুরুষোত্তম ভট্টাচার্য ও অনিন্দ্যজ্যোতি মজুমদার (সম্পা):আন্তর্জাতিক সম্পর্কের রূপরেখা
রুমকী বসু ও অঞ্জনা ঘোষঃ সম্মিলিত জাতিপুঞ্জ
অনীক চট্টোপাধ্যায়: ঠাণ্ডাযুদ্ধের পর আন্তর্জাতিক সম্পর্ক
নির্মলকান্তি ঘোষঃ আন্তর্জাতিক সংগঠন ও জাতিপুঞ্জ
গৌরীপদ ভট্টাচার্যঃ আন্তর্জাতিক সম্পর্ক
শক্তি মুখার্জী, ইন্দ্রাণী মুখার্জীঃ আন্তর্জাতিক সম্পর্ক

Discipline-specific Electives

The choice is between Courses in 1A and 1B and between Courses in 2A and 2B--- one each from the two segments offered.

Public Administration Code: PLS-G-DSE-A-5-1A-TH+TU

Module I

1. Nature and Scope of Public Administration.
2. Key Concepts: Hierarchy; Unity of Command; Span of Control; Authority; Centralization and Decentralization; Line and Staff; Communication and Control; Delegation; Decision-making;Coordination and Leadership.
3. Major Approaches: New Public Administration; Comparative Public Administration; Development Administration; New Public Management.

Module II

4. Bureaucracy: Views of Weber and Marx.
5.Public Policy: Formulation and Implementation.
6. Major Programmes (basic features and objectives): MGNREGA; Sarva Shiksha Abhiyan; National Rural Health Mission.

Readings:

Mohit Bhattacharya: Public Administration: Structure, Process and Behaviour.
A. Avasthi and S. Avasthi: Pubic Administration.
M. Bhattacharya: Restructuring Public Administration.
M.P. Sharma: Public Administration in Theory and Practice.
Rumki Basu: Public Administration: Concepts and Theories.
Sapru, R.K. Public Policy: Formulation, Implementation and Evaluation. New Delhi: Sterling Publishers.

মোহিত ভট্টাচার্য ও বিশ্বনাথ ঘোষ: জনপ্রশাসন ও পরিকল্পনা
সোমা ঘোষ: জনপ্রশাসন: তত্ত্ব ও প্রয়োগ
রাজশ্রী বসু: জনপ্রশাসন

Indian Foreign Policy Code: PLS-G-DSE-A-5-1B-TH+TU

Module I

1. Foreign Policy: meaning and determinants.

2. National Interest as key concept in foreign policy.

3. Instruments of foreign policy: diplomacy; propaganda; military.

Module II

4. Evolution of Indian foreign policy.

5. Basic principles of Indian foreign policy.

6. India and her neighbours: Bangladesh; Pakistan; Nepal; Sri Lanka.

Readings:

K.K Ghai, *International Relations: Theory and Practice of International Politics*
Vinay Kumar Malhotra, *International Relations*, Fourth edition, Vikas Publications.
Peu Ghosh, *International Relations*, Pretince Hall Publishers.
Pushpesh Pant, *International Relations in the Twenty-first Century*, Tata McGraw Hill Publishers.
Prakash Chander and Prem Aroa, *International Relations and Comparative Politics*, Cosmos Bookhive Publicaitons.
Aneek Chatterjee, *Neighbours, Major Powers and Indian Foreign Policy*, Orient Blackswan.
Prem Arora, *Foreign Policy of India*, Cosmos Bookhive Publishers.

Feminism: Theory and Practice Code: PLS-G-DSE-B-6-2A-TH+TU

Module I

1. Distinction between sex and gender. Biologism and Social Constructivism.

2. Patriarchy and Feminism.

3. Theoretical foundation: Liberal; Socialist; Marxist; Radical Feminism; New Feminist ideas

Module II

4. Traditional historiography and Feminist critiques.

5. Social reform movements and position of women: Indian context.

6. Gender relations in family: consumption; entitlement; property rights.

Readings:

B. Hooks, (2010) 'Feminism: A Movement to End Sexism', in C. Mc Cann and S. Kim (eds), *The Feminist Reader: Local and Global Perspectives,* New York: Routledge, pp. 51-57
R. Delmar, (2005) 'What is Feminism?', in W. Kolmar & F. Bartkowski (eds) *Feminist Theory: A Reader,* pp. 27-37.
U. Chakravarti, (2003) *Gendering Caste through a Feminist Len,* Kolkata, Stree, pp. 139-159.
C. MacKinnon, 'The Liberal State' from *Towards a Feminist Theory of State,* Available at http://fair-use.org/catharine-mackinnon/toward-a-feminist-theory-of-the-state/chapter-8
N. Menon (2008) 'Gender', in R. Bhargava and A. Acharya (eds), *Political Theory: An Introduction,* New Delhi: Pearson, pp. 224-233.

রাজশ্রী বসু ও বাসবী চক্রবর্তী (সম্পা): প্রসঙ্গ মানবীবিদ্যা

Human Rights: Theory and Indian Context Code: PLS-G-DSE-B-6-2B-TH+TU

Module I

1. History of the idea of human rights; Evolution of generations of human rights.
2. Universal Declaration of Human Rights: provisions and significance.
3. UN and human rights: charters; UN Human Rights Commission; Vienna Declaration and Programme of Action.

Module II

4. Indian Constitution and the foundation of rights.
5. National and State Human Rights Commissions: structure and functions.
6. Human rights in India: problems and remedies.

Readings:

Universal Declaration of Human Rights, www.un.org/en/udhrbook/pdf/udhr_booklet_en_web.pdf

Alok Kumar Meena, *Human Rights in India: Concepts and Concerns*, India: Pointer Publishers.
S.C. Joshi, *Human Rights: Concepts, Issues and Laws*, India: Akansha Publishing House.
Amit Bhattacharya and Bimal Kanti Ghosh (eds.), *Human Rights in India, Historical Perspective and Challenges Ahead*.
D. O'Byrne, (2007) 'Theorizing Human Rights', in *Human Rights: An Introduction,* Delhi, Pearson.
M. Ishay, (2004) *The History of Human Rights: From Ancient Times to the Globalization Era*, Delhi: Orient Blackswan.

Skill Enhancement Courses

[The choice lies between Courses 1 and 2 of Section A and Courses 1 and 2 of Section B. One particular course in Gr. A --- between PLS-G-SEC-3/5-A(1)-TH and PLS-G-SEC-3/5-A(2)-TH is to be chosen either in Sem-III or in Sem-V. One particular course in Gr. B--- between PLS-G-SEC-4/6-B(1)-TH and PLS-G-SEC-4/6-B(2)-TH is to be chosen either in Sem IV or in Sem VI]

Legal Literacy Code: PLS-G-SEC-3-A(1)-TH

Module I

1. Legal Issues of Criminal Jurisdiction: History, Definition and Concept, Major Processes— Detention, Arrest, Bail, Search and Seizure.
2. Indian Penal Code: History, Definition. Major Aspects—Protection of Primary and Secondary Personal Rights, Criminal Conspiracy, Offences against the State, Offences related to Marriage.
3. Personal Laws: Laws related to Marriage (examples from Hindu, Islam and Christian Laws).

Module II

4. Consumer Rights Laws: Definition of Consumer Rights, Process of filing a complaint. Right to Information Act: provisions; importance.

5. Anti-Terror Laws: Meaning, Terrorist and Disruptive Activities (Prevention) (TADA) Act 1987, 2002 and Prevention of Terrorism (POTA) Act 2002.

6.Human Rights Laws: Meanings, Universal Declaration of Human Rights (UDHR), Human Rights Act of 1993, Issues of rights of Children and Women.

Readings:

K. Sankaran and U. Singh, *Towards Legal Literacy,* New Delhi: Oxford University Press, 2008. Articles on Laws relating to criminal justice and offences against Women.
Oxford Handbook of Human Rights and Criminal Justice in India- The system and Procedure. New Delhi: Oxford University Press, 2006. Relevant articles on FIR, Detention, Bail.
M. Mohanty et al., *Weapon of the Oppressed, Inventory of People's Rights in India*, Delhi: Danish Books, 2011. Articles on Adivasis and Dalits.
S. Durrany, *The Protection of Women From Domestic Violence Act 2005*, New Delhi: Indian Social Institute, 2006.
V. Kumari, (2008) 'Offences Against Women', in K, Sankaran and U. Singh (eds.) *Towards Legal Literacy,* New Delhi: Oxford University Press.

P. D. Mathew,(2004)*The Measure to Prevent Sexual Harassment of Women in Work Place.* New Delhi: Indian Social Institute.
D. Srivastva, (2007) 'Sexual Harassment and Violence against Women in India: Constitutional and Legal Perspectives', in C. Kumar and K. Chockalingam (eds) *HumanRights, Justice, and Constitutional Empowerment*, Delhi: Oxford University Press.
S. Naib, (2013) 'Right to Information Act 2005', in *The Right to Information in India,* New Delhi: Oxford University Press, Available at http://www.humanrightsinitiative.org/publications/rti/guide_to_use_rti_act_2005_English2012_light_Aspire.pdf.
Bare Acts**:**

Consumer Protection Act, 1986, http://chdslsa.gov.in/right_menu/act/pdf/consumer.pdf.
Criminal law Amendment Act, 2013, http://egazette.nic.in/WriteReadData/2013/E_17_2013_212.pdf 10.04.2013.
Protection of Women Against Domestic Violence Act, 2005, http://wcd.nic.in/wdvact.pdf.
Right to Information Act, 2005, http://righttoinformation.gov.in/rti-act.pdf.
Scheduled Castes and Scheduled Tribes Prevention of Atrocities Act, 1989, http://tribal.nic.in/writereaddata/linkimages/poaact989E4227472861.pdf.
Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006, http://tribal.gov.in/writereaddata/mainlinkFile/File1033.pdf.
The Persons with Disabilities (Equal Opportunities, Protection of Rights, Full Participation) Act, 1995, http://bhind.nic.in/Sparsh_disability%20act%201995.pdf.
The Right of Children to Free and Compulsory Education Act, 2009, http://www.delta.org.in/form/rte.pdf.
*The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Bill, 2012***,** http://164.100.24.219/BillsTexts/LSBillTexts/PassedLoksabha/144C_2010_LS_Eng.pdf.
Criminal Law Amendment Act, 2013**,** mha.nic.in/pdfs/TheCrimnalLaw030413.pdfFile Format: PDF/Adobe Acrobat –Quick View

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Elementary Dimensions of Research

Code: PLS-G-SEC-4-B(1)-TH

Module I

1. Concepts, variables (dependent and independent), propositions and hypothesis.
2. Research design: definition, purpose of research, units of analysis, fallacies.
3. Ethics in research---issues and problems.
4. Research Report writing.

Module II

4. Sources and Techniques of data collection – quantitative and qualitative data
5. Sampling: definition, probability and non-probability. Scales and Measurement
6. Statistical method of data analysis: descriptive and inferential (Overview). Graphic representation of data (Bar graph, Histogram, Pie Chart)

Readings:

R. Kumar, Research Methodology: A Step-by-Step Guide for Beginners, Sage pub., 2010.
W.L. Neuman, Social Research Methods: Qualitative and Quantitative Approaches, Pearson.
R. Chatterjee, (1979) Methods of Political Enquiry, Calcutta: The World Press Pvt. Ltd.

Understanding the Legal System Code: PLS-G-SEC-5-A(2)-TH

Module I

1. Historical background, procedures of Supreme Court and High Court in India (special focus on writ jurisdictions), Judicial Activism and Judicial Restraint.
2. Public Interest Litigation (PIL): Meaning, major features and Scope, principles, Major Guidelines for admitting PIL.
3. Administrative Tribunals: Concepts and major Features, tribunals for other matters.

Module II

4. Subordinate Courts: Constitutional provisions, structure and jurisdiction, National Legal Services Authority, Lok Adalats, Family Courts and Gram Nyayalayas.
5. Elections Laws: Representation of People Act 1950, Representation of People Act 1951, Delimitation Act 2002.
6. Other Constitutional Dimensions: Anti-defection Laws (major provisions of 91st Amendment Act, 2003), Co-operative Societies (provisions of 97th Amendment Act), Mahila Courts.

Readings:

Creating Legal Awareness, edited by Kamala Sankaran and Ujjwal Singh (Delhi: OUP, 2007)
Asha Bajpai, *Child Rights in India: Law, Policy, and Practice*, Oxford University Press, New Delhi,2003.
B.L. Wadhera, *Public Interest Litigation - A Handbook*, Universal, Delhi, 2003.
P.C. Rao and William Sheffiled *Alternate Dispute Resolution: What it is and How it Works*, Universal Law Books and Publishers, Delhi, 2002
J. Kothari, (2005) 'Criminal Law on Domestic Violence', *Economic and Political Weekly,* Vol. 40(46), pp. 4843-4849.
H. Mander, and A. Joshi, *The Movement for Right to Information in India, People's Power for the Control of Corruption*, http://www.rtigateway.org.in/Documents/References/English/Reports/12.%20An%20article%20on%20RTI%20by%20Harsh%20Mander.pdf.
M, Mohanty et al. (2011) *Weapon of the Oppressed, Inventory of People's Rights in India*. Delhi: Danish Books.
Centre for Good Governance, (2008) *Right to Information Act, 2005: A Citizen's Guide*, http://www.rtigateway.org.in/Documents/Publications/A%20CITIZEN'S%20GUIDE.pdf
K. Sankaran and U. Singh, *Towards Legal Literacy,* New Delhi: Oxford University Press, 2008.
Oxford Handbook of Human Rights and Criminal Justice in India- The system and Procedure, New Delhi: Oxford University Press. Relevant articles.

Basic Research Methods Code: PLS-G-SEC-6-B(2)-TH

Module I

1. Case study.

2. Survey Approach: Interviewing- different types and forms, qualities of a good interviewer; Preparing questionnaire, types of questionnaire. Pilot Survey.
3. Focus Groups: role of researcher; uses and abuses.

Module II

4. Experimental research: types. Aggregate Data analysis: sources, utility and limitations.
5. Content Analysis: major issues.
6. Participant observation: modes, advantages and disadvantages.

Readings:

R. Chatterjee, (1979) Methods of Political Enquiry, Calcutta: The World Press Pvt. Ltd.
D. E. McNabb, (2004) Research Methods for Political Science- Quantitative and Qualitative Methods, New Delhi: Prentice-Hall of India Pvt. Ltd.

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

University of Calcutta

CBCS Syllabus

B.A.(Honours) Sanskrit

DETAILS OF COURSE STRUCTURE

Distribution of courses in different semesters for B.A. (Honours) Sanskrit

Distribution of course in different Semesters for B.A (Honours) in Sanskrit

CBCS Syllabus, Details of Courses structure, University of Calcutta

	Sem-1	**Sem-2**	**Sem-3**	**Sem-4**	**Sem-5**	**Sem-6**
Core Course(CC)	2Th+2P/TU CC-1& 2	2Th+2P/TU CC-3 & 4	3Th+3P/TU CC-5,6 &7	3Th+3P/TU CC-8,9 &10	2Th+2P/TU CC-11 & 12	2Th+2P/TU CC-13 & 14
Elective Course:						
1.Generic Elective(GE)	1Th+1P/TU GE-1	1Th+1P/TU GE-2	1Th+1P/TU GE-3	1Th+1P/TU GE-4		
2.Discipline Specific Elective(DSE)					2Th+2P/TU DSE-1,2	2Th+2P/TU DSE-3,4
Ability Enhancement Compulsory Course (AECC)	1Th+0P/TU (AECC-1)	1Th+0P/TU (AECC-2)				
Skill Enhancement Course (SEC)			1Th+0P/TU SEC-A-1	1Th+0P/TU SEC-B-2		
Total Number of Courses and Marks	4x100=400	4x100=400	5x100=500	5x100=500	4x100=400	4x100=400
Total Credits	20	20	26	26	24	24

TH=Theory, P=Practical, TU=Tutorial

CC for Honours (Sanskrit) Coding

Semester-1	SAN-A-CC-1-TH/TU SAN-A-CC-2-TH/TU
Semester-2	SAN-A-CC-3-TH/TU SAN-A-CC--4TH/TU
Semester-3	SAN-A-CC-5-TH/TU SAN-A-CC-6-TH/TU SAN-A-CC-7-TH/TU
Semester-4	SAN-A-CC-8-TH/TU SAN-A-CC-9-TH/TU SAN-A-CC-10-TH/TU
Semester-5	SAN-A-CC-11-TH/TU SAN-A-CC-12-TH/TU
Semester-6	SAN-A-CC-13-TH/TU SAN-A-CC-14-TH/TU

DSE for Honours (Sanskrit) Coding

Semester-5	SAN-A-DSE-1-TH/TU SAN-A-DSE-2-TH/TU
Semester-6	SAN-A-DSE-3-TH/TU SAN-A-DSE-4-TH/TU

SEC for Honours (Sanskrit) Coding

Semester-3	SAN-A-SEC-A-1-TH/TU
Semester-4	SAN-A-SEC-B-2-TH/TU

Guideline for execution of CBCS Syllabus 2018-2019

All India CBCS Syllabus keeping in view the UG BOS in Sanskrit (C.U) recommends the following measures.

60% Sanskrit Question and Answer in 1st and 2nd Semester, 80% in 3rd and 4th Semester and 100% in 5th and 6th Semester be strictly followed. In Honours, Sanskrit Language and Devanāgari scripts be used .**For General in all six Semesters 60% answer are to be written in Sanskrit Language and Devanāgari Scripts.**

Each 65% marks of theory papers be sub-divided as follows:

1st and 2nd Semester:

a. Three Broad Questions Carrying 10 marks each: 3x10=30(at least two in Sanskrit)

b. Four textual questions, explanation, translation and Sanskrit rendering (wherever applicable) carrying 5 marks.(4x5-20) (at least two in Sanskrit)

c. Three short/Grammatical Notes carrying 5 marks each. 3x5=15(Two questions be answered in Sanskrit)

3rd and 4th Semester:

a. Out of three ,two broad questions to be answered in Sanskrit (3x10=30)

b. Out of four, three questions to be answered in Sanskrit.(4x5=20)

c. All three short/ Grammatical Notes to be Answered in Sanskrit.(3x5=15)

5th and 6th Semester 100% be answered in Devanāgari scripts and Sanskrit Language.

SEMESTER- 1

<table>
<tr><th>Course Code</th><th>Course Title / Topic</th><th>Credit</th><th>TH+ TU</th><th colspan="4">MARKS DISTRIBUTION</th></tr>
<tr><td rowspan="3">CC 1</td><td>Classical Sanskrit Literature(POETRY)</td><td></td><td></td><td>INTER -NAL ASSE SS-MEN T (IA)</td><td>ATTEN DANCE</td><td>Comprehen sive Continuous Assessment (CCA)</td><td>Theory</td></tr>
<tr><td rowspan="2"><u>Section- A</u>
Raghuvaṃśam :
Canto-I
Verses : 1-25
Allotted Marks-20
Lecture Hours(LH)-20

UNIT I
Canto I
A.M-10
Verses : 1-10
Introduction(Author & Text), Appropriateness of Title, Grammatical analysis, meaning, translation, Explanation, Content analysis, Characteristics of Raghu clan

UNIT II
Canto I
A.M-10
Verses : 11-25
Grammatical Analysis, meaning, translation, Explanation, Role of Dilīpa in the welfare of Subjects

<u>Section -B</u>
Kumārasambhavam :
Canto V
Verses : 1-30
Allotted Marks-20
LH-20

UNIT I
Canto V
A.M-10
Verses : 1-15
Introduction(Author & Text),</td><td></td><td></td><td>10</td><td>10</td><td>Project/ Tutorial
15</td><td>65</td></tr>
<tr><td>6</td><td>5+1</td><td></td><td></td><td></td><td></td></tr>
</table>

	Appropriateness of Title, Background of given contents, Text reading , grammatical Analysis, translation, explanation, Poetic excellence and plot **UNIT II** **Canto V** **A.M-10** **Verses : 16-30** Grammatical Analysis, translation, Explanation, Penance of Pārvatī, Poetic excellence and plot **<u>Section- C</u>** ***Kirātārjunīyam* :** **Canto-I** **Verses : 1-25** **Allotted Marks-20** **LH-30** **UNIT I** **Canto I** **A.M.-10** **Verses : 1-16** Introduction(Author & Text), Appropriateness of Title, Background of given contents, Grammatical Analysis, , translation, Explanation, Poetic Excellence, Thematic Analysis **UNIT II** **Canto I** **A.M-10** **Verses : 17-25** Grammatical Analysis, translation, Explanation, Poetic Excellence, Thematic Analysis **<u>Section- D</u>** ***Nītiśatakam* :** **Verses : 1-20** **1st Two Paddhatis** **Allotted Marks-10** **LH-20** **UNIT I** **Verses : 1-10** **A.M.-05** Grammatical Analysis, translation, Explanation						

	UNIT II **A.M-05** **Verses : 11-20** Translation, Explanation, Thematic Analysis, Bhartṛhari's Comments on Society **<u>Section- E</u>** **Origin and Development of Mahākāvya and Gītikāvya** **Allotted Marks-20** **LH-10** **UNIT I** **A.M-10** Origin Development of different types of Mahākāvya with special reference to Aśvaghoṣa, Kālidāsa, Bhāravi, Māgha, Bhaṭṭi, Śrīharṣa. **UNIT II** **A.M-10** Origin Development of Sanskrit with Gītikāvya special reference to Kālidāsa, Bihlaṇa, Jayadeva, Amaru, Bhartṛhariand their works.						

Course Code	Course Title / Topic	Credit	TH+ TU	MARKS DISTRIBUTION			
	Critical Survey of Sanskrit Literature			**INTERNAL ASSESS-MENT (IA)**	**ATTENDANCE**	**Comprehensive Continuous Assessment (CCA)**	**Theory**
CC 2	**<u>Section- A</u>** **Vedic Literature:** **Allotted Marks-30** **LH-25**			**10**	**10**	**Project/ Tutorial** **15**	**65**
	UNIT I **A.M-20** **Saṃhitā (Ṛk, Yajuṣ, Sāman, Atharva)** Time, Subject matter, Religion & Philosophy, Social life **UNIT II** **A.M-10** **Brāhmaṇa, Āraṇyaka, Upaniṣad,Vedāṅga (Brief Introduction)** **<u>Section-B</u>** ***Rāmāyaṇam* :** **Allotted Marks-15** **LH-15** **UNIT I** **A.M-10** ***Rāmāyaṇam*–** Time, Subject matter, *Rāmāyaṇam* as an *Ādikāvya*. **UNIT II** **A.M-5** ***Rāmāyaṇam* –** Source Text and its Cultural importance **<u>Section- C</u>** ***Mahābhārata* :** **Allotted Marks-15** **LH-15**	**6**	**5+1**				

	UNIT I **A.M--10** ***Mahābhārata* and its Time , Development and Subject matter** **UNIT II** **A.M-05** ***Mahābhārata***: Encyclopaedic nature, as a source, of subsequent literature, Cultural importance **<u>Section- D</u>** ***Purāṇas*** **Allotted Marks-10** **LH-15** **UNIT I** ***Purāṇas* :** Subject matter, Characteristics **UNIT II** ***Purāṇas* :** Social, Cultural and Historical Importance **<u>Section -E</u>** **General introduction to *Vyākaraṇa, Darśana, Sāhitya-Śāstra*** **Allotted Marks-20** **LH--30** **UNIT I** General introduction to *Vyākaraṇa*, Brief History of *Vyākaraṇa-Śāstra* **UNIT II** General introduction to *Darśana*. Major School of Indian Philosophy of *Cārvāka*, *Bauddha*, *Jaina*, *Sāṃkhya*, *Yoga*, *Nyāya-Vaiśeṣika*, *Pūrva Mīmāṃsā*and *Uttara Mīmāṃsā.* **UNIT III** General introduction to poetics- Six Major School of Indian Poetics- *Rasa*, *Alaṃkāra*, *Rīti*, *Dhvani*, *Vakrokti* and *Aucitya*						

AECC-1	**Environmental Science(ENVS)**	**02**	**2+0**				
GE- 1	**(Other than Sanskrit)**	**06**	**5+1**				

Suggested Reference Books: CC-1 & CC-2

1. C.R. Devadhar (Ed.), *Raghuvaṃśam* of Kālidāsa, MLBD. Delhi.

2. M.R. Kale (Ed.), *Raghuvaṃśam* of Kālidāsa, MLBD, Delhi.

3. Gopal RaghunathNandargikar (Ed.), *Raghuvaṃśam* of Kālidāsa, MLBD, Delhi.

4. कृष्णमणित्रिपाठी, रघुवंशम् (मल्लिनाथकृत-सञ्जीवनीटीका), चौखम्बासुरभारतीप्रकाशनम्, वाराणसी

5. नेमिचन्द्रशास्त्री, कुमारसम्भवम्, मोतिलालवाराणसीदास, दिल्ली

6. M.R. Kale (Ed.), *Kumārasambhavam*, MLBD, Delhi.

7. समीरशर्मा, मल्लिनाथकृतघण्टापथटीका, भारविकृत- किरातार्जुनीयम्, चौखम्बाविद्याभवन, वाराणसी

8. *Kirātārjunīyam*(Canto I), (Ed.), Ashoknath Sastri, Calcutta Book Agency.

9. M.R. Kale (Ed.), *Kirātārjunīyam*of Bhāravi, MLBD, Delhi.

10. M.R. Kale (Ed.), *Nītiśatakam* of Bhartṛhari, MLBD., Delhi.

11. विष्णुदत्तशर्माशास्त्री(व्या.), भतृहरिकृतनीतिशतकम्, विमलचन्द्रिकासंस्कृतटीकाहिन्दी-व्याख्यासहितम्, ज्ञानप्रकाशन, मेरठ.

12. Keith, A.B.: *History of Sanskrit Literature*, MLBD, Delhi.

13. Krishnamachariar :*History of Classical Sanskrit Literature*, MLBD, Delhi.

14. GaurinathShastri: *A Concise History of Sanskrit Literature*, MLBD, Delhi.

15. Winternitz, Maurice: *Indian Literature* (Vol. I-III), MLBD, Delhi.

16. वलदेव, उपाध्याय, संस्कृतसाहित्य का इतिहास, शारदा निकेतन, वाराणसी.

17. राधावल्लभ त्रिपाठी, संस्कृत साहित्य का अभिनव इतिहास, विश्वविद्यालय प्रकाशन,वाराणसी.

18. वलदेव। उपाध्याय, वैदिकसाहित्य और संस्कृति, वाराणसी.

19. *Vaiyākaraṇa-siddhāntakaumudī*, (Kāraka, Samāsa), Ayodhyānāth Sānyāl, Sanskrit Pustak Bhandar.

20. *Pāṇinīyam*, Nagendranath Sastri, Sanskrit Book Dipo.

21. *Veder parichay*, *Yogiraj* Basu

SEMESTER-2

<table>
<tr><th>Course Code</th><th>Course Title / Topic</th><th>Credit</th><th>TH +TU</th><th colspan="4">MARKS DISTRIBUTION</th></tr>
<tr><td rowspan="3">CC 3</td><td>Classical Sanskrit Literature(PROSE)</td><td></td><td></td><td>INTERNAL ASSESS-MENT (IA)</td><td>ATTENDANCE</td><td>Comprehensive Continuous Assessment (CCA)</td><td>Theory</td></tr>
<tr><td rowspan="2"><u>Section –A</u>
Śukanāsopadeśa:
Allotted Marks-30
LH-35

UNIT – I
Allotted Marks-20
Introduction – Author and text

UNIT II
Allotted Marks-10

Social and Political Thoughts depicted in Śukanāsopadeśa logical meaning and application of saying like बाणोच्छिष्टं जगत्सर्वम्, वाणी बाणो बभूव, पञ्चाननो बाणः etc.

<u>Section –B</u>
Rājavāhanacaritam:
Allotted Marks-30
LH-40

UNIT I
Allotted Marks-15

Para 1-8
Introduction- Author, Text, TextReading (Grammar, Translation and Explanation), poetic excellence, plot.

UNIT II
Allotted Marks-15

Remaining part- Text reading (Grammar, Translation and Explanation), poetic excellence,</td><td></td><td></td><td>10</td><td>10</td><td>Project/ Tutorial
15</td><td>65</td></tr>
<tr><td>06</td><td>5+1</td><td></td><td></td><td></td><td></td></tr>
</table>

	plot, Society, Language and style of Daṇḍin, Exposition of saying दण्डिनः पदलालित्यम्, कविर्दण्डी कविर्दण्डी कविर्दण्डी न संशयः **<u>Section –C</u>** **Origin and Development of prose, Important prose romances and fables** **Allotted Marks-30** **LH-25** **UNIT I** **Allotted Marks-15** Origin and Development of prose, Important prose romances and fables i) *Subandhu,Daṇḍī, Bāṇa, Ambikādatta, Vyāsa.* **UNIT II** **Allotted Marks-15** ii) *Pañcatantra, Hitopadeśa Vetālapañcaviṃśatikā,Siṃhāsana dvātriṃśikā, Puruṣaparīkṣā,Śukasaptati*.						

Course Code	Course Title / Topic	Credit	TH+ TU	MARKS DISTRIBUTION			
	SELF MANAGEMENT IN THE *GĪTĀ*			**INTERNAL ASSESS-MENT (IA)**	**ATTENDANCE**	**Comprehensive Continious Assessment (CCA)**	**Theory**
CC 4	**<u>Section -A</u>** ***Gītā : Cognition and emotive apparatus*** **Allotted Marks-30** **LH-25** **UNIT I** Hierarchy of *Indriya, Manas, Buddhi, Ātman* III, 42; XV. 7 Role of the *Ātman* : XV. 7; XV.9 Mind is a product of *Prakṛti* VII.4 Properties of three *Guṇas* and their impact on the Mind. XIII, 5-6; XIV. 5-8, II-13, XIV.17 **<u>Section -B</u>** **Allotted Marks-40** **LH-40** **UNIT I** **Allotted Marks-10** ***Gītā : Controlling the mind Confusion and Conflict*** Nature of conflict I.1 ; IV.16 ; I.45 ; II.6 causal factors- ignorance-II.41 ; *Indriya* II.6o, Mind II.67 *; Rajoguṇa*-III.36-39, XVI. 21 ; weakness of mind .II.3 ; IV.5 **UNIT II** **Allotted Marks-15** Means of controlling the Mind Meditation difficulties-VI. 34-35 ; Procedure VI. 11-14 Balanced life-III.8, VI.6-7 Diet control-XVII. 8-10 Physical and mental discipline-XVII.14-19 ; VI.36			**10**	**10**	**Project/ Tutorial** **15**	**65**
		06	**5+1**				

	UNIT III **Allotted Marks-15** Means of conflict resolution Importance of knowledge –II. 52; IV.38; IV. 42 Clarity of *buddhi*-XVIII.30-32 Process of decision making – XVIII.63 Control over senses-II.59, 64 Surrender of *Kartṛbhāva*-XVIII.13-16 ; V.8-9 Desirelessness-II.48 ; II.55 Putting others before self –III.25 **<u>Section- C</u>** **Allotted Marks-20** **LH-35** **UNIT I** ***Gītā : Self-management through devotion*** Surrender of ego –II. 7; IX.27 ; VIII.7 ; XI. 55 ; II.47 Abandoning frivolous debates-VII.21 ; IV.11 ; IX.26 Acquisition of moral qualities-XII.11 ; XII.13-1						
AECC 2	**ENGLISH/ MIL COMMUNICATION**	**02**	**2+0**				
GE 2	**(Other than Sanskrit)**	**06**	**5+1**				

Reference books : CC- 3 & CC- 4

1.शुकनासोपदेश, प्रह्लाद-कुमार, महेशचन्द्र दाश,,दिल्ली.

2.शुकनासोपदेश, नीरदवरण चक्रवर्त्ती, संस्कृत पुस्तक भाण्डार (Bengali).

3.राजवाहनचरितम्, S. Roy.

4.राजवाहनचरित, सत्यनारायण चक्रवर्त्ती, संस्कृत पुस्तक भाण्डार (Bengali).

5. श्रीमद्भगवद्गीता, स्वामी जगदीश्वरानन्द, उद्बोधन कार्यालय (Bengali).

6. श्रीमद्भगवद्गीता, एस्. राधाकृष्णन् कृत व्याख्या हिन्दी अनुवाद, राजपाल् एण्ड सन्स्, दिल्ली

7. *Śrīmadbhagavadgītārahasya*- The Hindu Philosophy of life & Ethics.

8.*Karmayogaśāstra* Religion, Original Sanskrit stanzas with English Translation, Bal Gangadhar Tilak & Balchandra Sitaram Sukthankar,J.S. Tilak & S.S Tilak.

9. Sri Aurobinda- Essays on the *Gītā*, Sri Aurobinda Ashram, Pandichery.

SEMESTER- 3

Course Code	Course Title / Topic	Credit	TH +TU	MARKS DISTRIBUTION			
	***CLASSICAL SANSKRIT LITERATURE (DRAMA*)**			**INTERNAL ASSESS-MENT (IA)**	**ATTENDANCE**	**Comprehensive Continuous Assessment (CCA)**	**Theory**
CC 5	**Section –A** ***Svapnavāsavadattam*** **ACT I –VI** **Allotted Marks-25** **LH-30** **UNIT I** Act I-IV: Story, Meaning/Translation, Explanation. **UNIT II** Act V-VI: Characterisation, Society, story of regains, Bhāsa's Style. **Section –B** ***Abhijñānaśakuntalam* (Act I-IV)** **Allotted Marks-25** **LH-30** **UNIT I** Introduction, Author, Explanation of terms like *Nāndī, Prastāvanā, Sūtradhāra, Naṭī, Viṣkambhaka, Vidūṣaka*. **UNIT II** Text reading, Grammar, Translation, Explanation, Plot, Timing of Action, Personification of Nature, Purpose and design behind	**06**	**5+1**	**10**	**10**	**Project/ Tutorial** **15**	**65**

	Abhijñānaśakuntalam. **<u>Section- C</u>** ***Abhijñānaśakuntalam* (Act V-VII)** **Allotted Marks-15** **LH-30** **UNIT I** Society,Marriage, Tax system, Poetic excellence, Popular saying about Kālidāsa & Śakuntalam, **UNIT II** Language of Kālidāsa, Use of Prakrit. **<u>Section –D</u>** **Critical Survey of Sanskrit Drama** **Allotted Marks-25** **LH-10** **UNIT I** **Allotted Marks-10** Sanskrit Drama : Origin and Development, Nature of Sanskrit Drama **UNIT II** **Allotted Marks-15** Sanskrit Drama : Origin and Development, works of Bhāsa, Kālidāsa, Śudraka, Viśākhadatta, Śriharṣa, Bhavabhūti, Bhaṭṭanārāyaṇaand Dramatists and their Works.							

REFERENCE of CC- 5

1.Bose, Ramendramohan,*Abhijñānaśakuntalam.*

2. Roy, Saradaranjan,*Abhijñānaśakuntalam*

3. Chakravartti, Satyanarayan,*Abhijñānaśakuntalam*, Sanskrit Pustak Bhandar (Bengali)

4. Basu, Anilchandra, *Abhijñānaśakuntalam*, Sanskrit Book Depot (Bengali)

5. Basu, Anilchanra, *Svapnavāsavadattam*, Sanskrit Book Depot (Bengali)

6. Kale, M.R (Ed) *Abhijñānaśakuntalam*, M L B D, Delhi

7. Gadkar, Gajendra(Ed.), Bose, Ramendramohan, *Abhijñānaśakuntalam*, Calcutta

8. Kale, M. R (Ed.) *Svapnavāsavadattam*, M L B D. Delhi

9.Bhat, G. K, *Sanskrit Drāmā*, Karnataka University Press, Dharwar

10. Keith. A.B, *Sanskrit Drama*, Oxford University Press, London

11. Basu, Debendranath, *Sakuntalāy Nāṭyakalā* (Bengali)

12. Dharmapal, Gauri, *Srotobahā Mālinī.*

Course Code	Course Title / Topic	Credit	TH+ TU	MARKS DISTRIBUTION			
	Poetics and Literary Criticism			**INTERNAL ASSESS-MENT (IA)**	**ATTEND-ANCE**	**Comprehensive Continuous Assessment (CCA)**	**Theory**
CC 6	**<u>Section-A</u>** **Introduction to Sanskrit Poetics** **Allotted Marks-20** **LH-15** **UNIT I** **Allotted Marks-10** Introduction to Poetics, Origin and Development of Sanskrit Poetics, Various names of Sanskrit Poetics. **UNIT II** **Allotted Marks-10** Definition (*Lakṣaṇa*), Objectives (*Prayojana*) and Causes (*Hetu*) of Poetry. (After *Kāvyaprakāśa*) **<u>Section- B</u>** **Forms of *Kāvya*- Literature** **Allotted Marks-15** **LH-15** **UNIT I** Forms of Poetry : *Dṛśya*, *Śravya, Miśra* (*Campū*) (After *Kāvyaprakāśa*) **UNIT II** *Mahākāvya*, *Khaṇḍakāvya*, *Gadyakāvya*, : *Kathā*, Ākhyāyikā, (After *Sāhityadarpaṇa*)			**10**	**10**	**Project/ Tutorial** **15**	**65**
		06	**5+1**				

	<u>Section-C</u> ***Śabda-śakti* and *rasa-sūtra*** **Allotted Marks-25** **LH-30** **UNIT I** **Allotted Marks-10** Power/Function of word and meaning (According to *Kāvyaprakāśa*) *abhidhā* (expression/ denotative meaning)*lakṣaṇa* (indication/ indicative meaning) and *vyañjanā*(suggestion/ suggestive meaning) **UNIT II** **Allotted Marks-15** Rasa : *Rasa-sūtra* of Bharata and its prominent expositions *: utpattivāda, anupattivāda, bhuktivāda* and *abhivyaktivāda, alaukikattva* (transcendental nature of rasa (as discussed in *kāvyaprakāśa*) **<u>Section -D</u>** **Figures of speech and Meter** **Allotted Marks-30** **LH-40** **UNIT I** **Allotted Marks-15** Figures of Speech – *Anuprāsa, Yamaka, Śleṣa, Upamā, Rūpaka, Sandeha, Bhrāntimān, Apahṇuti, Utprekṣā, Atiśayokti, Tulyayogitā, Dīpaka, Dṛṣṭānṭa, Nidarśanā, Vyatireka, Samāsokti, Svabhāvokti, Aprastutapraśaṃsā,*						

	Arthāntaranyāsa, Kāvyaliṅga, Vibhāvanā(According to *Sāhityadarpaṇa* X) **UNIT II** **Allotted Marks-15** **Metres :** *Chandas* : Nature and Classification, *Anuṣṭupa, Āryā, Indravajrā, Upendravajrā, Drutavilambitam, Upajāti, Vasantatilakam, Mālinī, Mandākrāntā, Śikhariṇī, Śārdūlavikrīḍitam, Sragdharā* (According to *Chandomañjarī*)						

REFERENCE BOOKS- CC -6

1. Mukhopadhyaya, Bimalakanta(sa) S*ā*hityadarpa*ṇ*am.

2.Bandyopadhyaya, Udaychandra(sa) S*ā*hityadarpa*ṇ*am. (10th Chapter).

3.Vidyanidhi, Gurunatha,(sa) *Chandomañjarī*.

4. Bhattacharya, Bishnupada, *Prācinbhāratīya Alaṃkāraśāstrer Bhūmikā*.

5. साहित्यदर्पणम्, कृष्णमोहन-शास्त्री (लक्ष्मीटीकासहितम्) चौखाम्बा सुरभारती.

6. साहित्यदर्पणम्, हरिदाससिद्धान्तवागीशः, चौखाम्बा-सुरभारती.

7. Dwivedi, R.C *The Poetic Light*; MLBD.

8. Kane, P.V, History of Sanskrit Poetic and its Hindi translation by Indrachand Shastri, MLBD

9. Ganganath Jha, *Kāvyaprakāśa*(with Eng Translation), Bharatiya Vidya Bhavan Prakashan, Varanasi.

10. Ray,S.R, S*ā*hityadarpa*ṇ*am, Visvanatha (ch I, IV, X) with English exposition, Delhi.

11. S*ā*hityadarpa*ṇ*am (Ch. VI) , Kārikā 6/1,2

12. बलदेव-उपाध्याय, संस्कृत-आलोचना, हिन्दि समिति, सूचना विभाग, उ,प्र.

Course Code	Course Title / Topic	Credit	TH+ TU	MARKS DISTRIBUTION			
	Indian Social Institutions and Polity			**INTERNAL ASSESS-MENT (IA)**	**ATTEND-ANCE**	**Comprehensive Continuous Assessment (CCA)**	**Theory**
CC 7	**<u>SECTION -A</u>** **Indian Social Institutions: Nature and Concepts** **Allotted Marks-20** **LH-20** **UNIT I** **Indian Social Institutions: Definition and scope.** **Allotted Marks-10** Sociological Definition of Social Institutions. Trends of Social Changes, Sources of Indian social Institutions (Vedic Literature *Purāṇa, Rāmāyaṇa, Mahābhārata,* Dharmaśāstra, Buddhist and Jain Literature, Literary Works, Inscription Memories of foreign Writers) **UNIT II** **Social Institution and Dharmaśāstra Literature :** **Allotted Marks-10** Dharmaśāstra as a special branch, studies of social Institution, sources of Dharma (*Manusmṛti, 2.12 , Yājñavalkyasmṛti 1.7)* Different kinds of Dharma in the sense of Social Ethics (*Manusmṛti 10.63 ; Viṣṇupurāṇa* 2.16-			**10**	**10**	**Project/ Tutorial** **15**	**65**
		06	**5+1**				

	17) ; Six kinds of Dharma in the sense of Duties (*Mitākṣarā* ṭīkā on *Yājñavalkyasmṛti* 1.1) Tenfold dharma as Ethical qualities *(Manusmṛti* 6.92), Forteen *Dharmaśāstra* (*Yājñavalkyasmṛti* 1.3). **<u>Section-B</u>** **Structure of Society and Values of Life** **Allotted Marks-30** **LH-30** **Unit I** Varṇa-System and Caste System: Four-fold division of *Varṇa* System, (*Ṛgveda*, 10.90.12), *Mahābhārata*, Śāntiparva,72.3-8); Division of *Varṇa* according to *Guṇa* and *Karma* (*Bhagvadgītā*, 4.13, 18.41-44). **Unit II** Origin of Caste-System from Inter-caste Marriages (*Mahābhārata*, Anuśāsanaparva, 48.3-11); Emergence of non-Aryan tribes in Varṇa-System (*Mahābhārata*, Śāntiparva, 65.13-22). Social rules for up-gradation and down-gradation of Caste System (*Āpastambadharmasūtra* 2.5.11.10-11, *Baudhāyanadharmasūtra*, 1.8.16.13-14, *Manusmṛti*, 10,64, *Yājñavalkyasmṛti*, 1.96) **Unit III** **Position of Women in the Society :** Brief survey of position of						

	women in different stages of Society. Position of women in *Mahābhārata* (*Anuśāsanaparva*, 46.5-11, *Sabhāparva*, 69.4-13. Praise of women in The *Bṛhatsaṁhitā* of Varāhamihira (Strīpraśaṁsā, chapter-74.1-10) **Unit IV** **Social Values of Life :** Social Relevance of Indian life style with special reference to Sixteen *Saṁskāras*. Four aims of life '*Puruṣārtha Catuṣṭaya'*- 1. Dharma, 2. Artha, 3. Kāma, 4. Mokṣa. Four Āśramas- 1. Brahmacarya, 2. Gārhasthya, 3. Vānaprastha, 4. Sannyāsa **<u>Section –C</u>** **Allotted Marks-20** **Indian Polity : Origin and Development** **LH-25** **Unit I** **Allotted Marks-10** **Initial stage of Indian Polity (from Vedic period to Buddhist period).** Election of King by the people: '*Viśas'* in Vedic period (*Ṛgveda*,10.173; 10.174; *Atharvaveda*,3.4.2; 6.87.1-2). Parliamentary Institutions:'Sabhā, 'Samiti' and 'Vidatha' in Vedic period (*Atharvaveda*,7.12.1;12.1.6 ; *Ṛgveda* ,10.85.26); King-maker 'Rājakartāraḥ' Council in *Atharvaveda* (3.5.6-7),Council of 'Ratnin' in *Śatapathabrāhmaṇa*(5.2.5.1);						

	Coronation Ceremony of Samrāṭ in *Śatapathabrāhmaṇa* (51.1.8-13; 9.4.1.1-5) Republic States in the Buddhist Period (Dīgghanikāya, Mahāparinirbbaṇa Sutta, Aṅguttaranikāya,1.213;4.252,256) **Unit II** **Allotted Marks-10** **Later Stages of Indian Polity (From Kauṭilya to Mahatma Gandhi).** Concept of Welfare State in *Arthaśāstra* of Kauṭilya (*Arthaśāstra*, 1.13 : 'mātsyanyāyābhibhuṭḥ' to 'yo' asmān gopāyatīti') Essential Qualities of King (*Arthaśāstra*,6.1.16-18: 'sampādayaty asampannaḥ' to 'jayaty eva na hīyate'); State Politics 'Rājadharma' (*Mahābhārata* , Śāntiparva,120.1-15; *Manusmṛti*, 7.1-15; Śukranīti,1.1-15); Constituent Elements of Jain Polity in *Nitivākyāmṛta* of Somadeva Suri, (Daṇḍanīti- samuddeśa, 9.1.18 and Jānapada-samuddeśa, 19.1.10). Relevance of Gandhian Thought in Modern Period with special reference to 'Satyāgraha' Philosophy **<u>Section –D</u>** **Allotted Marks-20** **Cardinal Theories and Thinkers of Indian Polity** **LH-25** **Unit I** **Cardinal Theories of Indian Polity**: **Allotted Marks-15** 'Saptāṅga' Theory of State: 1. Svāmin, 2. Amātya, 3. Janapada 4. Pura, 5. Kośa, 6.						

	Daṇḍa and 7. Mitra (Arthaśāstra, 6.1. Mahābhārata, Śāntiparva, 56.5, Śukranīti, 1.61-62). 'Maṇḍala'Theory of Inter-State Relations: 1.Ari, 2. Mitra, 3. Ari-mitra, 4.Mitra- mitra, 5.Ari-mitramitra; 'Śāḍgunya'Policy of War and Peace : 1. Sandhi, 2. Vigraha, 3. Yāna, 4. Āsana, 5. Saṁśraya 6.Dvaidhibhāva. 'CaturvidhaUpāya'for Balancing the power of State : 1.Sāma 2.Dāna,3.Daṇḍa.4.Bheda; Three Types of State Power 'Śakti': 1.Prabhu –śakti, 2.Mantra-śakti, 3. Utsāha-śakti. **Unit II** **Important Thinkers on Indian Polity:** **Allotted Marks-05** Manu, Kauṭilya, Kāmandaka, Śukrācārya, SomadevaSuri, Mahatma Gandhi						
SEC-A-1	**Sanskrit Writing Skill** 1.Translation : 40 marks English to Sanskrit 20 marks and Sanskrit to English 20 marks 2. Comprehension in Sanskrit (10 marks) 3.Paragraph Writings(10marks) 4.Letter Writing (10Marks) 5.Essay Writing(20 Marks)	**02**	**2+0**				
GE-3	**(Other than Sanskrit).**	**06**	**5+1**				

Recommended Books/Readings: CC 7

1. *Āpastambadharmaśūtra* - (Trans.), Bühler, George, The Sacred Laws of the Āryas, SBE Vol. 2, Part 1,1879

2. *Arthaśāstra* of Kautilya - (Ed.)Kangale, R.P. Delhi, Motilal Banarasidas 1965

3. *Atharvavedasaṁhitā* - (Trans.) R.T.H. Griffith, Banaras, 1896-97, rept.(2 Vols) 1968.

4. *Baudhāyanadharmaśūtr*a - (Ed.) Umesha Chandra Pandey,Chowkhamba Sanskrit Series Office,Varanasi,1972.

5. *Mahābhārata* (7 Vols) - (Eng. Tr.) H.P. Shastri, London, 1952-59.

6. Manu's Code of Law - (Ed. & Trans.) :Olivelle, P. (A Critical Edition and Translation of the Manava- Dharamaśāstra), OUP, New Delhi, 2006.

7. *Rāmāyaṇa of Vālmīki* — (Eng. Tr.) H.P. Shastri, London, 1952-59. (3 Vols)

8. *Ṛgvedasaṁhitā* (6 Vols)- (Eng. Tr.) H.H. Wilson, Bangalore Printing & Publishing Co., Bangalore, 1946.

9. *Śatapathabrāhmaṇa* - (with Eng. trans. ed.) Jeet Ram Bhatt, Eastern (3 Vols), BookLinkers, Delhi, 2009.

10. *Visṇupurāṇa* - (Eng. Tr.) H.H. Wilson, Punthi Pustak,reprint, Calcutta, 1961.

11. *Yājñavalkyasmṛti* with Mitākṣarā commentary - Chowkhamba Sanskrit Series Office,Varanasi,1967

12. अंगुत्तरनिकाय (1-4 भाग) बनारस 1980

13. आपस्तम्बधर्मसूत्र—हरदत्तकीटीकासहित्, चौखम्बासंस्कृत सीरीज, वाराणसी।

14.कौटिलीयअर्थशास्त्र—हिन्दि अनुवाद—उदयवीरशास्त्री, मेहरचन्द्दलछमनदास,दिल्ली,1968।

15. दिग्घनिकाय(1—2 भाग)—सम्पा०जे०कश्यपविहार 1958।

16. नीतिवाक्यामृतम्—सोमदेवसूरविरचित, व्या०रामचन्द्रमालवीय, चौखम्बा विद्याभवन, वाराणसी, 1972।

17. बौधायनधर्मसूत्र—आनन्द आश्रमसंस्कृतसीरीज, पूना।

18. बृहत्संहिता—वराहमिहिरविरचित हिन्दिअनुवाद—बलदेवप्रसाद मिश्र, खेमराजश्रीकृष्णदास,प्रकाशन, मुम्बई।

19. महाभारत(1—6 भाग)—हिन्द्दीअनुवादसहित, (अनु०) रामनारायणदत्तशास्त्रीपाण्डेय, गीताप्रेस, गोरखपुर।

20. मनुस्मृति (1—13 भाग) — (सम्पा०एवव्या०) उर्मिलारुस्तगी, जे.पी. पल्बिशिं हाउस, दिल्ली, 2005।

21.History of Dharmashastra(Vol.1)- P.V. Kane.

22. Concise History of Dharmaśastra-Sureshchandra Bandyopadhyay, MLBD.

23. Dharma-Artha-Niti- Sastra—Tapati Mukhopadhyayay.

24. Manusaṃhitā- Manabendu Bandyopadhyay - Sanskrit pustak Bhandar.

25. Śukranītisāra- Manabendu Bandyopadhyay, Swadesh.

26. Kauṭilya Arthaśāstra(Vol. 2)- Manabendu Bondhopadhyaya, Sanskrit Pustak Bhandar.

27. Kauṭiliya: The Arthaśāstra- L.N. rangrajan, Penguin Books, India.

SEMESTER- 4

Course Code	Course Title / Topic	Credit	TH+ TU	MARKS DISTRIBUTION			
	Indian Epigraphy, Palaeography and Chronology			**INTERN-AL ASSESS-MENT (IA)**	**ATTEND-ANCE**	**Comprehensive Continuous Assessment (CCA)**	**Theory**
CC 8	**<u>Section -A</u>** **Epigraphy** **Allotted Marks-20** **LH-25**			**10**	**10**	**Project/ Tutorial** **15**	**65**
	Unit I Introduction to Epigraphy and Types of Inscriptions **Unit II** Importance of Indian Inscriptions in the reconstruction of Ancient Indian History and Culture **Unit III** History of Epigraphical Studies in India **Unit IV** History of Decipherment of Ancient Indian Scripts (Contribution of Scholars in the field of epigraphy): Fleet, Cunninghum, Princep, Bùhler, Ojha, D.C.Sircar. **<u>Section- B</u>** **Palaeography** **Allotted Marks-25** **LH-30** **Unit I** Antiquity of the Art of Writing **Unit II** Writing Materials, Inscribers and Library **Unit III** Introduction to Ancient Indian Scripts.	**06**	**5+1**				

	<u>Section -C</u> **Study of selected inscriptions** **Allotted Marks-30** **LH-30** **Unit I** Aśoka's Giranāra Rock Edict-1 Aśoka's Sāranātha Pillar Edict **Unit II** Girnāra Inscription of Rudradāmana **Unit III** Eran Pillar Inscription of Samudragupta 04 Credits Mehrauli Iron Pillar Inscription of Candra **Unit IV** Khalimpur Copperplate Inscription of Dharmapāla **<u>Section -D</u>** **Chronology** **Allotted Marks-15** **LH-15** **Unit I** General Introduction to Ancient Indian Chronology **Unit II** System of Dating the Inscriptions (Chronograms) **Unit III** Main Eras used in Inscriptions - Vikrama Era, Śaka Era and Gupta Era						

Recommended Books/Readings: CC -8

1.अभिलेख—मंजूषा, रणजीतसिंहसैनी,न्यू भारतीयबुककार्पोरेशन, दिल्ली, 2000.

2. उत्कीर्णलेखपञ्चकम्, झाबन्धु ,वाराणसी, 1968.

3. उत्कीर्णलेखस्तबकम्, जियालालकाम्बोज, ईस्टनबुकलिंकर्स्, दिल्ली.

4. भारतीयअभिलेख, एस.एस. राणा, भारतीयविघाप्रकाशन, दिल्ली, 1978.

5. भारतीयप्राचीनलिपिमाला, गौरीशंकर हीराचन्द्दओझा, अजमेर, 1918.

6. *Select Inscriptions* (Vol.I) - D.C. Sircar, Calcutta, 1965.

7. नारायण, अवधकिशोरएवंठाकुरप्रसादवर्मा :प्राचीनभारतीयलिपिशास्त्रऔरअभलेखिकी , वाराणसी, 1970.

8. पाण्डे, राजबली :भारतीयपुराणलणप, लोकभारतीप्रकाशन, इलाहाबाद, 1978.

9. ब्यूलर, जॉज :भारतीयपुरालिपि् शास्त्र, (हिन्दीअनु०) मङ्गलनाथसिंह, मोतीलालबनारसीदास, दिल्ली, 1966.

10. मुले, गुणाकर :अक्षरकथा, प्रकाशनविभाग, भारतसरकार,दिल्ली, 2003.

11. राही, ईश्वरचन्द्द :लेखनकलाकाइतिहास (खण्ड 1—2), उत्तरप्रदेशहिन्दीसंस्थान,

लखनऊ, 1983.

12. सरकार, डी.सी. : भारतीयपुरालिपिविघा, (हिन्दीअनु०) कष्णदत्तवाजपेयी, विघानिधिप्रकाशन,दिल्ली, 1996.

13. सहाय,शिवस्वरूप : भारतीयपुरालेखोंकाअध्ययन, मोतीलालबनारसीदास,दिल्ली. Dani, Ahmad Hasan :Indian Paleography, Oxford, 1963.

14. Pillai, Swami Kannu& K.S. Ramchandran :Indian Chronology (Solar, Lunar and Planetary), Asian Educational Service, 2003.

15. Satyamurty, K. :Text Book of Indian Epigraphy, Lower Price Publication, Delhi, 1992.

16. Debarcana Sarkar, *Nityakaler tui puratan*, Paschimbanga Rajya Pustak Parsad,

17.D.C. Sarkar, Ashoker *Abhilekha*, Mahabodhi Society.

18. Georg Bûhler,*Indian Paleography* , Munshiram Manoharlal.

Course Code	Course Title / Topic	Credit	TH+ TU	MARKS DISTRIBUTION			
	Modern Sanskrit Literature			**INTERNAL ASSESS-MENT (IA)**	**ATTEN D-ANCE**	**Comprehensive Continuous Assessment (CCA)**	**Theory**
CC 9	**<u>Section- A</u>** **Mahākāvya and Charitakāvya** **Allotted Marks-50** **LH-30**			**10**	**10**	**Project/ Tutorial** **15**	**65**
	Unit I **Survey of Modern Sanskrit Literature in Bengal.** **Allotted Marks-20** **UNIT II** **Allotted Marks-30** **General Survey** Pandit Kshama Rao, P. K. Narayana Pillai, S.B. Varmekar, Paramananda Sastri, Rebaprasad Dwivedi Janaki vallabh Sastri,Ramkaran Sarma, Jagannath Pathak, S. Surender Rajan, Shankar Dev Avatare. Haridas Siddhanta Vagisha, Mulasankar, M. Yajnika, Mahalinga Shastri Leela Rao Dayal, Yatindra Vimal Chowdhury, Virendra Kumar Bhattacharya **<u>Section- B</u>** **Gadya and Rūpaka** **Allotted Marks-40** **LH-70** **Unit I** **Allotted Marks-10** Śivarājāvijayam (Niśvāsa-I) By Ambika Datta Vyasa **UNIT II** **Allotted Marks-10**	**06**	**5+1**				

	Atha Kim-Siddheswar Chattopadhyaya. **UNIT III** **Allotted Marks-10** Daridradurdaivam of Shrijiva Nyayatirtha **UNIT IV** **Allotted Marks-10** Rukmiṇīharaṇam (Canto I) Haridasa Siddhantavagisha						

Recommended Books: CC -9

1. मिश्र अभिराजराजेन्द्र,कल्पवल्ली (समकालीन- संस्कृत –काव्य- संखालना)—साहित्य एकादमी, 2013

2. प्रभु शंकर जोशी—भीमायनम्, शारदागौरवग्रन्थमाला, पुणे

3. त्रिपाठी राधावल्लभ—नवस्पन्दः, मध्यप्रदेशहिन्द्दीग्रन्थअकादमी

4.त्रिपाठी राधावल्लभ—आयति, रास्ट्रीय संस्कृत संस्थान, दिल्ली. University Grants Commission (UGC) Page 45 of 141 PROPOSED UNDER GRADUATE COURSES FOR SANSKRIT (HON.) UNDER CHOICE BASED CREDIT SYSTEM (CBCS) Detail of the Core Course for Sanskrit

5. आधुनिक संस्कृत- साहित्य सञ्चयन् (सम्पा०) गिरीशचन्द्रपन्त,विघानिधिप्रकाशन, दिल्ली 2008.

6. तदेवगगनंसैवधरा (काव्यसंग्रह) —श्रीनिवासरथविरचित,

7. विंशशताब्दी संस्कृत—काव्यामृतम् — (संक) अभिराजराजेन्द्रमिश्र (भाग—1)

8. उपाध्याय, रामजी—आधुनिक संस्कृत नाटक, चौखम्बासुरभारतीप्रकाशन, वाराणसी, 1996.

9. त्रिपाठी, राधावल्लभ—संस्क्रुत साहित्य, बीसवींशताब्दी, रास्ट्रीय संस्कृत संस्थान 1999.

10. भार्गव, दयानन्द—आधुनिक संस्कृत साहित्य, राजस्थानीग्रन्थागार, जोधपुर, 1987.

11. त्रिवेदी, मीरा - आधुनिक सस्कृत महिला नाट्यकार, परिमल, परिमल् पाब्लिकेशन्, दिल्ली 2000.

12. रुचिश्रेष्ठ-—बीसवींशताब्दी,संस्कृत लोक कथा साहित्य, रास्ट्रीय संस्कृत संस्थान, 2008.

13. शास्त्री, कलानाथ—आधुनिक काल का संस्कृत गद्य—साहित्य, रास्ट्रीय संस्कृत संस्थान, 1995.

14. शुक्ल, हीरालाल— आधुनिक सस्कृत साहित्य,रचनाप्रकाशन, इलाहाबाद, 1971.

15. Joshi, K.R. & S.M. Ayachuit ² Post Independence Sanskrit Literature, Nagpur, 1991.

16. Prajapati, Manibhai K. ² Post Independence Sanskrit Literature: A Critical Survey, Patna, 2005.

17. UshaSatyavrat, Sanskrit Dramas of the Twentieth Century, Mehar Chand Lachmandas, Delhi, 1987.

18. Dwivedi Rahas Bihari – AdhunikMahakāvya Samikshanam

19. Tripathi RadhaVallabha– Sanskrit SahityaBeesaveenShatabdi , 1999, Delhi

20. Musalgaonkar Kesava Rao – Adhunik Sanskrit KāvyaParampara, 2004

21. Narang, S.P. – KalidasaPunarnava,

22.Upadhyaya, Ramji–Adhunik Sanskrit Natak, Varanasi

<table>
<tr><th>Course Code</th><th>Course Title / Topic</th><th>Credit</th><th>TH+ TU</th><th colspan="4">MARKS DISTRIBUTION</th></tr>
<tr><td rowspan="3">CC 10</td><td>SANSKRIT WORLD LITERATURE</td><td></td><td></td><td>INTER N-AL ASSES S-MENT (IA)</td><td>ATTEN D-ANCE</td><td>Comprehe nsive Continuou s Assessmen t (CCA)</td><td>Theory</td></tr>
<tr><td rowspan="2"><u>Section- A</u>
Allotted Marks--15
LH-15

Unit I
Sanskrit Studies in West:
William Jones, Charles Wilkins, H. Wilson, MaxMùller, J.G. Buhler.

<u>Section- B</u>
Allotted marks-15
LH-20

Unit I
Sanskrit Studies in East:
Swami Vivekananda , Sri Aurobindo, Dayānanda Sarasvatī, Haridāsa Siddhāntavāgiśa, Śrījīva Nyāyatīrtha, Kshitish Chandra Chatterji, Roma Choudhuri, Pañcānana Tarkaratna & Ramaranja Mukherji.

<u>Section- C</u>
Sanskrit Fables in World Literature
Allotted marks-15
LH-15

Unit I
Translation of Paňcatantra in Eastern and Western</td><td></td><td></td><td>10</td><td>10</td><td>Project/ Tutorial
15</td><td>65</td></tr>
<tr><td>06</td><td>5+1</td><td></td><td></td><td></td><td></td></tr>
</table>

	Translation of Vetālapaṅcaviṁśatikā, Siṁhāsanadvātriṁśikā and Śukasaptati in Eastern **Unit II** Languages and Art. **<u>Section –D</u>** **Allotted marks-15** **LH-20** *Rāmāyaṇa* and *Mahābhārata* in South Eastern Asia **Unit I** Rāma Kathā in south eastern countries **Unit II** *Mahābhārata* stories as depicted in folk cultures of SE Asia **<u>Section- E</u>** **Kālidāsa in the West** **Allotted marks-10** **LH-15** English and German translation of Kālidāsa 's writings and their influence on western literature and theatre. **<u>Section- F</u>** **Sanskrit Studies across the World** **Allotted marks-20** **LH-15** i. Sanskrit Study Centres in Asia ii.Sanskrit Study Centres in Europe iii. Sanskrit Study Centres in America						
SEC-B-2	**Spoken & Computational Sanskrit** **1.Translation : 40 marks** English to Sanskrit 20 marks and Sanskrit to	**02**	**2+0**				

	English 20 marks **2.** Comprehension in Sanskrit (10 marks) 3.Paragraph Writings(10marks) 4.Letter Writing (10Marks) 5.Essay Writing(20 Marks)						
GE 4	**(Other than Sanskrit)**	**06**	**5+1**				

Recommended Books/Readings: -10

1. The Bhagavad Gita and the West: The Esoteric Significance of the Bhagavad Gita and Its Relation to the Epistles of Paul", by Rudolf Steiner, p. 43. arisebharat.com/2011/10/22/impact-of-bhagvad-gita-on-west/

2. Bhagavad Gita - World Religions

3. Bannerji, Suresh Chandra- 'Influence of Sanskrit outside India, A Companion to Sanskrit Literature, MLBD, 1971.

4. Excerpt from Wood's 2008 update of Kalila and Dimna- Fables of Friendship and Betrayal.

5. Falconer, Ion Keith (1885), Kalilah and Dimnah or The Fables of Bidpai, Cambridge University Press, Amsterdam, 1970.

6. Hertel, Johannes(1908-15), The Paňcatantra : a collection of ancient Hindu tales, in the recension called Paňcākhyānaka, and dated 1199 A.D., of the Jaina monk, Pūrṇabhadra, critically edited in the original Sanskrit, Harvard Oriental Series Volume 11,12,13, 14.

7. History of Sanskrit Literature, A Berriedale Keith, Motilal Banarsidas Publishers Pvt. Limited, India, 1993.

8. History of the Migration of Paňcatantra.

9. Impact of Bhagvad Gita on West | Arise Bharat

10. Influence of Bhagavad Gita - Wikipedia, the free encyclopedia

11. Jacobs, Joseph (1888), The earliest English version o the Fables of Bidpai , London.

12. James A. Hijiya, "The Gita of Robert Oppenheimer" Proceeding of the American Philosphical Society, 144, no. 2 (Retrieved on 27 February 2011).

13., कालिदासग्रन्थावली, रेवाप्रसाद्विवेदी, हिन्दुसंस्कृतविश्वविद्यालय,वाराणसी, 1986.

SEMESTER –5

<table>
<tr><th>Course Code</th><th>Course Title / Topic</th><th>Credit</th><th>TH+ TU</th><th colspan="4">MARKS DISTRIBUTION</th></tr>
<tr><td rowspan="3">CC 11</td><td>Vedic Literature</td><td></td><td></td><td>INTERN-AL ASSESS-MENT (IA)</td><td>ATTEND-ANCE</td><td>Comprehensive Continuous Assessment (CCA)</td><td>Theory</td></tr>
<tr><td rowspan="2"><u>Section- A</u>
Allotted Marks-50
LH-40

Unit I
Allotted Marks-30
Ṛgveda- Agni-1.1, Akṣa sukta-10.34, Hiraṇyagarva-10.121, Vāk Sūkta-10.125

Unit II
Allotted Marks-10
Śukla Yajurveda-Rudrādhyāya 16.1-14,

UNIT III
Allotted Marks-10
Atharvaveda-Sāmmanasyam-3.30
Bhūmi-12.1-12

<u>Section –B</u>
Allotted Marks-15
Vedic Grammar
LH-30

Declensions (śabdarūpa), Subjunctive Mood (leṭ), Gerunds (ktvārthaka, Tumarthaka), Vedic Accent and Padapāṭha.

<u>Section-C</u>
Allotted Marks-25
Brāhmaṇa and Upaniāṣad
LH-30

Unit I
Allotted Marks-10</td><td></td><td></td><td>10</td><td>10</td><td>Project/ Tutorial
15</td><td>65</td></tr>
<tr><td>06</td><td>5+1</td><td></td><td></td><td></td><td></td></tr>
</table>

	A..Manumatsyakathā of Śatapatha Brāhmaṇa. B. Śunasepa Upākhyāna of Aitareya Brāhmaṇa **Unit II** **A.M-15** Bṛhadaranyaka Upanisad-4.4 & 4.5						
DSE -1	**Darśana** **A.M-90** **Section-A** **Unit-I** **A.M-30** **LH-30** Tarkabhāṣā **Unit-II** **A.M-30** **LH-30** Saptapadārthī **Section-B** **Unit-I** **A.M-30** **LH-40** Vivekacūḍāmaṇi	**06**	**5+1**				

Recommended Books/Readings: 11

1.ऋग्वेद संहिता (सायणाचार्यकृतभाष्य एवं हिन्दीव्याख्या सहित), संस्करण) रामगोविन्द त्रिवेदी, चौखम्बासंस्कृतप्रतिष्ठान, दिल्ली.

2. Atharvaveda (Śaunakīya): (Ed.) Vishva Bandhu, VVRI, Hoshiharpur, 1960.

3. शुक्लयजुर्वेदसंहिता, (पदपाठ, उवट-महीधर भाष्य संवलीत तत्त्वबोधिनी हिन्दी व्याख्या सहित) (संस्करण) रामकृष्ण शास्त्री, चौखाम्बा संस्कृत प्रतिष्ठान, दिल्ली

4. Śatapatha Brāhmaṇa , (Ed.) Ganga Prasad Upadhyaya, SLBSRS Vidyapeeth, Delhi.

5. Śuklayajurveda-Saṁhitā, (Vājasaneyi-Mādhyandina), (Ed.) Jagadish Lal Shastri, MLBD, Delhi, 1978.

6. मुण्डकोपनिषद् (शाङकरभाष्य), संस्करण) जियालालकाम्बोज, ईस्टर्णबुकलिंकर्स, दिल्ली.

7. वैदिक संग्रह, कृष्णलाल,ईस्टर्णबुकलिंकर्स, दिल्ली.

8..*Ṛksūktavaijayantī*, H.D. Velankar, Bharatiya Vidya Bhavan, Bombay, 1972.

9. ऋक्सूक्तनिकर ,उमाशंकरशर्मा ऋषि, चौखाम्बा ओरियान्टाल वाराणसी

10. वेदेर भाषा ओ छन्द, गौरिधर्मपाल, पश्चिमस्बङ्ग राज्य पुस्तक पर्षद

11. पुर नतुन वेदेर कविता, गौरिधर्मपाल, प्रेसिडेन्सि लाइब्रेरी

14. *Vedic Selection*,Pt I, I,I III, K. C Chaterjee, C.U

15.वैदिक व्याकरण, अमरकुमार चट्टोपाध्याय, संस्कृत पुस्तक भाण्डार

16. वृहदारण्यकोपनिषद्, झर्णा भट्टाचार्य

17. वृहदारण्यकोपनिषद्, दास घोष गोस्वामी, संस्कृत वुक डिपो

18. Aitariya Brāhmaṇa, ed. Satyabrata Sāmaśramā.

Course Code	Course Title / Topic	Credit	TH +TU	MARKS DISTRIBUTION			
	Sanskrit Grammar			**INTERNAL ASSESS-MENT (IA)**	**ATTEND-ANCE**	**Comprehensive Continuous Assessment (CCA)**	**Theory**

CC 12	**<u>Section-A</u>** **Allotted Marks-10** **LH-10** The Concept of the Saṃjñā-Sūtra, Vārtika, Bhāśya, Karmapravacanīya, Nipāta, Gati, Upasarga, Guṇa, Vṛddhi, Ktin, Ghi, Ghu, Nadī, Upadhā, Samprasāraṇa**,** **<u>Section-B</u>** **Allotted Marks-25** **LH-30** General Introduction of Philology, i. Classification of Languages, ii.Production and Classification of Sounds, iii. Phonetic Laws iv. Vedic and Classical Sanskrit v. Ablaut vi. Phonetic Tendencies vii. Semantics **<u>Section-C</u>** **Allotted Marks-30** **LH-30** Kārakaprakaraṇam Vaiyākaraṇasiddhāntakaumudī **<u>Section -D</u>** **Allotted Marks-25** **LH-30** Samāsaprakaraṇam Vaiyākaraṇasiddhāntakaum-udī			**10**	**10**	**Project/ Tutorial** **15**	**65**
DSE-2	**Kāvya** **A.M-90** **Section-A** **Unit-I** **A.M-35** Sāhityadarpaṇa ,Ch-I	**06** **06**	**5+1** **5+1**				

	Unit-II **A.M-35** Sāhityadarpaṇa ,Ch-II **Unit-III** **A.M-30** Sāhityadarpaṇa ,Ch-III						

Recommended Books/Readings: 12

1. Kale, M.R. - *Higher Sanskrit Grammar*, MLBD, Delhi (Hindi Translation also available).

2.शास्त्री, धरानन्द्द —लघुसिद्धान्तकौमुदी, मूल एवं हिन्दीव्याख्या, मोतीलालबनारसीदास, दिल्ली.

2. शास्त्री, भीमसेन — लघसिद्धान्तकौमुदी, भौमीव्याख्या(भाग— 1), भौमीप्रकाशन, दिल्ली

3. Siddhāntakoumudī (samāsa and kāraka prakaraṇam in Bengali by Dr. Sacchidananda Mukhopadhyaya.

4. Vaiyākaraṇa Siddhāntakoumudī (Sañjā Paribhāsāin Bengali)by Prof. M. K Ganguly.

5. Linguistic Introduction to Sanskrit by Batakrishna Ghosh.

6. Sanskrit Grammar by R.G Bhandarkar.

7. Taraporewala, I.J.S. 1931. Elements of the Science of Language. Calcutta: Calcutta University Press. Revised Edn. 1962.

8. Verma, S.K. & Krishnaswamy. 1989. Modern Linguistics. Delhi etc.: Oxford University Press.

9.Astadhyayi of Panini by Sumitra M. Katre

SEMESTER 6

Course Code	Course Title / Topic	Credit	TH +TU	MARKS DISTRIBUTION			
	Indian Ontology & Epistemology			**INTERNAL ASSESS-MENT (IA)**	**ATTEND-ANCE**	**Comprehensive Continuous Assessment (CCA)**	**Theory**
CC 13	**Section- A** **Allotted Marks-20** **LH-30** **Essentials of Indian Philosophy**			**10**	**10**	**Project/ Tutorial** **15**	**65**
	Unit I Meaning and purpose of darśana, general classification of philosophical schools in classical Indian philosophy **Unit II** Realism (yathārthavāda or vastuvāda) and Idealism (pratyayavāda), Monism (ekatvavāda), Dualism (dvaitavāda) & Pluralism (bahutvavāda) ; dharma (property)-dharmī (substratum) **Unit III** Causation (kāryakāraṇavāda) : naturalism (svabhāvavāda), doctrine of pre-existence of effect (satkāryavāda), doctrine of real Transformation (pariṇāmavāda), doctrine of illusory transformation (vivartavāda), doctrine of nonpreexistence of effect in cause (asatkāryavāda and ārambhavāda) **Section –B** **Ontology(Based on Tarkasaṃgrahaḥ)** **Allotted Marks-30** **LH-30**	**06**	**5+1**				

	Unit- I Concept of padārtha, three dharmas of padārthas, definition of Dravya, **Unit II** Sāmānya, Viśeṣa, Samavāya, Abhāva. **Unit III** Definitions of first seven dravyas and their examination; Ātman and its qualities, Manas **Unit IV** Qualities (other than the qualities of the Ātman) Five types of Karma. **Section-C** **Epistemology(Based on Tarkasaṃgrahaḥ)** **Allotted Marks-40** **LH-40** **Unit I** Buddhi(jñāna) – nature of jñāna in Nyāya vaiśeṣika; smṛti-anubhava; yathārtha and ayathārtha **Unit II** Karaṇa and Kāraṇa, definitions and types of pramā, kartā-kāraṇa-vyāpāra-phala, **Unit III** Pratyakṣa **Unit IV** Anumāna including hetvābhāsa **Unit V** Upamāna and śabda pramāṇa **Unit VI** Types of ayathārtha anubhava						

DSE-3	**Vyākaraṇa** **A.M-90** **Section-A** **Unit-I** Siddhāntakaumudī-Strīpratyaya (Total Marks-30) LH-25 **Section-B** **Unit-I** Siddhāntakaumudī-TiṅantaPrakaraṇa (√bhū) (Total Marks-30) LH-40 **Section-C** **Unit-I** Siddhāntakaumudī-Ajanta Puṃliṅga (Total Marks-30) LH-35	**06**	**5+1**				

Recommended Books/Readings: 13

1. A Primer of Indian Logic, Kuppuswami Shastri, Madras, 1951.

2. Tarkasaṁgraha of Annambhaṭṭa (with Dīpikā & Nyāyabodhinī), (Ed. & Tr.) Athalye & Bodas, Mumbai, 1930.

3. Tarkasaṁgraha of Annambhaṭṭa (with Dīpikā & Nyāyabodhinī), (Ed. & Tr.) Virupakshananda, Sri Ramkrishna Nath, Madras, 1994.

4. Tarkasaṁgraha of Annambhaṭṭa (with Dīpikā commentary with Hindi Translation), (Ed.& Tr), Pankaj Kumar Mishra, Parimal Publication, Delhi-7. 2013.

5. Tarkasaṁgraha, Narendra Kumar, Hansa Prakashan, Jaipur.

6. Chatterjee, S. C. & D. M. Datta - Introduction to Indian Philosophy, Calcutta University, Calcutta, 1968 (Hindi Translation also).

7. Chatterjee, S. C. – The Nyāya Theory of Knowledge, Calcutta, 1968.

8. Hiriyanna, M. - Outline of Indian Philosophy, London, 1956 (also Hindi Translation).

9. Radhakrishnan, S. - Indian Philosophy, Oxford University Press, Delhi, 1990.

10. Chatterjee, S.C. : Introduction to Indian Philosophy, Calcutta

11. D.M. Dutt (हिन्दी अनुवाद) भारतीय दर्शन

12. Bhattacharya, Chandrodaya, The Elements of Indian Logic and Epistemology,

13. Maitra, S.K., Fundamental Questions of Indian Metaphysics & Logic

14. Jha, V. N., Tarkasaṃgraha of Annambhaṭṭa (English Translation with Notes), CIFSS, Kerala (India),2016 (2nd Ed.)

15. तर्कसंग्रह, (अध्यापना सहित),नारायण चन्द्र गोस्वामी, संस्कृत पुस्तक भाण्डार, कोलकाता.

16.भारतीय दर्शनेर रूपरेखा, अमित भट्टाचार्य, संस्कृत वुक डिपो, कोलकाता

Course Code	Course Title / Topic	Credit	TH +TU	MARKS DISTRIBUTION			
	Sanskrit Composition & Communication			**INTERNAL ASSESS-MENT (IA)**	**ATTEND-ANCE**	**Comprehensive Continuous Assessment (CCA)**	**Theory**
CC 14	**Section- A** **Vibhaktyartha, Voice & Kṛt** **Allotted Marks-25** **LH-35**			**10**	**10**	**Project/ Tutorial** **15**	**65**
	Unit I (i) Vibhaktyartha Prakaraṇa of Laghusiddhāntakaumudī (ii) Voice (kaṭṛ, karma and bhāva) **Unit II** Selections from Kṛt Prakaraṇa-	**06**	**5+1**				

	from Laghusiddhantakaumudī Major Sūtras for the formation of kṛdanta words (tavyat, tavya, anīyar, yat, ṇyat,ṇvul, Tṛc, Aṇ, kta, ktavatu, śatṛi, śāṇac, tumun,ktvā,lyap,lyuṭ,ghañ,ktin **<u>Section -B</u>** **Allotted Marks-30** **LH-35** **Translation and Communication** (i).Translation from Bengali/English to Sanskrit on the basis of cases(10marks), ii.Compounds and kṛt suffixes.(10marks) (iii). Translation from Sanskrit to Bengali and English(10marks) **Unit II** **Allotted Marks-10** Communicative Sanskrit: Spoken Sanskrit. **<u>Section-C</u>** **Essay** **Allotted Marks-35** **LH-30** **Unit-I** Essay (traditional subjects) e.g.Veda, Upaniṣad, Sanskrit Language, Saṃskṛiti, Rāmāyaṇa, Mahābhārata, Purāṇa, Gītā, principal Sanskrit poets. **Unit II** Essay based on issues and topic related to modern subjects like entertainment, sports, national and international affairs and social problems.						

DSE-4	**Veda** **A.M-90** **Section-A** **Unit-I** **LH-25** A. M-20 Eastern & Western interpretation of the Veda **Unit-II** **LH-25** **A.M-25** Śunaḥśepopākhyāna of AitareyaBrāhmaṇa **Section-B** **Unit-I** **LH-25** **A.M-25** TaittiriyopaniṣadŚikṣāvallī(Adhyāya-I, Anuvāka: 1-12 **Unit-II** **LH-25** **A.M-20** Muṇḍakopaniṣad (Muṇḍaka-1.2.2)	**06**	**5+1**				

Recommended Books/Readings: 14

1. शास्त्री, धरानन्द —लघुसिद्धान्तकौमुदी, मूल एवं हिन्दीव्याख्या, मोतीलालबनारसीदास, दिल्ली.

2. शास्त्री, भीमसेन — लघसिद्धान्तकौमुदी, भौमीव्याख्या(भाग— 1), भौमीप्रकाशन, दिल्ली

3. नौटियाल, चक्रधर — बृहद्—अनुवाद—चन्द्रिका, मोतीलालबनारसीदास,दिल्ली.

4. पाण्डेय, राधामोहन —संस्कृतसहचर, स्टूडेण्टस्फ्रेण्डस्, पटना.

5. द्विवेदी, कपिलदेव — रचनानुवादकौमुदी,विश्वविद्यालयप्रकाशन, वाराणसी.

6. द्विवेदी, कपिलदेव — सम्स्कृतनिबन्द्धशतकम्विश्वविद्यालयप्रकाशन, वाराणसी Apte, V.S. - *The Students' Guide to Sanskrit Composition*,Chowkhamba Sanskrit Series, Varanasi (Hindi Translation also available).

7. Kale, M.R. - *Higher Sanskrit Grammar*, MLBD, Delhi (Hindi Translation also available).

8. Kanshiram- *Laghusiddhāntakaumudī* (Vol.1), MLBD, Delhi, 2009.

9. Shastri, Janakinath-*A help to the Study of Sanskrit*, M.L Dey &Co ,Kolkata

University of Calcutta

CBCS Syllabus

DETAILS OF COURSE STRUCTURE

Distribution of courses in different semesters for General Course in Sanskrit

	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6
Core Course(CC)	2Th+2P/TU CC-1	2Th+2P/TU CC-2	2Th+2P/TU CC-3	2Th+2P/TU CC-4		
Language(LCC)			1Th+1TU LCC 1(1)	1Th+1TU LCC 2(1)	1Th+1TU LCC 1(2)	1Th+1TU LCC 2(2)
Elective Course						
1.Generic Elective(GE)	1Th+1P/TU GE-1	1Th+1P/TU GE-2				
2.Discipline Specific Elective					2Th+2P/T DSE- 1, 2	2Th+2P/TU DSE-3, 4
Ability Enhancement Compulsory Course (AECC)	1Th+0P/TU (AECC-1)	1Th+0P/TU (AECC-2)				
Skill Enhancement Course (SEC)			1Th+0P/TU SEC-A-1	1Th+0P/TU SEC-B-1	1Th+0P/TU SEC-A-2	1Th+0P/TU SEC-B-2
Total Number of Courses and Marks	4x100=400	4x100=400	4x100=400	4x100=400	4x100=400	4x100=400
Total Credits	20	20	20	20	20	20

TH=Theory, P=Practical, TU=Tutorial

CC for General (Sanskrit) Coding

Semester-1	SAN-G-CC-A1-TH/TU G-CC-B1-TH/TU
Semester-2	SAN-G-CC-A2-TH/TU G-CC-B2-TH/TU
Semester-3	SAN-G-CC-A3-TH/TU G-CC-B3-TH/TU
Semester-4	SAN-G-CC-A4-TH/TU G-CC-B4-TH/TU

DSE for general (Sanskrit) Coding

Semester-5	SAN-G-DSE-1-TH/TU SAN-G-DSE-2-TH/TU
Semester-6	SAN-G-DSE-3-TH/TU SAN-G-DSE-4-TH/TU

SEC for general (Sanskrit) Coding

Semester-3	SAN-G-SEC-A-1-TH/TU
Semester-4	SAN-G-SEC-B-1-TH/TU
Semester-5	SAN-G-SEC-A-2-TH/TU
Semester-6	SAN-G-SEC-B-2-TH/TU

Guideline for execution of CBCS Syllabus 2018-2019

All India CBCS Syllabus keeping in view the UG BOS in Sanskrit (C.U) recommends the following measures.

60% Sanskrit Question and Answer in 1st and 2nd Semester, 80% in 3rd Semester and 4th Semester and 100% in 5th and 6th Semester be strictly followed. In Honours Sanskrit Language and Devanāgari script be used .**For General in all six Semesters 60% answer are to be written in Sanskrit Language and Devanagari Scripts.**

Each 65% marks of theories be sub-divided as follows:

1st and 2nd Semester:

a. Three Broad Questions Carrying 10 marks each: 3x10=30(at least two in Sanskrit)

b. Four textual questions explanation, translation and Sanskrit rendering (wherever applicable) carrying 5 marks.(4x5-20) (at least two in Sanskrit)

c. Three short/Grammatical Notes carrying 5 marks each. 3x5=15(Two questions be answered in Sanskrit)

3rd and 4th Semester:

a. Two broad questions to be answered in Sanskrit (3x10=30)

b. Out of four, three questions to be answered in Sanskrit.(4x5=20)

c. All three short/ Grammatical Notes to be Answered in Sanskrit.(3x5=15)

5thand d6th Semester 100% be answered in devanaāgari script and Sanskrit Language.

** **B.A (General) Course may be treated as GE for other Discipline**

SEMESTER-1

<table>
<tr><th>Course Code</th><th>Course Title / Topic</th><th>Credit</th><th>TH+ TU</th><th colspan="4">MARKS DISTRIBUTION</th></tr>
<tr><td rowspan="3">CC-A1</td><td>Sanskrit Poetry</td><td></td><td></td><td>INTER -NAL ASSE SS-MEN T (IA)</td><td>ATTEN DANCE</td><td>Comprehen sive Continuous Assessment (CCA)</td><td>Theory</td></tr>
<tr><td rowspan="2"><u>Section- A</u>
Raghuvaṃśam :
Canto-I
Verses : 1-25
Allotted Marks(A.M)-20
LH-30</td><td></td><td></td><td rowspan="2">10</td><td rowspan="2">10</td><td>Project/ Tutorial
15</td><td rowspan="2">65</td></tr>
<tr><td>6</td><td>5+1</td><td colspan="2"></td></tr>
<tr><td colspan="8">UNIT I
Canto I
A.M-10
Verses : 1-10
Introduction(Author & Text), Meaning/translation, Explanation, Story, Characteristics of Raghu clan, Characteristics of Dilīpa.

UNIT II
Canto I
A.M-10
Verses : 11-25
Meaning/translation, Explanation, Role of Dilīpa for the welfare of the Subjects. Appropriateness of Title, Background of given contents.

<u>Section -B</u>
Śiśupālavadham:
Canto I
Verses : 1-30
Allotted Marks-20
LH-30

UNIT I
Canto I
A.M-10
Verses : 1-15
Introduction(Author & Text), Appropriateness of Title,</td></tr>
</table>

	Background of given contents. Grammar, Translation, Explanation, Poetic excellence, thematic analysis **UNIT II** **Canto I** **A.M-10** **Verses : 16-30** Grammar, Translation, Explanation, Poetic excellence, thematic analysis. माघे सन्तित्रयोगुणाः, मेघे माघे गतो वयः,तावद् भारवेर्भातियावन्माघस्यनोदयः। **<u>Section- C</u>** ***Nītiśatakam* :** **Verses : 1-20** **Allotted Marks-20** **LH-20** **UNIT I** **Verses : 1-10** **A.M-10** Translation, Explanation **UNIT II** **Verses : 11-20** **A.M-10** Translation, Explanation, Social experiences of Bhartṛhari, Types of Fool. **<u>Section- D</u>** **History of Sanskrit Poetry** **Allotted Marks-30** **LH-20** **UNIT I** **A.M-15** Aśvaghoṣa, Kālidāsa, Bhāravi, Māgha, Śrīharṣa, Jayadeva, Bhartṛhari and their works. **UNIT II** **A.M-15** Origin and Development of Different types of MahākāvyaandGītikāvya with						

	special reference to the above mentioned Poets and their works.						
CC-B1	Other than Sanskrit	**06**	**5+1**				
Eng1	Other than Sanskrit	**06**	**5+1**				
AECC (1)	**ENVS**	**2**	**2+0**				

Suggested Books/Readings

1. C.D. Devadhar (Text, Eng. Tr.), *Raghuvaṁśam* of Kālidāsa, MLBD. Delhi.

2. M.R. Kale (Text, Eng. Tr.), *Raghuvaṁśam* of Kālidāsa, MLBD, Delhi.

3. GopalRaghunathNandergikar, *Raghuvaṁśam* of Kālidāsa, MLBD, Delhi.

4. कृष्णमणि त्रिपाठी (सम्पा.) रघुवंशम् (मल्लिनाथकृत-सञ्जीवनीटीका), चौखम्बा सुरभारती प्रकाशन, वाराणसी।

5. Mirashi, V.V., *Kālidāsa* , Popular Publication, Mumbai.

6. Keith, A.B.,*History of Sanskrit Literature*, MLBD, Delhi.

7. Krishnamachariar.M, *History of Classical Sanskrit Literature*, MLBD, Delhi.

8. GaurinathShastri, *A Concise History of Sanskrit Literature*, MLBD, Delhi.

9. Winternitz, Maurice, *Indian Literature* (Vol. I-III), also Hindi Translation, MLBD, Delhi.

10. Ghosh, Yuthika, *Śatakatraya,*RajyaPustakParsad.

11. Das, Devkumar, *Raghuvaṁśam*(Canto-1), BalaramPrakashani.

12. Environmental Awareness Reflected in Sanskrit Literature, ed. by Prof. V.N.Jha. CASS, University of Poona,1991.

13. Vriksayurveda(The Science of Plants of lives) ed. by Surapala, Pub. by Asian Agri-History Foundation 1994.

SEMESTER-2

Course Code	Course Title / Topic	Credit	TH+ TU	MARKS DISTRIBUTION			
	Sanskrit Prose			**INTER -NAL ASSE SS-MEN T (IA)**	**ATTEN DANCE**	**Comprehen sive Continuous Assessment (CCA)**	**Theory**
	Section- A ***Śukanāsopadeśa*** **Allotted Marks(A.M)-30** **LH-35** **UNIT I** **(A.M)-15** Introduction- Author/Text（up to the end of the text.) **UNIT II** **(A.M)-15** Society and political thought depicted in *Śukanāsopadeśa*, logical meaning and application of sayings. **Section -B** **Śivarājavijayam,Niśvāsa-I** **Allotted Marks-30** **LH-35** **UNIT I** **Para 1 to 20** **(A.M)-15** Introduction- Author/Text, Text reading (Grammar, Translation, and Explanation), poetic excellence, plot, Timing of Action. **UNIT II** **(A.M)-15** **From Para 21 to the end of the text.** Text reading (Grammar, Translation, and Explanation), Poetic excellence, plot, Timing of Action. **Section- C** **Survey of Sanskrit Literature:**			**10**	**10**	**Project/ Tutorial** **15**	**65**
CC-A2		**6**	**5+1**				

	Prose **Allotted Marks-30** **LH-30** **UNIT I** **(A.M)-15** Origin and development of prose and important prose romances : Subandhu, Bāṇa, Daṇḍin, AmbikādattaVyāsa. **UNIT II** **(A.M)-15** Pañcatantra, Hitopadeśa, Vetālapañcaviṃśatikā, Siṃhāsanadvātriṃśikā and Puruṣaparīkṣā.						
CC-B2	**Other than Sanskrit**	**06**	**5+1**				
ENG2	**English/ Communication/Sanskrit** (Declensions, conjugations, kārakavibhakti Rules, Kṛt-suffixes &comprehention)	**06**	**5+1**				
AECC (2)	**Other than Sanskrit**	**02**	**2+0**				

Suggested Books/Readings:

1. A.B. Keith, *History of Sanskrit Literature*, MLBD, Delhi (हिन्दी अनुवाद, मंगलदेव शास्त्री, मोतिलाल बनारसीदास, दिल्ली।

2. Krishnamachariar.M, *History of Classical Sanskrit Literature*, MLBD, Delhi.

3. GaurinathShastri, *A Concise History of Sanskrit Literature*, MLBD, Delhi.

4. Winternitz, Maurice, *Indian Literature* (Vol. I-III), also Hindi Translation, MLBD, Delhi.

5. Bhattacharyya, Niradbaran, *Śukanāsopadeśa,* Sanskrit PustakBhandar.

- **For Environmental Studies**

1.V.N. jha(Ed.) Environmental Awareness Reflated in Sanskrit Literature; CASS, Pune, 1991(Proceedings of National Seminar)

2.Surapālaśvṛkṣāyurveda, Asian Agni-History Foundation, 1996.

SEMESTER-3

<table>
<tr><th>Course Code</th><th>Course Title / Topic</th><th>Credit</th><th>TH+ TU</th><th colspan="4">MARKS DISTRIBUTION</th></tr>
<tr><td rowspan="3">CC-A3</td><td>Sanskrit Drama</td><td></td><td></td><td>INTER-NAL ASSESS-MENT (IA)</td><td>ATTEN DANCE</td><td>Comprehensive Continuous Assessment (CCA)</td><td>Theory</td></tr>
<tr><td><u>Section- A</u>
Abhijñānaśākuntalam:Kālidāsa
Acts I-IV
Allotted Marks-25
LH-30</td><td></td><td></td><td>10</td><td>10</td><td>Project/ Tutorial
15</td><td>65</td></tr>
<tr><td>UNIT I
Acts I-IV
(a) Explanation of terms like nāndī, prastāvanā, sūtradhāra, naṭī, viṣkambhaka and vidūṣaka.
(b)Text Reading (Grammar, Translation, and Explanation), Poetic excellence, Plot.

<u>Section -B</u>
Abhijñānaśākuntalam:
Kālidāsa
Act V-VII
Allotted Marks-15
LH-30

UNIT I
Acts V-VII
(a) Text Reading (Grammar, Translation, Explanation), Poetic excellence, Plot, Timing of Action. Personification of nature.

(b) Kāvyeṣunāṭakamramyam, upamā, Language of Kālidāsa, dhvani in Kālidāsa, Purpose and design behind Abhijñānaśākuntalam and other problems related to the text.</td><td>6</td><td>5+1</td><td></td><td></td><td></td><td></td></tr>
</table>

	Section- C **Technical Terms from Sanskrit Dramaturgy:** **Allotted Marks-20** **LH-20** **UNIT I** **Allotted Marks-10** नाटक, नायक, नायिका, पूर्वरङ्ग, नान्दी, सूत्रधार, नेपथ्य, प्रस्तावना, कञ्चुकी एवं विदूषक। **UNIT II** **Allotted Marks-10** अङ्क, स्वगत, प्रकाश, अपवारित, जनान्तिक, आकाशभाषित, विष्कम्भक, प्रवेशक, भरतवाक्यम्। **Section- D** **History of Sanskrit Drama and an Introduction to Principle of Sanskrit Drama** **Allotted Marks-30** **LH-20** **UNIT I** **Allotted Marks-15** Origin and Development **UNIT II** **Allotted Marks-15** Some important dramatists and dramas: Bhāsa, Kālidāsa, Śūdraka, Viśākhadatta, Harṣa, Bhavabhūti, and their works						
	Other than Sanskrit						
CC-B3		**06**	**5+1**				
LCC-1(1)	**English/ Communication/Sanskrit** (Declensions, conjugations, kārakavibhakti Rules, Kṛt-suffixes &comprehention)	**06**	**5+1**				

SEC-A- 1	**Basic Sanskrit** **1. Translation : 40 marks** Vernacular to Sanskrit 20 marks Sanskrit to Vernacular- 20 marks **2. Comprehension in Sanskrit -10 marks** **3. Paragraph Writing- 10 marks** **4. Letter Writing- 10 marks** **5. Easy Writing- 20 marks**	**02**	**2+0**				

Suggested Books/Readings:

1. C.D. Devadhar (Ed.), *Abhijñanaśākuntalam*, MLBD, Delhi.

2. M.R. Kale (Ed.), *Abhijñanaśākuntalam*, MLBD, Delhi.

3. GajendraGadkar (Ed.), *Abhijñanaśākuntalam*.

4. Ramendramohan Bose, Abhijñanaśākuntalam, Modern Book Agency, Calcutta.

5. RatnamayiDikshit, *Women in Sanskrit Dramas*, MeherchandLacchman Das, Delhi.

6. A.B. Keith, *Sanskrit Drama*, Oxford University Press London, 1970.

7. MinakshiDalal, *Conflict in Sanskrit Drama*, Somaiya Publication Pvt. Ltd.

8. G. K. Bhat, *Sanskrit Drama*, Karnataka University Press, Dharwar, 1975.

9. Chakraborty, Satyanarayan, *Abhijñanaśākuntalam*, Sanskrit PustakBhandar.

10. Basu, Anil, *Abhijñanaśākuntalam*, Sanskrit Book Depo.

11. Pt. JivānandaVidyāsāgar, *Hitopadeśa*, Saraswati press, Kolkata.

12. Krishnamacharian, *History of Classical Sanskrit Literature*, MLBD, Delhi.

13. BimanBihari Bhattacharya, *Saṃskṛ̣taSāhityerrūparekhā*, Sanskrit PustakBhandar, Kolkata.

14. YuthikaGhosh, *Śatakatraya*, PachimbangaRajyaPustakParshad.

SEMESTER-4

<table>
<tr><th>Course Code</th><th>Course Title / Topic</th><th>Credit</th><th>TH+ TU</th><th colspan="4">MARKS DISTRIBUTION</th></tr>
<tr><td rowspan="3">CC-A4</td><td>Sanskrit Grammar</td><td></td><td></td><td>INTER-NAL ASSESS-MENT (IA)</td><td>ATTEN DANCE</td><td>Comprehensive Continuous Assessment (CCA)</td><td>Theory</td></tr>
<tr><td><u>Section- A</u>
Laghusiddhāntakaumudī : Saṃjñāprakaraṇa
Allotted Marks(A.M)-20
LH-25</td><td></td><td></td><td>10</td><td>10</td><td>Project/ Tutorial
15</td><td>65</td></tr>
<tr><td>UNIT I
Saṃjñāprakaraṇa

<u>Section -B</u>
Laghusiddhāntakaumudī : Sandhiprakaraṇa
Allotted Marks-35
LH-35

UNIT I
(A.M)-15
ac sandhi:
yaṇ, guṇa, dīrgha, ayādi, vṛddhi and pūrvarūpa.
(b) Text Reading (Grammar, Translation, Explanation), Poetic excellence, Plot, Timing of Action. Personification ofnature .

UNIT II
(A.M)-10
halsandhi: ścutva, utva, anunāsikatva, chhatva and jaśtva:

UNIT III
(A.M)-10
visargasandhi: utva, lopa, ṣatva and rutva

<u>Section –C</u>
Laghusiddhāntakaumudī: VibhaktyarthaPrakaraṇa
Allotted Marks-35
LH-40</td><td>6</td><td>5+1</td><td></td><td></td><td></td><td></td></tr>
</table>

CC –B4	**UNIT I** Vibhaktyarthaprakaraṇa **Other than Sanskrit**	**06**	**5+1**				
LCC-2(1)	**Other than Sanskrit**	**06**	**5+1**				
SEC-B-1	Spoken Sanskrit (Marks: 40) & Computer Awareness for Sanskrit(Basic Computer Awareness, Typing in Unicode for Preservation and Digitalization of Sanskrit Text Web Publishing) (Marks: 50)	**02**	**2+0**				

Suggested Books/Readings:

1. धरानन्द शास्त्री, लघुसिद्धान्तकौमुदी, मूल एवं हिन्दी व्याख्या, दिल्ली।

2. भीमसेनशास्त्री, लघुसिद्धान्तकौमुदी, भैमी व्याख्या (भाग-1), भैमी प्रकाशन, दिल्ली

3. चारुदेव शास्त्री, व्याकरण चन्द्रोदय (भाग-1,2 एवं 3), मोतिलाल बनारसीदास, दिल्ली।

4. सत्यपाल सिंह (सम्पा.), लघुसिद्धान्तकौमुदीः प्रकाशिका नाम्नी हिन्दी व्याख्या सहिता, शिवालिक पाब्लिकेशन, दिल्ली, 2014।

5. V.S. Apte, *The Students' Guide to Sanskrit Composition*, Chowkhamba Sanskrit Series, Varanasi (Hindi Translation also available).

6. M.R. Kale, *Higher Sanskrit Grammar*, MLBD, Delhi (Hindi Translation also available).

7. Kanshiram, *Laghusiddhāntakaumudī* (Vol. I), MLBD, Delhi, 2009.

8. Online Tools for Sanskrit Grammar developed by Computational Linguistics Group, Department of Sanskrit, University of Delhi: http://sanskrit.du.ac.in.

9. Johannes Hertel, *The Panchatantra: a collection of ancient Hindu tales*, Harvard Oriental Series, Vol. 11.

10. ShyamacharanPandey, *Pañcatantram*, MLBD, Delhi.

11. M.R. Kale, *Pañcatantram*, , MLBD, Delhi.

12. Sutapa Bhattacharya, *Laghusiddhāntakaumudī*, Sanskrit Book Depot.

SEMESTER-5

<table>
<tr><th>Course Code</th><th>Course Title / Topic</th><th>Credit</th><th>TH +TU</th><th colspan="4">MARKS DISTRIBUTION</th></tr>
<tr><td rowspan="3">DSE -1</td><td>Philosophy, Religion and Culture in Sanskrit Tradition</td><td></td><td></td><td>INTER-NAL ASSES S-MENT (IA)</td><td>ATTEN DANCE</td><td>Comprehen sive Continuous Assessment (CCA)</td><td>Theory</td></tr>
<tr><td rowspan="2"><u>Section- A</u>
Dharma
Allotted Marks-30
Lecture Hours(LH)-35

UNIT I
Allotted Marks-10
Form of God, Mode of worship, Bhakta as a morally evolved person - Gitā Chapter XII

UNIT II
Allotted Marks-10
Dharma – ten-fold dharma and its versions, definitions of satya, ahiṃsā, asteya, aparigraha, pañcamahāyajña; theory of three debts.

UNIT III
Allotted Marks-10
Man’s initiative and God’s design; God’s līlā and Kṛpā, Daiva versus puruṣakāra, adṛṣṭa, three types of karma – sañcita, kriyamāṇa and prārabdha karma.

<u>Section -B</u>
Saṃskāra and Puruṣārtha
Allotted Marks-30
LH-35

UNIT I
Allotted Marks-15
Process of acculturation – importance of Saṃskāra.

UNIT II</td><td></td><td>10</td><td>10</td><td>Project/
Tutorial
15</td><td>65</td></tr>
<tr><td>6</td><td>5+1</td><td></td><td></td><td></td><td></td></tr>
</table>

	Allotted Marks-15 Aim of human life – theory of Puruṣārtha. **<u>Section- C</u>** **Svadharma** **Allotted Marks-30** **LH-30** **UNIT I** **Allotted Marks-15** An 'amoral' person – svadharma and karmayoga, sthitaprajña in the Gitā (Chapter II). **UNIT II** **Allotted Marks-15** Prakṛti – three guṇas and their impact on personality.						

Suggested Books/Readings:

1. Radhakrishnan, *Gītā*.

2. Gītā with Hindi Translation, Gita Press, Goraphpur.

3. RajbaliPandey, Hindu Samskar.

4.शिवदत्त ज्ञानी, भरतीय संस्कृति।

5. राजबली पाण्डेय, हिन्दु संस्कार।

6. पी. बी. काणे, धर्मशास्त्र का इतिहास (खण्ड-1)।

7. Swami Jagadiswarananda, *Śrīmadbhagavadagītā*, UdbodhanKaryalaya, Kolkata.

Course Code	Course Title / Topic	Credit	TH+ TU	MARKS DISTRIBUTION			
	Indian Perspectives in Personality Development			**INTER-NAL ASSESS-MENT (IA)**	**ATTEN DANCE**	**Comprehensive Continuous Assessment (CCA)**	**Theory**
DSE -2	**Section- A** **Historical Perspective** **Allotted Marks(A.M)-15** **LH-20** **UNIT I** Historical Perspective: Ṛgveda, 1.164.37; Chāndogyopaniṣad,VI. 2.3, VI.8.6, VIII.1.4 Bṛhadāraṇyakopaniṣad, II.5.18-19 **Section -B** **Concept of a person** **Allotted Marks-30** **LH-30** **UNIT I** Concept of a person, Gītā, Chapter:1, Verses:1-30 Jīva as Core and Eight-fold Nature as Cover Kṣetrajña as Core and Kṣetra as Cover Chapter-13, Verses-1-2, Chapter-13, Verses: 5-6, Chapter-13, Vrses-19-23. Akṣara as Core and Kṣara as Cover, Chapter-15, Verses:7-11 and 6-19. **Section- C** **Personality Types** **Allotted Marks-15** **LH-20** **UNIT I** Personality Types Gītā, Chapter-14, Verses:5-14, Chapter-17, Verses:2-6, Chapter-17, Verses:11.21	**6**	**5+1**	**10**	**10**	**Project/ Tutorial** **15**	**65**

	Section- D **Measures for behavioural Improvement** **Allotted Marks-30** **LH-30** **UNIT I** Measures for behavioural Improvement Control of Senses and Mind (Gītā: Chapter-2, Verses:59-60, 64 and 68, Chapter:3, Verses:41-43, Chapter: 6, Verses:19-23. Right Faith (Gītā, Chapter: 9, Verses:3, 22, 23-28, 30-34) Recognition of Svadharma - Inner Urge; (Gītā, Chapter: 2, Verses:31,41-44, Chapter:3, Verses:4, 5, 8, 9, 27-30, 33-34, Chapter:4, Verses:18-22, Chapter:5, Verses:11-12, Chapter:7, Verses:15, 18, 20-23, 27-29) Channelizing Innate Urges on Social Lines: (Gītā, Chapter:18, Verses:41-62).						
LCC 1(2)	**Other than Sanskrit**	**06**	**5+1**				
SEC-A-2	**Basic Elements of Āyurveda** Introduction of Āyurveda(Marks – 30) Carakasaṃhitā-(Sūtrasthānam) (Marks – 30) Taittirīyopaniṣad (Marks – 30)	**02**	**2+0**				

Suggested Books/Readings:

1. Radhakrishnan, *TheBhagvadgītā*.

2. Swami Jagadiswarananda, *Śrīmadbhagavadagītā*, UdbodhanKaryalaya, Kolkata.

3.Eassy on the Gītā by Sri Aurobinda, Aurobindo Ashram, Pondicherry, 1992.

SEMESTER- 6

Course Code	Course Title / Topic	Credit	TH+ TU	MARKS DISTRIBUTION			
	Literary Criticism			**INTER -NAL ASSE SS-MEN T (IA)**	**ATTEN DANCE**	**Comprehen sive Continuous Assessment (CCA)**	**Theory**
DSE-3	**Section- A** *Kāvyaprakāśa*: Kāvyavaiśiṣṭya and KāvyaPrayojana **Allotted Marks-35** **LH-35**			**10**	**10**	**Project/ Tutorial** **15**	**65**
	UNIT I *Kāvyaprakāśa*: KāvyaVaiśiṣṭya and KāvyaPrayojana **Section -B** *Kāvyaprakāśa*: KāvyaKāraṇa **Allotted Marks-25** **LH-30** **UNIT I** *Kāvyaprakāśa*: KāvyaKāraṇa **Section- C** *Kāvyaprakāśa*: KāvyaSvarūpa and Kāvyabheda **Allotted Marks-30** **LH-35** **UNIT I** *Kāvyaprakāśa*: KāvyaSvarūpa and Kāvyabheda	**6**	**5+1**				

Suggested Books/Readings:

1. Nagendra (Ed.), *Kāvyaprakāśa* of Mammaṭa, Commentary in Hindi by AcharyaVishveshvar, J–ānamaṇḍala Varanasi, 2014.

2. ParasnathDwivedi (ed.), *Kāvyaprakāśa* of Mammaṭa, VinodPustakMandir, Agra, 1986.

3. GanganathJha, *Kāvyaprakāśa* with Eng. translation), BharatiyaVidyaPrakashan, Varanasi.

4. RamanadaAcharya, *Kāvyaprakāśa* (Bengali), Sanskrit PustakBhandar, Kolkata.

Course Code	Course Title / Topic	Credit	TH+ TU	MARKS DISTRIBUTION			
	Nationalism in Sanskrit Literature			**INTER-NAL ASSESS-MENT (IA)**	**ATTEN DANCE**	**Comprehensive Continuous Assessment (CCA)**	**Theory**
DSE-4	**<u>Section- A</u>** **Concepts and Basic Features of Indian Nationalism** **Allotted Marks-30** **LH-35**			**10**	**10**	**Project/ Tutorial** **15**	**65**
	UNIT I **Allotted Marks-15** **Meaning, Definitions and Elements of Indian Nation 'Rāṣṭra':** Meaning of Nation, Definitions and Constituent Elements of Nation in Western Perspective. Indian Concept of Nation: 'Rāṣṭra', Meaning, Etymology and Definitions, Essential Elements of 'Rāṣṭra'in Sanskrit Literature (Atharvaveda,11.9.17; 12.1,1-12 ŚuklaYajurveda, 22.22) 'Rāṣṭra'in the Context of 'Saptāṅga' Theory of State (Kauṭilya'sArthaśāstra, 6.1, Mahābhārata, Śāntiparva, 56.5; Śukranīti, 1.61- 62) **UNIT II** **Allotted Marks-15** **Meaning, Definitions and Elements of Indian Nationality:** Meaning of Nationality, Definitions and Constituent Elements of Nationality, Essential Factors of Nationality: National Integration, Patriotism, Freedom, Religious Tolerance, National Pride, National Consciousness and Citizenship. Special Features of	**6**	**5+1**				

	Indian Nationalism: Social Harmony (SāmājikaSamarsata), Equality of the Religions, International Brotherhood, Unity in Diversity and Cultural Conciousness. **<u>Section -B</u>** **Name of Country, National Symbols and Rise of Nationalism** **Allotted Marks-30** **LH-35** **UNIT I** **Allotted Marks-15** **Name of the Country 'Bharatavarsha' and National Symbols:** Different views regarding name of 'Bharatavarsha' in Vedic and Pauranic Literature, National Symbols of India: National Anthem-'Jana GanaMana', National Song-'VandeMataram', National Flag of India, National Emblem 'Ashok Chakra', National Calendar of India 'ŚakaSaṃvat'. **UNIT II** **Allotted Marks-15** **Rise of Indian Nationalism and Freedom Struggle Movement:** Major Factors which led to the rise of nationalist sentiments in modern period with special reference to Western Thought and Education, Rediscovery of India's Past, Socio-religious reform movements and Impact of contemporary national movements worldwide. Brief survey of Socio-religious nationalistic thought of modern India with special reference to Raja Ram Mohan Ray, Swami DayanandSaraswati, Swami Vivekananda, Bankim Chandra Chattopadhyay, Mahatma						

	Gandhi, Madan Mohan Malaviya, VirSavarkar and Dr.B.R.Ambedkar. **<u>Section- C</u>** **Nationalistic Thought and Modern Sanskrit Literature** **Allotted Marks-30** **LH-30** **UNIT I** **Allotted Marks-15** **Contributions of Sanskrit Literature to Freedom Struggle Movement:** Survey of nationalistic trends in modern Sanskrit literature before Independence; Survey of nationalistic trends in modern Sanskrit literature after Independence. **UNIT II** **Allotted Marks-15** **Modern Nationalistic Thought and Gandhian Sanskrit Literature:** Social, political and religious background of Gandhian Thought with special reference to 'GrāmaSvarāja' (Local Self Government), 'Satyāgraha' (Truth Fullness), 'Ahiṃsā' (Non Violence), 'Prajātantra' (People's Democracy) and 'DhārmikaSahisnuta' (Religious Tolerance). Contemporary Sanskrit Literature on Gandhian Thought with special reference to 'Satyāgrahagitā' of PanditaKsamarava, 'Bhāratavijayanātakam' of Mathura PriadDikshita, 'Gandhicaritam' ofCharudevaShastri, 'Gandhi Gitā' of Prof. Indra.						
LCC2 (2)	**Other than Sanskrit**	**06**	**5+1**				

SEC-B-2	**Yogasūtra of Patañjali (Samādhipāda, Sādhanapāda, Vibhūtipāda)**	**02**	**2+0**				

Suggested Books/Readings:

1. R.P. Kangle (ed.), *Arthaśāstra* of Kauṭilya, MotilalBanarasidas, Delhi, 1965.

2. R.T.H. Griffith (Trans.), *AtharvavedaSamhita* (2 Vol.), Banaras, 1968.

3. H.P. Shastri (Eng. Trans.), *Mahābhārata* (7 Vol.), London, 1952-59.

4. H.P. Shastri (Eng. Trans.), *Ramayana* of Vālmīki(3 Vol.), London, 1952-59.

5. H.H. Wilson (Eng. Tr.), *Viṣṇupurāṇa*, PunthiPustak, Calcutta, 1961.

6. उदयवीर शास्त्री (अनु.), कौटिल्यीय अर्थशास्त्र, मेहरचन्द-लक्ष्मनदास, दिल्ली, 1968।

7. रामनारायण दत्तशास्त्री पाण्डेय (अनु.), महाभारत (1-6 भाग) हिन्दी अनुवादसहित, गीताप्रेस, गोरखपुर।

8. सातवलेकर, यजुर्वेदहिन्दीअनुवादसहित, श्रीपाद दामोदर, पारडी ।

9. मुनिलाल गुप्त (अनु), विष्णुपुराण हिन्दी अनुवाद सहित, गीताप्रेस ,गोरखपुर।

10. शतपथब्राह्मण (1-5भाग) माध्यन्दिनीय शाखा, सायणाचार्य एवं हरिस्वामी टीकासहित, दिल्ली।

11. ब्रह्माशंकर मिश्र, शुक्रनीति हिन्दी अनुवाद, चौखम्भा संस्कृत सिरीज, वाराणसी, 1968।

12. पण्डिता खमाराव, सत्याग्रहगीता, पेरिस, 1932।

13. जानकीनाथ शर्मा ,(सम्पा), श्रीमद्वाल्मीकिरामायणम् (1-2भाग), हिन्दी अनुवाद सहित, गीताप्रेस ,गोरखपुर।

14. अनूप चन्द कपूर, राजनीतिविज्ञान के सिद्धान्त, प्रिमियर पब्लिशिंग हाउस, दिल्ली, 1967।

15.योगेन्द्र गोस्वामी (सम्पा.), राष्ट्रीय एकता और भारतीय साहित्य, काशी अधिवेशन स्मृति ग्रन्थ, 201।

16.कुमुद टंडन, महात्मा गान्धी परख संस्कृत काव्य, ईष्टार्न बुक लिंकर्स, दिल्ली, 1991।

17. शशि तिवारी, राष्ट्रीयता एवं भारतीय साहित्य, विद्यानिधि प्रकाशन, दिल्ली, 2007।

18. शशि तिवारी, संस्कृतसाहित्य में राष्ट्रवाद, विद्यानिधि प्रकाशन, दिल्ली, 2013।

19. हरिनारायण दीक्षित, संस्कृतसाहित्य में राष्ट्रभावना, ईष्टार्न बुक लिंकर्स, दिल्ली, 2006।

20.इकबाल नारायण,आधुनिक राजनीतिक विचारधाराएं, ग्रन्थविकाश, जयपुर, 2001।

21.पुष्पेन्द्र कुमार (सम्पा.), पुराणों मेंराष्ट्रीय एकता, नागप्रकाशन, दिल्ली।

22.अजय कुमार मिश्र, मथुरा प्रसाद दीक्षित के नाटक, प्रकाशनविभाग, दिल्ली विश्वविद्यालय , दिल्ली, 2002 ।

23.बाबू गुलाब राय,राष्ट्रीयता, किताब घर दिल्ली, 1996।

24.सत्या एन. राय, भारत में उपनिवेशवाद और राष्ट्रवाद, दिल्ली 1953।

25. S.K. Belvalkar, *Mahābhārata*: ŚāntiParvam, 1954.

26. B. Chakrabarty, and R. Pandey, Modern Indian Political Thought, Sage Publications, New Delhi, 2010.

27. P. Chatterjee, The Nation and its Fragments: Colonial and Postcolonial Histories, New Delhi, Oxford University Press, 1993.

28. M.K. Gandhi, The Collected Works of Mahatma Gandhi, Ahmedabad, Navajivan, 1958.

29.M. N. Jha, Modern Indian Political Thought, MeenakshiParkashan, Meerut.

30. R. Pradhan, Raj to Swaraj, Macmillan, New Delhi, 2008.

31. HiralalShukla, Modern Sanskrit Literature, Delhi, 2002.

Directives:

Lecture duration = 1 hour

Per course paper 6 hrs/ week

6*4= 24 hrs /month

24*6= 144 hrs/Sem(6 months)

Average 100 hrs are allotted per course paper (holidays, tutorials, internal assessment will be scheduled in the rest 44 hrs)

DSE

We cannot offer choices in DSE in view of the infrastructural constraints in UG colleges under CU; in this respect we refer to the Syllabi offered by WBSU (Barasat), Burdwan University and Sidho Kanho Birsa University. Only 4 DSE papers are to be answered in 5^{th} and 6^{th} Semester (DSE 1 and 2 in Semester 5 & DSE 3 & 4 in Semester 6). Same pattern is to be followed in DSE General Course.

The UGBOS (CBCS) Syllabus Committee resolved that allotted marks to each course paper should be 90 (notionally fixed) of which 65 will be theoretical, 15 Tutorial (TU) and 10 Internal Assessment (IA); since the syllabi for the TU and IA belong to that of the same CC (of 90 marks).

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

SOCIOLOGY

B.A. (HONOURS)

SYLLABUS

Under Choice Based Credit System (CBCS)

UNIVERSITY OF CALCUTTA

2018

Note:

- **Attendance: 10 marks per paper**
- **Internal Assessment: 10 marks per paper**

- **Core Courses, Discipline Specific Elective and Generic Elective Courses: (TU+Th=15+65) = (1+5 credits each) = 6 Credits each**

- **Skill Enhancement Courses: (Th=2 credits each) =2 Credits each**

Course Distribution:

- Core Course:14: 6 Credits each
  - 2 Courses each in Semesters 1 and 2
  - 3 Courses each in Semesters 3 and 4
  - 2 Courses each in Semesters 5 and 6
- Elective Courses:

i. Discipline Specific Elective DSE:4: 6 Credits each
   - 2 Courses each in Semesters 5 and 6,taking one from each group -A & B

ii. Skill Enhancement Elective: 2 : 2 credits each
   - 1 Course each in Semesters 3 and 4

iii. Generic Elective: 4 : 6 Credits each
   - 1 Course each in Semesters 1, 2, 3 and 4

Important Note:

- **UGC Model Syllabus for Sociology has been followed while framing the Syllabus Below. Reference:https://www.ugc.ac.in/pdfnews/6144453 _BA-Honours Sociology.pdf**
- **The Readings provided below include many of those of the UGC Model CBCS Syllabus in Sociology.**
- **The format is subject to the common structural CBCS format of the University.**

❖ Suggested Mode for 15 Marks Tutorial Segment:

- **Written Mode:**15 marks written evaluation by college CT (Class test) - (7^{th}/ 8^{th} week of the semester); Upto 1200 words Term papers- (1/2@ 500/600 Words each) Book review/ Excerpt review/ Comprehension- Syllabus based Topic selection by College

- **Presentation Mode:** Paper or Report Presentation/Poster presentation (may be in groups) (In whichever paper it is suitable)/ Fieldwork and Report writing on Syllabus based topics or Current topics.

[All modes/ themes/ topic of the tutorial related segments to be decided by concerned faculty of respective colleges.]

	LIST OF COURSES FOR HONOURS PROGRAM	
	CORE COURSE	**(6 Credits per Core Course)**
Semesters	**Subject-Hon-Core-Semester-Paper-Th&TU**	**14 - CORE COURSES**
1st Semester	SOC-A-CC -1-1-TH&TU	Introductory Sociology I
	SOC-A-CC -1-2-TH&TU	Sociology of India-I
2nd Semester	SOC-A-CC -2-3-TH&TU	Introductory Sociology-II
	SOC-A-CC -2-4-TH&TU	Sociology of India II
3rd Semester	SOC-A-CC -3-5-TH&TU	Political Sociology
	SOC-A-CC -3-6-TH&TU	Sociology of Religion
	SOC-A-CC -3-7-TH&TU	Sociology of Gender and Sexuality
4th Semester	SOC-A-CC -4-8-TH&TU	Economic Sociology
	SOC-A-CC -4-9-TH&TU	Population Studies
	SOC-A-CC -4-10-TH&TU	Social Stratification
5th Semester	SOC-A-CC -5-11-TH&TU	Sociological Thinkers I
	SOC-A-CC -5-12-TH&TU	Research Methods – I
6th Semester	SOC-A-CC -6-13-TH&TU	Sociological Thinkers-II
	SOC-A-CC -6-14-TH&TU	Research Methods – II
ELECTIVE COURSES		
SKILL ENHANCMENT COURSE(2 Credits per Course)		
GROUP-A:	**Any 1 Paper in Semester-3**	
3rd Semester	SOC-A-SEC- 3-A(1)-TH	Reading, Writing and Interpretation in Sociology
	SOC-A-SEC- 3-A(2)-TH	Gender Sensitization
GROUP-B: Any 1 Paper in Semester-4		
4th Semester	SOC-A-SEC- 4-B (1)-TH	Statistical Reasoning for Sociology
	SOC-A-SEC- 4- B(2)-TH	Theory and Practice of Development
DISCIPLINE SPECIFIC ELECTIVE (6 Credits per Course)		
GROUP-A: Any 1 paper in Semester-5		
SOC-A-DSE- 5 -A(1)-TH&TU		Urban Sociology
SOC-A-DSE- 5 -A(2)-TH&TU		Sociology of Work and Industry
GROUP-A: Any 1 paper in Semseter-6		
SOC-A-DSE- 6 -A(3)-TH&TU		Environmental Sociology
SOC-A-DSE- 6 -A(4)-TH&TU		Agrarian Sociology
GROUP-B: Any 1 paper in Semester-5		
SOC-A-DSE-5 -B(1)-TH&TU		India Sociological Traditions
SOC-A-DSE-5 -B(2)-TH&TU		Sociology of Visual Culture and Media
GROUP-B: Any 1 paper in Semester-6		
SOC-A-DSE-6 -B(3)-TH&TU		Sociology of Health and Medicine
SOC-A-DSE-6 -B(4)-TH&TU		Project: Fieldwork And Dissertation
GENERIC ELECTIVE (6 Credits per Course)		

- **Note: Core Courses Designed for General Program will be offered as Generic Elective course for students of Other Discipline**

Course Structure for B.A. (Honours)

Course Components	B.A. Honours
Core Course (CC)	14
Language Core Course (LCC)	0
Generic Elective (GE)	4**
Discipline Specific Elective (DSE)	4
Ability Enhancement Compulsory Course (AECC)	2
Skill Enhancement Elective Course (SEC)	2
Total no. of courses	26
****Covering two subjects**	

Semester Wise Courses for B.A . (Honours)

	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6
Core Course (CC)	2Th+2TU CC-1 & 2	2Th+2TU CC-3&4	3Th+3TU CC-5,6 &7	3Th+3TU CC-8, 9 & 10	2Th+2TU CC-11 & 12	2Th+2TU CC-13&14
Elective Courses:						
i)Generic Elective (GE)	1Th+1 TU GE-1	1Th+1 TU GE-2	1Th+1 TU GE-3	1Th+1 TU GE-4		
ii)Discipline Specific Elective (DSE)					2Th+2 TU DSE-A(1) DSE-B(1)	2Th+2 TU DSE-B(2) DSE-B(2)
Ability Enhancement Compulsory Course (AECC)	1Th+0 TU AECC-1	1Th+0TU AECC-2				
Skill Enhancement Course(SEC)			1Th+0TU SEC-A(1)	1Th+0TU SEC-B(2)		
Total No. of Courses and Marks	4 x 100=400	4 x 100 =400	5 x 100 =500	5 x 100 =500	4 x 100 =400	4 x 100 =400
Total Credits	**20**	**20**	**26**	**26**	**24**	**24**

Th= Theory TU=Tutorial

- CC/GE/ DSE : Each Theory and Practical Course have 4 and 2 Credits respectively/ Each Theory and Tutorial Course have 5 and 1 Credit(s) respectively
- GE: Covering two disciplines with two courses each; any discipline in any semester; CC of a different subject in General course is to be treated as GE for Honours Course
- DSE/SEC: Choice must be group specific to each semester.
- AECC/SEC : Each Course has 2 Credits
- AECC-1: Communicative English / MIL; AECC-2: Environmental Studies

SEMESTER-1

CC-1

Introductory Sociology– I

1. Sociology: Discipline and Perspective

1.1 Thinking Sociologically

1.2 Emergence of Sociology, Sociology as a science; Sociology and Common Sense

1.3Some Basic Concepts: Association; Aggregates: Community, Categories, Groups and its Forms; Status and Role; Norms and Values.

1.4Individual and Society; Socialization: Concept and Agencies; Culture – meaning and characteristics; Types of culture – popular, elitist, folk, and consumer cultures; Pluralism and Multiculturalism, Culture and Personality.

2. Sociology and Other Social Sciences

2.1 Sociology and Social Anthropology

2.2 Sociology & Psychology

2.3 Sociology & History

3. Human Society

3.1 Social Institutions and Social Processes

3.2 Social control: meaning, agencies and mechanisms

3.3 Conformity and Deviance.

3.4 Social Change, definition, factors, Social Mobility

Readings:

1. A. Beteille : Sociology—Essays on Approach and Method (OUP)
2. Allan G Johnson. 2008, *The Forest and the Trees: Sociology as Life Practice and Promise*, Philadelphia: Temple University Press, Introduction and Chapter 1, 'The Forest, the Trees and One Thing', Pp. 1-36 McGraw-Hill, Chapter 8, Pp. 185-209
3. Alex Inkeles: What Is Sociology?
4. Alex Thio: Sociology
5. Andre, Beteille, 2009, *Sociology: Essays in Approach and Method*, Delhi: Oxford University Press, Chapter 1, 'Sociology and Common Sense', Pp. 13-27
6. Anthony Giddens : Sociology
7. G. Rocher: A General Introduction to Sociology
8. George Ritzer. Encyclopaedia of sociology
9. Gilles Ferreol& Jean-Pierre Noreck: An Introduction to Sociology(PHI Learning)
10. Gordon Marshal. Dictionary of Sociology (OUP)
11. Harry M. Johnson Sociology
12. Henry Tischler. Introduction to Sociology
13. J Ross Eshleman& B.G. Cashion: Sociology an Introduction
14. M. Haralambas&R. M. Heald. Sociology Themes and Perspectives.

15. P. Worsely: New Introducing Sociology
16. T. Bottomore : Sociology—A Guide to Problems and Literature

Reference:

1. Béteille, André, 1985, *Six Essays in Comparative Sociology*, New Delhi: Oxford University Press, Chapter 1, 'Sociology and Social Anthropology', Pp. 1-20
2. Beteille, André, 2002, *Sociology: Essays in Approach & Method*, Oxford University Press, Chapter 2, 'Sociology and Social Anthropology', Pp. 28-54
3. Beattie, J., 1966, *Other Cultures*, London R.K.P., Chapter 2, 'Social Anthropology and Some Other Sciences of Man', Pp. 25- 29
4. Burke, Peter, 1980, *Sociology and History*, George Allen and Unwin, Chapter 1, 'Sociologists and Historians', Pp. 13-30
5. Bottomore, T. B. 1971, *Sociology: A Guide to Problems and Literature*, London: Allen and Unwin. Chapter 4, 'The Social Sciences, History and Philosophy', Pp. 65-80
6. Bierstedt, Robert, 1974, *The Social Order*, New York: McGraw Hill Book Company Part 3, Chapter 5, 'The Meaning of Culture', p. 125-151, Chapter 6, 'The Content of Culture' Pp. 152-187, Chapter 7, 'The Acquisition of Culture', Pp. 188-212.
7. Bierstedt, Robert 1974, *The Social Order*, McGraw Hill, Chapter 20, 'The Problem of Social Change' Pp. 527-567
8. Firth, Raymond, 1956, *Human Types*, Thomas Nelson & Sons, Chapter 3,'Work and Wealth of Primitive Communities', Pp. 71-97
9. Garner, James Finn, 1994, *Politically Correct Bedtime Stories: Modern Tales for Our Life and Times*, New Jersey: John Wiley & Sons Inc., Chapters, 'Little Red Riding Hood' & 'Rumpelstiltskin'.
10. Horton, Paul B., Chester L. Hunt. 2004, *Sociology*. New Delhi: Tata McGraw Hill. Chapter 9, Pp. 210- 229
11. MacIver, Robert M, and Charles Hunt Page. 1949. *Society*, New York: Rinehart. Chapter 10, 'Types of Social Groups', Pp. 213-237
12. Redfield, Robert 1956, Chapter 16, 'How Human Society Operates', in Harry L Shapiro (ed.) *Man, Culture and Society*. New York: Oxford University Press, Pp.345-368
13. Ritzer, George, 2004, The *McDonaldisation of Society*, Pine Forge Press, Chapter 1, 'An Introduction to McDonaldisation', Pp. 1-20, Chapter 2, McDonaldisation and Its Precursors' Pp. 21-39, Chapter 9, 'McDonaldisation In a Changing World', Pp. 167-199
14. Ritzer, George, 1996, *Classical Sociological Theory*, New York: McGrawHill, Chapter 1, 'A Historical Sketch of Sociological Theory- The Early Years',Pp. 13-46

CC-2

Sociology of India – I

1. India: An Object of Knowledge

1.1 The Colonial Discourse

1.2 The Nationalist Discourse

1.3 The Subaltern Critique

2. Indian Society: Concepts and Institutions

2.1**. Caste: Concept and Critique**

2.1.1 Varna & Jati; Dominant Caste

2.1.2 Jajmani System; Caste Mobility: Sanskritization

2.2. **Agrarian Classes**

2.2.1 Nature of Agrarian Class

2.3**. Tribe: Profile and Location**

2.3.1 Features

2.3.2 Regional Distribution

2.4**. Village: Structure and Change**

2.4.1 Village Solidarity

2.4.2 Internal Regulation

2.5. **Kinship: Principle and Pattern**

2.6. **Religion and Society**

2.6.1 Role of Religion

Readings:

1. A. R. Desai. Bharatiya Jatiatabader SamajikPatabhumi (Social Background of Indian Nationalism).
2. A. R. Desai. Rural sociology
3. A. Beteille. Caste, Class and Power: Changing Patterns
4. Amartya Sen. Argumentative India (Chs. 10, 11)
5. Bernard Cohn, Colonialism and its forms of knowledge, Princeton University Press
6. Aniruddha Choudhury. 2016. “Bharater Samaj Prasange”Chatterjee Publishers.
7. David Mandelbaum – Society in India
8. Ghanshyam Shah. Caste and Democratic Politics in India
9. Guha, R., 1982, *Subaltern Studies, Volume I.* Delhi: Oxford University Press, Pp.1-8
10. Hemendorf. Tribes in India
11. K. L. Sharma – Social Stratification and Mobility
12. K. L. Sharma – Social Stratification in India
13. M. N. Srinivas – Caste – Its Twentieth Century Avatar
14. M. N. Srinivas – Social Change in Modern India

15. Nadeem Hashain. Tribal India Today (Chs. 4-8)
16. Neera Chandhoke et.al,(eds) : Contemporary Society in India
17. P. Oberoi (ed) - Family, Kinship and Marriage in India
18. Rajni Kothari (ed.) – Caste in Indian Politics
19. Ram Ahuja – Indian Social System
20. Ram Ahuja : Society in India
21. Ramanuj Ganguly and S. A. H. Moinuddin. SamakaleenBharatiyaSamaj. PHI. Learning
22. S. C. Dube – Indian Society
23. T. K. Oommen – Social Structure and Politics
24. T. N. Madan : Religion in India; Delhi: Oxford University Press.
25. Thaper : Tribe, Caste and Religion in India (Articles by Aran and Beteille)
26. Vandana Madan : The Village in India
27. Veena Das: Handbook of Indian Sociology: Oxford Companion to Sociology and Anthropology
28. Yogendra Singh – Culture Change in India
29. Yogendra Singh – Essays on Modernization in India
30. Yogendra Singh – Social Change in India
31. Yogendra Singh – The Modernization of Indian Tradition

References:

1. Cohn, B.S., 1990, *An Anthropologist among the Historians and Other Essay*s, Delhi: Oxford University Press, Pp.136-171
2. Kaviraj, S., 2010, *The Imaginary Institution of India*, Ranikhet: Permanent Black, Pp.85-126
3. Srinivas, M.N., 1969, „The Caste System in India", in A. Béteille (ed.) Social Inequality: Selected Readings, Harmondsworth: Penguin Books, Pp.265- 272
4. Mencher, J., 1991, „The Caste System Upside Down", in D. Gupta (ed.), Social Stratification, Delhi: Oxford University Press, Pp.93-109
5. Dhanagare, D.N., 1991, "The Model of Agrarian Classes in India", in D. Gupta (ed.), Social Stratification, Delhi: Oxford University Press, Pp. 271-275
6. Breman, J., 1999, "The Study of Industrial Labour in Post-Colonial India: The Formal Sector", Contributions to Indian Sociology, 33(1&2), Pp.1-41

8. Haimendorf, C. V. F., 1967, "The Position of Tribal Population in India", in P. Mason India and Ceylon: Unity and Diversity, New York: Oxford University Press, Chapter 9

9. Srinvas, M. N., 1987, *The Dominant Caste and Other Essays*, Delhi: Oxford University Press, Pp.20-59

10 Karve, I., 1994, „The Kinship Map of India", in P. Uberoi (ed.) *Family, Kinship and Marriage in India*. Delhi: Oxford University Press, Pp.50-73

11. Srinivas, M.N. and A. M. Shah, 1968, "Hinduism", in D. L. Sills (ed.) *The International Encyclopaedia of Social Sciences*, Volume 6, New York:Macmillan, Pp.358-366

12. Momin, A.R., 1977, „The Indo Islamic Tradition", *Sociological Bulletin*, 26, Pp.242-258

13. Uberoi, J.P.S., 1997, „The Five Symbols of Sikhism", in T.N. Madan (ed.) *Religion in India*, Delhi: Oxford University Press, Pp. 320-332

SEMESTER-2

CC-3

Introductory Sociology – II

1. **On the Plurality of Sociological Perspective**
2. **Functionalism**
   - 2.1 General arguments;
   - 2.1 Contributions of Parsons and Merton;
   - 2.2 Critical overview.
3. **Interpretive Sociology**
   - 3.1 General arguments;
   - 3.2 Contributions of Weber
4. **Conflict Perspective**
   - 4.1 General arguments;
   - 4.2 Contributions of Dahrendorf and Coser;
   - 4.3 Critical overview
5. **Structuralism**
   - 5.1 General arguments;
   - 5.2 Contributions of Levi-Strauss
6. **Feminist Perspective**
   - 6.1 General arguments;
   - 6.2 Stages of development of feminism;
   - 6.3 Varieties of feminist sociology**.**

Readings:

1. Anthony Elliot and Charles Lemert, 2014. Introduction to Contemporary Social theory, Routledge.
2. Bert N. Adams and R.A. Sydie. 2002. Sociological Theory. Sage, Vistara
3. Baert, Patrick. 1998. Social Theory in the Twentieth Century. New York. NYU Press.
4. Bottomore, T. B. 1971. *Sociology: A Guide to Problems and Literature*, London: Allen and Unwin, Chapter 2, Pp. 29-47
5. Bottomore, Tom and Nisbet, Robert. 2004. A History of Sociological Analysis. Jaipur: Rawat
6. Bottomore, Tom. 2002. The Frankfurt School. London: Routledge
7. Collins, Randall. 1994. Four Sociological Traditions. New York. OUP
8. Ganguly, RamanujTatwa O Chintadarshe Samakalin Samajtatwa Bani/ReenaPrakashan, Kolkata
9. G. Ritzer, 1996. Sociological Theory

10. Gouldner, Alvin, 1977, ‘Sociology’s Basic Assumptions’ in Thompson, Kenneth and Jeremy Tunstall, *Sociological Perspectives*, New York:Penguin Books Ltd, Pp. 13-17
11. Leach, Edmund, 1973, 'Structuralism in Social Anthropology', In Robey, David *Structuralism: An Introduction*, 1st ed., Oxford: Clarendon Press, 37-56
12. Paul Ransome. 2010. Social Theory; Policy Press.
13. Pip Jones. 2005. Introducing Social Theory. Atlantic publishing and Distribution.
14. Seidman, Steven. 2011. Contested Knowledge: Social Theory Today. Singapore: Wiley-Blackwell
15. Stevi Jackson and Jackie Jones 1998. Contemporary Feminist Theories; NYU Press
16. Thompson, Kenneth and Jeremy Tunstall, Sociological Perspectives, New York: Penguin Books Ltd
17. Turner, 1995. The Structure of Sociological Theory
18. Wallace and Wolf, 1990. Contemporary Sociological Theory
19. Weber, Max, 1978, *Economy & Society: An outline of Interpretive Sociology*, Vol. 1, University of California Press, Basic Concepts, Pages 4-26

References:

1. Dahrendorf, Ralf, 1968, *Essays in the Theory of Society,* Stanford: Stanford University Press, Chapters 4 & 5, Pp. 107-150
2. Durkheim, Emile, 1984, *The Division of Labour in Society*, Basingstoke: Macmillan. Pp. 149-174
3. Giddens, Anthony, 2010, *Sociology*, 6th edition, Polity, Chapter 7, ‘Social
4. Interaction in Everyday Life’, Pp. 247-280
5. Jackson, S. and S. Scott (eds.), 2002, Gender: A Sociological Reader,
6. London: Routledge, Introduction, Pp. 1-26
7. Magill, Frank N., 1996, *International Encyclopedia of Sociology*, Volume 1,
8. Marx, Karl, 1990, *Selected writings in Sociology and Social Philosophy,* Penguin Books Limited, Pp. 88-101
9. Radcliffe Brown, A.R., 1976, *Structure and Function in Primitive Society*, Free
10. Routledge, Pp. 690-693, Press Chapter 9 & 10, Pp. 178-204

CC-4

Sociology of India – II

1. Ideas of India

1.1. Gandhi and Ambedkar
  1.1.1 Gandhi on Harijan
  1.1.2 Ambedkar: Dalit &Hindu Society
1.2. Indological and Ethnographic Approaches

2. Resistance, Mobilization, Change

2.1. Dalit Politics
2.2. Mobility and Change
2.3. Women's Movement
2.4. Peasant Movements
2.5. Ethnic Movements
2.6. Middle Class Phenomenon

3. Challenges to Civilization, State and Society

3.1. Communalism: Factors and Control measures
3.2. Secularism: Significance, Issues and Challenges
3.3. Nationalism: Concept and Growth Factors

Readings:

1. Aniruddha Chaudhury. ed. "Bharater Samajtatta"2016, Chatterjee publishers
2. Deshpande, S., 2003, Contemporary India: A Sociological View, New Delhi: Penguin Books
3. Dhanagare, D. N. (1993). Themes and Perspectives in Indian Sociology. RawatPublication, Jaipu
4. Ganguly, Ramanuj. Tatwa O Chintadarshe Samakalin Samajtatwa, Bani/Reena Prakashan, Kolkata
5. Ganguly, Ramanuj and S. A. H. Moinuddin. 2008. SamakaleenBharatiyaSamaj. PHI. Learning.
6. M.N.Srinivas 1996. Village, Caste, Gender and Method, OUP.
7. M.N.Srinivas. 1986. Caste in Modern India, Media Promoters & Pub.
8. M.N.Srinivas. 1996. Caste- Its Twentieth Century Avatar, Penguin
9. P.K. Mishra et al (eds). 2007. M.N. Srinivas: The Man and his Works. Rawat.

10. Y. Singh. 1986. Indian Sociology, Vistar Pub. B. K. Nagla. 2008. Indian Sociological Thought. Jaipur: Rawat Publications

References:

1. Ambedkar, B. R., 1971 [1936], *Annihilation of Caste*, Jullunder: Bheem Patrika
2. Baruah, S., 2010, 'The Assam Movement' in T.K. Oommen (ed.) *Social Movements I: Issues of Identity*. Delhi: Oxford University Press, Pp.191-208
3. Deshpande, S., 2003, *Contemporary India: A Sociological View*, New Delhi: Penguin Books, Pp.125-150
4. Dumont, L. and D. Pocock, 1957, 'For a Sociology of India', *Contributions to Indian Sociology*, 1, Pp.7-22
5. Dumont, L., 1997, *Religion, Politics and History in India*, Paris: Mouton, Pp.89-110
6. Kumar, R., 1986, 'The Varieties of Secular Experience', in *Essays in the Social History of Modern India*, Calcutta: Oxford University Press, Pp.31-46
7. Madan, T.N., 1997, *Modern Myths, Locked Minds*, Delhi: Oxford University Press, Pp.233-265
8. Mangala Subramaniam. 2004 The Indian Women's Movement - - Contemporary Sociology Vol. 33, No. 6, Nov.
9. Menon, N., (ed.) 1999, *Gender and Politics in India*, Delhi: Oxford University Press, pp.342-369.
10. Oommen, T. K., 1997, *Citizenship and National identity: From Colonialism to Globalism*. New Delhi: Sage Publications, pp.143-172.
11. Pouchepadass, J., 1980, 'Peasant Classes in Twentieth Century Agrarian Movements in India', in E. Hobsbawm (ed.) *Peasants in History*, Delhi: OxfordUniversity Press, Pp.136-155
12. Shah, G., 2001, *Dalit Identity and Politics*, New Delhi: Sage Publications, Pp.17-43
13. Srinivas, M.N., 1956, 'A Note on Sanskritization and Westernization', *The Far Eastern Quarterly*, 15(4), Pp. 481-496
14. U. Kalpagam. 2000. The Women's Movement in India Today-New Agendas and Old Problems - Feminist Studies Vol. 26, No. 3, Autumn, 2000
15. Uberoi, P. et al., 2007, 'Introduction: The Professionalization of Indian Anthropology and Sociology: Peoples, Places and Institutions' in P. Uberoi et al., (eds.) *Anthropology in the East: Founders of Indian Sociology and Anthropology*, New Delhi: Permanent Black, Pp. 1-63

SEMESTER-3

CC-5

Political Sociology

1. **Contextualising the study of Politics**

2. **Basic Concepts**
   2.1**Power and Authority**: Meaning and types of influence, characteristics and distribution of power
   2.2**State, Governance and Citizenship:** State-Society Relations, Concept of Citizenship, Rights, Obligations and Civil society
   2.3**Elites and the Ruling Classes: Nature and types**

3. **Political Systems**
   3.1 Segmentary: Meaning and Characteristics
   3.2 Totalitarian and Democratic: Meaning and Characteristics

4. **Everyday State and Local Structures of Power in India**
   4.1 Caste, Class and Patriarchy

Readings:

1. Ali Ashraf. and L.N. Sharma, Political Sociology: A New Grammar of Politics, 1983 University Press
2. Anthony M. Orum and John G. Dale Political Sociology. Power and Participation in the Modern World. Fifth Edition 2009 OUP
3. Bhattacharya, D.C. Political Sociology
4. Baral, J.K. Political Sociology
5. Bottomore, T.B. 1993, Elites and Society, 2 Edition, Routledge
6. T.Bottomore, Political Sociology, Blackie & Sons, Bombay, 1975
7. Burchell, Graham et al (Eds),1991, The Foucault Effect: Studies in Governmentality, The University of Chicago Press
8. DavitaGlasberg and Deric Shannon Political Sociology: Oppression, Resistance, and the State, 2010, Pine Forge.
9. Dipankar Gupta. 1996. Political Sociology in India: Contemporary Trends. Orient Longman
   _____ 2013.Revolution from Above: India's Future and the Citizen Elite; Rainlight,
10. Fuller, C.J. and V. Benei (Eds.), 2000. The Everyday State and Society in Modern India. Social Science Press.

11. Jodhka ,Surinder 2013. Interrogating India's Modernity: Democracy, Identity, and Citizenship. OUP India.
12. LipsetS.M.Modern Political Analysis, Printice Hall, New Delhi 1983
13. Lukes, Steven. 2005, Power: A Radical View, 2 Ed., Hampshire: Palgrave
14. Mills, C. Wright, 1956. The Power Elite, New Edition, OUP
15. MukhopadhyayAmal Kumar, Political Sociology, 1994, K.P. Bagchi Kolkata
16. Robbins, Paul. Political ecology: A critical introduction. Vol. 16. 2011, John Wiley & Sons.
17. S. N. Eisenstadt, Political Sociology: A Reader, 1971, New York: Basic Books
18. Swartz, M.J (Ed), 1968. Local Level Politics: Social and Cultural Perspectives, University of London Press, pp. 281-94
19. TapanBiswal. Governance and Citizenship. Vava Books Pvt. Limited. 2017
20. Tarlo, Emma, 2003 Unsettling Memories: Narratives of the Emergency in Delhi, University of California Press, pp. 62-93
21. Caste, Class and Patriarchy; Economic and Political Weekly; Vol. 28, Issue No. 10, 06 Mar, 1993

References:

1. Chandhoke, N. &Priyadarshi, P. (eds.) 2009. Contemporary India: Economy, Society, Politics. New Delhi: Pearson.
2. Chakravarty, B. &Pandey, K. P. 2006. Indian Government and Politics. New Delhi: Sage
3. Singh, M.P. &Saxena, R. 2008. Indian Politics: Contemporary Issues and Concerns. New Delhi: PHI Learning.
4. Vanaik, A. & Bhargava, R. (eds.) 2010. Understanding Contemporary India: Critical Perspectives. New Delhi: Orient Blackswan.
5. Menon, N. and Nigam, A. 2007. Power and Contestation: India Since 1989. London: Zed Book.
6. Austin, G. 1999. Indian Constitution: Corner Stone of a Nation. New Delhi: Oxford University Press. Austin, G. 2004. Working of a Democratic Constitution of India. New Delhi: Oxford University Press.
7. Bara, J & Pennington, M. (eds.). 2009. Comparative Politics. New Delhi: Sage. Caramani, D. (ed.). 2008. Comparative Politics. Oxford: Oxford University Press.
8. Hague, R. and Harrop, M. 2010. Comparative Government and Politics: An Introduction. (Eight Edition). London: Palgrave McMillan.

CC-6

Sociology of Religion

1. **Religion as a Sociological Concept**
   - 1.1 Formulating Religious
   - 1.2 Durkheim: Scared and Profane
   - 1.3 Marx: Religion as Ideological weapon
   - 1.4 Weber: Religious Ethics and Economy
   - 1.5 Religion and Everdaylife

2. **Elements of Religious**
   - 2.1 Sacred, Myth, Ritual
   - 2.2 Time-Space
   - 2.3 Rationality

3. **Religion and Society: Contemporary Direction**
   - 3.1 Religious Fundamentalism
   - 3.2 Secularism and Communalism: Meaning, Characteristics and Factors
   - 3.3 Religious Pluralism
   - 3.4 Diversity in Religion and Identity: Class, Gender, Sexuality

Readings:

1. Alan Adrich. Religion in the Contemporary World. Introduction. Polity
2. Berger, Peter L. "Reflections on the sociology of religion today." Sociology of Religion 62.4 (2001): 443-454.
3. Berger, Peter L. The sacred canopy: Elements of a sociological theory of religion. Anchor/Open Road Media, 2011.
4. Berger, Peter, Thomas Luckmann. "Sociology of religion and sociology of Knowledge" Sociology and Social Research 47.4 (1963): 417-427
5. Béteille, A. 2002. *Sociology: Essays on Approach and Method*. OUP: New Delhi, pp134-150.
6. Casanova, José. Public religions in the modern world. University of Chicago Press, 1994.
7. Chadwick, Owen. *The Secularization of the European Mind in the* Nineteenth *Century*. Cambridge: Cambridge University Press, 1975, pp 1- 20.
8. Davie, Grace. The sociology of religion: A critical agenda. Sage, 2014.
9. Dawson, Andrew. Sociology of religion. Hymns Ancient and Modern Ltd, 2011.
10. Dillon, Michele, ed. Handbook of the Sociology of Religion. Cambridge University Press, 2003.
11. E. E. Evans-Pritchard. 1963 (1940). The Nuer. Oxford: Clarendon Press

12. Emile Durkheim. 1995. *The elementary forms of religious life*. Translated by Karen E. Fields. New York: The Free Press. Book one and Conclusion, pp. 21-39,418-440.
13. Giddens.A. 1973. Capitalism and Modern Social TheoryCambridge University Press; Revised ed. edition 8 February 1973
14. Johnstone, Ronald L. Religion and society in interaction: The sociology of religion. PrenticeHall, 1975.
15. Johnstone, Ronald L. Religion in society: A sociology of religion. Routledge, 2015.
16. Madan, T.N. 1991. 'Secularism in its Place' in T. N. Madan, T.N. (ed.) Religion *in India*. New Delhi: OUP, pp 394 -413.
17. Nancy Tatom Ammerman. 2013. In Search of Religion in Everyday Life. Oxford Scholarship Online 2013.
18. Saberwal, S. 1991. 'Elements of Communalism' in T. N. Madan, (ed.) *Religion in India*. OUP: New Delhi, pp 339 -350. 18
19. Sontheimer, Gunther-Dietz, and Hermann Kulke. *Hinduism* Reconsidered. New Delhi: Manohar, 2001. Hinduism: The Five Components and their Interaction. pp. 305 – 322
20. Srinivas, M.N. 1952. *Religion and Society among the Coorgs of* South *India,* Clarendon: Oxford, pp 100-122.
21. Stephen Hunt. 2005. Religion and Everyday Life (The New Sociology) 1st Edition; Routledge; 1 edition (June 25, 2005)
22. Turner, Bryan S., ed. The new Blackwell companion to the sociology of religion. John Wiley &Sons, 2016.

References:

1. Malinowski, Bronislaw. 1948. *Magic, science and religion and other essays*. Selected, and with an introduction by Robert Redfield. Boston: The Free Press, pp.119-124.
2. Max Weber. 2001. *The Protestant ethic and the spirit of capitalism*. Translated by Stephen Kalberg. England: Roxbury Publishing Press, pp. 103-126.
3. Momin. A.R., 2004. 'The Indo-Islamic Tradition' in Robinson, R. (ed.) *Sociology of Religion in India*. New Delhi: Sage. pp 84-99.
4. Omvedt, G. 2003. *Buddhism in India: Challenging Brahmanism and* Caste, New Delhi: Sage, pp 23-53.
5. Pickering, William Stuart Frederick. Durkheim's sociology of religion: Themes and theories. Casemate Publishers, 2009.
6. Robbins, Thomas. Cults, converts and charisma: The sociology of new religious movements. Sage Publications, Inc, 1988.
7. Robinson, R. 2003. 'Christianity in the Context of Indian Society and Culture' in Das Veena (ed.), *Oxford Indian Companion to Sociology* and *Social Anthropology*, OUP: New Delhi, pp. 884- 907.
8. Smith, Christian, and Robert D. Woodberry. Sociology of religion. Blackwell Publishing Ltd, 2001.
9. Uberoi, J.P.S. 1991. 'The Five Symbols of Sikhism' in Madan, T.N. (ed.) *Religion in India*. New Delhi: OUP, pp 320 -333.
10. Weber Max. 1905. *The Protestant Ethic and the Spirit of Capitalism*, New York: Free Press, pp 39– 50

CC-7

Sociology of Gender and Sexuality

1. **Gendering Sociology:** An overview

2. **Gender as a Social Construct**
   2.1. Gender, Sex and Sexuality, Gender stereotyping and socialization, Gender role and identity
   2.2. Gender stratification and inequality, Gender discrimination and patriarchy, Production of Masculinity and Femininity,

3. **Gender: Differences and Inequalities**
   3.1 Class, Caste
   3.2 Family, Work
   3.3 Third Gender
   3.4 Sexual violence

4. **Gender, Power and Resistance**
   4.1 Power and Subordination
   4.2 Resistance and Movements (Chipko/ Gulabi Gang)

Readings:

1. Abbott, Pamela, Claire Wallace and Melissa Tyler. 2005. *An Introduction to Sociology: Feminist Perspectives.* London: Routledge.
2. Bhasin, Kamala. 1993. What is Patriarchy? New Delhi: Kali for Women.
3. Bhasin, Kamla, 2003. Understanding Gender, Kali for Women.
4. Chaudhuri, Maitrayee 2004.Feminism in India: Issues in Contemporary Indian Feminism Kali for Women, New Delhi.
5. Dube, Leela 1996 "Caste and Women" in M.N.Srinivas (ed.) *Caste: Its twentieth century avatar*, New Delhi: Penguin (pp 1-27).
6. Dyer.T., Gorshkov.M.K, Modi. Ishwar, Chunling.Li and Mapadimeng, 2018. Handbook of Sociology of Youth in BRIC COUNTRIES; World Scientific.
7. Fernandes, Leela.(ed). 2014. Routledge Handbook of Gender in South Asia. London: Routledge
8. Furr.L, Allen. 2018. Women, Violence and Social Stigma. Jaipur: Rawat Publications.
9. Halberstam, Judith. 1998. "An Introduction to Female Masculinity: Masculinity without men, in Female Masculinity. London: Duke University Press (pp 1-43) New Delhi: Zubaan 2012
10. Holmes, Mary. 2009. *Gender and Everyday Life*. London: Routledge.

11. Jackson, Stevi and Sue Scott (eds.) 2002. Gender: A Sociological Reader. London: Routledge.
12. Kabeer, Naila 1994. Reversed Realities: Gender Hierarchies in Development Thought: Gender Hierarchies in Development
13. Kalia, H.L. 2005. Work and the Family. Jaipur: Rawat Publications.
14. Menon, Nivedita (ed.).1999. Gender and Politics in India. New Delhi: Oxford University Press.
15. Rege, Sharmila. (ed). 2003. Sociology of Gender: The Challenge of Feminist Sociological Knowledge. New Delhi: Sage

References:

1. Kandiyoti, Deniz. 1991. “Bargaining with Patriarchy” in Judith Lorber and Susan A. Farrell (eds.). 1991. The Social Construction of Gender. Newbury Park, Calif: Sage Publications (pp 104-118).
2. Mangala Subramaniam. 2004 The Indian Women's Movement - - Contemporary Sociology Vol. 33, No. 6, Nov.
3. Newton, Esther. 2000. “Of Yams, Grinders and Gays: The Anthropology of Homosexuality” in Margaret Mead Made Me Gay: Personal Essays, Public Ideas. Durham: Duke University Press (pp 229-237)
4. Palriwala, Rajni, 1999. “Negotiating Patriliny: Intra-household Consumption and Authority in Rajasthan (India)”, in Rajni Palriwala and Carla Risseeuw (eds.). 1996. Shifting Circles of Support: Contextualizing Kinship and Gender in South Asia and Sub-Saharan Africa. New Delhi: Sage Publications (pp 190-220).
5. Rege, S. 1998. “Dalit Women Talk Differently: A Critique of 'Difference' and Towards a Dalit Feminist Standpoint Position.” Economic and Political Weekly,Vol. 33, No. 44 (Oct.31-Nov. 6, 1998)(pp39-48)
6. Sherry Ortner. 1974. “Is male to female as nature is to culture?” M.Z. Rosaldo and L. Lamphere (eds.) Women, culture and society. Stanford: Stanford University Press (pp 67-87)
7. Stanley, L. 2002. ‘Should Sex Really be Gender or Gender Really be Sex’, in S. Jackson and S. Scott (eds.) Gender: A Sociological Reader, London: Routledge (pp31-41).
8. U. Kalpagam. 2000. The Women's Movement in India Today-New Agendas and Old Problems - Feminist Studies Vol. 26, No. 3, Autumn, 2000
9. Uberoi, Patricia “Feminine Identity and National Ethos in Indian Calendar Art” In Economic and Political Weekly Vol. 25, No. 17 (Apr. 28,1990), (pp WS 41-48).
10. Whitehead, A. 1981, “I’ m Hungry Mum”: The Politics of Domestic Budgeting” in K. Young et al. (eds.) *Of Marriage and the Market: Women’s Subordination Internationally and its Lessons.* London: Routledge and Kegan Paul (pp.93-116).

SEMESTER-4

CC-8

Economic Sociology

1. Perspectives in Economic Sociology

1.1 Formalism and Substantivism

1.2 New Economic Sociology

2. **Forms of Exchange**

2.1 Reciprocity and Gift

2.2 Exchange and Money

3. **Systems of Production and Consumption**

3.1 Hunting and Gathering

3.2 Domestic Mode of Production

3.3 Peasant - the Indian scenario: Land revenue systems; Land reforms

3.4 Capitalism

3.5 Socialism

4**. Some Contemporary Issues in Economic Sociology**

4.1 Development and Globalisation

Readings:

1. Anderson, Perry: Passages from Antiquity to Feudalism, London, NLB; Verso.
2. Appu, P S: Land Reforms in India, Vikas Publishing House. Chapters 1, 2, 3.
3. Bottomore,Tom : Theories of Modern Capitalism
4. Dube, S C: Kamar, Oxford. Chapter 2, the Economic Life.
5. Granovetter, Mark: Economic Action and Social Structure in Granovetter and Swedberg (ed): The Sociology of Economic Life, Westview Press
6. Harrison, David: Sociology of Modernisation and Development, London, Unwin Hyman
7. Haynes, Jeffrey: Development Studies, Polity.
8. LeClaire and Schneider (ed): Economic Anthropology. Rinehart and Winston
   ---------- Three articles :(i) Karl Polanyi: The Economy as instituted process; (ii) George Dalton: Economic theory and primitive society; and (iii) Richard F. Salisbury: Anthropology and Economics
9. Mair, Lucy : An Introduction to Social Anthropology;
10. N M C Machado: Karl Polanyi and New Economic Sociology : Notes on the Concept of Disembeddedness (article in PDF on Google) ;
11. Polanyi: Ibid. Chapter also available in Granovetter and Schneider (ed) The Sociology of Economic Life

12. Sen, Sunanda. 2007. Globalization and Development National Book Trust, 2007/2011.
13. Srinivas, M N: The Remembered Village, Oxford. Chapter IV, The Universe of Agriculture.
14. Sur, Basabi: The Economic and the Non-economic, World View, Kolkata
15. Weber, Max: Essays in Economic Sociology, ed. by Swedberg, Princeton University Press. Chapter sixteen, 'Sociological categories of economic action'

References:

1. Kumar, Dharma: The Cambridge Economic History of India Vol. II. Orient Longman
2. Polanyi, Karl : The Livelihood of Man. Academic Press
3. Smelser, Neil J. and Swedberg, Richard (ed) : The Handbook of Economic Sociology, Princeton University and Russell Sage Foundation
4. Weber, Max: Economy and Society. Ed. by Roth and Wittich. California Press, Berkley. Chap. Sociological categories of economic action

CC-9

Population Studies

1. Introducing Population Studies

1.1 Definition, Nature and Scope
1.2 Demography and Sociology
1.3 Concepts and Approaches:
1.3.1 Malthusian perspective
1.3.2 Marxist perspective
1.3.3 Demographic Transition theory

2. Population, Social Structure and Processes

2.1 Population Size and Growth
2.2 Fertility, Culture and fertility.
2.3 Mortality, Determinants, Reproduction and Mortality

3. Population, Gender and Migration

3.1 Women, Family, Status and fertility
3.2 Society and New Reproductive Technologies
3.3 Migration, Types and consequences.

4. Population Dynamics and development

4.1 Population as constraint and resources of development.
4.2 Population programmes and policies in India.

Readings:

1. Agarwala, S.N. India's population problem.
2. Chandra, S. Population pattern and social change in India.
3. Cox. P. Demography
4. Haq, Ehsanul. 2007. 'Sociology of Infant Mortality in India', Think India Q*uarterly*, July-September, 10(3): 14-57.
5. Heer, David. M. Society and Population.
6. Patel, Tulsi. 2007. 'Female Foeticide: Family Planning and State Society Intersection in India'. In T. Patel (ed.). Sex-selective Abortion in India: Gend*er, Society and New Reproductive Technologies*. New Delhi: Sage Publications, pp. 316-356.
7. Premi, Mahendra K. 2006. 'Population Composition (Age and Sex)', Population of India: In the New Millennium. New Delhi: National Book Trust, pp.103-127.

8. Sinha and Zacharia. Elements of demography.
9. Srivastava. O. S. Demography and Population Studies.
10. Visaria, Pravin and Visaria, Leela. 2006. 'India's Population: Its Growth and Key Characteristics'. In Veena Das (ed.). Handbook of Indian Sociology, New Delhi: Oxford University Press, pp. 61-77.
11. Weeks. John. R. Population---- An introduction to concepts and issues.

Reference:

1. Chopra, Radhika. 2011. Militant and Migrant: The Politics and Social His*tory of Punjab.* Routledge Publications, pp. 88-134.
2. Cox, Peter Richmond. 1950. Demography. University of California Press, pp.01-08.
3. Davis, Kingsley. 1951. 'Caste and Demography', Population of India and Pakistan, Princeton, NJ: Princeton University Press, pp. 52-60.
4. Dudley, Kirk. 1996. 'Demographic Transition Theory', *Population Studies*, 50(3): 361-387.
5. Durkheim, Emile. 1982 (1895). *The Rules of Sociological Method*. (trans. W. D. Halls). New York: The Free Press, pp. 136-137; 188, 203.
6. Furedi, Frank. 1997. Population and Development: A Critical Introduction. Oxford: Polity Press, Chapters 4&5, pp. 40-55. 4.2.1
7. Guilmoto, Christophe Z. 2011. 'Demography for Anthropologists: Populations, Castes, and Classes'. In Isabelle Clark-Decès (ed.). A Companion to the Anthropology of India, Blackwell Publishing Ltd.pp. 25-41.
8. Heer, David M. and Grigsby, Jill S. 1992. 'Fertility', Society and Population. New Delhi: Prentice-Hall, pp. 46-61.
9. Jeffrey, Roger and Jeffrey, Patricia. 1997. Population, Gender and Politics: Demographic Change in Rural North India. Cambridge: Cambridge University Press, pp. 117-164.
10. Kaur, Ravinder. 2004. 'Across Region Marriages: Poverty, Female Migration and the Sex Ratio', Economic & Political Weekly, XXXIX (25): 2595-2603.
11. Malthus, Thomas Robert. 1986. An Essay on the Principle of Population. London: William Pickering, Chapters 1-2,
12. Visaria, P. 1976. 'Recent Trends in Indian Population Policy', Economic and Political Weekly, August, 2: 31-34.
13. Xaxa, Virginius. 2004. 'Women and Gender in the Study of Tribes in India', Indian Journal of Gender Studies, 11(3): 345-367.

Suggested Readings:

Government of India. 2000. National Population Policy. New Delhi (http://www.populationcommission.nic.in/facts1.htm).

1. Mukherjee, Radhakamal. 1934. 'On the Criterion of Optimum Population', *American Journal of Sociology*, 40(3): 344-348.
2. Sen, Amartya, 2003. 'Population: Delusion and Reality', *Asian Affairs*
3. Caldwell, John C. 2001. 'Demographers and the Study of Mortality: Scope, Perspectives and Theory', *Annals of the New York Academy of Sciences*, 954: 19-34.
4. Castles, Stephen. 2003. 'The International Politics of Forced Migration', *Development*, 46(3): 11-20.
5. Dyson, Tim and Moore, Michael. 1983. 'On Kinship Structure: Female Autonomy and Demographic Behaviour in India', *Population andDevelopment Review*, 9(1): 35-60.
6. Bose, Ashish. (ed.). 1974. *Population in India's Development (1947-2000)*. Delhi: Vikas Publishing House.

CC-10

Social Stratification

1. Introducing Stratification: Meaning and Forms

2. Theories of Stratification

2.1. Marx and unequal economic capacities;

2.2 Weber and Class, Status, Power

2.3 Functionalism

3. Identities and Inequalities

3.1. Caste, Race and Ethnicity

3.2. Feminism and Gendered Stratification

4. Mobility and Reproduction

4.1 Meaning, Forms and Nature

4.2 Institutionalised Practices

Readings:

1. Beteille, Andre Inequality among Men. London: Blackwell, 1977. Chapter 1. The Two Sources of Inequality. Pp. 1-22
2. Bilton And Others Introductory Sociology
3. Bottero, Wendy. Stratification. London: Routledge, 2005. Chapters 12 & 14 pp. 205-223 & 246-258
4. Bottomore, T. B. Classes in Modern Society. New York: Pantheon Books, 1966. Chapters. 2 & 3 The Nature of Social Class & Classes in Industrial Societies. 9-75
5. Bourdieu Pierre 'Cultural Reproduction and Social Reproduction' In The Structure of Schooling: Readings in the Sociology of Education. Richard Arum and Irenee Beattie, Editors. NY: McGraw Hill. 1973: 56-68.
6. Browne Ken An Introduction to sociology
7. Collins Patricia Hill 'Toward a New Visio: Race Class and Gender as Categories of Analysis and Correction' Race, Sex & Class, Vol. 1, No. 1 (Fall 1993), pp. 25-45.
8. David Grusky. 2008. Social Stratification: Class, Race, and Gender in Sociological Perspective; Avalon Publishing.
9. Dipankar Gupta. 1992. Social stratification. Oxford University Press
10. _____ 2000.Interrogating Caste: Understanding Hierarchy and Difference in Indian Society. Penguin Books
11. Dipali Saha 2006. Sociology of Social Stratification; Global Vision Publishing House
12. Eshelman, J. R. & B. G. Cashion Sociology
13. Jain, Ravindra K. 'Hierarchy, Hegemony and Dominance: Politics of Ethnicity in Uttar Pradesh, 1995' Economic and Political Weekly, Vol. 31, No. 4 (Jan. 27, 1996), pp. 215-223

14. Giddens, Anthony Sociology
15. Haralambos and Heald Sociology: Themes and Perspectives
16. Johnson, H. M. Sociology
17. Kasturi DasGupta 2015.Introducing Social Stratification: The Causes and Consequences of Inequality; Lynne Rienner Publishers.
18. Kanhaiya Lal Sharma1994. Social Stratification and Mobility; Rawat Publications.
19. McLellan, David. The Thought of Karl Marx. London: Papermac, 1995. Part 2. Chapter 6. Class, pp. 182-194
20. Mitchell, Juliet. Woman's Estate. Harmondsworth: Penguin, 1971. Chapter 5, Position of Women 1. Pp. 99-122
21. Omi, Michael, and Howard Winant. Racial Formation in the United States. New York: Routledge &Kegan Paul, 1986. Chapters 1 & 4, pp. 14-24 and 57-69
22. Pitt-Rivers Julian 'Race Color and Class in Central America and the Andes' Daedalus, Vol. 96, No. 2, Color and Race (Spring, 1967), pp. 542-559
23. Sharma, K. L. Social Stratification & Mobility
24. Sharma, K. L. Caste Class In India.
25. Smelser, N. J Sociology
26. Tawney, R. H. Equality. London: Unwin Books, 196 32
27. Thio, Alex Sociology : A Brief Introduction
28. Tischler, H. L. Introduction to Sociology
29. Weber, Max, Hans Heinrich Gerth, and C. Wright Mills. From Max Weber. New York: Oxford University Press, 1946. Chapter VII, Class, Status, Party. Pp. 180 – 195
30. Worsley, Peter. Introducing Sociology.2nd ed. Harmondsworth: Penguin Books, 1970. Chapter 8, Social Stratification: Class, Status and Power, pp. 395 – 408

References:

1. Acker, Joan. 'Women and Social Stratification: A Case of Intellectual Sexism'. American Journal of Sociology 78.4, 1973. Pp. 936-944
2. Bailey F G 'Closed Social Stratification in India', European Journal of Sociology Vol. 4, No. 1 1963. pp. 107-124
3. Bendix Reinhard 'Inequality and d Social Structure: Comparison of Marx and Weber' American Sociological Review, Vol. 39, No. 2 (Apr., 1974), pp. 149-161
4. Davis, Kingsley, and Wilbert E. Moore. 'Some Principles of Stratification'. American Sociological Review 10.2 1945: pp. 242-249; 394-397
5. Stinchcombe Arthur L 'Some Empirical Consequences of the Davis-Moore Theory of Stratification'. American Sociological Review 28.5 1963, pp. 805-808
6. Tumin, Melvin M. 'Some Principles of Stratification: A Critical Analysis'. American Sociological Review 18.4 (\1953: 387-394
7. Wrong Dennis H. 'The Functional Theory of Stratification: Some Neglected Considerations' American Sociological Review, Vol. 24, No. 6 (Dec., 1959), pp. 772-782

SEMESTER-5

CC-11

Sociological Thinker I

1. Origin & development of sociology as a distinct discipline

1.1 Role of European Enlightenment; French, American & Industrial Revolutions
1.2 Contributions of Montesquieu & St. Simon
1.3 Auguste Comte: Positivism; Law of Three Stages

2. Karl Marx

2.1 Materialist Conception of History
2.2 Capitalist Mode of Production

3. Max Weber

3.1 Social Action & Ideal Types
3.2 Religion & Economy

4. Emile Durkheim

4.1 Social Fact: Suicide
4.2 Individual & Society: Division of Labour

Readings:

1. Aron, Raymond. 1965. Main Currents in Sociological Thought. Vol. I & II.
2. Atal, Yogesh 2003. Sociology: From where to where, Jaipur: Rawat Publication.
3. Barnes, H.E. 1959. Introduction to the History of Sociology, Univ. of Chicago Press.
4. Coser, L.A., 1977. Masters of Sociological Thought, Rawat.
5. Fletcher, Ronald. 2000. The Making of Sociology, (Vol. I & II), Rawat.
6. Giddens, A. 1971. Capitalism and Modern Social Theory: An Analysis of the Writings of Marx, Durkheim and Max Weber. Cambridge: Cambridge University Press.
7. Hughes, John. J. Peter Martin & W.W. Sharrock. 1995. Understanding Classical Sociology-Max Weber and Durkheim. Sage.
8. Morrison, Ken. 1995. Marx, Durkheim, Weber: Formations of Modern Social Thought. Sage Publications.
9. Ritzer, G. 1996. Sociological Theory. New York: McGraw Hill Companies.
10. Ritzer, G. 1996. Sociological Theory. New York: McGraw Hill Companies.
11. Turner, Bryan S. 1999. Classical Sociology, Sage Publications, New Delhi.

References:

1. Durkheim, E. (1951). Suicide: A Study in Sociology. New York: The Free Press.
2. Durkheim, E. (1958). The Rules of Sociological Method. New York: The Free Press.
3. Gane, Mike. (1992). The Radical Sociology of Durkheim and Mauss. London: Routledge.
4. Gane, Mike. 1992. The Radical Sociology of Durkheim and Mauss. London: Routledge. Pages: 1-10
5. Giddens, A. 1971. Capitalism and Modern Social Theory: An Analysis of the Writings of Marx, Durkheim and Max Weber. Cambridge: Cambridge University Press.
6. Goodwin, Glenn A & Scimecca, Joseph A. 2006. Classical Sociological Theory-Rediscovering the Promise of Sociology. Australia: Thomson/Wadsworth.
7. Johnson, H.M. (1995): Sociology: A Systematic Introduction, New Delhi: Allied Publishers.
8. Marx, K. and F. Engels. 1969. Selected Works Vol. 1. Moscow: Progress Publishers. pp. 13-15, 16-80, 98-106, 142-174, 502-506.
9. McLellan, David. 1975. Marx. London: Fontana Press.
10. Poggi, Gianfranco. 2006. Weber. Cambridge, UK: Polity. Pages: 1-16 (16)
11. Timasheff, N. S. (1967). Sociological Theory. Random House.
12. Weber, Max. 1947. The Theory of Social and Economic Organization. New York: The Free Press, pp. 87-123
13. Weber, Max. 2002. The Protestant Ethic and the Spirit of Capitalism (translated by Stephen Kalberg). London: Blackwell Publishers, pp. 3-54, 103-126, Chapters I, II, III, IV & V.

CC-12

Research Methods – I

1. **The Logic of Social Research**
   - 1.1 What is Social Research
   - 1.2 Objectives and Typology of Social Research.
   - 1.3 Relationship between theory and research
   - 1.4 Concept, Conceptualization and Operationalization, & Hypothesis
   - 1.5 Objectivity and Reflexivity

2. **Methodological Perspective**
   - 2.1 The Positivist Method
   - 2.2 The Interpretative Method
   - 2.3 The Humanist Method
   - 2.4 Feminist Method

3. **Modes of Enquiry**
   - 3.1 Steps of Research
   - 3.2 Primary and Secondary data.
   - 3.3 Method of data collection: Survey method and Observation method.
   - 3.4 Tools and techniques of data collection: Questionnaire and Interview.
   - 3.5 Analysing Data: Quantitative and Qualitative: an overview

4. **Research Project -I**: Writing a Research Proposal (Formulation of Research Problem, Rationale, Review of Literature, and Objectives of the Study)

Readings:

1. Babbie.E. The Practice of Social Research
2. Baily, K.J. Methods of Social Research
3. Baker,T.L. Doing Social Research.
4. Blalock A. Introduction to Social Research.
5. Bryman, Alan. 2004, *Quantity and Quality in Social Research*, New York: Routledge, Chapter 2 & 3 Pp. 11-70
6. Goode, W. E. and P. K. Hatt. 1952. *Methods in Social Research*. New York: McGraw Hill. Chapters 5 and 6. Pp. 41-73.
7. Jayram, N.1989. Sociology: Methods and Theory. Madras: MacMillan, Madras
8. Kothari.C.R Research Methodology
9. Nachmias and Nachmias Research Methods in the Social Sciences
10. Plumer Documents of life
11. Punch, Keith. 1996. Introduction to Social Research, Sage, London.
12. Sarantakos. S Social Research

13. Sharma.R.K. Sociological Methods and Techniques
14. Shipmen, Martin. 1988The Limitations of Social Research Sage, London.
15. Singh K Quantitative Social Research Methods
16. Singleton.R.A, Straits. B.C. Approaches to Social Research
17. Srinivas, M.N. et al 2002(reprint), *The Fieldworker and the Field: Problems and Challenges in Sociological Investigation*, New Delhi: OUP, Introduction Pp. 1-14.
18. Young, P.V. 1988 Scientific Social Survey and Research Prentice Hall, New Delhi.

References:

1. Beiteille, A. 2002, *Sociology: Essays on Approach and Method*, New Delhi: OUP, Chapter 4 Pp. 72-94
2. Durkheim, E. 1958, *The Rules of Sociological Method*, New York: The Free Press, Chapter 1, 2 & 6 Pp. 1-46, 125-140
3. Gluckman, M. 1978, 'Introduction', in A. L. Epstein (ed.), *The Craft of Social Anthropology*, Delhi: Hindustan Publishing Corporation, Pp. xv-xxiv
4. Gouldner, Alvin. 1970, *The Coming Crisis of Western Sociology*, New York: Basic Books, Chapter 13 Pp. 481-511
5. Harding, Sandra 1987, "Introduction: Is there a Feminist Method?" in Sandra Harding (ed.) *Feminism & Methodology: Social Science Issues*, Bloomington: Indiana University Press, Pp. 1-14
6. Merton, R.K. 1972, *Social Theory & Social Structure*, Delhi: Arvind Publishing House, Chapters 4 & 5 Pp. 139-171
7. Mills, C. W. 1959, *The Sociological Imagination*, London: OUP Chapter 1 Pp. 3-24
8. Weber, Max. 1949, *The Methodology of the Social Sciences*, New York: The Free Press, Foreword and Chapter 2 Pp. 49-112

SEMESTER-6

CC-13

Sociological Thinkers II

1. **Orientation to Post Classical Theories**
2. **Talcott Parsons**
   2.1 Action Systems
3. **Claude Levi-Strauss**
   3.1 Structuralism
4. **G. H. Mead and Erving Goffman**
   4.1 Interactional Self and Dramaturgy
5. **Peter L. Berger and Thomas Luckmann**
   5.1 Social Construction of Reality: An overview
   5.1.1 Society as Objective Reality: Institutionalization
   5.1.2 Society as Subjective Reality: Socialization
6. **Max Horkheimar, T.W. Adorno and Herbert Marcuse**
   6.1 Frankfurt school and Critical Tradition

Readings:

1. Ritzer George, 1996: Sociological theory (4th edition) McGraw Hill.
2. Bottomore, Tom. 2002, The Frunkfurt School, London: Routledge.
3. Turner, Jonathan. 1994. The Structure of sociological theory. Jaipur: Rawat Publications.
4. Coser, L. 1977, Masters of Sociological Thought, Rawat: Jaipur
5. Parsons, T. and E. Shils (eds). 1951. Towards a General Theory of Action. New York: Harper and Row Publishers
6. Horkheimar. M and Adorno. T.W. The Dialectic of Enlightenment. 2002. Stanford University Press. Stanford: California. pp 1-34. Chapter 1, The Concept of Enlightenment
7. Collins, Randall. 2004. Theoretical Sociology: Rawat publications
8. Craib, Ian. 2015. Modern Social Theory, Routledge
9. Wallace, A. Ruth and Wolf, Alison. 1990. Contemporary Sociological Theory. New Delhi: Prentice Hall.
10. Berger, P.L. 2011. Invitation to Sociology: A Humanistic Perspective, Open Road Media

References:

1. Levi Stauss, C. 1993. “Structure and Dialectics”, in Structural Anthropology Volume I. Harmondsworth: Penguin, pp. 232-242
2. Mead, G.H. 1934 (Fourteenth Impression 1967) Mind Self and Society. Chicago: University of Chicago Press. Part III, pp 135-226
3. Marcuse, H. 1964. One Dimensional Man: Studies in the Ideology of Advanced Industrial Society. Boston: Boston Press, pp. 7-92
4. Goffman, E. 1956. The Presentation of Self in Everyday Life. Edinburgh: University of Edinburgh (Monograph No. 2)
5. Turner, B.S (ed.) 2013, The Social System, Routledge
6. Berger, P. L. and T. Luckmann. 1991. The Social Construction of Reality London: Penguin Books

CC-14

Research Methods – II

1. **Doing Social Research**
   - 1.1 The Process of Social Research
   - 1.2 Research Design: Explanatory, Exploratory, Descriptive
   - 1.3 Sampling: Definition and typology, merits and demerits.
   - 1.4 Field (Issues and Context)

2. **Statistical Methods**
   - 2.1 Levels of Measurement: Nominal, Ordinal, Interval, and Ratio. Continuous and Discrete variables. Ratio, Proportion and Percentages.
   - 2.2 Frequency Distribution; Grouping of data; Cumulative frequency and percentage distribution.
   - 2.3 Graphic techniques: Bar diagram; pie Chart; Frequency Polygon; Histogram; Ogive; Levels of measurement and graphic presentations.
   - 2.4 Measurement of Central Tendency: Mean, Median, Mode. Comparative analysis. Skewness.
   - 2.5 Measures of Dispersion: Range; Inter quartile Range; Mean Deviation; Variance and Standard Deviation.

3. **Research Project –II**
   - 3.1 Research Design,
   - 3.2 Field Work and Report Writing
   - 3.3Bibliography, Citation.

Readings:

1. Bailey, K. 1994. The Research Process in *Methods of social research*. Simon and Schuster, 4th ed. The Free Press, New York NY 10020. Pp.3-19.
2. Das N.G.: Statistics
3. Elifson, Kirk W., Richard P. Runyon, and Audrey Haber. Fundamentals of social statistics. McGraw-Hill Humanities, Social Sciences & World Languages, 1990.
4. Garett.H.E. Statistics in Psychology and education
5. Goon, A.M., M.K. Gupta and B. Dasgupta-) Basic Statistics, Kolkata World Press Pvt. Ltd, 1978 Blalock : Social Statistics
6. Gupta, Akhil and James Ferguson. 1997. *Anthropological Locations.* Berkeley: University of California Press. Pp.1-46.
7. Gupta, S. P. 2007. Elementary Statistical Methods. Sultan Chand & Sons.
8. Irvine, John, Ian Miles, and Jeff Evans, (Eds). Demystifying social statistics. London: Pluto Press, 1979.
9. Srinivas, M.N. et al 2002(reprint), *The Fieldworker and the Field: Problems and Challenges in Sociological Investigation*, New Delhi: OUP, Introduction Pp. 1-14.

SECTION-II

ELECTVE COURSES

SKILL ENHANCEMENT COURSE

(2 Credits each)

SEMESTER-3&4

Group-A

SEC-A (1)

Reading, Writing and Interpretation in Sociology

Purposes for reading: People read different kinds of text (e.g., scholarly articles, textbooks, reviews) for different reasons. Some purposes for reading might be # for specific information; # to get an overview of the text; # to relate new content to existing knowledge; # to write something (often depends on a prompt); # to critique an argument; # to learn something; # for general comprehension

1. Introduction: The virtues of repetition
Textual reading and writing: A text until some provisional goal is achieved.

1.1 Assignment, Day 1: Read a short (1-2 page) academic text and summarize it in one paragraph (3-4 sentences). (This is without prior guidance by the instructor).
1.2 Assignment, Day 2: Re-read the same text and re-write the summary after a brief discussion of CONTENT (does the summary contain most ofthe most important points made in the text?)
1.3 Assignment, Day 3: Re-read the same text and re-write the summary again after a brief discussion of FORM (is the summary well structured, clear and effective?)

2. Techniques for reading
2.1 Grasping the whole: Overview
2.2 Divide and conquer: Taking texts apart
2.2.1 Titles as the shortest summary of a text
2.2.2 Introductions and Conclusions
2.2.3 Identifying important passages and sentences
2.2.4 Everything is not equally important: Distribution of emphasis
2.2.5. Isolating words & terms: Dictionaries, Encyclopaedias
2.2.6 Contextualizing texts and asking for help from teachers/tutors

3. Techniques for writing
3.1 Building a structure: What do you want to say?
3.1.1 Beginning, middle and conclusion – stages of argument
3.1.2Working with blocks: Sections, Paragraphs, Sentences
3.1.3Sections and Paragraphs as key building blocks of academic prose
3.1.4 Sentences and punctuation; length, balance, continuity

3.2 Borrowing material: Paraphrasing, Quoting, Citing
3.2.1 Plagiarism
3.2.2 Quotations: When? Why? How?
3.2.3 Citation styles

4 Interpretations:

Peer Reviewing: Students will practice evaluating each other's work throughout the semester, but the last week can be formalized and stepped up into a more elaborate exercise.

4.1 Assignment, Day 1: The whole class does an individualized, two-part composite reading and writing exercise designed by the instructor based on semester long experience of student abilities and interests.

4.2 Assignment, Day 2: The reading part of the individual assignment will be randomly distributed for students to evaluate and comment on their colleagues' work. The instructor moderates discussion of strengths and weaknesses, highlighting techniques for recognizingquality (or its lack).

4.3 Assignment, Day 3: The writing part of the assignment will similarly distributed and evaluated through interactive, moderated discussion.

Readings:

Examples could include:

1. Keynes, John Maynard 1936.*The general theory of employment, interest and money*, Palgrave Macmillan, United Kingdom
2. Parsons, Talcott 1951.*The social system*, Glencoe III, Free Press
3. Douglas, Mary 1986. *How institutions think*, Syracuse University Press, Syracuse, New York.
4. Romila Thapar 2004.*Somanatha: The many voices of history*, Penguin Books, India
5. Sunil Khilnani 1997.*The idea of India,* Penguin Books.
6. Louis Dumont 1980.*Homo Hierarchicus,* University of Chicago Press.
7. Well-known guides to academic writing (such as Howard Becker's *Writing for Social Scientists*) will also be used where appropriate..

Group-A

SEC-A(2)

Gender Sensitization

1. **What is Gender?**
   - 1.1 Gender as a category
   - 1.2 Gender, Sex and sexuality
   - 1.3 Masculinity and Femininity
   - 1.4 Private and public dichotomy
   - 1.5 Gender stereotypes

2. **Gender Construction**
   - 2.1 Beyond the gender binary
   - 2.2Ideas and Discrimination on LGBT

3. **Gender Practices and Policies**
   - 3.1 Gender Inequality
     - 31.1 Female Infanticide and Child Marriage
     - 3.1.2 Pocso Act: Overview and Awareness
     - 31.3 Eve teasing, Rape, Domestic violence
   - 3.2 Gender and Workplace Harassment
     - 3.2.1 Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 ("POSH Act")
     - 3.2.2 Vishakha judgment and Current situation

Readings:

1. Abbott, Pamela, Claire Wallace and Melissa Tyler. 2005. An Introduction to Sociology: Feminist Perspectives. London: Routledge.
2. Aanchal Kapur, Sanjay Muttoo, Suman Bisht. 2004. from Thought to Action: Building Strategies on Violence against Women. Kriti,
3. Anil Dutta Mishar. 2002. Patterns of Gender Violence. Radha Publications,
4. Bhasin, Kamala. 1993. What is Patriarchy? New Delhi: Kali for Women.
5. Bhasin, Kamla, 2003. Understanding Gender, Kali for Women.
6. C. Chidamabaranathan, I. Jenitta Mary, and M. D. Allen Selvakumar A FEMINIST ANALYSIS ON FEMALE INFANTICIDE; INTERNATIONAL JOURNAL OF BUSINESS POLICY AND ECONOMICS Vol. 4, No. 1, (2011) : 85-96

7. Chaudhuri, Maitrayee 2004.Feminism in India: Issues in Contemporary Indian Feminism Kali for Women, New Delhi.
8. Dube, Leela. 'On the Construction of Gender: Hindu Girls in Patrilineal India', *Economic and Political Weekly*, Vol. 23, No. 18 (Apr. 30, 1988), pp. WS11-WS19
9. Dyer.T., Gorshkov.M.K, Modi. Ishwar, Chunling.Li and Mapadimeng, 2018. Handbook of Sociology of Youth in BRIC COUNTRIES; World Scientific.
10. Ehrlich, Susan (eds). 2017. The Handbook of language, Gender and Sexuality, John Wiley & Sons
11. Fernandes, Leela.(ed). 2014. Handbook of Gender in South Asia. London: Routledge
12. Furr.L, Allen. 2018. Women, Violence and Social Stigma. Jaipur: Rawat Publications.
13. Gibson, M.A, Deborah T. Meem & Jonathan Alexander. (2013), Finding out: An Introduction to LGBT Studies, Sage
14. Halberstam, Judith. 1998. "An Introduction to Female Masculinity: Masculinity without men, in Female Masculinity. London: Duke University Press (pp 1-43) (Also New Delhi: Zubaan 2012 Reprint)
15. Holmes, Mary. 2009. Gender and Everyday Life. London: Routledge.
16. Jackson, Stevi and Sue Scott (eds.) 2002. Gender: A Sociological Reader. London: Routledge.
17. Kabeer, Naila 1994. Reversed Realities: Gender Hierarchies in Development Thought: Gender Hierarchies in Development
18. Kaur, Manmeet: Female Foeticide – A Sociological Perspective. The Journal of Family Welfare. March 1993. 39(1). p. 40-43.
19. Karlekar, Malavika. Domestic Violence, *Economic and Political Weekly*, Vol. 33, No. 27(Jul. 4-10, 1998), pp. 1741-1751
20. Kimmel, Michael S. *The Gendered Society*. New York: Oxford University Press, 2011. Chapter 13. Gender of Violence, Pp. 381-407
21. Kirsch, M.H. 2013, Queer Theory and Social Change, Routledge.
22. Mamta Mahrotra. Gender Inequality in India. Prabhat Publications.
23. Menon, Nivedita (ed.).1999. Gender and Politics in India. New Delhi: Oxford University Press.
24. Nicola Malizia. 2017. A Social Problem: Individual and Group Rape; Advances in Applied Sociology, 2017, 7, 95-114.
25. Omvedt, Gail, *Violence Against Women: New Movements and New Theories in India.* Delhi: Kali for Women, 1990. Pp. 1-40.
26. Naquvi, Farah. 2010. This Thing called Justice: Engaging Laws on Violence against Women In India, in Bishakha Dutta (ed.), Nine Degrees of Justice: New Perspectives on Violence Against Women in India. Delhi: Zuban, 2010.
27. Rege, Sharmila. (ed). 2003. Sociology of Gender: The Challenge of Feminist Sociological Knowledge. New Delhi: Sage.
28. Rehana Ghadiallyedited, 2007. Urban Women in Contemporary India: A Reader, Sage
29. Serano, J. 2013. Excluded: Making Feminist and Queer Movements More Inclusive, Hachette UK, 2013.

30. Shilpa Khatri Babbar. 2014. Child Welfare: A critical analysis of some of the socio-legal legislations in India. Journal Of Humanities And Social Science (IOSR-JHSS) Volume 19, Issue 8, Ver. II (Aug. 2014), PP 54-60
31. Sneh Lata Tandon and Renu Sharma 2006. Female Foeticide and Infanticide in India: An Analysis of Crimes against Girl Children; International Journal of Criminal Justice Sciences Vol 1 Issue 1 January 2006.
32. T.V. Sekher and Neelambar Hatti. 2010. Disappearing Daughters and Intensification of Gender Bias: Evidence from Two Village Studies in South India; SOCIOLOGICAL BULLETIN 59 (1), January – April 2010, pp. 111-133.
33. Tejani, Sheba. Sexual Harassment at the Workplace: Emerging Problems and Debates, *Economic and Political Weekly*, Vol. 39, No. 41 (Oct. 9-15, 2004), pp. 4491-4494
34. V. K. Madan, 2013. THE DYNAMICS OF RAPE IN MODERN INDIAN SOCIETY; AGORA International Journal of Juridical Sciences, No. 4 (2013), pp. 81-87.
35. Yadav. Mukesh 2013. SC on Eve-Teasing: Human Rights of Woman in India; J Indian Acad Forensic Med. April-June 2013, Vol. 35, No. 2.

References:

1. Aadil Bashir, Shabana Khurshid. 2013. Eve Teasing and Molestation – A Case Study of District Srinagar; International Journal of Science and Research (IJSR); Volume 2 Issue 12, December 2013
2. Ashay Abbhi | Kirthi Jayakumar | Manasa Ram Raj | Ramya Padmanabhan. 2013. Child Marriages in India An insight into Law and Policy December 2013 Final Report of the Red Elephant Foundation; December 2013.
3. Chesfeeda Akhtar. 2013. Eve teasing as a form of violence against women: A case study of District Srinagar, Kashmir; International Journal of Sociology and Anthropology; Vol. 5(5), pp. 168-178, August, 2013
4. Chowdhry, Prem. Enforcing Cultural Codes: Gender and Violence in Northern India, Economic and Political Weekly, Vol. 32, No. 19 (May 10-16, 1997), pp. 1019-1028
5. Cristina Bicchieri Ting Jiang Jan Willem Lindemans . 2015. A Social Norms Perspective on Child Marriage: The General Framework; University of Pennsylvania, To be Published by UNICEF.
6. Das, Veena & Kim Turcot DiFruscia. 2010. Listening to Voices: An Interview with Veena Das, Altérités, vol. 7, no 1,: 136-145.
7. Jennifer L. Solotaroff, Rohini Prabha Pande. Violence against Women and Girls: Lessons from South Asia; South Asia development Forum; The World Bank.
8. Kandiyoti, Deniz. 1991. “Bargaining with Patriarchy” in Judith Lorber and Susan A. Farrell (eds.). 1991. The Social Construction of Gender. Newbury Park, Calif: Sage Publications (pp 104-118).
9. M. E. Khan, 2014. Sexuality, Gender Roles, and Domestic Violence in South Asia; Population Council, 2014

10. MacKinnon, Catharine A. *Only Words*. Cambridge, Mass.: Harvard University Press, 1993. Chapter II Racial and Sexual Harassment. Pp. 43 – 68.
11. Menon, Nivedita. Recovering Subversion: Feminist Politics beyond the Law. Ranikhet: Permanent Black. 2004. Chapter 3. Sexual Violence: Escaping the Body.Pp. 106 – 156
12. Newton, Esther. 2000. "Of Yams, Grinders and Gays: The Anthropology of Homosexuality" in Margaret Mead Made Me Gay: Personal Essays, Public Ideas. Durham: Duke University Press (pp 229-237)
13. Palriwala, Rajni, 1999. "Negotiating Patriliny: Intra-household Consumption and Authority in Rajasthan (India)", in Rajni Palriwala and Carla Risseeuw (eds.). 1996. Shifting Circles of Support: Contextualizing Kinship and Gender in South Asia and Sub-Saharan Africa. New Delhi: Sage Publications (pp 190-220).
14. Phipps, Alison 2009. Rape and respectability: ideas about sexual violence and social class. Sociology, 43 (4). pp. 667-683.
15. Rege, S. 1998. "Dalit Women Talk Differently: A Critique of 'Difference' and Towards a Dalit Feminist Standpoint Position." Economic and Political Weekly,Vol. 33, No. 44 (Oct.31-Nov. 6, 1998)(pp39-48)
16. Sharon L. Talboys, Manmeet Kaur, James Van Derslice, Lisa H. Gren, Haimanti Bhattacharya, and Stephen C. Alder. 2017. What Is Eve Teasing? A Mixed Methods Study of Sexual Harassment of Young Women in the Rural Indian Context; SAGE Open January-March 2017: 1–10
17. Sherry Ortner. 1974. "Is male to female as nature is to culture?" M.Z. Rosaldo and L. Lamphere (eds.) Women, culture and society. Stanford: Stanford University Press (pp 67-87)
18. Stanley, L. 2002. 'Should Sex Really be Gender or Gender Really be Sex', in S. Jackson and S. Scott (eds.) Gender: A Sociological Reader, London: Routledge (pp31-41).
19. Uberoi, Patricia "Feminine Identity and National Ethos in Indian Calendar Art" In Economic and Political Weekly Vol. 25, No. 17 (Apr. 28,1990), (pp WS 41-48).
20. Whitehead, A. 1981, "I' m Hungry Mum": The Politics of Domestic Budgeting" in K. Young et al. (eds.) *Of Marriage and the Market: Women's Subordination Internationally and its Lessons.* London: Routledge and Kegan Paul (pp.93-116)

Group-B

SEC-B (1)

Statistical Reasoning for Sociology

1. Use of statistics in Social Research: Descriptive and Inferential Statistics
2. Basic Concepts: Statistics, population, parameter, statistics, Sample, variable
3. Sampling – types and applications
4. Frequency Distribution and Graphical Techniques
5. Coding and Tabulation
6. Central tendency -- Mean, Median, Mode
7. Dispersion --- Range, variance, Standard Deviation

Readings:

1. Blalock. Social Statistics
2. Das N.G.: Statistics
3. Elifson, Kirk W., Richard P. Runyon, and Audrey Haber. Fundamentals of social statistics. McGraw-Hill Humanities, Social Sciences & World Languages, 1990.
4. Goon, A.M., M.K. Gupta and B. Dasgupta. Basic Statistics, Kolkata World Press Pvt. Ltd, 1978
5. Goon, A.M., M.K. Gupta and B. Dasgupta. Fundamentals of Statistics; Volume-I
6. Irvine, John, Ian Miles, and Jeff Evans, (Eds). Demystifying social statistics. London: Pluto Press, 1979.
7. Kothari, C R. Research Methodology, New Delhi: New Age International, , 2004.

Group-B

SEC-B (2)

Theory & Practice of Development

1. **What is development?**
2. **Recent trends in Development and Post development**
   - 2.1 Social development indicators
   - 2.2 Sustainable development
   - 2.3 Growth-Development Debate
   - 2.4 Private–Public Partnership-PPP

3. **Social services & development**
   - 3.1 Concept of social service
   - 3.2 Social services for socialization and development
   - 3.3 Participatory development: Gender and Development GAD; Civil society& grassroots initiatives: SHG; NGO
   - 3.4 Corporate Social Responsibility CSR

4. **Human Development: Growth vs. Development**
   - 4.1 Development with dignity
   - 4.2 Decentralisation of development: Panchayat & Municipality
   - 4.3 MGNREGA
   - 4.4 Digital India

Readings:

1. Adamsen L, Rasmussen JM. 2001. Sociological perspectives on self-help groups: reflections on conceptualization and social processes; Journal of Advanced Nursing. 2001 Sep; 35 (6):909-17.
2. Anner, Mark. 2012. "Social responsibility and global workers' rights: Corporations' precarious quest for legitimacy with labour control", in: Politics & Society, in print as of time of class, pp.1-36
3. Aparajita Pattnaik and Srimati Nayak. 2017. Corporate social responsibility: principles and practices in India International Research Journal of Social Sciences, 42-46.
4. Arora, Ramesh. K. & Hooja, Meenakshi. 2009. Panchati Raj, participation and decentralisation. Rawat publications.
5. Banerjee, S. B. 2008. Corporate social responsibility: The good, the bad and the ugly. Critical Sociology, 34(1), pp. 51-79.
6. Barnett, T., 1988. Sociology & Development, Nutchinson, London.
7. Bhaduri, Amit. 2005. Development with dignity: A case for full employment. New Delhi: National Book Trust.

8. Chandhoke, Neera. 1995. State & civil society: Explorations in Political theory, Sage publications.
9. Chaubey, P.K. 2001. Population policy for India. New Delhi: Kanishka Publishers.
10. Dreze, J. & Sen, Amartya. 2013. An uncertain glory: Indian and its contradictions.
11. Dreze, Jean, and Amartya Sen. 2002. *India: Development and participation*. USA: Oxford University Press.
12. Hobhouse, L.T., 1966. *Social Development*, London: George Allen & Unwin.
13. Jayaram, N. (Ed.) 2005. *On civil society: Issues & Perspectives*. New Delhi: Sage publications.
14. K. Raja Reddy C.S. Reddy. 2012. Self Help Groups in India: A Study on Quality and Sustainability; ENABLE Publication.
15. Lee, Fang Cook & Quiaoling He. 2010. "Corporate social responsibility and HRM in China: a study of textile and apparel enterprises. Asia Pacific Business Review, Vol.16 (3) July, pp.355-376. 3.
16. Maddick, Henry. (2018). Panchayati Raj: A study of rural local governance in India. Rawat Publications.
17. MoRD, 2012. MGNREGA Sameeksha: An anthology of research studies on the Mahatma Gandhi National Rural Employment Guarantee Act, 2005, 2006-2012. New Delhi: Orient Blackswan.
18. Moura-Leite, Rosamaria C. & Robert C. Padgett. 2011. "Historical background of corporate social responsibility". Social Responsibility Journal, Vol.7 (4), pp.528-539.
19. Nagaraj, R. (2012). Growth, Inequality and Social Development in India: Is Inclusive Growth Possible? Springer.
20. Pandey, Ragendra. 1985. Sociology of development. New Delhi: Mittal Publications.
21. Samal, Sandhyarani. 2015. Self-Help groups and women empowerment: Problems and prospects. International Journal of Applied Research; 1(13): 235-239.
22. Sen, Amartya. And Sudhir Anand. 1994. ''Sustainable Human Development: Concepts and Priorities.'' Background Paper for the Human Development Report. New York: Human Development Report Office.
23. Singh, Katar. 2009. *Rural Development: Principles, Policies and Management*, New Delhi: SAGE Publications India Pvt Ltd.
24. Singha Roy, D.K. (Ed). 2001. Critical issues of grassroots mobilisation and collective action. Social development and empowerment of the marginalised groups. New Delhi: Sage publications.
25. Thakur, Shabnam, 2012. Panchayati Raj, decentralisation and rural development. Abhijeet publications.
26. Thomas, Pradip Niman. 2012. *Digital India: Understanding information, communication and social change*. New Delhi: Sage publications India Pvt Ltd.
27. UN, 2007. Indicators of sustainable development: Guidelines and methodologies. Third ed. New York: United Nations.
28. UNDP, 2015. MGNREGA Sameeksha II: An anthology of research studies (2012-2014). United Nations Development Programme.
29. UNDP, 2016. Human development report. New York: United Nations.
30. Vveinhardt, J., Andriukaitiene, R. 2017. Management Culture as Part of Organizational Culture in the Context of Corporate Social Responsibility Implementation. Economics and Sociology, 10(3), 294-320.

References:

1. Agarwal, A. (1992), "What is sustainable development?" Down to Earth, June 15th, 50-51.
2. Chantia, A. (2008). Awareness regarding activities of national service scheme: An appraisal. *Anthropologist*, Vol. 10(4), 289-296.
3. Chakravarthy, Sukhemoy. Development Planning: The Indian Experience. Oxford University Press.
4. Dhanagare, D.N. (1996). Development process and environmental problems.
5. Dube, S.C. (1988). Modernisation and development. New Delhi: Vistaar Publications.
6. EREN KARACA AKBA2012. A SOCIOLOGICAL STUDY OF CORPORATE SOCIAL RESPONSIBILITY: A MARXIST PERSPECTIVE. Online Thesis
7. Gadgil, D.R. (1967). District development planning. Poona: Gokhale Institute of Politics and Economics.
8. Haq, Mathbulul. (1988). Changing paradigm of development: The evolving participatory society. *Journal of Social & Economic Development*, 35-45.
9. Kaikobad, N.F. & Krishan, Kapil, K. (1971). Training & consultancy needs in National service scheme. Tata Institute of Social Sciences.
10. Kennedy Nyataya, Isaboke Peter. 2016. Women Self Help Groups Enhancing Women's Development Processes in Kenya; International Journal of Research in Sociology and Anthropology (IJRSA) Volume 2, Issue 2, 2016, PP 18-25.
11. M. Saravanan, 2016. "THE IMPACT OF SELF-HELP GROUPS ON THE SOCIOECONOMIC DEVELOPMENT OF RURAL HOUSEHOLD WOMEN IN TAMIL NADU - A STUDY" International Journal of Research – Granthaalayah, Vol. 4, No. 7: 22-31.
12. Minimol M. C. and Makesh K. G. 2012..Empowering rural women in Kerala: A study on the role of Self Help Groups (SHGs); International Journal of Sociology and Anthropology Vol. 4(9), pp. 270-280, November, 2012
13. Mukhtar Ahmad Bhat & Irshad Ahmad Wani, Ahsan Ahrar, Manzoor Ahmad. 2014. Empowerment of Women through Self Help Group in Madhya Pradesh: A Sociological Study; Journal Of Humanities And Social Science; Volume 19, Issue 1, Ver. IX, PP 80-94.
14. Oommen, T.K. (1998). Changing paradigm of development: The evolving participatory society. *Journal of Social and Economic Development*, 35-45.
15. Rawat, S.S. Panchayat Raj and rural development. Research India Press.
16. Saiyidain, K.G. (1961). National service for the youth. New Delhi: Government of India.
17. Santhanam M.L. (1993). Community participation in sustainable development. *The Indian Journal of Public Administration*. Vol. XXXIX (3).
18. Sen, Amartya. 1989. ''Development as Capabilities Expansion.'' Journal of Development Planning 19: 41 – 58
19. Sen, Amartya. Resources, values, and development. Harvard University Press, 1997.
20. Singh, S.P. (2003). *Planning and management for rural development*. New Delhi: Mittal Publications.

DISCIPLINE SPECIFIC ELECTIVE

SEMESTER-5 & 6

Group A

DSE-A-(1)
Urban Sociology

1. **Introducing Urban Sociology**
   - 1.1 Emergence, Development and Importance of Urban Sociology
   - 1.2 Rural-urban continuum: An Overview
   - 1.3 Urban, Urbanism and Urbanity
   - 1.4 Urbanization processes and patterns

2. **Perspectives in Urban Sociology**
   - 2.1. Ecological
   - 2.2. Political Economy
   - 2.3. Network
   - 2.4 City as Culture

3**. Movements and Settlementswith reference to India**
   - 3.1. Migration: Meaning, Types, Factors
   - 3.2 Types of Urban Settlements: City and its types
   - 3.3 Trends of Settlement and its Implications: Smart Cities

4. **Urban Space: Problems with reference to India**
   - 4.1 Housing and Slum
   - 4.2 Poverty
   - 4.3 Crime and juvenile delinquency
   - 4.4 Beggary

Readings:

- Flanagan, W., 1993. Contemporary Urban Sociology Cambridge: University of Cambridge
- Harvey, David 1985 The Urban Experience, Baltimore: Johns Hopkins University Press, Chapter 1. Money, Time, Space and the City. Pp. 1-35
- Lewis, Wirth 1938 “Urbanism as a way of Life” in American Journal of Sociology, Vol 44, No.1, July, Pp1-24.
- Lin, J & Christopher Mele, 2012, The Urban Sociology Reader, Routledge
- Mann, P. H. 2003. An Approach to Urban Sociology, Taylor & Francis
- Manuel, Castells 2002, “ Conceptualizing the city in the Information Age” in I.Susser (ed.) The Castells Reader on Cities and Social Theory, Blackwell Publishers, Malden, Pp 1-13

- Mumford, Lewis 1961. The City in History: its origins and transformations and its prospects. Mariner Books, Pp 3-29, 94-118
- Parker, Simon. Urban Theory and Urban Experience: Encountering the City, London: Routledge. Chapter 2. Foundations of Urban Theory Pp. 8 – 26
- Ramachandran, R. 2009, Urbanization and Urban Systems in India, Oxford University Press
- Rao, M.S.A, 1981, "Some aspects of the sociology of migration", Sociological Bulletin,Vol. 30, 1. Pp21-38
- Simmel, Georg, 1903, "Metropolis and the Mental Life" in Gary Bridge and Sophie Watson, eds. The Blackwell City Reader. Oxford and Malden. Wiley-Blackwell, 2002.
- Weber, Max 1978. The City. The Free Press: New York. Pp 65-89

References:

- Alfred de Souza 1979 The Indian City; Poverty, ecology and urban development, Manohar Publishers
- Abrahamson, M. 2013. Urban Sociology: A Global Introduction, Cambridge University Press.
- Desai A R and Pillai S D (ed) 1970 Slums and Urbanisation, Popular prakashan,
- Jayapalan, N. 2013, Urban Sociology, Atlantic Publishers
- Patel, Sujata&Kushal Deb, 2009, Urban Studies, Oxford University Press
- Rao, M.S.A., 1992, Urban Sociology in India, Orient Longman
- Ronnan, Paddison, 2001, Handbook of Urban Studies. Sage
- Saunders, P. 2013. Social Theory and Urban Question, Routledge
- Sharma, R.K. 1997, Urban Sociology, Atlantic Publishers

Group A

DSE- A- (2)

Sociology of Work and Industry

1. **Interlinking Work and Industry**
   - 1.1 Concept of work and occupation
   - 1.2 Work in industrial society

2. **Forms of Industrial Culture and Organisation**
   - 2.1 Industrialism
   - 2.2 Post-industrial Society
   - 2.3 Information Society

3. **Dimensions of Work**
   - 3.1 Alienation: Causes and Consequence
   - 3.2 Gender: Women and Industry, Gender Discrimination in Work
   - 3.3 Nature of Unpaid Work and Forced Labour

4. **Work in the Informal Sector**
   - 4.1 Definition, Informal sector in Developing countries
   - 4.2Women's Work and the Informal sector

5. **Risk, Hazard and Disaster**
   - 5.1 Nature and Types of Industrial Risk, Hazard and Disaster
   - 5.2 Dimensions and Trends of Vulnerability and Exposure

Readings:

1. AGARWALA, RINA. 2009. An Economic Sociology of Informal Work: The Case of India; *Economic Sociology of Work Research in the Sociology of Work*, Volume 18, 315–342. Emerald Publishing
2. Ajaya Kumar Naik. 2009. Informal Sector and Informal Workers in India; Paper Prepared for the Special IARIW-SAIM Conference on "Measuring the Informal Economy in Developing Countries" IARIW website.
3. Beck, U., 2000: Risk society revisited: Theory, politics and research programmes. In: The Risk Society and Beyond [Adam, B., U. Beck, and J. van Loon (eds.)]. SAGE Publications, London, UK, 211-229.
4. Bell, Daniel. 1976, *The Coming of Post-Industrial Society*, London: Heineman, Introduction, Pp.12-45
5. Bhosale, B. V. 2014.Informal sector: Issues of Work and livelihood: Socio-Economic Perspective; YOJANA October 2014

6. Bhowmik. Sharit K.2009. India Labour Sociology Searching for a Direction; Work and Occupations Volume 36 Number 2 May 2009 126-144
7. Breman, Jan. 2003, "The Informal Sector" in Veena Das, (ed.) *The Oxford India Companion to Sociology and Social Anthropology*, New Delhi: OUP, Pp.1287-1312
8. Breman, Jan.nd. At Work in the Informal Economy of India; A Perspective from the Bottom Up (OIP)
9. Cardona, O.D., M.K. van Aalst, J. Birkmann, M. Fordham, G. McGregor, R. Perez, R.S. Pulwarty, E.L.F. Schipper, and B.T. Sinh, 2012: Determinants of risk: exposure and vulnerability. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp. 65-108.
10. Das C.R. 2015. A Sociological Study on the Emergence and Growth of Disaster Education in India. International Research Journal of Social Sciences. Vol. 4(1), 81-85, January (2015)
11. Edgell, Stephen. 2006, "Unpaid Work-Domestic and Voluntary work" in *The Sociology of Work: Continuity and Change in Unpaid Work*. New Delhi: Sage, Pp.153-181
12. Gilbert,S.J.-(1985) Fundamentals of Industrial Sociology, Tata Mac Graw Hill Publishing Co. Ltd., New Delhi
13. Grint, Keith. The sociology of work: introduction. Polity, 2005.
14. Kalyani, Muna. 2016. Indian Informal Sector: an Analysis; International Journal of Managerial Studies and Research (IJMSR) Volume 4, Issue 1, January 2016, PP 78-85
15. Kumar, Krishan. 1999, *From Post-industrial to Post-modern society,* Oxford: Blackwell Publishers Ltd., Chapter 2 and 6, Pp 6-35 and 154-163
16. M.F. de Souza Porto, C.M. de Freitas. 2003. Vulnerability and industrial hazards in industrializing countries: an integrative approach; Futures 35 (2003) 717–736.
17. MAITI, DIBYENDU. 2010. The Informal Sector in India: A Means of Exploitation or Accumulation? Journal of South Asian Development 5:1 (2010): 1–13; Sage Pub.
18. Mammo Muchie, Saradindu Bhaduri, Angathevar Baskaran, Fayaz Ahmad Sheikh. 2016. Edited: Informal Sector Innovations: Insights from the Global South Routledge.
19. Miller and Form-(1964) Industrial Sociology, Harper and Row, New York
20. Mohammed Abunemeh, Rani El meouche, Ihab Hijaze, Ahmed Mebarki, Isam Shahrour (2017). Hazards, vulnerability and interactions at construction sites: spatial risk mapping. Journal of Information Technology in Construction (ITcon), Vol. 22, pg. 63-79,
21. Parker, Stanley Robert. The sociology of industry. Vol. 1. Allen & Unwin Australia, 1977.
22. Ramaswamy E. A. and Uma Ramaswamy. 1981, *Industry and Labour*. New Delhi: Oxford University Press, Chapter 3, Pp.33-65

23. Rath, Navaneeta. 2016. Impact of Globalization on the Urban Informal Economy: A Study of the Women Craft Workers of Odisha; Imperial Journal of Interdisciplinary Research (IJIR) Vol-2, Issue-6, 2016.
24. Sansiya, Preeti. 2013. WOMEN IN INFORMAL SECTOR (A SOCIOLOGICAL INQUIRY) International Journal of Research in Social Sciences And Humanities http://www.ijrssh.com (IJRSSH) 2013, Vol. No. 2, Issue No. IV, Oct-Dec
25. Schneider Eugene-(1979) Industrial Sociology, New Delhi, Tata Mac Graw Hills
26. Seth,N.R.(ed)-(1982)Industrial Sociology in India, Kolkata, Allied Publishers
27. Talib, Mohammad. 2010, *Writing Labour- Stone Quarry workers in Delhi*. New Delhi:OUP, Chapter 1, Pp. 23-54
28. Wisner, B. Blaikie, P. Cannon, T. and Davis, I., At Risk: Natural hazards, people's vulnerability and disasters Second edition 2003. [The three chapters constitute Part I of the book, and have been made available in the public domain by the authors and Routledge as part of the UNDP follow up to the Hyogo Framework for Action 2005.]

References:

1. Bell, Daniel. 1976, *The Coming of Post-Industrial Society*, London: Heineman, Introduction, Pp.12-45
2. Breman, Jan. 2003, "The Informal Sector" in Veena Das, (ed.) *The Oxford India Companion to Sociology and Social Anthropology*, New Delhi: OUP, Pp.1287-1312
3. Coser, 1990, "Forced Labour in Concentration Camps" in Erikson, K. and S.P.Vallas (eds.) *The Nature of Work: Sociological Perspectives*, New Haven and London: American Sociological Association, Presidential Series and Yale University Press, Pp. 162-69
4. Devine, Fiona. 1992, "Gender Segregation in the Engineering and Science Professions: A case of continuity and change" in *Work, Employment and Society', 6 (4)* Pp.557-75.
5. Edgell, Stephen. 2006, "Unpaid Work-Domestic and Voluntary work" in *The Sociology of Work: Continuity and Change in Unpaid Work*. New Delhi: Sage, Pp.153-181
6. Erikson, Kai. 1990. "On Work and Alienation" in Erikson, K. and S.P. Vallas (eds)*The Nature of Work: Sociological Perspectives*. New Haven and London: American Sociological Association, Presidential Series and Yale University Press, Pp. 19-33
7. Etzioni, A. and P.A. Jargowsky. 1990, "The false choice between high technology and basic industry" in K. Erikson and P. Vallas (eds.) *The Nature of Work: Sociological Perspectives*, New Haven and London: Yale University Press, Pp. 304-317
8. Freeman, Carla. 2009, "Femininity and Flexible Labour: Fashioning Class through Gender on the global assembly line" in Massimiliano Mollona, Geert De Neve and Jonathan Parry (eds.) *Industrial Work and Life: AnAnthropological Reader*, London:Berg, Pp.257-268

9. Grint, Keith. 2005, “Classical Approaches to Work: Marx, Durkheim and Weber‟ in *The Sociology of Work: An Introduction*. Polity Press. Cambridge. Pp. 90-112
10. Kumar, Krishan. 1999, *From Post-industrial to Post-modern society,* Oxford: Blackwell Publishers Ltd., Chapter 2 and 6, Pp 6-35 and 154-163
11. Laughlin, Kim. 1995, Rehabilitating Science, Imagining "Bhopal" in George E. Marcus (ed.) *Techno scientific Imaginaries: Conversations, Profilesand Memoirs,* Chicago: University of Chicago Press, Pp. 277-302
12. Ramaswamy E. A. and Uma Ramaswamy. 1981, *Industry and Labour*, New Delhi: Oxford University Press, Chapter 3, Pp.33-65
13. Talib, Mohammad. 2010,*Writing Labour- Stone Quarry workers in Delhi*. New Delhi:OUP, Chapter 1, Pp. 23-54
14. Taylor, Steve. 1998, “Emotional Labour and the new Workplace‟ in Thompson and Walhurst (eds.) *Workplace of the Future.*London:Macmillan, Pp. 84-100
15. Uberoi, J.P.S. 1970, “Work, Study and Industrial worker in England‟ in *Man, Science and Society*. IIAS: Simla. Pp 34-452.
16. Zonabend, Francoise. 2009, “The Nuclear Everyday” in Massimiliano Mollona, Geert De Neve and Jonathan Parry (ed.) *Industrial Work andLife: An Anthropological Reader*, London: Berg, Pp 167-185

Group A

DSE-A (3)

Environmental Sociology

1. Envisioning Environmental Sociology

1.1. Environmental Sociology: Origin, New Directions
1.2. Realist-Constructionist Debate
1.3 Development, Displacement and Rehabilitation: Major Issues

2. Approaches

2.1 Human Ecology – New Environmental Paradigm
2.2 Treadmill of Production
2.3 Ecological Modernization
2.4 Ecofeminism
2.5 Political Ecology and Ecological Marxism
2.6 Convergence of Different Approaches: Sustainable Development

3. Environmental Movements in India

3.1Chipko
3.2 Narmada
3.3 Silent Valley Movement

4. Global Issues

4.1 Global Environmental Politics: Major Issues
4.2 Climate Change: Major Issues

Readings:

1. Agarwal, Bina, 2007. The Gender and Environment Debate: Lessons from India. In Mahesh Rangarajan. (ed.) 2007. Environmental Issues in India: A Reader. New Delhi: Pearson, Longman, Ch 19, (pp. 316-324, 342-352).
2. Bell, MM. (2008). An Invitation to Environmental Sociology. Thousand Oaks, CA: Sage 3rd ed. Ch 1. (pp. 1-5).
3. Burns, T.R. (2016) Sustainable development: Agents, systems and the environment, Current Sociology, Vol. 64, Issue 6, pp.875-906.
4. Buttel F. H. (1987) New Directions in Environmental Sociology. Annual Review of Sociology, Vol.13: 465-88.
5. Buttel, F. H. (2000). Ecological modernization as social theory. Geoforum, 31(1), 57-65.

6. Catton, W. R. Jr. & Dunlap, R. E. (1978) Environmental Sociology: A New Paradigm. The American Sociologist 13: 41-49.
7. Chatterjee, Deba Prashad (2008) 'Oriental Disadvantage versus Occidental Exuberance: Appraising Environmental Concern in India – A Case Study in a Local Context' International Sociology Vol. 23(1): 05–35.
8. Clark, B. and Foster, J. B. (2010) Marx's Ecology in the 21st Century, World Review of Political Economy, vol. 1, no. 1, pp. 142-56.
9. Dunlap Riley E. (2010) 'The Maturation and Diversification of Environmental Sociology: From Constructivism and Realism to Agnosticism and Pragmatism' in Redclift, M. R. & Woodgate, G. (eds.) The International Handbook of Environmental Sociology, Second Edition, Cheltenham, Edward Elgar Publishing Limited. Ch. 1, (pp.15-32)
10. Evanoff, R. J. (2005). Reconciling realism and constructivism in environmental ethics. Environmental Values, 61-81.
11. Foster J. B. (2010) 'Marx's Ecology and its Historical Significance' in Redclift, M. R. & Woodgate, G. (eds.) The International Handbook of Environmental Sociology, Second Edition, Cheltenham, Edward Elgar Publishing Limited. Ch. 7, (pp.106-120).
12. Gould, K. A., Pellow, D. N., & Schnaiberg, A. (2004). Interrogating the Treadmill of Production: Everything You Wanted to Know about the Treadmill but Were Afraid to Ask. Organization & Environment, 17(3), 296-316.
13. Guha, R. Chipko: Social history of an environmental movement. In Ghanshyam Shah ed. (2002). Social Movements and the State (Vol. 4). Sage Publications Pvt. Ltd., Ch. 16 (pp.423-454).
14. Hannigan, J. A. (1995). Environmental Sociology. Routledge, London and New York, 2nd ed. Ch1 and 2. (pp. 10-15, 16 - 35).
15. Khagram, S., Riker, J. V., & Sikkink, K. (2002).Restructuring the global politics of development: The Case of India's Narmada Valley Dams. Restructuring World Politics: Transnational Social Movements, Networks, and Norms (Vol. 14). U of Minnesota Press. (pp.206-30).
16. Leahy, T. (2007). Sociology and the Environment. Public Sociology: An Introduction to Australian Society. Eds. Germov, John and Marilyn, Poole. NSW: Allen & Unwin, Ch 21 (pp. 431-442).
17. Martell, Luke(1994) Ecology and Society: An Introduction, Cambridge, Polity Press.
18. Mol, A. P. (2002). Ecological modernization and the global economy. Global Environmental Politics, 2(2), 92-115.
19. O'Connor, J. (1994). Is sustainable capitalism possible? Is capitalism sustainable? Political Economy and the Politics of Ecology. The Guilford Press. Ch . (pp.152-175).
20. Padel, F., & Das, S. (2008). Orissa's highland clearances: The reality gap in R & R. Social Change, 38(4), 576-608.
21. Redclift, M. R. & Woodgate, G. (2010) The International Handbook of Environmental Sociology, Second Edition, Cheltenham, Edward Elgar Publishing Limited. Ch. 1, pp.15-32, 77-90,106-120

22. Robbins, P. (2011). Political Ecology: A Critical Introduction (Vol. 16). Wiley and Sons ltd. East Sussex, U.K. Ch 1 (pp.10-25).
23. Scoones, I. (2008). Mobilizing against GM crops in India, South Africa and Brazil. Journal of Agrarian Change, 8(2-3), 315-344.
24. Shiva, V. (1988). Women in Nature. In Staying Alive: Women, Ecology and Development. Zed Books. Ch 3 (pp.38-54).

References:

1. Chatterjee, Deba Prashad (2009) 'Appraising a local environmental movement in India: some major determinants of participation', chapter 8 (pp.140-169) in Manmohan Singh Gill and Jasleen Kewlani (eds.) Environmental Conscience: Socio-Legal and Judicial Paradigm, New Delhi, Concept Publishing Company.
2. Guha, R., & Alier, J. M. (1998). The environmentalism of the poor. In Varieties of environmentalism: Essays North and South. New Delhi: Oxford University Press.
3. Osofsky, H. M. (2003). Defining Sustainable Development after Earth Summit 2002. Loy. LA Int'l & Comp. L. Rev., 26, 111.
4. Baviskar, A. (1999). In the Belly of the River: Tribal Conflicts over Development in the Narmada Valley. Oxford University Press.

Group A

DSE-A-(4)

Agrarian Sociology

1. Agrarian Societies and Agrarian Studiesin India

1.1 Village community: Features and Types
1.2 Rural social structure
1.3 Village studies: An overview

2. Key Issues in Agrarian Sociologyin India

2.1 Land Reforms and tenancy reforms
2.1 Rural poverty in India: conditions and problems of the agricultural labourers
2.3 Agrarian unrest and farmers movements

3. Themes in Agrarian Sociology of India

3.1 Labour and agrarian class structure
3.2 Caste, Gender and Agrarian realities
3.3 Green revolution and its impact on agriculture

4. Agrarian Futuresof India

4.1Rural society in transition: Nature, and Dimensions
4.1.1 Agents of change: Corporate Initiatives in Agriculture and Its Implications
4.2 Rural development in India: An overview
4.3 Agrarian crisis

Readings:

1. Beteille, Andre. 'The Study of Agrarian Systems: An Anthropological Approach', from Marxism and Class Analysis, New Delhi: Oxford. 2007. Pp. 84-93.
2. Chitambar J. B. (1973). Introduction Rural Sociology. New Delhi: Wiley Eastern Limited.
3. Dhanagare D.N. 1988. Peasant movements in India, New Delhi, Oxford.
4. Desai A.R. 1997. Rural Sociology in India – Bombay Popular Prakasan.
5. Desai, A.R. (1979): Rural India in Transition, Bombay: Popular Prakashan.
6. Doshi S.L. & P.C. Jain 2002. Rural Sociology, Jaipur, Rawat.
7. Dube, S.C. 1988. India's changing Village: Human Factor in Community Development Himalayan Publishing House, Bombay.
8. Gupta D. N. 2001. Rural Development System. New Delhi Books India International.

9. Jain, Gopal Lal, 1985. Rural development. Mangaldeep Publication, Jaipur.
10. Lal, S. K. (Ed) Sociological Perspective of Land Reforms.
11. Maheshwari, S.R. 1985. Rural Development in India, New Delhi: Sage Publication.
12. Majmudar D. N. (1962). Caste and Communication in an Indian Village. Bombay: Asia Publishing House.
13. Radhakrishnan, P. (1989), Peasant Struggles, Land Reforms and Social Change, Malbar, 1836 – 1982.
14. Singh, Katar, 1995. Rural development: Principle policies and Management Sage: New Delhi.

References:

1. Amin, Shahid. 'Unequal Antagonists: Peasants and Capitalists in Eastern UP in 1930s', Economic and Political Weekly, Vol. 16, No. 42/43 (Oct. 17-24, 1981), pp. PE 19-25, 28, 29.
2. Baker, Christopher J. 'Frogs and Farmers: The Green Revolution in India, and its Murky Past' from, Tim P. Bayliss-Smith and Sudhir Wanmali (Ed.) Understanding Green Revolutions: Agrarian Change and Development Planning in South Asia, Cambridge: Cambridge University Press. 1984. Pp. 37-51.
3. Bandopadhyay, D. 'Reflections on Land Reform in India since Independence' from T. V. Satyamurthy (Ed.) Industry and Agriculture in India Since Independence, Delhi: Oxford University Press. Pp. 301-327.
4. Brass, Tom. 'The New Farmer's Movements in India', from, Tom Brass (ed.), The New farmer's Movements in India, Essex: Frank Cass. (1995). Pp.1-20.
5. Dhanagare, D. N. 'Green Revolution and Social Inequalities in Rural India' from, Economic and Political Weekly, Vol. 22, No. 19/21, Annual Number (May, 1987), pp. AN: 137-139, 141-144.
6. Dumont, Rene. 'Agriculture as Man's Transformation of the Rural Environment', in Teodor Shanin (ed.) Peasants and Peasant Societies, Hamondsworth: Penguin. 1971. Pp. 141-149.
7. Feder, Ernest. 'The New World Bank Programme for the Self-Liquidation of the Third World Peasantry', Journal of Peasant Studies, Volume 3, Issue 3, 1976. Pp. 343-352.
8. Gough, Kathleen. 'Indian Peasant Uprisings' Economic and Political Weekly, Vol. 9, No. 32/34, Special Number (Aug., 1974), 1391-1393+1395-1397+1399+1401-1403+1405-1406.
9. Ludden, David. (1999), 'Agriculture' from, An Agrarian History of South Asia, Cambridge: Cambridge University Press. 1999, Pp . 6-35.
10. Mencher, Joan P. 'Problems in Analyzing Rural Class Structure', Economic and Political Weekly, Vol. 9, No. 35 (Aug. 31, 1974), pp. 1495+1497+1499-1503.
11. Omvedt, Gail. 'The Downtrodden among the Downtrodden: An Interview with a Dalit Agricultural Laborer' Signs, Vol. 4, No. 4, The Labor of Women: Work and Family (Summer, 1979), pp. 763-774.
12. Thorner, Daniel and Alice Thorner. 'The Agrarian Problem in India Today', from, Land and Labour in India, Bombay: Asia Publishing House. 1962. Pp. 3-13.
13. Thorner, Alice. 'Semi-Feudalism or Capitalism? Contemporary Debate on Classes and Modes of Production in India', Parts: 1-3, Economic and Political Weekly, Vol. 17, No. 49 (Dec. 4, 1982), pp. 1961-1968; No. 50 (Dec. 11, 1982), pp. 1993-1999; No. 51 (Dec. 18, 1982), pp. 2061-2064.

14. Vasavi. A. R. 'Agrarian Distress in Bidar: Market, State and Suicides', Economic and Political Weekly, Volume 34, Number 32. (1999). Pp. 2263-2268.

Group B

DSE- B (1)

Indian Sociological Traditions

1. G S Ghurye
1.1 Caste and Race
1.2 City and Civilization

2. Radhakamal Mukerjee
2.1 Personality, Society, Values
2.2 Social Ecology

3. D P Mukerji
3.1 Tradition and Modernity
3.2 Middle Class

4. Verrier Elwin
4.1. Tribes in India

5. M.N. Srinivas
5.1. Social Change

6. Irawati Karve
6.1. Gender and Kinship

7. Leela Dube(
7.1 Caste and Gender

Readings:

1. Amal K. Mukhopadhyay (ed). The Bengali Intellectual Tradition
2. Chakraborty, D 2010, D P Mukerji and the Middle Class in India, Sociological Bulletin59 (2), May-August 235-255.
3. Roma Chatterji. 'The Nationalist Sociology of Benoy Kumar, Sarkar' in Patricia Uberoi et.al.(eds): *Anthropology in the East: Founders of Indian*
4. Dhanagare, D.N (1999), Themes and Perspectives in Indian Sociology, Delhi: RawatPublications Chp 7
5. Dube, Leela 2001, Anthropological Explorations in Gender: Intersecting Fields, New Delhi: Sage Chp 3,5 & 6

6. Dube, Leela 1967, Caste, Class and Power: Eastern Anthropologist Lucknow 20(2) 215-225
7. East: Founders of Indian Sociology and Anthropology, New Delhi: Permanent Black
8. Elwin, Verrier 1952, Bondo Highlander, Bombay: OUP
9. Elwin, Verrier 1955, The Religion of an Indian Tribe, Bombay: OUP Chp 11, 15, 16, 17
10. Ghurye, G.S. 1969, Caste and Race in India, Delhi: Popular Prakashan Pp 114-140,404-460 (82 pages)
11. Ghurye, G.S. 1962, Cities and Civilization, Delhi: Popular Prakashan
12. Guha, Ramchandra 2010, "Between Anthropology and Literature: The Ethnographies of Verrier Elwin‟ in Patricia Uberoi, Satish Despande and Nandini Sundar (eds)Anthropology in the East: Founders of Indian Sociology and Anthropology, New Delhi: Permanent Black
13. Karve, Irawati 1961, Hindu Society — an interpretation, Pune: Deshmukh Prakashan
14. Karve, Irawati 1965, Kinship Organization in India, Bombay and New York: Asia Publishing House
15. Madan T N 2011, Sociological Traditions: Methods and Perspectives in the Sociology ofIndia, New Delhi: Sage
16. Madan, T.N. 2010, "Search for Synthesis: The Sociology of D.P Mukerji" in Patricia Uberoi, Satish Despande and Nandini Sundar (ed) Anthropology in the East: Founders of Indian Sociology and Anthropology, New Delhi: Permanent Black
17. Mukerjee, Radhakamal 1932, (reproduced in1994) „An Ecological Approach toSociology‟ in Ramchandra Guha (ed) Social Ecology Delhi: OUP
18. Mukerjee, Radhakamal 1932, The concepts of balance and organization in Social Ecology Sociology and Social Research 16 (July-August 1932) 503-516
19. Mukerjee, Radhakamal 1950, The Social Structure of Values, London: George Allen and Unwin Chp 2,3, 5, 6 & 9
20. Mukerjee, Radhakamal 1951, The Dynamics of Morals, London: Macmillan & Co
21. Mukerji D.P. (1942 republished 2002), Modern Indian Culture: A Sociological Study, New Delhi: Rupa& Co.
22. Mukerji D.P. (1958 second edition 2002), Diversities: Essays in Economics, Sociology and Other Social Problems, Delhi: Manak Publications Pg 177-225, 261-276
23. D. P. Mukerji Personality and the Social Diversities
24. Munshi, Indra 2004, Verrier Elwin and Tribal Development‟ in T.B. Subba and Sujit Som (eds) Between Ethnography and Fiction: Verrier Elwin and the Tribal Question inIndia, New Delhi: Orient Longman
25. Srinivas, M. N.1992, On Living in a Revolution and Other Essays, Delhi: OUP Chp1,2,3,5&7
26. Srinivas, M.N. 1971, Social Change in Modern India University of California Press Berkeley Chp 4-5
27. Swapan K. Pramanick. Sociology of G. S. Ghurye
28. Sundar, Nandini 2010 "In the Cause of Anthropology: The Life and Work of Irawati Karve" in Patricia Uberoi, Satish Despande and Nandini Sundar (ed) Anthropology in

theEast: Founders of Indian Sociology and Anthropology Permanent Black New Delhi.
29. Uberoi, Patricia Despande Satish and Sundar Nandini (ed) 2010, Anthropology in the East: Founders of Indian Sociology and Anthropology; Permanent Black, New Delhi, India
30. Upadhya, Carol 2010, „The Idea of an Indian Society: G.S. Ghurye and the Making of Indian Sociology‟ in Patricia Uberoi, Satish Despande and Nandini Sundar (ed)Anthropology in the East: Founders of Indian Sociology and Anthropology New Delhi:Permanent Black
31. Venugopal, C.N. 1988, Ideology and Society in India: Sociological Essays, New Delhi:Criterion Publications Chp 7

Group B

DSE- B (2)

Sociology of Visual Culture and Media

1. Introduction

1.1 Introducing Visual Cultures and the Process of 'Seeing'
1.2 The Spectacles of Modernity
1.3 Media practices in diversities

2. Visual Environments and Representations

2.1 Power and gaze of the State
2.2 Visual Practices and Identity formation
2.4 Visual Cultures of Everyday Life

3. Sociology of Media

3.1 Theories of Media
3.2 Media Representation – Old & New
3.3 Media & Globalization
3.4 Globalizing Media
3.5 Role of Internet
3.6. Impact of Media on Human Behaviour

Readings:

1. Anthony Giddens: Sociology
2. Baker, Michael J., and John MT Balmer. "Visual identity: trappings or substance." European Journal of marketing31.5/6, 366-382.
3. Barrat D.: Media Sociology
4. Bilton and others: Introductory Sociology (Macmillan)
5. Burgin, Victor. In/different spaces: Place and memory in visual culture
6. Debord, G. "The Society of the Spectacle (Detroit, MI: Red and Black)."
7. Griffiths, Alison. Wondrous difference: Cinema, anthropology, and turn-of-the-century visual culture.
8. Jenks, Chris, ed. Visual culture.
9. Jones M. & Jones E: Mass Media
10. McCarthy, Anna. Ambient television: Visual culture and public space.
11. Mirzoeff, Nicholas, ed. The visual culture reader.

12. Mirzoeff, Nicholas. How to see the world.
13. Plummer: Sociology: A Global Perspective
14. Rancière, Jacques. Aesthetics and its Discontents.
15. Smith, Marquard, ed. Visual culture studies: Interviews with key thinkers.
16. Tagg, John. "Evidence, truth and order: Photographic records and the growth of the state." The Burden of Representation
17. Tavin, Kevin M. "Wrestling with angels, searching for ghosts: Toward a critical pedagogy of visual culture." Studies in art education
18. Waisbord S. (Ed): Media Sociology: A Reappraisal

References:

1. Appadurai, Arjun, and Carol A. Breckenridge. 'Museums are Good to Think: Heritage on View in India.' *Representing the Nation: A Reader: Histories.Heritage, and Museums.* (Eds.) David Boswell and Jessica Evans .New York: Routledge, 1999.
2. Babb, Lawrence A., and Susan Snow Wadley. *Media and the Transformation of Religion in South Asia*. Philadelphia: University of Pennsylvania, 1995.
3. Bakhtin, Mikhail. 'The Grotesque Image of the Body and Its Sources' In Mariam Fraser & Monica Greco (ed) *The Body: A Reader*. London: Routledge, 2005.
4. Baker, Michael J., and John MT Balmer. "Visual identity: trappings or substance?." European Journal of marketing31.5/6, 366-382.
5. Berger, John. Ways of Seeing. London: British Broadcasting, 1972. (p. 7- 33)
6. Bourdieu, Pierre. 'Identity and Representation: Elements for a Critical Reflection on the Idea of Region' In John B. Thompson (ed) Language andSymbolic Power. Cambridge: Polity, 1991. pp. 220- 228
7. Cohn, Bernard, 1987 (1983), "Representing Authority in Colonial India", in An Anthropologist Among the Historians and Other Essays, Delhi: OUP, pp. 632-650
8. Debord, Guy. *Society of the Spectacle*. Detroit: Black & Red, 1983. (p. 7- 17)
9. Fenske, Gail & Deryck Holdsworth, 'Corporate Identity and the New York Office Building: 1895-1915' In David Ward and Olivier Zunz (ed) *TheLandscape of Modernity: New York City, 1900-1940*. Baltimore: Johns Hopkins UP, 1997.
10. Foucault, Michel. 'Panopticism' In *Discipline and Punish: The Birth of the Prison*. New York: Pantheon, 1977. (p. 195-203)
11. MacDougall, David. 'Photo Hierarchicus: Signs and Mirrors in Indian Photography' in Indian Photography" Visual Anthropology, 1992, 5 (2): 103-29) 17.Certeau, Michel De. The Practice of Everyday Life. (Trans) Steven
12. Mally, Lynn. Revolutionary Acts: Amateur Theater and the Soviet State, 1917-1938. Ithaca: Cornell UP, 2000. (p. 147-169)
13. Mazumdar, Ranjani. *Bombay Cinema: An Archive of the City*. Minneapolis: University of Minnesota, 2007
14. Mirzoeff, Nicholas. 'The Right to Look, or, How to Think With and Against Visuality' In *The Right to Look: A Counterhistory of Visuality*. Durham, NC: Duke UP, 2011.

15. Mitchell, W.J.T. ‘Showing Seeing: A Critique of Visual Culture’ In *Journal of Visual Culture* August 2002 vol. 1 no. 2 165-180
16. Pinney, Christopher. ‘What do Pictures Want Now: Rural Consumers of Images, 1980-2000’ In Photos of the Gods: The Printed Image and Political Struggle in India. London: Reaktion, 2004. Pp. 181-200
17. Pinney, Christopher. *Camera Indica: The Social Life of Indian Photographs*. Chicago: University of Chicago, 1997.
18. Ranciere, Jacques. ‘Problems and Transformations of Critical Art’ In *Aesthetics and Its Discontents*. Cambridge, UK: Polity, 2009.
19. Rappoport, Erika D. ‘A New Era of Shopping: The Promotion of Women’s Pleasure’, Leo Charney and Vanessa R. Schwartz (ed) *Cinema and theInvention of Modern Life*. Berkeley & Los Angeles: University of California Press, 1995
20. Rendall, Berkeley: University of California, 1984 (p. xi-xxiv)
21. Roma Chatterji ‘Global Events and Local Narratives: 9/11 and the Chitrakaars’ In *Speaking with Pictures: Folk Art and Narrative Tradition inIndia* (p 62-103) (Total number of pages w/o pictures - 20)
22. Sciorra, Joseph. ‘Religious Processions as Ethnic and Territorial Markers in a Multi-ethnic Brooklyn Neighborhood’ In Robert A. Orsi (ed) *Gods of the City*. Indiana University Press: 1999
23. Shohat, Ella & Robert Stam ‘Narrativizing Visual Culture’, In Nicholas Mirzoeff (ed) The Visual Culture Reader. 2nd ed. London: Routledge, 2002. (p. 37-41)
24. Srivastava, Sanjay. ‘Urban spaces, Disney-Divinity and Moral Middle classes in Delhi’ In Economic and Political Weekly Vol. XLIV, Nos. 26 & 27 (June 27, 2009), pp. 338-345
25. Tagg, John. ‘Evidence, Truth and Order: Photographic Records and the Growth of the State’ In *Essays on The*Burden of Representation: Essays on Photographies *and Histories.* Amherst: University of Massachusetts, 1988
26. Thomas de la Peña, Carolyn. ‘Ready-to-Wear Globalism: Mediating Materials and Prada's GPS’ In *Winterthur Portfolio.* Vol. 38, No. 2/3 (Summer/Autumn 2003), pp. 109-129
27. Weinbaum, Alys Eve. *The Modern Girl around the World: Consumption, Modernity, and Globalization*. Durham: Duke UP, 2008. Print.

Group B

DSE- B (3)

Sociology of Health and Medicine

1. **Introduction to the Sociology of Health and Medicine**
   - 1.1 Origin and development.
   - 1.2 Conceptualizing Health, Disease, and Illness.
   - 1.3 Social and Cultural dimensions of illness and medicine.
   - 1.4 Medicine as an Institution, Medical Ethics.

2. **Theoretical Orientation in Health and Illness**
   - 2.1 Social Approaches
   - 2.2 Cultural Approaches
   - 2.3 Discourse and Power
   - 2.4 Feminist Approach

3. **Negotiating Health and Illness**
   - 3.1 Medical practices: Health Care System, Health as an Industry
   - 3.2 Public Health: Prevention and awareness of health problems
   - 3.3 Health policy in India

Readings:

1. Biswamoy Pati, Mark Harrison, 2009. Edited The Social History of Health and Medicine in Colonial India, Routledge.
2. Conrad Peter. 2018. The Sociology of Health and Illness: Critical Perspectives; Sage.
3. Jonathan Gabe, Michael Bury, Mary Ann Elston 2004. Edited Key Concepts in Medical Sociology
4. G. Wilson: Understanding Old Age.
5. Kevin White 2017. An Introduction to the Sociology of Health and Illness; Sage.
6. Kumar,Deepak: Disease and medicine in India: A Historical Overview.
7. Madhu Naglaedited. Readings in Indian Sociology: Volume IV: Sociology of Health
8. Mohammad Akram Sociology of Health; Rawat Publications, 2014.
9. Morten Knudsen, Werner Vogd. 2015. Edited. Systems Theory and the Sociology of Health and Illness: Observing Healthcare. Routledge.

10. Patel, Tulsi (2012) Global Standards in Childbirth Practices. In (eds.) V. Sujatha and Leena Abraham Medical Pluralism in Contemporary India. New Delhi: Orient Black Swan. (Pages 232-254).
11. S.K. Biswas: Ageing in Contemporary India.
12. Sanjay Sharma. 1995. Health hazards, gender, and society; Rawat Publications,
13. Scambler Graham: Sociological Theory and Medical Sociology.
14. Scambler. Graham 2012. Edited Contemporary Theorists for Medical Sociology
15. Shireen J. Jejeebhoy, P. M. Kulkarni, K. G. Santhya, Firoza Mehrotra.2014. Population and Reproductive Health in India: An Assessment of the Current Situation and Future Needs. Oxford University Press.
16. Turner, Bryan: Medical Power and Social knowledge.
17. V. Sujatha. 2014. Sociology of Health and Medicine: New Perspectives. OUP
18. William C. Cockerham 2016. Edited The New Blackwell Companion to Medical Sociology, John Wiley& SonsLtd.

References:

1. Annandale, Ellen (1988) *The Sociology of Health and Medicine.* Cambridge: Polity Press.
2. Baer, Hans A., Singer, Merrill and Susser, Ida (1994) Medical Anthropology and the World System, Westport: Praeger. Chapters 10 and 11 (Pages 307-348)
3. Banerji, Debabar (1984) The Political Economy of Western Medicine in Third World Countries. In (ed.) John McKinlay *Issues in the PoliticalEconomy of Healthcare*. New York*:* Tavistock.
4. Boorse, Christopher (1999) On the distinction between Disease and Illness. In (eds.) James Lindermann Nelson and Hilde Lindermann Nelson, *Meaning and Medicine: A Reader in the Philosophy of Healthcare*, New York: Routledge. (Pages 16-27)
5. Das, Veena, R.K. Das and Lester Coutinho (2000) Disease Control and Immunization: A Sociological Enquiry. In *Economic and Political Weekly*, Feb. 19-26. Pages 625-632.
6. Evans- Pritchard, E.E. (2010) The Notion of Witchcraft Explains Unfortunate Events. In (eds.) Byron J.Good, Micheal M. J. Fischer, Sarah S. Willen and Mary-Jo Del Vecchio Good A Reader in Medical Anthropology: Theoretical Trajectories, Emergent Realities, Oxford: Wiley- Blackwell, Chapter2 (Pages 18-25).
7. Foucault, Michel (1994) The Birth of the Clinic: An Archaeology of Medical Perception, New York: Vintage Books. Chapter1 and Conclusion. (Pages 3-20 and 194-199).
8. Fruend, Peter E.S., McGuire, Meredith B. and Podthurst, Linda S. (2003) *Health, Illness and the Social Body*, New Jersey: Prentice Hall. Chapter 9 (Pages 195-223)
9. Good, Byron (1994) *Medicine, Rationality and Experience: An Anthropological Perspective.* Cambridge: Cambridge University Press.Chapter 6. (Pages 135- 165).

10. Gould, Harold A. (I965) Modern Medicine and Folk Cognition in Rural India in *Human Organization*, No. 24. pp. 201- 208.
11. Inhorn, Marcia (2000). Defining Women's health: Lessons from a Dozen Ethnographies, *Medical Anthropology Quarterly,* Vol. 20(3): 345-378.
12. Kleinman, Arthur (1988) The Illness Narratives: Suffering, Healing and the Human Condition. New York : Basic Books Inc. Publishers. Chapter 1. (Pages 3-30).
13. Leslie, Charles (1976) Asian Medical Systems: A Comparative Study, London: University of California Press, Introduction. (Pages 1-12).
14. Morgan, Lynn. Morgan (1987) Dependency Theory and the Political Economy of Health: An Anthropological Critique. Medical Anthropology Quarterly, New Series, Vol.1, No.2 (June, 1987) pp. 131-154.
15. Nichter, Mark and Mimi Nichter (1996) Popular Perceptions of Medicine: A South Indian Case Study. In *Anthropology and InternationalHealth*. Amsterdam: OPA. Chapter7 (Pages 203-237)
16. Patel, Tulsi (2012) Global Standards in Childbirth Practices. In (eds.) V. Sujatha and Leena Abraham Medical Pluralism in Contemporary India. New Delhi: Orient BlackSwan. (Pages 232-254).
17. Qadeer, Imrana (2011) Public Health In India, Delhi: Danish Publishers, Part III, (Pages 221-252).
18. Talcott Parsons (1951) The Social System, London: Routledge & Kegan Paul Ltd. Chapter 10, (Pages 428-479).
19. Turner, Bryan, S. (1995) Medical Power and Social Knowledge, London: Sage. Chapter 5. (Pages.86-108).

Group B

DSE- B (4)

PROJECT: FIELDWORK AND DISSERTATION

Dissertation may be written by using any method as prescribed in the syllabus. Size of the dissertation should be around 5000 words. Dissertation paper will be examined jointly by one Internal and one External Examiner to be appointed by the University. Marks will be awarded jointly by the Internal and External Examiners on the basis of the Fieldwork, Written Dissertation and Viva-voce.

SOCIOLOGY

B.A.(General Program)

SYLLABUS

Under Choice Based Credit System (CBCS)

UNIVERSITY OF CALCUTTA
2018

Note:

- ❖ **Attendance: 10 marks per paper**
- ❖ **Internal Assessment: 10 marks per paper**

- ➢ **<u>Core Courses, Discipline Specific Elective and Generic Elective Courses</u>: (TU+Th=15+65) = (1+5 credits each) = 6 Credits each**

- ➢ **<u>Skill Enhancement Courses:</u> (Th=2 credits each) =2 Credits each**

Course Distribution:

- ➢ <u>Core Courses</u>:8: 6 Credits each
  - 2 Courses each in Semesters 1, 2, 3 and 4 covering two subjects

  <u>LCC:</u> 4 : 6 Credits each (2 courses each from LCC(1) & LCC(2))

- ➢ <u>Elective Courses</u>:

i. Discipline Specific Elective DSE:4: 6 Credits each
- 2Courses in each Semesters 5 and 6,of 2 subjects, (Group-A& B for specified semester)

ii. Skill Enhancement Elective: 4 : 2 credits each
- 2 Courses each in Semesters 3and 5 from Group-A of 2 subjects
- 2 Courses each in Semesters 4and 6 from Group-Bof 2 subjects

iii. Generic Elective: 2 : 6 Credits each
- 1 Course each in Semesters 1and 2 from one subject different from Core Subjects including LCC

Important Note:

- ❖ **UGC Model Syllabus for Sociology has been followed while framing the Syllabus Below. Reference:https://www.ugc.ac.in/pdfnews/1196038_BA_Sociology.pdf**
- ❖ **The Readings provided below include many of those of the UGC Model CBCS Syllabus in Sociology.**
- ❖ **The format is subject to the common structural CBCS format of the University.**

❖ Suggested Mode for 15 Marks Tutorial Segment:

- **Written Mode: 15 marks written evaluation by college CT (Class test) -(7th/ 8th week of the semester); Upto1000/1200 words Term papers- (1/2@ 500/600 Words each)**

- **Presentation Mode: Paper or Report Presentation/ writing on Syllabus based topics or Current topics.**

[All modes/ themes/ topic of the tutorial related segments to be decided by concerned faculty of respective colleges.]

LIST OF COURSES - GENERAL PROGRAM	
CORE COURSES/GENERIC ELECTIVE (4 Courses)	
Subject-Gen-Core/Generic-Semester-Paper-Th &TU	**(6 Credits per Course)** 4x6=24 Credits
SOC-G-CC/GE-1-1-TH&TU	Introduction to Sociology
SOC-G-CC/GE-2-2-TH&TU	Sociology of India
SOC-G-CC/GE-3-3-TH&TU	Sociological Theories
SOC-G-CC/GE-4-4-TH&TU	Methods of Sociological Enquiry
Skill Enhancement Course (2 Credits per Course) 4 courses in 4 semesters from 2 subjects	
GROUP-A: 2Courses each in Semesters3/ 5 from Group-A of 2 subjects	
SOC-G-SEC-X-A(1)-TH	Techniques of Social Research
SOC-G-SEC-X-A (2)-TH	Gender Sensitization
GROUP-B:2Courses each in Semesters 4/ 6 from Group-B of 2 subjects	
SOC-G-SEC-X-B(1)-TH	Theory and Practice of Development
SOC-G-SEC-X- B(2)-TH	Applications of Statistics for Sociology
DISCIPLINE SPECIFIC ELECTIVE (6 Credits per Course)	
GROUP-A 2 Courses in Semesters 5 from 2 subjects	
SOC-G-DSE- 5 -A(1)-TH&TU	Religion and Society
SOC-G-DSE- 5 -A(2)-TH&TU	Family Marriage Kinship
GROUP-B 2 Courses in Semesters 6from 2 subjects	
SOC-G-DSE-6-B(1)-TH&TU	Social Stratification
SOC-G-DSE-6-B(2)-TH&TU	Gender and Sexuality

Course Structure for B.A. (General)

Course Components	B.A. General
Core Course (CC)	8**
Language Core Course (LCC)	4
Generic Elective (GE)	2
Discipline Specific Elective (DSE)	4**
Ability Enhancement Compulsory Course (AECC)	2
Skill Enhancement Elective Course (SEC)	4**
Total no. of courses	24
**Covering two subjects	

Semester wise Courses forB. A. (General):

	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6
Core Course (CC)	2Th+2TU **CC-1**	2Th+2TU **CC-2**	2Th+2TU **CC-3**	2Th+2TU **CC-4**		
Language(LCC)			1Th+1TU **L1(1)**	1Th+1TU **L2(1)**	1Th+1TU **L1(2)**	1Th+1TU **L2(2)**
Elective Courses:						
i)Generic Elective (GE)	1Th+1TU **GE-1**	1Th+1TU **GE-2**				
ii)Discipline Specific Elective (DSE)					2Th+2TU **DSE-A (1A+2A)**	2Th+2TU **DSE-B (1B+2B)**
Ability Enhancement Compulsory Course (AECC)	1Th+0P/TU **AECC-1**	1Th+0P/TU **AECC-2**				
Skill Enhancement Elective (SEC)			1Th+0TU **SEC-A(1)**	1Th+0TU **SEC-B(1)**	1Th+0TU **SEC-A(2)**	1Th+0TU **SEC-B(2)**
Total No. of Courses and Marks	**4 x 100=400**	**4 x 100 =400**	**4 x 100 =400**	**4 x 100 =400**	**4 x 100 =400**	**4 x 100 =400**
Total Credits	20	20	20	20	20	20

Th= Theory TU= Tutorial

- CC/LCC/GE/DSE: Each Theory and Practical Course have 4 and 2 Credits respectively/ Each Theory and Tutorial Course have 5 and 1 Credit(s) respectively
- CC : 4 courses each from 2 disciplines(one course from each subject under each semester)
- LCC: L1-English courses; L2=MIL courses; two courses each
- GE**:** Two courses from one subject different from core subject
- DSE: 2 courses each from 2 disciplines
- AECC/SEC : Each Course has 2 Credits
- AECC-1: Communicative English/MIL,AECC-2: Environmental Studies
- SEC**:** 2 courses from two subjects
- DSE/SEC: Choice must be group specific to each semester

Semester-1

CC/GE-1

Introduction to Sociology

1. **Sociology: Discipline and Perspective**
   - 1.1Nature and Scope of Sociology
   - 1.2 Sociology as a science
   - 1.3 Sociology and Common Sense

2. **Sociology and Other Social Sciences**
   - 2.1 Sociology and Social Anthropology
   - 2.2 Sociology &Psychology
   - 2.3 Sociology &History

3. **Basic Concepts**
   - 3.1 Individual and Group
   - 3.2 Associations and Institutions
   - 3.3 Culture and Society
   - 3.4 Social Change

Readings:

1. A. Beteille : Sociology—Essays on Approach and Method (OUP)
2. Alex Inkeles: What Is Sociology?
3. Alex Thio: Sociology
4. Andre, Beteille, 2009, *Sociology: Essays in Approach and Method*, Delhi: Oxford University Press, Chapter 1, 'Sociology and Common Sense', Pp. 13-27
5. Anthony Giddens : Sociology
6. G. Rocher: A General Introduction to Sociology
7. George Ritzer : Encyclopaedia of sociology
8. Gilles Ferreol& Jean-Pierre Noreck: An Introduction to Sociology(PHI Learning)
9. Gordon Marshal : Dictionary of Sociology (OUP)
10. Harry M. Johnson : Sociology
11. Henry Tischler: Introduction to Sociology
12. J Ross Eshleman& B.G. Cashion: Sociology an Introduction
13. M. Haralambas&R. M. Heald: Sociology Themes and Perspectives.
14. P. Worsely: New Introducing Sociology
15. T. Bottomore : Sociology—A Guide to Problems and Literature

Reference:

1. Béteille, André, 1985, *Six Essays in Comparative Sociology*, New Delhi: Oxford University Press, Chapter 1, 'Sociology and Social Anthropology', Pp. 1-20
2. Beteille, André, 2002, *Sociology: Essays in Approach & Method*, Oxford University Press, Chapter 2, 'Sociology and Social Anthropology', Pp. 28-54
3. Beattie, J., 1966, *Other Cultures*, London R.K.P., Chapter 2, 'Social Anthropology and Some Other Sciences of Man', Pp. 25- 29
4. Burke, Peter, 1980, *Sociology and History*, George Allen and Unwin, Chapter 1, 'Sociologists and Historians', Pp. 13-30
5. Bottomore, T. B. 1971, *Sociology: A Guide to Problems and Literature*, London: Allen and Unwin. Chapter 4, 'The Social Sciences, History and Philosophy', Pp. 65-80
6. Bierstedt, Robert, 1974, *The Social Order*, New York: McGraw Hill Book Company Part 3, Chapter 5, 'The Meaning of Culture', p. 125-151, Chapter 6, 'The Content of Culture' Pp. 152-187, Chapter 7, 'The Acquisition of Culture', Pp. 188-212.
7. Bierstedt, Robert 1974, *The Social Order*, McGraw Hill, Chapter 20, 'The Problem of Social Change' Pp. 527-567
8. Firth, Raymond, 1956, *Human Types*, Thomas Nelson & Sons, Chapter 3,'Work and Wealth of Primitive Communities', Pp. 71-97
9. Garner, James Finn, 1994, *Politically Correct Bedtime Stories: Modern Tales for Our Life and Times*, New Jersey: John Wiley & Sons Inc., Chapters, 'Little Red Riding Hood' & 'Rumpelstiltskin'.
10. Horton, Paul B., Chester L. Hunt. 2004, *Sociology*. New Delhi: Tata McGraw Hill. Chapter 9, Pp. 210- 229
11. MacIver, Robert M, and Charles Hunt Page. 1949. *Society*, New York: Rinehart. Chapter 10, 'Types of Social Groups', Pp. 213-237
12. Redfield, Robert 1956, Chapter 16, 'How Human Society Operates', in Harry L Shapiro (ed.) *Man, Culture and Society*. New York: Oxford University Press, Pp.345-368
13. Ritzer, George, 2004, The *McDonaldisation of Society*, Pine Forge Press, Chapter 1, 'An Introduction to McDonaldisation', Pp. 1-20, Chapter 2, McDonaldisation and Its Precursors' Pp. 21-39, Chapter 9, 'McDonaldisation In a Changing World', Pp. 167-199
14. Ritzer, George, 1996, *Classical Sociological Theory*, New York: McGrawHill, Chapter 1, 'A Historical Sketch of Sociological Theory- The Early Years',Pp. 13-46

Semester-2

CC/GE-2
Sociology of India

1. **India as a Plural Society**
   - **1.1 Unity and Diversity**
   - **1.2 Problem of National Unity**

2. **Social Institutions and Practices**
   - **2.1 Caste**
     - 2.1.1 Sanskritization
     - 2.1.2 Changing aspects
   - **2.2 Tribe**
     - 2.2.1 Features
     - 2.2.2 Tribes in contemporary India
   - **2.3 Class**
     - 2.3.1 Rural class
     - 2.3.2 Urban class
   - **2.4 Village**
     - 2.4.1 Self-sufficient village community
   - **2.5 Family and Kinship**
     - 2.5.1 Types of family
     - 2.5.2 Kinship in India

3. **Identities and Change**
   - **3.1 Dalits' Movement**
   - **3.2 Women's Movement**

4. **Challenges to State and Society**
   - **4.1Communalism**
     - 4.1.1 Problems
     - 4.1.2 Solution
   - **4.2 Secularism**
     - 4.2.1 Concept
     - 4.2.2 Nature

Readings:

1. A. R. Desai, Social Background of Indian Nationalism (6Th-Edn): Popular Prakashan, 2005
2. AniruddhaChoudhury. 2016. "BharaterSamajPrasange" Chatterjee Publishers.
3. B Kuppuswamy, Social Change in India: Vikas Publications, 1972

4. Biswajit Ghosh (Ed), Development and Civil Society: Rawat, 2012
5. Ganguly&Moinuddin, SamakalinBharatiyaSamaj: PHI Learning 2008 (in Bengali)
6. Gerald James Larson, India's Agony over Religion: Suny Press, 1995
7. Giri Raj Gupta. Family and Social Change in Modern India:, Vikas Publishing House, 1976
8. N.Jayaram, On Civil Society: Issues and Perspectives: Sage, 2005
9. NeeraChandhoke& Praveen Priyadarshi, Contemporary India: Economy, Society, Politics: Pearson Education India, 2009
10. Patricia Uberoi, Family, Kinship and Marriage in India: OUP India, 1994
11. Rajendra K Sharma, Indian Society: Institutions and Change: Atlantic Publishers &Dist, 2004
12. Shah, Ghanshyam. Dalit i d e n t i t y a n d p o l i t i c s. Delhi: Sage 2001
13. T. N. Madan, Religion in India: OUP India, 1992
14. Veena Das, Handbook of Indian Sociology: OUP India, 2006

References:

1. Alavi, Hamaza and John Harriss (eds.) 1989. *Sociology of 'Developing Societies': South Asia.*London: Macmillan. John Harriss, „The Formation of Indian society: Ideology and Power". 126 –133.
2. Deshpande, Satish, 2003, *Contemporary India : A Sociological View*.New Delhi; Viking, pp. 125-150.
3. Dumont, L. 1997, *Religion, Politics and History in India.* Paris: Mouton, Chapter 5
4. Haimendorf, C.V.F., 1967, „The Position of Tribal Population in India", in Philip Mason (ed.), *India and Ceylon: Unity and Diversity*, New York: Oxford University Press, Chap9.
5. Karve, Iravati. 1994, „The Kinship map of India", in Patricia Uberoi(ed.) *Family, kinship and marriage in India.* Delhi: Oxford University Press, pp.50-73.
6. Kumar, Radha. 1999, "From Chipko to sati: The Contemporary womens "movement", in NiveditaMenon (ed.) *Gender and Politics in India*. Delhi: Oxford University Press, pp. 342-369.
7. Madan, T.N., 1997, *Modern Myths and Locked Minds*. Delhi: Oxford University Press, Chap 8.
8. Mason, Philip 1967. "Unity and Diversity: An Introductory Review" in Philip Mason(ed.) India and Ceylon: Unity and Diversity. London: Oxford University Press, Introduction
9. Shah, A. M., 1998, *The Family in India: Critical Essays*. Orient Longman, 52-63.
10. Shah, Ghanshyam. 2001, *Dalit identity and politics.* Delhi: Sage, Chap1 and 7.
11. Srinivas, M.N., 1956, "A Note on Sanskritization and Westernization", *The Far Eastern Quarterly*, Volume 15, No. 4, pp 481-496.
12. Srinivas, M.N., 1969, "The Caste System in India", in A. Beteille (ed.) *Social Inequality: Selected Readings.* Harmondsworth: Penguin Books, pp.265-272.

13. Srinivas, M.N., 1987, *The Dominant Caste and Other Essays*, Delhi: Oxford University Press, pp.20-59.
14. Stern, Robert W. 2003. *Changing India.* Cambridge: CUP. Introduction. Change, societies of India and Indian Society. pp. 1 – 31.
15. Thorner, Daniel, 1992."Agrarian Structure" in Dipankar Gupta (ed.), *Social Stratification in India*, New Delhi: Oxford University Press, pp. 261-270.

Semester-3

CC/GE-3
Sociological Theories

1. **Emergence of sociology as a new discipline: A brief account**
2. **Karl Marx**
   2.1 Materialist Conception of History
   2.2 Class and Class Struggle
3. **Emile Durkheim**
   3.1 Social Fact
   3.2 Forms of Solidarity
4. **Max Weber**
   4.1 Ideal Types and Social Action
   4.2 Types of Authority

Readings:

1. Alan Swingewood. A Short History of Sociological Thought; PHI Learning, 1991
2. Aron, Ramond. 1967(1982 reprint). Main currents in sociological thoughts (2volumes). Harmondsworth, Middlesex: Penguin Books.
3. H.E. Barnes. Introduction to History of Sociology
4. Coser, Lewis A. 1979. Masters of Sociological Thought. Rawat: Jaipur
5. Ernest Fischer. How to Read Karl Marx, Aakar: New Delhi 2008
6. Fletcher, Ronald. 1994. The Making of Sociology (2 volumes) Jaipur-Rawat.
7. Maurice Cornforth. DwandamulokBastubad(tr. Into Bengali by BholanathBandyopadhyay)
8. Morrison, Ken.1995 Marx, Durkheim, Weber: Formation of Modern Social Thought. London; sage.
9. Santanu Ghosh. SamajtatwikChintadhara
10. Ramanuj Ganguly, 2nd Ed Tatwo O ChintadarsheSamokalinSamajtatwa:, Reena Books: Kolkata 2013 (in Bengali)
11. Ritzer, George. 1996. Sociological Theory. New Delhi. Tata-McGraw Hill.
12. The Communist Manifesto (21 February 1848), Karl Marx & Friedrich Engels, Echo Library, 2009

Semester-4

CC/GE-4
Methods of Sociological Enquiry

1. **The Logic of Social Research**
   - 1.1 Concepts; Variables; Propositions
   - 1.2 Conceptualization and Operationalization
   - 1.3Formulation and Verification of Hypotheses
   - 1.4 Research Design: Exploratory, Explanatory, Descriptive
   - 1.5 Sampling logic: Probability and Non-probability

2. **Methodological Perspectives**
   - 2.1 The Positivist Method
   - 2.2 The Interpretative Method
   - 2.3 The Comparative Method
   - 2.4 The Ethnographic Method

3. **Modes of Enquiry**
   - 3.1 Theory and Research
   - 3.2 Quantitative & Qualitative: Survey & Experimental Research; Qualitative Field Research & Unobtrusive Research- Types, Tools & Techniques
   - 3.3 Analysis & Interpretation of data: Quantitative & Qualitative

Readings:

1. Babbie, Earl. 2010. The practice of social research. California: Wadsworth Cengage Learning.
2. Bajaj and Gupta. 1972 Elements of Statistics. New Delhi: R.Chand and Co., New Delhi.
3. Beteille, A. and Madan, T.N. 1975 Encounter and experience: Personal Accounts of Fieldwork. Vikas Publishing House, New Delhi.
4. Bryman, Alan. 2012. Social research methods (4^{th}ed). Oxford University Press.
5. Bryman, Alan. 1988 Quality and Quantity in Social Research Unwin Hyman, London
6. Bryman, Alan. 2004, Quantity and Quality in Social Research, New York: Routledge.
7. Chattopadhyay, Krishnadas& Sen, Sudarshana. (2013). Rudiments of social research. Kolkata: Levant Books.
8. Creswell, John. 2014. Research Design: Qualitative, Quantitative & Mixed method approaches (4^{th}ed.). Sage publications.
9. Jayram, N.1989. Sociology: Methods and Theory. Madras: MacMillan, Madras
10. Kothari,C.R. Research Methodology: Methods and Techniques, Bangalore, Wiley Eastern.
11. Nachmias, David. &Nachmias, Chava. 1981. Research methods in the social sciences. New York: St. Martin's Press.
12. Punch, Keith. 1996. Introduction to Social Research, Sage, London.

13. Ranjit Kumar. 2011. Research Methodology: A step-by-step guide for beginners. Sage Publications.
14. Shipmen, Martin. 1988The Limitations of Social Research Sage, London.
15. Young, P.V. 1988 Scientific Social Survey and Research Prentice Hall, New Delhi.

References:

1. Ahuja, Ram. 2011. Research methods. Rawat publications.
2. Béteille, A. 2002, Sociology: Essays on Approach and Method, New Delhi: Oxford University Press, Chapter 4, pp. 72-94.
3. Durkheim, E. 1958, The Rules of Sociological Method, New York: The Free Press.
4. Geertz, Clifford. 1973. Interpretation of Cultures, New York: Basic Books. Chapter 1, pp. 3-30; Chapter 1& 2, pp. 1-46.
5. Gluckman, M. 1978, 'Introduction', in A. L. Epstein (ed.), The Craft of Social Anthropology, Delhi: Hindustan Publishing Corporation, pp. xv-xxiv.
6. Goode, W.J. and P. K. Hatt. *Methods in Social Research* (Indian reprint). New Delhi: Surjeet Publisher, 2006.
7. Guthire, G. Basic Research Methods: An Entry to Social Science research. New Delhi: Sage, 2010.
8. May, Tim. 2001. Social Research: Issues, methods & process. Philadelphia: Open University Press.
9. McTavish, Don. G. &Loether, Herman J. 2015. Social research: An evolving process. Noida: Pearson India Education Services Pvt. Ltd.
10. Merton, R. K. 1972, Social Theory and Social Structure, Delhi: Arvind Publishing House.
11. Mills, C. W. 1959, The Sociological Imagination, London: Oxford University Press, Chapter 1, pp. 3-24.
12. Neuman, Lawrence. 2014. Social Research Methods: Qualitative and Quantitative Approaches (7^{th}ed). Pearson Education Limited.
13. Radcliffe-Brown, A. R. 1958, Methods in Social Anthropology, Delhi: Asia Publishing Corporation, Chapter 5, pp. 91-108.
14. Srinivas, M.N. et. al. 2002(reprint), The Fieldworker and the Field: Problems and Challenges in Sociological Investigation, New Delhi: OUP, Introduction, pp. 1-14.
15. Weber, Max. 1949, The Methodology of the Social Sciences, New York: The Free Press, Foreword, pp. iii- x.

Skill Enhancement Course

(2 Credits per Course)

Semesters 3,4, 5 and 6

SEC-A : Semester 3/5

SEC-B : Semester 4/6

SEC-A-(1)

Techniques of Social Research

1. **Research Design**
   - 1.1 Formulation of a research problem
   - 1.2 Framing research questions

2. **Data Collection**
   - 2.1 Secondary sources: Reading & Reviewing appropriate literature
   - 2.2 Sampling frameworks; Probability & Non-Probability
   - 2.3 Primary sources: Methods of data collection; Questionnaire; Interview; preparation & framing; limitations

3. **Data Analysis**
   - 3.1 Data Recording, Coding, Processing and interpretation
   - 3.2 Content analysis
   - 3.3 Case Study Method

4. **Project Report Writing**
   - 4.1 Writing social research report; some basic considerations
   - 4.2 Organization of the report
   - 4.3 Reference& Bibliography

Readings:

1. Babbie, Earl. 2010. The practice of social research. California: Wadsworth Cengage Learning.
2. Baker, Therese, L. 1994. Doing Social Research (2nd edition). New York: McGraw-Hill, Inc. Britt, Steuart Henderson. 1971. The Writing of Readable Research Reports. Journal of Marketing Research 8, no.
3. Bryman, Alan. 2012. Social research methods (4^{th}ed). Oxford University Press.
4. Ranjit Kumar. 2011. Research Methodology: A step-by-step guide for beginners. Sage Publications.

References:

1. Ahuja, Ram. 2011. Research methods. Rawat publications.
2. Amir B. Marvasti, 2004, Qualitative Research in Sociology, London: Sage.
3. Béteille, A. 2002, Sociology: Essays on Approach and Method, New Delhi: Oxford University Press, Chapter 4, pp. 72-94.
4. Booth, P.F. 1991. Report Writing, Huntingdon: Elm Publications.
5. Bryman, Alan. 2004, Quantity and Quality in Social Research, New York: Routledge, Chapter 2 & 3, pp. 11-70.
6. Chattopadhyay,Krishnadas& Sen, Sudarshana. 2013. Rudiments of social research. Kolkata: Levant Books.
7. Creswell, John. 2014. Research Design: Qualitative, Quantitative & Mixed method approaches (4thed.). Sage publications.
8. Gluckman, M. 1978, 'Introduction', in A. L. Epstein (ed.), The Craft of Social Anthropology, Delhi: Hindustan Publishing Corporation, pp. xv-xxiv.
9. Geertz, Clifford. 1973. Interpretation of Cultures, New York: Basic Books. Chapter 1, pp. 3-30.
10. Lofland J. and Lofland L. 1984, Analysing Social Settings: A Guide to Qualitative Observation and Experiment, California: Wadsworth
11. Mills, C. W. 1959, The Sociological Imagination, London: Oxford University Press, Chapter 1, pp. 3-24.
12. Merton, R. K. 1972, Social Theory and Social Structure, Delhi: Arvind Publishing House, Chapters 4 & 5, pp. 139-171.
13. Neuman, Lawrence. 2014. Social Research Methods: Qualitative and Quantitative Approaches (7thed). Pearson Education Limited.
14. May, Tim. 2001. Social Research: Issues, methods & process. Philadelphia: Open University Press.
15. McTavish, Don. G. &Loether, Herman J. 2015. Social research: An evolving process. Noida: Pearson India Education Services Pvt. Ltd.
16. Morgan, David L. 1996, “Focus Groups”, Annual Review of Sociology 22, pp. 29-52
17. Nachmias, David. &Nachmias, Chava. 1981. Research methods in the social sciences. New York: St. Martin’s Press.
18. Radcliffe-Brown, A. R. 1958, Methods in Social Anthropology, Delhi: Asia Publishing Corporation, Chapter 5, pp. 91-108.
19. Srinivas, M.N. et. al. 2002(reprint), The Fieldworker and the Field: Problems and Challenges in Sociological Investigation, New Delhi: OUP, Introduction, pp. 1-14.

SEC-A-(2)

Gender Sensitization

1. **What is Gender?**
   - 1.1 Gender as a category
   - 1.2 Gender, Sex and sexuality
   - 1.3 Masculinity and Femininity
   - 1.4 Private and public dichotomy
   - 1.5 Gender stereotypes

2. **Gender Construction**
   - 2.1 Beyond the gender binary
   - 2.2 Ideas and Discrimination on LGBT

3. **Gender Practices and Policies**
   - 3.1 Gender Inequality
     - 3.1.1 Female Infanticide and Child Marriage
     - 3.1.2 Pocso Act: Overview and Awareness
     - 3.1.3 Eve teasing, Rape, Domestic violence
   - 3.2 Gender and Workplace Harassment
     - 3.2.1 Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 ("POSH Act")
     - 3.2.2 Vishakha judgment and Current situation

Readings:

1. Abbott, Pamela, Claire Wallace and Melissa Tyler. 2005. An Introduction to Sociology: Feminist Perspectives. London: Routledge.
2. AanchalKapur, Sanjay Muttoo, SumanBisht. 2004. from Thought to Action: Building Strategies on Violence against Women. Kriti,
3. Anil DuttaMishar. 2002. Patterns of Gender Violence. Radha Publications,
4. Bhasin, Kamala. 1993. What is Patriarchy? New Delhi: Kali for Women.
5. Bhasin, Kamla, 2003. Understanding Gender, Kali for Women.

6. C. Chidamabaranathan, I. Jenitta Mary, and M. D. Allen Selvakumar A FEMINIST ANALYSIS ON FEMALE INFANTICIDE; INTERNATIONAL JOURNAL OF BUSINESS POLICY AND ECONOMICS Vol. 4, No. 1, (2011) : 85-96
7. Chaudhuri, Maitrayee 2004.Feminism in India: Issues in Contemporary Indian Feminism Kali for Women, New Delhi.
8. Dube, Leela. 'On the Construction of Gender: Hindu Girls in Patrilineal India', *Economic and Political Weekly*, Vol. 23, No. 18 (Apr. 30, 1988), pp. WS11-WS19
9. Ehrlich, Susan (eds). 2017. The Handbook of language, Gender and Sexuality, John Wiley & Sons
10. Fernandes, Leela.(ed). 2014. Handbook of Gender in South Asia. London: Routledge
11. Furr.L, Allen. 2018. Women, Violence and Social Stigma. Jaipur: Rawat Publications.
12. Gibson, M.A, Deborah T. Meem& Jonathan Alexander. (2013), Finding out: An Introduction to LGBT Studies, Sage
13. Halberstam, Judith. 1998. "An Introduction to Female Masculinity: Masculinity without men, in Female Masculinity. London: Duke University Press (pp 1-43) (Also New Delhi: Zubaan 2012 Reprint)
14. Holmes, Mary. 2009. Gender and Everyday Life. London: Routledge.
15. Jackson, Stevi and Sue Scott (eds.) 2002. Gender: A Sociological Reader. London: Routledge.
16. Kabeer, Naila 1994. Reversed Realities: Gender Hierarchies in Development Thought: Gender Hierarchies in Development
17. Kaur, Manmeet: Female Foeticide – A Sociological Perspective. The Journal of Family Welfare. March 1993. 39(1). p. 40-43.
18. Karlekar, Malavika. Domestic Violence, *Economic and Political Weekly*, Vol. 33, No. 27(Jul. 4-10, 1998), pp. 1741-1751
19. Kimmel, Michael S. *The Gendered Society*. New York: Oxford University Press, 2011. Chapter 13. Gender of Violence, Pp. 381-407
20. Kirsch, M.H. 2013, Queer Theory and Social Change, Routledge.
21. MamtaMahrotra. Gender Inequality in India. Prabhat Publications.
22. Menon, Nivedita (ed.).1999. Gender and Politics in India. New Delhi: Oxford University Press.
23. Nicola Malizia. 2017. A Social Problem: Individual and Group Rape; Advances in Applied Sociology, 2017, 7, 95-114.
24. Omvedt, Gail, *Violence Against Women: New Movements and New Theories in India.* Delhi: Kali for Women, 1990. Pp. 1-40.
25. Naquvi, Farah. 2010. This Thing called Justice: Engaging Laws on Violence against Women In India, in BishakhaDutta (ed.), Nine Degrees of Justice: New Perspectives on Violence Against Women in India. Delhi: Zuban, 2010.
26. Rege, Sharmila. (ed). 2003. Sociology of Gender: The Challenge of Feminist Sociological Knowledge. New Delhi: Sage.
27. RehanaGhadially edited, 2007. Urban Women in Contemporary India: A Reader, Sage

28. Serano, J. 2013. Excluded: Making Feminist and Queer Movements More Inclusive, Hachette UK, 2013.
29. ShilpaKhatriBabbar. 2014. Child Welfare: A critical analysis of some of the socio-legal legislations in India. Journal Of Humanities And Social Science (IOSR-JHSS) Volume 19, Issue 8, Ver. II (Aug. 2014), PP 54-60
30. SnehLataTandon andRenu Sharma 2006. Female Foeticide and Infanticide in India: An Analysis of Crimes against Girl Children; International Journal of Criminal Justice Sciences Vol 1 Issue 1 January 2006.
31. T.V. Sekher and NeelambarHatti. 2010. Disappearing Daughters and Intensification of Gender Bias: Evidence from Two Village Studies in South India; SOCIOLOGICAL BULLETIN 59 (1), January – April 2010, pp. 111-133.
32. Tejani, Sheba. Sexual Harassment at the Workplace: Emerging Problems and Debates, *Economic and Political Weekly*, Vol. 39, No. 41 (Oct. 9-15, 2004), pp. 4491-4494
33. V. K. Madan, 2013. THE DYNAMICS OF RAPE IN MODERN INDIAN SOCIETY; AGORA International Journal of Juridical Sciences, No. 4 (2013), pp. 81-87.
34. Yadav. Mukesh 2013. SC on Eve-Teasing: Human Rights of Woman in India; J Indian Acad Forensic Med. April-June 2013, Vol. 35, No. 2.

References:

1. Aadil Bashir, ShabanaKhurshid. 2013. Eve Teasing and Molestation – A Case Study of District Srinagar; International Journal of Science and Research (IJSR); Volume 2 Issue 12, December 2013
2. AshayAbbhi | KirthiJayakumar | Manasa Ram Raj | RamyaPadmanabhan. 2013. Child Marriages in India An insight into Law and Policy December 2013 Final Report of the Red Elephant Foundation; December 2013.
3. ChesfeedaAkhtar. 2013. Eve teasing as a form of violence against women: A case study of District Srinagar, Kashmir; International Journal of Sociology and Anthropology; Vol. 5(5), pp. 168-178, August, 2013
4. Chowdhry, Prem. Enforcing Cultural Codes: Gender and Violence in Northern India, Economic and Political Weekly, Vol. 32, No. 19 (May 10-16, 1997), pp. 1019-1028
5. Cristina Bicchieri Ting Jiang Jan Willem Lindemans . 2015. A Social Norms Perspective on Child Marriage: The General Framework; University of Pennsylvania, To be Published by UNICEF.
6. Das, Veena& Kim TurcotDiFruscia. 2010. Listening to Voices: An Interview with Veena Das, Altérités, vol. 7, no 1,: 136-145.
7. Jennifer L. Solotaroff, RohiniPrabhaPande. Violence against Women and Girls: Lessons from South Asia; South Asia development Forum; The World Bank.

8. Kandiyoti, Deniz. 1991. “Bargaining with Patriarchy” in Judith Lorber and Susan A. Farrell (eds.). 1991. The Social Construction of Gender. Newbury Park, Calif: Sage Publications (pp 104-118).
9. M. E. Khan, 2014. Sexuality, Gender Roles, and Domestic Violence in South Asia; Population Council, 2014
10. MacKinnon, Catharine A. *Only Words*. Cambridge, Mass.: Harvard University Press, 1993. Chapter II Racial and Sexual Harassment. Pp. 43 – 68.
11. Menon, Nivedita. Recovering Subversion: Feminist Politics beyond the Law. Ranikhet: Permanent Black. 2004. Chapter 3. Sexual Violence: Escaping the Body.Pp. 106 – 156
12. Newton, Esther. 2000. “Of Yams, Grinders and Gays: The Anthropology of Homosexuality” in Margaret Mead Made Me Gay: Personal Essays, Public Ideas. Durham: Duke University Press (pp 229-237)
13. Palriwala, Rajni, 1999. “Negotiating Patriliny: Intra-household Consumption and Authority in Rajasthan (India)”, in RajniPalriwala and Carla Risseeuw (eds.). 1996. Shifting Circles of Support: Contextualizing Kinship and Gender in South Asia and Sub-Saharan Africa. New Delhi: Sage Publications (pp 190 -220).
14. Phipps, Alison 2009. Rape and respectability: ideas about sexual violence and social class. Sociology, 43 (4). pp. 667-683.
15. Rege, S. 1998. “Dalit Women Talk Differently: A Critique of 'Difference' and Towards a Dalit Feminist Standpoint Position.” Economic and Political Weekly,Vol. 33, No. 44 (Oct.31-Nov. 6, 1998) (pp39-48)
16. Sharon L. Talboys, ManmeetKaur, James Van Derslice, Lisa H. Gren, Haimanti Bhattacharya, and Stephen C. Alder. 2017. What Is Eve Teasing? A Mixed Methods Study of Sexual Harassment of Young Women in the Rural Indian Context; SAGE Open January-March 2017: 1–10
17. Sherry Ortner. 1974. “Is male to female as nature is to culture?” M.Z. Rosaldo and L. Lamphere (eds.) Women, culture and society. Stanford: Stanford University Press (pp 67-87)
18. Stanley, L. 2002. ‘Should Sex Really be Gender or Gender Really be Sex’, in S. Jackson and S. Scott (eds.) Gender: A Sociological Reader, London: Routledge (pp31-41).
19. Uberoi, Patricia “Feminine Identity and National Ethos in Indian Calendar Art” In Economic and Political Weekly Vol. 25, No. 17 (Apr. 28,1990), (pp WS 41-48).
20. Whitehead, A. 1981, “I’ m Hungry Mum”: The Politics of Domestic Budgeting” in K. Young et al. (eds.) *Of Marriage and the Market: Women’s Subordination Internationally and its Lessons.* London: Routledge and Kegan Paul (pp.93-116)

SEC-B-(1)

Theory and Practice of Development

1. **What is development?**

2. **Recent trends in Development and Post development**
   2.1 Social development indicators
   2.2 Sustainable development
   2.3 Growth-Development Debate
   2.4 Private–Public Partnership-PPP

3. **Social services & development**
   3.1 Concept of social service
   3.2 Social services for socialization and development
   3.3 Participatory development: Gender and Development GAD; Civil society& grassroots initiatives: SHG; NGO
   3.4 Corporate Social Responsibility-CSR

4. **Human Development: Growth vs. Development**
   4.1 Development with dignity
   4.2 Decentralisation of development: Panchayat & Municipality
   4.3 MGNREGA
   4.4 Digital India

Readings:

1. Arora, Ramesh. K. &Hooja, Meenakshi. 2009. Panchati Raj, participation and decentralisation. Rawat publications.
2. Adamsen L, Rasmussen JM. 2001. Sociological perspectives on self-help groups: reflections on conceptualization and social processes; Journal of Advanced Nursing. 2001 Sep; 35 (6):909-17.
3. AparajitaPattnaik and SrimatiNayak. 2017. Corporate social responsibility: principles and practices in India International Research Journal of Social Sciences, 42-46.

4. Banerjee, S. B. 2008. Corporate social responsibility: The good, the bad and the ugly. Critical Sociology, 34(1), pp. 51-79.
5. Barnett, T., 1988. Sociology & Development, Nutchinson, London.
6. Bhaduri, Amit. 2005. Development with dignity: A case for full employment. New Delhi: National Book Trust.
7. Chandhoke, Neera. 1995. State & civil society: Explorations in Political theory, Sage publications.
8. Chaubey, P.K. 2001. Population policy for India. New Delhi: Kanishka Publishers.
9. Dreze, Jean, and Amartya Sen. 2002. *India: Development and participation*. USA: Oxford University Press.
10. Dreze, J. & Sen, Amartya. 2013. An uncertain glory: Indian and its contradictions.
11. Hobhouse, L.T., 1966. *Social Development*, London: George Allen & Unwin.
12. Jayaram, N. (Ed.) 2005. *On civil society: Issues & Perspectives*. New Delhi: Sage publications.
13. K. Raja Reddy C.S. Reddy. 2012. Self Help Groups in India: A Study on Quality and Sustainability; ENABLE Publication.
14. Maddick, Henry. (2018). Panchayati Raj: A study of rural local governance in India. Rawat Publications.
15. MoRD, 2012. MGNREGA Sameeksha: An anthology of research studies on the Mahatma Gandhi National Rural Employment Guarantee Act, 2005, 2006-2012. New Delhi: Orient Blackswan.
16. Nagaraj, R. (2012). Growth, Inequality and Social Development in India: Is Inclusive Growth Possible? Springer.
17. Pandey, Ragendra. 1985. Sociology of development. New Delhi: Mittal Publications.
18. Samal, Sandhyarani. 2015. Self-Help groups and women empowerment: Problems and prospects. International Journal of Applied Research; 1(13): 235-239.
19. Sen, Amartya. And SudhirAnand. 1994. ‘‘Sustainable Human Development: Concepts and Priorities.’’ Background Paper for the Human Development Report. New York: Human Development Report Office.
20. Singha Roy, D.K. (Ed). 2001. Critical issues of grassroots mobilisation and collective action. Social development and empowerment of the marginalised groups. New Delhi: Sage publications.
21. Singh, Katar. 2009. *Rural Development: Principles, Policies and Management*, New Delhi: SAGE Publications India Pvt Ltd.
22. Thakur, Shabnam, 2012. Panchayati Raj, decentralisation and rural development. Abhijeet publications.
23. Thomas, PradipNiman. 2012. *Digital India: Understanding information, communication and social change*. New Delhi: Sage publications India Pvt Ltd.
24. Vveinhardt, J., Andriukaitiene, R. 2017. Management Culture as Part of Organizational Culture in the Context of Corporate Social Responsibility Implementation. Economics and Sociology, 10(3), 294-320.
25. UN, 2007. Indicators of sustainable development: Guidelines and methodologies. Third ed. New York: United Nations.
26. UNDP, 2015. MGNREGA Sameeksha II: An anthology of research studies (2012-2014). United Nations Development Programme.
27. UNDP, 2016. Human development report. New York: United Nations.

References:

1. Agarwal, A. (1992), "What is sustainable development?" Down to Earth, June 15th, 50-51.
2. Chantia, A. (2008). Awareness regarding activities of national service scheme: An appraisal. *Anthropologist*, Vol. 10(4), 289-296.
3. Chakravarthy, Sukhemoy. Development Planning: The Indian Experience. Oxford University Press.
4. Dhanagare, D.N. (1996). Development process and environmental problems.
5. Dube, S.C. (1988). Modernisation and development. New Delhi: Vistaar Publications.
6. EREN KARACA AKBA2012. A SOCIOLOGICAL STUDY OF CORPORATE SOCIAL RESPONSIBILITY: A MARXIST PERSPECTIVE. Online Thesis
7. Gadgil, D.R. 1967. District development planning. Poona: Gokhale Institute of Politics and Economics.
8. Haq, Mathbulul. 1988. Changing paradigm of development: The evolving participatory society. *Journal of Social & Economic Development*, 35-45.
9. Kaikobad, N.F. &Krishan, Kapil, K. 1971. Training & consultancy needs in National service scheme. Tata Institute of Social Sciences.
10. Kennedy Nyataya, Isaboke Peter. 2016. Women Self Help Groups Enhancing Women's Development Processes in Kenya; International Journal of Research in Sociology and Anthropology (IJRSA) Volume 2, Issue 2, 2016, PP 18-25.
11. M. Saravanan, 2016. "THE IMPACT OF SELF-HELP GROUPS ON THE SOCIOECONOMIC DEVELOPMENT OF RURAL HOUSEHOLD WOMEN IN TAMIL NADU - A STUDY" International Journal of Research – Granthaalayah, Vol. 4, No. 7: 22-31.
12. Minimol M. C. and Makesh K. G. 2012..Empowering rural women in Kerala: A study on the role of Self Help Groups (SHGs); International Journal of Sociology and Anthropology Vol. 4(9), pp. 270-280, November, 2012
13. Mukhtar Ahmad Bhat&Irshad Ahmad Wani, AhsanAhrar, Manzoor Ahmad. 2014. Empowerment of Women through Self Help Group in Madhya Pradesh: A Sociological Study; Journal Of Humanities And Social Science; Volume 19, Issue 1, Ver. IX, PP 80-94.
14. Oommen, T.K. 1998. Changing paradigm of development: The evolving participatory society. *Journal of Social and Economic Development*, 35-45.
15. Rawat, S.S. Panchayat Raj and rural development. Research India Press.
16. Saiyidain, K.G. 1961. National service for the youth. New Delhi: Government of India.
17. Santhanam M.L. 1993. Community participation in sustainable development. *The Indian Journal of Public Administration*. Vol. XXXIX (3).
18. Sen, Amartya. 1989. ''Development as Capabilities Expansion.'' Journal of Development Planning 19: 41 – 58
19. Sen, Amartya. Resources, values, and development. Harvard University Press, 1997.
20. Singh, S.P. 2003. *Planning and management for rural development*. New Delhi: Mittal Publications.

SEC-B-(2)

Applications of Statistics for Sociology

1. **Basic Concepts: Statistics, population, parameter, statistics, Sample, variable**
2. **Definition of Social Statistics and Use of statistics in Social Research**
3. **Frequency Distribution**
4. **Graphical presentation of Data**
5. **Sampling – Types and uses**
6. **Coding and Tabulation**
7. **Central Tendency --- Mean, Median, Mode**

Readings:

1. Elifson, Kirk W., Richard P. Runyon, and Audrey Haber. Fundamentals of social statistics. McGraw-Hill Humanities, Social Sciences & World Languages, 1990.
2. Das N.G.: Statistics
3. Kothari, C R Research Methodology, New Delhi: New Age International, 2004.

Discipline Specific Elective

(6 Credits per Course)

Semesters 5 and 6

DSE-A: Semester-5

DSE-B: Semester-6

DSE-A(1)
Religion and Society

1. Understanding Religion

1.1. Sociology of Religion: Meaning and Scope
1.2. Durkheim: Sacred and Profane
1.3 Weber: Religious Ethics and Economy

2. Religion in India

2.1. Hinduism
2.2. Islam
2.3. Christianity
2.4. Sikhism
2.5. Buddhism

3. Secularism &Communalism: Meaning, Characteristics and Factors

Readings:

1. Asad. T. 1993. Genealogies of Religion: Discipline and Reasons of Power in Christianity andIslam, John Hopkins Press: Baltimore, pp 27-54.
2. Berger, Peter L. "Reflections on the sociology of religion today." Sociology of Religion 62.4 (2001): 443-454.
3. Berger, Peter L. The sacred canopy: Elements of a sociological theory of religion. Anchor/Open Road Media, 2011.
4. Béteille, A. 2002. Sociology: Essays on Approach and Method. OUP: New Delhi, pp134-150.
5. Dillon, Michele, ed. Handbook of the Sociology of Religion. Cambridge University Press, 2003.
6. Fuller, C. J. 2004, *The Camphor Flame: Popular Hinduism and Society in India*, New Jersey: Princeton University Press, Introduction.
7. Madan, T.N. 1991. 'Secularism in its Place' in T. N. Madan, T.N. (ed.) *Religion in India.* New Delhi: OUP, pp 394 -413.
8. Momin. A.R., 2004. 'The Indo-Islamic Tradition' in Robinson, R.(ed.) *Sociology of Religion in India*. New Delhi: Sage. pp 84-99.
9. Omvedt, G. 2003. *Buddhism in India: Challenging Brahmanism and Caste*, New Delhi: Sage, pp 23-53.
10. Robinson, R. 2003. 'Christianity in the Context of Indian Societyand Culture' in Das Veena (ed.), *Oxford Indian Companion to Sociology and Social Anthropology*, OUP: New Delhi, pp. 884- 907.
11. Saberwal, S. 1991. 'Elements of Communalism' in T. N. Madan, (ed.) *Religion in India*. OUP: New Delhi, pp 339 -350.
12. Sontheimer, Gunther-Dietz, and Hermann Kulke. *Hinduism Reconsidered*. New Delhi: Manohar, 2001. Hinduism: The Five Componentsand their Interaction. pp. 305 – 322.
13. Srinivas, M.N. 1952. *Religion and Society among the Coorgs of South India*, Clarendon: Oxford, pp 100-122.
14. Uberoi, J.P.S. 1991. 'The Five Symbols of Sikhism' in Madan, T.N. (ed.) *Religion in India*. New Delhi: OUP, pp 320 -333.

DSE-A (2)

Family, Marriage & Kinship

1. **Introduction to Family, Marriage and Kinship**
   - 1.1 Different forms of family and marriage
   - 1.2 Biological, social & cultural kinship

2. **Family & Household**
   - 2.1 Structure & Change; Alternatives &Emergent forms of family; Divorce and Separation
   - 2.2 Reimagining families: Unconventional family relationships; families of choice

3. **Marriage & Kinship**
   - 3.1 Marriage, Alliance, Descent &Prestations

4. **Contemporary Issues in Family, Marriage & Kinship**
   - 1.1 Cultural codes in choice & regulation of marriage
   - 1.2 Power & discrimination in the family; Gender gap
   - 1.3 New Reproductive Techniques: Assisted Reproductive Technology, Donor insemination, Surrogacy.

Readings:

1. Carsten, J., 2004, 'Introduction' in After Kinship, Cambridge: Cambridge University Press, pp.1-30.
2. Carsten, J., 2004, 'Assisted Reproduction' in After Kinship, Cambridge: Cambridge University Press, pp. 163-183.
3. Chambers, Deborah. 2012. A sociology of family life: Change and diversity in intimate relations. Cambridge: Polity Press.
4. Chowdhry, P., 1998, 'Enforcing Cultural Codes: Gender and Violence in Northern India', in M. E. John and J. Nair (eds.), A Question of Silence: The Sexual Economies of Modern India, New Delhi: Kali for Women, pp. 332-67.
5. Dumont, L., 1968, 'Marriage Alliance', in D. Shills (ed.), International Encyclopedia of the Social Sciences, U.S.A.: Macmillan and Free Press, pp.19-23.
6. Haralambos and Heald. Sociology—Themes and Perspectives
7. Kahn, Susan Martha, 2004, 'Eggs and Wombs: The Origins of Jewishness', in R. Parkin and L. Stone (eds.), Kinship and Family: An Anthropological Reader, U.S.A.: Blackwell, Pp. 362-77
8. Kapadia. K.M., 1955. Marriage and Family in India. Oxford University Press.
9. KarveIrawati, 1953. Kinship Organization in India. Asia Publishing House.
10. Patricia Uberoi, 1993. Family, Kinship and Marriage in India. Oxford University Press.

11. Palriwala, Rajni&Uberoi, Patricia (Eds.). 2008. Marriage, Migration & Gender. Sage Publications.
12. Parkin, R. and L. Stone, 2004, 'General Introduction', in R. Parkin and L. Stone (eds.), Kinship and Family: An Anthropological Reader, U.S.A.: Blackwell, pp. 1-23.
13. Schneider, D. M., 2004. 'What is Kinship All About?', in R.Parkin and L. Stone (eds.), Kinship and Family: An Anthropological Reader, U.S.A.: Blackwell, pp. 257-274.
14. Shah, A.M., 1998, 'Changes in the Indian Family: An Examination of Some Assumptions', in A.M. Shah, The Family in India: Critical Essays, New Delhi: Orient Longman.
15. Sharma, U., 1993, 'Dowry in North India: Its Consequences for Women', in Patricia Uberoi (ed.), Family, Kinship and Marriage in India. Delhi: Oxford University Press, pp. 341-356.
16. Thorner, Daniel and Alice Thorner. 1962. 'The Agrarian Problem in India Today', from, Land and Labour in India, Bombay: Asia Publishing House.
17. Uberoi, P. 1993. Family, Kinship and Marriage in India. New Delhi: OUP.
18. Worsley, Peter. 1984. Introducing Sociology. Harmondsworth: Penguin Books.

References:

1. Alex, Inkeles. 1975. Sociology. London: Prentice Hall.
2. Anthony Giddens. 2013. Sociology (Seventh Edition).
3. Berger, Peter. 1966. An Invitation to Sociology – A Humanist Perspective. Harmondsworth: Penguin.
4. Bottomore, T.B. 1962. Sociology. London: George Allen and Unwin.
5. Charsley, K., 2005, 'Unhappy Husbands: Masculinity and Migration in Transnational Pakistani Marriages', Journal of the Royal Anthropological Institute, (N.S.) 11, pp. 85-105.
6. Chowdhry, P., 1998, 'Enforcing Cultural Codes: Gender and Violence in Northern India', in M. E. John and J. Nair (eds.), A Question of Silence: The Sexual Economies of Modern India, New Delhi: Kali for Women, pp. 332-67.
7. Fortes, M., 1970, 'The Structure of Unilineal Descent Groups', in M. Fortes, Time and Social Structure and Other Essays, University of London: The Athlone Press, pp. 67-95.
8. Fulcher, James and John Scott. 2007. Sociology. Third Ed. OUP.
9. Ghurye G. S. : Urbanization & Family Change,
10. Haralambos and Holborn. 2000. Sociology – Themes and Perspectives. Collins.
11. Jayaram, N. 1987. Introductory Sociology. Macmillan Press Limited.
12. Leach, E.R., 1961, 'Polyandry, Inheritance and the Definition of Marriage with Particular Reference to Sinhalese Customary Law', in E. R. Leach (ed.), Rethinking Anthropology, London: The Athlone Press, pp. 105-113.
13. John, M. E. et.al., 2008, 'Structural Contexts of Adverse Sex Ratios' in M. E. John et.al., Planning Families, Planning Gender: The Adverse Child Sex Ratio in Selected Districts of

Madhya Pradesh, Rajasthan, Himachal Pradesh, Haryana and Punjab, New Delhi: Action Aid, pp. 68-78.
14. Macionis, John. 1996. Sociology. New Jersey: Prentice Hall.
15. Radcliffe-Brown, A. R. and D. Forde (eds.), 1950, African Systems of Kinship and Marriage, London: Oxford University Press, Introduction, pp.1-39.
16. Simpson, B., 2004, 'Gays, Paternity and Polyandry: Making Sense of New Family Forms in Contemporary Srilanka', in R. Chopra, C. Osella and F. Osella (eds.), South Asian Masculinities: Context of Change, Sites of Continuity, Delhi: Kali for Women, 160-174.

DSE-B(1)
Social Stratification

1. Social Stratification: Concepts and Approaches

1.1 Concepts

1.2 Approaches– Marx and Weber

2. Forms of Social Stratification

2.1 Race and Ethnicity

2.2 Caste and Class

2.3 Gender

2.4 Poverty and Social Exclusion

3. Social Mobility

3.1Concepts

3.2 Factors

3.3 Types

Readings:

1. Anthony Giddens: Sociology
2. Bilton and others: Introductory Sociology (Macmillan)
3. Dipankar Gupta : Social Stratification (OUP)
4. G. Rocher: A General Introduction to Sociology
5. Gilles Ferreol& Jean-Pierre Noreck: An Introduction to Sociology(PHI Learning)
6. Gordon Marshal : Dictionary of Sociology (OUP)
7. Harry M. Johnson Sociology
8. Henry Tischler: Introduction to Sociology
9. J Ross Eshleman& B.G. Cashion: Sociology an Introduction
10. M. Haralambas&R. M. Heald: Sociology Themes and Perspectives.
11. N. Jayaram : Introductory Sociology (Macmillan)
12. N.J. Smelser: Sociology

References:

1. Barth, F. (ed), *Ethnic Groups and Boundaries*, Little Brown and Co. Boston, 1969, 10-16.
2. Béteille, A. 1983. 'Introduction in Andre Béteille (ed.): *Equality and Inequality: Theory and Practice*; Delhi: Oxford University Press. pp.1- 27.
3. Béteille, A. *Caste, Class and Power* Chapter: 1, Oxford University Press, 1971.

4. Bettie, Julie. 2003. Women without Class: Girls, Race, and Identity. California: University of California Press, pp 57-94.
5. Debe, Leela. 1996 "Caste and Women" in M.N. Srinivas (ed.) *Caste: Its Twentieth Century Avatar*, New Delhi: Penguin.
6. Grusky, D.V. 1994. *Social Stratification Perspective.* Boulder: Westview Press, Part I V, pp 245-264.
7. Gupta, D. 1991. 'Hierarchy and Difference' in Dipankar Gupta (ed*.): Social Stratification* Delhi: Oxford University Press, pp 1-21.
8. Immanuel, Maurice Wallerstein, *The Construction of Peoplehood, Racism, Nationalism, Ethnicity*, 1991, London Press, pp-71-85.
9. Joe,R. Feagin 'The Continuing Significance of Race' *American Sociological Review*, 56, (Feb-91) pp 101-116.
10. Macleod, Jay. 1987. 'Levelled Aspirations: Social Reproduction Takes its Toll', in *Ain't No Makin It: Aspirations and Attainment in a Low IncomeNeighbourhood.* USA: Westview Press, pp. 112-136.
11. Maria Charles and David B. Grusky. *Occupational Ghettos: The Worldwide Separation of Women and Men*, Stanford University Press, 2004 pp 389-402.
12. McClintock, Anne, and George Robertson. 'Soft-soaping Empire: Commodity Racism and Imperial Advertising' In Nicholas Mirzoeff (ed) *The Visual Culture Reader:* Second Edition. 2002. Routledge Taylor & Francis Group, 304-316
13. Newman, K. S and Victor Tan Chen.2007. *The Missing Class: Portraits of the Near Poor in America*, Boston: Beacon Press Book, pp1-10.Breigher,R.L.(ed)1990. *Social Mobility and Social Structure.* New York; Cambridge University Press, Ch. 5, pp.103-30.
14. Papanek, Hanna. 1990. "To Each Less Than She Needs, From Each More Than She Can Do: Allocations, Entitlements and Value" in Irene Tinker (ed.), *Persisting Inequality: Women World Development*, Oxford: Clarendon Press, pp. 121-164.
15. Sharma, Ursula. 1999. *Caste*. Open University Press, pp.1-94.
16. Timothy Smeeding, 'Poorer by Comparison; Poverty, Work and Public Policy in Comparative Perspective', *Pathways Magazine*, Stanford Center for the Study of Poverty and Inequality, Winter 2008, pp1-25.
17. William, Jutius Wilson 1978, *The Declining Significance of Race: Blacks and Changing American Institution.* University of Chicago Press, pp. 1 – 23 & 183-188.

DSE-B(2)

Gender and Sexuality

1. **Gendering Sociology:** An overview

2. **Gender as a Social Construct**
   - 2.1. Gender, Sex and Sexuality, Gender role and identity
   - 2.2. Gender discrimination and patriarchy, Production of Masculinity and Femininity.

3. **Gender: Differences and Inequalities**
   - 3.1 Caste, Gender and Violence
   - 3.2 Domestic and Familial Violence
   - 3.3 Public space and violence
   - 3.4 Violence, Harassment and the Workplace

4. **Gender, Power and Resistance**
   - 4.1 Power and Subordination
   - 4.2 Resistance and Movements (Chipko/ Gulabi Gang)

Readings:

1. Abbott, Pamela, Claire Wallace and Melissa Tyler. 2005. An Introduction to Sociology: Feminist Perspectives. London: Routledge.
2. Bhasin, Kamala. 1993. What is Patriarchy? New Delhi: Kali for Women.
3. Bhasin, Kamla, 2003. Understanding Gender, Kali for Women.
4. Chaudhuri, Maitrayee 2004.Feminism in India: Issues in Contemporary Indian Feminism Kali for Women, New Delhi.
5. Dube, Leela 1996 “Caste and Women” in M.N.Srinivas (ed.) *Caste: Its twentieth century avatar*, New Delhi: Penguin (pp 1-27).
6. Fernandes, Leela.(ed). 2014. Routledge Handbook of Gender in South Asia. London: Routledge
7. Furr.L, Allen. 2018. Women, Violence and Social Stigma. Jaipur: Rawat Publications.
8. Halberstam, Judith. 1998. “An Introduction to Female Masculinity: Masculinity without men, in Female Masculinity. London: Duke University Press (pp 1-43) (Also New Delhi: Zubaan 2012 Reprint)
9. Holmes, Mary. 2009. Gender and Everyday Life. London: Routledge.
10. Jackson, Stevi and Sue Scott (eds.) 2002. Gender: A Sociological Reader. London: Routledge.
11. Kabeer, Naila 1994. Reversed Realities: Gender Hierarchies in Development Thought: Gender Hierarchies in Development
12. Kalia, H.L. 2005. Work and the Family. Jaipur: Rawat Publications.

13. Menon, Nivedita (ed.).1999. Gender and Politics in India. New Delhi: O U P.
14. Rege, Sharmila. (ed). 2003. Sociology of Gender: The Challenge of Feminist Sociological Knowledge. New Delhi: Sage

References:

1. Kandiyoti, Deniz. 1991. “Bargaining with Patriarchy” in Judith Lorber and Susan A. Farrell (eds.). 1991. The Social Construction of Gender. Newbury Park, Calif: Sage Publications (pp 104-118).
2. Newton, Esther. 2000. “Of Yams, Grinders and Gays: The Anthropology of Homosexuality” in Margaret Mead Made Me Gay: Personal Essays, Public Ideas. Durham: Duke University Press (pp 229-237)
3. Palriwala, Rajni, 1999. “Negotiating Patriliny: Intra-household Consumption and Authority in Rajasthan (India)”, in RajniPalriwala and Carla Risseeuw (eds.). 1996. Shifting Circles of Support: Contextualizing Kinship and Gender in South Asia and Sub-Saharan Africa. New Delhi: Sage Publications (pp 190-220).
4. Rege, S. 1998. “Dalit Women Talk Differently: A Critique of 'Difference' and Towards a Dalit Feminist Standpoint Position.” Economic and Political Weekly,Vol. 33, No. 44 (Oct.31-Nov. 6, 1998)(pp39-48)
5. Stanley, L. 2002. ‘Should Sex Really be Gender or Gender Really be Sex’, in S. Jackson and S. Scott (eds.) Gender: A Sociological Reader, London: Routledge (pp31-41).
6. Sherry Ortner. 1974. “Is male to female as nature is to culture?” M.Z. Rosaldo and L. Lamphere (eds.) Women, culture and society. Stanford: Stanford University Press (pp 67-87)
7. Uberoi, Patricia “Feminine Identity and National Ethos in Indian Calendar Art” In Economic and Political Weekly Vol. 25, No. 17 (Apr. 28, 1990), (pp WS 41-48).
8. Whitehead, A. 1981, “I’ m Hungry Mum”: The Politics of Domestic Budgeting” in K. Young et al. (eds.) *Of Marriage and the Market: Women’s Subordination Internationally and its Lessons.* London: Routledge and Kegan Paul (pp.93-116).

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Website :www.caluniv.ac.in

Ref.No : CUS/ 432 /18.
Dated the 19th July, 2018

CORRIGENDUM

It is notified for all concerned that the syllabus for "Urdu (Honours/General/LCC2/AECC1), vide notification no. CSR/12/18, dt. 04.6.18" published on 12-06-18 is withdrawn and the corrected version of the syllabus is enclosed herewith.

20/07/18
Secretary

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

LIST OF COURSES OF URDU HONOURS CBCS SYSTEM

CORE COURSES

6 Credits per Core Courses

Semesters : Subjest-Hon-Core-Semester-Paper-Th&TU : 1 4 – CORE COURSES

1st Semester	: URD-A-CC-1-1-Th&TU	:	Urdu Zaban - o - Adab Ki Tarikh
	URD-A-CC-1-2-Th&TU	:	CLASSIKI GHAZAL
2nd Semester	: URD-A-CC-2-3-Th&TU	:	QASIDA AUR MARSIYA
	URD-A-CC-2-4-Th&TU	:	MASNAVI NAZM AUR RUBAI
3rd Semester	: URD-A-CC-3-5-Th&TU	:	DASTAN AUR NOVEL
	URD-A-CC-3-6-Th&TU	:	AFSANA AUR DRAMA
	URD-A-CC-3-7-Th&TU	:	MAKATEEB, SAWANEH AUR KHAKEY
4th Semester	: URD-A-CC-4-8-Th&TU	:	INSHAIYA, MAQALAAT AUR SAHAFAT
	URD-A-CC-4-9- Th&TU	:	NAIEE, TARAQQI PASAND AUR JADID GHAZAL
	URD-A-CC-4-10-Th&TU	:	TARAQQI PASAND AUR JADID NAZM
5th Semester	: URD-A-CC-5-11-Th&TH	:	ADABI TEHRIKAAT
	URD-A-CC-5-12-Th&TH	:	ADAB AUR TANQEED
5th Semester	: URD-A-CC-6-13-Th&TH	:	GHALIB
	URD-A-CC-6-14-Th&TH	:	BANGAL KA URDU ADAB

DESCIPLINE SPECIFIC ELETIVE (6 CREDITS PER SCORE)

GROUP –A-1	Any 1 paper in Semester-5
URDU-A-DSE-A(1)-Th&TU	MEER
URD-A-DSE-5-A(2)-Th&TU	IQBAL
GROUP-A-2	Any 1 paper in Semester-6
URD-A-DSE-6-A(3)-Th&TU	TARAQQI PASAND SHAIRI
URD-A-DSE-6-A(4)-Th&TU	JADID SHAIRI
GROUP-B-1	Any 1 paper in Semester-5
URD-A-DSE-5-A(1)-Th&TU	TANZ-O-MEZAH
URD-A-DSE-5(2)-Th&TU	SIR SYED AUR UN KA AHAD
GROUP-B-2	Any 1 paper in Semester-6
URD-A-DSE-A(3)-Th&TU	Mohd. Hussain Aazaad
URD-A-DSE-6-A(4)-Th&TU	NazeerAkbarabaadi

Ability Enhancement Compulsory Course **Urdru Nao-Nasr**

SKILL ENHANCMENT COURSE (2 Credits per Course)

GROUP-A:	Any 1 paper in Semester 3
3rd semester: URD-A-SEC-3-A(1)-Th	Barqi Zarae Iblagh
:URD-A-SEC-3-A(2)-Th	Urdu Adab Aur Hindustani Film
GROUP-B:	Any 1 paper in Semester 4
4thsemester: URD-A-SEC-4-B(1)-Th	Urdu Sahafat
:URD-A-SEC-4-B(2)-Th	Urdu Mein Awami Zarae Iblagh

Syllabus for Core Courses (Honours)

URDU

Total Marks: 100

Attendance: 10 marks per paper

Internal Assessment: 10

Tmarks per paper

CORE COURSES

THEORY

CC-1

Urdu Zaban - o - Adab Ki Tarikh

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

اردو زبان وادب کی تاریخ

URDU ZABAN-O-ADAB KI TARIKH

ہندوستان میں آریوں کی آمد اور ہند آریائی زبان کا ارتقاء، مغربی ہندی اور اس کی بولیاں

اردو زبان وادب کی ترقی اور فروغ میں صوفیائے کرام کی خدمات

اردو زبان کے آغاز وارتقاء سے متعلق مختلف نظریات

دکن میں اردو کا آغاز وارتقاء (شاعری اور نثر)

شمالی ہند میں اردو کا آغاز وارتقاء (شاعری اور نثر)

دبستان دہلی اور دبستان لکھنو کی شعری روایت

فورٹ ولیم کالج اور دلی کالج کی ادبی خدمات

۱۸۵۷ء کے بعد مغربی اثرات اور اردو ادب میں نئے رجحانات کا فروغ

انجمن پنجاب اور سرسید تحریک

اردو ادب پر ترقی پسند تحریک کے اثرات

اردو ادب پر جدیدیت کے اثرات

۱۹۸۰ء کے بعد اردو ادب کی مجموعی صورت حال کا عمومی جائزہ

متن برائے تدریس

مغربی ہندی اور اس کی بولیاں (انتخاب از: مقدمۂ تاریخ زبان اردو) مسعود حسین خاں

TUTORIAL

Urdu Zaban - o - Adab Ki Tarikh

Tutorial Activities (Project Work / Term Paper [Based on Urdu Zaban - o - Adab Ki Tarikh])

.....END.....

Reference Books

آب حیات	:	مولانا محمد حسین آزاد
مقدمۂ تاریخ زبان اردو	:	مسعود حسین خاں
ہندوستانی لسانیات	:	محی الدین قادری زور
اردو کی ابتدائی نشوونما میں صوفیائے کرام کا حصہ	:	مولوی عبدالحق
تاریخ ادب اردو	:	جمیل جالبی
اردو نثر کا ارتقاء	:	رفیعہ سلطانہ
تاریخِ ادب اردو	:	رام بابو سکسینہ
پنجاب میں اردو	:	محمود شیرانی
دکن میں اردو	:	نصیرالدین ہاشمی
ترقی پسند ادب	:	سردار جعفری
اردو میں ترقی پسند ادبی تحریک	:	خلیل الرحمٰن اعظمی
اردو ادب کی تحریکیں	:	انور سدید

CC-2

Classiki Ghazal

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

کلاسیکی غزل

CLASSIKI GHAZAL

غزل کا فن : غزل کا مفہوم اور اس کی ہیئت۔ غزل کی شعریات

غزل کا ارتقاء : غزل کا پس منظر۔ غزل کا ارتقاء۔ ترقی کے منازل

غزل کے موضوعات : حسن و عشق، تصوف، نفسیات انسانی، جذبات و احساسات مشاہدۂ کائنات، تجربہ حیات وغیرہ

امتیازی عناصر : ایجاز و اختصار۔ استعاراتی اور علامتی اسلوب کی معنویت۔ داخلی اور خارجی کیفیات

دکن میں غزل :دکن میں غزل کی روایت۔ قلی قطب شاہ اور ان کے معاصرین کی غزل کا عمومی جائزہ۔ ولی اور سراج کا خصوصی مطالعہ

شمالی ہند میں غزل :شمالی ہند میں غزل کی روایت۔ حاتم، مظہر جاں جاناں آبرو کی غزل کا عمومی جائزہ۔ میر تقی میر، سودا، غالب اور مومن کا خصوصی مطالعہ

لکھنؤ میں غزل :دبستان لکھنؤ کی غزل گوئی، امتیازی خصوصیات، جرأت، انشاء اور آتش کی غزل گوئی کا عمومی مطالعہ، مصحفی اور ناسخ کی غزل گوئی کا خصوصی مطالعہ

غزلیات برائے تدریس : مصرع

ولی

مفلسی سب بہار کھوتی ہے

کوچۂ یار عین کاسی ہے

سراج

دو رنگی خوب نئیں یک رنگ ہو جا

خبر تحیر عشق سن نہ جنوں رہا نہ پری رہی

میر

منھ تکا ہی کرے ہے جس تس کا

پیغام غم جگر کا گلزار تک نہ پہنچا

سودا

بس ہو تو رکھوں آنکھوں میں اس آفت جاں کو

دلدار اس کو خواہ دل آزار کچھ کہو

مصحفی

نظروں میں تیری پیارے گو بے وقار تھے ہم

خواب تھا یا خیال تھا کیا تھا

ناسخ

کوچۂ یار کو ہم یاد کیا کرتے ہیں

ہیں اشک مری آنکھوں میں قلزم سے زیادہ

غالب

ہے بسکہ ہر اک ان کے اشارے میں نشاں اور

دل ناداں تجھے ہوا کیا ہے

مومن

گر غیر کے گھر سے نہ دل آرام نکلتا

لگے خدنگ جب اس نالۂ سحر کا سا

Classiki Ghazal

Tutorial Activities (Project Work / Term Paper [Based on Classiki Ghazal])

.....END.....

Reference Books

کلیات ولی : مرتبہ:نورالحسن ہاشمی

کلیات سراج : مرتبہ:عبدالقادر سروری

کلیات میر : مرتبہ:احمد محفوظ

کلیات سودا : مرتبہ:نسیم احمد

کلیات مصحفی : مرتبہ:نورالحسن نقوی

انتخاب ناسخ : رشید حسن خاں

دیوان غالب	:	اسداللہ خاں غالب
دیوان مومن	:	مومن خاں مومن
آب حیات	:	مولانا محمد حسین آزاد
ہماری شاعری	:	مسعود حسن رضوی
اُردو غزل	:	یوسف حسین خان
غزل اور متغزلیں	:	ابواللیث صدیقی
غزل کی سرگذشت	:	اختر انصاری
ولی سے اقبال تک	:	سید عبداللہ
اردو شاعری کا فنی ارتقاء	:	ڈاکٹر فرمان فتح پوری
پہچان اور پرکھ	:	آل احمد سرور
شعر شور انگیز	:	شمس الرحمٰن فاروقی
صنفیات	:	قاضی افضال حسین
بازیافت		ندیم احمد

CC-3

Qasida Aur Marsiya

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

قصیدہ اور مرثیہ

QASIDA AUR MARSIYA

قصیدہ

قصیدہ کی تعریف۔ ہیئت۔ اجزائے ترکیبی
قصیدے کی شعریات: شکوہ بیان، جدت ادا، مبالغہ آرائی، اظہار فضل و کمال
اردو قصائد کا آغاز وارتقاء۔ دکن اور شمالی ہند میں
سودا، ذوق، اور غالب کی قصیدہ نگاری

قصائد برائے تدریس :

سودا : قصیدہ در تضحیک روزگار
ذوق : ہے آج یوں خوش نما نورِ سحر رنگِ شفق

مرثیہ

مرثیہ کی تعریف۔ ہیت۔ اجزائے ترکیبی۔
اقسامِ مرثیہ۔ شخصی اور کربلائی مرثیے کا فرق
اردو مرثیے کا آغاز وارتقاء
دبستانِ دہلی اور دبستانِ لکھنؤ کے اہم مرثیہ نگاروں کا عمومی جائزہ
انیس و دبیر کا خصوصی مطالعہ

مراثی برائے تدریس :

انیس : جب بادبانِ کشتیِ شاہِ اُمم گرا (ابتدائی ۲۵ بند)
دبیر : جب شامیوں میں صبح کی نوبت کا غل ہوا (ابتدائی ۲۵ بند)

Qasida Aur Marsiya

Tutorial Activities (Project Work / Term Paper [Based on Qasida Aur Marsiya])

.....END.....

Reference Books

اُردو میں قصیدہ نگاری	:	محمود الٰہی
اردو میں قصیدہ نگاری	:	ابو محمد سحر
اُردو قصیدہ نگاری	:	اُم ہانی اشرف
اُردو مرثیہ نگاری	:	اُم ہانی اشرف
اردو مرثیہ	:	اطہر فاروقی
اردو مرثیہ کا ارتقاء	:	مسیح الزماں
موازنہ انیس و دبیر	:	شبلی
انیس کی مرثیہ نگاری	:	محمد احسن فاروقی
روح انیس	:	سید مسعود حسن رضوی ادیب
انیس شناسی	:	گوپی چند نارنگ
دبستانِ دبیر	:	ڈاکٹر ذاکر حسین فاروقی

CC-4

Masnavi Nazm Aur Rubai

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

مثنوی،نظم اور رباعی

MASNAVI NAZM AUR RUBAI

مثنوی

مثنوی کی تعریف۔ ہیئت۔ اجزائے ترکیبی
اقسام اور موضوعات
اردو مثنوی کا آغاز وارتقاء۔ دکن اور شمالی ہند میں
میر، میر حسن اور دیا شنکر نسیم کی مثنوی نگاری

مثنوی برائے تدریس :

میر : مثنوی در حال عشق (مکمل)

نظم

نظم کی تعریف اور اس کی مختلف قدیم اور جدید ہیئتیں
نظم نگاری کا آغاز وارتقاء۔ دکن اور شمالی ہند میں
نظم کے فروغ میں انجمن پنجاب کی خدمات
نظیر، اور اقبال کی نظم نگاری

نظمیں برائے تدریس :

نظیر : بنجارہ نامہ
حالی : نشاط امید
اقبال : تصویر درد

رباعی

رباعی کی تعریف۔ ہیئت، وزن، موضوعات ومضامین
رباعی کی مختصر تاریخ اور رباعی نگاروں کا عمومی جائزہ
انیس، امجد حیدر آبادی، اور فراق کی رباعی نگاری

رباعیاں برائے تدریس :

انیس : دولت کا ہمیں خیال آتا ہی نہیں ۔ یہ نشۂ فقر ہے کہ جاتا ہی نہیں
بلبل یہاں آ کے خوش بیانی سیکھے ۔ انداز فغاں مجھ سے فغانی سیکھے

امجد حیدر آبادی : ہے کعبہ و بت خانہ میں جلوہ تیرا ۔ ہر کافر و دیں دار ہے شیدا تیرا
پیشانی پہ گو نقش گنہ کندہ ہے ۔ لیکن دل و جان سے ترا بندہ ہے

فراق : آنگن میں لئے چاند کے ٹکڑے کو کھڑ - ہاتھوں پہ جھلاتی ہے اسے گود بھری
آئے معنی کائنات مجھ میں آجا ۔ اے راز صفات و ذات مجھ میں آجا

Masnavi Nazm Aur Rubai

Tutorial Activities (Project Work / Term Paper [Based on Masnavi Nazm Aur Rubai])

.....END.....

Reference Books

اردو مثنوی کا ارتقاء : عبدالقادر سروری
اردو کی تین مثنویاں : خان رشید
نظم جدید کی کروٹیں : وزیر آغا
جدید اردو نظم : نظریہ و عمل : عقیل احمد صدیقی
اقبال ایک بازدید : زرینہ زریں

CC-5

Dastan Aur Novel

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

داستان اور ناول

DASTAN AUR NOVEL

داستان

داستان کی تعریف۔اجزائے ترکیبی۔فنی خصوصیات

داستانوں کی سماجی اور تہذیبی قدر و قیمت

اردو داستانوں کا آغاز وارتقاء

دکن۔شمالی ہند اور فورٹ ولیم کالج میں لکھی جانے والی داستانوں کا عمومی جائزہ

سب رس۔باغ و بہار اور فسانہ عجائب کا خصوصی مطالعہ

متن برائے تدریس :

باغ و بہار : سیر تیسرے درویش کی

فسانہ عجائب : جولانی سمند تیز رفتار قلم کی..... کیفیت حسن انجمن آرا تو تے سے سننا شہزادے کا نادیدہ عاشق ہونا، وحشت سے سر دھننا

ناول

ناول کی تعریف۔اجزائے ترکیبی۔فنی خصوصیات

اردو ناول کا آغاز وارتقاء

نذیر احمد، رتن ناتھ سرشار، مرزا ہادی رسوا عبدالحلیم شرر، پریم چند، اور قرۃ العین حیدر کی ناول نگاری کا جائزہ

امراؤ جان ادا۔گئودان اور آگ کا دریا کا خصوصی مطالعہ

اردو ناول کا ہم عصر منظر نامہ

Dastan Aur Novel

Tutorial Activities (Project Work / Term Paper [Based on Dastan Aur Novel])

.....END.....

Reference Books

داستان سے افسانے تک	:	وقار عظیم
اردو ناول کی تنقیدی تاریخ	:	احسن فاروقی
اردو ناول کی تاریخ و تنقید	:	احسن فاروقی
بیسویں صدی میں اردو ناول	:	یوسف سرمست
پریم چند کا تنقیدی مطالعہ	:	ڈاکٹر قمر رئیس
پریم چند: ایک مطالعہ	:	ہنس راج رہبر

CC-6

Afsana Aur Drama

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

افسانہ اور ڈراما

AFSANA AUR DRAMA

افسانہ

افسانے کی تعریف۔ اجزائے ترکیبی۔ صنفی خصوصیات

اردو افسانے کی تاریخ کا اجمالی جائزہ

اردو افسانہ آزادی سے پہلے اور آزادی کے بعد

پریم چند، منٹو، غلام عباس، بیدی اور انتظار حسین کی افسانہ نگاری کا تفصیلی جائزہ

افسانے برائے تدریس:

سوا سیر گیہوں	:	منشی پریم چند
نیا قانون	:	منٹو
فینسی ہیئر کٹنگ سیلون	:	غلام عباس
کوارنٹین	:	رجندر سنگھ بیدی
ہندوستان سے ایک خط	:	انتظار حسین

ڈراما

ڈراما کی تعریف۔ اجزائے ترکیبی۔

ڈراما کے اقسام: اسٹیج ڈراما۔ ادبی ڈراما۔ ریڈیائی ڈرامہ۔ یک بابی ڈراما۔ نکڑ ڈراما۔ ٹیلی ڈراما

ڈرامے کے لوازمات

اردو ڈرامے کی تاریخ کا اجمالی جائزہ۔

اردو ڈراما آزادی سے پہلے اور آزادی کے بعد

آغا حشر اور حبیب تنویر کی ڈراما نگاری کا تفصیلی جائزہ

ڈرامے برائے تدریس :

سفید خون : آغا حشر

آگرہ بازار : حبیب تنویر

AFSANA AUR DRAMA

Tutorial Activities (Project Work / Term Paper [Based on Afsana Aur Drama])

.....END.....

Reference Books

کلیات پریم چند	:	پریم چند
کلیات غلام عباس	:	مرتبہ: ندیم احمد
کلیات منٹو	:	مرتبہ: ڈاکٹر ہمایوں اشرف
کلیات راجندر سنگھ بیدی	:	مرتبہ: وارث علوی
پریم چند کا تنقیدی مطالعہ	:	ڈاکٹر قمر رئیس
اردو افسانہ: روایت و تجربہ	:	مرتبہ گوپی چند نارنگ
افسانے کی حمایت میں	:	شمس الرحمٰن فاروقی
نیا افسانہ	:	وقار عظیم
بیدی نامہ	:	شمس الحق عثمانی
پریم چند: ایک مطالعہ	:	ہنس راج رہبر
اُردو ڈراما: روایت و تجربہ	:	عطیہ نشاط
اُردو تھیٹر	:	عبدالعلیم نامی
اُردو ڈراما نگاری	:	قمر اعظم ہاشمی
بنگال میں اردو ڈراما (آغاز تا حال):		مشتاق احمد
اُردو ڈراما کا ارتقاء	:	عشرت رحمانی
اردو ڈراما: پس منظر، منظر	:	ڈاکٹر شیخ الماس حسین

CC-7

Makateeb, Sawaneh Aur Khakey

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

مکاتیب، سوانح اور خاکے

MAKATEEB, SAWANEH AUR KHAKEY

مکاتیب

مکتوب نگاری کا فن

اردو میں مکتوب نگاری کے ابتدائی نمونے

اردو میں مکتوب نگاری کی روایت، ترقی اور فروغ کا حال

اردو کے اہم مکتوب نگاروں کا عمومی جائزہ

غالب، مولانا ابوالکلام آزاد اور فیض کی مکتوب نگاری کا تفصیلی مطالعہ

مکاتیب برائے تدریس

غالب کا خط	سید صاحب۔۔۔۔۔نہ تم مجرم نہ میں گنہگار (میر مہدی مجروح کے نام، خط نمبر: ۱۰)
مولانا ابوالکلام آزاد کا خط	حکایات بادہ و تریاک (غبار خاطر، خط نمبر:)
فیض کا خط	آج کل لیلائے سخن غیر حاضر ہے.....(صلیبیں مرے دریچے میں، خط نمبر: ۵۵)

سوانح

سوانح نگاری کا فن

اردو میں سوانح نگاری کی روایت

اردو کے اہم سوانح نگاروں کا عمومی جائزہ

حالی کی سوانح نگاری کا تفصیلی مطالعہ

سوانح برائے تدریس

یادگار غالب (پہلا حصہ)	حالی

خاکے

خاکہ نگاری کا فن
اردو میں خاکہ نگاری کی ابتدا اور فروغ کا حال
اردو کے اہم خاکہ نگاروں کا عمومی جائزہ
رشید احمد صدیقی کی خاکہ نگاری کا تفصیلی مطالعہ

خاکہ برائے تدریس

محمد ایوب عباسی رشید احمد صدیقی

TUTORIAL

Makateeb, Sawaneh Aur Khakey

Tutorial Activities (Project Work / Term Paper [Based on Makateeb, Sawaneh Aur Khakey])

.....END.....

Reference Books

اردو نثر کا فنی ارتقاء	:	ڈاکٹر فرمان فتح پوری
خطوط غالب	:	مرتبہ :خلیق انجم
اردو میں خاکہ نگاری	:	صابرہ سعید
مطالعۂ خطوطِ غالب	:	عبدالقوی دسنوی
صنفیات	:	قاضی افضال حسین
غالب کی تخلیقی حسیت	:	شمیم حنفی

CC-8

Inshaiya, Maqalaat Aur Sahafat

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

انشائیہ، مقالات اور صحافت

INSHAIYA, MAQALAAT AUR SAHAFAT

انشائیہ

انشائیہ کی تعریف۔ اسلوب اور فنی خصوصیات
اردو میں انشائیہ نگاری کی روایت، ترقی اور فروغ کا حال
اردو کے اہم انشائیہ نگاروں کا عمومی جائزہ
مجتبیٰ حسین کی انشائیہ نگاری کا خصوصی مطالعہ

انشائیہ برائے تدریس
برف کی الماری مجتبیٰ حسین

مقالات

مقالہ کا مفہوم۔ مقالہ اور انشائیہ کا فرق
اردو میں مقالہ نگاری کی روایت، فروغ اور ترقی کے منازل
اردو کے اہم مقالہ نگاروں کا عمومی جائزہ
سرسید کی مقالہ نگاری کا تفصیلی مطالعہ

مقالات برائے تدریس
تعصب سرسید

صحافت

صحافت کا فن۔ صحافت کا [illegible]

صحافت کی اہمیت اور افادیت۔صحافی کی ذمہ داریاں

اردو صحافت کا آغاز وارتقاء

صحافت کی موضوعاتی قسمیں: سیاسی وسماجی۔تہذیبی اور ثقافتی۔اخلاقی اور مذہبی۔

اداریہ نویسی۔کالم نویسی۔رپورٹ نگاری، انٹرویو، خبرنامہ وغیرہ۔

مولانا ابوالکلام آزاد اور مولانا عبدالرزاق ملیح آبادی کا خصوصی مطالعہ۔

TUTORIAL

Inshaiya, Maqalaat Aur Sahafat

Tutorial Activities (Project Work / Term Paper [Based on Inshaiya, Maqalaat Aur Sahafat])

.....END.....

Reference Books

انشائیہ اور انشائیے	:	سید محمد حسنین
اردو نثر کا فنی ارتقاء	:	ڈاکٹر فرمان فتح پوری
سرسید اور ان کے نامور رفقاء	:	ڈاکٹر سید عبداللہ
صنفیات	:	قاضی افضال حسین
اردو صحافت کے دوسو سال	:	مرتبہ: ارتضا کریم

CC-9

Naiee, Taraqqi Pasand Aur Jadid Ghazal

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

نئی، ترقی پسند اور جدید غزل

NAIEE, TARAQQI PASAND AUR JADID GHAZAL

۱۸۵۷ء کے بعد غزل کے مزاج میں تبدیلی

نئے رجحانات، جدید شاعری کی تحریک اور غزل پر اس کے اثرات داغ، امیر مینائی، حالی، شاد عظیم آبادی، فانی، حسرت، کا عمومی مطالعہ
اقبال، یگانہ، فراق وحشت کا خصوصی مطالعہ۔

سیاسی، سماجی اقتصادی اور انقلابی پس منظر

نیا سماجی شعور اور غزل پر اس کے اثرات۔
مخدوم، مجروح اور پرویز شاہدی کا عمومی مطالعہ، فیض کا خصوصی مطالعہ

جدیدیت کا رجحان اور غزل

۱۹۶۰ کے بعد غزلیہ شاعری کا جائزہ
ناصر کاظمی اور شہریار کا خصوصی مطالعہ

۱۹۸۰ کے بعد غزل کا منظر نامہ

۱۹۸۰ کے بعد غزلیہ شاعری کا جائزہ
عرفان صدیقی کا خصوصی مطالعہ

غزلیات برائے تدریس : مصرع

اقبال

انوکھی وضع ہے سارے زمانے سے نرالے ہیں

کہوں کیا آرزوئے بے دلی مجھ کو کہاں تک ہے

یگانہ

سب ترے سوا کافر آخر اس کا مطلب کیا

چلے چلو جہاں لے جائے ولولہ دل کا

فراق

دیکھتے دیکھتے اتر بھی گئے

شام غم کچھ اس نگاہ ناز کی باتیں کرو

وحشت

آئینہ خیال تھا عکس پذیر راز کا

ضبط کی کوشش ہے جان نا تواں مشکل میں ہے

فیض

نہ گنواؤ ناوک نیم کش دل ریزہ ریزہ گنوا دیا

گلوں میں رنگ بھرے باد نو بہار چلے

ناصر کاظمی

کچھ یادگار شہر ستمگر ہی لے چلیں

دل دھڑکنے کا سبب یاد آیا

شہریار

اہل جہاں یہ دیکھ کے حیران ہیں بہت

وہ بے وفا ہے ہمیشہ ہی دل دکھاتا ہے

عرفان صدیقی

وہ جس نے پود لگائی ہے پھول بھی دے گا

جھلس رہے ہیں کڑی دھوپ میں شجر میرے

Reference Books

ترانۂ وحشت	:	وحشت کلکتوی
کلیاتِ فیض	:	فیض احمد فیض
اُردو غزل	:	یوسف حسین خان
ہماری شاعری	:	مسعود حسن رضوی
غزل اور متغزلیں	:	ابواللیث صدیقی
ولی سے اقبال تک	:	سید عبداللہ
افکار، کراچی	:	فیض نمبر، مرتب: محمود احمد ہنر
فیض شناسی	:	مرتبہ اسدالزماں اسد (مغربی بنگال اردو اکیڈمی)
رضا علی وحشت	:	حیات اور شاعری وفا راشدی
نساخ سے وحشت تک	:	سید لطیف الرحمٰن
فراق گورکھپوری	:	اردو شاعری کا انتخابی سلسلہ، انجمن ترقی اردو
برگ نے	:	ناصر کاظمی
ہجر کے موسم	:	شہریار
سوغات (بنگلور) جدید شاعری نمبر	:	محمود ایاز
اردو شاعری کا فنی ارتقاء	:	ڈاکٹر فرمان فتح پوری
اردو غزل کی روایت، ترقی پسند غزل:		ڈاکٹر ممتاز الحق
اقبال ایک بازدید	:	زرینہ زریں
تعصبات اور تنقید	:	ندیم احمد
وحشت کلکتوی: حیات اور کارنامے	:	ڈاکٹر سید علی عرفان نقوی

CC-10

Taraqqi Pasand Aur Jadid Nazm

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

ترقی پسند اور جدید نظم

TARAQQI PASAND AUR JADID NAZM

ترقی پسند نظم

ترقی پسند فکر اور اردو نظم۔ موضوعات اور اسالیب بیان
ترقی پسند نظم کی روایت
ترقی پسند نظم گو شعراء کا عمومی مطالعہ
ترقی پسند تصورات سے انحراف کا رویہ
فیض، مخدوم، پرویز شاہدی اور اختر الایمان کی نظم نگاری کا خصوصی مطالعہ

نظم برائے تدریس :

ادھر نہ دیکھو : فیض
ایک لڑکا : اختر الایمان
بے چہرگی : پرویز شاہدی

جدید نظم کے پیش رو

حلقہ ارباب ذوق اور اردو نظم۔ شعری تصورات۔ نئے تجربات
حلقہ کے نظم گو شعراء کا عمومی مطالعہ
میراجی اور راشد کی نظم نگاری کا تفصیلی جائزہ

نظم برائے تدریس :

کلرک کا نغمۂ محبت : میراجی
اندھا کباڑی : ن۔م۔راشد

جدید نظم

جدید فکر اور اردو نظم۔ موضوعاتی تنوع۔ شعری تصورات

جدید نظم گو شعراء کا عمومی مطالعہ

محمد علوی اور ندا فاضلی کی نظم نگاری کا تفصیلی جائزہ

نظم برائے تدریس :

کون؟ : محمد علوی

آدمی کی تلاش : ندا فاضلی

TUTORIAL

Taraqqi Pasand Aur Jadid Nazm

Tutorial Activities (Project Work / Term Paper [Based on Taraqqi Pasand Aur Jadid Nazm])

.....END.....

Reference Books

اردو میں ترقی پسند ادبی تحریک : خلیل الرحمٰن اعظمی

اردو ادب کی تحریکیں : انور سدید

جدیدیت کی فلسفیانہ اساس : شمیم حنفی

حلقۂ ارباب ذوق اور اردو نظم : زرینہ زریں

CC-11

Adabi Tehrikaat

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

ادبی تحریکات

ADABI TEHRIKAAT

اردو میں ادبی تحریکات کی روایت۔تحریک اور رجحان کا فرق

اصلاح زبان کی تحریک۔ایہام گوئی۔مفہوم اور اثرات۔ایہام گوئی کی مخالفت میں آتش اور ناسخ کا حصہ

علی گڑھ تحریک۔علی گڑھ تحریک کا پس منظر۔فکری بنیادیں۔اردو ادب پر تحریک کے اثرات

رومانی تحریک۔رومانی تحریک کا پس منظر۔تصوراتی اساس۔رومانیت اور کلاسیکیت۔اردو نظم ونثر پر ان کے اثرات

ترقی پسند تحریک۔اس کا پس منظر۔اردو ادب پر اس کے اثرات

حلقہ ارباب ذوق کی تشکیل۔مقاصد۔ادبی تصورات۔نئے تجربات۔اردو ادب پر اس کے اثرات

جدیدیت کا مفہوم۔اردو میں جدیدیت کا آغاز۔جدیدیت کا سرمائے ادب

تحریک نسواں۔تانیثیت کا اساسی تصور۔تحریک نسواں کا دائرۂ عمل۔فلسفۂ تانیثیت کا اثر اردو ادب پر

TUTORIAL

Adabi Tehrikaat

Tutorial Activities (Project Work / Term Paper [Based on Adabi Tehrikaat])

.....END.....

Reference Books

اردو ادب میں رومانی تحریک	:	محمد حسن
اردو میں ترقی پسند ادبی تحریک	:	خلیل الرحمٰن اعظمی
ترقی پسند ادب	:	عزیز
اردو ادب کی تحریکیں	:	انور سدید

حلقۂ ارباب ذوق	:	یونس جاوید
ادبی تحریکات ورجحانات	:	انور پاشا
تانیثیت اوراردوادب	:	انور پاشا
حلقۂ ارباب ذوق اوراردو نظم	:	زرینہ زریں

CC-12

Adab Aur Tanqeed

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

ادب اور تنقید

ADAB AUR TANQEED

ادب

ادب کی تعریف۔ ماہیت۔ فنی لوازمات۔ بنیادی موضوعات

ادب کے متعلق اہم نظریات۔ ادب کی اہمیت اور اور اس کی ضرورت

ادب کا رشتہ: انسانی زندگی سے۔ انسانی احساسات و جذبات سے۔ فرد اور سماج سے

تنقید

تنقید کی تعریف۔ اس کا مفہوم۔ ادب پارے کی اہمیت۔ تنقید کی اہمیت اور افادیت۔ تنقید کے مختلف طریقۂ کار

ادب اور تنقید کا باہمی رشتہ۔ تذکرہ نگاری کی روایت۔ تذکروں کی تنقیدی اہمیت

تنقید کے مختلف دبستانوں کا مجموعی جائزہ۔ مختلف دبستان تنقید میں عملی تنقید کا خصوصی مطالعہ

تاثراتی، جمالیاتی، مارکسی تنقید اور جدید تنقید کا خصوصی مطالعہ

حالی، آل احمد سرور، مجنوں گورکھپوری، احتشام حسین اور کلیم الدین احمد کی تنقید نگاری کا خصوصی مطالعہ

متن برائے تدریس

شاعری کے لئے کیا کیا شرائط ہیں؟ (انتخاب از: مقدمۂ شعر و شاعری) — حالی

تنقید کیا ہے؟ (تنقید کیا ہے) — آل احمد سرور

TUTORIAL

Adab Aur Tanqeed

Tutorial Activities (Project Work / Term Paper [Based on Adab Aur Tanqeed])

.....END.....

Reference Books

مقدمۂ شعر و شاعری	:	حالی
کلیات محمد حسن عسکری	:	محمد حسن عسکری
تنقیدی افکار	:	شمس الرحمٰن فاروقی
اردو میں عملی تنقید کے مختلف پہلوؤں کا تنقیدی مطالعہ:		زرینہ زریں

CC-13

Ghalib

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

غالب

GHALIB

حیات

غالب کی حالت زندگی۔

غالب کا عہد۔ادبی، تہذیبی اور سماجی حالات

غالب کی شخصیت اور فن پر سفر کلکتہ کے اثرات

غالب کے ممتاز معاصرین، تلامذۂ غالب

غالب اور جدید ذہن

فن

غالب کی غزل گوئی

غالب کی قصیدہ نگاری

غالب کی مکتوب نگاری

غزلیات برائے تدریس : مصرع

- پھر مجھے دیدۂ تر یاد آیا
- کی وفا ہم سے تو غیر اس کو جفا کہتے ہیں
- جہاں تیرا نقشِ قدم دیکھتے ہیں
- کسی کو دے کے دل کوئی نوا سنج فغاں کیوں ہو
- عشق مجھ کو نہیں وحشت ہی سہی

قصیدہ برائے تدریس : مصرع

صبح دم دروازۂ خاور کھلا.....طبلۂ عنبر کھلا (کُل بائیس اشعار)

مکاتیب برائے تدریس:

''کاشانۂ دل کے ماہِ دو ہفتہ''، خط نمبر:۷ (منشی ہرگوپال تفتہ کے نام)

''صاحب! تم جانتے ہو کہ یہ معاملہ کیا ہے.....''، خط نمبر:۲۷ (منشی ہرگوپال تفتہ کے نام)

''کل تمہارے خط کا جواب بھیج چکا ہوں، پہنچا ہوگا.....''خط نمبر:۱۷ (علاؤالدین احمد خاں علائی کے نام)

TUTORIAL

Ghalib

Tutorial Activities (Project Work / Term Paper [Based on Ghalib])

.....END.....

Reference Books

یادگارِ غالب	:	الطاف حسین حالی
محاسن کلام غالب	:	عبدالرحمٰن بجنوری
نقد غالب	:	مختارالدین آرزو
غالب	:	غلام رسول مہر
گلِ رعنا	:	مالک رام
غالب نامہ	:	شیخ محمد اکرام
ذکرِ غالب	:	مالک رام
غالب شناسی	:	ظ-انصاری
تلاشِ غالب	:	نثار احمد فاروقی
تلامذۂ غالب	:	مالک رام

CC-14

Bangal Ka Urdu Adab

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

بنگال کا اردو ادب

BANGAL KA URDU ADAB

بنگال میں اردو زبان وادب کی تاریخ۔ ارتقا اور فروغ

بنگال میں اردو غزل کا آغاز وارتقا آزادی سے قبل اور آزادی کے بعد تا حال۔

انشا اللہ خان انشا، قدرت اللہ قدرت، مخلص مرشد آبادی، عبد الغفور نساخ اور وحشت کا خصوصی مطالعہ۔

غزلیات برائے تدریس : مصرع

انشا اللہ خان انشا	ٹک آنکھ ملاتے۔۔۔۔۔۔۔۔۔۔۔۔
	جھوٹا نکلا قرار تیرا۔۔۔۔۔۔۔۔۔۔۔۔
قدرت اللہ قدرت	نہ واقف کارواں سے ہوں۔۔۔۔۔۔۔۔
	غنیمت بوجھ ملنے کو یہ عالم۔۔۔۔۔۔۔۔۔
مخلص مرشد آبادی	اگر روز وشب یوں۔۔۔۔۔۔۔۔۔۔۔۔
	سجن تجھ کو مجھ سے۔۔۔۔۔۔۔۔۔۔۔۔
نساخ	جان دنے لگے۔۔۔۔۔۔۔۔۔۔۔۔۔۔۔
	پردہ نہ بیچ میں کبھی آئے۔۔۔۔۔۔۔۔۔۔۔
وحشت کلکتوی	بغیر از صدق کچھ مطلب۔۔۔۔۔۔۔۔۔۔
	صرف وفا ہوا کہ شہید جفا ہوا۔۔۔۔۔۔۔۔
وکیل اختر	آپ سے جھک کے جو۔۔۔۔۔۔۔۔۔۔۔۔
	جلتا ہوا گھر میرا تو۔۔۔۔۔۔۔۔۔۔۔۔

بنگال میں نظم نگاری کا عمومی جائزہ۔ پرویز شاہدی کی نظم نگاری کا خصوصی جائزہ۔

بنگال میں اردو نثر کا آغاز وارتقا۔ فورٹ ولیم کالج کی ادبی خدمات۔

ترقی پسند تحریک کے اثرات اردو غزل، نظم اور نثر پر ۔۱۹۶۰ کے بعد کی شاعری اور نثر۔

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متن برائے تدریس

یہ عبارت فارسی میں۔۔۔۔۔۔۔۔۔۔سمیت جا پڑی۔(انتخاب از آرائش محفل عرف قصہ حاتم طائی)	حیدر بخش حیدری
نوابی دربار (پہلا، دوسرا اور تیسرا حصہ)	نواب سید محمد آزاد
مثنوی حزن اختر	واجد علی شاہ
ہلہ آتا ہے	اشک امرتسری

TUTORIAL

Bangal Ka Urdu Adab

Tutorial Activities (Project Work / Term Paper [Based on Bangal Ka Urdu Adab])

.....END.....

Reference Books

بنگال میں اردو	:	وفا راشدی
فورٹ ولیم کالج کی ادبی خدمات	:	عبیدہ بیگم
نساخ سی وحشت تک	:	لطیف الرحمان
مرشد آباد کی چار کلاسیکی شعرا	:	یوسف تقی
نوابی دربار	:	مشتاق احمد
بیچ کا ورق	:	ظفر اوگانوی
انشا اللہ خان انشا: حیات اور فن	:	ندیم احمد

Discipline Specific Electives (DSE)

GROUP A-1

DSE-A-(1)

Meer

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

میر

MEER

1۔میر: سوانح اور عہد

2۔میر کی غزل گوئی

3۔میر کی شاعری مثنوی، مرثیہ اور رباعی کے حوالے سے

4۔میر کی تذکرہ نگاری: نکات الشعرا

4۔متنی تدریس:

غزل:

☆ ہستی اپنی حباب کی سی ہے

☆ چلتے ہو تو چمن کو چلیے، سنتے ہیں کہ بہاراں ہے

☆ تھا مستعارِ حسن سے اس کے جو نور تھا

☆ الٹی ہو گئیں سب تدبیریں کچھ نہ دوا نے کام کیا

مرثیہ:

☆ نہ چھوڑی دشمنوں نے گھر میں شے دوست

رباعی:

☆ حیرت ہے کہ ہو رقیب محرم تیرا

☆ ملیے اس شخص سے جو آدم ہووے

مثنوی:

☆ مثنوی در ہجو خانہ خود

TUTORIAL

Meer

Tutorial Activities (Project Work / Term Paper [Based on Meer])

.....END.....

Reference Books

1۔کلیاتِ میر، جلد اول، دوم	قومی کونسل برائے فروغ اردو زبان
2۔کلیاتِ میر، جلد اول، دوم	مرتبہ: احمد محفوظ، قومی کونسل برائے فروغ اردو زبان
3۔میر تقی میر: حیات اور شاعری	خواجہ احمد فاروقی
4۔پیغمبرانِ سخن	علی سردار جعفری
5۔نقدِ میر	سید عبداللہ
6۔افکارِ میر	مرتبہ: ایم حبیب خان
7۔شعر شور انگیز، جلد اول تا چہارم	شمس الرحمن فاروقی
8۔اسلوبیاتِ میر	گوپی چند نارنگ
9۔میر	قاضی عبدالودود
10۔میر تقی میر نمبر	رسالہ نقوش (لاہور)، حصہ دوم
11۔میر تقی میر نمبر	رسالہ آجکل (دہلی)

GROUP A-1

DSE-A- (2)

Iqbal

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

اقبال

IQBAL

1۔سوانح،شخصیت اور عہد

2۔اقبال کا ذہنی وفکری نشوونما

3۔اقبال کی غزل گوئی

4۔اقبال کی نظم نگاری

5۔اقبال کے یہاں قومی یکجہتی اور وطن کا تصور

6۔اقبال کا فلسفۂ خودی

7۔اقبال کے یہاں شاہین، ابلیس، مردِ کامل اور کرگس کا تصور

8۔متنی تدریس: غزل

☆کبھی اے حقیقت منتظر نظر آ لباسِ مجاز میں

☆ترے عشق کی انتہا چاہتا ہوں

نظم

☆طلبۂ علی گڈھ کے نام

☆جوابِ شکوہ

9۔اقبال کی نثر نگاری، مضامین اور مکاتیب کے حوالے سے

TUTORIAL

Iqbal

Tutorial Activities (Project Work / Term Paper [Based on Iqbal])

.....END.....

Reference Books

1۔اقبال: شاعر و مفکر — پروفیسر نورالحسن نقوی

2۔اقبال اور قومی یکجہتی — ڈاکٹر منظر اعجاز

3۔اقبال کا فن — پروفیسر گوپی چند نارنگ

GROUP A-2

DSE - A (3)

Taraqqi Pasand Shairi

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

ترقی پسند شاعری

TARAQQI PASAND SHAIRI

تاریخی ارتقاء

ترقی پسند تحریک کا پس منظر۔ ہندوستان میں ترقی پسند ادبی تحریک کا آغاز۔ پہلی کل ہند کانفرنس۔ تحریک کے بنیادی مسائل اور مقاصد

ترقی پسند شاعری (نظم)

موضوعات۔ تصورات۔ ہیت

ترقی پسند نظم نگاری کا ارتقاء اور فروغ

ترقی پسند نظم نگاروں کا جائزہ

مجاز۔ جذبی۔ فیض۔ مخدوم۔ سردار جعفری۔ کیفی۔ جاں نثار اور پرویز شاہدی کی نظم نگاری کا خصوصی مطالعہ

ترقی پسند شاعری (غزل)

موضوعات۔ تصورات۔ ہیت

ترقی پسند غزل کا ارتقاء اور ترقی کے منازل

ترقی پسند غزل گویوں کا جائزہ

جذبی۔ فیض۔ جاں نثار۔ مجروح سلطان پوری اور پرویز شاہدی کی نظم نگاری کا خصوصی مطالعہ

متن برائے تدریس (نظم)

آوارہ	مجاز
آج بازار میں پابجولاں چلو	فیض
شیروانی	پرویز شاہدی

متن برائے تدریس (غزل)

تمام عمر عذابوں کا سلسلہ تو رہا	جاں نثار
ہم پرورش لوح قلم کرتے رہیں گے	فیض
جلا کے مشعل جاں ہم جنوں صفات چلے	مجروح

TUTORIAL

Taraqqi Pasand Shairi

Tutorial Activities (Project Work / Term Paper [Based onTaraqqi Pasand Shairi])

.....END.....

Reference Books

اردوادب میں رومانی تحریک	:	محمد حسن
اردو میں ترقی پسند ادبی تحریک	:	خلیل الرحمٰن اعظمی
ترقی پسند ادب	:	عزیز
اردوادب کی تحریکیں	:	انور سدید

GROUP A - 2

DSE - A - (4)

Jadid Shairi

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

جدید شاعری

JADID SHAIRI

تاریخی ارتقاء

جدید شاعری کا پس منظر۔ اردو میں جدید میلان کا آغاز۔ جدیدیت کے بنیادی مسائل اور مقاصد

جدیدیت کے پیش رو۔ میراجی اور راشد کی شاعری کا خصوصی مطالعہ

جدید شاعری (نظم)

موضوعات۔ تصورات۔ ہیت

جدید نظم نگاری کا ارتقاء اور فروغ

جدید نظم نگاروں کا جائزہ

اختر الایمان۔ شہریار اور ندا فاضلی کی نظم نگاری کا خصوصی مطالعہ

جدید شاعری (غزل)

موضوعات۔ تصورات۔ انحراف۔ مزاج اور اسلوب

جدید غزل کا ارتقاء اور ترقی کے منازل

جدید غزل گویوں کا جائزہ

ناصر کاظمی۔ شہریار اور عرفان صدیقی کی غزل گوئی کا خصوصی مطالعہ

متن برائے تدریس (نظم)

دور و نزدیک	میراجی
دریچے کے قریب	راشد
نیا امرت	شہریار

متن برائے تدریس (غزل)

گرفتہ دل ہیں بہت آج تیرے دیوانے	ناصر کاظمی
تجھ سے بچھڑے ہر تو اب کس سے ملاقات ہے ہمیں	شہر یار

کہیں تو لٹنا ہے پھر نقد جاں بچانا کیا　　عرفان صدیقی

TUTORIAL

Jadid Shairi

Tutorial Activities (Project Work / Term Paper [Based on Jadid Shairi])

.....END.....

Reference Books

اردو ادب کی تحریکیں	:	انور سدید
جدیدیت کی فلسفیانہ اساس	:	شمیم حنفی
حلقۂ ارباب ذوق	:	یونس جاوید
ادبی تحریکات ور جحانات	:	انور پاشا
تانیثیت اور اردو ادب	:	انور پاشا
حلقۂ ارباب ذوق اور اردو نظم	:	زرینہ زریں

GROUP B - 1

DSE - B (1)

Tanz-o-Mezah

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

طنزومزاح

TANZ-O-MEZAH

طنزومزاح کی تعریف۔ان کی اہمیت

طنزاورمزاح میں فرق

اردوادب میں طنزومزاح کا تدریجی ارتقاء

طنزومزاح (شاعری)

میر۔سودا،انشااورنظیر کے ہجویات۔شہرآشوب اورطنزیہ ومزاحیہ نظمیں

اودھ پنچ کا دور۔اودھ پنچ کے طنزومزاح نگار

اکبرالہٰ کا خصوصی مطالعہ

طنزومزاح (نثر)

اردونثر میں طنزومزاح کی ابتداءارتقاءاورفروغ

اودھ پنچ کا دور۔اودھ پنچ کے طنزومزاح نگار

رتن ناتھ سرشار کا خصوصی مطالعہ

طنزومزاح کا جدید دور۔اہم طنزومزاح نگار

پطرس کا خصوصی مطالعہ

متن برائے تدریس (شاعری)

آدمی نامہ نظیراکبرآبادی

متن برائے تدریس (نثر)

کتے پطرس بخاری

TUTORIAL

Tanz-o-Mezah

Tutorial Activities (Project Work / Term Paper [Based on Tanz-o-Mezah])

.....END.....

Reference Books

اردو ادب میں طنز و مزاح	:	وزیر آغا
طنزیات و مضحکات	:	رشید احمد صدیقی
ظرافت اور تنقید	:	احمد جمال پاشا
پیروڈی: نقد و انتخاب	:	امتیاز وحید

GROUP B-1

DSE - B (2)

Sir Syed Aur Un Ka Ahad

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

سرسیداوران کا عہد

SIR SYED AUR UN KA AHAD

1۔سرسید:شخصیت اورعہد

2۔سرسیداورعلی گڈھ تحریک (سیاسی،تعلیمی اورتہذیبی نظریات کے تناظر میں)

3۔سرسید کے رفقااورمعاصرین

4۔ادب،علم وآگہی اورصحافت میں سرسید کا حصہ۔سرسید کی تصانیف کا تفصیلی محاکمہ

4۔متنی تدریس:

☆ریا اور مخالفت: سرسیداحمدخاں

☆اسبابِ بغاوتِ ہند : سرسیداحمدخاں

TUTORIAL

Sir Syed Aur Un Ka Ahad

Tutorial Activities (Project Work / Term Paper [Based on Sir Syed Aur Un Ka Ahad])

.....END.....

Reference Book

1۔حیاتِ جاوید حالی

2۔سرسیداوران کے نامور رفقا سیدعبداللہ

3۔سرسیداحمدخاں خلیق احمدنظامی

4۔سرسیداورہندوستانی مسلمان نورالحسن نقوی

5۔سرسید کی صحافت اصغرعباس

6۔سرسیداوراردوزبان وادب قمرالہدیٰ فریدی

GROUP B - 2

DSE - B (3)

Mohd. Hussain Aazaad

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

محمد حسین آزاد

1۔محمد حسین آزاد: شخصیت اور عہد۔
2۔نظم جدید کے فروغ میں انجمنِ پنجاب اور محمد حسین آزاد۔
3۔محمد حسین آزاد کے نثری اسالیب۔
4۔محمد حسین آزاد کی تنقید نگاری۔آب حیات کے حوالے سے۔
5۔ادب میں محمد حسین آزاد کا مقام۔
6۔آزاد کی نظم گوئی۔

7 ۔متنی تدریس:

☆علوم کی بدنصیبی	نیرنگِ خیال، محمد حسین آزاد
☆نظم اردو کی تاریخ	آبِ حیات، محمد حسین آزاد

معاون کتب:

1۔محمد حسین آزاد (مونوگراف)	عتیق اللہ
2۔تنقیدِ آبِ حیات	مسعود حسن رضوی ادیب
3۔داستانِ تاریخِ اردو	حامد حسن قادری
4۔تاریخِ ادبِ اردو	جمیل جالبی
5۔محمد حسین آزاد نمبر	مجلّہ ''فکر و نظر'' علی گڈھ
6 آبِ حیات	محمد حسین نژاد
7۔نیرنگ خیال	محمد حسین آزاد

Tutorial Activities (Project Work / Term Paper)

GROUP B - 2

DSE - B (4)

Nazeer Akbaraabaadi

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

نظیر اکبرآبادی

1۔نظیر اکبرآبادی کی شخصیت

2۔نظیر اکبرآبادی کا عہد اور اس کا مزاج

3۔عوامی شاعری کا مفہوم اور اس کی روایت

4۔کلامِ نظیر (نظم،غزل) کا لب ولہجہ،موضوعات،زبان اور ہیئتی امتیازات

4۔متنی تدریس:

☆انتخاب کلام:نظیر اکبرآبادی

نظم:

بلدیو کا میلہ، رنگ ہے روپ ہے جھمیلا ہے

بنجارہ نامہ، ٹک حرص وہوا کو چھوڑ میاں

آدمی نامہ، دنیا میں بادشاہ ہے سو ہے وہ بھی آدمی

غزل:

عشق پھر رنگ وہ لایا ہے کہ جی جانے ہے

بحرِ ہستی میں صحبتِ احباب

یہ حسن ہے آہ یا قیامت کا اک بھبھوکا بھبھک رہا ہے

معاون کتب:

1۔زندگانیِ بے نظیر — سید محمد عبدالغفور شہباز

2۔نظیر اکبرآبادی (مونوگراف) — محمد حسن

3۔نظیر فہمی — مرتبہ:شمس الحق عثمانی

4۔نظیر کا آوازہ بلند — محمد ذاکر

5۔رسالہ غالب نامہ (نظیر اکبرآبادی نمبر)،جنوری ۲۰۱۰،مدیر:صدیق الرحمٰن قدوائی

6۔انتخاب نظیر اکبرآبادی — رشید حسن خان: ناشر:مکتبہ جامعہ لمیٹڈ،نئی دہلی۔

Tutorial Activities (Project Work / Term Paper)

Ability Enhancement Compulsary Course

AECC

Total Marks: 100

Attendance: 10 marks per paper

Internal Assessment: 10

Theory : 80

Urdu Nazm - o - Nasr

اردو نظم ونثر

غزل

میر تقی میر کی غزل گوئی اور ان کی دو غزلیں ۱۔ ابتدائے عشق میں روتا ہے کیا ۲۔ ہستی اپنی حباب کی سی ہے (برائے تدریس)

مرزا غالب کی غزل گوئی اور ان کی دو غزلیں ۱۔ کوئی اُمید بر نہیں آتی ۲۔ کوئی اُمید بر نہیں آتی (برائے تدریس)

مومن کی غزل گوئی اور ان کی دو غزلیں ۱۔ دل میں اس شوخ کے جو راہ نہ کی ۲۔ دیکھ لو شوقِ ناتمام میرا (برائے تدریس)

نظم

اقبال کی نظم نگاری اور ان کی نظم لالۂ صحرا (برائے تدریس)

مخدوم کی نظم نگاری اور ان کی نظم سپاہی (برائے تدریس)

فیض کی نظم نگاری اور ان کی نظم صبح آزادی (برائے تدریس)

نثر

میر امن کی داستان نگاری اور ان کی داستان باغ و بہار سے '' شروع قصے میں ''(برائے تدریس)

رجب علی بیگ سرور کی داستان نگاری اور ان کی داستان فسانۂ عجائب '' داستان اعجاز بیان سلطان فیروز بخت کی ''(برائے تدریس)

غالب کی خطوط نگاری اور ان کا خط بنام میر مہدی مجروح (خط نمبر ۱۰) '' سید صاحب نہ تم مجرم نہ میں گنہگار ''(برائے تدریس)

سر سید کی مقالہ نگاری اور ان کا مقالہ ''سمجھ''(برائے تدریس)

کرشن چندر کی افسانہ نگاری اور ان کا افسانہ ''مہالکشمی کا پل''(برائے تدریس)

صرف ونحو (گرامر)

محاورات۔اصطلاحات۔امثال

کلیات میر، کلیات غالب، کلیات مومن : میر، غالب، مومن

کلیات اقبال، کلیات مخدوم، کلیات فیض : اقبال، مخدوم، فیض

خطوط غالب (مرتبہ: خلیق انجم) : غالب

انتخاب مضامین سرسید : سرسید احمد خان

اردو کے تیرہ افسانے : مرتب: اطہر پرویز

Skill Enhancement Course

SEC - A- 1

Barqi Zarae Iblagh

برقی ذرائع ابلاغ

ریڈیو

ریڈیو۔ابتدااورارتقا۔ریڈیوکی خصوصیت اوراہمیت

ریڈیایی ڈراما، فیچر، ڈوکومینٹری، ادبی پروگرام، تفریحی پروگرام

خبرنامہ(اقسام)، اناونسمنٹ، انٹرویو، تبصرہ اور گفتگو کا فن

ٹیلی ویژن

ٹیلی ویژن۔ابتدااورارتقا۔ریڈیوکی خصوصیت اوراہمیت

خبرنامہ(اقسام)۔اناونسمنٹ، انٹرویو، اشتہار

ٹی وی سیریل، ٹیلی ڈراما، ٹیلی فلم، ڈوکومینٹری

عصرحاضر میں ذرائع ابلاغ کی اہمیت۔

Reference Book

اردو ریڈیو ٹیلی وژن میں ترسیل وابلاغ کی زبان : کمال احمد صدیقی

ریڈیو نشریات: تاریخ، اصناف اور پیش کش : زبیر شاداب

Rudin R: Broadcasting in the 21st Century, Palgrave, 2011

Saxena A: Radio in New Avatar: AM to FM, Kanishka Publishers, Distributors, 2011

Shrivastava, K.M., Radio and TV Journalism, Sterling Publishers Pvt. Ltd.,2005

Boyd A, Stewart P & Alexander S.R.: Broadcast Journalism, Focal, 2008

G. Anita: News Editing: Principles and Practices, Kaniska Publication, 2012

Paul S: News Reporting Practice, El Alma Publications, 2014

SEC - A- 2

Urdu Adab Aur Hindustani Film

اردو ادب اور ہندوستانی فلم

ہندوستانی فلم کا آغاز وارتقاء

ادب اور فلم کا رشتہ

ہندوستانی فلم اور اردو شاعری، اردو ناول اور اردو افسانہ

ہندوستانی فلم کے موضوعات اور مسائل

ہندوستانی سماج پر فلم کے اثرات

فلم اسکرپٹ نویسی کا فن اور اس کے فنی تقاضے

متنی تدریس:

ساحر لدھیانوی : جنہیں ناز ہے ہند پہ وہ کہاں ہیں

کیفی اعظمی : وقت نے کیا کیا حسیں ستم

شہریار : یہ کیا جگہ ہے دوستو یہ کون سا دیار ہے

سعادت حسن منٹو : افسانہ " ہتک "

مرزا ہادی رسوا : امراؤ جان ادا

عملی کام:

فلم میں اسکرپٹ لکھنے کی مشق

Reference Book

ہمارا سنیما : پریم پال اشک

عالمی اردو ادب سنیما صدی نمبر : مدیر۔ نند کشور کرم

ہندوستانی فلمیں اور اردو : محمد خالد عابدی

ہندوستانی فلموں میں تہذیب اودھ کی عکاسی : منتظر ن قایمی

اردو دنیا (ہندوستانی سنیما ایک سو سال اور اردو) : مدیر: خواجہ محمد اکرام الدین: فروری ۲۰۱۳

Barnouw E, Krishnaswamy S.: Indian Film, Oxford University Press, 1980

Ray S: Speaking of Films, Penguin India, 2005

Gokulsing, K. M & Dissanayake, W: Indian Popular Cinema: A Narrative of Cultural Change, Trentham Books Ltd, 2004

SEC - B - 1

Urdu Sahafat

۱۔صحافت کی تعریف،ادب اور سماج سے رشتہ۔

۲۔ اردو صحافت کا آغاز وارتقا ۔

۳۔صحافت کے موضوعاتی اقسام: حادثاتی،تقریبی، تعلیمی،سماجی،سیاسی،تہذیبی وثقافتی،اخلاقی ومذہبی موضوعات وغیرہ ۔

۴۔اداریہ نویسی،کالم نویسی،خبر نگاری،مراسلہ نگاری،انٹرویو اور فیچر وغیرہ۔

۵۔ اردو صحافت،مسائل اور امکانات۔

۶۔ اردو کے اہم صحافیوں کا عمومی مطالعہ۔

۷۔ ابوالکلام آزاد ۔۔۔الہلال اور البلاغ۔۔خصوصی مطالعہ۔

۸۔ عبد الرزاق ملیحا آبادی کا خصوصی مطالعہ ۔

Reference Book

اردو صحافت میں اظہار و ابلاغ کے مختلف پیرائے کا تنقیدی جائزہ: ڈاکٹر صالح عبداللہ

اردو صحافت کا ارتقا : معصوم مرادابادی

اردو صحافت کا جائزہ : احمد ابراہیم علوی

ابوالکلام آزاد : ملک زادہ منظور احمد

ابوالکلام آزاد : احمد صعید ملیح آبادی

Kamath,V : The Journalists Handbook, Vikas Publishing House, 1980

Kamath,V : Professional Journalism, Vikas Publishing House, 1980

H Geoffrey & S David : Practical Newspaper Reporting. SAGE Publications Ltd, 2010

G. Anita: News Editing: Principles and Practices, Kaniska Publication, 2012

SEC - B - 2

Urdu Mein Awami Zarae Iblagh

اردو میں عوامی ذرائع ابلاغ

۱۔عوامی ذرائع ابلاغ(MASS COMMUNICATION) کی تعریف۔اقسام۔زبان۔موضوعات۔

۲۔ عوامی ذرائع ابلاغ کا عہد بہ عہد ارتقا۔

۳۔عوامی ذرائع ابلاغ کی معنویت اور اہمیت۔

۴۔ عوامی ذرائع ابلاغ کے منفی اور مثبت اثرات سماج پر۔

۵۔ عوامی ذرائع ابلاغ کا کردار اور اس کی ذمہ داریاں۔

۶۔عوامی ذرائع ابلاغ کے مسائل اور امکانات۔

۷۔ عوامی ذرائع ابلاغ۔قوانین اور اقدار۔

۸۔ہندوستانی پریس کاؤنسل ۔ منصوبہ اور اختیارات۔

Reference Book

عوامی ذرائع ترسیل وابلاغ : اشتیاق احمد

ابلاغیات : محمد شاہد

جدید ابلاغ : مہدی حسن

عوامی ترسیل : دیوندر اسر 2 - B - SEC

Urdu Mein Awami Zarae Iblagh

اردو میں عوامی ذرائع ابلاغ

۱۔عوامی ذرائع ابلاغ(MASS COMMUNICATION) کی تعریف۔اقسام۔زبان۔موضوعات۔

۲۔ عوامی ذرائع ابلاغ کا عہد بہ عہد ارتقا۔

۳۔عوامی ذرائع ابلاغ کی معنویت اور اہمیت۔

۴۔ عوامی ذرائع ابلاغ کے منفی اور مثبت اثرات سماج پر۔

۵۔ عوامی ذرائع ابلاغ کا کردار اور اس کی ذمہ داریاں۔

۶۔عوامی ذرائع ابلاغ کے مسائل اور امکانات۔

۷۔ عوامی ذرائع ابلاغ۔قوانین اور اقدار۔

۸۔ہندوستانی پریس کاؤنسل ۔ منصوبہ اور اختیارات۔

Reference Book

عوامی ذرائع ترسیل وابلاغ : اشتیاق احمد

ابلاغیات : محمد شاہد

جدید ابلاغ : مہدی حسن

عوامی ترسیل : دیوندر اسر

Natarajan: 'History of Indian Journalism', Publications Dvn.(Reprint 1997).

Rangaswamy Parthasarathi: 'Journalism in India', Sterling Publishers, 1989.

McQuail D: Mass Communication Theory: An Introduction, Sage Publication 2005

Ghosh S: Mass Communication: An India Perspective, Shishu Sahitya Samsad, 2009

Kumar K. J: Mass Communication in India, Jaico Publishing House 2013

Ravindranath P.K.: Press laws and Ethics of Journalism, Authorspress, 2004

Natarajan: 'History of Indian Journalism', Publications Dvn.(Reprint 1997).laws and Ethics of Journalism, Authorspress, 200

END

UNIVERSITY OF CALCUTTA

GURUPADA SAREN
SECRETARY
COUNCILS FOR UNDERGRADUATE STUDIES,
UNIVERSITY OF CALCUTTA.

SENATE HOUSE
Kolkata – 700 073.
Phone : 2257-3376, 2241-0071-74,
E-mail :u.g.councilsc.u@gmail.com
Website :www.caluniv.ac.in

Ref.No : CUS/ 432 /18.
Dated the 19th July, 2018

CORRIGENDUM

It is notified for all concerned that the syllabus for "Urdu (Honours/General/LCC2/AECC1), vide notification no. CSR/12/18, dt. 04.6.18" published on 12-06-18 is withdrawn and the corrected version of the syllabus is enclosed herewith.

20/07/18
Secretary

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

LIST OF COURSES - GENERAL PROGRAM

LCC2

CORE COURSES / GENERIC ELECTIVE (4 COURSES)

SUBJECT-GEN-CORE/GENERIC-SEMESTER-PAPER-TH&TU — (6 CREDITS PER COURSE) 4X 6= 24 CREDITS

URD-G-CC/GE-1-1-TH&TU — URDU ZABAN-O-ADAB KI MUKHTESAR TARIKH

URD-G-CC-/GE-2-2-TH&TU — GHAZAL

URD-G-CC-/GE-3-3-TH&TU — NAZM

URD-G-CC-/GE-4-4-TH&TU — DASTAN AUR NOVEL

DISCIPLINE SPECIFIC ELECTIVE (6 CREDITS PER COURSE)

Group – A 2 COURSES IN SEMESTER 5 FROM 2 SUBJECTS .

URD-G-DSE-X-A(1)-TH&TU — URDU GHAZAL

URD-G-DSE-X-A(2)-TH&TU — NAZIR AKBARABADI

URD-G-DSE-X-A-(3)-TH&TU — MANTO

URD- -G-DSE-X-B(4)-TH&TU — GHULAM ABBAS

Group – B

URD-G-DSE-X-B(1)-TH&TU — AFSANA AUR DRAMA.

URD-G-DSE-X-B(2)-TH&TU — BENGAL KA URDU ADAB.

URD-G-DSE-X-B(3)TH&TU — MEER .

URD-G-DSE-X-B(4)TH&TU — GHALIB.

ABILITY ENHANCEMENT COMPULSORY COURSE (AECC).

SKILL ENHANCEMENT COURSE.

GROUP-A. 2 COURSE EACH IN SEMESTER 3/5 FROM GROUP A OF 2 SUBJECTS.

URD-G-SEC-X-A-(1)-TH&TU — URDU MEIN AWAMI ZARAE IBLAGH.

URD-G-SEC-X-A-(2)-TH&TU — SAHAFAT.

GROUP-B. 2 COURSES EACH IN SEMESTER 4/6 FROM GROUP B OF 2 SUBJECTS.

URD-G-SEC-X-B(1)-TH&TU — BARQI ZARAE IBLAGH.

URD-G-SEC-X-B(2)-TH&TU — URDU ADAB AUR HINDUSTANI FILM

Syllabus for (B.A. General)

URDU

Total Marks: 100

Attendance: 10 marks per paper

Internal Assessment: 10 marks per paper

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks Tutorial

Theory Courses (5 credits each) Tutorial Courses (1 credits each)

LCC-2

URD-G-LCC(2)

جدید شاعری

JADID SHAIRI

جدید شاعری کا پس منظر۔ اردو میں جدید میلان کا آغاز۔ جدیدیت کے بنیادی مسائل اور مقاصد

جدید شاعری (نظم)

موضوعات۔ تصورات۔ ہیت

جدید نظم نگاری کا ارتقاء اور فروغ

جدید نظم نگاروں کا جائزہ

اختر الایمان اور شہریار کی نظم نگاری کا مطالعہ

جدید شاعری (غزل)

موضوعات۔ تصورات۔ اسلوب

جدید غزل کا ارتقاء اور ترقی کے منازل

جدید غزل گویوں کا جائزہ

ناصر کاظمی۔ شہریار اور عرفان صدیقی کی غزل گوئی کا خصوصی مطالعہ

متن برائے تدریس (نظم)

وقت	شہریار

متن برائے تدریس (غزل)

گرفتہ دل ہیں بہت آج تیرے دیوانے	ناصر کاظمی
تجھ سے بچھڑے ہیں تو اب کس سے ملاتی ہے ہمیں	شہریار
کہیں تو لٹنا ہے پھر نقد جاں بچانا کیا	عرفان صدیقی

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Books

اردو ادب کی تحریکیں	:	انور سدید
جدیدیت کی فلسفیانہ اساس	:	شمیم حنفی
حلقۂ ارباب ذوق	:	یونس جاوید
ادبی تحریکات ور جحانات	:	انور پاشا
تانیثیت اور اردو ادب	:	انور پاشا
حلقۂ ارباب ذوق اور اردو نظم	:	زرینہ زریں

Total Marks: 100

Attendance: 10 marks per paper

Internal Assessment: 10 marks per paper

URD-G-LCC(2)

جدید فکشن - ناول اور افسانہ

JADID FICTION - NOVEL AUR AFSANA

ناول

ناول کی تعریف۔اجزائے ترکیبی

جدید ناول کا پس منظر۔ماقبل ناول نگاروں کا تعارف

جدید ناول کی ابتدا۔ارتقاء اور فروغ

اہم جدید ناول نگاروں کا عمومی مطالعہ

افسانہ

افسانہ کی تعریف۔اجزائے ترکیبی۔فنی خصوصیتیں

جدید افسانے کا پس منظر۔ماقبل افسانہ نگاروں کا تعارف۔منٹو،غلام عباس اور عصمت چغتائی کا خصوصی مطالعہ

جدید افسانے کی ابتدا۔ارتقاء اور فروغ

اہم جدید افسانہ نگاروں کا عمومی مطالعہ۔انتظار حسین اور سریندر پرکاش کا خصوصی مطالعہ

متن برائے تدریس

موذیل	منٹو
مکرجی بابو کی ڈائری	غلام عباس
رک جاو	سریندر پرکاش
انا کا زخم	بلراج مین را

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Books

کلیات غلام عباس	:	مرتبہ: ندیم احمد
کلیات منٹو	:	مرتبہ: ڈاکٹر ہمایوں اشرف
ناول کا فن	:	مترجم: ابوالکلام قاسمی
معاصر اردو ناول	:	رفیعہ شبنم عابدی
اردو افسانہ: روایت و تجربہ	:	مرتبہ گوپی چند نارنگ
افسانے کی حمایت میں	:	شمس الرحمٰن فاروقی
بازگوئی	:	سریندر پرکاش
سرخ و سیاہ	:	بلراج مین را (مرتبہ: سروالہدیٰ)
باریافت	:	ندیم احمد
بلراج مین را: ایک ناتمام سفر	:	مرتبہ: سروالہدیٰ

Total Marks: 100

Attendance: 10 marks per paper

Internal Assessment: 10 marks per paper

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks And 15 marks Tutorial

Core Courses / Generic Elective (GE)

Students of Urdu Department have to chose two GE from other Department (Subject)

Students of other Department (Subject) will chose two GE from the following

URD-G-CC-/GE-1-1-TH&TU

اردو زبان وادب کی مختصر تاریخ

URDU ZABAN-O-ADAB KI MUKHTESAR TARIKH

اردو زبان کی ابتداء ارتقاء اور فروغ

اردو زبان وادب کی ترقی اور فروغ میں صوفیائے کرام کی خدمات

اردو زبان کے آغاز وارتقاء سے متعلق مختلف نظریات

دکن میں اردو کا آغاز وارتقاء (شاعری اور نثر) — ولی، سراج اور وجہی کے کارناموں کا خصوصی مطالعہ

شمالی ہند میں اردو کا آغاز وارتقاء (شاعری اور نثر) — میر، فضل علی فضلی، نظیر، غالب اور اقبال کے کارناموں کا خصوصی مطالعہ

دبستان دہلی اور دبستان لکھنو کی شعری روایت

فورٹ ولیم کالج اور دلی کالج کی ادبی خدمات

انجمن پنجاب اور سرسید تحریک

اردو ادب پر ترقی پسند تحریک کے اثرات

اردو ادب پر جدیدیت کے اثرات

متن برائے تدریس

آب حیات کے ابتدائی دس صفحات — مولانا محمد حسین آزاد

مختلف نظریات (انتخاب از: مقدمۂ تاریخ زبان اردو) — مسعود حسین خاں

قصہ آزاد بخت کا (انتخاب از: باغ وبہار) — میر امن دہلوی

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Books

آب حیات	:	مولانا محمد حسین آزاد
مقدمۂ تاریخ زبان اردو	:	مسعود حسین خاں
ہنوستانی لسانیات	:	محی الدین قادری زور
اردو کی ابتدائی نشوونما میں صوفیائے کرام کا حصہ	:	مولوی عبدالحق
تاریخ ادب اردو	:	جمیل جالبی
اردو نثر کا ارتقاء	:	رفیعہ سلطانہ
تاریخ ادب اردو	:	رام بابو سکسینہ
پنجاب میں اردو	:	محمود شیرانی
دکن میں اردو	:	نصیر الدین ہاشمی
ترقی پسند ادب	:	سردار جعفری
اردو میں ترقی پسند ادبی تحریک	:	خلیل الرحمٰن اعظمی
اردو ادب کی تحریکیں	:	انور سدید

URD-G-CC-/GE-2-2-TH&TU

غزل

GHAZAL

غزل کا فن : غزل کا مفہوم اور اس کی ہیئت

غزل کا ارتقاء : غزل کا پس منظر۔غزل کا ارتقاء

غزل کے موضوعات : حسن و عشق، تصوف، نفسیات انسانی، جذبات و احساسات مشاہدۂ کائنات، تجربہ حیات وغیرہ۔

دکن میں غزل :دکن میں غزل کی روایت۔ ولی اور سراج کا خصوصی مطالعہ

شمالی ہند میں غزل :شمالی ہند میں غزل کی روایت۔ میر اور غالب کا خصوصی مطالعہ

لکھنؤ میں غزل :دبستان لکھنؤ کی غزل گوئی کی امتیازی خصوصیت۔ آتش کا خصوصی مطالعہ

۱۸۵۷ کے بعد کی غزلیہ شاعری کا مزاج

نئی غزل کا جائزہ۔ اقبال اور یگانہ کے حوالے سے

۱۹۶۰ سے تا حال غزلیہ شاعری کا جائزہ۔ ناصر کاظمی اور شہریار کا خصوصی مطالعہ

غزلیات برائے تدریس : مصرع

ولی

یاد کرنا ہر گھڑی اس یار کا

سراج

تھا بہانہ مجھے زنجیر کے ہل جانے کا

میر

جس سر کو غرور آج ہے یاں تاج وری کا

آتش

یہ آرزو تھی تجھے گل کے رو برو کرتے

غالب

درد منت کش دوا نہ ہوا

اقبال

ترے عشق کی انتہا چاہتا ہوں

یگانہ

ناصر کاظمی

گرفتہ دل ہیں بہت آج تیرے دیوانے

شہریار

دھوپ کے دشت میں بے سایہ شجر میں ہم تھے

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Books

دیوان غالب	:	اسداللہ خاں غالب
دیوان مومن	:	مومن خاں مومن
آب حیات	:	مولانا محمد حسین آزاد
ہماری شاعری	:	مسعود حسن رضوی
اُردو غزل	:	یوسف حسین خان
غزل اور متغزلیں	:	ابواللیث صدیقی
غزل کی سرگذشت	:	اختر انصاری
ولی سے اقبال تک	:	سید عبداللہ
اردو شاعری کا فنی ارتقاء	:	ڈاکٹر فرمان فتح پوری
پہچان اور پرکھ	:	آل احمد سرور
شعر شور انگیز	:	شمس الرحمٰن فاروقی
صنفیات	:	قاضی افضال حسین
بازیافت		ندیم احمد
اقبال ایک بازدید	:	زرینہ زریں

URD-G-CC-/GE-3-3-TH&TU

نظم

NAZM

اردو میں قصیدہ گوئی کی روایت : سوداؔ اور ذوقؔ کا خصوصی مطالعہ

دکن میں اردو مثنوی کی ابتدا اور ارتقاء : ملا وجہی اور نصرتی کی خدمات کی روشنی میں

شمالی ہندوستان میں اردو مثنوی : میر تقی میر، میر حسن اور دیا شنکر نسیم کے حوالے سے

مرثیہ گوئی کا آغاز وارتقاء : انیس اور دبیر کا خصوصی مطالعہ

اردو نظم نگاری کا آغاز وارتقاء : حالی، اقبال، اور فیض کی نظم نگاری کا خصوصی مطالعہ

اردو میں رباعی کا آغاز وارتقاء : اردو کے چند اہم رباعی گو

متن برائے تدریس

قصائد

قصیدہ شہر آشوب : سودا

ہے ابر درخشاں وہ صحن میں کمال کے : ذوق

مثنوی

سحر البیان : میر حسن (ابتدائی پندرہ صفحات)

مرثیہ

نمک خوان تکلم ہے فصاحت میری : انیس (ابتدائی پندرہ بند)

شیرِ خدا کا قوت بازو حسین ہے : دبیر (ابتدائی پندرہ بند)

نظم

حیات جاوید : مولانا الطاف حسین حالی

سرسید کی لوح تربت : سر محمد اقبال

آج بازار میں پابجولاں چلو : فیض احمد فیض

بند گھر اور چڑیا : محمد علوی

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Books

اردو میں قصیدہ نگاری	:	محمود الٰہی
اردو میں قصیدہ نگاری	:	ابو محمد سحر
اُردو قصیدہ نگاری	:	اُم ہانی اشرف
اُردو مرثیہ نگاری	:	اُم ہانی اشرف
انیس کی مرثیہ نگاری	:	محمد احسن فاروقی
روح انیس	:	سید مسعود حسن رضوی ادیب
انیس شناسی	:	گوپی چند نارنگ
اردو مثنوی کا ارتقاء	:	عبدالقادر سروری
اردو کی تین مثنویاں	:	خان رشید
نظم جدید کی کروٹیں	:	وزیر آغا
جدید اردو نظم : نظریہ و عمل	:	عقیل احمد صدیقی
اقبال ایک بازدید	:	زرینہ زریں

URD-G-CC-/GE-4-4-TH&TU

داستان اور ناول

DASTAN AUR NOVEL

داستان

داستان کی تعریف۔فنی خصوصیات

اردو داستانوں کا آغاز وارتقاء

فورٹ ولیم کالج میں لکھی جانے والی داستانوں کا عمومی جائزہ

باغ و بہار اور فسانہ عجائب کا خصوصی مطالعہ

متن برائے تدریس :

باغ و بہار : سیر تیسرے درویش کی

ناول

ناول کی تعریف۔اجزائے ترکیبی

اردو ناول کا آغاز وارتقاء

نذیر احمد، پریم چند، اور قرۃ العین حیدر کی ناول نگاری کا جائزہ

امراؤ جان ادا اور گئودان کا خصوصی مطالعہ

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Books

داستان امیر حمزہ کا مطالعہ (چار جلد) : شمس الرحمٰن فاروقی

داستان سے افسانے تک : وقار عظیم

اردو ناول کی تنقیدی تاریخ : احسن فاروقی

DISCIPLINE SPECIFIC ELECTIVE

Attendance: 10 marks per paper

Internal Assessment: 10 marks per paper

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks TutoriAL

Theory Courses (5 credits each) Tutorial Courses (1 credits each)

DSE

GROUP-A

URD-G-DSE-X-A(1)-TH&TU

اردو غزل

URDU GHAZL

غزل کا فن : غزل کا مفہوم اور اس کی ہیئت

دکن میں غزل :دکن میں غزل کی روایت۔ ولی اور سراج کا خصوصی مطالعہ

شمالی ہند میں غزل :شمالی ہند میں غزل کی روایت۔ میر اور غالب کا خصوصی مطالعہ

لکھنؤ میں غزل :دبستان لکھنؤ کی غزل گوئی کی امتیازی خصوصیت۔ آتش کا خصوصی مطالعہ

نئی غزل کا جائزہ۔ اقبال اور یگانہ کے حوالے سے

۱۹۶۰ سے تا حال غزلیہ شاعری کا جائزہ۔ ناصر کاظمی اور شہریار کا خصوصی مطالعہ

غزلیات برائے تدریس : مصرع

میر

جس سر کو غرور آج ہے یاں تاج وری کا

غالب

درد منت کش دوا نہ ہوا

اقبال

ترے عشق کی انتہا چاہتا ہوں

شہریار

دھوپ کے دشت میں بے سایہ شجر میں ہم تھے

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Books

دیوان غالب	:	اسداللہ خاں غالب
دیوان مومن	:	مومن خاں مومن
آب حیات	:	مولانا محمد حسین آزاد
ہماری شاعری	:	مسعود حسن رضوی
اُردو غزل	:	یوسف حسین خان
غزل اور متغزلیں	:	ابواللیث صدیقی
غزل کی سرگذشت	:	اختر انصاری
ولی سے اقبال تک	:	سید عبداللہ
اردو شاعری کا فنی ارتقاء	:	ڈاکٹر فرمان فتح پوری
پہچان اور پرکھ	:	آل احمد سرور
شعر شور انگیز	:	شمس الرحمٰن فاروقی
صنفیات	:	قاضی افضال حسین
بازیافت		ندیم احمد
اقبال ایک بازدید	:	زرینہ زریں

DSE

GROUP-A

URD-G-DSE-X-A(2)-TH&TU

نظیر اکبرآبادی

NAZIR AKBARABADI

حیات

نظیر کی حالت زندگی۔

نظیر کا عہد۔ادبی، تہذیبی اور سماجی حالات

نظیر کے عہد تک اردو میں نظم کی روایت۔نظیر کا انحرافی رویہ۔

نظیر کی نظموں سے ایک نئی روایت کی ابتداء

اردو نظم پر نظیر کے اثرات

فن

نظیر کی غزل گوئی

نظیر کی نظم نگاری

نظیر کی رباعیاں

غزلیات برائے تدریس : مصرع

- ہو کیوں نہ ترے کام میں حیران تماشا
- شور افگن جنوں ہے جس جا نگاہ کرنا

نظمیں برائے تدریس

بنجارہ نامہ

برسات کی بہاریں

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Books

زندگانی بے نظیر : عبدالغفور شہباز

نظیر اکبرآبادی : محمد حسن

DSE

GROUP-A

URD-G-DSE-X-A(3)-TH&TU

منٹو

Manto

حیات

منٹو کی حالت زندگی۔

منٹو کا عہد۔ ادبی، تہذیبی، سیاسی اور سماجی حالات

منٹو کے عہد تک اردو میں فکشن کی روایت۔

منٹو کے ممتاز معاصرین

اردو فکشن پر منٹو کے اثرات

فن

منٹو کی افسانہ نگاری

منٹو کے ڈرامے، مضامین، خاکے

متن برائے تدریس :

افسانہ نیا قانون۔ بابو گوپی ناتھ۔ موذیل۔ ٹھنڈا گوشت

خاکہ اختر شیرانی

مضمون ناک کی قسمیں

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Books

سعادت حسن منٹو : وارث علوی

ہمارے لئے منٹو صاحب : شمس الرحمٰن فاروقی

DSE

GROUP-A

URD-G-DSE-X-A(4)-TH&TU

غلام عباس

GHULAM ABBAS

حیات

غلام عباس کی حالت زندگی

غلام عباس کا عہد۔ادبی، تہذیبی، سیاسی اور سماجی حالات

غلام عباس کے عہد تک اردو میں فکشن کی روایت۔

غلام عباس کے ممتاز معاصرین

اردو فکشن پر غلام عباس کے اثرات

فن

غلام عباس کی افسانہ نگاری

غلام عباس کی ناول نگاری، مضامین، انٹرویز

متن برائے تدریس :

افسانہ فینسی ہیئر کٹنگ سیلون۔حمام میں۔دھنک۔مجسمہ

ناول جزیرۂ سخن وراں

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Books

کلیات غلام عباس	:	مرتبہ: ندیم احمد
غلام عباس: تنقیدی مطالعہ	:	محمد حمید شاہد
انتخاب غلام عباس	:	آصف فرخی

DSE

Group - B

URD-G-DSE-X-B(1)-TH&TU

افسانہ اور ڈراما

AFSANA AUR DRAMA

افسانہ

افسانے کی تعریف۔ اجزائے ترکیبی۔ صنفی خصوصیات

اردو افسانے کی تاریخ کا اجمالی جائزہ

اردو افسانہ آزادی سے پہلے اور آزادی کے بعد

پریم چند، منٹو، غلام عباس، بیدی، کرشن چندر اور انتظار حسین کی افسانہ نگاری کا تفصیلی جائزہ

افسانے برائے تدریس:

سوا سیر گیہوں	:	منشی پریم چند
نعرہ	:	منٹو
مجسمہ	:	غلام عباس
تلادان	:	رجندر سنگھ بیدی
جامن کا پیڑ	:	کرشن چندر
آخری آدمی	:	انتظار حسین

ڈراما

ڈراما کی تعریف۔ اجزائے ترکیبی۔

ڈراما کے اقسام: اسٹیج ڈراما۔ ادبی ڈراما۔ ریڈیائی ڈرامہ۔ یک بابی ڈراما۔ نکڑ ڈراما۔ ٹیلی ڈراما

ڈرامے کے لوازمات

اردو ڈرامے کی تاریخ کا اجمالی جائزہ۔

اردو ڈراما آزادی سے پہلے اور آزادی کے بعد

آغا حشر، محمد مجیب اور منٹو کی ڈراما نگاری کا تفصیلی جائزہ

ڈرامے برائے تدریس :

سفید خون : آغا حشر

حبہ خاتون : محمد مجیب

نیلی رگیں : منٹو

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Books

کلیات پریم چند	:	پریم چند
کلیات غلام عباس	:	مرتبہ: ندیم احمد
کلیات منٹو	:	مرتبہ: ڈاکٹر ہمایوں اشرف
کلیات راجندر سنگھ بیدی	:	مرتبہ: وارث علوی
پریم چند کا تنقیدی مطالعہ	:	ڈاکٹر قمر رئیس
اردو افسانہ: روایت و تجربہ	:	مرتبہ گوپی چند نارنگ
افسانے کی حمایت میں	:	شمس الرحمٰن فاروقی
نیا افسانہ	:	وقار عظیم
بیدی نامہ	:	شمس الحق عثمانی
پریم چند: ایک مطالعہ	:	ہنس راج رہبر
بنگال میں اردو ڈراما (آغاز تا حال):		مشتاق احمد
اُردو ڈراما کا ارتقاء	:	عشرت رحمانی
اردو ڈراما: پس منظر، منظر	:	ڈاکٹر شیخ الماس حسین

DSE

GROUP-B

URD-G-DSE-X-B(2)-TH&TU

بنگال کا اردو ادب

BENGAL KA URDU ADAB

بنگال میں اردو زبان وادب کی تاریخ۔ ارتقا اور فروغ

بنگال میں اردو غزل کا آغاز وارتقا آزادی سے قبل اور آزادی کے بعد تا حال۔

انشا اللہ خان انشا، قدرت اللہ قدرت، مخلص مرشد آبادی، عبدالغفور نساخ اور وحشت کا خصوصی مطالعہ۔

غزلیات برائے تدریس : مصرع

انشا اللہ خان انشا	ٹک آنکھ ملاتے۔۔۔۔۔۔۔۔۔۔۔۔۔
قدرت اللہ قدرت	نہ واقف کارواں سے ہوں۔۔۔۔۔۔۔۔
مخلص مرشد آبادی	وہ کون دن ہے کہ جب۔۔۔۔۔۔۔۔۔۔۔۔
نساخ	وہ ضعف ہے کہ جان بھی۔۔۔۔۔۔۔۔۔۔۔
وحشت کلکتوی	جو سچ پوچھو کتاب آرزو کا۔۔۔۔۔۔۔۔۔۔

بنگال میں نظم نگاری کا عمومی جائزہ۔ پرویز شاہدی کی نظم نگاری کا خصوصی جائزہ۔

بنگال میں اردو نثر کا آغاز وارتقا۔ فورٹ ولیم کالج کی ادبی خدمات۔ افسانوی اور غیر افسانوی نثر کی مختلف اصناف کا عمومی جائزہ۔

ترقی پسند تحریک کے اثرات اردو غزل، نظم اور نثر پر ۔۱۹۶۰ کے بعد کی شاعری اور نثر۔

متن برائے تدریس

مکتوب سفر (خط نمبر ۴) مشمولہ غبار خاطر	مولانا ابوالکلام آزاد
تغزل میں اصلاح کی ضرورت (مضمون)	وحشت کلکتوی
بھینٹ (افسانہ)	ل۔ احمد اکبرآبادی
شیروانی (نظم)	پرویز شاہدی

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Books

بنگال میں اردو	:	وفا راشدی
فورٹ ولیم کالج کی ادبی خدمات	:	عبیدہ بیگم
نساخ سی وحشت تک	:	لطیف الرحمان
مرشد آباد کی چار کلاسیکی شعرا	:	یوسف تقی
نوابی دربار	:	مشتاق احمد
بیچ کا ورق	:	ظفر اوگانوی
انشا اللہ خان انشا: حیات اور فن	:	ندیم احمد

DSE

Group - B

URD-G-DSE-X-B(3)-TH&TU

میر

MEER

1۔ میر کی سوانح حیات۔ میر کے زمانے کا ادبی، سماجی اور تہذیبی پس منظر

2۔ میر کی غزل گوئی

3۔ میر کی شاعری مثنوی، مرثیہ اور رباعی کے حوالے سے

4۔ میر کی تذکرہ نگاری: نکات الشعرا

متن برائے تدریس:

غزل:

☆ فقیرانہ آئے صدا کر چلے

☆ چلتے ہو تو چمن کو چلیے، سنتے ہیں کہ بہاراں ہے

☆ تھا مستعارِ حسن سے اس کے جو نور تھا

☆ الٹی ہو گئیں سب تدبیریں کچھ نہ دوا نے کام کیا

مرثیہ:

☆ نہ چھوڑی دشمنوں نے گھر میں شے دوست

رباعی:

☆ حیرت ہے کہ ہو رقیب محرم تیرا

☆ ملیے اس شخص سے جو آدم ہووے

مثنوی:

☆ مثنوی در ہجو خانہ خود

TUTORIAL

DSE-3 B (15 marks) - Meer

Tutorial Activities (Project Work / Term Paper [Based on Meer])

END

Reference Books

1۔کلیاتِ میر، جلد اول، دوم	قومی کونسل برائے فروغ اردو زبان
2۔کلیاتِ میر، جلد اول، دوم	مرتبہ: احمد محفوظ، قومی کونسل برائے فروغ اردو زبان
3۔میر تقی میر: حیات اور شاعری	خواجہ احمد فاروقی
4۔پیغمبرانِ سخن	علی سردار جعفری
5۔نقدِ میر	سید عبداللہ
6۔افکارِ میر	مرتبہ: ایم حبیب خان
7۔شعر شور انگیز، جلد اول تا چہارم	شمس الرحمن فاروقی
8۔اسلوبیاتِ میر	گوپی چند نارنگ
9۔میر	قاضی عبدالودود
10۔میر تقی میر نمبر	رسالہ نقوش (لاہور)، حصہ دوم
11۔میر تقی میر نمبر	رسالہ آجکل (دہلی)

DSE

Group - B

URD-G-DSE-X-B(4)TH&TU

غالب

GHALIB

حیات

غالب کی حالت زندگی۔

غالب کا عہد۔ ادبی، تہذیبی اور سماجی حالات

غالب کی شخصیت اور فن پر سفر کلکتہ کے اثرات

غالب کے ممتاز معاصرین

فن

غالب کی غزل گوئی

غالب کی قصیدہ نگاری

غالب کی مکتوب نگاری

غزلیات برائے تدریس : مصرع

- نقش فریادی ہے کس کی شوخی تحریر کا
- درد منت کش دوا نہ ہوا
- کسی کو دے کے دل کوئی نوا سنج فغاں کیوں ہو
- عشق مجھ کو نہیں وحشت ہی سہی

قصیدہ برائے تدریس : مصرع

صبح دم دروازۂ خاور کھلا.....طبلۂ عنبر کھلا (کُل بائیس اشعار)

مکاتیب برائے تدریس:

''جناب چودھری صاحب کی یاد آوری''، خط نمبر:۹ (چودھری عبدالغفور کے نام)

''اچھا ڈھکوسلا نکالا ہے''، خط نمبر:۸۳ (میر مہدی مجروح کے نام)

''کل تمہارے خط کا جواب بھیج چکا ہوں، پہنچا ہوگا.....'' خط نمبر:۱۷ (علاؤالدین احمد خاں علائی کے نام)

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Books

یادگارِ غالب	:	الطاف حسین حالی
محاسن کلام غالب	:	عبدالرحمٰن بجنوری
نقد غالب	:	مختارالدین آرزو
غالب	:	غلام رسول مہر
گلِ رعنا	:	مالک رام
غالب نامہ	:	شیخ محمد اکرام
ذکرِ غالب	:	مالک رام
غالب شناسی	:	ظ-انصاری
تلاشِ غالب	:	نثار احمد فاروقی
تلامذۂ غالب	:	مالک رام

ABILITY ENHANCEMENT COMPULSORY COURSE

AECC-

10+10+80=100

اردو نظم ونثر

URDU NAZM-O-NASR

غزل

میر تقی میر کی غزل گوئی اوران کی دوغزلیں ۱۔ ابتدائے عشق میں روتا ہے کیا ۲۔ ہستی اپنی حباب کی سی ہے (برائے تدریس)

مرزا غالب کی غزل گوئی اوران کی دوغزلیں ۱۔ کوئی اُمید برنہیں آتی ۲۔ کوئی اُمید برنہیں آتی (برائے تدریس)

مومن کی غزل گوئی اوران کی دوغزلیں ۱۔ دل میں اس شوخ کے جوراہ نہ کی ۲۔ دیکھ لوشوقِ ناتمام میرا (برائے تدریس)

نظم

اقبال کی نظم نگاری اوران کی نظم لالۂ صحرا (برائے تدریس) مخدوم کی نظم نگاری اوران کی نظم سپاہی (برائے تدریس) فیض کی نظم نگاری اوران کی نظم صبح آزادی (برائے تدریس)

نثر

میر امن کی داستان نگاری اوران کی داستان باغ وبہار سے'' شروع قصے میں ''(برائے تدریس)

رجب علی بیگ سرور کی داستان نگاری اوران کی داستان فسانۂ عجائب'' داستان اعجاز بیان سلطان فیروز بخت کی ''(برائے تدریس)

غالب کی خطوط نگاری اوران کا خط بنام میر مہدی مجروح (خط نمبر ۱۰)'' سید صاحب نہ تم مجرم نہ میں گنہگار ''(برائے تدریس)

سرسید کی مقالہ نگاری اوران کا مقالہ ''سمجھ''(برائے تدریس)

کرشن چندر کی افسانہ نگاری اوران کا افسانہ ''مہالکشمی کا پل''(برائے تدریس)

مضمون Unseen ترجمہ Unseen (انگریزی سے اردو)

صرف ونحو (گرامر) محاورات۔اصطلاحات۔امثال

Reference Books

کلیات میر، کلیات غالب، کلیات مومن : میر، غالب، مومن

کلیات اقبال، کلیات مخدوم، کلیات فیض : اقبال، مخدوم، فیض

فسانۂ عجائب (مرتبہ: رشید حسن خاں) : رجب علی بیگ سرور

خطوط غالب (مرتبہ: خلیق انجم) : غالب

Skill Enhancement Course

Total Marks: 100

Attendance: 10 marks per paper

Internal Assessment: 10 marks per paper

Multiple-Choice Questions: 20 marks; Subjective Questions: 45 marks and 15 marks for Tutorial

SEC

GROUP-A

URD-G-SEC-X-A-(1)-TH&TU

اردو میں عوامی ذرائع ابلاغ

URDU MEIN AWAMI ZARAE IBLAGH

۱۔عوامی ذرائع ابلاغ (Mass Media) کی تعریف، اقسام اور زبان

۲۔ابتدا اور عہد بہ عہد ارتقاء

۳۔عوامی ذرائع ابلاغ (Mass Media) کی سماجی معنویت

۴۔مثبت اور منفی اثرات

۵۔عوامی ذرائع ابلاغ (Mass Media) کا کردار اور اس کی ذمہ داریاں

۶۔عوامی ذرائع ابلاغ (Mass Media) مسائل اور امکانات

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Books

عوامی ذرائع ترسیل وابلاغ	اشفاق احمد
ابلاغیات	محمد شاہد حسین
جدید ابلاغ	مہدی حسن
عوامی ترسیل	دیوندر اسر

SEC

GROUP-A

URD-G-SEC-X-A-(2)-TH&TU

صحافت

SAHAFAT

۱۔صحافت کی تعریف،ادب اور سماج سے رشتہ

۲۔ اردو صحافت کا آغاز وارتقا

۳۔صحافت کے موضوعاتی اقسام: حادثاتی،تقریبی، تعلیمی،سماجی،سیاسی،تہذیبی وثقافتی،اخلاقی ومذہبی موضوعات وغیرہ

۴۔اداریہ نویسی،کالم نویسی،خبر نگاری،مراسلہ نگاری،انٹرویو اور فیچر وغیرہ

۵۔ اردو صحافت،مسائل اور امکانات

۶۔ اردو کے اہم صحافیوں کا عمومی مطالعہ

۷۔ ابوالکلام آزاد اور عبدالرزاق ملیح آبادی کا خصوصی مطالعہ

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

.....END.....

Reference Book

اردو صحافت میں اظہار وابلاغ کے مختلف پیرائے کا تنقیدی جائزہ: ڈاکٹر صالح عبداللہ

اردو صحافت کا ارتقا : معصوم مرادابادی

اردو صحافت کا جائزہ : احمد ابراہیم علوی

ابوالکلام آزاد : ملک زادہ منظور احمد

ابوالکلام آزاد : احمد صعید ملیح آبادی

Kamath,V : The Journalists Handbook, Vikas Publishing House, 1980

Kamath,V : Professional Journalism, Vikas Publishing House, 1980

H Geoffrey & S David : Practical Newspaper Reporting. SAGE Publications Ltd, 2010

G. Anita: News Editing: Principles and Practices, Kaniska Publication, 2012

SEC

GROUP-B

URD-G-SEC-X-B(1)-TH&TU

برقی ذرائع ابلاغ

BARQI ZARAE IBLAGH

ریڈیو

ریڈیو۔ابتدااورارتقا۔ریڈیوکی خصوصیت اوراہمیت

ریڈیای ڈراما، فیچر،ڈوکومینٹری،ادبی پروگرام،تفریحی پروگرام

خبرنامہ(اقسام)،اناؤنسمنٹ،انٹرویو،تبصرہ اور گفتگوکافن

ٹیلی ویژن

ٹیلی ویژن۔ابتدااورارتقا۔ریڈیوکی خصوصیت اوراہمیت

خبرنامہ(اقسام)۔اناؤنسمنٹ،انٹرویو،اشتہار

ٹی وی سیریل، ٹیلی ڈراما، ٹیلی فلم،ڈوکومینٹری

عصرحاضرمیں ذرائع ابلاغ کی اہمیت۔

TUTORIAL

AEEC-3 B (15 marks) - Barqi Zarae Iblagh

Tutorial Activities (Project Work / Term Paper [Sahafat])

.....END.....

Reference Books

اردوریڈیوٹیلی وژن میں ترسیل وابلاغ کی زبان : کمال احمدصدیقی

ریڈیونشریات:تاریخ،اصناف اورپیش کش : زبیرشاداب

اردوریڈیوٹیلی وژن میں ترسیل وابلاغ کی زبان : کمال احمدصدیقی

ریڈیونشریات:تاریخ،اصناف اورپیش کش : زبیرشاداب

Rudin R: Broadcasting in the 21st Century, Palgrave, 2011

Saxena A: Radio in New Avatar: AM to FM, Kanishka Publishers, Distributors, 2011

Shrivastava, K.M., Radio and TV Journalism, Sterling Publishers Pvt. Ltd.,2005

G. Anita: News Editing: Principles and Practices, Kaniska Publication, 2012

Paul S: News Reporting Practice, El Alma Publications, 2014

SEC

GROUP-B

URD-G-SEC-X-B(2)-TH&TU

اردو ادب اور ہندوستانی فلم

URDU ADAB AUR HINDUSTANI FILM

ہندوستانی فلم کا آغاز وارتقاء۔ادب اور فلم کا رشتہ

ہندوستانی فلم اور اردو شاعری، اردو ناول اور اردو افسانہ

ہندوستانی فلم کے موضوعات اور مسائل۔ ہندوستانی سماج پر فلم کے اثرات

فلم اسکرپٹ نویسی کا فن اور اس کے فنی تقاضے

متنی تدریس:

ساحر لدھیانوی : جنہیں ناز ہے ہند پہ وہ کہاں ہیں

کیفی اعظمی : وقت نے کیا کیا حسیں ستم

شہریار : یہ کیا جگہ ہے دوستو یہ کون سا دیار ہے

سعادت حسن منٹو : افسانہ " ہتک "

مرزا ہادی رسوا : امراؤ جان ادا

عملی کام:

فلم میں اسکرپٹ لکھنے کی مشق

TUTORIAL

Tutorial Activities (Project Work / Term Paper)

Reference Book

ہمارا سنیما : پریم پال اشک

عالمی اردو ادب سنیما صدی نمبر : مدیر۔نند کشور کرم

ہندوستانی فلمیں اور اردو : محمد خالد عابدی

ہندوستانی فلموں میں تہذیب اودھ کی عکاسی : منتظر ن قائمی

اردو دنیا

(ہندوستانی سنیما ایک سو سال اور اردو) : مدیر: خواجہ محمد اکرام الدین: فروری ۲۰۱۳

31Barnouw E, Krishnaswamy S.: Indian Film, Oxford University Press, 1980

Ray S: Speaking of Films, Penguin India, 2005

Gokulsing, K. M & Dissanayake, W: Indian Popular Cinema: A Narrative of Cultural Change, Trentham Books Ltd, 2004

END

UNIVERSITY OF CALCUTTA

NISHAT ALAM
Secretary,
Councils for Undergraduate Studies,
University of Calcutta.

SENATE HOUSE
87/1, College Street, Kolkata–700 073.
Phone : 2257-3376, 2241-0071-74
e-mail: u.g.councilsc.u@gmail.com
Website: www.caluniv.ac.in

Ref. No. CUS/154/17

Dated the 26th May, 2017

To
The Principals
of all the Undergraduate Colleges
offering B.Com (Honours & General) courses
affiliated to the University of Calcutta.

Sir/Madam,

The undersigned is directed to forward you the University Notification No. CSR/26/17, dt. 26.05.2017 containing new course structure, syllabi and revised admission regulations for three-year B.Com. (*Honours & General*) Courses of Studies.

The above shall be effective for the students getting admission to the three-year six-semester B.Com. (Honours & General) Courses of Studies under CBCS, from the academic session 2017-18 and onwards.

The said notification along with detail course structure, syllabi and admission regulations are available in the Calcutta University website.

Thanking you,

Yours faithfully,

26/05/17

(NISHAT ALAM)
Secretary

26/5/17

Enclo.: C.U. Notification No. CSR/26/17, dt. 26.05.2017

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 26 /17

It is notified for information of all concerned that the Syndicate in its meeting dated 23.05.2017 (vide Item No.46) resolved to approve the **New Course Structure & Syllabi and revised Admission Regulations for the B.Com. (Honours and General)** courses of study under this University as laid down in the accompanying pamphlet.

The above shall be effective for the students getting admission to the 3-year 6-Semester B.Com. (Honours and General) courses of study under CBCS, from the academic session 2017-2018 and onwards.

SENATE HOUSE
KOLKATA-700073
The 26th May, 2017

(Prof. Dr. Rajagopal Dhar Chakraborti)

Registrar

PART-B

Regulations relating to Admission for the Three-Year B.Com. (Honours & General) Courses of Studies conducted by the University of Calcutta

Admission Qualifications

1. A candidate who has passed the Higher Secondary (10+2) or its equivalent Examination is eligible to seek admission to the 1st year of the 3-year B.Com. (Honours/General) Course of Studies provided he/she has also passed in English having full marks not being less than 100 and fulfills the conditions as laid down in clause 2.

   Candidates who have passed the Higher Secondary (10+2) Vocational Examination in Business & Commerce conducted by the West Bengal State Council of Vocational Education and Training shall be eligible to seek admission to the B.Com. (General) 1st year Course of Studies under this University. However, no candidate shall be allowed admission after a lapse of more than 5 years from the year of passing the previous qualifying examination.

   (**Explanation:** The year of admission shall not be taken into account while calculating five years from the year of passing the previous qualifying Examination).

   For the purpose of determining eligibility for admission to the B.Com. Honours Courses, aggregate marks shall be calculated by adding the marks in top-four subjects in order of marks secured by a candidate. However, marks in compulsory Environmental Education/Studies shall not be taken into account for calculation of aggregate marks. However, If the subject "Environmental Science" is studied as an elective subject of 100 marks, it may be taken into account for the purpose of determining the aggregate marks.

2. (a) A candidate taking up B.Com. Honours Course in a subject must have obtained:
   i. A minimum of 50% marks in the aggregate and 45% marks in the subject or related subject at the previous qualifying examination.

   OR

   ii. 55% marks in the subject or related subject at the previous qualifying examination.

(b) However, candidates belonging to the Scheduled Caste or Scheduled Tribe Community taking up Honours Course of Study mast have obtained a minimum of 40% marks in the aggregate or 40% marks in the subject or related subject at the previous qualifying examination, as the case may be.

(c) **Seat reservation for admission in the first year class of three-year degree courses of studies shall be guided by the West Bengal State Higher Educational Institutions (Reservation in Admission), Act, 2013 and the West Bengal State Higher Educational Institutions (Reservation in Admission) Rules, 2014.**

(d)Following subjects be treated as related subjects for admission to B.Com. Honours courses:

Accountancy, Business Economics including Business Mathematics, Business Organization, Mathematics, Business Mathematics, Economics, Statistics, Business Studies, Office and Secretarial Practice, Financial Accounting, Elements of Cost Accountancy & Auditing, Book Keeping, Commerce, Cost Accountancy & Principle of Management, Commercial Law and preliminaries of Auditing, Costing and Taxation.

(e)A candidate shall be allowed to take up B.Com. (General) Course if he/she had passed the subject(s) at the previous qualifying examination as mentioned below:

Accountancy/ Business Economics including Business Mathematics/ Business Organization/ Mathematics/ Economics/ Statistics/ Commerce/ Accounts/ Business Studies/ Financial Accounting/ Office and Secretarial Practice/ Elements of Cost Accountancy and Auditing/ Book Keeping/ Business Mathematics/ Cost Accountancy & Principle of Management, , Commercial Law and preliminaries of Auditing, Costing and Taxation.

3. Students who have passed the Higher Secondary (10+2) Examination or its equivalent from the All India Boards/Councils (i.e. CBSE, ISC and National Institute of Open Schooling) need not require to submit the Migration Certificate for getting Registration under this University.

4. A candidate who is admitted to the Honours or General Course of Studies may take any of the four DSE (Discipline Specific Elective) Courses, two courses in each of the 5^{th} and 6^{th} Semester (as offered by the College).

5. B.Com. Honours & General Course Curricula / Structure

B.Com. Honours Course Structure under Semesterised CBCS

Year I: Semester I

		Marks	Credit Hours	
AECC 1.1Chg	**Language:** Communicative English - 50 Indian Language - 50	**100**	**2**	
GE 1.1 Chg	Microeconomics I & Statistics (50+50)	**100**	**6**	
CC 1.1 Chg	Business Laws	**100**	**6**	
CC 1.2 Chg	Principles of Management	**100**	**6**	
CC 1.1 Ch	Financial Accounting - I	**100**	**6**	
			26	

Year 1: Semester II

		Marks	Credit Hours	
GE 2.1 Chg	E-Commerce & Business Communication (50+50)	**100**	**6**	
CC2.1 Chg	Company Law	**100**	**6**	
CC 2.2 Chg	Marketing Management and Human Resource Management	**100**	**6**	
CC 2.1Ch	Cost and Management Accounting - I	**100**	**6**	
			24	

Year 2: Semester III

		Marks	Credit Hours	
SEC 3.1 Chg	Information Technology & Its Application in Business (Theory -50 + Practical- 50)	**100**	**4**	
GE 3.1 Chg	Business Mathematics & Statistics	**100**	**6**	
CC3.1 Ch	Financial Accounting II	**100**	**6**	
CC3.2 Ch	Indian Financial System	**100**	**6**	
			22	

Year 2: Semester IV

		Marks	Credit Hours	
GE 4.1 Chg	Microeconomics II & Indian Economy (50+50)	**100**	**6**	
CC 4.1 Chg	Entrepreneurship Development and Business Ethics	**100**	**6**	
CC 4.1 Ch	Taxation I	**100**	**6**	
CC 4.2 Ch	Cost and Management Accounting -II	**100**	**6**	
			24	

Year 3: Semester V

		Marks	Credit Hours	
CC 5.1Ch	Auditing & Assurance	**100**	**6**	
CC 5.2 Ch	Taxation II	**100**	**6**	
DSE 5.1 A*	Economics II and Advanced Business Mathematics	**100**	**6**	
DSE 5.2 A*	Corporate Accounting	**100**	**6**	
			24	

Options:

*Or DSE 5.1 M (Consumer Behaviour and Sales Management -50+50)
& DSE 5.2 M (Product & Pricing Management and Marketing Communication (50+50)

*Or DSE 5.1T (Public Finance and Taxation)
& DSE 5.2 T (Direct Tax: Laws and Practice)

*Or DSE 5.1 **e-**B (Fundamentals of Computer)
& DSE 5.2 e-B DBMS and System Analysis &Design (50+50)

Year 3: Semester VI

		Marks	Credit Hours	
AECC 6.1Chg	Environmental Studies	**100**	**2**	
SEC 6.1Chg	Computerised Accounting and e-Filing of Tax Returns	**100**	**4**	
CC 6.1 Ch	Project Work	**100**	**6**	
DSE 6.1 A**	Financial Reporting and Financial Statement Analysis	**100**	**6**	
DSE 6.2 A**	Financial Management	**100**	**6**	
			24	

Chg: Common for Honours and General; **Ch:** Core Course for Honours

Options:

******Or DSE 6.1 M (Retail Management and Marketing of Services (50+50)
& DSE 6.2 M (Rural Marketing and International Marketing (50+50)

**Or DSE 6.1 T (Indirect Tax: Laws and Practices)
& DSE 6.2 T (Tax Procedures and Planning)

**Or DSE 6.1 e-B (Internet & WWW and Functional e-Business System (50+50)
& DSE 6.2 e-B(Computer Applications and e-Business Applications – Practical (50+50)

Summary for B.Com. Hons.

		Marks	Credit Hours	
Ability Enhancement Compulsory Course (AECC)	Two Papers	**200**	**2 x 2 = 4**	
Skill Enhancement Elective Course (SEC)	Two Papers	**200**	**2x4 = 8**	
Generic Elective (GE)	Four Papers	**400**	**4 x 6 = 24**	
CORE COURSE (CC)	Fourteen Papers	**1400**	**14x 6 = 84**	
Discipline Specific Elective (DSE)	Four Papers	**400**	**4 x 6 = 24**	
		2600	**Total 144**	

B. B.Com. General Course Structure under Semesterised CBCS

Year I: Semester I

		Marks	Credit Hours	
AECC 1.1Chg	**Language:** Communicative English - 50 Indian Language - 50	**100**	**2**	
GE 1.1 Chg	Microeconomics I & Statistics	**100**	**6**	
CC 1.1 Chg	Business Laws	**100**	**6**	
CC 1.2 Chg	Principles of Management	**100**	**6**	
CC 1.1 Cg	Financial Accounting - I	**100**	**6**	
			26	

Year 1: Semester II

		Marks	Credit Hours	
GE 2.1 Chg	E-Commerce & Business Communication (50+50)	**100**	**6**	
CC 2.1 Chg	Company Law	**100**	**6**	
CC 2.2 Chg	Marketing Management & Human Resource Management	**100**	**6**	
CC 2.1Cg	Cost and Management Accounting I	**100**	**6**	
			24	

Year 2: Semester III

		Marks	Credit Hours	
SEC 3.1 Chg	Information Technology & Its Application in Business (Theory -50 + Practical- 50)	**100**	**4**	
GE 3.1 Chg	Business Mathematics & Statistics	**100**	**6**	
CC 3.1 Cg	Financial Accounting II	**100**	**6**	
			16	

Year 2: Semester IV

		Marks	Credit Hours	
GE 4.1 Chg	Microeconomics II & Indian Economy (50+50)	**100**	**6**	
CC 4.1 Chg	Entrepreneurship Development and Business Ethics	**100**	**6**	
CC 4.1 Cg	Taxation I	**100**	**6**	
CC 4.2 Cg	Cost and Management Accounting -II	**100**	**6**	
			24	

Year 3: Semester V

		Marks	Credit Hours	
CC 5.1 Cg	Auditing & Assurance	**100**	**6**	
DSE 5.1 A*	Taxation II	**100**	**6**	
DSE 5.2 A*	Corporate Accounting	**100**	**6**	
			18	

Options:

*Or DSE 5.1 M (Consumer Behaviour and Sales Management -50+50)
& DSE 5.2 M (Product & Pricing Management and Marketing Communication (50+50)
*Or DSE 5.1T (Public Finance and Taxation)
& DSE 5.2 T (Direct Tax: Laws and Practice)

*Or DSE 5.1 **e**-B (Fundamentals of Computer)
& DSE 5.2 e-B DBMS and System Analysis &Design (50+50)

Year 3: Semester VI

		Marks	Credit Hours	
AECC 6.1Chg	Environmental Studies	**100**	**2**	
SEC 6.1 Chg	Computerised Accounting and e-Filing of Tax Returns	**100**	**4**	
DSE 6.1 A**	Financial Reporting and Financial Statement Analysis	**100**	**6**	
DSE 6.2 A**	Financial Management	**100**	**6**	
			18	

Chg: Common for Honours and General; **Cg:** Core Course for General
Options:

******Or DSE 6.1 M (Retail Management and Marketing of Services (50+50)
& DSE 6.2 M (Rural Marketing and International Marketing (50+50)

**Or DSE 6.1 T (Indirect Tax: Laws and Practices)
& DSE 6.2 T (Tax Procedures and Planning)

**Or DSE 6.1 e-B (Internet & WWW and Functional e-Business System (50+50)
& DSE 6.2 e-B(Computer Applications and e-Business Applications – Practical (50+50)

Summary for B.Com. General

		Marks	Credit Hours	
Ability Enhancement Compulsory Course (AECC)	Two Papers	**200**	**2 x 2 = 04**	
Skill Enhancement Elective Course (SEC)	Two Papers	**200**	**2x4 = 08**	
Generic Elective (GE)	Four Papers	**400**	**4 x 6 = 24**	
CORE COURSE (CC)	Eleven Papers	**1100**	**11 x 6 =66**	
Discipline Specific Elective (DSE)	Four Papers	**400**	**4 x 6 = 24**	
		2300	**Total 126**	

Extracts from UGC CBCS Model for B.Com. Hons Syllabi (Page 2)

Notes:

1. For Practical Lab based

a. Core Courses BCH 1.2 (Financial Accounting), BCH 3.2 (Income-tax Law and Practice), BCH 3.4 (Business Statistics), BCH 4.2 (Business Mathematics), and BCH 5.2 (Fundamentals of Financial Management) there shall be 4 Credit Hrs. for Lectures + one Credit hr. (Two Practical Periods per week per batch) for Practical Lab + one credit Hr for Tutorials (per group)

b. Core Courses BCH 4.3 (Computer Applications in Business) and Discipline Specific Elective BCH Group A (e) (Computerised Accounting System), there shall be 4 Credit Hrs. for Lectures + Two Credit hrs. (4 Practical Periods per week per batch) for Practical Lab

c. Skill Enhancement Elective Course BCH 3.5(E-Commerce), there shall be 3 Credit Hrs. for Lectures + One Credit hrs. (2 Practical Periods per week per batch) for Practical Lab

2. For other core and elective papers, there shall be 5 lectures and one Tutorial (per batch)

From above, It appears that:

- **one credit** represents **one lecture hour** for theoretical papers and there will be **one credit hour for tutorial** for each of theoretical papers / subjects.
- For practical lab based papers, **one credit represents two practical periods** and there will be no tutorial for practical papers/subjects.

Therefore, it is suggested that:

AECC: 2 credit hours means 2 lecture hours, i.e., 120 minutes lectures or three (3) periods of 40 mins each per week.

SEC (involving lab): 4 credit hours may be divided into two credit hours for lectures (3 periods of 40 mins) and 2 credit hours for practical (4 practical periods per batch) per week

GE, CC and DSE: 6 credit hours means 5 credit hours for lectures (300 mins for lectures, i.e., 7-8 periods of 40 mins each) and 1 tutorial hour for each group/ batch of students per week.

University of Calcutta

B.Com. Syllabus (Honours)
under Semesterised CBCS

2017

University of Calcutta

Proposed B.Com. Honours Course Structure under CBCS

Year I: Semester I

		Marks	Credit Hours	
AECC 1.1Chg	**Language:** Communicative English - 50 Indian Language - 50	**100**	**2**	
GE 1.1 Chg	Microeconomics I & Statistics (50+50)	**100**	**6**	
CC 1.1 Chg	Business Laws	**100**	**6**	
CC 1.2 Chg	Principles of Management	**100**	**6**	
CC 1.1 Ch	Financial Accounting - I	**100**	**6**	
			26	

Year 1: Semester II

		Marks	Credit Hours	
GE 2.1 Chg	E-Commerce & Business Communication (50+50)	**100**	**6**	
CC2.1 Chg	Company Law	**100**	**6**	
CC 2.2 Chg	Marketing Management and Human Resource Management	**100**	**6**	
CC 2.1Ch	Cost and Management Accounting - I	**100**	**6**	
			24	

Year 2: Semester III

		Marks	Credit Hours	
SEC 3.1 Chg	Information Technology & Its Application in Business (Theory -50 + Practical- 50)	**100**	**4**	
GE 3.1 Chg	Business Mathematics & Statistics	**100**	**6**	
CC3.1 Ch	Financial Accounting II	**100**	**6**	
CC3.2 Ch	Indian Financial System	**100**	**6**	
			22	

Year 2: Semester IV

		Marks	Credit Hours	
GE 4.1 Chg	Microeconomics II & Indian Economy (50+50)	**100**	**6**	
CC 4.1 Chg	Entrepreneurship Development and Business Ethics	**100**	**6**	
CC 4.1 Ch	Taxation I	**100**	**6**	
CC 4.2 Ch	Cost and Management Accounting -II	**100**	**6**	
			24	

Year 3: Semester V

		Marks	Credit Hours	
CC 5.1Ch	Auditing & Assurance	**100**	**6**	
CC 5.2 Ch	Taxation II	**100**	**6**	
DSE 5.1 A*	Economics II and Advanced Business Mathematics	**100**	**6**	
DSE 5.2 A*	Corporate Accounting	**100**	**6**	
			24	

Options:

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Year 3: Semester VI

		Marks	Credit Hours	
AECC 6.1Chg	Environmental Studies	**100**	**2**	
SEC 6.1Chg	Computerised Accounting and e-Filing of Tax Returns	**100**	**4**	
CC 6.1 Ch	Project Work	**100**	**6**	
DSE 6.1 A**	Financial Reporting and Financial Statement Analysis	**100**	**6**	
DSE 6.2 A**	Financial Management	**100**	**6**	
			24	

Chg: Common for Honours and General; **Ch:** Core Course for Honours

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CONTENTS

GE 1.1 Chg

Microeconomics I & Statistics (50+50)

Marks: 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: Microeconomics I

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit:I Demand and Consumer behaviour
Concept of demand, demand function, law of demand, derivation of individual and market demand curves, shifting of the demand curve; elasticity of demand.
Consumer behaviour: Marshallian utility approach and Indifference Curve approach; utility maximization conditions . Income-Consumption Curve (ICC) and Price-Consumption Curve (PCC): Derivation of demand curve from PCC.

[L-15/Marks:15]

Unit: II Production and Cost
Production function: Short-run and Long-run; Relation among Total Product, Average Product and Marginal Product, Law of returns to a variable factor, Law of Returns to Scale; Concepts of Iso-quant and iso-cost line; Conditions for optimization (graphical approach).
Cost: Accounting and Economic Costs; Social and Private Costs; Short-run and Long-run Costs; Relation between Average and Marginal Costs; Determination of LAC curve from SAC curves, LMC.

[L-10/Marks:10]

Unit: III Perfect Competition
Concept of Perfectly Competitive market: Assumptions, Profit maximization conditions;
Related concepts of Total Revenue, Average Revenue and Marginal Revenue, Short-run and Long-run
equilibrium of a firm; determination of short-run supply curve of a firm, measuring producer surplus under perfect competition, Stability analysis– Walrasian and Marshallian, demand-supply analysis including impact of taxes and subsidy**.**

[L-15/Marks – 15]

Suggested Readings

• Pindyke and Rubinfeld, Micro Economics, Pearson
• Gould & Ferguson, Micro Economic Theory
• Banerjee & Majumdar, Business Economics and Business Environment, ABS
• Banerjee & Majumdar, Banijjik Arthaniti –o- Banijjik Paribesh(Bengali)
• Dwivedi, D.N., Managerial Economics, Vikash Publications
• Mankiw.N.G., Principles of Microeconomics, Cengage
• Das, P. & Sengupta A., Economics , Oxford
• Samuelson & Nordhaus, Macroeconomics, McGraw Hill

Module II: Statistics

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

1. **Fundamentals:**Definition of Statistics, Scope and limitation of Statistics,Attribute and variable,Primary and secondary data, Method of data collection, Tabulation of data, Graphs and charts, Frequency distribution, Diagrammatic presentation of frequency distribution. **[8 L /8Marks]**
2. **Measures of Central Tendency:**Meaning of central tendency, Common measures – mean (A.M., G.M., H.M.) median and mode, Partition values- quartiles, deciles and percentiles, Applications of different measures. [8 L /8Marks]
3. **Measures of Dispersion:**Meaning of dispersion,Common measure– range, quartile deviation, mean deviation and standard deviation; Relative measures of dispersion,Combinedstandard deviation,Applications of different measures. [8 L /8Marks]
4. **Moments, Skewness and Kurtosis:** Different types of moments and their relationships, Meaning of skewness and kurtosis, Different measures of skewness, Measure of kurtosis,Applications of different measures. [8 L /8Marks]
5. **Interpolation:** Finite differences, Polynomial function, Newton's forward and backward interpolation formula, Lagrange's interpolation formula. [8 L /8Marks]

Suggested Readings:

- Business Mathematics and Statistics- N G Das & J K Das (Tata McGraw Hill)
- Statistical Methods in Business and Social Science – G. V. Shenoy and M. Pant (Macmillan)
- Business Statistics – R. S. Bhardwaj (Excel Books)
- Statistics for Management – Levin, Rubin and Rastogi (Pearson Education)
- Statistics for Management, Srivastava and Rego, McGraw Hill
- Hazarika Padmalochan, A Text Book of Business Statistics, S.Chand
- Kellor & Arora, Business Statistics, Cengage
- Pillai and Bhagwati, Business Statistics, S.Chand
- Business Mathematics & Statistics – J. Chakraborti (Dey Book Concern)
- Business Mathematics & Statistics – R K Ghosh & S Saha (New Central Book Agency(P) Ltd
- Elementary Business Mathematics & Statistics – Dr. Priyotosh Khan (Elegant Publication)
- Business Mathematics & Statistics – Dr. S N De (Chhaya Prakashani)
- Business Mathematics & Statistics – N K Nag & S K Nag (Kalyani Publishers)
- Business Mathematics & Statistics – Dr. Ranjit Dhar (Dishari Prakashani)

CC 1.1 Chg

Business Laws

Marks: 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit 1: The Indian Contract Act, 1872 [No of classes 30 / Marks 30]
a) Contract – meaning, characteristics and kinds, Essentials of a valid contract
b) Offer and acceptance (Definition, Rules, Communication and Revocation of offer and acceptance)
c) Consideration (Definition, Elements, Types, Rules), "No Consideration No Contract" and its exceptions; Capacity to Parties (Definition and Types)
d) Consent, Free consent, Coercion, Undue Influence, Fraud, Misrepresentation, Mistake
e) Legality of objects and Consideration
f) Void and Voidable agreements – Definition, Types and Distinction
g) Discharge of a contract – Modes of discharge, Breach and Remedies against breach of contract
h) Specific Contracts - Contingent contracts, Quasi, Contract of Indemnity, Guarantee, Bailment, Pledges

Unit 2: The Sale of Goods Act, 1930 [No of classes 10 / Marks 10]
a) Contract of sale, meaning and difference between sale and agreement to sell
b) Conditions and warranties
c) Transfer of ownership in goods including sale by a non-owner
d) Unpaid seller – meaning, rights of an unpaid seller against the goods and the buyer

Unit 3: Partnership Laws [No of classes 20 / Marks 20]
A) The Partnership Act, 1932
a. Definition – Partner, Partnership
b) Nature and Characteristics of Partnership
c) Types of Partners
d) Registration of a Partnership Firms and consequences of non-registration
e) Rights and Duties of Partners
f) Dissolution of firms – meaning and grounds

B) The Limited Liability Partnership Act, 2008
a) Definition
b) Salient Features of LLP
c) Advantages and disadvantages of LLP
d) Differences between: LLP and Partnership, LLP and Company
e) Incorporation of LLP

Unit 4: The Negotiable Instruments Act 1881 [No of classes 10 / Marks 10]
a) Definition, Features, Types, Parties of Negotiable Instruments: Promissory Note, bill of exchange, Cheque (Definition and Types)
b) Endorsement: Types of Endorsement
c) Holder and Holder in Due Course, Privileges of Holder in Due Course.

d) Dishonour of Negotiable Instruments: Modes, Consequences, Notice of Dishonour; Noting and Protesting
e) Discharge of Negotiable Instruments: Meaning and Modes

Unit 5: Consumers Protection Act, 1986 [No of classes 10 / Marks 10]

a) Objectives and features of Consumers Protection Act
b) Definitions – Complainant, Complaint, Consumer, Consumer Dispute, Defect, Deficiency, District Forum, Person
c) Unfair trade practices
d) Consumer Protection Council (Central, State and District – their constitutions and objectives)
e) Consumer Dispute Redressal Agencies: Composition and jurisdiction of District forum, State Commission and National Commission

(If any new provisions are enacted in place of the existing provisions, the syllabus will accordingly include such new provisions in place of existing provisions with effect from such date as prescribed by Calcutta University. Similarly if any existing provision becomes redundant due to changes, it will be left out of the syllabus)

Suggested Readings

- Kumar Ravindra, Legal Aspects of Business, Cengage
- Tulsian & Tulsian, Business Laws, S.Chand
- Kapoor N.D., Business Laws, Sultan Chand
- Das S.K. & Roy P., Business Regulatory Framework, OUP
- Gulsan S.S., Business Laws, Excel Books
- Roychowdhury, Bhattacharjee & Datta, Business Regulatory Framework, Elegant Publishers
- Bhadra, Satpati and Mitra, Ainer Ruprekha (Bengali Version), Dishari

CC 1.2 Chg

Principles of Management

Marks: 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit-1: Introduction:
No. of classes: 16 / Marks: 16
Management-definition, importance, functions, nature-as profession, science and art, universality of management; levels of management; managerial tasks and skills.
Different Schools of Thoughts: Classical School-contributions of Taylor and Henri Fayol; Neo-classical school-Human Relations approach and Behavioral Science Approach; Modern School; System approach and Contingency approach.

Unit-2: Planning:
No. of classes: 16 / Marks: 16
Concept, importance, steps, types, premises, barriers to effective planning and remedial measures; strategic planning-concept forecasting –concept, techniques.

Unit-3: Organizing:
No. of classes: 16 / Marks: 16
Concept, importance, principles, different organization models-line and staff; Functional; Departmentation-need, basis, principles, Delegation of Authority-elements, steps barriers; Centralization and Decentralization of Authority; Span of Management; concept and determining factors.

Unit-4: Directing and Staffing:
No. of classes: 16 / Marks: 16
Directing: concepts, importance of directing,
Leadership: Concept, importance, types, leadership traits, Tannenbaum & Schmidt's Model and Blake & Mouton's Model.
Staffing: concepts, importance

Unit- 5: Motivation, Co-ordination and Control:
No. of classes: 16 / Marks: 16
Motivation: Concept, importance, importance of need theory, and contributions of McGregor, Maslow, Herzberg.
Coordination: concepts, importance, principles and implementation techniques.
Control: concepts, importance and tools of control.

Suggested Readings

- Kaul, Principle and Practice of Management, Vikash
- Koontz & Weirich, Essentials of Management, TMH
- Koontz, Weirich & Cannice, Management, McGraw Hill
- Stoner & Freeman, Management , PHI
- Drucker, P.F., Managing Challanges for the 21st Century, Butterworth, Oxford
- Mitra, J., & Somani, N., Principles of Management and Business Communications, Oxford

CC 1.1 Ch
FINANCIAL ACCOUNTING – I
Marks: 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

FINANCIAL ACCOUNTING – I

Unit	Topic	Details	Marks allotted	No. of Lectures
1	Introduction	• Nature of accounting; Users of accounting information; Qualitative characteristics of accounting information. • Double entry book keeping system – Basic accounting equation, meaning of assets, liabilities, equity, revenue and expenses. Accounting Cycle - Recording of transaction: Journal, Ledger and preparation of Trial Balance. • Bases of accounting; cash basis and accrual basis. • Basic concepts and conventions: entity, money measurement, going concern, cost, realisation, accruals, periodicity, consistency, prudence (conservatism), materiality, matching and full disclosures.	5	5
2	Concepts for determination of business income	• Revenue recognition: Meaning of revenue; objective; timing of recognition. Recognition of expenses. • Inventories: meaning. Significance of inventory valuation. Lower of cost or market rule; Inventory ascertainment and reconciliation.	15	15

		• The nature of depreciation. The accounting concept of depreciation. Factors in the measurement of depreciation. Methods of computing depreciation: straight line method and diminishing balance method; Disposal of depreciable assets; change in estimate and method of charging depreciation. Accounting for depreciation: Asset-depreciation, Asset-provision. • Reserves and provisions: Meaning; Objective; Types & Accounting		
		• Capital and revenue expenditures and receipts: general introduction only. • Adjustment and rectification		
3	Introduction to Accounting Standard	Financial accounting standards: concept, benefits, procedure for issuing accounting standards in India. Need for a global standard, IFRS (concept only).	10	10
	Introduction to Accounting Theory	Concept of accounting theory; relation with practice; GAAP; Capital – capital maintenance concepts; Limitations of Historic Cost accounting; Introduction to Fair Value accounting		
4	Final accounts of Trading Concern	Preparation of financial statements: of sole proprietorship business entities from a trial balance – Manufacturing, Trading, P/L A/c and Balance Sheet	15	15
5	Financial statements from Incomplete records and of NPO	Preparation of financial statements: a) from incomplete records b) of non-profit organisation	10	12
6	Accounting for special sales transaction	• Consignment: Basic features; difference with sales. Recording in the books of Consignor – at cost & at invoice price, Valuation of unsold stock; Ordinary commission. Treatment and valuation of abnormal & normal loss. Special commission; Del credere commission (with and without bad debt) - use of Consignment Debtors A/C. Recording in the books of Consignee • Accounting for sale on approval	25	23
	Sectional and Self balancing ledger	• Concept of sectional balancing, preparation of control accounts. Self balancing Ledger: advantages; Recording process; preparation of Adjustment accounts.		

	Insurance claim for loss of stock and for loss of profit	• Loss of stock: Physical & ownership concept; concept of under-insurance and average clause; computation of claim – with price change; consideration of unusual selling line; price reduction etc. • Loss of profit: Concept – insured & uninsured standing charges, GP rate, short sales and increased cost of working, average clause and computation of claim (simple type)		

Relevant Accounting Standards issued by the Institute of Chartered Accountants of India are to be followed.

Suggested Reading:

• Sukla, Grewal, Gupta: Advanced Accountancy Vol. I, S Chand
• R. L.Gupta & Radheswamy, Advanced Accountancy Vol. I, S. Chand
• Maheshwari & Maheshwari, Advanced Accountancy Vol. I, Vikash Publishing House Pvt. Ltd.
• Sehgal & Sehgal, Advanced Accountancy Vol. I, Taxman Publication
• B. Banerjee, Regulation of Corporate Accounting & Reporting in India, World Press.
• Hanif & Mukherjee, Financial Accounting, McGraw Hill
• Frank Wood, Business Accounting Vol 1, Pearson
• Tulsian, Financial Accounting, Pearson
• Mukherjee and Mukherjee, Financial Accounting I, Oxford
• Accounting Standards issued by ICAI

Year 1: Semester II

		Marks	Credit Hours	
GE 2.1 Chg	E-Commerce & Business Communication (50+50)	**100**	**6**	
CC2.1 Chg	Company Law	**100**	**6**	
CC 2.2 Chg	Marketing Management and Human Resource Management	**100**	**6**	
CC 2.1Ch	Cost and Management Accounting - I	**100**	**6**	
			24	

GE 2.1 Chg

E-Commerce & Business Communication (50+50)

Marks: 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I
E-Commerce

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1: Introduction [10 Marks, Class: 10]

E-Commerce-meaning, nature, concepts, types; e-commerce business models B2B [concept, major activities, types of B to B market (independent, buyer oriented, supplier oriented, e-market place)], B2C [portals, e-tailer, content provider, transaction broker, real life examples of B2C], C2C, C2B, etc.; forces behind e-commerce, e-Governance [meaning, types, significance, real life examples].

Unit 2: E-CRM and SCM [8 Marks, Class: 8]

E-CRM-definition, features, goals of E-CRM business framework, phases of E-CRM, types of E-CRM, Functional components of E-CRM, strategies for E-CRM solutions; SCM-definition, features, types of supply chain.

Unit 3: Digital Payment [8 Marks, Class: 8]

Methods of e-payments [Debit Card, Credit Card, Smart Cards, e-Money], electronic or digital wallet, digital signature (procedures, working and legal provisions), payment gateways [Core Banking Solution or CBS, Mobile Payment, UPI, NCPI, International Payments], Online banking [meaning, concepts, importance, electronic fund transfer, automated clearing house, automated ledger posting], risks involved in e-payments.

Unit 4: ERP [8 Marks, Class: 8]

Definition, features, major characteristics, levels of ERP, benefits of ERP, enterprise potential of ERP, modules of ERP, phases of ERP implementation, limitations of ERP.

Unit 5: New Trends in E-Commerce [6 Marks, Class: 6]

Social Commerce-concept, definition, features; Digital Marketing-definition, objectives, methods, limitations; Advertisement in Social Media-objectives, advantages and disadvantages, procedures

Suggested Readings

- P. T. Joseph**,** *E-Commerce: An Indian Perspective,* PHI Learning
- Henry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, *E-Commerce: Fundamentals and Applications,* Wiley.
- Laudon, *E-Commerce,* Pearson Education India
- Schneider G., E-Business, Cengage
- Bhaskar, B., E–Commerce, McGraw Hill

Module II

Business Communication

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1: Introduction [8 Marks, Class: 8]

Definition, objectives, importance, elements, process, forms, models, principles of effective communication, barriers to communication and remedial measures, role of communication in conflict resolution

Unit 2: Types of Communication [6 Marks, Class: 6]

Formal and informal communication, Grapevine, Characteristics of corporate communication, Characteristics of corporate communication, Communication network

Unit 3: Tools of Communication [6 Marks, Class: 6]

Emergence of communication technology, Modern Forms of communication, Fax, E-mail, Video Conferencing

Unit 4: Drafting [20 Marks, Class: 20]

Notice, Circular, Resolution & Minutes, Report, CV writing, Business letter writing- Offer letter, Quotation, Status enquiry, Confirmation, Execution, Refusal and cancellation of order, Recommendation, Credit collection, Claim, Bank loan

. Suggested Readings

- Anjanee, S. & Bhavana Adhikari, *Business Communication*, TMH
- Chaturvedi &Chaturvedi, *Business Communication : Concepts*, *Cases and Applications*, Pearson
- M.K.Shegal &Vandana Khetarpal, Business Communication, Excel Books
- R.K.Madhukar, *Business Communication*, Vikash Publishing House Pvt. Ltd.
- Rao, Kumar & Bindu, Business Communication, Cengage
- Khanna, Puja., Business Communication, Vikash
- Raman & Sharma, Technical Communication, Oxford
- Lesikar, Flatley et al, Business Communication, McGraw Hill

CC2.1 Chg

Company Law

Marks: 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit 1: INTRODUCTION TO COMPANY[No of classes 16 / Marks 16]

Meaning and Definition – Features –, High Lights of Companies Act 2013 - Body Corporate ,Kinds of Companies (Concept, Definition and Features) – One Person Company, Private Company, Public Company, Company limited by Guarantee, Company limited by Shares, Holding Company, Subsidiary Company, Government Company, Associate Company, Small Company, Foreign Company, Listed Company, Dormant company , Lifting of corporate veil.

Unit 2: FORMATION OF A COMPANY[No of classes 16 / Marks 16]

Steps in formation of a Company, Promotion Stage, Meaning of Promoter, Position of Promoter & Functions of Promoter, Incorporation Stage – Meaning, Contents, Forms of Memorandum of Association & Articles of Association and its alteration, Distinction between Memorandum of Association and Articles of Association, Doctrines of constructive notice and Indoor management, Certificate of Incorporation, Subscription Stage – Meaning & contents of Prospectus, Types, Misstatement in prospectus and its consequences.

Unit 3: COMPANY ADMINISTRATION[No of classes 16 / Marks 16]

Director (Concept and Definition), DIN, Qualification, Disqualification, Appointment, Position, Rights, Duties, Power, Resignation, Liabilities, Removal and Resignation of director. Key Managerial Personnel (Definition, Appointment and Qualifications) – Managing Director, Whole time Directors, the Companies Secretary, Chief Financial Officer, Resident Director, Independent Director, Women director.

Unit 4: SHARE CAPITAL & DEBENTURE[No of classes 16 / Marks 16]

Share, Share Capital - Types and Definition, Allotment and Forfeiture, Calls on Shares, ESOP, Buyback, Sweat Equity, Bonus, Right, Capital Reduction, Share Certificate, D-mat System, Transfer and Transmission, Redemption of Preference Shares, Debenture – Definition, Types, Rules Regarding Issue of Debenture.

Unit 5: CORPORATE MEETINGS[No of classes 16 / Marks 16]

Corporate Meetings - Shareholder and Board, Types of Meetings – Annual General Meeting Extraordinary General meeting, Minutes of Proceedings of General Meeting, Meeting of BOD and other meetings (Section 118), Requisite of Valid Meeting- Notice, Agenda, Chairman, Quorum, Proxy, Resolutions, Minutes, Postal Ballot, E- voting, Video Conferencing, Board Meetings and Resolutions

(If any new provisions are enacted in place of the existing provisions, the syllabus will accordingly include such new provisions in place of existing provisions with effect from such date as prescribed by Calcutta University. Similarly if any existing provision becomes redundant due to changes, it will be left out of the syllabus)

Suggested Readings

- Kumar Rabindra, Legal Aspects of Business, Cengage
- Bhadra, Satpati and Mitra, Ainer Ruprekha (Bengali Version), Dishari
- Kapoor, N.D., Corporate Law, S.Chand
- Arora, Bansal, Corporate Law, Oxford
- Roychowdhury, Bhattacharjee & Datta, Business Regulatory Framework, Elegant Publishers

CC 2.2 Chg

Marketing Management and Human Resource Management

Marks 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I
Marketing Management

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1: Introduction:
No. of classes: 8 / Marks: 8

Nature, scope and importance of marketing; Selling vs Marketing; Marketing mix, Marketing environment: concept, importance, and components (Economic, Demographic, Technological, Natural, Socio-Cultural and Legal).

Unit 2: Consumer Behaviour and Market segmentation:
No. of classes: 8 / Marks: 8
Consumer Behaviour: Nature and Importance, Factors influencing consumer buying behaviour.
Market segmentation: concept, importance and bases; Product differentiation vs. market segmentation.

Unit 3: Product:
No. of classes: 8 / Marks: 8
Concept and importance, Product classifications; Concept of product mix; Branding, packaging and labeling; Product life-cycle; New Product Development Process.

Unit 4: Pricing, Distribution Channels and Physical Distribution
No. of classes: 8 / Marks: 8
Pricing: Significance. Factors affecting price of a product. Pricing policies and strategies.
Distribution Channels and Physical Distribution: Channels of distribution - meaning and importance; Types of distribution channels; Factors affecting choice of distribution channel.

Unit 5: Promotion and Recent developments in marketing:
No. of classes: 8 / Marks: 8
Promotion: Nature and importance of promotion; Communication process; Types of promotion: advertising, personal selling, public relations & sales promotion, and their distinctive characteristics.
Recent developments in marketing: Social Marketing, online marketing, direct marketing, services marketing, green marketing, Rural marketing; Consumerism.

Suggested Readings:

- Kotler & Keller, Marketing Management, Pearson
- Ramaswamy and Namakumari, Marketing Management, McMillan
- Bhagwati, Pillai, Marketing Management, S.Chand
- Verma & Duggal, Marketing Management, Oxford
- Venugopal, P., Marketing Management, Sage
- Saxena, Marketing Management, McGraw Hill

Module II
Human Resource Management

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1: Nature and Scope
No. of classes: 8 / Marks: 8
Concept and meaning of HR, Understanding the Nature and Scope of HRM, Functions and importance.

Unit 2: Human Resource Planning
No. of classes: 8 / Marks: 8
Definition, Need and Features of Human Resource Planning, factors affecting Human Resource Planning.

Unit 3: Recruitment and Selection
No. of classes: 8 / Marks: 8
Definition of Recruitment, Source, need and importance of Recruitment, Recruitment Policy – process – sources of Recruitment Definition of Selection, Steps in selection.

Unit 4: Training and Development
No. of classes: 8 / Marks: 8
Training and Development Meaning and purpose of training, Benefits of training to organisation and employees -Training methods.

Unit 5: Job Evaluation and Performance Appraisal
No. of classes: 8 / Marks: 8
Job evaluation - objectives, scope, method, Job analysis, Job description, Job Specification - basic concept and significance,
Performance Appraisal - Concept

Suggested Readings:

- Mahajan, Reeta, Human Resource Management, Vikash
- Haldar & Sarkar, Human Resource Management, Oxford
- Sinha, Sekhar & Bala, Human Resource Management, Cengage
- Jyothi & Venkatesh, Human Resource Management, Oxford
- Wilton, N., An Introduction to Human Resource Management, Sage
- Dessler & Varkkey, Human Resource Management, Pearson

CC 2.1Ch
COST AND MANAGEMENT ACCOUNTING – I

Marks 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit	Topic	Content	Marks	Lecture
1.	**Introduction**	• Definition of Costing, Objectives of Cost Accounting; Management Accounting and difference with Cost Accounting; Installing a Cost Accounting System, Essentials of a good Cost Accounting System. • **Cost concepts, terms and classification of costs**: Cost, Cost object, Cost units and Cost Centres, Types	**10**	**6**

		of costs, classification of costs- Direct-Indirect, Elementwise, Functionwise, Behaviourwise, Sunk Cost, opportunity Cost. **Costing Methods and Techniques** (introduction only).		
2	**Material Costs**	• *Purchase of materials*: Organisation, purchase procedure, documentation, determination of material purchase costs. • *Storage of materials*: Need for storage, location and types, functions of a storekeeper, requisition, receipt, issue and transfer of materials, storage record, accounting for materials cost. • *Materials control*: Organisation; Tools: Just-in-Time Purchase; various stock levels, Economic Ordering Quantity and ABC Analysis; Periodic Inventory, Perpetual Inventory, Physical verification; Discrepancies in stock and their treatment. • Methods of Pricing Material Issues: FIFO, LIFO, and Weighted Average. • Treatment of Normal and Abnormal Loss of Materials	**10**	**10**
3	**Employee Cost and Incentive Systems**	• Introduction, Recording labour cost: Attendance and payroll procedures (Time-keeping, Time-Booking, Payroll procedure, Payment of wages-Piece rate, differential piece rate, time rate); Idle time (causes and treatment in Cost Accounting), Overtime (its effect and treatment in Cost Accounting), Labour turnover (Causes, impact and methods of calculating labour turnover). • Main Principles for sound system of wage incentive schemeslabour utilisation; System of Wage Payment and Incentives(Halsey, Halsey-weir, Rowan and Emerson • System of Incentive Schemes for Indirect Workers; Component of wages cost for costing purpose.	**10**	**12**
4	**Overhead and Cost Statement**	**Overhead** • *Introduction:* Definition, Classification of Overhead-Functional and Behavioural. • *Manufacturing Overheads:* Allocation and apportionment of Overhead; Absorption of Overhead: various methods and their application; Treatment of under absorption/over absorption of overheads. • *Administration and Selling & Distribution Overheads and their charging:* an introduction only • Preparation of Cost Sheet and estimation	**20**	**20**
5	**Cost Book-keeping**	**Cost Book-keeping** • Non-Integrated System: Meaning & Features; Ledgers Maintained; Accounts prepared; General/Cost Ledger Adjustment Account; Meaning of Closing Balance in Various Accounts; Disadvantages. • Reconciliation: Need for reconciliation; Items causing differences between Cost and Financial Profits and their reconciliation.	**10**	**8**

6	**Costing Methods**	• **Job Costing** (Job cost cards and databases, Collecting direct costs of each job, Attributing overhead costs to jobs, Applications of job costing). **Batch Costing** • **Contract Costing** - Progress payments, Retention money, Escalation clause, Contract accounts, Accounting for material, Accounting for plant used in a contract, Contract Profit and Balance sheet entries. • **Service Costing and Output Costing-** Introduction; Motor Transport Costing only • **Process Costing:** Meaning, Features, Process vs Job Costing, Principles of cost ascertainment for Materials, Labour & Overhead; Normal loss, Abnormal loss and gain and preparation of process accounts. Inter-process profit (simple cases). Valuation of WIP and Equivalent units (excluding intermediary process).	**20**	**24**
			80	**80**

Suggested Readings

- Horngren, Datar & Rajan, Cost Accounting,- A Managerial Emphasis, Pearson
- B.Banerjee, Cost Accounting, PHI
- Jawahar Lal & Seema Srivastava, Cost Accounting, TMH
- M.Y.Khan & P.K.Jain, Management Accounting, TMH
- Atkinson, Management Accounting, Pearson
- Bhattacharyya, Ashish K., Cost Accounting for Business Manageres, Elsevier
- Ravi M Kishore, Cost and management Accounting, Taxmann
- Mitra, J.K., Cost & Management Accounting, Oxford
- Hanif, M., Cost & Management Accounting, McGraw Hill
- Drury, Colin., Management and Cost Accounting, Cengage
- Satish Inamdar, Cost & Management Accounting, Everest Publishing House

- Bhattacharyya, Ashish K., Cost Accounting for Business Manageres, Elsevier
- Ravi M Kishore, Cost and management Accounting, Taxmann

Year 2: Semester III

		Marks	Credit Hours	
SEC 3.1 Chg	Information Technology & Its Application in Business (Theory -50 + Practical- 50)	**100**	**4**	
GE 3.3 Chg	Business Mathematics & Statistics	**100**	**6**	
CC3.1 Ch	Financial Accounting II	**100**	**6**	
CC3.2 Ch	Indian Financial System	**100**	**6**	

SEC 3.1 Chg

Information Technology & Its Application in Business
(Theory -50 + Practical- 50)

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I

Information Technology and Its Application in Business (Theory)

(Marks: 50)

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit1: Information Technology and Business [8 Marks, Class: 8]

Concepts of data, information and computer based information system, impact of information technology on business [business data processing, intra-organizational and inter-organizational communication by using network technology, business process outsourcing and knowledge process outsourcing], types of Information System- Transaction Processing System (TPS), Management Information System (MIS), Decision Support System (DSS), Knowledge Management System (KMS) and their implementation at managerial levels [operational, tactical and strategic].

Unit 2: Data Organization and Data Base Management System [10 Marks, Class: 10]

(a) Data Organisation: Character, field, record, file and database, types of data processing systems [Serial, Batch, Real-time, Online, Centralized, Distributed], File Organizations [Sequential, Direct, Indexed-Sequential, Relative], Traditional file organisation vs. Database file organisation.

(b) Database Management System: Concept of database management system (DBMS), definition, importance of DBMS, important terms of database [Entity, Attribute, Keys- Primary, Foreign and Candidate, Referential Integrity, Table, Views, Data Dictionary], types of database [Hierarchical, Network and Relational], basic ideas of Data Warehouse and Data Mining (definition, importance, advantages and disadvantages), Big data analysis- Concept.

Unit 3: Internet and Its Applications [8 Marks, Class: 8]

Meaning of Internet, IPAddress [IPv4, IPv6], URL, Domain Name System, Internet Protocols - TCP/IP, UDP, FTP, TELNET[brief ideas only], HTML, DHTML AND XML [Concepts only], Ethical Hacking, Cloud Computing, Mobile Computing, Internet of Things, Ethical issues in Social Networking.

Unit 4: Security and Encryption [8 Marks, Class: 8]

Need and concepts, dimension, definition and scope of e-security, security threats- Malicious Codes (Virus, Trozan Horse, Worm, Spyware, Ransomware), Hacking, Spoofing, Sniffing, Phishing, Spamming, Denial of Service (DoS) attacks, Technology solutions [Confidentiality: (Data Encryption & Decryption, Symmetric and asymmetric encryption), Security Implementation: Firewall, DMZ (De Militarized Zone), SSL, HTTPs, Significance of Website Auditing].

Unit 5: IT Act. 2000 and Cyber Crimes [6 Marks, Class: 6]

IT Act 2000- Definitions of different terms, Digital signature, Electronic Governance, Attribution, Acknowledgement and Dispatch of Electronic Records, Regulation of Certifying Authorities, Digital Signatures Certificates, Duties of Subscribers, Penalties and Adjudication, Appellate Tribunal, Offences and Cyber-crimes.

Module II

Information Technology and Its Application in Business (Practical)

(Marks: 50)

Internal Assessment: 10 marks

Semester-end Examinations: 40 marks

Total 50 marks

Unit 1: Word Processing [5 Marks, Class: 5]

Working with word document- Editing text, Find and Replace text, Formatting, Spell check, Autocorrect, Auto text; Bullets and numbering, Tabs, Paragraph Formatting, Indent, Page Formatting, Header and footer, Macros, Drop cap; Tables: Inserting, Filling and formatting a Table, Inserting Pictures and Video; Mail Merge- including linking with Database, Printing documents.

Creating Business Documents using the above facilities

Unit 2: Preparing Presentations [5 Marks, Class: 5]

Basics of presentations: Slides, Fonts, Drawing, Editing; Inserting: Tables, Images, texts, Symbols, Media; Design; Transition; Animation, Hyperlink and Slideshow.

Creating Business Presentations using above facilities.

Unit 3: Spreadsheet and its Business Applications [16Marks, Class: 16]

Managing worksheets- Formatting, Entering data, Editing, and Printing a worksheet; Handling operators in formula, Project involving multiple spreadsheets, Organizing Charts and graphs, Pivot Table.

Spreadsheet Functions: Mathematical [SUMIF, SQRT, SUBTOTAL, SUMPRODUCT etc.], Statistical [AVERAGE, STDEV, VAR, CORRELATION, REGRESSION etc.], Financial [PMT, RATE, PV, FV, NPER, IRR, NPV, Data Table Etc.] Logical [AND, OR, IF etc.], Date and Time, lookup and reference, Database and Text functions.

Creating Spreadsheet in the area of: Loan and Lease statement; Ratio Analysis; Payroll Statements; Capital Budgeting; Depreciation Accounting; Graphical Representation of Data; Frequency Distribution and its Statistical Parameters; Correlation and Regression

Unit 4: Database Management System [8 Marks, Class: 8]

Creation of Tables, Multiple Table Handling-Defining Relationship [Foreign Key], Simple and Conditional Queries, Types of Queries [Update, Delete, Append], Forms, Reports, Introduction to SQL through Basic Commands.

Applying DBMS in the areas of Accounting, Inventory, HRM and its accounting, Managing the data records of Employees, Suppliers and Customers.

Unit 5: Website Designing **[6 Marks, Class: 6]**

Introduction to HTML; Tags and Attributes: Text Formatting, Fonts, Hypertext Links, Tables, Images, Lists, Forms, Frames, Cascading Style Sheets.

Suggested Readings

- Thareja, IT & Application, Oxford
- Aurora, Computer Fundamentals, Vikash
- Sinha & Sinha, Fundamentals of Computers, BPB Publications
- Dhar, P., Fundamental of IT and Its Application in Business, APH

GE 3.3 Chg
Business Mathematics & Statistics
Marks 100

Module I
Business Mathematics
Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

1 **Permutations and Combinations:** Definition, Factorial Notation, Theorems on Permutation, Permutations with repetitions, Restricted Permutations;Theorems on Combination, Basic identities, Restricted Combinations**.** **[8 L /8Marks]**

2 **Set Theory**: Definition of set, Presentation of sets, Different types of sets- Null set, Finite and infinite Sets, Universal set, Subset, Power set etc.; Set Operations, Law of algebra of Sets. **[8 L /8Marks]**

3 **Binomial Theorem:** Statement of the theorem for positive integral index, General term, Middle term, Simple properties of binomial coefficients. **[8 L /8Marks]**

4 **Logarithm:** Definition, Base and Index of Logarithm, General properties of Logarithm, Common Problems**.** **[8 L /8Marks]**

5 **Compound Interest and Annuities:**Simple AP and GP Series, Different types of interest rates, Net present value, Types of annuities, Continuous compounding, Valuation of simple loans and debentures, Problems relating to Sinking Funds. **[8 L /8Marks]**

Module II
Statistics

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

6. **Correlation and Association:**Bivariate data, Scatter diagram, Pearson's correlationcoefficient, Spearman's rank correlation, Measures of association of attributes.

[8 L /8Marks]

7. **Regression Analysis:** Least squares method, Simple regression lines, properties of regression, Identification of regression lines. **[8 L /8Marks]**
8. **Index Numbers:** Meaning and types of index numbers, Problems of constructing index numbers, Construction of price and quantity indices, Test of adequacy, errors in index numbers, Chain base index numbers; Base shifting, Splicing, Deflating, Consumer price index and its uses.

[8 L /8Marks]

9. **Time Series Analysis:** Causes of variation in time series data, Components of time series, additive and multiplicative models, Determination of trend by semi-average, moving average and least squares(of linear, quadratic and exponential trend) methods; Computation of seasonal Indices by simple average, ratio-to-moving average, ratio-to-trend and link relative methods; Simple forecasting through time series data. **[8 L /8Marks]**
10. Probability Theory: Meaning of probability; Different definitions of probability; Conditional probability; Compound probability; Independent events, Simple problems.

[8 L /8Marks]

Suggested Readings

- Business Mathematics and Statistics- N G Das & J K Das (Tata McGraw Hill)
- Statistics for Business Decisions – J. K .Das (Academic Publishers)
- Basic Mathematics and its Application in Economics – S. Baruah (Macmillan)
- Mathematics for Economics and Business – R. S. Bhardwaj (Excel Books)
- Mathematics and Statistics for Management – K B Akhilesh and S Balasubrahmanyam (Vikash Publishing House Pvt.Ltd.)
- Business Statistics – G. C. Beri (Tata McGraw Hill)
- Fundamentals of Statistics – S.C.Gupta (Himalaya Publishing House)
- Statistics for Business and Economics – D. R. Anderson, D. J. Sweeney and T. A.
- Williams (Thomson Asia Pvt Ltd)
- Text Book of Business Mathematics , Padmalochan Hazarika, S.Chand
- Business Mathematics, Jameeruddin, Khanna & Bhamdri, Vikash
- Business Mathematics & Statistics – J. Chakraborti (Dey Book Concern)
- Business Mathematics & Statistics – R K Ghosh & S Saha (New Central Book Agency(P) Ltd
- Rajaretnam, Statistics for Social Sciences, Sage
- Elementary Business Mathematics & Statistics – Dr. Priyotosh Khan (Elegant Publication)
- Business Mathematics & Statistics – Dr. S N De (Chhaya Prakashani)
- Business Mathematics & Statistics – N K Nag & S K Nag (Kalyani Publishers)
- Business Mathematics & Statistics – Dr. Ranjit Dhar (Dishari Prakashani)

CC3.1Ch: FINANCIAL ACCOUNTING – II

Marks 100

Internal Assessment: 20 marks

Semester-end Examinations: 80 marks

Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

FINANCIAL ACCOUNTING – II

Unit	Topic	Details	Marks allotted	No. of lectures
1	Partnership accounts-I	Correction of appropriation items with retrospective effect. Change in constitution of firm – change in P/S ratio, admission, retirement and retirement cum admission – treatment of Goodwill, revaluation of assets & liabilities (with/without alteration of books), treatment of reserve and adjustment relating to capital; treatment of Joint Life Policy, Death of a partner	15	15
2	Partnership accounts-II	Accounting for dissolution of firm – insolvency of one or more partner, consideration of private estate and private liabilities. Piecemeal distribution – surplus capital basis; maximum possible loss basis.	15	15
3	Branch accounting	Concept of Branch; different types of Branches. Synthetic method – preparation of Branch account. Preparation of Branch Trading and P/L account. (at cost & at IP) – normal and abnormal losses. Analytical method – preparation of Branch Stock, Adjustment etc A/C (at cost & at IP) – normal & abnormal losses Independent branch – concept of wholesale profit	10	10
4	Hire purchase and Instalment payment system	Meaning; difference with Installment payment system; Recording of transaction in the books of buyer – allocation of interest – use of Interest Suspense a/c – partial and complete repossession Books of Seller – Stock and Debtors A/C (with repossession) Books of Seller – H.P. Trading A/C without HP Sales and HP Debtors and General Trading A/c (with repossession) Concept of operating and financial lease – basic concept only.	10	10

5	Departmental accounts	Concept, objective of preparation of departmental accounts; apportionment of common cost; Preparation of Departmental Trading and P/L account, Consolidated Trading and P/L account; inter departmental transfer of goods at cost, cost plus and at selling price and elimination of unrealized profit.	10	10
6	Investment Accounts	Maintenance of Investment Ledger; Preparation of Investment Account (transaction with brokerage, STT, cum & ex-interest), Valuation of Investment under FIFO and Average method; Investment Account for Shares (with Right Shares, Bonus Shares and Sale of Right). Relevant Accounting Standard.	10	10
7	Business Acquisition and Conversion of partnership into limited company	• Profit/ loss prior to incorporation; Accounting for Acquisition of business. • Conversion of Partnership into Limited Company – with and without same set of books	10	10
			80	**80**

Relevant Accounting Standards issued by the Institute of Chartered Accountants of India are to be followed.

Suggested Reading

• Sukla, Grewal, Gupta: Advanced Accountancy Vol. I & II, S Chand
• R. L.Gupta & Radheswamy, Advanced Accountancy Vol. I & II, S. Chand
• Maheshwari & Maheshwari, Advanced Accountancy Vol. I & II, Vikash Publishing House Pvt. Ltd.
• Sehgal & Sehgal, Advanced Accountancy Vol. I & II, Taxman Publication
• L.S.Porwal, Accounting Theory, Tata Mcgraw Hill
• Gokul Sinha, Accounting Theory & Management Accounting,
• B. Banerjee, Regulation of Corporate Accounting & Reporting in India, World Press.
• Frank Wood, Business Accounting Vol 1&II, Pearson
• Tulsian, Financial Accounting, Pearson
• Hanif & Mukherjee, Financial Accounting, Vol II, McGraw Hill
• Accounting Standards issued by ICAI

CC3.2 Ch

Indian Financial System

Full Marks:100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit:I Financial System and Its Components
Meaning, Significance and Role of the Financial System; Components of the Financial System; The structure of Indian Financial System.

[L-10/Marks:10]

Unit:II Financial Markets
(a) Money Market: Functions and Instruments; Role of Central Bank; Indian Money Market: An Overview, Call Money Market, Treasury Bills Market, Commercial Paper (CP) Market, Certificate of Deposit (CD) Market; Concepts- Repo, Reverse Repo; Recent trends in the Indian money market.

[L-10/Marks 10]

(b) Capital Market: Functions and Instruments; Primary and Secondary Markets- Functions and inter-relationship, Methods of New Issues; Indian debt market and equity market; Market Intermediaries- Brokers, Sub-Brokers; Role of Stock Exchanges in India; Recent trends in the Indian capital market.

[L-20/Marks:20]

Unit: III Financial Institutions
Commercial banking: Functions of Commercial Banks, Credit creation by commercial banks and its limitations; Reserve bank of India: Functions, Credit Control and Monetary Policy; Development Financial Institutions in India: NABARD, EXIM Bank, SIDBI; Life Insurance and General Insurance Companies in India: Functions; Mutual Funds: Concept of Mutual Fund, Types of Mutual Funds(open ended and close ended); Role of Mutual Funds in Indian capital market; Non-Banking Financial Companies (NBFCs):Definition, Functions, Regulations of RBI over NBFCs. **[L-20/Marks:20]**

Unit: IV Financial Services
Merchant Banks: Functions and Role, SEBI Regulations; Credit Rating: Objectives and Limitations, SEBI Regulations; Credit Rating Institutions and their functions. **[L-10/Marks:10]**

Unit: V Investors' Protection
Concept of investors' protection; Grievances regarding new issue market and Stock Exchange transactions, and the Grievance Redressal Mechanism; Role of SEBI, judiciary and the media.

[L-10/Marks:10]

Suggested Readings

- Khan, M. Y., Indian Financial System-Theory and Practice, TMH
- Bhole, L. M., Financial Markets and Institutions, TMH
- Majumder S., Indian Financial System
- Nayak and Sana, Indian Financial System, Rabindra Library
- Basu, A, Mazumdar, D, Datta S., Indian Financial System, ABS

• Gurusamy, Financial Services, TMH
• Pathak, B., Indian Financial System, Pearson
• Bhattacharyya S., Indian Financial System, Oxford University Press
• Saha, S.S., Indian Financial System and Markets, McGraw Hill
• Saha, S.S., Capital Markets and Securities Law, Taxmann

Year 2: Semester IV

		Marks	Credit Hours	
GE 4.1 Chg	Microconomics I & Indian Economy (50+50)	**100**	**6**	
CC 4.1 Chg	Entrepreneurship Development and Business Ethics	**100**	**6**	
CC 4.1 Ch	Taxation I	**100**	**6**	
CC 4.2 Ch	Cost and Management Accounting -II	**100**	**6**	
			24	

GE 4.1 Chg

Microeconomics-II & Indian Economy (50+50)

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I

Microeconomics-II

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit: I Monopoly

Concept of Monopoly: Sources of monopoly power; Short-run and Long-run equilibrium of a monopoly firm; Price discrimination; Social Cost of Monopoly (concept only).

[L-10/Marks:10]

Unit: II Imperfect Competition
Concept of Imperfectly Competitive market; Monopolistic Competition: Features and examples; Oligopoly: Non-Collusive Oligopoly: Sweezy's Kinked demand Curve Model, Collusive Oligopoly: Cartel (concept with example) **[L-15/Marks:15]**

Unit: III Factor Price Determination

Introduction; Marginal Productivity Theory of Distribution; Marginal Productivity Theory of Wage, Demand Curve of Labour, Supply Curve of Labour; Wage Determination in an Imperfectly Competitive Labour Market: Case of Collective Bargaining, Factors determining the power of trade unions to raise wages; Theory of Rent: Ricardian Theory of Rent, Modern Theory of Rent,Quasi-rent; Theory of Profit: Gross Profit and Net Profit, Accounting Profit and Normal Profit, Different Theories of Determination of Profit; Concept of Interest: Gross Interest and Net Interest, Classic Theory of Interest Rate Determination.

[**L-15/Marks 15]**

Suggested Readings

• Pindyke and Rubinfeld, Micro Economics, Pearson
• Gold & Ferguson, Micro Economic Theory
• Banerjee & Majumdar, Business Economics and Business Environment, ABS
• Banerjee & Majumdar, Banijjik Arthaniti –o- Banijjik Paribesh(Bengali),ABS
• Ratan Khasnabish & Ranesh Roy, Banijjik Arthaniti –o- Bharoter arthanaitik Paribesh(Bengali)
- Divedi, D.N., Managerial Economics, Vikash Publications
- Mankiw.N.G., Principles of Microeconomics, Cengage
- Das, P. & Sengupta A., Economics , Oxford
- Samuelson & Nordhaus, Macroeconomics, McGraw Hill

Module II
Indian Economy

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit:I Basic Issues in Economic Development
Concepts and measures of development and underdevelopment; Concept of national income: GDP,GNP,NDP,NNP,NI (concepts only). **[L 5/ Marks:5]**

Unit:II Basic Features of Indian Economy
Sectoral distribution of National Income and Occupational Structure; Structural Change in Indian Economy, issue of Service-led Growth. **[L 10/ Marks:10]**

Unit:III Sectoral Trends and Issues

(a) **Agricultural Sector**: Problem of low productivity; Green Revolution and its impact; Land Reforms; Problems of rural credit and marketing.
(b) **Industry and Service Sector**: An overview of industrial growth during pre-reform and post-reform

period; Role of Public Sector: its performance and the issue of disinvestment; Role of MSME sector, problems faced by the MSME Sector; Role of the Service Sector: growth of banking and insurance sector during the post-reform period.
(c) **External Sector**: Problem of unfavourable balance of payments and policy measures.

[L 15/ Marks:15]

Unit:IV Social Issues in Indian Economy
Problem of Poverty, Poverty alleviation measures; Problem of Unemployment and the policy measures.

[L 10/ Marks:10]

Suggested Readings

•Dutt & Sundaram, Indian Economy, S.Chand
• Mishra &Puri, Indian Economy, Himalaya Publishing House
• Uma Kapila, Indian Economy
• Joydeb Sarkhel & Swapan Kr. Roy, Bharoter arthanaiti(Bengali)
• Banerjee & Majumdar, Business Economics and Business Environment,ABS
• Banerjee & Majumdar, Banijjik Arthaniti –o- Banijjik Paribesh(Bengali),ABS
• Ratan Khasnabish & Ranesh Roy, Banijjik Arthaniti –o- Bharoter arthanaitik Paribesh(Bengali)
- Prakash, B.A., Indian Economy, Pearson
- Fernando, Indian Economy, Pearson

CC 4.1 Chg
Entrepreneurship Development and Business Ethics

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I
Entrepreneurship Development

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit-1: Introduction:
No. of classes: 10 / Marks: 10
Meaning, elements, determinants and importance of entrepreneurship and creative behavior; Entrepreneurship and Micro, Small and Medium Enterprises, Role of family business in India; The contemporary role models in Indian business: their values, business philosophy and behavioural orientations; Conflict in family business and its resolution.

Unit-2:
No. of classes: 10 / Marks: 10
Public and private system of stimulation, support and sustainability of entrepreneurship. Requirement, availability and access to finance, marketing assistance, technology, and industrial accommodation, Role of industries/entrepreneur's associations and self-help groups, The concept, role and functions of business incubators, angel investors, venture capital and private equity fund.

Unit-3:
No. of classes: 10 / Marks: 10
Sources of business ideas and tests of feasibility. Significance of writing the business plan/ project proposal; Contents of business plan/ project proposal; Designing business processes, location, layout, operation, planning & control; preparation of project report

Unit-4:
No. of classes: 10 / Marks: 10
Mobilizing Resources - Mobilizing resources for start-up. Accommodation and utilities; Preliminary contracts with the vendors, suppliers, bankers, principal customers; Basic start-up problems;

Module II
Business Ethics

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1: Business Ethics
No. of classes: 8 / Marks: 8
Introduction – Meaning - Scope – Types of Ethics – features – Factors influencing Business Ethics – significance of Business Ethics - Arguments for and against business ethics- Basics of business ethics - Corporate Social Responsibility and Business Ethics

Unit 2: Principles of Business Ethics
No. of classes: 8 / Marks: 8

Introduction – Meaning – Element – Ethics, Morale, Business ethics, Ethical dilemma [basic idea, features and significance of each of element]

Unit 3: Ethics in Management
No. of classes: 8 / Marks: 8
Introduction – Ethics in HRM – Ethics in Marketing — Ethics in Accounting and finance - Work place Ethics - Value and Ethics.

Unit 4: Corporate Culture
No. of classes: 8 / Marks: 8
Meaning – Role – Functions – Impact of Corporate Culture – Globalization and cross culture issues in ethics, Corporate Code of ethics

Unit 5: Ethics & Corporate Governance
No. of classes: 8 / Marks: 8
Concept of Corporate Governance, Scope, Reports on Corporate Governance and its benefits and limitations-- Corporate Governance and Business Ethics [Brief Concept]

Suggested Readings:

- Kuratko and Rao, *Entrepreneurship: A South Asian Perspective*, Cengage Learning.
- Robert Hisrich, Michael Peters, Dean Shepherd, *Entrepreneurship*, McGraw-Hill Education
- Desai, Vasant. *Dynamics of Entrepreneurial Development and Management*. Mumbai,
- Himalaya Publishing House.
- Dollinger, Mare J. *Entrepreneurship: Strategies and Resources*. Illinois, Irwin.
- Holt, David H. *Entrepreneurship: New Venture Creation*. Prentice-Hall of India, New Delhi.
- Plsek, Paul E. *Creativity, Innovation and Quality*. (Eastern Economic Edition), New Delhi:
- Prentice-Hall of India. ISBN-81-203-1690-8.
- Singh, Nagendra P. *Emerging Trends in Entrepreneurship Development*. New Delhi:
- ASEED.
- SS Khanka, *Entrepreneurial Development*, S. Chand & Co, Delhi.
- Hifrich, Manimala, Peters & Shepherd, *Entrepreneurship*, McGraw-Hill
- Kumar Arya, Entrepreneurship, Pearson
- Bamford and Bruton, Entrepreneurship, McGraw Hill
- SIDBI Reports on Small Scale Industries Sector.
- Roy, Entrepreneurship, Oxford
- Albuquerque, Business Ethics, Oxford
- Ferrell, Fraedrich, Farrell, Business Ethics, Cengage

Note: Latest edition of text books may be used.

CC 4.1 Ch

TAXATION-I

Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit 1 :

a) Basic Concepts and Definitions under IT Act
Assessee, Previous year, Assessment year, Person, Income, Sources of income, Heads of income, Gross total income, Total income, Maximum marginal rate of tax, Tax Evasion, Tax avoidance, Tax planning.

b) Residential Status and Incidence of Tax
Residential status of all persons except company

c) Incomes which do not form part of Total Income
Except section 10AA.

d) Agricultural Income

Definition, determination of agricultural and non-agricultural Income, assessment of tax liability when there are both agricultural and non-agricultural income

(L-10 / M-10)

Unit 2 : Heads of Income and Provisions governing Heads of Income

a) *Salaries*

b) *Income from House property* **(L-30 / M-30)**

Unit 3 : Heads of Income and Provisions governing Heads of Income

a) *Profits and Gains of Business and Profession*

Special emphasis on sec. 32, 32AC, 32AD, 35, 35D, 36(i)(ib), (ii), (iii), (iv), (vii), 37, 37(2B), 40A(2), 40A(3), 43B, (Excluding presumptive taxation)

b) *Capital Gains*

Meaning and types of capital assets, basic concept of transfer, cost of acquisition, cost of improvement and indexation, computation of STCG and LTCG, exemptions u/s 54, 54B, 54EC and 54F, capital gain on transfer of bonus shares, right entitlement and right shares, taxability of STCG and LTCG.

c) *Income from Other Sources*

Basis of charge excluding deemed dividend **(L-25 / M-25)**

Unit 4 : a) Income of other Persons included in Assessee's Total Income

Remuneration of spouse, income from assets transferred to spouse and Son's wife, income of minor.

b) Set off and Carry Forward of Losses

Mode of set off and carry forward, inter source and inter head set off, carry forward and set off of losses u/s 71B, 72, 73, 74, 74A.

c) Deductions from Gross Total Income

Basic concepts, deductions u/s 80C, 80CCC, 80CCD, 80CCE, 80D, 80DD, 80DDB, 80E, 80G, 80GG, 80GGC, 80TTA, 80U

d) Rebate u/s 87A (L-15 M-15)

If any new legislations/provisions are enacted in place of the existing legislations/provisions, the syllabus will accordingly include such new legislations/provisions in place of existing legislations/provisions with effect from such date as prescribed by CALCUTTA UNIVERSITY. Similarly if any existing provision becomes redundant due to changes, it will be left out of the syllabus.

Suggested Readings

- Singhnia V.K., and Singhania K, Direct Tax Law and Practice, Taxmann
- Lal and Vashist, Direct Taxes, Pearson
- Ahuja and Gupta, Direct Taxes Law And Practice, Bharat
- Manoharan & Hari, Direct Tax Laws, Snow White
- Roy, S. K., Principles and Practice of Direct & Indirect Taxes, ABS
- Sengupta, C.H., Direct & Indirect Taxes, Dey Book Concern

Latest edition of the books may be read.

CC 4.2 Ch

Cost and Management Accounting -II

Full Marks – 100

Internal Assessment: 20 marks

Semester-end Examinations: 80 marks

Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit	Topic	Content	Marks	Hours
1	**Joint Product & By product**	Meaning, treatment and apportionment of cost; decision relating further processing	**20**	**18**
	Activity Based Costing	Problems of traditional costing; meaning of Activity Based Costing; cost analysis under ABC; application of ABC (Simple problems)		
2	**Budget and Budgetary Control**	Budget and Budgetary Control; The budget manual, principal budget factor, preparation and monitoring procedures, Fixed and Flexible budget, preparation of functional budgets – concepts, cash budget, flexible budget.	**10**	**12**
3	**Standard Costing**	Standard Costs and Standard Costing; Uses, & Importance. Differences with Budgetary Control, Preliminary Steps. Classification of Standards. Analysis and computation of Materials, Labour and Overhead Costs (concepts only) Variances	**20**	**20**
4	**CVP Analysis, Marginal Costing**	**CVP Analysis** Introduction; CVP Assumptions and Uses; Break-Even Analysis: BE Point and Margin of Safety; Graphical presentation of CVP Relationship; Profit Graph **Marginal Costing and Management Decisions –** Marginal Costing vis-à-vis Absorption Costing; Cost statement under marginal costing and absorption costing; Marginal Costing Techniques.	**20**	**15**
5	**Short-term Decision Making**	Marginal Cost and decision relating Product Pricing; Product Mix; Make or Buy; Choosing among alternatives and closing down or suspending an activity. (with simple type of problems)	**10**	**15**
		Total	**80**	**80**

Suggested Readings

- Horngren, Foster & Rajan, Cost Accounting,- A Managerial Emphasis, Pearson
- B.Banerjee, Cost Accounting, PHI
- Jawahar Lal & Seema Srivastava, Cost Accounting, TMH
- M.Y.Khan & P.K.Jain, Management Accounting, TMH
- Atkinson, Management Accounting, Pearson
- Bhattacharyya, Ashish K., Cost Accounting for Business Manageres, Elsevier
- Ravi M Kishore, Cost and management Accounting, Taxmann
- Hanif, M., Cost and Managment Accounting, TMH
- Mitra, J.K., Cost and Management Accounting, Oxford
- Drury, C., Management and Cost Accounting, Cengage

Year 3: Semester V

		Marks	Credit Hours	
CC 5.1Ch	Auditing & Assurance	**100**	**6**	
CC 5.2 Ch	Taxation II	**100**	**6**	
DSE 5.1 A*	Economics II and Advanced Business Mathematics	**100**	**6**	
DSE 5.2 A*	Corporate Accounting	**100**	**6**	
			24	

CC 5.1Ch
Auditing & Assurance
Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

UNIT – I CONCEPT, NEED AND PURPOSE OF AUDIT (10M 10L)

- Definition-Nature-Scope and Objectives of Independent Financial Audit
- Basic Principles Governing an Audit, Concept of Auditor's Independence
- Errors and Fraud-Concepts, Means of doing Fraud, Auditor's Responsibility towards Detection and Prevention of Fraud, Difference between Audit and Investigation
- Classification of Audit- Organization Structure wise (Statutory, Non-statutory); Objective wise (Internal and Independent Financial Audit); Periodicity wise (Periodical, Continuous, Interim, Final); Technique wise (Balance Sheet, Standard, Systems, EDP);
- Standards on Auditing (SA)- Concept and Purpose

(This unit should be studied with SA 200[REVISED] and SA 240[REVISED])

UNIT – II AUDIT PROCEDURES AND TECHNIQUES (15M 15L)

- Auditing Engagement-Audit Planning- Audit Programme (Concept)
- Documentation: Audit Working Paper, Ownership and Custody of Working Papers-Audit file (Permanent and Current) – Audit Note Book- Audit Memorandum.
- Audit Evidence – Concept, Need, Procedures to obtain Audit Evidence
- Routine Checking, Test Checking and Auditing in Depth
- Concept of Analytical Procedure and Substantive Testing in Auditing.
- Audit of Educational Institutions, Hospitals and Hotels

(This unit should be studied with SA 210, SA 230, SA 300, SA 500, SA 520 and SA 530)

UNIT – III AUDIT RISK AND INTERNAL CONTROL SYSTEM (10M 10L)

- Audit Risk – Concept and Types only.
- Internal Control- Definition, Objectives
- Internal Check- Definition, Objectives
- Internal Audit- Definition, Objectives, Regulatory Requirement, Reliance by Statutory Auditor on Internal Auditor's Work

(This unit should be studied with SA 610)

UNIT – IV VOUCHING, VERIFICATION AND VALUATION (10M 10L)

- **Vouching:** Meaning, Objectives - Difference with Routine Checking – Factors to be Considered during Vouching - Vouching of Following Items: i) **Receipts:** Cash Sale, Collection from Debtors, Interest and Dividend from Investment, Sale of Fixed Assets. ii**) Payments:** Cash Purchase, Payment to Creditors, Payment of Wages and Salaries, Advertisement Expenses, Travelling Expenses, Research and Development Expenditure, Prepaid Expenses.
- **Verification and Valuation:** Concept, Objectives, Importance, Difference with Vouching, Difference between Verification and Valuation, Verification of following items: **i) Non-Current Assets:** Goodwill, Patent and Copy Right, Leasehold Land, Plant and Machinery, **ii) Investments iii) Current Assets:** Inventory, Loan and Advance, Cash and Bank Balances **iv) Non-current Liability**: Secured Loan **v) Current Liability**: Trade Payables (Sundry Creditors).

UNIT - V COMPANY AUDIT (15M 15L)

- Qualification, Disqualification, Appointment and Rotation, Removal and Resignation, Remuneration, Rights, Duties and Liabilities of Company Auditor
- Branch Audit and Joint Audit
- Depreciation – Concept and Provisions of the Companies Act
- Divisible Profit and Dividend (Final, Interim and Unclaimed/Unpaid): Provisions of the Act, Legal Decisions and Auditor's Responsibility

UNIT – VI AUDIT REPORT AND CERTIFICATE (10M 10L)

- Definition – Distinction between Report and Certificate- Different Types of Report
- Contents of Audit Report (As per Companies Act and Standards on Auditing)
- True and Fair View – Concept
- Materiality – Concept and Relevance

(This unit should be studied with SA 700)

UNIT – VII OTHER THRUST AREAS (10M 10L)

- Cost Audit – Concepts, Objectives Relevant Provisions of Companies Act
- Management Audit - Concepts, Objectives, Advantages
- Tax Audit – Concepts, Objectives, Legal Provisions
- Social Audit – Propriety Audit – Performance Audit – Environment Audit (Concepts only)

Notes:

1) **The provisions of the Companies Act, 1956 which are still in force would form part of the syllabus till the time their corresponding or new provisions of the Companies Act, 2013 are enforced.**
2) **If new Laws or Rules are enacted in place of the existing laws and rules, the syllabus would include the corresponding provisions of such new laws and rules with immediately following Academic Year.**
3) **Students are expected to develop analytical mind for answering problem based questions along with the theoretical questions.**

Suggested Readings:

- Tandon et al, Practical Auditing, S.Chand
- Gupta & Arora, Fundamentals of Auditing, TMH
- Jha, A., Auditing, Taxmann
- Basu, S. K., Auditing and Assurance, Pearson
- Ghosh, J., Contemporary Auditing and Assurance, Elegant Publishing
- **Standards on Audit (SA) issued by the Institute of Chartered Accountants of India**

CC 5.2 Ch
TAXATION-II
Full Marks – 100
Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I
Direct Tax

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Computation of Total Income and Tax Payable

a) Rate of tax applicable to different assesses (except corporate assessee)
b) Computation of tax liability of an individual, Firm (excluding application of AMT) **(L-15 / M-15)**

Unit 2 : TAX MANAGEMENT

a) Provision for Filing of Return
Date of filing of return, relevant forms of return, different types of returns, return by whom to be signed, PAN, TAN

b) Assessment of Return
Self assessment u/s140A, Summary assessment u/s 143(1), Scrutiny assessment u/s 143(3) and Best judgement assessment u/s 144.

c) Advance Tax
Who is liable to pay, due dates and computation of advance tax (excluding corporate assessees)

d) Interest & Fees
Section 234A, 234B, 234C, 234F (simple problems on interest and fees)

e) TDS
Provisions regarding TDS from salary, interest on securities, horse racing, lottery**.** **(L-25 / M-25)**

Module II
INDIRECT TAXES

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 3 : Central Sales Tax
Definitions, incidence and levy of tax, exemptions and exclusions, forms under CST, determination of turnover and tax payable, registration of dealers.
(L-8 / M-10)

Unit 4 : West Bengal Value Added Tax
Concepts and general principles, features, advantages and disadvantages, definitions, incidence and levy of tax, Rates of VAT, Calculation of VAT liability, Input tax credit (including on Capital goods), small dealers and composition scheme, registration of

dealers, cancellation of registration certificate.

(L-12 / M-10)

Unit 5 : Central Excise

Basic concepts, conditions and taxable event for levy of excise duty, Goods and excisable goods, Manufacture and deemed manufacture, Definitions of factory, broker or commission agent, wholesale dealer, sale or purchase, valuation – MRP, transaction value. **(L-12 / M-10)**

Unit 6 : Customs

Basic concepts, Taxable event, Territorial water, Indian customs water, Goods, Types of Customs duties – Basic, Additional, Protective, Safeguard, Counter-veiling duty on subsidised goods, Anti Dumping, Valuation of Custom Duty. **(L-8 / M-10)**

The indirect tax portion of this paper will be replaced by the Goods & Service Tax Law whenever the law is enforced and accordingly revised syllabus will be announced.
If any new legislations/provisions are enacted in place of the existing legislations/provisions, the syllabus will accordingly include such new legislations/provisions in place of existing legislations/provisions with effect from such date as prescribed by CALCUTTA UNIVERSITY. Similarly if any existing provision becomes redundant due to changes, it will be left out of the syllabus.

Suggested Readings

- Datey V.S., Indirect Taxes Law And Practice, Taxmann
- Sanjeev Kumar, Systematic Approach to Indirect Taxes, Bharat
- Bangar and Bangar, Students' Gide to Indirect Taxes, Aadhya Prakashan.
- Sengupta, C.H., Direct & Indirect Taxes, Dey Book Concern
- Roy, S. K., Principles and Practice of Direct & Indirect Taxes, ABS

Latest edition of the books may be read.

DSE 5.1 A
Macroeconomics and Advanced Business Mathematics (50+50)

Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I

Macroeconomics

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit – I:Introduction

Concepts and variables of Macroeconomics. **[L 2 / Marks:2]**

Unit – II: National Income Accounting
Concepts and measurement of National Income (numerical examples preferred); Circular flow of income – Real and Nominal GDP –Implicit deflator. **[L 6 / Marks:6]**

Unit – III: Determination of Equilibrium Level of National Income
Simple Keynesian Model; Consumption, saving and investment functions – National income determination; Investment multiplier, Government expenditure multiplier, Tax multiplier, Balanced Budget multiplier. **[L 10 / Marks:10]**

Unit – IV: Commodity market and Money market equilibrium
Concept of demand for Money: Liquidity Preference Approach; Derivation of IS and LM curves –Shifts of IS and LM curves-equilibrium in IS-LM model – Effectiveness of monetary and fiscal policies. **[L 10 / Marks:10]**

Unit – V: Money, Inflation and Unemployment
Concept of supply of money; Measures of money supply – High powered money – Money multiplier. Concept of Inflation – Demand-pull and Cost-push theories of inflation – Monetary and fiscal policies to control inflation; Unemployment: Voluntary and Involuntary, Frictional and Natural Rate of Unemployment (Concepts only). **[L 12 / Marks:12]**

Suggested Readings

- W. H. Branson, Macro Economic Theory and Policy
- Joydeb Sarkhel, Macro Economic Theory
- Mazumdar & Chatterjee, Macroeconomics & Advanced Business Mathematics, ABS
- Dornbusch, Fischer & Startz, Macroeconomics, TMH
- Samuelson & Nordhaus, Macroeconomics, McGraw Hill

Module II

Advanced Business Mathematics

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

1 **Functions,Limit and Continuity**: Definition of functions, Classification of functions, Different types of functions(excluding trigonometrical functions), Elementary ideas of limit and continuity through the use of simple algebraic functions. **[8 L /8Marks]**

2 **Differentiation and Integration**: Derivative and its meaning; Rules of differentiation; Geometrical interpretation; Significance of derivative as rate measure; Second order derivatives; Integration as anti-derivative process; Standard forms; Integration by substitution. **[8 L /8Marks]**

3 **Applications of Derivativeand Integration**: Maximum and minimum values ; Cost function ; Demand function ; Profit function; Increasing and decreasing functions ; Rate measure, Applied problems on Average cost (AC), Average variable cost (AVC), Marginal cost (MC), Marginal revenue (MR), Simple area calculation by integration method. **[8 L /8Marks]**

4 **Determinants**: Determinants upto third order, Elementary properties of determinants, Minors and co-factors, Solution of a system of linear equations by Cramer's Rule (up to three variables). **[8 L /8Marks]**

5 **Matrix**: Definition of matrix, Types of matrices, Operations on matrices (addition, subtraction, multiplication), Adjoint of a matrix, Inverse of a matrix , Solution of a system of linear equations by matrix inversion method (up to three variables).

[8 L /8Marks]

Suggested Readings

- Basic Mathematics and its Application in Economics – S. Baruah (Macmillan)
- Mathematics for Economics and Business – R. S. Bhardwaj (Excel Books)
- Mathematical Analysis for Economists - R. G. D. Allen(Macmillan)
- Mathematics for Management – M. Raghavachari (Tata McGraw-Hill)
- Mathematics for Business, Economics and Social Science – F. S. Budnick(Tata McGraw Hill)
- Advanced Business Mathematics – J. Chakraborti (Dey Book Concern)
- Advanced Business Mathematics – R K Ghosh & S Saha (New Central Book Agency(P) Ltd
- Advanced Business Mathematics – Dr. Priyotosh Khan (Elegant Publication)
- Advanced Business Mathematics – Dr. S N De (Chhaya Prakashani)
- Advanced Business Mathematics - N K Nag & S K Nag (Kalyani Publishers)
- Advanced Business Mathematics – Dr. Ranjit Dhar (Dishari Prakashani)

DSE 5.2 A
CORPORATE ACCOUNTING
Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

CORPORATE ACCOUNTING

Unit	Topic	Details	Marks allotted	No. of lectures
1	Company – Introduction And Accounting for Shares & debentures	• Meaning of Company; Maintenance of Books of Accounts; Statutory Books; Annual Return • Issue of Shares – issue, forfeiture, reissue, issue other than in cash consideration and issue to the promoters; Pro-rata issue of shares. Issue of debentures. Sweat equity. • Right and Bonus Share – Rules, Accounting • Underwriting of shares and debentures: Rules; Determination of Underwriters Liability – with marked, unmarked & firm underwriting; Accounting. • Employee Stock Option Plan – meaning; rules; Vesting Period; Exercise Period. Accounting for ESOP. Meaning and Accounting of ESPS.	20	20
2	Buy back and Redemption of preference shares	• Buy Back of Securities – meaning, rules and Accounting. • Redemption of Preference Shares – Rules and Accounting (with and without Bonus Shares)	10	10
3	Company Final Accounts	Introduction to Schedule III; Treatment of Tax; transfer to reserve, Dividend and applicable tax (out of current profit, out of past reserve); Preparation of Statement of Profit & Loss and Balance Sheet. (tax on net profit without recognizing deferred tax)	15	15
4	Redemption of debenture	Redemption of Debenture – Important Provisions, Accounting for Redemption: by conversion, by lot, by purchase in the open market (cum and ex-interest), held as Investment and Use of Sinking Fund	10	10
5	Valuation	Goodwill – valuation using different methods,i.e., Average Profit, Super Profit, Capitalisation and Annuity. Shares – Valuation using different methods: Asset approach, Earnings approach, Dividend Yield, Earnings-Price, Cum-div and Ex-div, Majority and Minority view and Fair Value	10	10

6	Company Merger And Reconstruction	• Amalgamation, Absorption and Reconstruction– Meaning; relevant standard and meaning of different terms, Accounting in the books of Transferor Company. Accounting in the books of Transferee (based on relevant accounting standard); inter-company transactions (excluding inter-company share holding). • Internal reconstruction – meaning, provisions and Accounting, Surrender of Shares for redistribution; preparation of Balance Sheet after reconstruction	15	15
		Total	80	80

Relevant Accounting Standards issued by the Institute of Chartered Accountants of India are to be followed.

Suggested Reading

• Sukla, Grewal, Gupta: Advanced Accountancy Vol. II, S Chand
• R. L.Gupta & Radheswamy, Advanced Accountancy Vol. II, S. Chand
• Maheshwari & Maheshwari, Advanced Accountancy Vol. II, Vikash Publishing
• Sehgal & Sehgal, Advanced Accountancy Vol. I II, Taxman Publication
• Hanif & Mukherjee, Financial Accounting, Vol III , TMH
• • Frank Wood, Business Accounting Vol II, Pearson
• V.K.Goyal, Corprate Accounting, Excel Books
• Rajasekaran, Corporate Accounting, Pearson
• Accounting Standards issued by ICAI

DSE Papers

SEMESTER V

DSE 5.1 M : Consumer Behaviour & Sales Management (50+50)

Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: Consumer Behaviour Marks

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Consumer Behaviour
No. of Classes 8 / Marks 8

• Concept : Application of Consumer Behaviour Knowledge
• Consumer Behaviour Model
• Market Segmentation
• Marketing Ethics

Unit 2 : Determinants of Consumer Behaviour
No. of Classes 8 / Marks 8

• Consumer as an Individual, Need, Motivation
• Personality, Perception, Learning Attitude
• Communication persuasion
• Consumers in their Social & Cultural Setting, the family, Social class, cross cultural consumer behaviour

Unit 3 : Consumer Decision-making Process
No. of Classes 8/ Marks 8

• Personal Influence & Opinion
• Leadership Process
• Diffusion of innovations
• Consumer decision making process

Unit 4 : Consumer Behaviour & Society
No. of Classes 8 / Marks 8

• Health - care Marketing
• Political marketing
• Social Marketing
• Environmental Marketing
• Public Policy & Consumer Protection

Unit 5 : Consumer Behaviour and Market Research
No. of Classes 8 / Marks 8

• Relevance of Marketing Information System
• Market Research in assessing Consumer Behaviour

Suggested Readings:

- Suhiffman & Kanuk, Consumer Behaviour, PHI
- Loudon & Bitta, Consumer Behaviour, TMH
- Bennet & Kassarjian, Consumer Behaviour, PHI
- Batra & Kazmi, Consumer Behaviour, Text & cases, Excel Books
- Beri, Marketing Research, TMH
- Bradley, marketing Research. Oxford University Press
- Schiffman and Kannak, Consumer Behaviour, Pearson Education

Module II : Sales Management

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Sales Organization
No. of Classes 8 / Marks 8

• Purpose and General principles of organization
• Every-growing complexity of Sales Organisation
• Different Models of Sales Organisation
• Factors determining Sales Organisation Structure
• Decentralised Structure
• Common problems associated with Structuring the Sales Organisation
• Modification of Sales Organisation
• Tasks of Chief Sales Executive

Unit 2 : Designing the Sales Force
No. of Classes 8 / Marks 8

• Objectives
• Strategies
• Structure size
• Sales force Compensation

Unit 3 : Managing the Sales Force
No. of Classes 8/ Marks 8

• Recruitment
• Selection
• Placement
• Transfer
• Training and Development
• Grievances handling of Sales Force
• Motivating Leading and Communicating with the Sales Force
• Performance Evaluation of Sale Force

Unit 4 : Personal Selling and Salesmanship
No. of Classes 8 / Marks 8

• Buyer-Seller Dyads
• Theories of selling
• Personal Selling as a Career
• Steps in Personal Selling – Methods of Approaching a Customer
• Handing Customer Objections
• Negotiations – Barganing and Negotiation Approaches, Bargaining Strategies and Tactics during Negotation

Unit 5 : Marketing Channels and Selection
No. of Classes 8 / Marks 8

• Need
• Functions
• Levels
• Identifying and Analyzing Customers' needs for Products Services
• Developing channel Objective, Selection of Appropriate Channel
• Selection of Appropriate channels
• Motivating, Leading, Communicating with the Channel Members
• Performance Evaluation of the Channel Members
• Modifying Channel Arrangements

Suggested Readings:

- Cundiff, Still and Govoni, Sales management, PHI
- Smith, Sales Management, PHI
- Kotler, Marketing Management, PHI
- Zieglar, et al Sales Promotion and Modern Merchandising
- Stem, Ansary and Coughlan Marketing Channels, PHI
- Warmer, Marketing and Distribution, Macmillan, New York
- Pyle, Marketing Principles, Macmillan, New York
- Doughlas, et al Fundamentals of Logistics and Distributions, TMH
- Gupta, Sales and Distribution Management, Excel Books
- Havaldar & Cavale, Sales and Distribution Management, McGraw Hill
- Hawkins, Motherbaugh & Mookerjee, Consumer Behaviour, McGraw Hill
- Schiffman, Wisenblit & Kumar, Consumer Behaviour, Pearson

DSE 5.2 M : Product & Pricing Management & Marketing Communication

Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: Product & Pricing Management

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Introduction to Product Management

No. of Classes 8 / Marks 8

• Product: Basic concept of product, levels, Importance in Marketing Mix, Product Mix Decisions
• Product-Life-Cycle: Concept, strategies related to different stages of PLC.
• Product Portfolio: Concept, Importance, BCG Model

Unit 2 : Marketing Environment and Market segmentation

No. of Classes 8/ Marks 8

• Marketing Environment: concept, Importance, Micro-environmental factors and Macro-environmental factors (Demographic, Economic, Natural, Technological, Socio-Cultural & Political-Legal)
• Market segmentation: Concept, Importance and bases

Unit 3 : New Product Development

No. of Classes 8 / Marks 8

Concept
Importance
Stages
Reasons for failure of a new product
Adoption process.

Unit 4 : Packaging and Branding:

No. of Classes 8 / Marks 8

Packaging:
• Concept
• Importance
• Packaging Strategies
• Legal and Ethical aspects of packaging
Branding:
• Concept
• Importance
• Positioning and repositioning strategies
• Basic concepts of Brand equity

Unit 4 : Pricing Management:

No. of Classes 8 / Marks 8

• Concept
• Important features of pricing as an element of Marketing Mix
• Importance of pricing in consumer buying process
• Determining factors of effective pricing
• Pricing methods
• Pricing in the Indian context
• Regulatory Price Environment

Suggested Reading:

- Kotler and Kellar, Marketing Management, Pearson

- William and Ferrell, Marketing, Houghton Miffin McGraw-Hill
- Neelamegham, Marketing in India: Cases and Readings, Vikas Publishing
- Majumder, Product Management in India, PHI
- McCarthy and Perreault, Basic Marketing Managerial Approach, Irwin, Homewood, Illinois
- Srivastava, R. K., product Management & New product Development, Excel Book
- Ramaswamy and namakumari, Marketing Management, Macmillan India
- Srinivasan Case Studies in marketing: The India Context, PHI
- Baker & Hart, Product Strategy and Management, Pearson

Module II: Marketing Communication

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Communication Process
No. of Classes 8 / Marks 8

• Importance of communication
• Steps involved in the process of Communication
• Barriers to Marketing Communication
• Social Media, Digital Marketing- Concepts

Unit 2 : Communication Mix
No. of Classes 8 / Marks 8

• Advertising : Definition & Importance
• Different Adverting Function
• Types of Advertising
• Advertising Process
• Setting Advertising Objective
• Budget
• Economic aspects of Advertising

Unit 3 : Advertising Process
No. of Classes 8 / Marks 8

• Advertising Appeal
• Copy Writing
• Headline
• Illustration
• Message
• Copy Type
• Campaign Planning
• Different Types of Media
• Media Planning
• Scheduling

Unit 4 : Impact of Advertising
No. of Classes 8 / Marks 8

• Advertising Agency Roles
• Relationships with Clients
• Role of Advertising Department
• Measuring Advertising Effectiveness
• Legal and Ethical Aspects of Advertising

Unit 5 : Sales Promotion
No. of Classes 8/ Marks 8

• Meaning
• Nature and Function
• Types
• Sales Promotion Techniques (Sample Distribution, Coupon, Price off premium plan, Consumer contests, Displays Demonstration, Trade Fairs and Exhibitions
• Role of Sales force
• Limitation of Sales Promotion

Suggested Readings:

- Batra and Myers, Advertising Management, Prentice Hall
- Sengupta, Brand Positioning Strategies for Competitive Advantage, TMH
- Cundiff, Still and Govoni, Sales Management, Prentice Hall
- Rossiter and Percy, Advertising and Promotion Management, MacGraw-Hill Sundage,
- Fryburger and Rotzoll, Advertising Theory and Practice, AITBS
- Belch and Belch, Advertising and Promotion, McGraw Hill

DSE 5.1T
PUBLIC FINANCE AND TAXATION

Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit 1: **Origin and Development of Public Finance (8 L /8 Marks)**

- *Meaning, The rationale for State intervention – market failure, externalities, public goods*
- *Public finance and private finance, principle of maximum social advantage*

Unit 2: **Taxation and Government Revenue (12 L /12 Marks)**

- *Benefit approach, Ability to pay approach*
- *Impact and incidence of taxation, Direct and indirect taxes, Excess burden of taxes*
- *Sources and classification of public revenues*

Unit 3: **Government Expenditure** **(4L /4Marks)**

- Provision of public goods and merit goods, redistribution objective of public expenditure

Unit 4: **Impact of Taxation and Public Expenditure** **(8 L /8Marks)**

- *Effect on production, investment, distribution and stability*

Unit 5: **Public Debt – Meaning, Impact and Management** (8 L /8Marks)

Unit 6: **Development of Federal Finance in India** **(8 L /8 Marks)**

- *The constitutional arrangements, Finance Commissions*

Unit 7: **Central Finances in India** **(8 L /8 Marks)**

- *Sources and uses of funds, effects of Fiscal Policy*
- *Different concepts of Deficit- Impact of deficit*

Unit 8: **State Finances** **(8 L /8 Marks)**

- *Sources and uses of funds, issues of federalism*

Unit 9: **Fiscal Reforms in India** **(8 L /8 Marks)**

- *Changing scenario of Indian tax Structure, FRBM Act*

Unit 10: **Issue of Public Debt in India –Internal and External** **(8 L /8 marks)**

Suggested Readings:

- Musgrave, R., The Theory of Public Finance, McGraw Hill
- Musgrave & Musgrave, Public Finance in Theory and Practice, McGraw Hill
- Bhargava B.M., The Theory and Working of Union Public of India
- Vaish & Agarwal, Public Finance, Willy Eastern
- Rosen, S.H. & Gayer, T., Public Finance, McGraw Hill

DSE 5.2 T

DIRECT TAX LAW AND PRACTICE

Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit 1 : **a) Residential Status and Incidence of Tax**

Residential status of a company & tax incidence. Income deemed to accrue or arise in India u/s 9.

b) Incomes which do not form part of Total Income
Sec 10(11A), 10(12A), 10(30), 10(31), 10(34) read with sec. 115BBDA, 10(35), 10(43) and 10AA. (L-10/M-10)

Unit 2 : **Heads of Income and Provisions Governing Heads of Income**

a) *Profits and gains of business or profession*
Advance level discussion with special emphasis on presumptive taxation

b) *Capital Gains*
Advance level discussion with special emphasis on transfer, treatment u/s 45(1A), 45(2), 45(3), 45(4), 45(5), Transfer of assets between holding and subsidiary company, and exemptions.

c) *Income from other sources*
Advance level discussion with special emphasis on gift and deemed dividend. (L-25 / M-25)

Unit 3 : **a) Income of other Persons included in Assessee's Total Income**
Revocable transfer of assets, Income from assets transferred to the benefit of spouse and son's wife, conversion of self acquired property into joint family property.

b) Deductions from Gross Total Income
Deductions u/s 80IAB, 80IAC, 80IBA, 80IE, 80JJ, 80JJAA
(L-10/ M-10)

Unit 4 : a) *Relief U/S 89*
b) *Double Taxation Relief*
c) *Business Restructuring – Amalgamation, Demerger, Stump Sale with special reference to treatment of depreciation and capital gains.*
(L-10 / M-10)

Unit 5 : **Computation of Total Income and Tax Payable**
Advance level problems on computation of total income and tax liability of an individual, HUF, Firm, LLP and AOP (including application of AMT)
(L-25 / M-25)

Suggested Readings

- *Singhnia V.K., and Singhania K, Direct Tax Law and Practice, Taxmann*
- *Lal and Vashist, Direct Taxes, Pearson*
- *Ahuja and Gupta, Direct Taxes Law And Practice, Bharat*
- *Manoharan and Hari, Direct Tax Laws, Snowwhite*

Latest edition of the books may be read.

DSE 5.1eB
FUNDAMENTALS OF COMPUTER

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit 1. Computer Basics: Characteristics of computer. Generations of computer. Type of computer – Mainframe, Mini, Micro (desktop, laptop and handheld), Super Computer. Inside a Computer – Power supply (SMPS), Motherboard, Ports and interfaces, Expansion Cards, memory Chips, Ribbon Cables, Storage devices, Processor. [15 lectures / 12 Marks]

Unit 2. **CPU organistion and architecture**: Arithmetic/Logic Unit (ALU), control Unit (CU), Registers, System Bus, Processor to Memory Communication Processor to I/O devices Communication. [12 lectures / 12 Marks]

Unit 3. Memory organization: Memory representation, Cache memory, Primary memory – RAM and ROM. Functions of RAM and ROM. Different types of RAM and ROM. Secondary memory – Magnetic and optical storage devices (brief description of different types). Storage organization of a Magnetic disk. Mass storage devices – RAID, Automated Tape Library. [10 lectures / 10 Marks]

Unit 4. **Input and Output devices**: Major types and their functions. [6 lectures / 6 Marks]

Unit 5. Operating System: Concept, types, functions. [6 lectures / 6 Marks]

Unit 6. Problem Solving Tools: Algorithm. Flowcharts- Concepts, advantages and disadvantages of flowcharts, Problem solving using flowcharts.
Decision Tables - Concepts, advantages and disadvantages of decision tables, Problem solving using decision tables. [10 lectures / 12 Marks]

Unit 7. Data communication and Computer networks: Transmission Modes - Simplex, Half-Duplex, Full Duplex. Analog and digital transmission. Synchronous and Asynchronous transmission.

Multiplexing. Network Concept, Types - LAN, WAN, MAN, VAN, SAN.
Various Topologies - Bus, Star, Ring, Mesh, Tree**.** Protocol Models - OSI, TCP/IP
[16 lectures/ 16 Marks]

Unit 8. Multimedia essentials: Definition, building blocks of multimedia**,** multimedia system, multimedia application. [5 lectures / 6 Marks]

Suggested Readings:

- ITLESL, Introduction to Computer Science, Pearson Education
- ITLESL, Introduction to Information Technology, Pearson Education
- .Sinha & Sinha, Fundamentals of Computers, BPB Publication.
- .Rajaraman, Fundamentals of Computers, PHI

DSE 5.2 eB

DATABASE MANAGEMENT SYSTEM & SYSTEM ANALYSIS AND DESIGN

Full Marks 100

Internal Assessment: 20 marks

Semester-end Examinations: 80 marks

Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: DATABASE MANAGEMENT SYSTEM

Internal Assessment: 10 marks

Semester-end Examinations: 40 marks

Total 50 marks

Unit 1. Introduction to DBMS: Concepts of database and database management system(DBMS). Data abstraction. Architecture – three schema architecture. Administration roles. (L8 /M8)
Unit 2. Data models: hierarchical model, network model and relational model. (L6 /M6)
Unit 3. Database languages: Data Definition Language (DDL), Data Manipulation Language (DML), and Data Control Language(DCL). (L6 /M6)
Unit 4. SQL – An Overview: SQL constructs, embedded SQL , Query & Query Optimization Techniques. (L6 /M6)
Unit 5. Database design: Design phases - conceptual, logical and physical . ER diagram and model. (L6 /M6)
Unit 6. Database Normalisation: Concept. Normal forms - 1NF, 2NF, 3NF, BCNF. (L4 /M4)
Unit 7. Indexing; Single level indexing - Primary, Clustering, Secondary. Multilevel indexing. (L4 /M4)

Suggested Readings:

- Korth, Data Base System Concepts, TMH
- Leon,Data Base Management System, VIKAS
- Ivan Bayross, PL/SQL Programming

Module II:SYSTEM ANALYSIS AND DESIGN

Internal Assessment: 10 marks

Semester-end Examinations: 40 marks

Total 50 marks

Unit 1. Overview of System analysis and design: system concepts. System Development models – Waterfall model, Spiral model. System development methods – major steps. (L8 /M8)
Unit 2. Phases in System Development: Problem definition. Analysis. Design. Implementation. Evaluation. (L6 /M6)
Unit 3. Information requirement analysis: Process modelling with physical and logical data flow

diagrams. (L10 /M10)

Unit 4. System design: Process descriptions, Input/output controls, object modeling, Database design, User Interface design, Documentation, Data Dictionary, Development methodologies: Top down, bottom up, structured chart, decision table, decision tree. (L10 /M10)

Unit 5. Testing – Unit, integration, system, Acceptance, regression, Test Case generation. (L6 /M6)

Suggested Reading:

• Parthasarathi, System Analysis & Design, EPH

• Raja Raman, Analysis & Design of Information Systems, PHI

Year 3: Semester VI

		Marks	Credit Hours	
AECC 6.1Chg	Environmental Studies	**100**	**2**	
SEC 6.1Chg	Computerised Accounting and e-Filing of Tax Returns (70+30)	**100**	**4**	
CC 6.1 Ch	Project Work	**100**	**6**	
DSE 6.1 A**	Financial Reporting and Financial Statement Analysis	**100**	**6**	
DSE 6.2 A**	Financial Management	**100**	**6**	
			24	

SEC 6.1Chg

COMPUTERISED ACCOUNTING SYSTEM and E-FILING OF TAX RETURN

Full Marks 100
Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit-1: Computerized Accounting Package: Using Generic Software [40 Marks, Class: 40]

(a) Company creation, ledger creation, order processing, accounting voucher, inventory voucher, memorandum voucher, invoicing, multiple godown handling, Transfer of materials across godowns, Bank Reconciliation,
(b) Cost Centre, Cost Category, Bill of Material (BoM), Budget and Controls
(c) Payroll Accounting
(d) TDS, GST
(e) Back up & Restore, Export and Import data

Unit 2: Designing Computerized Accounting System [15 Marks, Class:15]

(a) Introduction to DBMS Package – Table, Query, Form and Report
(b) Designing Computerized Accounting System using DBMS Package
Creating a voucher entry Form, Preparing ledgers, trial balance, profit & loss a/c, and balance sheet with Form wizard and Report
(c) Designing Payroll System for Accounting using Form, Query, and Report

Unit-3: E-filing of Tax return [25 Marks, Class: 25]

(a) Preparation and submission of the Income Tax Return (ITR) offline/online for individual taxpayer [e-filing without using DSC and with using DSC, EVC]
(b) View form 26AS,Upload return, View e-file returns, e-verification
(c) Use of e-tax calculator (including interest calculation u/s 234A, 234B, 234C)
(d) E-Pay tax (Challan No./ITNS 280, ITNS 281)
(e) Preparation and submission online form 10E [Relief u/s 89(1)]

Project Work: **Assignment based for each and every topic should be prepared**

- Software: Singhania, V.K., E-Filing of Income Tax Returns and Computations of Tax, Taxmann
- Software: "Excel Utility", incometaxindiaefiling.gov.in

CC 6.1 Ch
Project Work (Project Report - 50 + Viva-Voce Examination - 50)
Full Marks 100

DSE 6.1 A
FINANCIAL REPORTING AND FINANCIAL STATEMENT ANALYSIS

Full Marks 100
Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

FINANCIAL REPORTING AND FINANCIAL STATEMENT ANALYSIS

Unit	Topic	Details	Marks allotted	No. of lectures
1	Holding Company	Meaning of Holding Company & Subsidiary Company; relevant standard; Consolidation of Balance Sheets of Parent & Subsidiary (only one); Minority Interest – Basic principles and preparation of CBS; CBS with loss balance of Subsidiary Treatment for: Revaluation of Assets of Subsidiary, Intra-	15	15

		group Transactions, Holding of different securities. Consideration of dividend paid or proposed by Subsidiary in CBS; Bonus Shares issued or proposed to be issued by Subsidiary (excluding shares acquired on different dates by the Parent company, chain and cross holding)		
2	Accounting Standards	Conceptual Framework, Presentation of Financial Statements (Ind AS 1), Property, Plant and Equipment (Ind AS 16), Earnings per share (Ind AS 33), [Basic Definitions & Theoretical Concepts, Scope]	15	15
3	Fund Flow Statement	Concept of fund, meaning, nature, various sources And applications, advantages & limitations of Fund Flow Statement.	20	5
4	Cash Flow Statement	Meaning, objectives, difference with Fund Flow Statement; activity classification and preparation and presentation as per relevant Accounting Standard.		15
5	Introduction to Financial Statements Analysis	Nature and Component of Financial Statement; Meaning and Need for FSA, Traditional & Modern approaches to FSA, Parties interested in FSA. • Comparative Statement – meaning, preparation, uses, merits and demerits • Common -size Statement – meaning, preparation, uses, merits and demerits • Trend Analysis – meaning, determination, uses, merits and demerits	10	12
6	Accounting Ratios for FSA	Meaning, objective, Classification of Accounting Ratios, Advantages & Limitations Preparation of Classified Financial Statements and Statement of Proprietor's Fund from the given Ratios. Computation, Analysis and Interpretation of important ratios for measuring –Liquidity, Solvency, Capital Structure, Profitability and Managerial Effectiveness.	20	18
			80	80

Suggested Readings:

- R. L.Gupta & Radheswamy, Advanced Accountancy Vol. II, S. Chand
- Maheshwari & Maheshwari, Advanced Accountancy Vol. II, Vikash Publishing
- Sehgal & Sehgal, Advanced Accountancy Vol. I II, Taxman Publication

- Accounting Standards issued by ICAI
- L.S.Porwal, Accounting Theory, Tata Mcgraw Hill
- Gokul Sinha, Accounting Theory & Management Accounting,
- B. Banerjee, Regulation of Corporate Accounting & Reporting in India, World Press.
- Lev, Financial Statement Analysis-a new approach, Prentice Hall
- Foster G, Financial Statement Analysis, Prentice Hall
- White, Sondhi& Fred, Analysis and Use of Financial Statement, John Wiley
- Bernstein & Wild, Financial Statement Analysis; theory, application & interpretation, Mcgraw Hill
- Ormiston, Understanding Financial Statement, Pearson
- Bhattacharyya, Asish K., Introduction to Financial Statement Analysis, Elsevier
- Hanif & Mukherjee, Financial Accounting, Vol III, McGraw Hill
- Subramanyam, K.R. and Wild, Financial Statement Analysis, McGraw Hill

DSE 6.2 A

FINANCIAL MANAGEMENT

Full Marks 100
Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit	Topic	Content	Marks	Hours
1	**Introduction**	▪ Important functions of Financial Management ▪ Objectives of the firm: Profit maximisation vs. Value maximisation ▪ Role of Chief Financial Officer. ▪ Financial environment in which a firm has to operate	**10**	**10**
	Basic Concepts	• Time Value of Money: concept and reasons • Compounding and Discounting techniques • Concepts of Annuity and Perpetuity. • Risk-return relationship (concepts only)		
2	**Sources of Finance and Cost of Capital**	• Different sources of finance; long term and short term sources • Cost of capital: concept, relevance of cost of capital, Implicit and Explicit cost, specific costs (its computation) and weighted average cost (its computation) , rationale of after tax weighted average cost of capital, marginal cost of capital (its computation).	**10**	**10**
3	**Leverage and Capital Structure Theories**	• EBIT-EPS analysis and its limitations. Financial break even, point of indifference • Leverage- Business Risk and Financial Risk - Operating and financial leverage, Trading on Equity • Capital Structure decisions - Capital structure patterns, designing optimum capital structure, Constraints, Features of sound capital structure,	**10**	**10**

		Various capital structure theories (excluding M-M model).		
4	**Working Capital Management (1)**	• Introduction; Meaning and various concepts of Working Capital • Management of Working Capital and Issues in Working Capital • Estimating Working Capital Needs; Operating or Working Capital Cycle.	**10**	**10**
5	**Working Capital Management (2)**	▪ Policies relating Current Assets – Conservative, Aggressive and Balanced ▪ Various sources of finance to meet working capital requirements; Financing current assets: Strategies of financing (Matching, Conservative, and Aggressive policies) ▪ Management of components of working capital (debtors management only–credit period -simple type)	**10**	**10**
6	**Capital Expenditure Decisions (1)**	• Purpose, Distinguishing features, Objectives & Process, Understanding different types of projects • Concept of Cash flow; Cash flow vis-à-vis Profit and determination of Cash flow • Techniques of Decision making: Non-discounted and Discounted Cash flow Approaches • Payback Period method, Accounting Rate of Return and their relative merits and demerits	**10**	**10**
7	**Capital Expenditure Decisions (2)**	• Discounted Payback Period, Net Present Value, Profitability Index and Benefit Cost ratio, Internal Rate of Return, relative merits and demerits of the methods.(excluding replacement decision) • Ranking of competing projects, Ranking of projects with unequal lives. Capital Rationing.	**10**	**10**
8	**Dividend Decisions**	▪ Meaning, Nature and Types of Dividend, Dividend and Retention; concept of pay-out ratio, retention ratio and growth. ▪ Dividend policies and formulating a dividend policy ▪ Dividend Theories: Walter's Model, Gordon's Model,	**10**	**10**
		Total	**80**	**80**

Suggested Readings

- M.Y.Khan & P.K.Jain, Financial Management, TMH
- Van Horne, Financial Management & Policy, Pearson
- Van Horne, Fundamentals of Financial Management, PHI
- Banerjee, B., Financial Policy & Management Accounting, PHI
- Chandra,P., Financial Management, TMH
- Rustagi, R.P. *Fundamentals of Financial Management*. Taxmann Publication Pvt. Ltd.
- Pandey, I.M. *Financial Management.* Vikas Publications.
- Majumdar, Ali and Nesha, Financial Management, ABS
- Kothari, R, Financial Management, Sage

DSE 6.1 M
Retail Management and Marketing of Services (50+50)

Full Marks 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: Retail Management

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Introduction to Retailing
No. of Classes 8 / Marks 8

• Relevant Concept
• Importance
• Function

Unit 2 : Retailing in India
No. of Classes 8 / Marks 8

• Factors determining Growth of Retailing in India
• Impact of Retail in Nation's Economy
• Key Drivers of the Indian Retails Industry

Unit 3 : Retail Formats
No. of Classes 8 / Marks 8

• Concept
• Types of Retailing – Multi Channel Retailing, Single Channel Retailing
• Product factors of Retail format
• Location factors of Retail format
• Current Indian Scenario

Unit 4 : Pricing in Retail
No. of Classes 8 / Marks 8

• Price factors of Retail format
• Importance of Retail Pricing
• Factors affecting Retail Pricing
• Approaches to Product Pricing

Unit 5 : Promotion in Retail
No. of Classes 8 / Marks 8

• Need and Objective of Promotional Mix in Retailing
• Promotional Mix and Strategy development
• Customer Relationship Management

Suggested Reading

- Madaan, Fundamentals of Retailing, Tata McGraw-Hill
- Pradhan, S., Retailing Management, McGraw Hill
- Seshanna & Prasad, Retail Management, McGraw Hill
- Berman, Evans & Mathur, Retail Management, Pearson

Module II: Marketing of Services

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Introduction to Services Marketing & Services and economy of a country
No. of Classes 8 / Marks 8

• Concept of services
• Types
• Function
• Nature
• Characteristics
• Understanding Services Customers
• Impact of service marketing in the economy of a country

Unit 2 : Issues in Marketing of Services
No. of Classes 8 / Marks 8

• Service- Product or Packages
• Pricing in Services
• Place in Services
• Promotion of Service
• People in Services
• Physical Evidence
• Process Management

Unit 3 : Service Marketing Management
No. of Classes 8 / Marks 8

• Managing Services Quality
• Relationship marketing - Concept
• Service Communication Mix
• Communication Strategy

Unit 4 : Consumer Behaviour and Service
No. of Classes 8 / Marks 8

• Consumer Behaviour consideration
• Guidelines for Developing Service Communications
• Consumer Decision making process & ethical issues (concepts, factors influence decision making process, ethical decision making methods)

Unit 5 : Service Marketing in Non-profit and profit Organisations
No. of Classes 8 / Marks 8

Travel and Tourism
Financial Services
Information Technology Services
Media Services
Health Care Services
Educational Services

Suggested Reading

- Verma, H. V., Services Marketing, Pearson
- Venugopal and Raghu, Services Marketing, Himalaya Publishing Ltd.
- Ravi Shankar, Services Marketing : The Indian Perspective, Excel Books
- Rampal & Gupta, Services Marketing, Concepts, Applications & Cases, Galgotia
- Apte, Services Marketing, Oxford University Press

DSE 6.2 M
Rural Marketing and International Marketing (50+50)

Full Marks 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: Rural Marketing

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Rural Marketing and Environment
No. of Classes 8 / Marks 8

• Concept
• Importance
• Rural vs. Urban Marketing
• Geographic
• Economic
• Socio-Cultural
• Infrastructural factors
• Their influence on Rural Marketing Operation

Unit 2 : Rural Consumer
No. of Classes 8 / Marks 8

• Characteristics
• Attitudes
• Behaviour
• Buying Patterns and Influences

Unit 3 : Rural Marketing Strategies
No. of Classes 8 / Marks 8

• Segmenting Rural markets
• Product Planning for Rural markets
• Market Size
• Packaging and Branding Decisions
• Pricing Decisions

Unit 4 : Promotion and Distribution in Rural Markets
No. of Classes 8 / Marks 8

• Promotion in Rural Markets
• Distribution Channels and Logistics in Rural Markets

Unit 5 : Marketing of Agricultural Products
No. of Classes 8 / Marks 8

• Pricing
• Distribution of Agricultural Products
• Role of Government
• Other organization in Marketing Agricultural products
• Co-operative Marketing
• Problems in Agricultural Marketing

Suggested Readings:

- Rajagopal, Management of Rural Business, Wheeler
- Neelamegham, Marketing in India : Cases and Redings, Vikas Publishing
- Mathur, U. C., Rural Marketing, Wheeler
- Nyyar and Ramaswamy, Globallization and Agricutural Marketings, Rawat Publishers
- Mamoria, Agricultural marketing, Himalaya Publisheing House
- Kashyap, P., Rural Marketing, Pearson

Module II: International Marketing

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Introduction
No. of Classes 8 / Marks 8

• Definition
• Nature and Scope of International Marketing
• International Marketing Environment (Basic Concepts) PESTL-SOWC
• Market Entry (When-Why-How)
• Entry Strategy (Concept - Features - Advantages and Disadvantages)

Unit 2 : Product/ Service Planning for International Market
No. of Classes 8 / Marks 8

Categorization (Standardisation / Adaptation) of Product/ Service Planning
• Packaging and Labelling
• Quality
• After Sales services

Unit 3 : International Pricing
No. of Classes 8 / Marks 8

• Factors influencing International Price
• Pricing Strategy
• Export Price
• Price Quotation and Payment Terms

Unit 4 : Promotion and Distribution of Product/Service Abroad
No. of Classes 8/ Marks 8

Promotional Tools:
• Sales literature
• Direct Mail
• Personal Selling
• Advertising
• Trade Fairs and Exhibitions
• Distribution Channels (Categorization – Features - advantages and disadvantages)
• Logistics (Meaning – Categorization - advantages and disadvantages)
• Selection and management of Foreign Sales Agents

Unit 5 : Import and Export Policies and Practices in India
No. of Classes 8/ Marks 8

• EXIM Policy - An Overview
• Trends in India’s Foreign Trade
• Steps in Starting an Export Business

• Documentation and Procedure
• Legal Aspects
• Export Finance
• Export Risk Insurance
• Export Assistance and Incentives
• Export Oriented Unit
• Export Processing Zone

Suggested Readings

- Bhattacharyya and Varsney, International Marketing Management, Sultan Chand
- Bhattacharyya, Export Marketing Strategies for Success, Global Press
- Keegan, Multinational Marketing Management, Prentice Hall
- Kriplani, International Marketing, Prentice Hall
- Taggart and Mott, The Essence of International Business, Prentice Hall
- Kotler, Principles of Marketing, Prentice Hall
- Caterora and Keavenay, Marketing : an International Perspective, Irwin, Homewood, Illinois
- Paliwala, The Essence of International Marketing, Prentice Hall
- Vasudeva, International Marketing, Excel Books
- Pateora, Graham and Salwan, International Marketing, McGraw Hill

DSE 6.1 T Indirect Tax: Laws and Practices

Full Marks 100

Internal Assessment: 20 marks

Semester-end Examinations: 80 marks

Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Full Marks – 100

Unit 1 : a) Basic Concepts

Concepts of Indirect Tax, Difference between Direct and Indirect Tax, Indirect tax structure in India, Proposed changes in indirect tax structure in India.

b) **Central Excise** (L-25 / M-25)

Unit 2 : WB VAT (L 15 / M 15)

Unit 3 : Customs (L 20 / M 20)

Unit 4 : Central Sales Tax (L 10 / M 10)

Unit 5 : Service Tax (L 10 / M 10)

Suggested Readings

- Datey V.S., Indirect Taxes Law And Practice, Taxmann
- Sanjeev Kumar, Systematic Approach to Indirect Taxes, Bharat
- Bangar and Bangar, Students' Gide to Indirect Taxes, Aadhya Prakashan.

This Paper will be replaced by Goods & Service Tax Law whenever the law is enforced and accordingly revised syllabus will be announced.

Latest edition of the books may be read.

Paper DSE 6.2T
TAX PROCEDURE AND PLANNING
Full Marks 100
Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: TAX PROCEDURE

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Return of Income and Assessment

a) Different Returns & Forms for all types of assessees
b) Assessments and Reassessments (basic concepts)

(L 15 / M 15)

Unit 2 :
a) Advance Tax (all types of assessees)
b) Interest & Fees
c) Advance Ruling for Non-resident (L 10 / M 10)

Unit 3 :
a) TDS
b) Refund of Excess Payment (L 5 / M 5)

Unit 4 :
a) Penalties and Prosecutions
b) Appeals and Revisions
c) Income Tax Authorities (L 10 / M 10)

Module II: TAX PLANNING

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Basic Concepts

a) Concept and difference between tax planning, tax avoidance, tax evasion and tax management.
b) Objectives, requisites, factors and types of tax planning
c) Tax on distributed Profit and on units of mutual fund.

(L 5 / M 5)

Unit 2 : Tax Planning-I

a) Tax Planning under different Heads of Income
b) Tax Planning on Deductions under Chapter VIA (L 10/M 10)

Unit 3 : Tax Planning-II

a) Setting up a New Business : Location, nature and form of business.
b) Financial Management Decisions : Capital structure, dividend policy, deemed dividend and bonus shares.
c) Tax Planning related to sale of scientific research assets.

d) Tax Planning related to Amalgamation, Demerger and conversion of company into LLP.
e) Transfer of assets between Holding & Subsidiary company
f) Tax planning with reference to receipt of insurance premium.
g) Own fund versus borrowed fund for financing of assets.
h) Sale in domestic market or export

(L15 / M 15)

Unit 4 :
a) Tax planning in relation to Employees Compensation
b) Basic Concepts of transfer pricing, APA.
c) Relief for Double Taxation (covering more than one foreign country) (L10 / M 10)

Suggested Readings

- Singhania V.K., and Singhania K, Direct Tax Law and Practice, Taxmann
- Lal and Vashist, Direct Taxes, Pearson
- Ahuja & Gupta Corporate Tax Planning Management, Bharat Law House.
- Singhania V.K., and Singhania M, Corporate Tax Planning and Business Tax Procedure, Taxmann.

Latest edition of the books may be read.

DSE 6.1 e-B
Internet & WWW and Functional e-Business System (50+50)

Full Marks 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: INTERNET AND WORLD WIDE WEB

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1. Working of the internet with TCP/IP: Origin of TCP/IP. TCP/IP communication architecture, Internet Architecture, Working of TCP/IP,TCP/IP Applications - FTP, Telnet, Simple Mail Transfer Protocol, Network File System. **(L10 /M10)**

Unit 2. Internet Concepts: WWW, Internet and E-Commerce, Linking to the Internet, Internet Address, Internet Tools- Information Retrieval tools (ftp, Gopher),Communication Tools(Email, FTP, Telnet, Usenet), Multimedia Information Tools(Home page),Information Search Tools(Archie, Veronica, WAIS). Domain Name System. **(L12 /M12)**

Unit 3. Intranet and Extranet: Intranet, Intranet vs. Groupware, Intranet Hardware, Intranet Software, Intranet Services (Web (HTTP) Publishing, HTML,), Communication Systems (Email, Fax), Software used in Electronic mail, Electronic Meeting Systems(Audio conferencing, Video Conferencing, Groupware), Extranet**.** **(L6 /M6)**

Unit 4. Internet Security: Security on the internet, Network and Website Security Risks, Site Hacking, Security Incidents on the internet security and email, network and website security, Firewall(Concept, Components and Constituents, Benefits), Enterprise wide security Framework,

secure physical infrastructure). **(L12 /M12)**

Module II: FUNCTIONAL E-BUSINESS SYSTEM

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1. Applications of E-Business: Direct Marketing and Selling, Value Chain Integration, Supply Chain Management, Corporate Purchasing, Financial and Information Services, Obstacles in adopting E-Business Applications. **(L6 /M6)**
Unit 2. E-Strategy: Information and Strategy, The virtual value chain planning E-Business project, E-Business strategy and knowledge management**.** **(L 4 /M 4)**
Unit 3. Customer –effective Web design: Requirements of Intelligent Websites, Website Goals and Objectives, planning the budget, analyzing website structure, fixed versus flexible webpage design, choosing a page size, website development tools, design alternatives, outsourcing web design, testing and maintaining websites**.** **(L6 /M6)**
Unit 4. Electronic Payment Systems-Overview of Electronic Payment Systems, Customer to Merchant Payments, Peer to Peer Payments. Electronic Banking, Electronic Fund Transfers. **(L6 /M6)**
Unit 5. E-Business Marketing Concepts: Basic marketing concepts for internet marketing, EBusiness marketing and branding strategies, Strengthening the customer relationship. **(L4 /M4)**
Unit 6. E-Commerce and Online service industries: Online financial services. Online travel services. Online career services. **(L4 /M4)**
Unit 7. Mobile Commerce- Wireless Spectrum, WAP - Origins of WAP, WAP Architecture. Wireless Datagram Protocol(WDP), Short Message Services, General Packet Radio Service(GPRS),Wireless Technology (CDMA, GSM), Different generations in Wireless Communication, Mobile commerce and its future in India**.** **(L10 /M 10)**

Suggested Readings:

• S. Jaiswal, Doing Business on the Internet E-COMMERCE (Electronic Commerce for Business), Galgotia Publications.
• P.T.Joseph, E-Commerce An Indian Perspective, S.J., PHI.
• Kenneth C. Laudon, Carol Guerico Traver, 3.E-Commerce Business.Technology, Society, Pearson Education.
• Schneider, E-Commerce, Thomson Publication

DSE 6.2 e-B
COMPUTER APPLICATION (Practical) & E-BUSINESS APPLICATION (Practical)

Full Marks 100
Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I
COMPUTER APPLICATION (Practical)

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1: C++ **[20 classes / 20 marks]**
Unit 2: Use of Accounting software package – ACE, TALLY **[20 classes / 20 marks]**

Module II :E-BUSINESS APPLICATION (Practical)

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1: HTML & DHTML **[20 classes / 20 marks]**
Unit 2: JAVA **[20 classes / 20 marks]**

1. Oops Concept and Introduction to JAVA. 2. An overview of Java. 3. Data Types - variables and arrays. 4. Operators, Control statements. 5. Classes and objects. 6. Inheritance. 7. String and string buffer. 8. Exception handling. 9. Applets.

M: Marks allotted to the Unit**; L:** No. of Lectures/ Classes for the Unit

University of Calcutta



B.Com. Syllabus (General)

under Semesterised CBCS

2017

University of Calcutta

B.Com. General Course Structure under Semesterised CBCS

Year I: Semester I

		Marks	Credit Hours	
AECC 1.1Chg	**Language:** Communicative English - 50 Indian Language - 50	**100**	**2**	
GE 1.1 Chg	Microeconomics I & Statistics	**100**	**6**	
CC 1.1 Chg	Business Laws	**100**	**6**	
CC 1.2 Chg	Principles of Management	**100**	**6**	
CC 1.1 Cg	Financial Accounting - I	**100**	**6**	
			26	

Year 1: Semester II

		Marks	Credit Hours	
GE 2.1 Chg	E-Commerce & Business Communication (50+50)	**100**	**6**	
CC 2.1 Chg	Company Law	**100**	**6**	
CC 2.2 Chg	Marketing Management & Human Resource Management	**100**	**6**	
CC 2.1Cg	Cost and Management Accounting I	**100**	**6**	
			24	

Year 2: Semester III

		Marks	Credit Hours	
SEC 3.1 Chg	Information Technology & Its Application in Business (Theory -50 + Practical- 50)	**100**	**4**	
GE 3.1 Chg	Business Mathematics & Statistics	**100**	**6**	
CC 3.1 Cg	Financial Accounting II	**100**	**6**	
			16	

Year 2: Semester IV

		Marks	Credit Hours	
GE 4.1 Chg	Microeconomics II & Indian Economy (50+50)	**100**	**6**	
CC 4.1 Chg	Entrepreneurship Development and Business Ethics	**100**	**6**	
CC 4.1 Cg	Taxation I	**100**	**6**	
CC 4.2 Cg	Cost and Management Accounting -II	**100**	**6**	
			24	

Year 3: Semester V

		Marks	Credit Hours	
CC 5.1 Cg	Auditing & Assurance	**100**	**6**	
DSE 5.1 A*	Taxation II	**100**	**6**	
DSE 5.2 A*	Corporate Accounting	**100**	**6**	
			18	

Options:

*Or DSE 5.1 M (Consumer Behaviour and Sales Management -50+50)
& DSE 5.2 M (Product & Pricing Management and Marketing Communication (50+50)
*Or DSE 5.1T (Public Finance and Taxation)
& DSE 5.2 T (Direct Tax: Laws and Practice)

*Or DSE 5.1 **e**-B (Fundamentals of Computer)
& DSE 5.2 e-B DBMS and System Analysis &Design (50+50)

Year 3: Semester VI

		Marks	Credit Hours	
AECC 6.1Chg	Environmental Studies	**100**	**2**	
SEC 6.1 Chg	Computerised Accounting and e-Filing of Tax Returns	**100**	**4**	
DSE 6.1 A**	Financial Reporting and Financial Statement Analysis	**100**	**6**	
DSE 6.2 A**	Financial Management	**100**	**6**	
			18	

Chg: Common for Honours and General; **Cg:** Core Course for General
Options:

**Or DSE 6.1 M (Retail Management and Marketing of Services (50+50)
& DSE 6.2 M (Rural Marketing and International Marketing (50+50)

**Or DSE 6.1 T (Indirect Tax: Laws and Practices)
& DSE 6.2 T (Tax Procedures and Planning)

**Or DSE 6.1 e-B (Internet & WWW and Functional e-Business System (50+50)
& DSE 6.2 e-B(Computer Applications and e-Business Applications – Practical (50+50)

Summary for B.Com. General

		Marks	Credit Hours	
Ability Enhancement Compulsory Course (AECC)	Two Papers	**200**	**2 x 2 = 04**	
Skill Enhancement Elective Course (SEC)	Two Papers	**200**	**2x4 = 08**	
Generic Elective (GE)	Four Papers	**400**	**4 x 6 = 24**	
CORE COURSE (CC)	Eleven Papers	**1100**	**11 x 6 =66**	
Discipline Specific Elective (DSE)	Four Papers	**400**	**4 x 6 = 24**	
		2300	**Total 126**	

Extracts from UGC CBCS Model for B.Com. Hons Syllabi (Page 2)

Notes:

1. For Practical Lab based

a. Core Courses BCH 1.2 (Financial Accounting), BCH 3.2 (Income-tax Law and Practice), BCH 3.4 (Business Statistics), BCH 4.2 (Business Mathematics), and BCH 5.2 (Fundamentals of Financial Management) there shall be 4 Credit Hrs. for Lectures + one Credit hr. (Two Practical Periods per week per batch) for Practical Lab + one credit Hr for Tutorials (per group)

b. Core Courses BCH 4.3 (Computer Applications in Business) and Discipline Specific Elective BCH Group A (e) (Computerised Accounting System), there shall be 4 Credit Hrs. for Lectures + Two Credit hrs. (4 Practical Periods per week per batch) for Practical Lab

c. Skill Enhancement Elective Course BCH 3.5(E-Commerce), there shall be 3 Credit Hrs. for Lectures + One Credit hrs. (2 Practical Periods per week per batch) for Practical Lab

2. For other core and elective papers, there shall be 5 lectures and one Tutorial (per batch)

From above, It appears that:

- **one credit** represents **one lecture hour** for theoretical papers and there will be **one credit hour for tutorial** for each of theoretical papers / subjects.
- For practical lab based papers, **one credit represents two practical periods** and there will be no tutorial for practical papers/subjects.

Therefore, it is suggested that:

AECC: 2 credit hours means 2 lecture hours, i.e., 120 minutes lectures or 3 periods of 40 mins each per week.

SEC (involving lab): 4 credit hours may be divided into two credit hours for lectures (3 periods of 40 mins) and 2 credit hours for practical (4 practical periods per batch) per week

GE, CC and DSE: 6 credit hours means 5 credit hours for lectures (300 mins for lectures, i.e., 7-8 periods of 40 mins each) and 1 tutorial hour for each group/ batch of students per week.

CONTENTS

GE 1.1 Chg

Microeconomics I & Statistics (50+50)

Marks: 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I

Microeconomics I

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit:I Demand and Consumer behaviour
Concept of demand, demand function, law of demand, derivation of individual and market demand curves, shifting of the demand curve; elasticity of demand.
Consumer behaviour: Marshallian utility approach and Indifference Curve approach; utility maximization conditions . Income-Consumption Curve (ICC) and Price-Consumption Curve (PCC): Derivation of demand curve from PCC.

[L-15/Marks:15]

Unit: II Production and Cost
Production function: Short-run and Long-run; Relation among Total Product, Average Product and Marginal Product, Law of returns to a variable factor, Law of Returns to Scale; Concepts of Iso-quant and iso-cost line; Conditions for optimization (graphical approach).
Cost: Accounting and Economic Costs; Social and Private Costs; Short-run and Long-run Costs; Relation between Average and Marginal Costs; Determination of LAC curve from SAC curves, LMC.

[L-10/Marks:10]

Unit: III Perfect Competition
Concept of Perfectly Competitive market: Assumptions, Profit maximization conditions;
Related concepts of Total Revenue, Average Revenue and Marginal Revenue, Short-run and Long-run equilibrium of a firm; determination of short-run supply curve of a firm, measuring producer surplus under perfect competition, Stability analysis– Walrasian and Marshallian, demand-supply analysis including impact of taxes and subsidy**.**

[L-15/Marks – 15]

Suggested Readings
- Pindyke and Rubinfeld, Micro Economics, Pearson
- Gould & Ferguson, Micro Economic Theory
- Banerjee & Majumdar, Business Economics and Business Environment, ABS
- Banerjee & Majumdar, Banijjik Arthaniti –o- Banijjik Paribesh(Bengali)

- Dwivedi, D.N., Managerial Economics, Vikash Publications
- Mankiw.N.G., Principles of Microeconomics, Cengage
- Das, P. & Sengupta A., Economics , Oxford
- Samuelson & Nordhaus, Macroeconomics, McGraw Hill

Module II
Statistics (50 marks)

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

1. **Fundamentals:**Definition of Statistics, Scope and limitation of Statistics,Attribute and variable,Primary and secondary data, Method of data collection, Tabulation of data, Graphs and charts, Frequency distribution, Diagrammatic presentation of frequency distribution. **[8 L /8Marks]**
2. **Measures of Central Tendency:**Meaning of central tendency, Common measures – mean (A.M., G.M., H.M.) median and mode, Partition values- quartiles, deciles and percentiles, Applications of different measures. **[8 L /8Marks]**
3. **Measures of Dispersion:**Meaning of dispersion,Common measure– range, quartile deviation, mean deviation and standard deviation; Relative measures of dispersion,Combinedstandard deviation,Applications of different measures. **[8 L /8Marks]**
4. **Moments, Skewness and Kurtosis:** Different types of moments and their relationships, Meaning of skewness and kurtosis, Different measures of skewness, Measure of kurtosis,Applications of different measures**.** **[8 L /8Marks]**
5. **Interpolation:** Finite differences, Polynomial function, Newton's forward and backward interpolation formula, Lagrange's interpolation formula**.** **[8 L /8Marks]**

Suggested Readings:

- Business Mathematics and Statistics- N G Das & J K Das (Tata McGraw Hill)
- Statistical Methods in Business and Social Science – G. V. Shenoy and M. Pant (Macmillan)
- Business Statistics – R. S. Bhardwaj (Excel Books)
- Statistics for Management – Levin, Rubin and Rastogi (Pearson Education)
- Statistics for Management, Srivastava and Rego, McGraw Hill
- Hazarika Padmalochan, A Text Book of Business Statistics, S.Chand
- Kellor & Arora, Business Statistics, Cengage
- Pillai and Bhagwati, Business Statistics, S.Chand
- Business Mathematics & Statistics – J. Chakraborti (Dey Book Concern)
- Business Mathematics & Statistics – R K Ghosh & S Saha (New Central Book Agency(P) Ltd
- Elementary Business Mathematics & Statistics – Dr. Priyotosh Khan (Elegant Publication)
- Business Mathematics & Statistics – Dr. S N De (Chhaya Prakashani)
- Business Mathematics & Statistics – N K Nag & S K Nag (Kalyani Publishers)
- Business Mathematics & Statistics – Dr. Ranjit Dhar (Dishari Prakashani)

CC 1.1 Chg

Business Laws

Marks: 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit 1: The Indian Contract Act, 1872 [No of classes 30 / Marks 30]
a) Contract – meaning, characteristics and kinds, Essentials of a valid contract
b) Offer and acceptance (Definition, Rules, Communication and Revocation of offer and acceptance)
c) Consideration (Definition, Elements, Types, Rules), "No Consideration No Contract" and its exceptions; Capacity to Parties (Definition and Types)
d) Consent, Free consent, Coercion, Undue Influence, Fraud, Misrepresentation, Mistake
e) Legality of objects and Consideration
f) Void and Voidable agreements – Definition, Types and Distinction
g) Discharge of a contract – Modes of discharge, Breach and Remedies against breach of contract
h) Specific Contracts - Contingent contracts, Quasi, Contract of Indemnity, Guarantee, Bailment, Pledges

Unit 2: The Sale of Goods Act, 1930 [No of classes 10 / Marks 10]
a) Contract of sale, meaning and difference between sale and agreement to sell
b) Conditions and warranties
c) Transfer of ownership in goods including sale by a non-owner
d) Unpaid seller – meaning, rights of an unpaid seller against the goods and the buyer

Unit 3: Partnership Laws [No of classes 20 / Marks 20]
A) The Partnership Act, 1932
a. Definition – Partner, Partnership
b) Nature and Characteristics of Partnership
c) Types of Partners
d) Registration of a Partnership Firms and consequences of non-registration
e) Rights and Duties of Partners
f) Dissolution of firms – meaning and grounds

B) The Limited Liability Partnership Act, 2008
a) Definition
b) Salient Features of LLP
c) Advantages and disadvantages of LLP
d) Differences between: LLP and Partnership, LLP and Company
e) Incorporation of LLP

Unit 4: The Negotiable Instruments Act 1881 [No of classes 10 / Marks 10]
a) Definition, Features, Types, Parties of Negotiable Instruments: Promissory Note, bill of exchange, Cheque (Definition and Types)
b) Endorsement: Types of Endorsement
c) Holder and Holder in Due Course, Privileges of Holder in Due Course.
d) Dishonour of Negotiable Instruments: Modes, Consequences, Notice of Dishonour; Noting and Protesting
e) Discharge of Negotiable Instruments: Meaning and Modes

Unit 5: Consumers Protection Act, 1986 **[No of classes 10 / Marks 10]**

a) Objectives and features of Consumers Protection Act
b) Definitions – Complainant, Complaint, Consumer, Consumer Dispute, Defect, Deficiency, District Forum, Person
c) Unfair trade practices
d) Consumer Protection Council (Central, State and District – their constitutions and objectives)
e) Consumer Dispute Redressal Agencies: Composition and jurisdiction of District forum, State Commission and National Commission

(If any new provisions are enacted in place of the existing provisions, the syllabus will accordingly include such new provisions in place of existing provisions with effect from such date as prescribed by Calcutta University. Similarly if any existing provision becomes redundant due to changes, it will be left out of the syllabus)

Suggested Readings

- Kumar Ravindra, Legal Aspects of Business, Cengage
- Tulsian & Tulsian, Business Laws, S.Chand
- Kapoor N.D., Business Laws, Sultan Chand
- Das S.K. & Roy P., Business Regulatory Framework, OUP
- Gulsan S.S., Business Laws, Excel Books
- Roychowdhury, Bhattacharjee & Datta, Business Regulatory Framework, Elegant Publishers
- Bhadra, Satpati and Mitra, Ainer Ruprekha (Bengali Version), Dishari

CC 1.2 Chg

Principles of Management

Marks: 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit-1: Introduction:

No. of classes: 16 / Marks: 16

Management-definition, importance, functions, nature-as profession, science and art, universality of management; levels of management; managerial tasks and skills.

Different Schools of Thoughts: Classical School-contributions of Taylor and Henri Fayol; Neo-classical school-Human Relations approach and Behavioral Science Approach; Modern School; System approach and Contingency approach.

Unit-2: Planning:
No. of classes: 16 / Marks: 16
Concept, importance, steps, types, premises, barriers to effective planning and remedial measures; strategic planning-concept forecasting –concept, techniques.

Unit-3: Organizing:
No. of classes: 16 / Marks: 16
Concept, importance, principles, different organization models-line and staff; Functional; Departmentation-need, basis, principles, Delegation of Authority-elements, steps barriers; Centralization and Decentralization of Authority; Span of Management; concept and determining factors.

Unit-4: Directing and Staffing:
No. of classes: 16 / Marks: 16
Directing: concepts, importance of directing,
Leadership: Concept, importance, types, leadership traits, Tannenbaum & Schmidt's Model and Blake & Mouton's Model.
Staffing: concepts, importance

Unit- 5: Motivation, Co-ordination and Control:
No. of classes: 16 / Marks: 16
Motivation: Concept, importance, importance of need theory, and contributions of McGregor, Maslow, Herzberg.
Coordination: concepts, importance, principles and implementation techniques.
Control: concepts, importance and tools of control.

Suggested Readings

- Kaul, Principle and Practice of Management, Vikash
- Koontz & Weirich, Essentials of Management, TMH
- Koontz, Weirich & Cannice, Management, McGraw Hill
- Stoner & Freeman, Management , PHI
- Drucker, P.F., Managing Challanges for the 21st Century, Butterworth, Oxford
- Mitra, J., & Somani, N., Principles of Management and Business Communications, Oxford

CC 1.1 Cg
FINANCIAL ACCOUNTING – I
Marks: 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

FINANCIAL ACCOUNTING – I

Unit	Topic	Details	Marks allotted	No. of Lectures
1	Introduction	• Nature of accounting; Users of accounting information; Qualitative characteristics of accounting information. • Double entry book keeping system – Basic accounting equation, meaning of assets, liabilities, equity, revenue and expenses. Accounting Cycle - Recording of transaction: Journal, Ledger and preparation of Trial Balance. • Bases of accounting; cash basis and accrual basis. • Basic concepts and conventions: entity, money measurement, going concern, cost, realisation, accruals, periodicity, consistency, prudence (conservatism), materiality, matching and full disclosures.	5	5
2	Concepts for determination of business income	• Revenue recognition: Meaning of revenue; objective; timing of recognition. Recognition of expenses. • Inventories: meaning. Significance of inventory valuation. Lower of cost or market rule; Inventory ascertainment and reconciliation.	15	15
		• The nature of depreciation. The accounting concept of depreciation. Factors in the measurement of depreciation. Methods of computing depreciation: straight line method and diminishing balance method; Disposal of depreciable assets; change in estimate and method of charging depreciation. Accounting for depreciation: Asset-depreciation, Asset-provision. • Reserves and provisions: Meaning; Objective; Types & Accounting		
		• Capital and revenue expenditures and receipts: general introduction only. • Adjustment and rectification		
3	Introduction to Accounting Standard	Financial accounting standards: concept, benefits, procedure for issuing accounting standards in India. Need for a global standard, IFRS (concept only).	10	10
	Introduction to Accounting Theory	Concept of accounting theory; relation with practice; GAAP; Capital – capital maintenance concepts; Limitations of Historic Cost accounting; Introduction to Fair Value accounting		
4	Final accounts of Trading Concern	Preparation of financial statements: of sole proprietorship business entities from a trial balance – Manufacturing, Trading, P/L A/c and Balance Sheet	15	15

5	Financial statements from Incomplete records and of NPO	Preparation of financial statements: a) from incomplete records b) of non-profit organisation	10	12
6	Accounting for special sales transaction	• Consignment: Basic features; difference with sales. Recording in the books of Consignor – at cost & at invoice price, Valuation of unsold stock; Ordinary commission. Treatment and valuation of abnormal & normal loss. Special commission; Del credere commission (with and without bad debt) - use of Consignment Debtors A/C. Recording in the books of Consignee • Accounting for sale on approval	25	23
	Sectional and Self balancing ledger	• Concept of sectional balancing, preparation of control accounts. Self balancing Ledger: advantages; Recording process; preparation of Adjustment accounts.		
	Insurance claim for loss of stock and for loss of profit	• Loss of stock: Physical & ownership concept; concept of under-insurance and average clause; computation of claim – with price change; consideration of unusual selling line; price reduction etc. • Loss of profit: Concept – insured & uninsured standing charges, GP rate, short sales and increased cost of working, average clause and computation of claim (simple type)		

Relevant Accounting Standards issued by the Institute of Chartered Accountants of India are to be followed.

Suggested Reading:

• Sukla, Grewal, Gupta: Advanced Accountancy Vol. I, S Chand
• R. L.Gupta & Radheswamy, Advanced Accountancy Vol. I, S. Chand
• Maheshwari & Maheshwari, Advanced Accountancy Vol. I, Vikash Publishing House Pvt. Ltd.
• Sehgal & Sehgal, Advanced Accountancy Vol. I, Taxman Publication
• B. Banerjee, Regulation of Corporate Accounting & Reporting in India, World Press.
• Hanif & Mukherjee, Financial Accounting, McGraw Hill
• Frank Wood, Business Accounting Vol 1, Pearson
• Tulsian, Financial Accounting, Pearson
• Mukherjee and Mukherjee, Financial Accounting I, Oxford
• Accounting Standards issued by ICAI

Year 1: Semester II

		Marks	Credit Hours	
GE 2.1 Chg	E-Commerce & Business Communication (50+50)	**100**	**6**	
CC2.1 Chg	Company Law	**100**	**6**	
CC 2.2 Chg	Marketing Management and Human Resource Management	**100**	**6**	
CC 2.1Ch	Cost and Management Accounting - I	**100**	**6**	
			24	

GE 2.1 Chg

E-Commerce & Business Communication (50+50)

Marks: 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I
E-Commerce

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1: Introduction [10 Marks, Class: 10]

E-Commerce-meaning, nature, concepts, types; e-commerce business models B2B [concept, major activities, types of B to B market (independent, buyer oriented, supplier oriented, e-market place)], B2C [portals, e-tailer, content provider, transaction broker, real life examples of B2C], C2C, C2B, etc.; forces behind e-commerce, e-Governance [meaning, types, significance, real life examples].

Unit 2: E-CRM and SCM [8 Marks, Class: 8]

E-CRM-definition, features, goals of E-CRM business framework, phases of E-CRM, types of E-CRM, Functional components of E-CRM, strategies for E-CRM solutions; SCM-definition, features, types of supply chain.

Unit 3: Digital Payment [8 Marks, Class: 8]

Methods of e-payments [Debit Card, Credit Card, Smart Cards, e-Money], electronic or digital wallet, digital signature (procedures, working and legal provisions), payment gateways [Core Banking Solution or CBS, Mobile Payment, UPI, NCPI, International Payments], Online banking

[meaning, concepts, importance, electronic fund transfer, automated clearing house, automated ledger posting], risks involved in e-payments.

Unit 4: ERP [8 Marks, Class: 8]

Definition, features, major characteristics, levels of ERP, benefits of ERP, enterprise potential of ERP, modules of ERP, phases of ERP implementation, limitations of ERP.

Unit 5: New Trends in E-Commerce [6 Marks, Class: 6]

Social Commerce-concept, definition, features; Digital Marketing-definition, objectives, methods, limitations; Advertisement in Social Media-objectives, advantages and disadvantages, procedures

Suggested Readings

- P. T. Joseph**,** *E-Commerce: An Indian Perspective*, PHI Learning
- Henry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, *E-Commerce: Fundamentals and Applications,* Wiley.
- Laudon, *E-Commerce*, Pearson Education India
- Schneider G., E-Business, Cengage
- Bhaskar, B., E–Commerce, McGraw Hill

Module II

Business Communication

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1: Introduction **[8 Marks, Class: 8]**

Definition, objectives, importance, elements, process, forms, models, principles of effective communication, barriers to communication and remedial measures, role of communication in conflict resolution

Unit 2: Types of Communication **[6 Marks, Class: 6]**

Formal and informal communication, Grapevine, Characteristics of corporate communication, Characteristics of corporate communication, Communication network

Unit 3: Tools of Communication **[6 Marks, Class: 6]**

Emergence of communication technology, Modern Forms of communication, Fax, E-mail, Video Conferencing

Unit 4: Drafting **[20 Marks, Class: 20]**

Notice, Circular, Resolution & Minutes, Report, CV writing, Business letter writing- Offer letter, Quotation, Status enquiry, Confirmation, Execution, Refusal and cancellation of order, Recommendation, Credit collection, Claim, Bank loan

Suggested Readings

- Anjanee, S. & Bhavana Adhikari, *Business Communication*, TMH
- Chaturvedi &Chaturvedi, *Business Communication : Concepts, Cases and Applications*, Pearson
- M.K.Shegal &Vandana Khetarpal, Business Communication, Excel Books
- R.K.Madhukar, *Business Communication*, Vikash Publishing House Pvt. Ltd.
- Rao, Kumar & Bindu, Business Communication, Cengage
- Khanna, Puja., Business Communication, Vikash
- Raman & Sharma, Technical Communication, Oxford
- Lesikar, Flatley et al, Business Communication, McGraw Hill

CC2.1 Chg

Company Law

Marks: 100

Internal Assessment: 20 marks

Semester-end Examinations: 80 marks

Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit 1: INTRODUCTION TO COMPANY[No of classes 16 / Marks 16]

Meaning and Definition – Features –, High Lights of Companies Act 2013 - Body Corporate ,Kinds of Companies (Concept, Definition and Features) – One Person Company, Private Company, Public Company, Company limited by Guarantee, Company limited by Shares, Holding Company, Subsidiary Company,

Government Company, Associate Company, Small Company, Foreign Company, Listed Company, Dormant company , Lifting of corporate veil.

Unit 2: FORMATION OF A COMPANY[No of classes 16 / Marks 16]

Steps in formation of a Company, Promotion Stage, Meaning of Promoter, Position of Promoter & Functions of Promoter, Incorporation Stage – Meaning, Contents, Forms of Memorandum of Association & Articles of Association and its alteration, Distinction between Memorandum of Association and Articles of Association, Doctrines of constructive notice and Indoor management, Certificate of Incorporation, Subscription Stage – Meaning & contents of Prospectus, Types, Misstatement in prospectus and its consequences.

Unit 3: COMPANY ADMINISTRATION[No of classes 16 / Marks 16]

Director (Concept and Definition), DIN, Qualification, Disqualification, Appointment, Position, Rights, Duties, Power, Resignation, Liabilities, Removal and Resignation of director. Key Managerial Personnel (Definition, Appointment and Qualifications) – Managing Director, Whole time Directors, the Companies Secretary, Chief Financial Officer, Resident Director, Independent Director, Women director.

Unit 4: SHARE CAPITAL & DEBENTURE[No of classes 16 / Marks 16]

Share, Share Capital - Types and Definition, Allotment and Forfeiture, Calls on Shares, ESOP, Buyback, Sweat Equity, Bonus, Right, Capital Reduction, Share Certificate, D-mat System, Transfer and Transmission, Redemption of Preference Shares, Debenture – Definition, Types, Rules Regarding Issue of Debenture.

Unit 5: CORPORATE MEETINGS[No of classes 16 / Marks 16]

Corporate Meetings - Shareholder and Board, Types of Meetings – Annual General Meeting Extraordinary General meeting, Minutes of Proceedings of General Meeting, Meeting of BOD and other meetings (Section 118), Requisite of Valid Meeting- Notice, Agenda, Chairman, Quorum, Proxy, Resolutions, Minutes, Postal Ballot, E- voting, Video Conferencing, Board Meetings and Resolutions

(If any new provisions are enacted in place of the existing provisions, the syllabus will accordingly include such new provisions in place of existing provisions with effect from such date as prescribed by Calcutta University. Similarly if any existing provision becomes redundant due to changes, it will be left out of the syllabus)

Suggested Readings

- Kumar Rabindra, Legal Aspects of Business, Cengage
- Bhadra, Satpati and Mitra, Ainer Ruprekha (Bengali Version), Dishari
- Kapoor, N.D., Corporate Law, S.Chand
- Arora, Bansal, Corporate Law, Oxford
- Roychowdhury, Bhattacharjee & Datta, Business Regulatory Framework, Elegant Publishers

CC 2.2 Chg

Marketing Management and Human Resource Management

Marks 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I

Marketing Management

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1: Introduction:
No. of classes: 8 / Marks: 8
Nature, scope and importance of marketing; Selling vs Marketing; Marketing mix, Marketing environment: concept, importance, and components (Economic, Demographic, Technological, Natural, Socio-Cultural and Legal).

Unit 2: Consumer Behaviour and Market segmentation:
No. of classes: 8 / Marks: 8
Consumer Behaviour: Nature and Importance, Factors influencing consumer buying behaviour.
Market segmentation: concept, importance and bases; Product differentiation vs. market segmentation.

Unit 3: Product:
No. of classes: 8 / Marks: 8
Concept and importance, Product classifications; Concept of product mix; Branding, packaging and labeling; Product life-cycle; New Product Development Process.

Unit 4: Pricing, Distribution Channels and Physical Distribution
No. of classes: 8 / Marks: 8
Pricing: Significance. Factors affecting price of a product. Pricing policies and strategies.
Distribution Channels and Physical Distribution: Channels of distribution - meaning and importance; Types of distribution channels; Factors affecting choice of distribution channel.

Unit 5: Promotion and Recent developments in marketing:
No. of classes: 8 / Marks: 8
Promotion: Nature and importance of promotion; Communication process; Types of promotion: advertising, personal selling, public relations & sales promotion, and their distinctive characteristics.
Recent developments in marketing: Social Marketing, online marketing, direct marketing, services marketing, green marketing, Rural marketing; Consumerism.

Suggested Readings:

- Kotler & Keller, Marketing Management, Pearson
- Ramaswamy and Namakumari, Marketing Management, McMillan
- Bhagwati, Pillai, Marketing Management, S.Chand
- Verma & Duggal, Marketing Management, Oxford
- Venugopal, P., Marketing Management, Sage
- Saxena, Marketing Management, McGraw Hill

Module II

Human Resource Management

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1: Nature and Scope
No. of classes: 8 / Marks: 8
Concept and meaning of HR, Understanding the Nature and Scope of HRM, Functions and importance.

Unit 2: Human Resource Planning
No. of classes: 8 / Marks: 8
Definition, Need and Features of Human Resource Planning, factors affecting Human Resource Planning.

Unit 3: Recruitment and Selection
No. of classes: 8 / Marks: 8
Definition of Recruitment, Source, need and importance of Recruitment, Recruitment Policy – process – sources of Recruitment Definition of Selection, Steps in selection.

Unit 4: Training and Development
No. of classes: 8 / Marks: 8
Training and Development Meaning and purpose of training, Benefits of training to organisation and employees -Training methods.

Unit 5: Job Evaluation and Performance Appraisal
No. of classes: 8 / Marks: 8
Job evaluation - objectives, scope, method, Job analysis, Job description, Job Specification - basic concept and significance,
Performance Appraisal - Concept

Suggested Readings:

- Mahajan, Reeta, Human Resource Management, Vikash
- Haldar & Sarkar, Human Resource Management, Oxford
- Sinha, Sekhar & Bala, Human Resource Management, Cengage
- Jyothi & Venkatesh, Human Resource Management, Oxford
- Wilton, N., An Introduction to Human Resource Management, Sage
- Dessler & Varkkey, Human Resource Management, Pearson

CC 2.1Cg
COST AND MANAGEMENT ACCOUNTING – I

Marks 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

COST AND MANAGEMENT ACCOUNTING-I

Unit	Topic	Content	Marks	Lecture
		MODULE - I		
1.	**Introduction**	• Definition of Costing, Objectives of Cost Accounting; Installing a Cost Accounting System, Essentials of a good Cost Accounting System. • **Cost concepts, terms and classification of costs**: Cost, Cost object, Cost units and Cost Centres, Types of costs, classification of costs- Direct-Indirect, Elementwise, Functionwise, Behaviourwise. **Costing Methods and Techniques** (introduction only).	**10**	**6**
2	**Material Costs**	• *Purchase of materials*: Organisation, purchase procedure, documentation. • *Storage of materials*: Need for storage, functions of a storekeeper, storage record, accounting for materials cost. • *Materials control*: Organisation; Tools: Just-in-Time Purchase; various stock levels, Economic Ordering Quantity; Periodic Inventory, Perpetual Inventory, Physical verification. • Methods of Pricing Material Issues: FIFO, LIFO, Weighted Average.	**10**	**10**
3	**Employee Cost and Incentive Systems**	• Introduction, Recording labour cost: Attendance and payroll procedures (Time-keeping, Time-Booking, Payroll procedure, Payment of wages-Piece rate, differential piece rate, time rate), Idle time (causes and treatment in Cost Accounting), Overtime (its effect and treatment in Cost Accounting). • Main Principles for sound system of wage incentive schemes-(Halsey, Halsey-weir, Rowan); System of Wage Payment and Incentives.	**10**	**12**
4	**Overhead And Presentation of Cost**	**Overhead** • *Introduction:* Definition, Classification of Overhead-Functional and Behavioural. • *Manufacturing Overheads:* Allocation and apportionment of Overhead; Absorption of Overhead: various methods and their application; Treatment of under absorption/over absorption of overheads; Basic concepts of different Capacities. Preparation of Cost Sheet (single product only)	**20**	**20**
	Cost Book-keeping	Non-Integrated System: Meaning & Features; Ledgers Maintained; Accounts prepared; General/Cost Ledger Adjustment Account; Meaning of Closing Balance in	**10**	**8**

		Various Accounts (Simple type) Reconciliation: Need for reconciliation; Items causing differences between Cost and Financial Profits and their reconciliation.		
	Costing Methods	• **Job Costing and Batch Costing** • **Contract Costing** - Progress payments, Retention money, Escalation clause, Contract accounts, Accounting for material, Accounting for plant used in a contract, Contract Profit. • **Service Costing -** Introduction; Motor Transport Costing only • **Process Costing:** Meaning, Features, Process vs Job Costing, Normal loss, Abnormal loss and gain and preparation of process accounts.	**20**	**24**
		Total	**80**	**80**

Suggested Readings

- Horngren, Datar & Rajan, Cost Accounting,- A Managerial Emphasis, Pearson
- B.Banerjee, Cost Accounting, PHI
- Jawahar Lal & Seema Srivastava, Cost Accounting, TMH
- M.Y.Khan & P.K.Jain, Management Accounting, TMH
- Atkinson, Management Accounting, Pearson
- Bhattacharyya, Ashish K., Cost Accounting for Business Manageres, Elsevier
- Ravi M Kishore, Cost and management Accounting, Taxmann
- Mitra, J.K., Cost & Management Accounting, Oxford
- Hanif, M., Cost & Management Accounting, McGraw Hill
- Drury, Colin., Management and Cost Accounting, Cengage
- Satish Inamdar, Cost & Management Accounting, Everest Publishing House

- Bhattacharyya, Ashish K., Cost Accounting for Business Manageres, Elsevier
- Ravi M Kishore, Cost and management Accounting, Taxmann

Year 2: Semester III

		Marks	**Credit Hours**	
SEC 3.1 Chg	Information Technology & Its Application in Business (Theory -50 + Practical- 50)	**100**	**4**	
GE 3.3 Chg	Business Mathematics & Statistics	**100**	**6**	
CC3.1 Ch	Financial Accounting II	**100**	**6**	
			16	

SEC 3.1 Chg

Information Technology & Its Application in Business
(Theory -50 + Practical- 50)

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I
Information Technology and Its Application in Business (Theory)

(Marks: 50)

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit1: Information Technology and Business [8 Marks, Class: 8]

Concepts of data, information and computer based information system, impact of information technology on business [business data processing, intra-organizational and inter-organizational communication by using network technology, business process outsourcing and knowledge process outsourcing], types of Information System- Transaction Processing System (TPS), Management Information System (MIS), Decision Support System (DSS), Knowledge Management System (KMS) and their implementation at managerial levels [operational, tactical and strategic].

Unit 2: Data Organization and Data Base Management System [10 Marks, Class: 10]

(a) Data Organisation: Character, field, record, file and database, types of data processing systems [Serial, Batch, Real-time, Online, Centralized, Distributed], File Organizations [Sequential, Direct, Indexed-Sequential, Relative], Traditional file organisation vs. Database file organisation.

(b) Database Management System: Concept of database management system (DBMS), definition, importance of DBMS, important terms of database [Entity, Attribute, Keys- Primary, Foreign and Candidate, Referential Integrity, Table, Views, Data Dictionary], types of database [Hierarchical, Network and Relational], basic ideas of Data Warehouse and Data Mining (definition, importance, advantages and disadvantages), Big data analysis- Concept.

Unit 3: Internet and Its Applications [8 Marks, Class: 8]

Meaning of Internet, IPAddress [IPv4, IPv6], URL, Domain Name System, Internet Protocols - TCP/IP, UDP, FTP, TELNET[brief ideas only], HTML, DHTML AND XML [Concepts only], Ethical Hacking, Cloud Computing, Mobile Computing, Internet of Things, Ethical issues in Social Networking.

Unit 4: Security and Encryption [8 Marks, Class: 8]

Need and concepts, dimension, definition and scope of e-security, security threats- Malicious Codes (Virus, Trozan Horse, Worm, Spyware, Ransomware), Hacking, Spoofing, Sniffing, Phishing, Spamming, Denial of Service (DoS) attacks, Technology solutions [Confidentiality: (Data Encryption & Decryption, Symmetric and asymmetric encryption), Security Implementation: Firewall, DMZ (De Militarized Zone), SSL, HTTPs, Significance of Website Auditing].

Unit 5: IT Act. 2000 and Cyber Crimes [6 Marks, Class: 6]

IT Act 2000- Definitions of different terms, Digital signature, Electronic Governance, Attribution, Acknowledgement and Dispatch of Electronic Records, Regulation of Certifying Authorities, Digital Signatures Certificates, Duties of Subscribers, Penalties and Adjudication, Appellate Tribunal, Offences and Cyber-crimes.

Module II

Information Technology and Its Application in Business (Practical)

(Marks: 50)

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1: Word Processing [5 Marks, Class: 5]

Working with word document- Editing text, Find and Replace text, Formatting, Spell check, Autocorrect, Auto text; Bullets and numbering, Tabs, Paragraph Formatting, Indent, Page Formatting, Header and footer, Macros, Drop cap; Tables: Inserting, Filling and formatting a Table, Inserting Pictures and Video; Mail Merge- including linking with Database, Printing documents.

Creating Business Documents using the above facilities

Unit 2: Preparing Presentations [5 Marks, Class: 5]

Basics of presentations: Slides, Fonts, Drawing, Editing; Inserting: Tables, Images, texts, Symbols, Media; Design; Transition; Animation, Hyperlink and Slideshow.

Creating Business Presentations using above facilities.

Unit 3: Spreadsheet and its Business Applications [16Marks, Class: 16]

Managing worksheets- Formatting, Entering data, Editing, and Printing a worksheet; Handling operators in formula, Project involving multiple spreadsheets, Organizing Charts and graphs, Pivot Table.

Spreadsheet Functions: Mathematical [SUMIF, SQRT, SUBTOTAL, SUMPRODUCT etc.], Statistical [AVERAGE, STDEV, VAR, CORRELATION, REGRESSION etc.], Financial [PMT, RATE, PV, FV, NPER, IRR, NPV, Data Table Etc.] Logical [AND, OR, IF etc.], Date and Time, lookup and reference, Database and Text functions.

Creating Spreadsheet in the area of: Loan and Lease statement; Ratio Analysis; Payroll Statements; Capital Budgeting; Depreciation Accounting; Graphical Representation of Data; Frequency Distribution and its Statistical Parameters; Correlation and Regression

Unit 4: Database Management System [8 Marks, Class: 8]

Creation of Tables, Multiple Table Handling-Defining Relationship [Foreign Key], Simple and Conditional Queries, Types of Queries [Update, Delete, Append], Forms, Reports, Introduction to SQL through Basic Commands.

Applying DBMS in the areas of Accounting, Inventory, HRM and its accounting, Managing the data records of Employees, Suppliers and Customers.

Unit 5: Website Designing **[6 Marks, Class:6]**

Introduction to HTML; Tags and Attributes: Text Formatting, Fonts, Hypertext Links, Tables, Images, Lists, Forms, Frames, Cascading Style Sheets.

Suggested Readings

- Thareja, IT & Application, Oxford
- Aurora, Computer Fundamentals, Vikash
- Sinha & Sinha, Fundamentals of Computers, BPB Publications
- Dhar, P., Fundamental of IT and Its Application in Business, APH

GE 3.3 Chg
Business Mathematics & Statistics
Marks 100

Module I
Business Mathematics
Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

1 **Permutations and Combinations:** Definition, Factorial Notation, Theorems on Permutation, Permutations with repetitions, Restricted Permutations; Theorems on Combination, Basic identities, Restricted Combinations. **[8 L /8Marks]**

2 **Set Theory**: Definition of set, Presentation of sets, Different types of sets- Null set, Finite and infinite Sets, Universal set, Subset, Power set etc.; Set Operations, Law of algebra of Sets. **[8 L /8Marks]**

3 **Binomial Theorem:** Statement of the theorem for positive integral index, General term, Middle term, Simple properties of binomial coefficients. **[8 L /8Marks]**

4 **Logarithm:** Definition, Base and Index of Logarithm, General properties of Logarithm, Common Problems**.** **[8 L /8Marks]**

5 **Compound Interest and Annuities:**Simple AP and GP Series, Different types of interest rates, Net present value, Types of annuities, Continuous compounding, Valuation of simple loans and debentures, Problems relating to Sinking Funds. **[8 L /8Marks]**

Module II
Statistics

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

6. **Correlation and Association:** Bivariate data, Scatter diagram, Pearson's correlationcoefficient, Spearman's rank correlation, Measures of association of attributes. [8 L /8Marks]
7. **Regression Analysis:** Least squares method, Simple regression lines, properties of regression, Identification of regression lines.[8 L /8Marks]
8. **Index Numbers:** Meaning and types of index numbers, Problems of constructing index numbers, Construction of price and quantity indices, Test of adequacy, errors in index numbers, Chain base index numbers; Base shifting, Splicing, Deflating, Consumer price index and its uses. [8 L /8Marks]
9. **Time Series Analysis:** Causes of variation in time series data, Components of time series, additive and multiplicative models, Determination of trend by semi-average, moving average and least squares(of linear, quadratic and exponential trend) methods; Computation of seasonal Indices by simple average, ratio-to-moving average, ratio-to-trend and link relative methods; Simple forecasting through time series data. [8 L /8Marks]
10. **Probability Theory:** Meaning of probability; Different definitions of probability; Conditional probability; Compound probability; Independent events, Simple problems. [8 L /8Marks]

Suggested Readings

- Business Mathematics and Statistics- N G Das & J K Das (Tata McGraw Hill)
- Statistics for Business Decisions – J. K .Das (Academic Publishers)
- Basic Mathematics and its Application in Economics – S. Baruah (Macmillan)
- Mathematics for Economics and Business – R. S. Bhardwaj (Excel Books)
- Mathematics and Statistics for Management – K B Akhilesh and S Balasubrahmanyam (Vikash Publishing House Pvt.Ltd.)
- Business Statistics – G. C. Beri (Tata McGraw Hill)
- Fundamentals of Statistics – S.C.Gupta (Himalaya Publishing House)
- Statistics for Business and Economics – D. R. Anderson, D. J. Sweeney and T. A.
- Williams (Thomson Asia Pvt Ltd)
- Text Book of Business Mathematics , Padmalochan Hazarika, S.Chand
- Business Mathematics, Jameeruddin, Khanna & Bhamdri, Vikash
- Business Mathematics & Statistics – J. Chakraborti (Dey Book Concern)
- Business Mathematics & Statistics – R K Ghosh & S Saha (New Central Book Agency(P) Ltd
- Rajaretnam, Statistics for Social Sciences, Sage
- Elementary Business Mathematics & Statistics – Dr. Priyotosh Khan (Elegant Publication)
- Business Mathematics & Statistics – Dr. S N De (Chhaya Prakashani)
- Business Mathematics & Statistics – N K Nag & S K Nag (Kalyani Publishers)
- Business Mathematics & Statistics – Dr. Ranjit Dhar (Dishari Prakashani)

CC3.1Cg
FINANCIAL ACCOUNTING – II
Marks 100
Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks
Marks shown against the units indicate marks for Semester–end Examinations

Unit	Topic	Details	Marks allotted	No. of lectures
1	Partnership accounts-I	Correction of appropriation items with retrospective effect. Change in constitution of firm – change in P/S ratio, admission, retirement and retirement cum admission – treatment of Goodwill, revaluation of assets & liabilities (with/without alteration of books), treatment of reserve and adjustment relating to capital; treatment of Joint Life Policy, Death of a partner	15	15
2	Partnership accounts-II	Accounting for dissolution of firm – insolvency of one or more partner, consideration of private estate and private liabilities. Piecemeal distribution – surplus capital basis; maximum possible loss basis.	15	15
3	Branch accounting	Concept of Branch; different types of Branches. Synthetic method – preparation of Branch account. Preparation of Branch Trading and P/L account. (at cost & at IP) – normal and abnormal losses. Analytical method – preparation of Branch Stock, Adjustment etc A/C (at cost & at IP) – normal & abnormal losses Independent branch – concept of wholesale profit	10	10
4	Hire purchase and Instalment payment system	Meaning; difference with Installment payment system; Recording of transaction in the books of buyer – allocation of interest – use of Interest Suspense a/c – partial and complete repossession Books of Seller – Stock and Debtors A/C (with repossession) Books of Seller – H.P. Trading A/C without HP Sales and HP Debtors and General Trading A/c (with repossession)	10	10

		Concept of operating and financial lease – basic concept only.		
5	Departmental accounts	Concept, objective of preparation of departmental accounts; apportionment of common cost; Preparation of Departmental Trading and P/L account, Consolidated Trading and P/L account; inter departmental transfer of goods at cost, cost plus and at selling price and elimination of unrealized profit.	10	10
6	Investment Accounts	Maintenance of Investment Ledger; Preparation of Investment Account (transaction with brokerage, STT, cum & ex-interest), Valuation of Investment under FIFO and Average method; Investment Account for Shares (with Right Shares, Bonus Shares and Sale of Right). Relevant Accounting Standard.	10	10
7	Business Acquisition and Conversion of partnership into limited company	• Profit/ loss prior to incorporation; Accounting for Acquisition of business. • Conversion of Partnership into Limited Company – with and without same set of books	10	10
			80	80

Relevant Accounting Standards issued by the Institute of Chartered Accountants of India are to be followed.

Suggested Reading

• Sukla, Grewal, Gupta: Advanced Accountancy Vol. I & II, S Chand
• R. L.Gupta & Radheswamy, Advanced Accountancy Vol. I & II, S. Chand
• Maheshwari & Maheshwari, Advanced Accountancy Vol. I & II, Vikash Publishing House Pvt. Ltd.
• Sehgal & Sehgal, Advanced Accountancy Vol. I & II, Taxman Publication
• L.S.Porwal, Accounting Theory, Tata Mcgraw Hill
• Gokul Sinha, Accounting Theory & Management Accounting,
• B. Banerjee, Regulation of Corporate Accounting & Reporting in India, World Press.
• Frank Wood, Business Accounting Vol 1&II, Pearson
• Tulsian, Financial Accounting, Pearson
• Hanif & Mukherjee, Financial Accounting, Vol II, McGraw Hill
• Accounting Standards issued by ICAI

GE 4.1 Chg

Microeconomics-II & Indian Economy (50+50)

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I

Microeconomics-II

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit: I Monopoly
Concept of Monopoly: Sources of monopoly power; Short-run and Long-run equilibrium of a monopoly firm; Price discrimination; Social Cost of Monopoly (concept only). **[L 10/ Marks:10]**

Unit: II Imperfect Competition
Concept of Imperfectly Competitive market; Monopolistic Competition: Features and examples; Oligopoly: Non-Collusive Oligopoly: Sweezy's Kinked demand Curve Model, Collusive Oligopoly: Cartel (concept with example) **[L 15/ Marks:15]**

Unit: III Factor Price Determination

Introduction; Marginal Productivity Theory of Distribution; Marginal Productivity Theory of Wage, Demand Curve of Labour, Supply Curve of Labour; Wage Determination in an Imperfectly Competitive Labour Market: Case of Collective Bargaining, Factors determining the power of trade unions to raise wages; Theory of Rent: Ricardian Theory of Rent, Modern Theory of Rent,Quasi-rent; Theory of Profit: Gross Profit and Net Profit, Accounting Profit and Normal Profit, Different Theories of Determination of Profit; Concept of Interest: Gross Interest and Net Interest, Classic Theory of Interest Rate Determination. **[L 15/ Marks 15]**

Suggested Readings

- Pindyke and Rubinfeld, Micro Economics, Pearson
- Gold & Ferguson, Micro Economic Theory
- Banerjee & Majumdar, Business Economics and Business Environment, ABS
- Banerjee & Majumdar, Banijjik Arthaniti –o- Banijjik Paribesh(Bengali),ABS
- Ratan Khasnabish & Ranesh Roy, Banijjik Arthaniti –o- Bharoter arthanaitik Paribesh(Bengali)
- Divedi, D.N., Managerial Economics, Vikash Publications
- Mankiw.N.G., Principles of Microeconomics, Cengage
- Das, P. & Sengupta A., Economics , Oxford
- Samuelson & Nordhaus, Macroeconomics, McGraw Hill

Module II
Indian Economy

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit:I Basic Issues in Economic Development
Concepts and measures of development and underdevelopment; Concept of national income: GDP,GNP,NDP,NNP,NI (concepts only). **[L 5/ Marks:5]**

Unit:II Basic Features of Indian Economy
Sectoral distribution of National Income and Occupational Structure; Structural Change in Indian Economy, issue of Service-led Growth. **[L 10/ Marks:10]**

Unit:III Sectoral Trends and Issues

(a) **Agricultural Sector**: Problem of low productivity; Green Revolution and its impact; Land Reforms; Problems of rural credit and marketing.
(b) **Industry and Service Sector**: An overview of industrial growth during pre-reform and post-reform period; Role of Public Sector: its performance and the issue of disinvestment; Role of MSME sector, problems faced by the MSME Sector; Role of the Service Sector: growth of banking and insurance sector during the post-reform period.
(c) **External Sector**: Problem of unfavourable balance of payments and policy measures.
[L 15/ Marks:15]

Unit:IV Social Issues in Indian Economy
Problem of Poverty, Poverty alleviation measures; Problem of Unemployment and the policy measures.
[L 10/ Marks:10]

Suggested Readings

•Dutt & Sundaram, Indian Economy, S.Chand
• Mishra &Puri, Indian Economy, Himalaya Publishing House
• Uma Kapila, Indian Economy
• Joydeb Sarkhel & Swapan Kr. Roy, Bharoter arthanaiti(Bengali)
• Banerjee & Majumdar, Business Economics and Business Environment,ABS
• Banerjee & Majumdar, Banijjik Arthaniti –o- Banijjik Paribesh(Bengali),ABS
• Ratan Khasnabish & Ranesh Roy, Banijjik Arthaniti –o- Bharoter arthanaitik Paribesh(Bengali)
- Prakash, B.A., Indian Economy, Pearson
- Fernando, Indian Economy, Pearson

CC 4.1 Chg

Entrepreneurship Development and Business Ethics

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I

Entrepreneurship Development

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit-1: Introduction:
No. of classes: 10 / Marks: 10
Meaning, elements, determinants and importance of entrepreneurship and creative behavior;
Entrepreneurship and Micro, Small and Medium Enterprises, Role of family business in India; The contemporary role models in Indian business: their values, business philosophy and behavioural orientations; Conflict in family business and its resolution.

Unit-2:
No. of classes: 10 / Marks: 10
Public and private system of stimulation, support and sustainability of entrepreneurship. Requirement, availability and access to finance, marketing assistance, technology, and industrial accommodation, Role of industries/entrepreneur's associations and self-help groups, The concept, role and functions of business incubators, angel investors, venture capital and private equity fund.

Unit-3:
No. of classes: 10 / Marks: 10
Sources of business ideas and tests of feasibility. Significance of writing the business plan/ project proposal; Contents of business plan/ project proposal; Designing business processes, location, layout, operation, planning & control; preparation of project report

Unit-4:
No. of classes: 10 / Marks: 10
Mobilizing Resources (10 Lectures) Mobilizing resources for start-up. Accommodation and utilities; Preliminary contracts with the vendors, suppliers, bankers, principal customers; Basic start-up problems;

Module II
Business Ethics

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1: Business Ethics
No. of classes: 8 / Marks: 8
Introduction – Meaning - Scope – Types of Ethics – features – Factors influencing Business Ethics – significance of Business Ethics - Arguments for and against business ethics- Basics of business ethics - Corporate Social Responsibility and Business Ethics

Unit 2: Principles of Business Ethics
No. of classes: 8 / Marks: 8

Introduction – Meaning – Element – Ethics, Morale, Business ethics, Ethical dilemma [basic idea, features and significance of each of element]

Unit 3: Ethics in Management
No. of classes: 8 / Marks: 8
Introduction – Ethics in HRM – Ethics in Marketing — Ethics in Accounting and finance - Work place Ethics - Value and Ethics.

Unit 4: Corporate Culture
No. of classes: 8 / Marks: 8
Meaning – Role – Functions – Impact of Corporate Culture – Globalization and cross culture issues in ethics, Corporate Code of ethics

Unit 4: Ethics & Corporate Governance
No. of classes: 8 / Marks: 8
Concept of Corporate Governance, Scope, Reports on Corporate Governance and its benefits and limitations-- Corporate Governance and Business Ethics [Brief Concept]

Suggested Readings:

- Kuratko and Rao, *Entrepreneurship: A South Asian Perspective,* Cengage Learning.
- Robert Hisrich, Michael Peters, Dean Shepherd, *Entrepreneurship,* McGraw-Hill Education
- Desai, Vasant. *Dynamics of Entrepreneurial Development and Management*. Mumbai,
- Himalaya Publishing House.
- Dollinger, Mare J. *Entrepreneurship: Strategies and Resources*. Illinois, Irwin.
- Holt, David H. *Entrepreneurship: New Venture Creation*. Prentice-Hall of India, New Delhi.
- Plsek, Paul E. *Creativity, Innovation and Quality*. (Eastern Economic Edition), New Delhi:
- Prentice-Hall of India. ISBN-81-203-1690-8.
- Singh, Nagendra P. *Emerging Trends in Entrepreneurship Development*. New Delhi:

ASEED.
- SS Khanka, *Entrepreneurial Development,* S. Chand & Co, Delhi.
- Hifrich, Manimala, Peters & Shepherd, *Entrepreneurship,* McGraw-Hill
- Kumar Arya, Entrepreneurship, Pearson
- Bamford and Bruton, Entrepreneurship, McGraw Hill
- SIDBI Reports on Small Scale Industries Sector.
- Roy, Entrepreneurship, Oxford
- Albuquerque, Business Ethics, Oxford
- Ferrell, Fraedrich, Farrell, Business Ethics, Cengage

Note: Latest edition of text books may be used.

CC 4.1 Cg

TAXATION-I

Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit 1 :

a) Basic Concepts and Definitions under IT Act
Assessee, Previous year, Assessment year, Person, Income, Sources of income, Heads of income, Gross total income, Total income, Maximum marginal rate of tax, Tax Evasion, Tax avoidance, Tax planning.

b) Residential Status and Incidence of Tax
Residential status of all persons except company

c) Incomes which do not form part of Total Income
Except section 10AA.

d) Agricultural Income
Definition, determination of agricultural and non-agricultural Income.

(L-10 / M-10)

Unit 2 : Heads of Income and Provisions governing Heads of Income

a) *Salaries*
b) *Income from House property* **(L-30 / M-30)**

Unit 3 : Heads of Income and Provisions governing Heads of Income

a) *Profits and Gains of Business or Profession*
Special emphasis on sec. 32, 32AC, 32AD, 35, 35D, 36(1)(2), (iii), (vii), 37, 37(2B), 40A(2), 40A(3), 43B, (Excluding presumptive taxation)

b) *Capital Gains*
Meaning and types of capital assets, basic concept of transfer, cost of acquisition, cost of improvement and indexation, computation of STCG and LTCG, exemptions u/s 54, 54EC and 54F, capital gain on transfer of bonus shares, right entitlement and right shares, taxability of STCG and LTCG.

c) *Income from Other Sources*

Basis of charge excluding deemed dividend **(L-25 / M-25)**

Unit 4 : a) Income of other Persons included in Assessee's Total Income
Remuneration of spouse, income from assets transferred to spouse and Son's wife, income of minor.

b) Set off and Carry Forward of Losses
Mode of set off and carry forward, inter source and inter head set off, carry forward and set off of losses u/s 71B, 72, 73, 74, 74A.

c) Deductions from Gross Total Income
Basic concepts, deductions u/s 80C, 80CCC, 80CCD, 80CCE, 80D, 80DD, 80DDB, 80E, 80G, 80GG, 80GGC, 80TTA, 80U

d) Rebate u/s 87A (L-15 / M-15)

If any new legislations/provisions are enacted in place of the existing legislations/provisions, the syllabus will accordingly include such new legislations/provisions in place of existing legislations/provisions with effect from such date as prescribed by CALCUTTA UNIVERSITY. Similarly if any existing provision becomes redundant due to changes, it will be left out of the syllabus.

Suggested Readings

- Singhnia V.K., and Singhania K, Direct Tax Law and Practice, Taxmann
- Lal and Vashist, Direct Taxes, Pearson
- Ahuja and Gupta, Direct Taxes Law And Practice, Bharat
- Manoharan & Hari, Direct Tax Laws, Snow White
- Roy, S. K., Principles and Practice of Direct & Indirect Taxes, ABS
- Sengupta, C.H., Direct & Indirect Taxes, Dey Book Concern

Latest edition of the books may be read.

CC 4.2 Cg
Cost and Management Accounting -II
Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit	Topic	Content	Marks	Lecture
1	Joint Product and By products	Concept of Joint products and by-products; Apportionment of common costs to joint products, and costing of By Products.	20	18
	ABC	Problems of traditional costing; meaning of Activity Based Costing; cost analysis under ABC; advantages and disadvantages.		
2	Budget and Budgetary Control	Budget and Budgetary Control; principal budget factor, preparation and monitoring procedures, Fixed and Flexible budget, preparation of cash budget, flexible budget.	10	12

3	**Standard Costing**	Standard Costs and Standard Costing; Uses, & Importance. Differences with Budgetary Control, Preliminary Steps. Classification of Standards. Analysis and computation of Materials, Labour and Overhead Cost (concepts only) variance.	**20**	**20**
4	**CVP Analysis, Marginal Costing**	**CVP Analysis** Introduction; CVP Assumptions and Uses; Break-Even Analysis: BE Point and Margin of Safety; Graphical presentation of CVP Relationship; Profit Graph **Marginal Costing and Management Decisions –** Marginal Costing vis-à-vis Absorption Costing; Cost statement under marginal costing and absorption costing; Marginal Costing Techniques. **Problems relating above areas**	**20**	**15**
5	**Short term Decision**	Marginal costing Techniques; Marginal Cost and product Pricing; Product Mix and Make or Buy Decisions (simple Type).	**10**	**15**
			80	**80**

Suggested Readings

- Horngren, Foster & Rajan, Cost Accounting,- A Managerial Emphasis, Pearson

• B.Banerjee, Cost Accounting, PHI
• Jawahar Lal & Seema Srivastava, Cost Accounting, TMH
• M.Y.Khan & P.K.Jain, Management Accounting, TMH
• Atkinson, Management Accounting, Pearson
• Bhattacharyya, Ashish K., Cost Accounting for Business Manageres, Elsevier
• Ravi M Kishore, Cost and management Accounting, Taxmann
• Hanif, M., Cost and Managment Accounting, TMH
• Mitra, J.K., Cost and Management Accounting, Oxford
• Drury, C., Management and Cost Accounting, Cengage

Year 3: Semester V

		Marks	Credit Hours	
CC 5.1 Cg	Auditing & Assurance	**100**	**6**	
DSE 5.1 A*	Taxation II	**100**	**6**	
DSE 5.2 A*	Corporate Accounting	**100**	**6**	
			18	

CC 5.1Cg

Auditing & Assurance

Full Marks – 100

Internal Assessment: 20 marks

Semester-end Examinations: 80 marks

Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

UNIT – I CONCEPT, NEED AND PURPOSE OF AUDIT (10M 10L)

- Definition-Nature-Scope and Objectives of Independent Financial Audit
- Basic Principles Governing an Audit- Concept of Auditor's Independence
- Errors and Fraud-Concepts, Means of Doing Fraud, Auditor's Responsibility towards Detection and Prevention of Fraud.
- Classification of Audit- Organization Structure wise (Statutory, Non-statutory); Objective wise (Internal and Independent Financial Audit); Periodicity wise (Periodical, Continuous, Interim, Final)
- Standards on Auditing (SA)- Concept and Purpose

(This unit should be studied with SA 200 and SA 240)

UNIT – II AUDIT PROCEDURES AND TECHNIQUES (15M 15L)

- Auditing Engagement-Audit Planning- Audit Programme (Definitions)
- Documentation: Audit Working Paper, Ownership and Custody of Working Papers-Audit File (Permanent and Current) – Audit Note Book- Audit Memorandum.
- Audit Evidence – Concept, Procedures to Obtain Audit Evidence
- Routine Checking, Test Checking and Auditing in Depth
- Audit of Educational Institutions and Hospitals

(This unit should be studied with SA 210, SA 230, SA 300, SA 500, SA 520 and SA 530)

UNIT – III INTERNAL CONTROL SYSTEM (10M 10L)

- Internal Control- Definition, Objectives
- Internal check-Definition, Objectives
- Internal Audit- Definition, Objectives, Reliance by Statutory Auditor on Internal Auditor's Work

(This unit should be studied with SA 610)

UNIT – IV VOUCHING, VERIFICATION AND VALUATION (10M 10L)

- **Vouching** - Meaning, Objectives – Factors to be Considered during Vouching - Vouching of Following Items: i) **Receipts:** Cash Sale, Collection from Debtors, Interest and Dividend from Investment, Sale of Fixed Assets. Ii**) Payments:** Cash Purchase, Payment to Creditors, Payment of Wages and Salaries, Advertisement Expenses, Travelling Expenses
- **Verification and Valuation** – Concept, Objectives, Importance, Difference with Vouching, Difference between Verification and Valuation, Verification of Following Items: **i) Non-Current Assets:** Goodwill, Patent and Copy Right, Plant and Machinery, **ii) Investments** iii**) Current Assets:** Inventory, Loan and Advance, Cash and Bank Balances iv**) Non-current Liability**: Secured Loan v) **Current Liability**: Trade Payables (Sundry Creditors).

UNIT - V COMPANY AUDIT (15M 15L)

- Qualification, Disqualification, Appointment and Rotation, Removal and Resignation,
- Branch Audit and Joint Audit
- Depreciation – Concept and Provisions of the Companies Act
- Divisible Profit and Dividend (Final, Interim and Unclaimed/Unpaid): Provisions of the Act, Legal Decisions and Auditor's Responsibility.

UNIT - VI AUDIT REPORT AND CERTIFICATE (10M 10L)

- Definition – Distinction between Report and Certificate- Different types of Report
- Contents of Audit Report (As per Companies Act and Standards on Auditing)
- True and Fair View – Concept
- Materiality – Concept

(***This unit should be studied with SA 700)***

UNIT – VII OTHER THRUST AREAS (10M 10L)

- Cost Audit – Concepts, Objectives Relevant Provisions of Companies Act
- Management Audit - Concepts, Objectives, Advantages
- Tax Audit - Social Audit – Propriety Audit – Performance Audit – Environment Audit (Concepts only)

Notes and Appendices

Notes:

1) **The provisions of the Companies Act, 1956 which are still in force would form part of the syllabus till the time their corresponding or new provisions of the Companies Act, 2013 are enforced.**
2) **If new Laws or Rules are enacted in place of the existing laws and rules, the syllabus would include the corresponding provisions of such new laws and rules with immediately following Academic Year.**
3) **Students are expected to develop analytical mind for answering problem based questions along with the theoretical questions.**

Suggested Readings:

- Gupta & Arora, Fundamentals of Auditing, TMH
- Tandon et al, Practical Auditing, S.Chand
- Jha, A., Auditing, Taxmann
- Basu, S. K., Auditing and Assurance, Pearson
- Ghosh, J., Contemporary Auditing and Assurance, Elegant Publishing
- **Standards on Audit (SA) issued by the Institute of Chartered Accountants of India**

DSE 5.1A
TAXATION-II
Full Marks – 100
Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I
Direct Tax

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Computation of Total Income and Tax Payable

a) Rate of tax applicable to different assesses (except corporate assessee)
b) Computation of tax liability of an individual, Firm (excluding application of AMT) **(L-15 / M-15)**

Unit 2 : TAX MANAGEMENT

a) Provision for Filing of Return
Date of filing of return, relevant forms of return, different types of returns, return by whom to be signed, PAN, TAN

b) Assessment of Return
Self assessment u/s140A, Summary assessment u/s 143(1), Scrutiny assessment u/s 143(3) and Best judgement assessment u/s 144.

c) Advance Tax
Who is liable to pay, due dates and computation of advance tax (excluding corporate assessees)

d) Interest & Fees
Section 234A, 234B, 234C, 234F (simple problems on interest and fees)

e) TDS
Provisions regarding TDS from salary, interest on securities, horse racing, lottery. **(L-25 / M-25)**

Module II
INDIRECT TAXES

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 3 : Central Sales Tax
Definitions, incidence and levy of tax, exemptions and exclusions, forms under CST, determination of turnover and tax payable, registration of dealers.
(L-10 / M-10)

Unit 4 : West Bengal Value Added Tax
Concepts and general principles, features, advantages and disadvantages, definitions, incidence and levy of tax, Rates of VAT, Calculation of VAT

liability, Input tax credit (including on Capital goods), small dealers and composition scheme, registration of dealers, cancellation of registration certificate.

(L-10 / M-10)

Unit 5 : Central Excise

Basic concepts, conditions and taxable event for levy of excise duty, Goods and excisable goods, Manufacture and deemed manufacture, Definitions of factory, broker or commission agent, wholesale dealer, sale or purchase, valuation – MRP, transaction value. **(L-10 / M-10)**

Unit 6 : Customs

Basic concepts, Taxable event, Territorial water, Indian customs water, Goods, Types of Customs duties – Basic, Additional, Protective, Safeguard, Counter-veiling duty on subsidised goods, Anti Dumping, Valuation of Custom Duty. **(L-10 / M-10)**

The indirect tax portion of this paper will be replaced by the Goods & Service Tax Law whenever the law is enforced and accordingly revised syllabus will be announced. If any new legislations/provisions are enacted in place of the existing legislations/provisions, the syllabus will accordingly include such new legislations/provisions in place of existing legislations/provisions with effect from such date as prescribed by CALCUTTA UNIVERSITY. Similarly if any existing provision becomes redundant due to changes, it will be left out of the syllabus.

Suggested Readings

- Datey V.S., Indirect Taxes Law And Practice, Taxmann
- Sanjeev Kumar, Systematic Approach to Indirect Taxes, Bharat
- Bangar and Bangar, Students' Gide to Indirect Taxes, Aadhya Prakashan.
- Sengupta, C.H., Direct & Indirect Taxes, Dey Book Concern
- Roy, S. K., Principles and Practice of Direct & Indirect Taxes, ABS

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Latest edition of the books may be read.

DSE 5.2 A

CORPORATE ACCOUNTING

Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit	Topic	Details	Marks allotted	No. of lectures
1	Company – Introduction And Accounting for Shares & debentures	• Meaning of Company; Maintenance of Books of Accounts; Statutory Books; Annual Return • Issue of Shares – issue, forfeiture, reissue, issue other than in cash consideration and issue to the promoters; Pro-rata issue of shares. Issue of debentures. Sweat equity. • Right and Bonus Share – Rules, Accounting • Underwriting of shares and debentures: Rules; Determination of Underwriters Liability – with marked, unmarked & firm underwriting; Accounting. • Employee Stock Option Plan – meaning; rules; Vesting Period; Exercise Period. Accounting for ESOP. Meaning and Accounting of ESPS.	20	20
2	Buy back and Redemption of preference shares	• Buy Back of Securities – meaning, rules and Accounting. • Redemption of Preference Shares – Rules and Accounting (with and without Bonus Shares)	10	10
3	Company Final Accounts	Introduction to Schedule III; Treatment of Tax; transfer to reserve, Dividend and applicable tax (out of current profit, out of past reserve); Preparation of Statement of Profit & Loss and Balance Sheet. (tax on net profit without recognizing deferred tax)	15	15
4	Redemption of debenture	Redemption of Debenture – Important Provisions, Accounting for Redemption: by conversion, by lot, by purchase in the open market (cum and ex-interest), held as Investment and Use of Sinking Fund	10	10
5	Valuation	Goodwill – valuation using different methods,i.e., Average Profit, Super Profit, Capitalisation and Annuity. Shares – Valuation using different methods: Asset approach, Earnings approach, Dividend Yield, Earnings-Price, Cum-div and Ex-div, Majority and Minority view and	10	10

		Fair Value		
6	Company Merger And Reconstruction	• Amalgamation, Absorption and Reconstruction– Meaning; relevant standard and meaning of different terms, Accounting in the books of Transferor Company. Accounting in the books of Transferee (based on relevant accounting standard); inter-company transactions (excluding inter-company share holding). • Internal reconstruction – meaning, provisions and Accounting, Surrender of Shares for redistribution; preparation of Balance Sheet after reconstruction	15	15
		Total	80	80

Relevant Accounting Standards issued by the Institute of Chartered Accountants of India are to be followed.

Suggested Reading

• Sukla, Grewal, Gupta: Advanced Accountancy Vol. II, S Chand
• R. L.Gupta & Radheswamy, Advanced Accountancy Vol. II, S. Chand
• Maheshwari & Maheshwari, Advanced Accountancy Vol. II, Vikash Publishing
• Sehgal & Sehgal, Advanced Accountancy Vol. I II, Taxman Publication
• Hanif & Mukherjee, Financial Accounting, Vol III , TMH
• • Frank Wood, Business Accounting Vol II, Pearson
• V.K.Goyal, Corprate Accounting, Excel Books
• Rajasekaran, Corporate Accounting, Pearson
• Accounting Standards issued by ICAI

DSE Papers

SEMESTER V

DSE 5.1 M : Consumer Behaviour & Sales Management (50+50)

Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: Consumer Behaviour

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Consumer Behaviour
No. of Classes 8 / Marks 8

• Concept : Application of Consumer Behaviour Knowledge
• Consumer Behaviour Model
• Market Segmentation
• Marketing Ethics

Unit 2 : Determinants of Consumer Behaviour
No. of Classes 8 / Marks 8

• Consumer as an Individual, Need, Motivation
• Personality, Perception, Learning Attitude
• Communication persuasion
• Consumers in their Social & Cultural Setting, the family, Social class, cross cultural consumer behaviour

Unit 3 : Consumer Decision-making Process
No. of Classes 8 / Marks 8

• Personal Influence & Opinion
• Leadership Process
• Diffusion of innovations
• Consumer decision making process

Unit 4 : Consumer Behaviour & Society
No. of Classes 8 / Marks 8

• Health - care Marketing
• Political marketing
• Social Marketing
• Environmental Marketing
• Public Policy & Consumer Protection

Unit 5 : Consumer Behaviour and Market Research
No. of Classes 8 / Marks 8

• Relevance of Marketing Information System
• Market Research in assessing Consumer Behaviour

Suggested Readings:

- Suhiffman & Kanuk, Consumer Behaviour, PHI
- Loudon & Bitta, Consumer Behaviour, TMH
- Bennet & Kassarjian, Consumer Behaviour, PHI
- Batra & Kazmi, Consumer Behaviour, Text & cases, Excel Books
- Beri, Marketing Research, TMH
- Bradley, marketing Research. Oxford University Press
- Schiffman and Kannak, Consumer Behaviour, Pearson Education

Module II : Sales Management

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Sales Organization
No. of Classes 8 / Marks 8

• Purpose and General principles of organization
• Every-growing complexity of Sales Organisation
• Different Models of Sales Organisation
• Factors determining Sales Organisation Structure
• Decentralised Structure
• Common problems associated with Structuring the Sales Organisation
• Modification of Sales Organisation
• Tasks of Chief Sales Executive

Unit 2 : Designing the Sales Force
No. of Classes 8 / Marks 8

• Objectives
• Strategies
• Structure size
• Sales force Compensation

Unit 3 : Managing the Sales Force
No. of Classes 8 / Marks 8

• Recruitment
• Selection
• Placement
• Transfer
• Training and Development
• Grievances handling of Sales Force
• Motivating Leading and Communicating with the Sales Force
• Performance Evaluation of Sale Force

Unit 4 : Personal Selling and Salesmanship
No. of Classes 8 / Marks 8

• Buyer-Seller Dyads
• Theories of selling
• Personal Selling as a Career
• Steps in Personal Selling – Methods of Approaching a Customer
• Handing Customer Objections
• Negotiations – Barganing and Negotiation Approaches, Bargaining Strategies and Tactics during Negotation

Unit 5 : Marketing Channels and Selection
No. of Classes 8 / Marks 8

• Need
• Functions
• Levels
• Identifying and Analyzing Customers' needs for Products Services
• Developing channel Objective, Selection of Appropriate Channel
• Selection of Appropriate channels
• Motivating, Leading, Communicating with the Channel Members
• Performance Evaluation of the Channel Members
• Modifying Channel Arrangements

Suggested Readings:

- Cundiff, Still and Govoni, Sales management, PHI
- Smith, Sales Management, PHI
- Kotler, Marketing Management, PHI
- Zieglar, et al Sales Promotion and Modern Merchandising
- Stem, Ansary and Coughlan Marketing Channels, PHI
- Warmer, Marketing and Distribution, Macmillan, New York
- Pyle, Marketing Principles, Macmillan, New York
- Doughlas, et al Fundamentals of Logistics and Distributions, TMH
- Gupta, Sales and Distribution Management, Excel Books
- Havaldar & Cavale, Sales and Distribution Management, McGraw Hill
- Hawkins, Motherbaugh & Mookerjee, Consumer Behaviour, McGraw Hill
- Schiffman, Wisenblit & Kumar, Consumer Behaviour, Pearson

DSE 5.2 M : Product & Pricing Management (50) & Marketing Communication (50)

Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: Product & Pricing Management

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Introduction to Product Management
No. of Classes 8 / Marks 8

• Product: Basic concept of product, levels, Importance in Marketing Mix, Product Mix Decisions
• Product-Life-Cycle: Concept, strategies related to different stages of PLC.
• Product Portfolio: Concept, Importance, BCG Model

Unit 2 : Marketing Environment and Market segmentation
No. of Classes 8 / Marks 8

• Marketing Environment: concept, Importance, Micro-environmental factors and Macro-environmental factors (Demographic, Economic, Natural, Technological, Socio-Cultural & Political-Legal)
• Market segmentation: Concept, Importance and bases

Unit 3 : New Product Development
No. of Classes 8 / Marks 8

Concept
Importance
Stages
Reasons for failure of a new product
Adoption process.

Unit 4 : Packaging and Branding:
No. of Classes 8 / Marks 8

Packaging:
• Concept
• Importance
• Packaging Strategies
• Legal and Ethical aspects of packaging
Branding:
• Concept
• Importance
• Positioning and repositioning strategies
• Basic concepts of Brand equity

Unit 4 : Pricing Management:
No. of Classes 8 / Marks 8

• Concept
• Important features of pricing as an element of Marketing Mix
• Importance of pricing in consumer buying process
• Determining factors of effective pricing

• Pricing methods
• Pricing in the Indian context
• Regulatory Price Environment

Suggested Reading:

- Kotler and Kellar, Marketing Management, Pearson
- William and Ferrell, Marketing, Houghton Miffin McGraw-Hill
- Neelamegham, Marketing in India: Cases and Readings, Vikas Publishing
- Majumder, Product Management in India, PHI
- McCarthy and Perreault, Basic Marketing Managerial Approach, Irwin, Homewood, Illinois
- Srivastava, R. K., product Management & New product Development, Excel Book
- Ramaswamy and namakumari, Marketing Management, Macmillan India
- Srinivasan Case Studies in marketing: The India Context, PHI
- Baker & Hart, Product Strategy and Management, Pearson

Module II: Marketing Communication

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Communication Process
No. of Classes 8 / Marks 8

• Importance of communication
• Steps involved in the process of Communication
• Barriers to Marketing Communication
• Social Media, Digital Marketing- Concepts

Unit 2 : Communication Mix
No. of Classes 8 / Marks 8

• Advertising : Definition & Importance
• Different Adverting Function
• Types of Advertising
• Advertising Process
• Setting Advertising Objective
• Budget
• Economic aspects of Advertising

Unit 3 : Advertising Process
No. of Classes 8 / Marks 8

• Advertising Appeal
• Copy Writing
• Headline

• Illustration
• Message
• Copy Type
• Campaign Planning
• Different Types of Media
• Media Planning
• Scheduling

Unit 4 : Impact of Advertising
No. of Classes 8 / Marks 8

• Advertising Agency Roles
• Relationships with Clients
• Role of Advertising Department
• Measuring Advertising Effectiveness
• Legal and Ethical Aspects of Advertising

Unit 5 : Sales Promotion
No. of Classes 8 / Marks 8

• Meaning
• Nature and Function
• Types
• Sales Promotion Techniques (Sample Distribution, Coupon, Price off premium plan, Consumer contests, Displays Demonstration, Trade Fairs and Exhibitions
• Role of Sales force
• Limitation of Sales Promotion

Suggested Readings:

- Batra and Myers, Advertising Management, Prentice Hall
- Sengupta, Brand Positioning Strategies for Competitive Advantage, TMH
- Cundiff, Still and Govoni, Sales Management, Prentice Hall
- Rossiter and Percy, Advertising and Promotion Management, MacGraw-Hill Sundage,
- Fryburger and Rotzoll, Advertising Theory and Practice, AITBS
- Belch and Belch, Advertising and Promotion, McGraw Hill

DSE 5.1T
PUBLIC FINANCE AND TAXATION

Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit 1: **Origin and Development of Public Finance (L 8/8 Marks)**

- *Meaning, The rationale for State intervention – market failure, externalities, public goods*
- *Public finance and private finance, principle of maximum social advantage*

Unit 2: **Taxation and Government Revenue (L 8/12 Marks)**

- *Benefit approach, Ability to pay approach*
- *Impact and incidence of taxation, Direct and indirect taxes, Excess burden of taxes*
- *Sources and classification of public revenues*

Unit 3: **Government Expenditure (L 8/4Marks)**

- Provision of public goods and merit goods, redistribution objective of public expenditure

Unit 4: **Impact of Taxation and Public Expenditure (L 8/8Marks)**

- *Effect on production, investment, distribution and stability*

Unit 5: **Public Debt – Meaning, Impact and Management (L 8/8Marks)**

Unit 6: **Development of Federal Finance in India (L 8/8 Marks)**

- *The constitutional arrangements, Finance Commissions*

Unit 7: **Central Finances in India (L 8/8 Marks)**

- *Sources and uses of funds, effects of Fiscal Policy*
- *Different concepts of Deficit- Impact of deficit*

Unit 8: **State Finances (L 8/8 Marks)**

- *Sources and uses of funds, issues of federalism*

Unit 9: **Fiscal Reforms in India (L 8/8 Marks)**

- *Changing scenario of Indian tax Structure, FRBM Act*

Unit 10: **Issue of Public Debt in India –Internal and External (L 8/8 marks)**

Suggested Readings:

- Musgrave, R., The Theory of Public Finance, McGraw Hill
- Musgrave & Musgrave, Public Finance in Theory and Practice, McGraw Hill
- Bhargava B.M., The Theory and Working of Union Public of India
- Vaish & Agarwal, Public Finance, Willy Eastern
- Rosen, S.H. & Gayer, T., Public Finance, McGraw Hill

DSE 5.2 T
Paper DSE 5.2T

DIRECT TAX LAW AND PRACTICE
Full Marks – 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit 1 : **a) Residential Status and Incidence of Tax**
Residential status of a company & tax incidence. Income deemed to accrue or arise in India u/s 9.

b) Incomes which do not form part of Total Income
Sec 10(11A), 10(12A), 10(30), 10(31), 10(34) read with sec. 115BBDA, 10(35), 10(43) and 10AA. **(L-10/M-10)**

Unit 2 : **Heads of Income and Provisions Governing Heads of Income**

a) *Profits and gains of business or profession*
Advance level discussion with special emphasis on presumptive taxation

b) *Capital Gains*
Advance level discussion with special emphasis on transfer, treatment u/s 45(1A), 45(2), 45(3), 45(4), 45(5), Transfer of assets between holding and subsidiary company, and exemptions.

c) *Income from other sources*
Advance level discussion with special emphasis on gift and deemed dividend. **(L-25 / M-25)**

Unit 3 : **a) Income of other Persons included in Assessee's Total Income**
Revocable transfer of assets, Income from assets transferred to the benefit of spouse and son's wife, conversion of self acquired property into joint family property.

b) Deductions from Gross Total Income
Deductions u/s 80IAB, 80IAC, 80IBA, 80IE, 80JJ, 80JJAA
(L-10 / M-10)

Unit 4 : a) *Relief U/S 89*

b) *Double Taxation Relief*

c) *Business Restructuring – Amalgamation, Demerger, Stump Sale with special reference to treatment of depreciation and capital gains.*
(L-10 / M-10)

Unit 5 : **Computation of Total Income and Tax Payable**
Advance level problems on computation of total income and tax liability of an individual, HUF, Firm, LLP and AOP (including application of AMT)
(L-25 / M-25)

Suggested Readings

- *Singhnia V.K., and Singhania K, Direct Tax Law and Practice, Taxmann*
- *Lal and Vashist, Direct Taxes, Pearson*
- *Ahuja and Gupta, Direct Taxes Law And Practice, Bharat*
- *Manoharan and Hari, Direct Tax Laws, Snowwhite*

Latest edition of the books may be read.

DSE 5.1eB
FUNDAMENTALS OF COMPUTER

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit 1. Computer Basics: Characteristics of computer. Generations of computer. Type of computer – Mainframe, Mini, Micro (desktop, laptop and handheld), Super Computer. Inside a Computer – Power supply (SMPS), Motherboard, Ports and interfaces, Expansion Cards, memory Chips, Ribbon Cables, Storage devices, Processor. [12 lectures / 12 Marks]

Unit 2. **CPU organistion and architecture**: Arithmetic/Logic Unit (ALU), control Unit (CU), Registers, System Bus, Processor to Memory Communication Processor to I/O devices Communication. [12 lectures / 12 Marks]

Unit 3. Memory organization: Memory representation, Cache memory, Primary memory – RAM and ROM. Functions of RAM and ROM. Different types of RAM and ROM.

Secondary memory – Magnetic and optical storage devices (brief description of different types). Storage organization of a Magnetic disk. Mass storage devices – RAID, Automated Tape Library. [10 lectures / 10 Marks]

Unit 4. **Input and Output devices**: Major types and their functions. [6 lectures / 6 Marks]

Unit 5. Operating System: Concept, types, functions. [6 lectures / 6 Marks]

Unit 6. Problem Solving Tools: Algorithm. Flowcharts- Concepts, advantages and disadvantages of flowcharts, Problem solving using flowcharts.

Decision Tables - Concepts, advantages and disadvantages of decision tables, Problem solving using decision tables. [12 lectures / 12 Marks]

Unit 7. Data communication and Computer networks: Transmission Modes - Simplex, Half-Duplex, Full Duplex. Analog and digital transmission. Synchronous and Asynchronous transmission. Multiplexing. Network Concept, Types - LAN, WAN, MAN, VAN, SAN.
Various Topologies - Bus, Star, Ring, Mesh, Tree**.** Protocol Models - OSI, TCP/IP
[16 lectures/ 16 Marks]

Unit 8. Multimedia essentials: Definition, building blocks of multimedia**,** multimedia system, multimedia application. [6 lectures / 6 Marks]

Suggested Readings:

- ITLESL, Introduction to Computer Science, Pearson Education
- ITLESL, Introduction to Information Technology, Pearson Education
- .Sinha & Sinha, Fundamentals of Computers, BPB Publication.
- .Rajaraman, Fundamentals of Computers, PHI

DSE 5.2 eB

DATABASE MANAGEMENT SYSTEM & SYSTEM ANALYSIS AND DESIGN

Full Marks 100

Internal Assessment: 20 marks

Semester-end Examinations: 80 marks

Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: DATABASE MANAGEMENT SYSTEM

Internal Assessment: 10 marks

Semester-end Examinations: 40 marks

Total 50 marks

Unit 1. Introduction to DBMS: Concepts of database and database management system(DBMS). Data abstraction. Architecture – three schema architecture. Administration roles. (L8 /M8)

Unit 2. Data models: hierarchical model, network model and relational model. (L6 /M6)

Unit 3. Database languages: Data Definition Language (DDL), Data Manipulation Language (DML), and Data Control Language(DCL). (L6 /M6)

Unit 4. SQL – An Overview: SQL constructs, embedded SQL , Query & Query Optimization Techniques. (L6 /M6)

Unit 5. Database design: Design phases - conceptual, logical and physical . ER diagram and model. (L6 /M6)

Unit 6. Database Normalisation: Concept. Normal forms - 1NF, 2NF, 3NF, BCNF. (L4 /M4)

Unit 7. Indexing; Single level indexing - Primary, Clustering, Secondary. Multilevel indexing. (L4 /M4)

Suggested Readings:

- Korth, Data Base System Concepts, TMH
- Leon,Data Base Management System, VIKAS
- Ivan Bayross, PL/SQL Programming

Module II:SYSTEM ANALYSIS AND DESIGN

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1. Overview of System analysis and design: system concepts. System Development models – Waterfall model, Spiral model. System development methods – major steps. (L8 /M8)
Unit 2. Phases in System Development: Problem definition. Analysis. Design. Implementation. Evaluation. (L6 /M6)
Unit 3. Information requirement analysis: Process modelling with physical and logical data flow diagrams. (L10 /M10)
Unit 4. System design: Process descriptions, Input/output controls, object modeling, Database design, User Interface design, Documentation, Data Dictionary, Development methodologies: Top down, bottom up, structured chart, decision table, decision tree. (L10 /M10)
Unit 5. Testing – Unit, integration, system, Acceptance, regression, Test Case generation. (L6 /M6)

Suggested Reading:

- Parthasarathi, System Analysis & Design, EPH
- Raja Raman, Analysis & Design of Information Systems, PHI

Year 3: Semester VI

		Marks	Credit Hours	
AECC 6.1Chg	Environmental Studies	**100**	**2**	
SEC 6.1Chg	Computerised Accounting and e-Filing of Tax Returns (70+30)	**100**	**4**	
DSE 6.1 A**	Financial Reporting and Financial Statement Analysis	**100**	**6**	
DSE 6.2 A**	Financial Management	**100**	**6**	
			24	

SEC 6.1Chg

COMPUTERISED ACCOUNTING SYSTEM and E-FILING OF TAX RETURN

(Practical)

Full Marks 100
Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit-1: Computerized Accounting Package: Using Generic Software [40 Marks, Class: 40]

(a) Company creation, ledger creation, order processing, accounting voucher, inventory voucher, memorandum voucher, invoicing, multiple godown handling, Transfer of materials across godowns, Bank Reconciliation,
(b) Cost Centre, Cost Category, Bill of Material (BoM), Budget and Controls
(c) Payroll Accounting
(d) TDS, GST
(e) Back up & Restore, Export and Import data

Unit 2: Designing Computerized Accounting System [15 Marks, Class:15]

(a) Introduction to DBMS Package – Table, Query, Form and Report
(b) Designing Computerized Accounting System using DBMS Package
Creating a voucher entry Form, Preparing ledgers, trial balance, profit & loss a/c, and balance sheet with Form wizard and Report
(c) Designing Payroll System for Accounting using Form, Query, and Report

Unit-3: E-filing of Tax return [25 Marks, Class: 25]

(a) Preparation and submission of the Income Tax Return (ITR) offline/online for individual taxpayer [e-filing without using DSC and with using DSC, EVC]
(b) View form 26AS,Upload return, View e-file returns, e-verification
(c) Use of e-tax calculator (including interest calculation u/s 234A, 234B, 234C)
(d) E-Pay tax (Challan No./ITNS 280, ITNS 281)
(e) Prepare and submit online form 10E [Relief u/s 89(1)]

Project Work: **Assignment based for each and every topic should be prepared**

- Software: Singhania, V.K., E-Filing of Income Tax Returns and Computations of Tax, Taxmann
- Software: "Excel Utility", incometaxindiaefiling.gov.in

DSE 6.1 A

FINANCIAL REPORTING AND FINANCIAL STATEMENT ANALYSIS

Full Marks 100
Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

FINANCIAL REPORTING AND FINANCIAL STATEMENT ANALYSIS

Unit	Topic	Details	Marks allotted	No. of lectures
1	Holding Company	Meaning of Holding Company & Subsidiary Company; relevant standard; Consolidation of Balance Sheets of Parent & Subsidiary (only one); Minority Interest – Basic principles and preparation of CBS; CBS with loss balance	15	15

		of Subsidiary Treatment for: Revaluation of Assets of Subsidiary, Intra-group Transactions, Holding of different securities. Consideration of dividend paid or proposed by Subsidiary in CBS; Bonus Shares issued or proposed to be issued by Subsidiary (excluding shares acquired on different dates by the Parent company, chain and cross holding)		
2	Accounting Standards	Conceptual Framework, Presentation of Financial Statements (Ind AS 1), Property, Plant and Equipment (Ind AS 16), Earnings per share (Ind AS 33), [Basic Definitions & Theoretical Concepts, Scope]	15	15
3	Fund Flow Statement	Concept of fund, meaning, nature, various sources And applications, advantages & limitations of Fund Flow Statement.	20	5
4	Cash Flow Statement	Meaning, objectives, difference with Fund Flow Statement; activity classification and preparation and presentation as per relevant Accounting Standard.		15
5	Introduction to Financial Statements Analysis	Nature and Component of Financial Statement; Meaning and Need for FSA, Traditional & Modern approaches to FSA, Parties interested in FSA. • Comparative Statement – meaning, preparation, uses, merits and demerits • Common -size Statement – meaning, preparation, uses, merits and demerits • Trend Analysis – meaning, determination, uses, merits and demerits	10	12
6	Accounting Ratios for FSA	Meaning, objective, Classification of Accounting Ratios, Advantages & Limitations Preparation of Classified Financial Statements and Statement of Proprietor's Fund from the given Ratios. Computation, Analysis and Interpretation of important ratios for measuring –Liquidity, Solvency, Capital Structure, Profitability and Managerial Effectiveness.	20	18
			80	80

Suggested Readings:

- L.S.Porwal, Accounting Theory, Tata Mcgraw Hill
- Gokul Sinha, Accounting Theory & Management Accounting,
- B. Banerjee, Regulation of Corporate Accounting & Reporting in India, World Press.
- Lev, Financial Statement Analysis-a new approach, Prentice Hall

- Foster G, Financial Statement Analysis, Prentice Hall
- White, Sondhi& Fred, Analysis and Use of Financial Statement, John Wiley
- Bernstein & Wild, Financial Statement Analysis; theory, application & interpretation, Mcgraw Hill
- Ormiston, Understanding Financial Statement, Pearson
- Bhattacharyya, Asish K., Introduction to Financial Statement Analysis, Elsevier
- Hanif & Mukherjee, Financial Accounting, Vol III, McGraw Hill
- Subramanyam, K.R. and Wild, Financial Statement Analysis, McGraw Hill

DSE 6.2 A

FINANCIAL MANAGEMENT

Full Marks 100
Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Unit	Topic	Content	Marks	Hours
1	**Introduction**	▪ Important functions of Financial Management ▪ Objectives of the firm: Profit maximisation vs. Value maximisation ▪ Role of Chief Financial Officer. ▪ Financial environment in which a firm has to operate	**10**	**10**
	Basic Concepts	• Time Value of Money: concept and reasons • Compounding and Discounting techniques • Concepts of Annuity and Perpetuity. • Risk-return relationship (concepts only)		
2	**Sources of Finance and Cost of Capital**	• Different sources of finance; long term and short term sources • Cost of capital: concept, relevance of cost of capital, Implicit and Explicit cost, specific costs (its computation) and weighted average cost (its computation) , rationale of after tax weighted average cost of capital, marginal cost of capital (its computation).	**10**	**10**
3	**Leverage and Capital Structure Theories**	• EBIT-EPS analysis and its limitations. Financial break even, point of indifference • Leverage- Business Risk and Financial Risk - Operating and financial leverage, Trading on Equity • Capital Structure decisions - Capital structure patterns, designing optimum capital structure, Constraints, Features of sound capital structure, Various capital structure theories (excluding M-M model).	**10**	**10**
4	**Working Capital Management (1)**	• Introduction; Meaning and various concepts of Working Capital • Management of Working Capital and Issues in Working Capital • Estimating Working Capital Needs; Operating or Working Capital Cycle.	**10**	**10**
5	**Working**	▪ Policies relating Current Assets – Conservative, Aggressive	**10**	**10**

	Capital Management (2)	and Balanced ▪ Various sources of finance to meet working capital requirements; Financing current assets: Strategies of financing (Matching, Conservative, and Aggressive policies) ▪ Management of components of working capital (debtors management only–credit period -simple type)		
6	**Capital Expenditure Decisions (1)**	• Purpose, Distinguishing features, Objectives & Process, Understanding different types of projects • Concept of Cash flow; Cash flow vis-à-vis Profit and determination of Cash flow • Techniques of Decision making: Non-discounted and Discounted Cash flow Approaches • Payback Period method, Accounting Rate of Return and their relative merits and demerits	**10**	**10**
7	**Capital Expenditure Decisions (2)**	• Discounted Payback Period, Net Present Value, Profitability Index and Benefit Cost ratio, Internal Rate of Return, relative merits and demerits of the methods.(excluding replacement decision) • Ranking of competing projects, Ranking of projects with unequal lives. Capital Rationing.	**10**	**10**
8	**Dividend Decisions**	▪ Meaning, Nature and Types of Dividend, Dividend and Retention; concept of pay-out ratio, retention ratio and growth. ▪ Dividend policies and formulating a dividend policy ▪ Dividend Theories: Walter's Model, Gordon's Model,	**10**	**10**
		Total	**80**	**80**

Suggested Readings

- M.Y.Khan & P.K.Jain, Financial Management, TMH
- Van Horne, Financial Management & Policy, Pearson
- Van Horne, Fundamentals of Financial Management, PHI
- Banerjee, B., Financial Policy & Management Accounting, PHI
- Chandra,P., Financial Management, TMH
- Rustagi, R.P. *Fundamentals of Financial Management*. Taxmann Publication Pvt. Ltd.
- Pandey, I.M. *Financial Management.* Vikas Publications.
- Majumdar, Ali and Nesha, Financial Management, ABS
- Kothari, R, Financial Management, Sage

DSE 6.1 M
Retail Management and Marketing of Services (50+50)

Full Marks 100

Internal Assessment: 20 marks

Semester-end Examinations: 80 marks

Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: Retail Management

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Introduction to Retailing
No. of Classes 8 / Marks 8

• Relevant Concept
• Importance
• Function

Unit 2 : Retailing in India
No. of Classes 8 / Marks 8

• Factors determining Growth of Retailing in India
• Impact of Retail in Nation's Economy
• Key Drivers of the Indian Retails Industry

Unit 3 : Retail Formats
No. of Classes 8 / Marks 8

• Concept
• Types of Retailing – Multi Channel Retailing, Single Channel Retailing
• Product factors of Retail format
• Location factors of Retail format
• Current Indian Scenario

Unit 4 : Pricing in Retail
No. of Classes 8 / Marks 8

• Price factors of Retail format
• Importance of Retail Pricing
• Factors affecting Retail Pricing
• Approaches to Product Pricing

Unit 5 : Promotion in Retail
No. of Classes 8 / Marks 8

• Need and Objective of Promotional Mix in Retailing
• Promotional Mix and Strategy development
• Customer Relationship Management

Suggested Reading

- Madaan, Fundamentals of Retailing, Tata McGraw-Hill
- Pradhan, S., Retailing Management, McGraw Hill
- Seshanna & Prasad, Retail Management, McGraw Hill
- Berman, Evans & Mathur, Retail Management, Pearson

Module II: Marketing of Services

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Introduction to Services Marketing & Services and economy of a country
No. of Classes 8 / Marks 8

• Concept of services
• Types
• Function
• Nature
• Characteristics
• Understanding Services Customers
• Impact of service marketing in the economy of a country

Unit 2 : Issues in Marketing of Services
No. of Classes 8 / Marks 8

• Service- Product or Packages
• Pricing in Services
• Place in Services
• Promotion of Service
• People in Services
• Physical Evidence
• Process Management

Unit 3 : Service Marketing Management
No. of Classes 8 / Marks 8

• Managing Services Quality
• Relationship marketing - Concept
• Service Communication Mix
• Communication Strategy

Unit 4 : Consumer Behaviour and Service
No. of Classes 8 / Marks 8

• Consumer Behaviour consideration
• Guidelines for Developing Service Communications
• Consumer Decision making process & ethical issues (concepts, factors influence decision making process, ethical decision making methods)

Unit 5 : Service Marketing in Non-profit and profit Organisations
No. of Classes 8 / Marks 8

Travel and Tourism
Financial Services
Information Technology Services

Media Services
Health Care Services
Educational Services

Suggested Reading

- Verma, H. V., Services Marketing, Pearson

- Venugopal and Raghu, Services Marketing, Himalaya Publishing Ltd.
- Ravi Shankar, Services Marketing : The Indian Perspective, Excel Books
- Rampal & Gupta, Services Marketing, Concepts, Applications & Cases, Galgotia
- Apte, Services Marketing, Oxford University Press

DSE 6.2 M
Rural Marketing and International Marketing (50+50)

Full Marks 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: Rural Marketing

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Rural Marketing and Environment
No. of Classes 8 / Marks 8

• Concept
• Importance
• Rural vs. Urban Marketing
• Geographic
• Economic
• Socio-Cultural
• Infrastructural factors
• Their influence on Rural Marketing Operation

Unit 2 : Rural Consumer
No. of Classes 8 / Marks 8

• Characteristics
• Attitudes
• Behaviour
• Buying Patterns and Influences

Unit 3 : Rural Marketing Strategies
No. of Classes 8 / Marks 8

• Segmenting Rural markets
• Product Planning for Rural markets
• Market Size
• Packaging and Branding Decisions
• Pricing Decisions

Unit 4 : Promotion and Distribution in Rural Markets
No. of Classes 8 / Marks 8

• Promotion in Rural Markets
• Distribution Channels and Logistics in Rural Markets

Unit 5 : Marketing of Agricultural Products
No. of Classes 8 / Marks 8

• Pricing
• Distribution of Agricultural Products
• Role of Government
• Other organization in Marketing Agricultural products
• Co-operative Marketing
• Problems in Agricultural Marketing

Suggested Readings:

- Rajagopal, Management of Rural Business, Wheeler
- Neelamegham, Marketing in India : Cases and Redings, Vikas Publishing
- Mathur, U. C., Rural Marketing, Wheeler
- Nyyar and Ramaswamy, Globallization and Agricutural Marketings, Rawat Publishers
- Mamoria, Agricultural marketing, Himalaya Publisheing House
- Kashyap, P., Rural Marketing, Pearson

Module II: International Marketing

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : Introduction
No. of Classes 8 / Marks 8

• Definition
• Nature and Scope of International Marketing
• International Marketing Environment (Basic Concepts) PESTL-SOWC
• Market Entry (When-Why-How)
• Entry Strategy (Concept - Features - Advantages and Disadvantages)

Unit 2 : Product/ Service Planning for International Market
No. of Classes 8 / Marks 8

Categorization (Standardisation / Adaptation) of Product/ Service Planning
• Packaging and Labelling
• Quality
• After Sales services

Unit 3 : International Pricing
No. of Classes 8 / Marks 8

• Factors influencing International Price
• Pricing Strategy
• Export Price
• Price Quotation and Payment Terms

Unit 4 : Promotion and Distribution of Product/Service Abroad
No. of Classes 8 / Marks 8

Promotional Tools:
• Sales literature
• Direct Mail
• Personal Selling
• Advertising
• Trade Fairs and Exhibitions
• Distribution Channels (Categorization – Features - advantages and disadvantages)
• Logistics (Meaning – Categorization - advantages and disadvantages)
• Selection and management of Foreign Sales Agents

Unit 5 : Import and Export Policies and Practices in India
No. of Classes 8 / Marks 8

• EXIM Policy - An Overview
• Trends in India's Foreign Trade
• Steps in Starting an Export Business
• Documentation and Procedure
• Legal Aspects
• Export Finance
• Export Risk Insurance
• Export Assistance and Incentives
• Export Oriented Unit
• Export Processing Zone

Suggested Readings

- Bhattacharyya and Varsney, International Marketing Management, Sultan Chand
- Bhattacharyya, Export Marketing Strategies for Success, Global Press
- Keegan, Multinational Marketing Management, Prentice Hall
- Kriplani, International Marketing, Prentice Hall
- Taggart and Mott, The Essence of International Business, Prentice Hall

- Kotler, Principles of Marketing, Prentice Hall
- Caterora and Keavenay, Marketing : an International Perspective, Irwin, Homewood, Illinois
- Paliwala, The Essence of International Marketing, Prentice Hall
- Vasudeva, International Marketing, Excel Books
- Pateora, Graham and Salwan, International Marketing, McGraw Hill

DSE 6.1 T Indirect Tax: Laws and Practices

Full Marks 100

Internal Assessment: 20 marks

Semester-end Examinations: 80 marks

Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Full Marks – 100

Unit 1 : a) Basic Concepts

Concepts of Indirect Tax, Difference between Direct and Indirect Tax, Indirect tax structure in India, Proposed changes in indirect tax structure in India.

b) **Central Excise** (L-25 / M-25)

Unit 2 : WB VAT (L 15 / M 15)

Unit 3 : Customs (L 20 / M 20)

Unit 4 : Central Sales Tax (L 10 / M 10)

Unit 5 : Service Tax (L 10 / M 10)

Suggested Readings

- Datey V.S., Indirect Taxes Law And Practice, Taxmann
- Sanjeev Kumar, Systematic Approach to Indirect Taxes, Bharat
- Bangar and Bangar, Students' Gide to Indirect Taxes, Aadhya Prakashan.

This Paper will be replaced by Goods & Service Tax Law whenever the law is enforced and accordingly revised syllabus will be announced.

Latest edition of the books may be read.

Paper DSE 6.2T

TAX PROCEDURE AND PLANNING

Full Marks 100

Internal Assessment: 20 marks

Semester-end Examinations: 80 marks

Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: TAX PROCEDURE

Internal Assessment: 10 marks

Semester-end Examinations: 40 marks

Total 50 marks

Unit 1 : **Return of Income and Assessment**

a) Forms for all types of assesses
b) Assessments and Reassessments (basic concepts)

(L 15 / M 15)

Unit 2 :
a) Advance Tax (all types of assessees)
b) Interest & Fees
c) Advance Ruling for Non-resident (L 10 / M 10)

Unit 3 :
a) TDS
b) Refund of Excess Payment (L 5 / M 5)

Unit 4 :
a) Penalties and Prosecutions
b) Appeals and Revisions
c) Income Tax Authorities (L 10 / M 10)

Module II: TAX PLANNING

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1 : **Basic Concepts**

a) Concept and difference between tax planning, tax avoidance, tax evasion and tax management.
b) Objectives, requisites, factors and types of tax planning
c) Tax on distributed Profit and on units of mutual fund.

(L 5 / M 5)

Unit 2 : **Tax Planning-I**

a) Tax Planning under different Heads of Income
b) Tax Planning on Deductions under Chapter VIA (L 10/M 10)

Unit 3 : **Tax Planning-II**

a) Setting up a New Business : Location, nature and form of business.
b) Financial Management Decisions : Capital structure, dividend policy, deemed dividend and bonus shares.
c) Tax Planning related to sale of scientific research assets.
d) Tax Planning related to Amalgamation, Demerger and conversion of company into LLP.
e) Transfer of assets between Holding & Subsidiary company
f) Tax planning with reference to receipt of insurance premium.
g) Own fund versus borrowed fund for financing of assets.
h) Sale in domestic market or export

(L15 / M 15)

Unit 4 :
a) Tax planning in relation to Employees Compensation
b) Basic Concepts of transfer pricing, APA.
c) Relief for Double Taxation (covering more than one foreign country) (L10 / M 10)

Suggested Readings

- Singhania V.K., and Singhania K, Direct Tax Law and Practice, Taxmann
- Lal and Vashist, Direct Taxes, Pearson
- Ahuja & Gupta, Corporate Tax Planning Management, Bharat Law House.
- Singhania V.K., and Singhania M, Corporate Tax Planning and Business Tax Procedure, Taxmann.

Latest edition of the books may be read.

DSE 6.1 e-B
Internet & WWW and Functional e-Business System (50+50)

Full Marks 100

Internal Assessment: 20 marks
Semester-end Examinations: 80 marks
Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I: INTERNET AND WORLD WIDE WEB

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1. Working of the internet with TCP/IP: Origin of TCP/IP. TCP/IP communication architecture, Internet Architecture, Working of TCP/IP,TCP/IP Applications - FTP, Telnet, Simple Mail Transfer Protocol, Network File System. (L10 /M10)
Unit 2. Internet Concepts: WWW, Internet and E-Commerce, Linking to the Internet, Internet Address, Internet Tools- Information Retrieval tools (ftp, Gopher),Communication Tools(Email, FTP, Telnet, Usenet), Multimedia Information Tools(Home page),Information Search Tools(Archie, Veronica, WAIS). Domain Name System. (L12 /M12)
Unit 3. Intranet and Extranet: Intranet, Intranet vs. Groupware, Intranet Hardware, Intranet Software, Intranet Services (Web (HTTP) Publishing, HTML,), Communication Systems (Email, Fax), Software used in Electronic mail, Electronic Meeting Systems(Audio conferencing, Video Conferencing, Groupware), Extranet. (L6 /M6)
Unit 4. Internet Security: Security on the internet, Network and Website Security Risks, Site Hacking, Security Incidents on the internet security and email, network and website security, Firewall(Concept, Components and Constituents, Benefits), Enterprise wide security Framework, secure physical infrastructure). (L 12/M12)

Module II: FUNCTIONAL E-BUSINESS SYSTEM

Internal Assessment: 10 marks
Semester-end Examinations: 40 marks
Total 50 marks

Unit 1. Applications of E-Business: Direct Marketing and Selling, Value Chain Integration, Supply Chain Management, Corporate Purchasing, Financial and Information Services, Obstacles in adopting E-Business Applications. (L6 /M6)
Unit 2. E-Strategy: Information and Strategy, The virtual value chain planning E-Business project, E-Business strategy and knowledge management. (L 4 /M 4)
Unit 3. Customer –effective Web design: Requirements of Intelligent Websites, Website Goals and Objectives, planning the budget, analyzing website structure, fixed versus flexible webpage design, choosing a page size, website development tools, design alternatives, outsourcing web design, testing

and maintaining websites. (L6 /M6)

Unit 4. Electronic Payment Systems-Overview of Electronic Payment Systems, Customer to Merchant Payments, Peer to Peer Payments. Electronic Banking, Electronic Fund Transfers. (L6 /M6)

Unit 5. E-Business Marketing Concepts: Basic marketing concepts for internet marketing, EBusiness marketing and branding strategies, Strengthening the customer relationship. (L4 /M4)

Unit 6. E-Commerce and Online service industries: Online financial services. Online travel services. Online career services. (L4 /M4)

Unit 7. Mobile Commerce- Wireless Spectrum, WAP - Origins of WAP, WAP Architecture. Wireless Datagram Protocol(WDP), Short Message Services, General Packet Radio Service(GPRS),Wireless Technology (CDMA, GSM), Different generations in Wireless Communication, Mobile commerce and its future in India. (L10 /M10)

Suggested Readings:

• S. Jaiswal, Doing Business on the Internet E-COMMERCE (Electronic Commerce for Business), Galgotia Publications.

• P.T.Joseph, E-Commerce An Indian Perspective, S.J., PHI.

• Kenneth C. Laudon, Carol Guerico Traver, 3.E-Commerce Business.Technology, Society, Pearson Education.

• Schneider, E-Commerce, Thomson Publication

DSE 6.2 e-B
COMPUTER APPLICATION (Practical) & E-BUSINESS APPLICATION (Practical)

Full Marks 100

Internal Assessment: 20 marks

Semester-end Examinations: 80 marks

Total 100 marks

Marks shown against the units indicate marks for Semester–end Examinations

Module I
COMPUTER APPLICATION (Practical)

Internal Assessment: 10 marks

Semester-end Examinations: 40 marks

Total 50 marks

Unit 1: C++ [20 classes / 20 marks]

Unit 2: Use of Accounting software package – ACE, TALLY [20 classes / 20 marks]

Module II :E-BUSINESS APPLICATION (Practical)

Internal Assessment: 10 marks

Semester-end Examinations: 40 marks

Total 50 marks

Unit 1: HTML & DHTML [20 classes / 20 marks]

Unit 2: JAVA [20 classes / 20 marks]

1. Oops Concept and Introduction to JAVA. 2. An overview of Java. 3. Data Types - variables and arrays. 4. Operators, Control statements. 5. Classes and objects. 6. Inheritance. 7. String and string buffer. 8. Exception handling. 9. Applets.

M: Marks allotted to the Unit**; L:** No. of Lectures /Classes for the Unit

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthrópólogy (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

UNIVERSITY OF CALCUTTA

SYLLABUS

FOR

THREE-YEAR B.Sc. HONOURS COURSE

UNDER CHOICE BASED CREDIT SYSTEM

BOTANY

FOR SESSION 2018-2019

Core courses (CC-Total 14 courses to be studied in semesters. All theoretical papers i.e., BOT-A…TH are of 4 credits each and the respective practical papers i.e., BOT-A….P of 2 credits each)

SEM I:

1. Phycology and Microbiology (BOT-A-CC-1-1-TH, BOT-A-CC-1-1-P)
2. Mycology and Phytopathology (BOT-A-CC-1-2-TH, BOT-A-CC-1-2-P)

SEM II

3. Plant anatomy (BOT-A-CC-2-3-TH, BOT-A-CC-2-3-P)
4. Archegoniate (BOT-A-CC-2-4-TH, BOT-A-CC-2-4-P)

SEM III

5. Palaeobotany and Palynology (BOT-A-CC-3-5-TH, BOT-A-CC-3-5-P)
6. Reproductive biology of Angiosperms (BOT-A-CC-3-6-TH, BOT-A-CC-3-6-P)
7. Plant systematic (BOT-A-CC-3-7-TH, BOT-A-CC-3-7-P)

SEM IV

8. Plant geography, Ecology and Evolution (BOT-A-CC-4-8-TH, BOT-A-CC-4-8-P)
9. Economic Botany (BOT-A-CC-4-9-TH, BOT-A-CC-4-9-P)
10. Genetics (BOT-A-CC-4-10-TH, BOT-A-CC-4-10-P)

SEM V

11. Cell and Molecular biology (BOT-A-CC-5-11-TH, BOT-A-CC-5-11-P)
12. Biochemistry (BOT-A-CC-5-12-TH, BOT-A-CC-5-12-P)

SEM VI

13. Plant Physiology (BOT-A-CC-6-13-TH, BOT-A-CC-6-13-P)
14. Plant Metabolism (BOT-A-CC-6-14-TH, BOT-A-CC-6-14-P)

Skill enhancement courses (SEC- 2, two papers to be selected from the list taking 1 from SEC A in 3rd SEM and 1 from SEC B in 4th SEM. Both the papers of 2 credits each and theoretical only)

SEC A (SEM III)

1. Applied Phycology, Mycology and Microbiology (BOT-A-SEC-A-3-1)
2. Biofertilizers (BOT-A-SEC-A-3-2)

SEC B (SEM IV)

3. Plant Breeding (BOT-A-SEC-B-4-3)
4. Mushroom Culture Technology (BOT-A-SEC-B-4-4)

Discipline specific elective courses (DSE, four courses to be selected from the 2 groups (A & B). A student shall choose any one paper from each of Group- A and Group- B in 5th AND 6th SEM. Each course comprises of theoretical component of 4 credits and practical ones of 2 credits)

DSE-A (Group- A)

SEM V

1. Biostatistics (BOT-A-DSE-A-5-1-TH, BOT-A-DSE-A-5-1-P)
2. Industrial and Environmental Biology (BOT-A-DSE-A-5-2-TH, BOT-A-DSE-A-5-2-P)

SEM VI

3. Medicinal and Ethnobotany (BOT-A-DSE-A-6-3-TH, BOT-A-DSE-A-6-3-P)
4. Stress Biology (BOT-A-DSE-A-6-4-TH, BOT-A-DSE-A-6-4-P)

DSE-B (Group-B)

SEM V

5. Plant Biotechnology (BOT-A-DSE-B-5-5-TH, BOT-A-DSE-B-5-5-P)
6. Horticultural practices and Post Harvest Technology (BOT-A-DSE-B-5-6-TH, BOT-A-DSE-B-5-6-P)

SEM VI

7. Research Methodology (BOT-A-DSE-B6-7-TH, BOT-A-DSE-B-6-7-P)
8. Natural resource management (BOT-A-DSE-B-6-8-TH, BOT-A-DSE-B-6-8-P)

DISSERTATION/PROJECT: A Dissertation / Project may be given in lieu of a DSE. This is considered as a special course and will be of 6 credits. (Vide page 4 of CUS/268(CIR/18, dated 07.05.2018)). However, the details of the topics, modalities of evaluation etc. to be notified latter on.

SEMESTER	COURSE OPTED	COURSE NAME	CREDIT
I	Core Course 1- BOT-A-CC-1-1-TH	Phycology and microbiology	4
	Core Course 1- BOT-A-CC-1-1-P	Phycology and microbiology Practical	2
	Core Course 2- BOT-A-CC-1-2-TH	Mycology and phytopathology	4
	Core Course 2- BOT-A-CC-1-2-P	Mycology and phytopathology Practical	2
II	Core Course 3- BOT-A-CC-2-3-TH	Plant anatomy	4
	Core Course 3- BOT-A-CC-2-3-P	Plant anatomy Practical	2
	Core Course 4- BOT-A-CC-2-4-TH	Archegoniate	4
	Core Course 4- BOT-A-CC-2-4-P	Archegoniate Practical	2
III	Core Course 5- BOT-A-CC-3-5-TH	Palaeobotany and palynology	4
	Core Course 5- BOT-A-CC-3-5-P	Palaeobotany and palynology Practical	2
	Core Course 6- BOT-A-CC-3-6-TH	Reproductive biology of angiosperms	4
	Core Course 6- BOT-A-CC-3-6-P	Reproductive biology of angiosperms Practical	2
	Core Course 7- BOT-A-CC-3-7-TH	Plant systematics	4
	Core Course 7- BOT-A-CC-3-7-P	Plant systematics Practical	2
	SEC A – BOT-A-SEC-A-3-1/ BOT-A-SEC-A-3-2	Only **ONE** paper to be selected	2
IV	Core Course 8- BOT-A-CC-4-8-TH	Plant geography, ecology and evolution	4
	Core Course 8- BOT-A-CC-4-8-P	Plant geography, ecology and evolution Practical	2
	Core Course 9- BOT-A-CC-4-9-TH	Economic botany	4
	Core Course 9- BOT-A-CC-4-9-P	Economic botany Practical	2
	Core Course 10- BOT-A-CC-4-10-TH	Genetics	4
	Core Course 10- BOT-A-CC-4-10-P	Genetics Practical	2
	SEC B – BOT-A-SEC-B-4-3/ BOT-A-SEC-B-4-4	Only **ONE** paper to be selected	2
V	Core Course 11- BOT-A-CC-5-11-TH	Cell and molecular biology	4
	Core Course 11- BOT-A-CC-5-11-P	Cell and molecular biology Practical	2
	Core Course 12- BOT-A-CC-5-12-TH	Biochemistry	4
	Core Course 12- BOT-A-CC-5-12-P	Biochemistry Practical	2
	DSE A: BOT-A-DSE-A-5-1 & 2-TH & P	Only **ONE** paper to be selected from Group A	4 & 2
	DSE B: BOT-A-DSE-B-5-5 & 6-TH & P	Only **ONE** paper to be selected from Group B	4 & 2

VI	Core Course 13- BOT-A-CC-6-13-TH	Plant physiology	4
	Core Course 13- BOT-A-CC-6-13-P	Plant physiology practical	2
	Core Course 14- BOT-A-CC-6-14-TH	Plant metabolism	4
	Core Course 14- BOT-A-CC-6-14-P	Plant metabolism Practical	2
	DSE A: BOT-A-DSE-A-6-3&4-TH & P	Only **ONE** paper to be selected Group A	4 & 2
	DSE B: BOT-A-DSE-B-6-7&8 -TH & P	Only **ONE** paper to be selected Group B	4 & 2

C.U. B.Sc. BOTANY (HONOURS)

SEMESTER I

CORE COURSE 1
PHYCOLOGY AND MICROBIOLOGY (BOT-A-CC-1-1-TH)
THEORETICAL
(Credits 4, Lectures-60)

PHYCOLOGY

1. General account :

1.1. Thallus organization, Structure of algal cell, 1.2. Ultrastructure of Plastids and Flagella, 1.3. Origin and evolution of sex, 1.4. Life cycle patterns, 1.5. Significant contributions of important phycologists (Fritsch, Smith, R. N. Singh, T.V. Desikachary, H.D. Kumar, M.O.P. Iyengar)

…….5 lectures

2. Classification:

2.1. Criteria and basis of Fritsch's classification

2.2. Classification by Lee (2008) upto phylum with examples

2.3. Salient features of Cyanobacteria, Rhodophyta, Chlorophyta , Charophyta, Bacillariophyta, Xanthophyta, Phaeophyta, Heterokantophyta.

…….5 lectures

3. Cyanobacteria:

3.1. Ultrastructure of cell, 3.2. Heterocyst - structure and function, 3.3. Ecology.

…….4 lectures

4. Bacillariophyta:

4.1. Cell structure, 4.2. Cell division, 4.3. Auxospore formation in Centrales and Pennales.

…….6 lectures

5. Life History:

5.1. *Chlamydomonas*, 5.2. *Oedogonium*, 5.3. *Chara*, 5.4. *Ectocarpus*, 5.5. *Polysiphonia*, 5.6. Evolutionary significance of *Prochloron*.

…….10 lectures

MICROBIOLOGY

1. *Virus*:

1.1. Discovery, 1.2.Plant virus- types, 1.3. Transmission and translocation of Plant virus, 1.4. TMV-

Physicochemical characteristics and Multiplication, 1.5. One step growth curve, 1.6. Lytic cycle (T4 phage) and Lysogenic cycle (Lambda phage), Significance of lysogeny, 1.7.Viroids and Prions.

…….10 lectures

2. *Bacteria*:

2.1. Discovery, .2.2. Distinguishing features of Archaea and Bacteria, 2.3. Characteristics of some major groups: Proteobacteria (Enterobacteria), Firmicutes, Mollicutes, Actinobacteria, Spirochaetes, Chlamydiae, 2.4. Bacterial growth curve and generation time, 2.5.Flagella (ultrastructure) & Pilli, 2.6. Cell wall – chemical structure and differences between Gram +ve & Gram – ve bacteria, 2.7. Bacterial genome and plasmid, 2.8. Endospore - formation, structure and function, 2.9.Genetic Recombination (a) Transformation – with special emphasis on Natural and Induced competence and DNA uptake, (b) Conjugation– F- factor, F^+ X F^-, Hfr X F^-, concept of F', chromosome mobilization, (c) Transduction– Generalised and specialized.

…….20 lectures

PRACTICAL- PHYCOLOGY AND MICROBIOLOGY (BOT-A-CC-1-1-P)
(Credits 2)

1. Work out: Algae, Bacterial staining
2. Identification with reasons: (Algae and bacteria)
3. Classroom performance (Lab notebook, submission and permanent slides)
4. Viva- voce

ALGAE

1. Work out of the following algae with reproductive structure (Free hand drawing and drawing under drawing prism with magnification): *Oedogonium*, *Chara*, *Ectocarpus.*

2. Study of (a) Permanent slides : *Gloeotrichia, Volvox, Vaucheria, Coleochaete, Polysiphonia,* Centric and Pennate diatom*;* (b) Macroscopic specimens : *Laminaria*, *Sargassum.*

MICROBIOLOGY

1. Preparation of bacterial media – (a) Nutrient agar and nutrient broth, (b) Preparation of slants and pouring Petri-plates.

2. Sub-culturing of bacterial culture.

3. Gram staining from bacterial culture.

4. Microscopic examination of bacteria from natural habitat (curd) by simple staining.

FIELD WORK

At least one local excursion to be conducted for study and collection of algae (only 5 from natural habitat) and another local excursion should be conducted to give an introductory idea about plant diversity (Collection not required).

CLASSROOM PERFORMANCE

1. Laboratory Note Book of each section must be signed by the respective teacher with date during practical classes.

2. Slides (permanent) prepared during practical classes.

3. Submission (5 algae collected from natural habitat and identified latter)

CORE COURSE 2
MYCOLOGY AND PHYTO-PATHOLOGY (BOT-A-CC-1-2-TH)
THEORETICAL
(Credits 4, Lectures 60)

MYCOLOGY

1. General Account:

1.1. Hyphal forms, 1.2. Fungal spore forms and mode of liberation, 1.3. Sexual reproduction and degeneration of sex, 1.4. Parasexuality and sexual compatibility, 1.5. Life cycle patterns.

…….6 lectures

2. Classification:

2.1. Classification of Fungi (Ainsworth, 1973) upto sub-division with diagnostic characters and examples. 2.2. General characteristics of Myxomycota, Oomycota, Zygomycota, Ascomycota, Basidiomycota, Deuteromycota.

…….6 lectures

3. Life history:

3.1. *Synchytrium*, 3.2. *Rhizopus*, 3.3. *Ascobolus*, 3.4. *Agaricus*.

…….10 lectures

4. *Mycorrhiza*:

4.1. Types with salient features, 4.2. Role in Agriculture & Forestry.

…….4 lectures

5. Lichen:

5.1. Types, 6.2. Reproduction, 6.3. Economic and ecological importance

…….4 lectures

PHYTO-PATHOLOGY

1. Terms and Definitions :

1.1. Disease concept, 1.2. Symptoms, 1.3. Etiology & causal complex, 1.4. Primary and secondary inocula, 1.5. Infection, 1.6. Pathogenecity and pathogenesis, 1.7. Necrotroph and Biotroph, 1.8. Koch's Postulates, 1.9. Endemic, Epidemic, Pandemic and Sporadic disease, 1.10. Disease triangle, 1.11. Disease cycle (monocyclic, polycyclic and polyetic).

…….6 lectures

2. Host – Parasite Interaction:

2.1. Mechanism of infection (Brief idea about Pre-penetration, Penetration and Post-penetration), 2.2. Pathotoxin (Definition,criteria and example), 2.3. Defense mechanism with special reference to Phytoalexin, 2.4. Resistance- Systemic acquired and Induced systemic.

…….6 lectures

3. Plant Disease Management :

3.1. Quarantine, 3.2. Chemical, 3.3. Biological, 3.4. Integrated.

…….8 lectures

4. Symptoms , Causal organism, Disease cycle and Control measures of:

4.1. Late blight of Potato, 4.2. Brown spot of rice, 4.3. Black stem rust of wheat, 4.4. Stem rot of jute.

…….10 lectures

PRACTICAL- MYCOLOGY AND PHYTO-PATHOLOGY (BOT-A-CC-1-2-P)
(Credits 2)

MYCOLOGY

1. Work out of the following fungi with reproductive structures (including microscopic measurement of Reproductive structures): *Rhizopus* (asexual), *Ascobolus* , *Agaricus* .

2. Study from permanent slides: Zygospore of *Rhizopus*, Conidia of *Fusarium*,Conidiophore of

Penicillium.

3. Morphological study of Fungi (fruit body of *Polyporus*, *Cyathus*), Lichens (fruticose and foliose).

PHYTO- PATHOLOGY

1. Preparation of fungal media (PDA).

2. Sterilization process.

3. Isolation of pathogen from diseased leaf.

4. Inoculation of fruit and subculturing.

5. Identification : Pathological specimens of Brown spot of rice, Bacterial blight of rice , Loose smut of wheat, Stem rot of jute, Late blight of potato; Slides of uredial, telial, pycnial & aecial stages of *Puccinia graminis*.

FIELD WORK

At least one local excursion to be conducted for study and collection of macrofungi (only 5).

CLASSROOM PERFORMANCE

1. Laboratory Note Book of each section must be signed by the respective teacher with date during practical classes

2. Slides (permanent) prepared during practical classes.

3. Submission (5 Macro fungi)

SEMESTER- II

CORE COURSE 3

PLANT ANATOMY (BOT-A-CC-2-3-TH)

(Credits 4, Lectures 60)

ANATOMY

1. Cell wall:

1.1. Ultrastructure & Chemical constituents, 1.2. Plasmodesmata- ultrastructure, 1.3. Concept of Apoplast and Symplast, 1.4. Growth and Thickening of cell wall.

…….8 lectures

2. Stomata:

2.1. Types (Metcalfe and Chalk, Stebbins and Khush).

…….4 lectures

3. Stele:

3.1 Leaf-trace and leaf-gap, 3.2. Stelar types & evolution

…….4 lectures

4. Primary structure of stem and root- Monocot and Dicot. Leaf- dorsiventral and isobilateral.

…….8 lectures

5. Secondary growth:

5.1. Normal (intra- & extra-stelar), 5.2. Anomalous (stem of *Bignonia*, *Boerhavia*, *Tecoma*, *Dracaena* and root of *Tinospora*).

…….12 lectures

6. Mechanical tissues and the Principles governing their distribution in plants.

……..8 lectures

7. Developmental Anatomy:

7.1. Organisation of shoot apex (Tunica–Corpus) and Root apex (Korper-Kappe), 7.2. Plastochrone.

……..8 lectures

8. Ecological Anatomy:

Adaptive anatomical features of 8.1. Hydrophytes, 8.2. Xerophytes.

…….4 lectures

9. Scope of plant anatomy: application in systematics, forensics and pharmacognosy.

…….4 lectures

PRACTICAL- PLANT ANATOMY (BOT-A-CC-2-3-P)

(Credits 2)

1.Workout on Plant Anatomy

2. Identification with reasons

3.Classroom performance: (Lab records, slides)

4. Viva

PLANT ANATOMY

1. Microscopic studies on: Types of stomata, sclereids, raphides (*Colocasia*), cystolith (*Ficus* leaf) starch grains, aleurone grains, laticiferous ducts, oil glands.

2. Study of anatomical details through permanent slides/ temporary stained mounts- a) Root- Monocot and dicot, b) Stem- Monocot and dicot, c) Leaf- Monocot and dicot.

3. Study of anomalous secondary structure in stem of *Bignonia*, *Boerhaavia*, *Tecoma*, *Dracaena* and root of *Tinospora*

4. Study of adaptive anatomical features: Hydrophytes (*Nymphaea* – petiole) and Xerophytes (*Nerium* – leaf).

CORE COURSE 4
ARCHAEGONIATE (BOT-A-CC-2-4-TH)
THEORITICAL
(Credits 4, Lectures 60)

BRYOPHYTES

1. General Account :

1.1. General characteristics and adaptations to land habit, 1.2. Classification (Strotler and Crandle Strotler, 2009) up to class with diagnostic characters and examples.

…….4 lectures

2. Life History: Gametophyte structure and Reproduction, Development and Structure of sporophyte, Spore dispersal in:

2.1. *Marchantia*, 2.2. *Anthoceros,* 2.3*. Funaria.*

…….6 lectures

3. Phylogeny:

3.1. Unifying features of archaegoniates; transition to land habit, 3.2. Origin of Alternation of Generations (Homologous and Antithetic theory), 3.3. Evolution of Sporophytes (Progressive and Regressive concept), 3.4. Origin of Bryophytes.

…….4 lectures

4. Importance :

Role of bryophytes in: 4.1. Plant succession, 4.2. Pollution Monitoring, 4.3. Economic importance of bryophytes with special reference to *Sphagnum*.

…….2 lectures

PTERIDOPHYTES

1. General Account:

1.1. Colonisation and rise of early land plants, 1.2. Classification of vascular plants by Gifford & Foster (1989) upto division (Rhyniophyta to Filicophyta) with diagnostic characters and examples.

…….4 lectures

2. Life History:

Sporophyte structure, Reproduction and Structure of gametophyte in 2.1. *Psilotum*, 2.2. *Selaginella*, 2.3. *Equisetum*, 2.4. *Pteris*.

…….8 lectures

3. Telome concept and its significance in the origin of different groups of Pteridophytes.

…….4 lectures

4. Heterospory and Origin of Seed habit.

…….4 lectures

5. Economic importance as food, medicine and Agriculture.

…….2 lectures

GYMNOSPERMS

1. Classification of vascular plants by Gifford & Foster (1989) upto division (Progymnospermophyta to Gnetophyta) with diagnostic characters and examples.

…….4 lectures

2. Progymnosperms :

Diagnostic characters of the group, 2.2.Vegetative and reproductive features of Archeopteris, 2.3. Phylogenetic importance.

…….6 lectures

3. Life History :

Distribution in India; Vegetative and Reproductive structure of sporophyte, Development of gametophyte in : 3.1. *Cycas* , 3.2. *Pinus* and 3.3. *Gnetum*.

…….8 lectures

4. Economic Importance with reference to Wood, Resins, Essential oils, and Drugs.

…….4 lectures

PRACTICAL- ARCHAEGONIATE (BOT-A-CC-2-4-P)
(Credits 2)

1.Workout on Pteridophytes

2. Identification with reasons (Bryophytes, Pteridophytes and Gymnosperms)

3.Classroom performance: (Lab records, slides)

4. Field report

5. Viva

BRYOPHYTES

1. Morphological study of the plant body: Genera as mentioned in theoretical syllabus and *Riccia, Porella*.

2. Study from permanent slides : *Riccia* (V.S. of thallus with sporophyte), *Marchantia* (L.S. through gemma cup, antheridiophore , archegoniophore) , *Anthoceros* (L.S. of sporophyte) , *Funaria* (L.S. of capsule).

PTERIDOPHYTES

1. Morphological study of the sporophytic plant body: Genera as mentioned in the theoretical syllabus and *Lycopodium, Ophioglossum* and *Marsilea*.

2. Workout of the reproductive structures: *Selaginella, Equisetum, Pteris*.

3. Study from permanent slides: *Psilotum* (T.S. of synangium), *Lycopodium* (L.S. of strobilus), *Ophioglossum* (L.S. of spike), *Dryopteris* (gametophyte), *Marsilea* (L.S. of sporocarp).

GYMNOSPERMS

1. Morphological study: *Cycas* (microsporophyll and megasporophyll), *Pinus* (female and male cone), *Gnetum* (female and male cone).

2. Study from permanent slides: *Cycas* (L.S. of ovule), *Pinus* (L.S. of male and female cone), *Ginkgo* (L.S. of female strobilus), *Gnetum* (L.S. of male cone and ovule).

FIELD STUDY

Botanical excursion to familiarize the students with the natural habitats of these groups is desirable. No individual collection should be allowed. Students should submit only photographs in their field report.

SEMESTER- III

CORE COURSE-5

PALAEOBOTANY AND PALYNOLOGY (BOT-A-CC-3-5-TH)

THEORETICAL

(Credits 4, Lectures 60)

PALAEOBOTANY & PALYNOLOGY

1. Geological time scale with dominant plant groups through ages.

…….4 lectures

2. Plant Fossil:

2.1. Types: Body fossil (Micro- and Megafossils), Trace fossil, Chemical fossil, Index fossil, 2.2. Different modes of preservation (Schopf, 1975), 2.3. Conditions favouring fossilization, 2.4. Nomenclature and Reconstruction, 2.5. Principle of fossil dating (a brief idea), 2.6.Importance of fossil study.

…….12 lectures

3. Fossil Pteridophytes:

Structural features, Geological distribution and Evolutionary significance of 3.1. *Rhynia*, 3.2. *Lepidodendron* (Reconstructed), 3.3. *Calamites* (Reconstructed).

…….10 lectures

4. Fossil gymnosperms:

Structural features and Geological distribution of reconstructed genera: 4.1. *Lyginopteris*, 4.2. *Williamsonia*, 4.3.*Cordaites*.

…….10 lectures

5. Indian Gondwana System - Three fold division with major megafossil assemblages.

…….6 lectures

6. Palynology:

6.1. Spore and Pollen, 6.2. Pollen aperture types, 6.3. NPC classification (Erdtman). 6.4. Pollen wall-Sporopollenin, Stratification and Ornamentation (sculpturing).

…….10 lectures

7. Applied Palynology:

Basic concepts of: 7.1. Palaeopalynology, 7.2. Aeropalynology, 7.3. Forensic palynology, 7.4. Melissopalynology.

…….8 lectures

PRACTICAL- PALAEOBOTANY AND PALYNOLOGY (BOT-A-CC-3-5-P)
(Credits 2)

1. Study from permanent preparations
2. Identification with reasons
3. Classroom performance: (Lab records)
4. Viva

PALAEOBOTANY AND PALYNOLOGY

1. Morphological study: *Ptilophyllum* and *Glossopteris* leaf fossils.

2. Study from permanent slides: T.S. of stem of *Rhynia*, *Lepidodendron*, *Calamites*, *Lyginopteris*, *Cordaites*.

3. Study of Pollen types (colpate, porate and colporate) from permanent slides.

Slides may be prepared from specimens: Colpate (*Leonurus sibiricus*/ *Brassica* sp.), Porate (*Hibiscus rosa-sinensis*), Colporate (*Cassia sophera*/ *C. tora*).

CLASSROOM PERFORMANCE

1. Laboratory Note Book of each section must be signed by the respective teacher with date during practical classes.

CORE COURCE- 6
REPRODUCTIVE BIOLOGY OF ANGIOSPERMS (BOT-A-CC-3-6-TH)
THEORETICAL
(Credits 4, Lectures 60)

MORPHOLOGY OF ANGIOSPERMS

1. Inflorescence types with examples.

…….8 lectures

2. Flower, induction of flowering, flower development- genetic and molecular aspects.

…….14 lectures

3. Fruits and seeds - types with examples.

…….8 lectures

EMBRYOLOGY

1. **Pre-fertilisation changes :**

1.1. Microsporogenesis and Microgametogenesis, 1.2. Megasporogenesis and Megagametogenesis (monosporic, bisporic and tetrasporic).

…….6 lectures

2. **Fertilisation:**

2.1. Pollen germination, 2.2. Pollen tube- growth, entry into ovule and discharge, 2.3. Double fertilization.

…….6 lectures

3. **Post-fertilization changes :**

3.1. Embryogenesis in Capsella, 3.2. Development of Endosperm (3 types).

…….10 lectures

4. **Apomixis & Polyembryony:**

4.1. Apomixis- Apospory and Apogamy, 4.2.Polyembryony- different types.

…….8 lectures

PRACTICAL- REPRODUCTIVE BIOLOGY OF ANGIOSPERMS (BOT-A-CC-3-6-P)
(Credits 2)

1. Identification with reasons (Morphology)
2.Classroom performance: (Lab records)
3. Field Records (Field note book/ project work)
4. Viva

REPRODUCTIVE BIOLOGY OF ANGIOSPERMS

1. Inflorescence types- study from fresh/ preserved specimens
2. Flowers- study of different types from fresh/ preserved specimens
3. Fruits- study from different types from fresh/preserved specimens
4. Study of ovules (permanent slides/ specimens/photographs)- types (anatropous, orthotropous, amphitropous and campylotropous)
5. Field study desirable
6. A project supported along with photographs taken during field study to be submitted giving comprehensive idea about different types of inflorescence, flowers and fruits.

CLASSROOM PERFORMANCE

Same as above.

CORE COURSE- 7
PLANT SYSTEMATICS (BOT-A-CC-3-7-TH)
THEORETICAL
(Credits 4, Lectures 60)

TAXONOMY OF ANGIOSPERMS

1. Introduction:

1.1. Components of Systematic: Nomenclature, Identification, Classification; 1.2. Taxonomy and its phases - Pioneer, Consolidation, Biosystematic and Encyclopaedic; alpha- and omega- taxonomy.

…….6 lectures

2. Nomenclature:

Type method, Publication, Rank of taxa, Rules of priority, Retention and rejection of names, Author Citation, Effective and valid publication, Elementary knowledge of ICN- Principles.

…….6 lectures

3. Systems of classification:

Broad outline of Bentham & Hooker (1862-1883), Cronquist (1988), Takhatajan (1991) - system of classification with merits and demerits. Brief reference of angiosperm phylogeny group (APG III) classification.

3.1. Systematics in Practice: Herbaria and Botanical Gardens – their role in teaching and research; important Herbaria and Botanical Gardens of India and world (3 each); 3.2. Dichotomous keys – indented and bracketed.

…….20 lectures

4. Phenetics and Cladistics:

Brief idea on Phenetics, Numerical taxonomy- methods and significance; Cladistics- construction of dendrogram and primary analysis; Monophyletic, polyphyletic and paraphyletic groups; Plesiomorphy and apomorphy.

…….8 lectures

5. Data sources in Taxonomy:

Supportive evidences from: 5.1. Phytochemistry, 5.2. Cytology, 5.3. Palynology and 5.4. Molecular biology data (Protein and Nucleic acid homology).

…….8 lectures

6. Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses) of the following families:

6.1. Monocotyledons: Alismataceae, Gramineae (Poaceae), Cyperaceae, Palmae (Arecaceae), Liliaceae, Musaceae, Zingiberaceae, Cannaceae, Orchidaceae.

6.2. Dicotyledons: Nymphaeaceae, Magnoliaceae, Leguminosae (subfamilies), Polygonaceae, Euphorbiaceae, Malvaceae, Umbelliferae (Apiaceae), Labiatae (Lamiaceae), Solanaceae, Scrophulariaceae, Acanthaceae, Rubiaceae, Cucurbitaceae, Compositae (Asteraceae).

…….12 lectures

PRACTICAL- PLANT SYSTEMATICS (BOT-A-CC-3-7-P)
(Credits 2)

1.Workout on Angiosperms

2. Spot Identification

3.Classroom performance: (Lab records)

4. Field Records (Field note book, Herbarium specimens)

5. Viva

ANGIOSPERMS

1. Work out, description, preparation of floral formula and floral diagram, identification up to genus with the help of suitable literature of wild plants and systematic position according to Benthum Hooker system of classification from the following families: Malvaceae, Fabaceae (Papilionaceae), Solanaceae, Scrophulariaceae, Acanthaceae, Labiatae (Lamiaceae), Rubiaceae.

2. Spot identification (Binomial, Family) of common wild plants from families included in the theoretical syllabus (list to be provided).

FIELD WORK

At least three excursions including one excursion to Acharya Jagadish Chandra Bose Indian Botanic Garden (Shibpur, Howrah) and Central National Herbarium (CNH).

FIELD RECORDS

1. Field Note Book (authenticated) with field notes on the plants of the area of excursion and

voucher specimen book.

2. Herbarium specimen: Preparation of 25 angiospermic specimens (identified with author citation, voucher number and arranged following Bentham & Hooker's system of classification) to be submitted during examination.

CLASSROOM PERFORMANCE

Same as above.

SEMESTER IV
CORE COURSE-8
PLANT GEOGRAPHY, ECOLOGY AND EVOLUTION (BOT-A-CC-4-8-TH)
THEORETICAL
(Credits 4, Lectures 60)

PLANT GEOGRAPHY

1. Phytogeographical regions:

1.1. Phytogeographical regions of India (Chatterjee 1960); 1.2. Dominant flora of Eastern Himalaya, Western Himalaya and Sunderban.

…….8 lectures

2. Endemism:

2.1 Endemic types and Factors; 2.2. Age & Area hypothesis and Epibiotic theory; 2.3. Endemism in Indian flora.

…….6 lectures

ECOLOGY

1. Preliminary idea on:

1.1. Habitat and Niche, 1.2. Ecotone and edge–effect, 1.3. Microclimate, 1.4. Ecads, ecotype and ecoclines, 1.5. Carrying capacity.

…….4 lectures

2. Community ecology:

2.1. Community- Characteristics and diversity, 2.2. Ecological succession –Primary and secondary, Seral stages (with reference to Hydrosere), autogenic and allogenic succession.

…….6 lectures

3.1. Plant indicators (metallophytes); 3.2. Phytoremediation.

…….4 lectures

4. Conservation of Biodiversity:

4.1. Level of Biodiversity: genetic, species & ecosystem diversity, 4.2. Biodiversity hot spots- criteria,

Indian hotspots, 4.3. *In- situ* and *ex-situ* conservation, 4.4. Seed-banks, 4.5. Cryopreservation

…….16 lectures

EVOLUTION

1.1 Introduction, 1.2. Theories of evolution: Natural selection, Group selection, Neutral theory of molecular evolution, 1.3. Phyletic gradualism, Punctuated equilibrium and Stasis

…….6 lectures

2.1 Brief idea on: Stabilizing directional, disruptive and sexual selection; Speciation: Sympatric and allopatric speciation; Coevolution, Adaptive radiation, Reproductive isolation

…….4 lectures

3.1. Simplified phylogeny of bacteria, algae, fungi, bryophyte, pteridophyte and gymnosperm, 3.2. Phylogenetic tree.

…….6 lectures

PRACTICAL- PLANT GEOGRAPHY, ECOLOGY AND EVOLUTION (BOT-A-CC-4-8-P)

(Credits 2)

1.Workout on ecological parameters

2.Classroom performance: (Lab records)

3. Field Records (Field note book of phytogeographical study and ecological study)

4. Viva

PLANT GEOGRAPHY

1. Field visit- at least one long excursion at different phytogeographical region of India.

2. Study of local flora and submission of a project report highlighting phytogeographical characteristics of the region.

ECOLOGY

1. Study of community structure by quadrat method and determination of (i) Minimal size of the quadrat, (ii) Frequency, density and abundance of components (to be done during excursion/ field visit).

2. Comparative anatomical studies of leaves form polluted and less polluted areas.

3. Measurement of dissolved O_2 by azide modification of Winkler's method.

4. Comparison of free CO_2 from different sources.

CORE COURSE- 9

ECONOMIC BOTANY (BOT-A-CC-4-9-TH)

THEORETICAL

(Credits 4, Lectures 60)

1. Origin of cultivated crops: Concepts of centre of origin, their importance with reference to Vavilov's work. Examples of major plant introductions; crop domestication and loss of genetic diversity; evolution of new crops/ varieties, importance of germplasm diversity.

…….6 lectures

2. Cereals: Rice and wheat (origin, morphology, processing and uses).

…….6 lectures

3. Legumes: Origin, morphology and uses of gram and mung bean. Importance to man and environment.

…….6 lectures

4. Sugar and starches: Morphology and processing of sugarcane, products and byproducts of sugarcane industry. Potato- morphology, propagation and uses.

…….5 lectures

5. Spices: Listing of important spices, their family and part used.

…….6 lectures

6. Beverages: Tea (morphology, processing and uses).

…….5 lectures

7. Oil and fats: General description, classification, extraction, their uses and health implications of mustard, soybean, coconut (Botanical name, family and uses). Essential oils- general account, extraction methods, comparison with fatty oils and their uses.

…….10 lectures

8. Drug-yielding plants: Therapeutic and habit forming drugs with special reference to Cinchona, Digitalis, Papavar, Cannabis and Tobacco (morphology, processing, uses and health hazards).

…….8 lectures

9. Timber: general account with special reference to Sal and Teak.

…….4 lectures

10. Fibers: Cotton and Jute (Morphology, extraction and uses).

…….4 lectures

PRACTICAL- ECONOMIC BOTANY (BOT-A-CC-4-9-P)

(Credits 2)

1. Workout, micro-chemical tests

2. Identification- T.S./L.S. of permanent slides

3.Classroom performance: (Lab records, permanent slides)

4. Field visit desirable to give an idea about cultivation of any crop (viz. rice, jute, mustard, tea, potato)

5. Field record of the visit, properly authenticated by escorting teacher

ECONOMIC BOTANY

1. Cereals: Wheat (habit sketch, L.S./T.S. of grain, starch grains, micro-chemical tests); rice (habit sketch, study of paddy and grain, starch grains, micro-chemical tests)
2. Legume: Soybean, ground nut (habit, fruit, seed structure, micro-chemical tests)
3. Source of sugars and starches: Sugarcane (habit sketch; cane juice- micro-chemical tests); potato (habit sketch, tuber morphology, T.S. of tuber to show localization of starch grains, W.M. of starch grains, micro-chemical tests.
4. Tea- tea leaves, tests for tannin
5. Mustard- plant specimen, seeds, tests for fat in crushed seeds
6. Habit sketch of *Digitalis*, *Papaver* and *Cannabis*.
7. Sal, Teak- section of young stem.
8. Jute- specimen, transverse section of stem, tests for lignin on T.S. of stem and study of fibre following maceration technique.

CORE COURSE 10
GENETICS (BOT-A-CC-4-10-TH)
THEORETICAL
(Credits 4, Lectures 60)

1. Introduction: Mendelian genetics and its extension

…….6 lectures

2. Linkage, Crossing over and Gene Mapping:

2.1.Complete and incomplete linkage (example), linked gene does not assort independently (example), linkage group, 2.2. Crossing over, crossing over produces recombination (example), detection of crossing over (McClintock's experiment), and 2.3.Molecular mechanism of crossing over (Holliday model), 2.4. Gene mapping with three point test cross, detection of middle gene in three point test cross, calculation of recombination frequencies, 2.5. Co-efficient of coincidence and

interference, mapping function, 2.6. Problems on gene mapping, 2.7. Molecular mapping – ISH, FISH (brief idea).

…….16 lectures

3. Epistasis and Polygenic inheritance in plants.

…….4 lectures

4. Aneuploidy and Polyploidy: Types, examples, meiotic behaviour and importance of: 4.1. Aneuploidy, 4.2. Polyploidy, 4.3. Speciation and evolution through polyploidy.

…….8 lectures

5. Chromosomal aberration: Types and meiotic behaviour of: 5.1. Deletion, 5.2. Duplication, 5.3. Translocation, and 5.4. Inversion.

…….6 lectures

6. Mutation :

6.1. Point mutation-Transition, Transversion and Frame shift mutation, 6.2. Molecular mechanisms (tautomerisation, alkylation, deamination, base analogue incorporation, dimerisation), 6.3. DNA repair (brief idea).

…….8 lectures

7. Structural organisation of Gene:

7.1. One Gene–one polypeptide concept, 7.2. Split gene, 7.3. Overlapping gene, 7.4. Repetitive DNA-tandem and interspersed, 7.5. Transposon (Ac-Ds system), 7.6. Homoeotic gene in plants (ABCE Quartet model of flowering).

…….12 lectures

PRACTICAL- GENETICS (BOT-A-CC-4-10-P)

(Credits 2)

1. Genetics

2. Identification

3. Classroom performance (Laboratory Records and slides)

4 Viva- voce

GENETICS

1. Introduction to chromosome preparation: Pre-treatment, Fixation, Staining, Squash and Smear preparation, Preparation of permanent slides.

2. Determination of mitotic index and frequency of different mitotic stages in pre-fixed root tips of *Allium cepa*.

3. Study of mitotic chromosome: Metaphase chromosome preparation, free hand drawing under high power objective, drawing with drawing prism under oil immersion lens, determination of 2n number, and comment on chromosome morphology of the following specimens from root tips:

Allium cepa, *Aloe vera*, *Lens esculenta*.

4. Study of chromosomal aberrations developed due to exposure to any two pollutants/ pesticides etc.

5. Study of meiotic chromosome: Smear preparation of meiotic cells, identification of different stages and free hand drawing of the following specimens from flower buds: *Allium cepa* and *Setcreasea* sp.

6. Identification from permanent slides : Meiosis – (i) normal stages (ii) abnormal stages – laggard, anaphase bridge, ring chromosome (*Rhoeo discolor*); Mitosis – (i) normal stages, (ii) abnormal stages- early separation, late separation, multipolarity, sticky bridge, laggard, fragmentation, (ii) pollen mitosis.

SEMESTER V

CORE COURSE- 11
CELL AND MOLECULAR BIOLOGY (BOT-A-CC-5-11-TH)
THEORETICAL
(Credits 4, Lectures 60)

CELL BIOLOGY

1. Origin and Evolution of Cells:

1.1. Evolution of nucleic acid (from PNA to DNA), Concept of RNA world, Ribozymes, First cell, 1.2. Origin of eukaryotic cell (endosymbiotic theory), 1.3. Small RNA- riboswitch, RNA interference, si RNA, mi RNA- brief idea, 1.4.Organellar DNA (cp- and mt- DNA).

…….6 lectures

2. Nucleus and Chromosome:

2.1. Nuclear envelope, Nuclear lamina and Nuclear pore complex, 2.2. Nucleolus-ultrastructure and ribosome biogenesis, 2.3. Chromatin ultrastructure and DNA packaging in eukaryotic chromosome, 2.4. Centromere: types, structure and function.

…….6 lectures

3. Cell cycle and its regulation:

3.1. Kinetochore and spindle apparatus-structural organization and functions, 3.2.Microtubules-structure, organization and function, 3.3. Mechanism of cell cycle control in Yeast (checkpoints and role of MPF), Apoptosis (Brief idea).

…….6 lectures

MOLECULAR BIOLOGY

1. DNA Replication, Transcription and Translation (Prokaryotes & Eukaryotes):

1.1. Central Dogma, 1.2. Semiconservative DNA replication – mechanism, enzymes involved in DNA replication- DNA polymerase, DNA gyrase, Helicase, Ligase, primase and other accessory proteins, 1.3. Eukaryotic replication with special reference to replication licensing factor, assembly of new nucleosome, replication at the end chromosome telomere, telomerase concept, 1.4. Fidelity of DNA replication- prokaryote: nucleotide selection, proof reading, mismatch repair; eukaryote: through selection of error prone DNA polymerase, 1.5.Transcription, 1.6 RNA processing, 1.7. Aminoacylation of tRNA, 1.8. Translation.

…….20 lectures

2. Gene Regulation:

2.1 Concept of Lac-operon, 2.2. Positive and negative control.

…….4 lectures

3. Genetic Code:

3.1 Properties-evidences & exceptions, 3.2. Decipherence of codon (Binding technique).

…….4 lectures

4. Recombinant DNA Technology:

4.1. Restriction endonuclease, - types and roles, 4.2. Vector (plasmid pBR 322), 4.3. Marker gene, 4.4. Steps of cloning technique, 4.5. PCR and its application, 4.6. Genomic DNA and cDNA library.

…….10 lectures

5. Development and causes of Cancer (in general and brief), tumor suppressor gene and oncogene.

…….4 lectures

PRACTICAL- CELL BIOLOGY (BOT-A-CC-5-11-P)
(Credits 2)

1. Work out

2.Identification

3.Classroom performance (Laboratory Records and slides)

4.Preparation of models/charts

5. Viva-voce

CELL BIOLOGY

1. Study of plant cell structure with the help of epidermal peal mount of Onion/*Rhoeo*/*Crinum*
2. Measurement of cell size by the technique of micrometry.
3. Counting cells per unit volume with the help of haemocytometer (Yeast/pollengrains)
4. Cytochemical staining of DNA- Pyronine-methyl green staining.

5. Estimation of DNA content through DPA staining.
6. Estimation of RNA through orcinol method.
7. Study of nucleolus through hematoxylin/ orcin staining and determination of nucleolar frequency.
8. Preparation of models/ charts: rolling circle, theta replication, semi-discontinuous replication, prokaryotic RNA polymerase and eukaryotic RNA polymerase II, assembly of spliceosome mechinary, splicing mechanism in group I and group II introns, ribozyme and alternative splicing.

CORE COURSE- 12
BIOCHEMISTRY (BOT-A-CC-5-12-TH)
THEORETICAL
(Credits 4, Lectures 60)

1. Biochemical Foundations:

1.1. Covalent and non-covalent bonds; hydrogen bond; Van der Waal's forces; 1.2. Structure and properties of water; 1.3. pH and buffer (inorganic and organic); 1.4. Handerson-Hasselbalch equation; 1.5. Isoelectric point.

…….6 lectures

2. Molecules of life:

2.1. Nucleic Acids – structure of nucleosides and nucleotides ; oligo- and poly nucleotides , B & Z form of DNA, RNA- different forms; nucleotide derivatives (ATP, NADP), 2.2. Proteins – structure and classification of amino acids; primary, secondary, tertiary and quaternary structure of proteins; 2.3. Carbohydrates - structure of mono-, di- and polysaccharide; stereoisomers, enantiomers and epimers; 2.4. Lipids - structure of simple lipid and compound lipid (phospholipids and glycolipids), fatty acids- saturated and unsaturated.

…….24 lectures

3. Energy flow and enzymology:

3.1. Bioenergetics-Thermodynamic principles; free energy; energy rich bonds- phosphoryl group transfer and ATP; redox potentials and Biological redox reactions, 3.2. Enzymes – classification and nomenclature (IUBMB); Co-factors and co-enzymes; isozymes, 3.3. Mechanism of enzyme action; enzyme inhibition; 3.4. Enzyme kinetics (Michaelis- Menten equation) and simple problems.

…….18 lectures

4. Cell membrane:

4.1. Membrane chemistry, 4.2. Membrane transport (uniport, symport, antiport), mechanism of ion

uptake.

…….6 lectures

5. Phosphorylation: ATP Synthesis- Chemiosmotic model, Oxidative and Photophosphorylation- Mechanism and differences.

…….6 lectures

PRACTICAL- BIOCHEMISTRY (BOT-A-CC-5-12-P)
(Credits 2)

1. Workout on Plant Biochemistry (Quantitative & Qualitative)
2. Classroom performance (Laboratory Records and slides)
3. Viva

PLANT BIOCHEMISTRY

Qualitative:

1. Detection of organic acids: citric, tartaric, oxalic and malic from laboratory samples.
2. Detection of carbohydrate and protein from plant samples.
3. Detection of the nature of carbohydrate – glucose, fructose , sucrose and starch from laboratory samples.
4. Detection of Ca, Mg, Fe, S from plant ash sample.

Quantitative:

1. Preparation of solutions and buffers.
2. Estimation of amino-nitrogen by formol titration method (glycine) .
3. Estimation of glucose by Benedicts quantitative reagent.
4. Estimation of titratable acidity from lemon.
5. Estimation of catalase activity in plant samples and effect of substrate, enzyme concentration and pH on enzyme activity.
6. Estimation of urease activity in plant samples.
7. Colorimetric estimation of protein by Folin phenol reagent.

SEMESTER VI

CORE COURSE-13
PLANT PHYSIOLOGY (BOT-A-CC-6-13-TH)
THEORETICAL (Credits 4, Lectures 60)

1. Plant-water relations:

1.1 Concept of water potential, components of water potential in plant system, 1.2. Soil-plant-Atmosphere continuum concept, Cavitation in xylem and embolism, 1.3. Stomatal physiology-mechanism of opening and closing, Role of carbon di-oxide, potassium ion, abscisic acid and blue light in stomatal movement, Antitranspirants.

…….6 lectures

2. Mineral nutrition: essential and beneficial elements, macro- and micronutrients, methods of study and use of nutrient solutions, criteria for essentiality, mineral deficiency symptoms, roles of essential elements, chelating agents.

…….6 lectures

3. Organic Translocation:

3.1. Phloem sap, P-protein, 3.2. Phloem loading and unloading, 3.3. Mass-flow (pressure flow) hypothesis and its critical evaluation.

…….6 lectures

4. Plant Growth Regulators:

4.1. Physiological roles of Auxin, Gibberellin, Cytokinin, Abscisic acid, Ethylene, 4.2. Chemical nature – IAA, GA3, Kinetin, 4.3. Biosynthesis and bioassay of IAA, 4.4. Mode of action of IAA, 4.5. Brassinosteroids and Polyamines as PGRs (brief idea).

…….18 lectures

5. Photomorphogenesis:

5.1. Concept of photomorphogenesis, 5.2. Photoperiodism and plant types, 5.3. Perception of photoperiodic stimulus, 5.4. Critical day length, concept of light monitoring, 5.5. Phytochrome, cryptochrome and phototropins- chemical nature and role in photomorphogenesis, 5.6. Role of GA in flowering, 5.7. Vernalisation – role of low temperature in flowering, 5.8. Concept of biological clock and biorhythm.

…….12 lectures

6. Seed dormancy: 6.1. Types, Causes and Methods of breaking seed dormancy, 6.2. Biochemistry of seed germination.

…….6 lectures

7. Physiology of Senescence and Ageing.

…….6 lectures

PRACTICAL- PLANT PHYSIOLOGY (BOT-A-CC-6-13-P)
(Credits 2)

1. Plant Physiology

2. Classroom performance (Laboratory records)

3. Viva- voce

PLANT PHYSIOLOGY

1. Determination of loss of water per stoma per hour.

2. Relationship between transpiration and evaporation.

3. Measurement of osmotic pressure of storage tissue by weighing method.

4. Measurement of osmotic pressure of *Rhoeo* leaf by plasmolytic method.

5. Effect of temperature on absorption of water by storage tissue and determination of Q_{10}.

6. Rate of imbibition of water by starchy, proteinaceous and fatty seeds and effect of seed coat.

7. To study the phenomenon of seed germination (effect of light).

8. To study the induction of amylase activity in germinating grains.

9. To study the effect of different concentrations of IAA on *Avena* coleopotile elongation (IAA bioassay)

CORE COURSE 14
PLANT METABOLISM (BOT-A-CC-6-14-TH)
THEORETICAL
(Credits 4, Lectures 60)

1. Concept of metabolism: Introduction, Anabolic and catabolic metabolic pathways, regulation of metabolism, role of regulatory enzymes (allosteric, covalent modulation and isozymes)

…….4 lectures

2. Photosynthesis:

2.1.Chemical structure of chlorophyll a and b, absorption and action spectra, biological significance of carotenoid pigments, 2.2. Red drop and Emerson effect, Components of photosystems (light harvesting complex), photochemical reaction centres, Cyclic and noncyclic electron transport, Water splitting mechanism, 2.3. Calvin cycle – Biochemical reactions & stoichiometry, 2.4. HSK Pathway– three variants of the pathway, 2.5. Photosynthetic efficiency of C_3 and C_4 plants and crop

productivity, 2.6. Photorespiration – mechanism and significance, 2.7. Crassulacean Acid Metabolism– mechanism and ecological significance.

…….16 lectures

3. Respiration:

3.1. EMP pathway, regulation and its anabolic role, 3.2. Conversion of Pyruvic acid to Acetyl CoA, 3.3. TCA-cycle and its amphibolic role, 3.4. Oxidative pentose phosphate pathway and its significance, 3.5. Mitochondrial electron transport system, uncouplers, 3.6. Oxidation of cytosolic $NADH+H^+$, 3.7. Stoichiometry of glucose oxidation (aerobic).

…….12 lectures

4. Nitrogen Metabolism:

4.1. Assimilation of nitrate by plants, 4.2. Biochemistry of dinitrogen fixation in Rhizobium, 4.3. General principle of amino acid biosynthesis (including GS and GOGAT enzyme system).

…….10 lectures

5. Lipid metabolism:

5.1. synthesis and breakdown of triglycerides, ß-oxidation, glyoxalate cycle, gluconeogenesis and its role in mobilization of the lipids during seed germinbations, α- oxidation.

…….8 lectures

6. Mechanism of signal transduction: receptor-ligand interactions, second messenger concept, calcium-calmodilin, G protein, MAP-kinase cascade.

…….10 lectures

PRACTICAL- PLANT METABOLISM (BOT-A-CC-6-14-P)

(Credits 2)

1. Workout on Plant metabolism

2. Classroom performance (Laboratory Records)

3. Viva

PLANT METABOLISM

1. A basic idea of chromatography: Principle, paper chromatography and column chromatography; demonstration of column chromatography.

2. Separation of plastidial pigments by solvent and paper chromatography.

3. Estimation of total chlorophyll content from different chronologically aged leaves (young, mature and senescence) by Arnon method.

4. Effect of HCO_3 concentration on oxygen evolution during photosynthesis in an aquatic plant and to find out the optimum and toxic concentration (either by volume measurement or bubble counting).

5. Measurement of oxygen uptake by respiring tissue (per g/hr.)

6.. Determination of the RQ of germinating seeds.

7. Test of seed viability by TTC method.

SKILL ENHANCEMENT COURSE- ELECTIVE (SEC)

SEC-A

APPLIED PHYCOLOGY, MYCOLOGY AND MICROBIOLOGY (BOT-A-SEC-A-3-1)

THEORETICAL

(Credits 2, Lectures 30)

APPLIED PHYCOLOGY

1. Algae as food and source of phycocolloid (Agar-agar, Algin, Carrageenan), 2. Diatomite, 3. Algal toxin, 4. Algal Biotechnology – potential of microalgae for SCP, β-carotene, Biodiesel, bioplastics from algae.

…….10 lectures

APPLIED MYCOLOGY

1. Fungi as food, 2. Cheese and Ethanol- Industrial production (brief outline), 3. Fungal sources and uses of Enzyme (Cellulase), Amino acid (Tryptophan), Vitamin (Riboflavin), Antibiotic (Griseofulvin), Pharmaceuticals (Cyclosporin-A). 4. Aflatoxin

…….10 lectures

APPLIED MICROBIOLOGY

1. Industrial Production of Vinegar and Streptomycin (brief outline), 2. Microbial sources and uses of Enzyme (Amylase, Protease), Amino acid (Glutamic acid, Lysine), Polysaccharides (Dextran), 3. Use of microbes as Biofertilizer and Biopesticides, 3.4. Use of microbes in mineral processing.

…….10 lectures

BIOFERTILIZERS (BOT-A-SEC-A-3-2)

THEORETICAL

(Credits 2, Lectures 30)

1. General account about the microbes used as biofertilizers- *Rhizobium*- isolation, identification, mass multiplication, carrier based inoculants, actinorrhizal symbiosis.

…….4 lectures

2. ***Azospirillum*:** isolation and mass multiplication- carrier based inoculants, associative effect of different microorganisms.

…….4 lectures

3. ***Azotobacter*:** classification, characteristics- crop response to *Azetobacter* inoculants, maintenance and mass multiplication.

…….4 lectures

4. Cyanobacteria (Blue green algae), *Azolla* and *Anabaena azollae* association, nitrogen fixation. Factors affecting growth, blue green algae and *Azolla* in rice cultivation.

…….4 lectures

5. *Mycorrhizal* association, types of mycorrhizal association, phosphorus nutrition, growth and yield- colonisation of VAM – isolation and inoculum production of VAM and its influence on growth and yield of crop plants.

…….8 lectures

6. **Organic farming**- green manuring and organic fertilizers, recycling of biodegradable municipal, agricultural and industrial wastes- biocompost making methods, types and methods of vermicomposting- field application.

…….6 lectures

SEC-B

PLANT BREEDING (BOT-A-SEC-B-4-3)

THEORITICAL

(Credits 2, Lectures 30)

1. **Plant breeding:** introduction and objectives, breeding systems- modes of reproduction in crop plants, important achievements and undesirable consequence of plant breeding.

…….4 lectures

2. **Methods of crop improvement:** Introduction- centres of origin and domestication of crop plants, plant genetics resources; acclimatization, selection methods- for self pollination, cross pollinated and vegetatively propagated plants, hybridization- for self, cross and vegetatively propagated plants, procedure, advantages and limitations.

…….6 lectures

3. Maintenance of germplasm, 3.1. Mass selections and Pure line selection, 3.2. Back cross method.

…….6 lectures

4. Heterosis and hybrid seed production, 4.1. Male sterility and its use in plant breeding.

…….2 lectures

5. Inbreeding and inbreeding depression, effect of outcrossing- a very brief idea.

…….4 lectures

6. Molecular Breeding (use of DNA markers in plant breeding).

…….2 lectures

7. Role of mutations, polyploidy, distant hybridization and role of biotechnology in crop improvements.

…….6 lectures

MUSHROOM CULTURE TECHNOLOGY (BOT-A-SEC-B-4-4)

THEORETICAL

(Credits 2, Lecture 30)

1. Introduction, nutritional and medicinal value of edible mushrooms; poisonous mushrooms, types of edible mushrooms available in India- *Volvariella volvacea, Pleurotus citrinopileatus*, *Agaricus bisporus*.

…….5 lectures

2. **Cultivation technology:** infrastructure: substrates (locally available), polythene bags, vessels, inoculation hook, inoculation loop, low cost stoves, sieves, culture racks, mushroom unit (thatched house), water sprayer, tray, small polythene bag. Pure culture: medium, sterilization, preparation of spawn, multiplication. Mushroom bed preparation- paddy straw, sugarcane trash, maize straw, banana leaves,. Factors affecting the mushroom bed preparation- low cost technology, composting technology in mushroom production.

…….12 lectures

3. **Storage and nutrition:** short term storage (Refrigeration- upto 24 hours), long term storage (canning, pickels, papads), drying, storage in salt solutions. Nutrition- proteins- amino acids, mineral elements nutrition- carbohydrates, crude fibre content- vitamins.

…….8 lectures

4. **Food preparation:** type of foods prepared from mushroom. Research centres- National level and regional level. Cost benefit ratio- marketing in India and abroad. Export value.

…….5 lectures

DISCIPLINE SPECIFIC ELECTIVE COURSES

DSE-A

BIOSTATISTICS (BOT-A-DSE-A-5-1-TH)

THEORETICAL

(Credits 4, Lectures 60)

1. **Biostatistics:** Definition, statistical methods, basic principles, variables- measurements, functions, limitations and uses of statistics.

…….12 lectures

2. **Biometry:** Data, Sample, Population, Random sampling, Frequency distribution- definition only.

…….12 lectures

3. **Central tendency–** Arithmetic Mean, Mode and Median; Measurement of dispersion–

Coefficient of variation, Standard Deviation, Standard error of Mean.

…….10 lectures

4. **Test of significance:** chi- square test for goodness of fit.

…….6 lectures

5. **Probability-** multiplicative and additive rules of probability: application and importance.

…….6 lectures

6. **Measurement of gene frequency:** Hardy-Weinberg equilibrium- conditions applied for its implications (simple problems to calculate genotypic and allelic frequencies).

…….14 lectures

PRACTICAL- BIOSTATISTICS (BOT-A-DSE-A-5-1-P)
(Credits 2)

1. Workout
2. Classroom performance (Laboratory Records)
3. Viva

BIOSTATISTICS

1. Univariate analysis of statistical data: Statistical tables, mean, mode, median, standard deviation and standard error (using seedling population / leaflet size).
2. Calculation of correlation coefficient values and finding out the probability.
3. Determination of goodness of fit in Mendellian and modified mono-and dihybrid ratios (3:1, 1:1, 9:3:3:1, 1:1:1:1, 9:7, 13:3, 15:1) by Chi-square analysis and comment on the nature of inheritance.
4. Calculation of 'F' value and finding out the probability value for the F value
5. Basic idea of computer programme for statistical analysis of correlation coefficient,'t' test, standard error, standard deviation.

INDUSTRIAL AND ENVIRONMENTAL MICROBIOLOGY (BOT-A-DSE-A-5-2-TH)
THEORETICAL
(Credits 4, Lectures 60)

1. Scope of microbes in industry and environment.

…….6 lectures

2. Bioreactors/ Fermenters and fermentation process: solid- state and liquid-state (stationary and submerged) fermentations; batch and continuous fermentations. Components of a typical

bioreactors, types of bioreactors- laboratory, pilot scale and production fermenters. Constantly stirred fermenter, tower fermenter, fixed bed and fluidized bed bioreactors and air- lift Fermenter.

…….12 lectures

3. Microbial production of industrial products: microorganisms involved, media, fermentation conditions, down stream processing and uses; filtration, centrifugation, cell disruption, solvent extraction, precipitation and ultrafiltration, liophilisation, spray drying, hands on microbial fermentations for the production and estimation of enzymes amylase or lipase activity, organic acids (citric or glutamic acid), alcohol (ethanol) and antibiotic (Penicillin).

…….12 lectures

4. Microbial enzymes of industrial interest and enzyme immobilization: microorganisms for industrial applications. Methods of immobilization, advantages and applications of immobilization, large scale application of immobilized enzymes (glucose isomerase and penicillin acylase).

…….8 lectures

5. Microbes and quality of environment: distribution of microbes in air, isolation of microorganisms from soil, air and water.

…….8 lectures

6. Microbial flora of water: water pollution, role of microbes in sewage and domestic waste water treatment systems. Determination of BOD, COD of water samples. Microorganisms as indicators of water quality, check coliform and fecal coliform in water samples.

…….8 lectures

7. Microbes in agriculture and remediation of contaminated soils: biological fixation, mycorrhizae, bioremediation of contaminated soils, isolation of root nodulating bacteria, arbuscular mycorrhizal colonization in plant roots.

…….8 lectures

PRACTICAL- INDUSTRIAL AND ENVIRONMENTAL MICROBIOLOGY (BOT-A-DSE-A-5-2-P)
(Credits 2)

1. Workout
2. Classroom performance (Laboratory Records)
3. Viva

INDUSTRIAL AND ENVIRONMENTAL MICROBIOLOGY

1. Principals and functioning of instruments in microbiology laboratory
2. Hands on sterilization techniques and preparation of culture media.
3. Preparation of slant, stab and pouring petriplate.

4. A visit to any educational institute/ industry to see an industrial fermenter, and other down-stream processing operations.

MEDICINAL AND ETHNOBOTANY (BOT-A-DSE-A-6-3-TH)
THEORETICAL
(Credits 4, Lectures 60)

1. Medicinal botany: History, scope and importance of medicinal plant, a brief idea about indigenous medicinal sciences- ayurveda, siddha and unani. Polyherbal formulations.

…….14 lectures

2. Pharmacognosy- General account :

2.1 Pharmacognosy and its importance in modern medicine, 2.2 Crude drugs, 2.3 Classification of drugs- chemical and pharmacological, 2.4 Drug evaluation– organoleptic, microscopic, chemical, physical and biological, 2.5. Major pharmacological groups of plant drugs and their uses.

…….12 lectures

3. Secondary metabolites:

3.1 Definition of secondary metabolites and difference with primary metabolites , 3.2 Interrelationship of basic metabolic pathways with secondary metabolite biosynthesis (outlines only), 3.3 Major types–terpenoids, phenolics, flavonoids, alkaloids and their protective action against pathogenic microbes and herbivores.

…….14 lectures

4. Pharmacologically active constituents:

Source plants (one example) parts used and uses of: 3.1 Steroids (Solasodin, Diosgenin, Digitoxin), 3.2 Tannin (Catechin), 3.3 Resins (Gingerol, Curcuminoids), 3.4 Alkaloids (Quinine, Atropine. Pilocarpine, Strychnine, Reserpine, Vinblastine), 3.5. Phenols (Sennocide and Capsaicin).

…….4 lectures

5. Ethnobotany and folk medicine: Definition, methods of study, application, Indian scenario, national interacts, Palaeo-ethnobotany, folk medicines in ethnobotany, ethnomedicine, ethnoecology, ethnic communities of India, application of natural products to certain diseases- Jaudice, cardiac, infertility, diabetics, blood pressure and skin diseases.

…….16 lectures

PRACTICAL- MEDICINAL AND ETHNOBOTANY (BOT-A-DSE-A-6-3-P)
(Credits 2)

1. Workout and chemical tests

2. Classroom performance (Laboratory Records)

3. Viva

MEDICINAL AND ETHNOBOTANY

1. Chemical tests for (a) Tannin (*Camellia sinensis* / *Terminalia chebula*), (b) Alkaloid (*Catharanthus roseus*) .

2. Powder microscopy – *Zingiber* and *Holarrhena* .

3. Histochemical tests of (a) Curcumin (*Curcuma longa*), (b) Starch in non-lignified vessel (*Zingiber*), (c) Alkaloid

(stem of *Catharanthus* and bark of *Holarrhena*).

STRESS BIOLOGY (BOT-A-DSE-A-6-4-TH)
THEORETICAL
(Credits 4, Lectures 60)

1. Plant stress- definition. Acclimation and adaptation.

…….2 lectures

2. Environmental factors- water stress, salinity stress and temperature stress- plant response. Pathogenesis- related (PR) proteins, systemic acquired resistance; mediation of insect and disease resistance by jasmonates.

…….20 lectures

3. Stress sensing mechanism in plants: calcium modulation, phospholipid signaling.

…….20 lectures

4. Developmental and physiological mechanisms that protect plants against environmental stress: adaptation of plants, changes in root-shoot ratios, aerenchyma development; osmotic adjustment, compatible solute production.

…….12 lectures

5. Reactive oxygen species- production and scavenging mechanism.

…….6 lectures

PRACTICAL- STRESS BIOLOGY (BOT-A-DSE-A-6-4-P)
(Credits 2)

1. Workout

2. Classroom performance (Laboratory Records)

3. Viva

STRESS BIOLOGY

1. Quantitative estimation of peroxidase activity in the seedlings in the absence and presence of salt stress.

2. Superoxide dismutase activity in the absence and presence of stress.

3. Catalase activity in the presence and absence of stress.

4. Comparative study of plants/seedlings subjected to different degree of stress/ pollutants.

5. To study the effect of stress (salt/ water/ heavy metal) on seed germination and seedling growth (any commonly available specimen)

DSE-B

PLANT BIOTECHNOLOGY (BOT-A-DSE-B-5-5-TH)

THEORETICAL

(Credits 4, Lectures 60)

1. **Plant tissue culture** –Introduction:
   1.1. Basic concept and milestones, 1.2. Cellular totipotency, 1.3. Tissue culture media, 1.4. Aseptic manipulation, 1.5. Cyto-differentiation and dedifferentiation.

   …….10 lectures
2. **Callus culture:**
   2.1. Callus induction, maintenance and application, 2.2. Suspension culture- introductory idea.

   …….6 lectures
3. **Plant regeneration:**
   3.1. Organogenesis (direct and indirect), 3.2. Somatic embryogenesis, 3.3. Significance of organogenesis and somatic embryogenesis, 3.4. Artificial seed.

   …….8 lectures
4. **Haploid Culture:**
   4.1. Anther and Pollen culture methods, 4.2. Applications.

   …….6 lectures
5. **Protoplast Culture:**
   5.1. Protoplast isolation and culture, 5.2. Protoplast fusion (somatic hybridization), 5.3. Significance.

   …….6 lectures
6. **Plant Genetic Engineering:**
   6.1. Brief concept of different gene transfer methods, special emphasis on *Agrobacterium* mediated gene transfer, Role of Reporter gene, 6.2. Achievements in crop biotechnology,

environment and industry (suitable example)- pest resistant plants (BT cotton), herbicide resistance, disease and stress tolerance, transgenic crop with improved quality (flavr tomato, golden rice), role of transgenic in population degradation (super-bug), leaching of minerals, production of industrial enzymes, oil, edible vaccine.

…….24 lectures

PRACTICAL- PLANT BIOTECHNOLOGY (BOT-A-DSE-B-5-5-P)
(Credits 2)

1. Field report on a visit to a tissue culture lab.
2. Classroom performance (Laboratory Records, charts/ models)
3. Viva

PLANT BIOTECHNOLOGY

1. Familiarization of basic equipments in plant tissue culture

2. Study through photographs/ charts/ models of anther culture, somatic embyogenesis, endosperm and embryo culture, micropropagation.

3. Preparation of basal media. Sterilization techniques.

4. Demonstration of any tissue culture technique during visit in a plant tissue culture lab.

DSE B
HORTICULTURAL PRACTICES AND POST- HARVEST TECHNOLOGY (BOT-A-DSE-B-5-6-TH)
THEORETICAL
(Credits 4, Lectures 60)

1. **Horticulture** –scope, importance and branches. Role in rural economy and employment generation; importance in food and nutritional security; urban horticulture and ecoturism.

   …….4 lectures
2. **Ornamental plants:** types, classifications (annuals, perennials, climbers and trees), identification and salient features of some ornamental plants (rose, marigold, gladiolus, carnations, orchids, poppies, gerberas, tuberose, sages, cacti and succulants). Ornamental flowering trees (Indian laburnum, gulmohor, jacaranda, Lagerostoemia, fishtail and Erica palms, simul, coral tree).

   …….4 lectures
3. **Fruit and vegetable crops:** production, origin and distribution; description of plants and their

economic products; management and marketing of vegetables and fruit crops; identification of some fruits and some vegetables varieties (citrus, banana, mango, chillis and cucurbits).

…….4 lectures

4. **Horticultural techniques:** application manures, fertilizers, nutrients and PGRs; weed controls, biofertilizers, biopesticides, irrigation methods. Hydroponics, propagation methods; vegetative (grafting, cutting, layering, budding), sexual (seed production), scope and limitations.

…….8 lectures

5. Landscaping and garden designing: planning and lay out (parks and gardens).

…….6 lectures

6. **Floriculture:** cut flowers, bonsai, commerce (market demand and supply), importance of flower shows and exhibitions.

…….6 lectures

7. **Post harvest technology:** Importance of post harvest technology in horticultural crops, evaluation of quality, traits; harvesting and handling of fruits, vegetables, cut flower; principles, methods of preservation and processing, methods of minimizing losses during storage and transportation; food irradiation- advantages and disadvantages; food safety.

…….10 lectures

8. **Disease control and management:** field and post harvest diseases, identification of deficiency symptoms, remedial measures and nutritional management practices; crop sanitation; IPM strategies (genetic, biological and chemical methods for pest control); quarantine practices; identification of common diseases and pest of ornamental fruits and vegetable crops.

…….8 lectures

9. **Horticultural crops-** conservation and management: documentation and conservation of germplasm. Role of micropropagation and tissue culture techniques; varieties and cultivars of various horticultural crops; IPR issues, national international and professional societies and sources of information on horticulture.

…….10 lectures

PRACTICAL- HORTICULTURAL PRACTICES AND POST- HARVEST TECHNOLOGY (BOT-A-DSE-B-5-6-P)
(Credits 2)

Field trip- field visits to gardens, standing crop sites, nurseries, vegetable gardens, horticultural fields at IARI/AHSI or other suitable locations and if possible to cold storage.

RESEARCH METHODOLOGY (BOT-A-DSE-B-6-7-TH)

THEORETICAL

(Credits 4, Lectures 60)

1. Basic concepts of research: research- definition and types of research (Descriptive vs. analytical, applied vs. fundamental, quantitative vs. qualitative, conceptual vs. emperical), research methods vs. methodology; literature- review and its consolidation; library research; field research; laboratory research.

.....10 lectures

2. General laboratory techniques: common calculations in botany laboratories; understanding the details on the label of reagent bottles; molarity and normality of common amino acids and bases; preparation of solutions. Dilution, percentage, molar, molal and normal solutions. Techniques of handling micropipettes; knowledge about common toxic chemicals and safety measures in their handling.

.....12 lectures

3. Data collection and documentation of observations. Maintaining of laboratory records, tabulation and generation of graphs. Imaging of tissue specimens and application of scale bars. The art of field photography.

.....6 lectures

4. Overview of biological problems: plant science research key areas, model organisms in research.

.....6 lectures

5. Methods to study plant cells/ tissue structure: whole mounts, peal mounts, squash preparations, clearing, maceration and sectioning, tissue preparation- fixation, dehydration etc., paraffin and plastic infiltration, preparation of thin and ultra-thin sections.

.....6 lectures

6. Plant micro-techniques: staining procedures, classification and chemistry of stains, staining equipments. Cytogenetic techniques with squashed plant materials.

.....12 lectures

7. The art of scientific writing and its presentation: numbers, units, abbreviations and nomenclature used in scientific writing. Writing references. Power point presentation. Poster presentation. Scientific writing ethics. Introduction to copy write- academic misconduct/ plagiarism.

.....8 lectures

PRACTICAL- RESEARCH METHODOLOGY (BOT-A-DSE-B-6-7-P)

(Credits 2)

1. Experiments based on calculations
2. Plant microtechnique experiments

3. The art of imaging of samples through photomicrography and field photography
4. Poster/ power point presentation on defined topics
5. Technical writing on topics assigned.

Natural resource management (BOT-A-DSE-B-6-8-TH)

THEORETICAL

(Credits 4, Lectures 60)

Unit 1: Natural resources
Definition and types.

…….. 2 lectures

Unit 2: Sustainable utilization
Concept, approaches (economic, ecological and socio-cultural).

…… 8 lectures

Unit 3: Land
Utilization (agricultural, pastoral, horticultural, silvicultural); Soil degradation and management.

…….. 8 lectures

Unit 4: Water
Fresh water (rivers, lakes, groundwater, aquifers, watershed); Marine; Estuarine; Wetlands; Threats and management strategies.

…… 8 lectures

Unit 5: Biological Resources
Biodiversity-definition and types; Significance; Threats; Management strategies; Bioprospecting; IPR; CBD; National Biodiversity Action Plan).

…….. 12 lectures

Unit 6: Forests
Definition, Cover and its significance (with special reference to India); Major and minor Forest products; Depletion; Management.

…… 6 lectures

Unit 7: Energy
Renewable and non-renewable sources of energy.

…… 6 lectures

Unit 8: Contemporary practices in resource management
EIA, GIS, Participatory Resource Appraisal, Ecological Footprint with emphasis on carbon footprint, Resource Accounting; Waste management.

…… 8 lectures

Unit 9: National and international efforts in resource management and conservation

…… 4 lectures

PRACTICAL- Natural resource management (BOT-A-DSE-B-6-8-P)
(Credits 2)

1. Estimation of solid waste generated by a domestic system (biodegradable and non-biodegradable) and its impact on land degradation.
2. Estimation of foliar dust deposition.
3. Determination of total solid in water (TDS)
4. Determination of chemical properties of soil by rapid spot test (carbonate, iron, nitrate)
5. Estimation of organic carbon percentage present in soil sample.
6. Collection of data on forest cover of specific area.

REFERENCES

Suggested Readings

1. General studies

1. Ganguli,H.C., Das, K.S.K. & Dutta, C.T. College Botany, Vol. I, latest Ed., New Central Book Agency

2. Ganguli,H.C. and Kar, A.K. College Botany, Vol. II, latest Ed., New Central Book Agency

3. Mukherjee, S. College Botany, Vol. III, latest Ed., New Central Book Agency

4. Uno, Storey & Moore, Principles of Botany, 2001, McGraw Hill.

5. Kenrick,P. & Crane, P. The Origin & early diversification of land plants (1997), Smithsonian Institute Press.

6. Bell, P.R. & Hensley, A.R. Green plants; their Origin & Diversity (2nd ed.), 2000, Cambridge University Press

7. Frenchel, T. The origin & early Evolution of life, 2002, Oxford University Press.

8. Hait, G., Ghosh, A. and Bhattacharya, K. A Text Book of Botany (Vols. I, II & III), 2007, New Central Book Agency

9. Lock, A.J., & Evans, D.E., Plant Biology, 2001, Viva Books

10. Chatterjee, T., Santra,S.C. and Das, A. Practical College Botany, New Central Book Agency

2. Algae

1. Kumar, H.D. Introductory Phycology (2nd ed.), 1999, Affiliated East-West Press Pvt. Ltd.

2. Lee, R.E. Phycology (3rd ed.), 1999, Cambridge University Press

3. Vashishta, B.R., Sinha, A.K. & Singh, V.P. Algae (9th ed.), 2002, S. Chand & Company

4. Sambamurty, A.S.S. A text book of Algae, 2005, I.K. International Pvt. Ltd. 22

5. Graham, L.E. & Wilcox, L.W. Algae, 2000, Prentice Hall

6. Smith, G.M. Cryptogamic Botany, Vol. 1 (2nd ed.), 1955. McGraw Hill

7. Prescott, G.W. Algae: A Review: 1969 Bishen Singh Mahendra Pal Singh

8. Fritsch, F.E. The Structure & Reproduction of Algae, 1936, Vols. I & II, Cambridge University Press

9. Hoek, Van den. Algae, 1995, Cambridge University press

10. Laura De Basanti : Algae, 2004

11. Ray, S. (3rd ed.), Algal Biotechnology Biodiversity, 2010, New Central Book Agency

12. Sharma, O.P. Text Book of Algae, Tata McGraw Hill

13. Ray, S. Algae: Cyanobacteria (2006), New Age International (P) Ltd. Publishers

3. Microbiology

1. Stainer, T.Y., Ingrahm, J.L., Wheelis, M.L. & Painter, P.R. General Microbiology (5th ed.), 1986, Macmillan Educaton Ltd.

2. Dubey, R.C. & Maheswari, D.K. A Text Book of Microbiology, 2005, S.Chand & Company

3. Case. Funke & Tortora, G.J. Microbiology, an Introduction (Latest Ed.)

4. Atlas, R.M. Principles of Microbiology, Latest Ed., McGraw Hill

5. Schlegel, H.G. General Microbiology, Latest Ed., Cambridge University Press

6. Prescott, L.M., Harley,P. & Klein,A. General Microbiogy (5th ed.), 2002, WBC McGraw Hill

7. Sinleton,P. Bacteria; in Biology, Biotechnology and Medicine (5th ed.), 1999, John Wiley & Sons Ltd.

8. Jay, J.M. Modern Food Microbiology (5th ed.), 1996, Chapman & Hall

9. Madigan,M.T., Martinko, J.M. & Parker, J. Brock, Biology of Microrganuisms (10th ed.), 2003, Prentice Hall

10. Hull, R. Matthew Plant Virology (4th ed.), 2002, Academic Press

11. Biswas, S.B. & Biswas, A. An Introduction to Viruses (4th ed.), 1996, Vikas Publishing House

12. Agarwal, A.K. & Parihar, P. Industrial Microbiology, 2005, Agrobios (India)

13. Power, C.B. & Dagimawata, H.F. General Microbiology, Vol. I&II, Himalaya Publishing House

14. Mitchel, R. Environmental Microbiology, Latest Ed. Wiley, N.Y.

15. Sale, A.J. Fundamental Principles of Microbiology, Latest Ed., Tata McGraw Hill

16. Banerjee, A.K. & Banerjee, N. Microbiology & Immunology, 2006, new Central Book Agency

17. Prescott & Dunn. Industrial Microbology

18. Verma, H.N. Basics of Plant Virology (2003), Oxford and IBH

4. Fungi, Lichen & Plant Pathology

1. Dubey, H.C. An Introduction to Fungi (2nd ed.), 1990, Vikas Publishing House 23

2. Webster, J. Introduction to Fungi (3rd ed.), Cambridge University Press

3. Alexopoulos, C.J., Mims, C.W. & Blackwell, M. Introductory Mycology (4th ed.), 1996, John Wiley & Sons

4. Hawksworth, D.L. Ainsworth & Bisby Dictionary of Fungi (8th ed.), 1995, Oxford University Press

5. Kavanagh, K. (ed.) Fungi, 2005, Wiley

6. Carlile, M.J., Witkinson, S.C. & Goodlay, G.W. The Fungi (2nd ed.), 2005, Academic Press

7. Arora, D. (ed.). Hand book of Fungal Biotechnology (2nd ed.), 2003, Dekker, N.Y.

8. Sharma, P.D. Fungi & Allied Organisms, 2005, Narosa Publishing House

9. Deacon, J.W. Fungal Biology, 2006, Black Well Science Ltd.

10. Ingold, C.T. & Hudson, H.J. The Biology of Fungi 96th ed.), 1993, Chapman & Hall

11. Sharma, O.P. Text book of Fungi, Tata McGraw Hill

12. Vashista, B.R. Fungi, Latesgt Ed., S. Chand & Company

13. Chopra, G.L. and Verma, V.A. Text Book of Fungi, Pradeep Publications

14. Liver, R. and Schweizer, M. Molecular Fungal Biology, 1999, Cambridge University Press

15. Dix, N.J. and Webster, J. Fungal Ecology, Chapman & Hall

16. Mehrotra, R.S. and Aneja, K.R. An Introduction to Mycology, Wiley Eastern Ltd.

17. Sharma, P.D. the Fungi, Rastogi Publication

18. Moore Landrecker, E. Fundamentals of the Fungi, Prentice Hall

19. Agrios, G.N. Plant Pathology (5th ed.), 2005, Elsvier, Academic Press

20. Mehrotra, R.S. & Agarwal, A. plant Pathology (2nd ed.), 2003, Tata McGraw Hill

21. Singh, R.S. Principles of Plant Pathology (4th ed.), 2002, oxford & IBH Publishing Com.

22. Manners, J.G. Principles of Plant Pathology (2nd ed.), 1993, Cambridge University Press

23. Trigiano et al. (ed.) Plant Pathology, Concepts and Laboratory exercises, 2004, CRC Press

24. Lucas John, A. Plant Pathology & Plant Pathogen, Oxford

25. Singh, R.S. Plant diseases, Oxford & IBH Publishing Com

26. Rangaswami, G.K. & Mahadevan, A. Diseases of Crop Plants in India, Prentice Hall

27. Dickinson, M. Molecular Plant Pathology, 2003, Bio-Scientific Publishers

28. Isaac, S. Fungal plant Interaction, 1992, Chapman & Hill

29. Bilgrami, K.S. and Dubey, H.C. A TextBook of Modern Plant Pathology, Vikas Publishing House

30. Sharma, P.D. Plant Pathology (2nd ed.), Rastogi Publications

31. Strange, R.N. (ed.) Introduction of plant Pathology, 2003, Wiley

32. Dube, H.C. An Introduction to Fungi (2005), Vikas Publishing House

5. Bryophytes

1. Parihar, N.S. Introduction to Embryophyta (Vol. 1 Bryophyta), Central Book Distributors

2. Shaw, A. Jonathan and Goffinet Bernard, Bryophyte Biology, 2009, Cambridge university Press

3. Rashid, A. An Introduction to Bryophyta, 1998, Vikas Publishing House

4. Chopra, R.N. & Kumar, P.K. Biology of Bryophyta, Latest Ed., Wiley Eastern

5. Puri, P. Bryophyte, Latest Ed., Atmaram & Sons

6. Vashista, B.R. Bryophyta, Latest Ed., S. Chand & Company

7. Schofield, W.B. Introduction to Bryology, 201, Blackburn Press

8. Smith, A.J.E. (ed.), Bryophyte Ecology, 1982, Chapman & Hall

9. Vanderpoorten & Goffinet, B., Introduction to Bryophytes, 2009, Cambridge university Press

6. Palaeobotany and Palynology

1. Stewart, W.N. & Rothwell, G.W. Palaeobotany & Evolution of Plants, Latest Ed., Cambridge university Press

2. Agashe, S.N. Palaeobotany, Latest Ed., Oxford & IBH

3. Thomas, B.A. & Spicer, R.A. The Evolution & Palaeobotany of Land Plants, Latest Ed., Croomhelm

4. Andrews, H.N. Studies in Palaeobotany, Latest., John Wiley & Sons

5. Meyen, S.V. Fundamentals of Palaeobotany, latest Ed., Chapman & Hill

6. Erdtman, G. pollen Morphology & Plant Taxonomy, Latest Ed., Lelden, E.G. Brill

7. Faegri, K. & Iversen, Text Book of Pollen Analysis, Latest Ed., Munksgor, Copenhagen

8. Nair, P.K. Pollen Morphology of Angiosperms, Latest Ed., Scholar Publications

9. Heslop- Harisson, Pollen: Development & Physiology, Latest Ed., Butterworth

10. Shivanne, K.H. Pollen Biology & Biotechnology, 2003, Oxford & IBH

11. Taylor, T.N. & Taylor, E. N. The Biology & Evolution of Fossil Plants, 1993, Prentice Hall.

12. Willis, K.J. & Mc Elwain, J.C. The Evolution of Plants, 2002, Oxford University Press.

13. Bhattacharya, K., Majumdar, M.R. & Gupta Bhattacharya, S. A Text Book of Palynology, 2006, New Central Book Agency.

7. Embryology

1. Raghavan, V. Molecular Embryology of Flowering Plants, 1997, Camb. University Press.

2. Maheswari, P. An Introduction to Embryology of Angiosperm, Latest Ed., Tata McGraw Hill.

3. Raghavan, V. Embryogenesis in Angiosperms: A Development & Experimental Study, 1986, Cambridge University Press.

4. Bhojwan, S.S. & Bhatnagar, S.D. The Embryology of Angiosperms(4th ed.), 1989, Vikas Publishing House.

5. John, B.M.(ed.). Experimental Embryology of Vascular Plants, 1982, Springer, Heidelberg.

6. Westhaff, P. et al. Molecular Plant Development; From Gene to plant, 1998, Oxford University Press.

8. Pteridophytes

1. Spore, K.R. The Morphology of Pteridophyte, Latest Ed. , Huchinson & Co. Ltd.

2. Rashid, A. An Introduction to Pteridophyta, Latest Ed., Vani Educational Books.

3. Vashista, P.C. Pteridophyta, Latest Ed., S. Chand & Company Pvt. Ltd.

4. Gifford, E. M. & Foster, A. S. Morphology & Evolution of Vascular Plants (3rd ed.), 1998, Freeman and Co.

5. Mukherjee, R.N. & Chakraborty, K.A. Introduction to Vascular Cryptogams (Pteridophyta) 1995, Kalyani Publications.

6. Parihar, N.S. The Biology & Morphology of Pteridophytes (2nd ed.), 1989, Central Book Distributors.

9. Gymnosperms

1. Sporne, K.R. The Morphology of Gymnosperms, Latest Ed., Hutchinson &Co. Ltd.

2. Vashishta, P.C. Gymnosperm, Latest Ed., S. Chand & Company Pvt.

3. Karkar, R.K. & Karkar, R. The Gymnosperms, Latest Ed.

4. Bhatnagar, S.P. & p.Moitra, A.Gymnosperm, 1997, New Age International

5. Biswas, C. & Johri, P.M. The Gymnosperm, 1997, Narosa Publishing House

6. Dutta, S.C. An Introduction to Gymnosperms (3rd ed.), 1984, Kalyani Publishers

7. Gifford, E.M. and Foster, A.S. Morphology & Evolution of Vascular Plants (3rd ed.), 1989, Freeman & Co.

8. Norstag, J. & Nicholls. T.J. The Biology of the Cycads, 1997, Cornell University Press

9. Friedman, W.E. Biology & Evolution of the Gnetales, 1996, University of Chicago Press

10. Ecology & Plant Geography

1. Chapman and Riss. Ecology: Principles and Applications, Latest Ed., Cambridge University Press

2. Shukla, R.S. & Chandel, P.S. Plant Ecology, Latest Ed., S. Chandel and Co.

3. Kumar, H.D. Modern Concept of Ecology, Latest Ed. Vikas Publishing House

4. Begon, M., Herper, J.L. and Townsend, C.R. Ecology- Individuals, Populations and Communities (3rd ed.), Oxford Blackwell Science

5. Verma, P.S. & Agarwal, U.K. Concept of Ecology, Latest Ed., S. Chand & Company

6. Odum, F.P. Fundamentals of Ecology, Latest Ed., Saunders

7. Sharma, P.D. Elements of Ecology, Latest Ed., Rastogi Publications

8. Ambasht, R.S. & Ambasht, N.K. A Text Book of Plant Ecology, Latest Ed., CBS Publication & Distributors

9. Mani, M.S. Bio-Geography of India, Latest Ed., Springer-Verlag.

10. Mackenzie et al. Ecology, Latest Ed., Viva Books.

11. Gurevitch, J. (et al.)., The Ecology of plants, 2002, Sinauer Associates.

12. Kimar, U. & Asija, M.J. Bio-diversity: Principles & Conservation, 2005, Student Edition, Agrobios (India)

13. Krishnamurthy, K.V. An Advanced Text Book on Biodiversity, 2003, Oxford & IBH Publishing Co. Ltd.

14. Mitra, D., Guha, J.K., Chowdhury, S.K. Studies in Botany, Vol. II (7th ed.) Moulik Library.

15. Primack, R.B. Essentials of Conservation Biology, 1993, Sinauer Associates.

16. Lo, C.P. & Yeung, A.K.W. Concepts and Techniques of Geographic Information Systems, 2002, Printice-Hall of India.

17. Cain, Bowman, Hacker. Ecology. 2014. 3rd Ed. Sinauer Associates

11. Evolution

1. Futuyma., D. Evolution. 2015. (3rd Ed.) Sinauer Associates

2. Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, Jane B. Reece. Campbell Biology. 2017. 11th Ed. Pearson

12. Anatomy

1. Fahn, A. Plant Anatomy (4th ed.), 1990, Wiley Eastern.

2. Mauseth, J. D. Plant Anatomy, Latest Ed., Benjamin Cummings Pub.

3. Metcalfe, C.P. & Chalk, L. Anatomy of Dicotyledons, Vol. I & II, London Press, Oxford

4. Dickison, W.C. Integrative Plant Anatomy, 2002, Academic Press

5. Eames, A.J. & Mac. Daniels, L.H. An Introduction to Plant Anatomy, Latest Ed., McGraw Hill

6. Esau, K. Anatomy of Seed Plants (2nd ed.), 1977, John Wiley & Sons

7. Cutter, E.G. Plant Anatomy: Experiment and Interpretations, Part I & II, Edward Arnold

8. Beck, C.B. An Introduction to plant Structure and Development (2nd ed.), Cambridge University Press

9. Howels, S.H. Molecular Genetics of Plant Development, 1998, Cambridge University Press

10. Pandey, B.P. Plant Anatomy, Latest Ed., S. Chand & Company

11. Tayal, M.S. Plant Anatomy, Latest Ed., Rastogi Publications

12. Roy, P. Plant Anatomy, Latest Ed., New Central Book Agency

13. Morphology and Taxonomy of Angiosperms

1. Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. and Donoghue, M.J. Plant Systematics, A Phylogenetic Approach (4th ed.), 2016, Sinauer Associaties, Inc.

2. Jones, S.B. and Luchsinger, A.E. Plant Systematics (2nd ed.), 1987, McGraw Hill Book Company

3. Singh, G. Plant Systematics: An Integrated Approach (3rd ed.), 2016, CRC Press

4. Sambamurty, A.V.S.S. Taxonomy of Angiosperms, 2005, I.K. International Pvt. Ltd.

5. Sivaranjan, V.V. Principles of Plant Taxonomy (2nd ed.), 1991, Oxford & IBH

6. Subrahmanyam, N.S. Modern Plant Taxonomy, Latest Ed., Vikas Publishing House

7. Naik, V.N. Taxonomy of Angiosperms, Latest Ed., Tata McGraw Hill

8. Stace, C. A Plant Taxonomy & Biosystematics, Latest Ed., Arnold Publishers

9. Mitra, J.N. An Introduction to Systematic Botany & Ecology, Latest Ed., World Press

10. Dutta, S.C. systematic Botany, Latest Ed., Wiley Eastern.

11. Lawrence, G.H.M. Taxonomy of Vascular Plants Ed., Oxford & IBH.

12. Prain, D. Bengal Plants (Vol I & II), Bishen Singh Mahendra Pal Singh.

13. Jeffrey, C. An Introduction to Plant Systematics, Latest Ed., Allied Publishers Pvt. Ltd.

14. Radford. A.B. Fundumentls of Plant Systematics, Latest Ed., Harper & Row.

15. Paria, N.D. and Chattopadhyay, S.P. Flora of Hazaribagh District, Bihar, 2000 & 2001, Vol I & II, BSI, Kolkata

16. Simpson, G. Plant Systematics, 2006, Springer.

17. Bhattacharya, B. Systematic Botany, 2006, Narosa Publishing House.

18. Heywood, V.H. Plant Taxonomy 1967, Edward Arnold, London.

19. Cronquist, A. The Evolution & Classification of Flowering Plant, 1988 (2nd ed.), New York Bot. Garden Bronx. New York.

20. Cronquist, A. An Integrated System of Classification of Flowering Plants. 1981. Bishen Singh Mahendra Pal Singh.

21. Subramanyam, N.S. Laboratory Manual of Plant Taxonomy (2nd ed.) 1999, Vikas Publishing House.

22. Mondal, A. Taxonomy: Advances Plant Taxonomy 2005, New Central Book Agency.

23. Heywood, V.H. Flowering Plants of the World 1978, Oxford University Press.

14. Biochemistry & Plant Physiology

1. Taiz, L., & Zeiger, E. Plant Physiology (4th ed.), 2006, Sinauer Associates, Inc. Publishers.

2. Lincoln Taiz, Eduardo Zeiger, Ian M. Møller, and Angus Murphy.Plant Physiology and Development. (6th ed.) Sinauer Associates.

3. Hopkins, W.G. & Hiiner, N.P. Introduction to Plant Physiology (3rd ed.) 2004, John Wiley & Sons.

4. Jain, V.K. Fundamental of Plant Physiology (7th ed.) 2004. S. Chand and Company.

5. Salisbury, F.B. & Ross, C.W. Plant Physiology (4th ed.), 19992, Wadsoworth Publishing Company.

6. Panday, S.N. & Sinha, B.K. Plant Physiology (4th ed.), 2006, Vikas Publishing House Pvt. Ltd.

7. Wilkins, M.B. Advances Plant Physiology. 1984, ELBS Longman.

8. Srivastava, L.M. Plant Growth and Development, 2001, Academy Press.

9. Davies P.J. (ed.) Plant Physiology: Physiology, Bio-Chemistry & Molecular Biology, Academic Press.

10. Mukherjee, S. & Ghosh, A. Plant Physiology (2nd ed.), 2005, New Central Book Agency.

11. Hames, B.D. Bio-Chemistry (2nd ed.) Viva Books.

12. Sackheim, G. Chemistry for Biology Students (5th ed.) 1996, Benjamin/Cummings

13. Raman, H. Transport Phenomenon in Plants, 1997. Narosa Publishing House.

14. Heldt, Hans-Walter. Plant Bio-Chemistry (3rd ed.), 2005. Elsevier Academic Press.

15. Chaudhuri, D., Kar, D.K., and Halder, S.A. Handbook of Plant Biosynthetic Pthways 2008, New Central Book Agencies.

16. Mehta, S.L., Lodha, M.L. & Bane, P.V. Recent Advances in Plant Biochemistry, 1989. I.C.A.R.

17. Conn, E.E. and Stumpf, R.R. Outlines of Bio-Chemistry, Latest Ed., Wiley Eastern.

18. Voet, D. and Voet, J.G., Bio-Chemistry (3rd ed.), 2005, John Wiley & Sons.

19. Mathews, C.K., Van Holder, K.E. & Ahren, K.G. Bio-Chemistry (3rd ed.), 2000, Pearson Education.

20. Lehninger Principles of Biochemistry. Sixth Edition. 2013. David L. Nelson, Michael M. Cox. Freeman, Macmillan.

21. Goodwin, T.W., & Mercer, E.I. Introduction to Plant Biochenistry, Latest Ed., Oxford Pergamon.

22. Berg, J.M., Tymoczko, J.L., & Stryer, L., Bio-Chemistry, Latest Ed., Freeman Publ.

23. Mekee, T. & Mekee, J.R. Bio-Chemistry: The Molecular Basis of Life, 2003, McGraw Hill.

24. Sinha, R.K. Modern Plant Physiology, 2004, Narosa Publishing House.

25. Srivastava, H.S. Plant Physiology (2nd ed.), 1998, Rastogi Publications.

26. Singhal, G.S. Concepts of Photobiology: Photosynthesis & Photomorphogenesis, 1999. Narosa Publishing House.

27. Hall. D.O. & Rao, K.K. photosynthesis (5th ed.), 1995, Cambridge University Press.

28. Buchanon, Gruissen and Jones. Plant Physiology & Biochemistry: Biochemistry and Molecular Biology of plants, 2000, I.K. International.

15. Pharmacognosy

1. Trease & Evans. Pharmacognosy, Saunders.

2. Taylor, V.E., Brady, L.R. and Robbers, J.E. Pharmacognosy, Ind. Ed. K.M. Vergese Co.

3. Wallis, T.E. Text Book of Pharmacognosy, Latest Ed., CBS Publishers & Distributors.

16. Cell Biology, Genetics & Molecular Biology

1. Pierce, Benjamin A. Genetics (2nd ed.), 2005, W.H. Freeman & Company.

2. Atherly, A.G., Girton, J.R. & McDonald, J.F. Science of Genetics, 1999, Saunders College Publications.

3. Hartwell, L.H., Hood, L., Goldberg, M.L., Reynolds, A.E., Silver, L.M. & Veres, R.C. Genetics (2nd ed.), 2004, McGraw Hill.

4. Tamarin, Robert H. Principles of Genetic (7th ed., 2002, Tata McGraw Hill.

5. Elrod, S.K. & Stanfield, W. Schuam's Outlines Genetics (4th ed.), 2002, Tata McGraw Hill.

6. Hartl, D.L. & Jones, E.W. Genetics , 2005, Jones & Barlett Publishers.

7. Lewin, B. Genes VIII, 2004, Pearson Educational International.

8. Watson, J.D., Baker, T.A., Bell, S.P., Gann, A., Levine, M. & Losick, R. Molecular Biology of the Gene (5th ed.) 2004. Pearson Education Inc.

9. Griffiths, A.I.F., Miller, J.H., Suzuki, D.T., Lewentin, C.R. & Gilbert, M.W. An Intrduction to Genetic Analysis, 2005 (8th ed.), W.H. Freeman & Company.

10. Brown, T.A. Genomes, 1999, John Wiley & Sons.

11. Brown, T.A. Genomes 3, 2007, Garland Science Publishing.

12. Snustad, D.P. & Simmons, M.J. Principles of Genetics (2nd ed.), 2000, (4th ed.), 2006, John Wiley & Sons.

13. Klug, W.S. & Cummings, M.R. Concepts of Genetics, 2003, Pearson Education.

14. Gerald Karp. Cell Biology. 2013. 7th Ed. International Student Version. Wiley.

15. Hawkins, J.D. Gene Structure & Expression (3rd ed.), 1996, Cambridge University Press.

16. Becker, M.W., Klemsmith, L.J. & Hardin, J. The World of the Cell (5th ed.), 2003, Pearson Education.

17. Cooper, G.M. The Cell, A molecular approach (2nd ed.), 2000, ASM Press.

18. Weaver, R.F. Molecular Biology (2nd ed./3rd ed.), 2002/2005, McGraw Hill.

19. Malacinski, G.M. Freifelder, Essentials of Molecular Biology (4th ed.), 2003, Narosa Publishing House.

20. Sambamurty, A.V.S.S. Genetics (2nd ed.), 2005, Narosa publishing House.

21. Sharma, A. & Sen, S. Chromosome Botany, 2002, Oxford & IBH Publishing.

22. Sen, S. & Kar, D.K. Cytology& Genetics, 2005, Narosa Publishing House.

23. Miglani. G.S. Advanced Genetics, 2002, Naroas Publishing House.

24. Gupta, P.K. Genetics, 2007, Rastogi Publications.

25. De Robertis, E.D.P. & De Robertis, E.M.M, Cell & Molecular Biology (8th ed.), 1987, Informed Limited.

26. Sharma, A.K. and Sharma, A. Chromosome Technique, 1980, Butterworth Publications.

27. Strickberg, M.W. Genetics, McMillan.

28. Jain, H.K. Genetics, 1999, Oxford & IBH Publishing Company.

29. Swanson, C.P., Merz, T. & Young, W.J. Cytogenetics, 1981, Prentice Hall.

30. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K. & Walter, P. Molecular Biology of the Cell, 2002 (4th ed.), Garland Sciences.

31. Gardner, E.J., Simmons, M.J. & Snustad, D.P. Principles of Genetics (8th ed.) 1991, John Wiley & Sons.

32. Twyman, R.M. Gene Tranfr to Plant Bios.

33. Gregory, T.R. The Evolution of the Genome, 2005, Elsevier.

34. Russel, P.J. Fundamental of Genetics (2nd ed.), 2000, Pearson Education.

35. Sinnott, E.W., Dunn, L.C. & Dobzhansky, T. Principles of Genetics (5th ed.) 1958, Tata McGraw Hill.

36. Old, R.W. & Primrose, S.B. Principles of Gene Manpultion, 1989, Blackwell Scientific Publications.

37. Kar, D.K. and Halder, S. Cell Biology, Genetics and Molecular Biology 2008, New Central Book Agency.

38. Roy, S.C. and De, K.K. Cell Biology, 1997, New Central Book Agency.

39. Bruce Alberts, Alexander Johnson, Julian Lewis, David Morgan, Martin Raff, Keith Roberts, Peter Walter. Molecular Biology of the Cell. 2015. 6th Ed: Garland Science.

40. Harvey Lodish , Arnold Berk, Chris A. Kaiser , Monty Krieger , Anthony Bretscher , Hidde Ploegh , Angelika Amon , Kelsey C. Martin. Molecular Cell Biology. 2013. 8th Ed. Freeman.

17. Plant Breeding & Biometry

1. Chaudhuri, H.K. Elementary Principles of Plant Breeding, Latest Ed., Oxford & IBH.

2. Allaed, R.W. Principles of Plant Breeding, 1960, John Wiley & Sons.

3. Poehlman, J.M. & Barthakur, D. Plant Breeding, Latest Ed., Oxford & IBH.

4. Singh, B.D. Plant Breeding, Principles & Methods (7th ed.), 2005, Kalyani Publishers.

5. Barley, N.T.J. Statistical Methods in Biology, Latest Ed., Cambridge University Press

6. Roy, D. Plant Breeding: Analysis & Exploitation of Variation, 2000, Narosa Publishing House.

7. Zar, J.H. Biostatistical Analysis (3rd ed.), 1996, Prentice Hall.

8. Kar, D.K. and Halder, S. Plant Breeding & Biometry, 2006, New Central Book Agency.

9. Dutta, Animesh K. Basic Biostatistics & its Application 2006, New Central Book Agency.

18. Plant Biotechnology

1. Chawla, H.S. An Introduction to Plant Biotechnology (2nd ed.), 2002,Oxford & IBH

2. Borer, A., Sentos, F.R. & Bowen, D.B. Understanding Biotechnology, 2003, Pearson Education

3. Ingacimuthu, S. Plant Biotechnology, 1997, Oxford & IBH

4. Walker, J.M. & Rapley, R. Molecular Biology & Biotechnology, 2000, Royal Society of Chemistry

5. Collin, H.A. and Edwards, S. Plant Cell Culture, 1998, Bios Scientific Publishers

6. Dixon, R.A. & Gonzales, R. A. Plant Cell Culture: A Practical Approach, 1994, Oxford University Press

7. Gamorgs, O.L. & Phillips, G.C. Plant Cell, Tissue and Organ Culture: Fundamental method, Narosa Publishing House

8. Dubey, R.C. Biotechnology, Latest Ed., S.Chand & Company Pvt. Ltd.

9. Bhojwani, S.S. & Razdan, M.I. Plant Tissue Culture: Theory and Practise, Elsevier

10. Rajdan, M.K. An Introduction to Plant Tissue Culture, Latest Ed., Oxford & IBH

11. Jha, T.B. & Ghosh, B. Plant Tissue Culture, 2003, Universities Press

12. Singh, B.D. Biotechnology Latest ed., Kalyani Publishers.

13. Mascarenhas, A.F. Handbook of Plant Tissue Culture, ICAR

14. Kar, D.K. & Halder, S. Plant Breeding, Biometry & Biotechnology, 2010, New Central Book Agency

15. Gupta, P.K. Biotechnology & Genomes, latest Ed., Rastogi Publications

16. Slatter, A., Scott, N. & Fowler, N. Plant Biotechnology, 2003, Oxford University Press

17. Dey, K.K. Plant Tissue Culture, 1992, New Central Book Agency

19. Natural resource management

1. Vasudevan, N. (2006). Essentials of Environmental Science. Narosa Publishing House, New Delhi.

2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.

3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi.

UNIVERSITY OF CALCUTTA

SYLLABUS

FOR

THREE-YEAR B.Sc. PROGRAMME IN

BOTANY (GENERAL COURSE)

UNDER CHOICE BASED CREDIT SYSTEM

BOTANY

Syllabus for three-year B.Sc. Botany Programme

(With effect from 2018-2019)

CORE COURSES (4)

Each theoretical course of 4 credits and practical of 2 credits.

1. Plant diversity I (Phycology, Mycology, Phytopathology, Bryophytes and Anatomy) – a) Theoretical- BOT-G-CC-1-1-TH b) Practical- BOT-G-CC-1-1-P (… … GE-1-1-TH & P)

2. Plant diversity II (Pteridophytes, Gymnosperms, Palaeobotany, Morphology and Taxonomy) – a) Theoretical- BOT-G-CC-2-2-TH b) Practical- BOT-G-CC-2-2-P (… … GE-2-2-TH & P)

3. Cell biology, Genetics and Microbiology – a) Theoretical- BOT-G-CC-3-3-TH b) Practical- BOT-G-CC-3-3-P (… … GE-3-3-TH & P)

4. Plant physiology and metabolism – a) Theoretical- BOT-G-CC-4-4-TH b) Practical- BOT-G-CC-4-4-P (… … GE-4-4-TH & P)

N.B.: The above said four core courses (CC) may be considered as GE 1, 2, 3 & 4 respectively for the honours students of other allied disciplines opting Botany as one of the general courses.

Skill enhancement courses (SEC, four courses to be selected strictly on 2 subjects out of 3 subjects opted taking 2 courses from each subject. Each general subject shall have 2 groups (A & B) of SEC papers. One paper from Group A from each of the 2 subjects to be chosen in the 3rd and 5th Semester, one paper from Group B of each of the 2 subjects to be chosen in the 4th and 6th Semesters. Each paper of 2 credits and theoretical only)

SEC A

1. Plant breeding and biometry (BOT-G-SEC-A-3/5-1)
2. Biofertilizers (BOT-G-SEC-A-3/5-2)

SEC B

1. Plant biotechnology (BOT-G-SEC-B-4/6-3)
2. Mushroom culture technology (BOT-G-SEC-B-4/6-4)

Discipline specific elective courses (DSE, two courses to be selected from the list taking one each from Group A in 5th semester and one from Group B in 6th Semester. Each course comprises of theoretical component of 4 credits and practical ones of 2 credits)

DSE A

1. Phytochemistry and medicinal botany- a) Theoretical- BOT-G-DSE-A-5-1-TH, b) Practical- BOT-G-DSE-A-5-1-P
2. Natural resource management- a) Theoretical- BOT-G-DSE-A-5-2-TH, b) Practical- BOT-G-DSE-A-5-2-P

DSE B

3. Economic botany- a) Theoretical- BOT-G-DSE-B-6-3-TH, b) Practical- BOT-G-DSE-B-6-3-P
4. Horticultural practices and post harvest technology - a) Theoretical- BOT-G-DSE-B-6-4-TH, b) Practical- BOT-G-DSE-B-6-4-P

SEMESTER	CORE COURSES (CC-1-4)	ABILITY ENHANCEMENT COMPULSORY COURSE (AEC-1&2)	SKILL ENHANCEMENT COURSE (SEC-1-4)	DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE-1&2)
I	PLANT DIVERSITY I (PHYCOLOGY, MYCOLOGY, PHYTOPATHOLOGY, BRYOPHYTES AND ANATOMY) **BOT-G-CC-1-1-TH** PRACTICALS **BOT-G-CC-1-1-P** OTHER DESCIPLINES (2)	AECC-1 ENGLISH COMUUNICATION		
II	PLANT DIVERSITY II (PTERIDOPHYTES, GYMNOSPERMS, PALAEOBOTANY, MORPHOLOGY AND TAXONOMY) **BOT-G-CC-2-2-TH** PRACTICALS **BOT-G-CC-2-2-P** OTHER DESCIPLINES (2)	AECC-2 ENVIRONMENTAL SCIENCE		
III	CELL BIOLOGY, GENETICS AND MICROBIOLOGY **BOT-G-CC-3-3-TH** PRACTICALS **BOT-G-CC-3-3-P** OTHER DESCIPLINES (2)		SEC-A	
IV	PLANT PHYSIOLOGY AND METABOLISM **BOT-G-CC-4-4-TH** PRACTICALS **BOT-G-CC-4-4-P** OTHER DESCIPLINES (2)		SEC-B	
V			SEC-A	DSE-A (any one from GROUP A) THEORY & PRACTICAL OTHER DESCIPLINES (2)
VI			SEC-B	DSE-B (any one from GROUP B) THEORY & PRACTICAL OTHER DESCIPLINES (2)

SEMESTER I

CORE COURSE 1
PLANT DIVERSITY I (PHYCOLOGY, MYCOLOGY, PHYTOPATHOLOGY, BRYOPHYTES AND ANATOMY) (BOT-G-CC-1-1-TH)
THEORETICAL
(Credits 4, Lectures 60)

1. Introduction to different plant groups

…….2 lectures

2. Phycology

2.1. Diagnostic characters and examples of Cyanophyceae, Rhodophyceae, Chlorophyceae, Charophyceae and Phaeophyceae, 2.2 Classification: Criteria and system of Fritsch, 2.3. Life histories of *Chlamydomonas*, *Chara* and *Ectocarpus*, 2.4. Role of algae in the environment, agriculture, biotechnology and industry.

…….14 lectures

3. Mycology

3.1 Diagnostic characters and examples of Oomycotina, Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina, Deuteromycotina (Ainsworth, 1973). 3.2 Life histories of *Rhizopus* and *Ascobolus*, 3.3. Economic importance of fungi, 3.4 Fungal symbioses: *Mycorrhiza*, Lichen and their importance.

…….12 lectures

4. Phytopathology

4.1 Symptoms - necrotic, hypoplastic and hyperplastic, 4.2 Koch's postulates, 4.3 Biotrophs and Necrotrophs, 4.4 Disease triangle, 4.5 Pathotoxins and phytoalexins (brief concept), 4.6 Symptoms, causal organism, disease cycle and control measures of plant diseases (Late blight of potato, Brown spot of Rice, Stem rot of jute).

…….10 lectures

5. Bryophytes

5.1 Unifying features of archaegoniates and transition to land habit, 5.2 Amphibian nature of bryophytes, 5.3 Diagnostic characters and examples of Hepaticopsida, Anthocerotopsida and Bryopsida (Proskauer 1957), 5.4 Life histories of *Marchantia* and *Funaria*, 5.5 Ecological and economic importance.

…….10 lectures

6. Anatomy

6.1 Stomata - Types (Metcalfe & Chalk), 6.2 Anatomy of root, stem and leaf of monocots and dicots, 6.3 Stelar types and evolution, 6.4 Secondary growth – normal in dicot stem and anomaly in stem of *Tecoma* & *Dracaena*.

…….12 lectures

PRACTICAL- PLANT DIVERSITY I (PHYCOLOGY, MYCOLOGY, PHYTOPATHOLOGY, BRYOPHYTES AND ANATOMY) (BOT-G-CC-1-1-P)
(Credits 2)

1. Work out: Microscopic preparation, drawing and labeling of *Chlamydomonas*, *Chara*, *Ectocarpus*, *Rhizopus* and *Ascobolus*
2. Anatomical studies (following double staining method) of: 2a. Stem- *Cucurbita*, sunflower and maize. 2b. Root- *Colocassia*, gram and orchid. 2c. Leaf- Nerium
3. Identification with reasons: 3a. Cryptogamic specimens (macroscopic/microscopic as prescribed in the theoretical syllabus. 3b. Pathological specimens (herbarium sheets) of Late blight of potato, Brown spot of rice and stem rot of jute.
4. Laboratory records: Laboratory note books (regularly signed) and slides (prepared in class) are to be submitted at the time of Practical Examination. Regular attendance in the class must be credited.
5. Atleast one local excursion to be conducted to give an idea of plant diversity, habitat of algae and fungi

SEMESTER II

CORE COURSE 2
PLANT DIVERSITY II (PTERIDOPHYTES, GYMNOSPERMS, PALAEOBOTANY, MORPHOLOGY AND TAXONOMY) (BOT-G-CC-2-2-TH)
THEORETICAL
(Credits 4, Lectures 60)

1. Pteridophytes
1.1 Diagnostic characters and examples of Psilophyta, Lycophyta, Sphenophyta & Filicophyta (Gifford & Foster 1989). 1.2 Life histories of *Selaginella* and *Pteris*, 1.3 Economic importance.

…….12 lectures

2. Gymnosperms
2.1 Progymnosperms (brief idea), 2.2 Diagnostic characters and examples of Cycadophyta, Coniferophyta and Gnetophyta (Gifford & Foster 1989), 2.3 Life histories of Cycas and Pinus, 2.4 Williamsonia (reconstructed), 2.5 Economic importance of Gymnosperms.

…….12 lectures

3. Paleobotany & Palynology
3.1 Fossil, fossilization process and factors of fossilization, 3.2 Importance of fossil study. 3.3 Geological time scale, 3.4 Palynology - Definition, spore & pollen (brief idea), Applications.

…….10 lectures

4. Angiosperm Morphology
4.1 Inflorescence types with examples, 4.2 Flower, 4.3 Fruits and seeds- type and examples.

…….12 lectures

5. Taxonomy of Angiosperms
5.1 Artificial, Natural and Phylogenetic systems of c1assificaiton with one example each, 5.2 Diagnostic features of following families- Malvaceae, Leguminosae (Fabaceae), Cucurbitaceae,

Rubiaceae, Compositae (Asteraceae), Solanaceae, Acanthaceae, Labiatae (Lamiaceae), Orchidaceae, Gramineae (Poaceae).

…….14 lectures

PRACTICAL- PLANT DIVERSITY II (PTERIDOPHYTES, GYMNOSPERMS, PALAEOBOTANY, MORPHOLOGY AND TAXONOMY) (BOT-G-CC-2-2-P)
(Credits 2)

1. Dissection, drawing and labelling, description of angiospermic plants and floral parts, floral formula and floral diagram, identification (family) from the following families: Leguminosae (Fabaceae), Malvaceae, Solanaceae, Labiatea (Lamiaceae), Acanthaceae.

2. Identification with reasons:

Macroscopic specimens of *Selaginella* and *Pteris*, male and female strobilus of *Cycas* and *Pinus*, Anatomical slides (stellar types, transfusion tissue, sieve tube, sunken stomata, lenticels), inflorescence types.

3. Spot identification of the following Angiospermic plants (scientific names and families): *Sida rhombifolia* (Malvaceae), *Abutilon indicum* (Malvaceae), *Cassia sophera* (Fabaceae), *Tephrosia halimtonii* (Fabaceae), *Crotolaria palida* (Fabaceae), *Coccinia grandis* (Cucurbitaceae), *Solanum indicum* (Solanaceae), *Nicotiana plumbagenifolia* (Solanaceae), *Leucas aspera* (Lamiaceae), *Leonurus sibiricus* (Lamiaceae), *Parthenium hysterophorus* (Asteraceae), *Tridax procumbense* (Asteraceae), *Eclipta prostrate* (Asteraceae), *Eragrostis tenella* (Poaceae), *Chrysopogon aciculantus* (Poaceae), *Eleusine indica* (Poaceae), *Vanda taesellata* (Orchidaceae).

4. Laboratory records: Laboratory note books (regularly signed) and slides (prepared in class) are to e submitted at the time of Practical Examination. Regular attendance in the class must be credited.

5. Field excursion: Local Excursions (at least two including one to Acharya Jagadish Chandra Bose Botanic Garden, Shibpur, Howrah)

6. Field Records: Field note book and 15 herbarium sheets of common Angiospermic weeds are to be prepared and submitted at the time of Practical Examination. Regular attendance in the class must be credited.

SEMESTER III

CORE COURSE 3
CELL BIOLOGY, GENETICS AND MICROBIOLOGY (BOT-G-CC-3-3-TH)
THEORETICAL
(Credits 4, Lectures 60)

1. Cell Biology and Genetics

1.1 Ultrastructure of nuclear envelope, nucleolus and their functions, 1.2 Molecular organisation of metaphase chromosome (Nucleosome concept).

…….6 lectures

2. Chromosomal aberrations- 2.1 deletion, duplication, inversion & translocation, 2.2 Aneuploidy & Polyploidy-types, importance and role in evolution.

…….6 lectures

3. Central Dogma, 3.1 Transcription and Translation.

…….10 lectures

4. Genetic Code- properties.

…….4 lectures

5. Linkage group and Genetic map (three-point test cross).

…….6 lectures

6. Mutation – 6.1 Point mutation (tautomerisation; transition, transversion and frame shift), 6.2 Mutagen-physical and chemical.

…….8 lectures

7. Brief concept of Split gene, Transposons.

…….4 lectures

2. Microbes

2.1 Viruses- Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); Economic importance; 2.2 Bacteria- discovery, general characteristics and cell structure; reproduction- vegetative, asexual and recombination (conjugation, transformation and transduction); Economic importance.

……. 16 lectures

RACTICAL- CELL BIOLOGY, GENETICS AND MICROBIOLOGY (BOT-G-CC-3-3-P)
(Credits 2)

1. Cell Biology:

Staining (Aceto-orcein) and squash preparation of onion root tip: study of mitotic stages. Determination of mitotic index (from onion root tip).

2. Microbiology:

Workout gram staining (curd/any natural source)

3. Identification with reasons:

Cytological slides of different mitotic and meiotic stages.

Different forms of bacteria (*Coccus*, *Bacillus*, *Spiral*)

4. Laboratory Records: Laboratory note books (regularly signed) and slides (prepared in class) are to be submitted at the time of Practical Examination. Regular attendance in the class must be credited

SEMESTER IV

CORE COURSE 4
PLANT PHYSIOLOGY AND METABOLISM (BOT-G-CC-4-4-TH)
THEORETICAL (Credits 4, Lectures 60)

1. Proteins
1.1 Primary, secondary and tertiary structure, 1.2 Nucleic acid- DNA structure, RNA types, 1.3 Enzyme- Classifications with examples (IUBMB), Mechanism of action.

…….8 lectures

2. Transport in plants
2.1 Ascent of sap and Xylem cavitation , 2.2 Phloem transport and source-sink relation.

…….4 lectures

3. Transpiration
3.1 Mechanism of stomatal movement, significance.

…….4 lectures

4. Photosynthesis
4.1 Pigments, Action spectra and Enhancement effect, 4.2 Electron transport system and Photophosphorylation, 4.3 C3 and C4 photosynthesis, CAM- Reaction and Significance.

…….12 lectures

5. Respiration
5.1 Glycolysis & Krebs cycle— Reactions and Significance, 5.2 ETS and oxidative phosphorylation.

…….8 lectures

6. Nitrogen metabolism
6.1 Biological dinitrogen fixation, 6.2 Amino acid synthesis (reductive amination and transamination).

…….6 lectures

7. Plant Growth regulators
7.1 Physiological roles of Auxin, Gibberellin, Cytokinin, Ethylene, ABA.

…….10 lectures

8. Photoperiodism (Plant types, Role of phytochrome and GA in flowering) and Vernalization.

…….6 lectures

9. Senescence (brief idea).

…….2 lectures

PRACTICAL- PLANT PHYSIOLOGY AND METABOLISM (BOT-G-CC-4-4-P)
(Credits 2)

Plant Physiology:

i) Experiment on Plasmolysis.

ii) Measurement of leaf area (graphical method) and determination of transpiration rate per unit

area by weighing method.

iii) Imbibition of water by dry seeds - proteinaceous and fatty seeds.

iv) Evolution of O2 during photosynthesis (using graduated tube).

v) Evolution of CO2 during aerobic respiration and measurement of volume.

SEC A

PLANT BREEDING AND BIOMETRY (BOT-G-SEC-A-3/5-1)

(Credits 2, Lectures 30)

1. Plant breeding:

1.1 Introduction and objective, 1.2 Techniques of hybridisation.

…….2 lectures

2. Mass and Pure line selection:

2.1 Procedure, 2.2 Advantages and limitations.

…….8 lectures

3. Heterosis and hybrid seed production.

…….4 lectures

4. Role of mutation, polyploidy, distant hybridization and role of biotechnology in crop improvement.

…….8 lectures

5. Biometry:

5.1 Measures of central tendency (Mean, Median and Mode), 5.2 Standard error and standard deviation, 5.3 Test of significance: Chi-square test for goodness of fit.

…….8 lectures

BIOFERTILIZERS (BOT-G-SEC-A-3/5-2)

(Credits 2, Lectures 30)

1. **Biofertilizers:** General account about microbes used as biofertilisers; *Rhizobium*-identification, mass multiplication. Actinorrhizal symbiosis.

   …….4 lectures
2. ***Azospirillum*-** identification, mass multiplication, associative effect of different microorganisms. *Azotobacter* and crop response to *Azotobacter* inoculums.

   …….6 lectures
3. Cyanobacteria, *Azolla*, *Anabaena* and *Azolla* association, blue green algae and *Azolla* in rice cultivation.

   …….6 lectures
4. **Mycorrhizal association:** 4.1 Types of Mycorrhizal association- Brief idea, 4.2 Its influence on growth and yield of crop plants.

…….6 lectures

5. **Organic farming:** 5.1 Green manuring and organic fertilizers, 5.2 Biocompost and vermicompost- making methods and field applications. 5.3 Recycling of biodegradable municipal, industrial and agricultural wastes.

…….8 lectures

SEC B
PLANT BIOTECHNOLOGY (BOT-G-SEC-B-4/6-3)
(Credits 2, Lectures 30)

1. Plant tissue culture- 1.1 Introduction and basic concepts, 1.2 Cellular potency, 1.3 Callus culture and plant regeneration.

…….4 lectures

2. Micropropagation- 2.1 Somatic embryogenesis and artificial seed.

…….4 lectures

3. Protoplast culture and its application.

…….6 lectures

4. Recombinant DNA technology- 4.1 Recombinant DNA, 4.2 Restriction enzymes, 4.3 Plasmids as vectors.

…….8 lectures

5. Gene cloning (basic steps).

…….4 lectures

6. Achievements in crop biotechnology- 6.1 Pest resistant plant (Bt cotton), 6.2 Transgenic crops with improved quality (flavr tomato and golden rice).

…….4 lectures

MUSHROOM CULTURE TECHNOLOGY (BOT-G-SEC-D-4/6-4)
(Credits 2, Lectures 30)

1. **Mushroom**- nutritional and medicinal value of mushrooms. Poisonous mushrooms.

…….4 lectures

2. Cultivation techniques/ technology of edible mushrooms in India: *Volvarealla volvacea, Pleuretus citrinopyrineatus, Agaricus bisporus*.

…….12 lectures

3. **Storage**- short term and long term, storage, drying.

…….6 lectures

4. **Food preparation**- types of foods prepared from mushroom. Cost and benefit ratio.

…….6 lectures

5. **Research centres**- national and regional.

…….2 lectures

DSE A (Group A)
PHYTOCHEMISTRY AND MEDICINAL BOTANY (BOT-G-DSE-A-5-1-TH)
THEORETICAL
(Credit 4, Lectures 60)

1. **Medicinal botany-** History, scope and importance of medicinal plants, a broef idea about indigenous medicinal sciences- Ayurbeda, Siddha and Unani. Polyherbal formulations.

…….14 lectures

2. **Phramacognosy**- 2.1 Scope and its importance, 2.2 Primary metabolites, 2.3 Secondary metabolites- alkaloids, terpenoids, phenolics and their functions.

…….10 lectures

3. **Organoleptic** evaluation of crude drugs.

…….10 lectures

4. **Pharmcologically active constituents:** Source plants (one example), parts used and uses of: 4.1 Steroids (Diosgenin, Digitoxin), 4.2 Tannin (Catechin), 4.3 Resins (Gingerol, Curcumnoids), 4.4 Alkaloids (Strychnine, Reserpine, Vinblastine), 4.5 Phenols (Capsaicin).

…….6 lectures

5. **Ethnobotany and folk medicine:** 5.1 Brief idea, 5.2 Applications of ethnobotany, 5.3 Application of natural product to certain diseases- Jaundice, Cardiac and Diabetics.

…….20 lectures

PRACTICAL- PHYTOCHEMISTRY AND MEDICINAL BOTANY (BOT-G-DSE-A-5-1-P)
(Credit 2)

1. Preparations of solution and buffers
2. Acquaintance with laboratory instruments- Autoclave, Incubator, Clinical centrifuge, Analytical balance, pH meter, Colorimeter, Water bath, Distillation plant, Laminar air flow.
3. Qualitative test for proteins and carbohydrates, reducing and non reducing sugar (glucose, fructose and sucrose)
4. Tests (chemical) for tannin and alkaloid
5. Identification of medicinal plants (list to be provided)
6. Field study (local) and listing of medicinal plants. Records to be substantiated with photographs and description.

NATURAL RESOURCE MANAGEMENTS (BOT-G-DSE-A-5-2-TH)
THEORETICAL
(Credits 4, Lectures 60)

1. Natural resources- definition and types.

…….2 lectures

2. Sustainable utilization- concept, approaches (economic, ecological and socio-cultural).

…….10 lectures

3. Land utilization. Soil degradation and management.

…….8 lectures

4. Water, fresh water marine, estuarine. Wetlands- threats and management.

…….10 lectures

5. Biological resources, biodiversity- definition and types. Significance, threats and management strategies.

…….10 lectures

6. Forests- definition, cover and its significance (with special reference to India). Major and minor forest products.

…….8 lectures

7. Energy- renewable and non-renewable source of energy.

…….8 lectures

8. EIA and waste management.

…….4 lectures

PRACTICAL- NATURAL RESOURCE MANAGEMENTS (BOT-G-DSE-A-5-2-P)
(Credits 2)

1. Estimation of solid waste generated by a domestic system (biodegradable and non-biodegradable) and its impact on land degradation.
2. Measurement of dominant woody species by DBH (diameter at breast height)
3. Study of community structure by Quadrat method and determination of minimal size of quadrat, frequency density and abundance of components to be done during field visit.
4. Measurement of dissolved O_2 by azide modification of Winkler's method.
5. Determination of chemical properties of soil by rapid spot test (carbonate, iron, nitrate)

DSE B

ECONOMIC BOTANY (BOT-G-DSE-B-6-3-TH)

THEORETICAL (Credits 4, Lectures 60)

1. Origin of cultivated plants: 1.1 Concepts of centres of origin and their importance with reference to Vavilov's work.

…….12 lectures

2. Rice- origin, morphology and uses.

…….12 lectures

3. Legumes: General account with special reference to *Vigna.*

…….8 lectures

4. Beverages: Tea- morphology, processing and uses.

…….12 lectures

5. Study of the following economically important plants (Scientific names, families, parts used and importance): 5.1 Cereals- Rice, wheat, 5.2 Pulses- Mong, gram, 5.3 Spices- Ginger, cumin, 5.4 Beverages- Tea, coffee, 5.5 Medicinal plants- Cinchona, neem, Ipecac, Vasaka, 5.6 Oil yielding plants- Mustard, groundnut, coconut, 5.7 Vegetables- Potato, raddish, bottle groud, cabbage, 5.8 Fibre yielding plants- Cotton, jute, 5.9 Timber yielding plants- Teak, Sal 5.10 Fruits- Mango, apple, 5.11 Sugar yielding plant- Sugarcane.

…….16 lectures

PRACTICAL- ECONOMIC BOTANY (BOT-G-DSE-B-6-3-P)

(Credits 2)

1. Study of economically important plants (rice/jute/ tea) through herbarium specimens and field study.
2. Study of cultivation practices in field and submission of report.
3. Study of local economically important plants and submission of report with photographs.

HORTICULTURAL PRACTICES AND POST HARVEST TECHNOLOGY (BOT-G-DSE-B-6-4-TH)

THEORETICAL

(Credits 4, Lectures 60)

1. Horticulture- role in rural economy and employment generation. Urban horticulture- its scope and importance.

…….6 lectures

2. Ornamental plants- identification and salient features of some ornamental plants (rose, marigold, gladiolus, gerberas, tube rose, carnations, cacti and succulents). Ornamental flowering trees (Gulmohor, Lagerstromia, Shimul, Coral tree and jacaranda).

…….12 lectures

3. Identification of some fruits and vegetable plants- Citrus, Banana, Papaya, Mango, Jackfruit, Chillies and cucurbits. Fruit processing- scope and benefits.

…….10 lectures

4. Horticultural techniques- propagation methods, application of manure, fertilizers, nutrients and PGR. Weed control. Biofertilizers and biopesticides.

…….12 lectures

5. Post harvest technology- importance of post harvest technology in horticultural practices. Harvesting and handling of fruits, vegetables and cut flower. Methods of preservation and processing.

…….10 lectures

6. Disease control and management- field and post harvest diseases of common crops. Crop sanitation, quarantine practices. Identification of common diseases and pest of fruits and vegetable crops.

…….10 lectures

PRACTICAL- HORTICULTURAL PRACTICES AND POST HARVEST TECHNOLOGY (BOT-G-DSE-B-6-4-P)

(Credits 2)

1. Field trips to gardens, standing crop sites, nurseries, vegetable gardens, horticultural fields and cold storages.

REFERENCES

Suggested Readings

1. General studies

1. Ganguli,H.C., Das, K.S.K. & Dutta, C.T. College Botany, Vol. I, latest Ed., New Central Book Agency

2. Ganguli,H.C. and Kar, A.K. College Botany, Vol. II, latest Ed., New Central Book Agency

3. Mukherjee, S. College Botany, Vol. III, latest Ed., New Central Book Agency

4. Uno, Storey & Moore, Principles of Botany, 2001, McGraw Hill.

5. Kenrick,P. & Crane, P. The Origin & early diversification of land plants (1997), Smithsonian Institute Press.

6. Bell, P.R. & Hensley, A.R. Green plants; their Origin & Diversity (2nd ed.), 2000, Cambridge University Press

7. Frenchel, T. The origin & early Evolution of life, 2002, Oxford University Press.

8. Hait, G., Ghosh, A. and Bhattacharya, K. A Text Book of Botany (Vols. I, II & III), 2007, New Central Book Agency

9. Lock, A.J., & Evans, D.E., Plant Biology, 2001, Viva Books

10. Chatterjee, T., Santra,S.C. and Das, A. Practical College Botany, New Central Book Agency

2. Algae

1. Kumar, H.D. Introductory Phycology (2nd ed.), 1999, Affiliated East-West Press Pvt. Ltd.

2. Lee, R.E. Phycology (3rd ed.), 1999, Cambridge University Press

3. Vashishta, B.R., Sinha, A.K. & Singh, V.P. Algae (9th ed.), 2002, S. Chand & Company

4. Sambamurty, A.S.S. A text book of Algae, 2005, I.K. International Pvt. Ltd. 22

5. Graham, L.E. & Wilcox, L.W. Algae, 2000, Prentice Hall

6. Smith, G.M. Cryptogamic Botany, Vol. 1 (2nd ed.), 1955. McGraw Hill

7. Prescott, G.W. Algae: A Review: 1969 Bishen Singh Mahendra Pal Singh

8. Fritsch, F.E. The Structure & Reproduction of Algae, 1936, Vols. I & II, Cambridge University Press

3. Microbiology

1. Stainer, T.Y., Ingrahm, J.L., Wheelis, M.L. & Painter, P.R. General Microbiology (5th ed.), 1986, Macmillan Educaton Ltd.

2. Dubey, R.C. & Maheswari, D.K. A Text Book of Microbiology, 2005, S.Chand & Company

3. Case. Funke & Tortora, G.J. Microbiology, an Introduction (Latest Ed.)

4. Jay, J.M. Modern Food Microbiology (5th ed.), 1996, Chapman & Hall

5. Madigan,M.T., Marinko, J.M. & Parker, J. Brock, Biology of Microrganuisms (10th ed.), 2003, Prentice Hall 10. Hull, R. Matthew Plant Virology (4th ed.), 2002, Academic Press

6. Biswas, S.B. & Biswas, A. An Introduction to Viruses (4th ed.), 1996, Vikas Publishing House

7. Agarwal, A.K. & Parihar, P. Industrial Microbiology, 2005, Agrobios (India)

8. Power, C.B. & Dagimawata, H.F. General Microbiology, Vol. I&II, Himalaya Publishing House

9. Mitchel, R. Environmental Microbiology, Latest Ed. Wiley, N.Y.

10. Sale, A.J. Fundamental Principles of Microbiology, Latest Ed., Tata McGraw Hill

11. Banerjee, A.K. & Banerjee, N. Microbiology & Immunology, 2006, new Central Book Agency

12. Prescott & Dunn. Industrial Microbology 18. Verma, H.N. Basics of Plant Virology (2003), Oxford and IBH

4. Fungi, Lichen & Plant Pathology

1. Dubey, H.C. An Introduction to Fungi (2nd ed.), 1990, Vikas Publishing House 23

2. Arora, D. (ed.). Hand book of Fungal Biotechnology (2nd ed.), 2003, Dekker, N.Y.

3. Sharma, P.D. Fungi & Allied Organisms, 2005, Narosa Publishing House

4. Deacon, J.W. Fungal Biology, 2006, Black Well Science Ltd.

5. Ingold, C.T. & Hudson, H.J. The Biology of Fungi 96th ed.), 1993, Chapman & Hall

6. Sharma, O.P. Text book of Fungi, Tata McGraw Hill

7. Vashista, B.R. Fungi, Latesgt Ed., S. Chand & Company

8. Chopra, G.L. and Verma, V.A. Text Book of Fungi, Pradeep Publications

9. Mehrotra, R.S. and Aneja, K.R. An Introduction to Mycology, Wiley Eastern Ltd.

10. Sharma, P.D. the Fungi, Rastogi Publication

11. Mehrotra, R.S. & Agarwal, A. plant Pathology (2nd ed.), 2003, Tata McGraw Hill

12. Singh, R.S. Principles of Plant Pathology (4th ed.), 2002, oxford & IBH Publishing Com.

13. Manners, J.G. Principles of Plant Pathology (2nd ed.), 1993, Cambridge University Press

14. Singh, R.S. Plant diseases, Oxford & IBH Publishing Com

15. Rangaswami, G.K. & Mahadevan, A. Diseases of Crop Plants in India, Prentice Hall

16. Sharma, P.D. Plant Pathology (2nd ed.), Rastogi Publications

17. Strange, R.N. (ed.) Introduction of plant Pathology, 2003, Wiley

18. Dube, H.C. An Introduction to Fungi (2005), Vikas Publishing House

5. Bryophytes

1. Parihar, N.S. Introduction to Embryophyta (Vol. 1 Bryophyta), Central Book Distributors

2. Shaw, A. Jonathan and Goffinet Bernard, Bryophyte Biology, 2009, Cambridge university Press

3. Rashid, A. An Introduction to Bryophyta, 1998, Vikas Publishing House

4. Chopra, R.N. & Kumar, P.K. Biology of Bryophyta, Latest Ed., Wiley Eastern

5. Puri, P. Bryophyte, Latest Ed., Atmaram & Sons

6. Vashista, B.R. Bryophyta, Latest Ed., S. Chand & Company

6. Palaeobotany and Palynology

1. Stewart, W.N. & Rothwell, G.W. Palaeobotany & Evolution of Plants, Latest Ed., Cambridge university Press

2. Agashe, S.N. Palaeobotany, Latest Ed., Oxford & IBH

3. Thomas, B.A. & Spicer, R.A. The Evolution & Palaeobotany of Land Plants, Latest Ed., Croomhelm

4. Nair, P.K. Pollen Morphology of Angiosperms, Latest Ed., Scholar Publications

5. Shivanne, K.H. Pollen Biology & Biotechnology, 2003, Oxford & IBH

6. Bhattacharya, K., Majumdar, M.R. & Gupta Bhattacharya, S. A Text Book of Palynology, 2006, New Central Book Agency.

7. Embryology

1. Raghavan, V. Molecular Embryology of Flowering Plants, 1997, Camb. University Press.

2. Maheswari, P. An Introduction to Embryology of Angiosperm, Latest Ed., Tata McGraw Hill.

3. Raghavan, V. Embryogenesis in Angiosperms: A Development & Experimental Study, 1986, Cambridge University Press.

4. Bhojwani, S.S. & Bhatnagar, S.D. The Embryology of Angiosperms (4th ed.), 1989, Publishing House.

8. Pteridophytes

1. Spore, K.R. The Morphology of Pteridophyte, Latest Ed. , Huchinson & Co. Ltd.

2. Rashid, A. An Introduction to Pteridophyte, Latest Ed., Vani Educational Books.

3. Vashista, P.C. Pteridophyta, Latest Ed., S. Chand & Company Pvt. Ltd.

4. Gifford, E. M. & Foster, A. S. Morphology & Evolution of Vascular Plants (3rd ed.), 1998, Freeman and Co.

9. Gymnosperms

1. Sporne, K.R. The Morphology of Gymnosperms, Latest Ed., Hutchinson &Co. Ltd.

2. Vashishta, P.C. Gymnosperm, Latest Ed., S. Chand & Company Pvt.

3. Karkar, R.K. & Karkar, R. The Gymnosperms, Latest Ed.

4. Bhatnagar, S.P. & p.Moitra, A.Gymnosperm, 1997, New Age International

5. Biswas, C. & Johri, P.M. The Gymnosperm, 1997, Narosa Publishing House

6. Dutta, S.C. An Introduction to Gymnosperms (3rd ed.), 1984, Kalyani Publishers

7. Gifford, E.M. and Foster, A.S. Morphology & Evolution of Vascular Plants (3rd ed.), 1989, Freeman & Co.

10. Ecology & Plant Geography

1. Shukla, R.S. & Chandel, P.S. Plant Ecology, Latest Ed., S. Chandel and Co.

2. Kumar, H.D. Modern Concept of Ecology, Latest Ed. Vikas Publishing House

3. Verma, P.S. & Agarwal, U.K. Concept of Ecology, Latest Ed., S. Chand & Company

4. Odum, F.P. Fundamentals of Ecology, Latest Ed., Saunders

5. Sharma, P.D. Elements of Ecology, Latest Ed., Rastogi Publications

6. Ambasht, R.S. & Ambasht, N.K. A Text Book of Plant Ecology, Latest Ed., CBS Publication & Distributors

7. Mani, M.S. Bio-Geography of India, Latest Ed., Springer-Verlag.

8. Krishnamurthy, K.V. An Advanced Text Book on Biodiversity, 2003, Oxford & IBH Publishing Co. Ltd.

9. Mitra, D., Guha, J.K., Chowdhury, S.K. Studies in Botany, Vol. II (7th ed.) Moulik Library.

10. Cain, Bowman, Hacker. Ecology. 2014. 3rd Ed. Sinauer Associates

11. Evolution

1. Futuyma., D. Evolution. 2015. (3rd Ed.) Sinauer Associates

12. Anatomy

1. Fahn, A. Plant Anatomy (4th ed.), 1990, Wiley Eastern.

2. Eames, A.J. & Mac. Daniels, L.H. An Introduction to Plant Anatomy, Latest Ed., McGraw Hill

3. Esau, K. Anatomy of Seed Plants (2nd ed.), 1977, John Wiley & Sons

4. Pandey, B.P. Plant Anatomy, Latest Ed., S. Chand & Company

5. Tayal, M.S. Plant Anatomy, Latest Ed., Rastogi Publications

6. Roy, P. Plant Anatomy, Latest Ed., New Central Book Agency

7. Morphology and Taxonomy of Angiosperms

8. Singh, G. Plant Systematics: An Integrated Approach (3rd ed.), 2016, CRC Press

9. Sambamurty, A.V.S.S. Taxonomy of Angiosperms, 2005, I.K. International Pvt. Ltd.

10. Sivaranjan, V.V. Principles of Plant Taxonomy (2nd ed.), 1991, Oxford & IBH

11. Subrahmanyam, N.S. Modern Plant Taxonomy, Latest Ed., Vikas Publishing House

12. Naik, V.N. Taxonomy of Angiosperms, Latest Ed., Tata McGraw Hill

13. Stace, C. A Plant Taxonomy & Biosystematics, Latest Ed., Arnold Publishers

14. Mitra, J.N. An Introduction to Systematic Botany & Ecology, Latest Ed., World Press

15. Dutta, S.C. systematic Botany, Latest Ed., Wiley Eastern.

16. Lawrence, G.H.M. Taxonomy of Vascular Plants Ed., Oxford & IBH.

17. Prain, D. Bengal Plants (Vol I & II), Bishen Singh Mahendra Pal Singh.

18. Jeffrey, C. An Introduction to Plant Systematics, Latest Ed., Allied Publishers Pvt. Ltd.

19. Radford. A.B. Fundumentls of Plant Systematics, Latest Ed., Harper & Row.

20. Paria, N.D. and Chattopadhyay, S.P. Flora of Hazaribagh District, Bihar, 2000 & 2001, Vol I & II, BSI, Kolkata 16. Simpson, G. Plant Systematics, 2006, Springer.

21. Bhattacharya, B. Systematic Botany, 2006, Narosa Publishing House.

22. Subramanyam, N.S. Laboratory Manual of Plant Taxonomy (2nd ed.) 1999, Vikas Publishing House.

23. Heywood, V.H. Flowering Plants of the World 1978, Oxford University Press.

14. Biochemistry & Plant Physiology

1. Taiz, L., & Zeiger, E. Plant Physiology (4th ed.), 2006, Sinauer Associates, Inc. Publishers.

2. Lincoln Taiz, Eduardo Zeiger, Ian M. Møller, and Angus Murphy.Plant Physiology and Development. (6th ed.) Sinauer Associates.

3. Hopkins, W.G. & Hiiner, N.P. Introduction to Plant Physiology (3rd ed.) 2004, John Wiley & Sons.

4. Jain, V.K. Fundamental of Plant Physiology (7th ed.) 2004. S. Chand and Company.

5. Salisbury, F.B. & Ross, C.W. Plant Physiology (4th ed.), 19992, Wadsoworth Publishing Company.

6. Panday, S.N. & Sinha, B.K. Plant Physiology (4th ed.), 2006, Vikas Publishing House Pvt. Ltd.

7. Wilkins, M.B. Advances Plant Physiology. 1984, ELBS Longman.

8. Srivastava, L.M. Plant Growth and Development, 2001, Academy Press.

9. Davies P.J. (ed.) Plant Physiology: Physiology, Bio-Chemistry & Molecular Biology, Academic Press.

10. Mukherjee, S. & Ghosh, A. Plant Physiology (2nd ed.), 2005, New Central Book Agency.

11. Hames, B.D. Bio-Chemistry (2nd ed.) Viva Books.

12. Sackheim, G. Chemistry for Biology Students (5th ed.) 1996, Benjamin/Cummings

13. Raman, H. Transport Phenomenon in Plants, 1997. Narosa Publishing House.

14. Chaudhuri, D., Kar, D.K., and Halder, S.A. Handbook of Plant Biosynthetic Pthways 2008, New Central Book Agencies.

15. Mehta, S.L., Lodha, M.L. & Bane, P.V. Recent Advances in Plant Biochemistry, 1989. I.C.A.R.

16. Conn, E.E. and Stumpf, R.R. Outlines of Bio-Chemistry, Latest Ed., Wiley Eastern.

17. Singhal, G.S. Concepts of Photobiology: Photosynthesis & Photomorphogenesis, 1999. Narosa Publishing House.

18. Hall. D.O. & Rao, K.K. photosynthesis (5th ed.), 1995, Cambridge University Press.

19. Buchanon, Gruissen and Jones. Plant Physiology & Biochemistry: Biochemistry and Molecular Biology of plants, 2000, I.K. International.

15. Pharmacognosy/ Medocinal Botany

1. Trease & Evans. Pharmacognosy, Saunders.

2. Trivedi P.C. 2006. Medicinal Plants: Ethnobotanical approach, Agrobios India

3. S.K. Jain, Manual of Ethnobotany, Scientific Publishers, Jodhpur 1995.

16. Cell Biology, Genetics & Molecular Biology

1. Pierce, Benjamin A. Genetics (2nd ed.), 2005, W.H. Freeman & Company.

2. Atherly, A.G., Girton, J.R. & McDonald, J.F. Science of Genetics, 1999, Saunders College Publications.

3. Hartwell, L.H., Hood, L., Goldberg, M.L., Reynolds, A.E., Silver, L.M. & Veres, R.C. Genetics (2nd ed.), 2004, McGraw Hill.

4. Tamarin, Robert H. Principles of Genetic (7th ed., 2002, Tata McGraw Hill.

5. Elrod, S.K. & Stanfield, W. Schuam's Outlines Genetics (4th ed.), 2002, Tata McGraw Hill.

6. Hartl, D.L. & Jones, E.W. Genetics , 2005, Jones & Barlett Publishers.

7. Lewin, B. Genes VIII, 2004, Pearson Educational International.

8. Watson, J.D., Baker, T.A., Bell, S.P., Gann, A., Levine, M. & Losick, R. Molecular Biology of the Gene (5th ed.) 2004. Pearson Education Inc.

9. Griffiths, A.I.F., Miller, J.H., Suzuki, D.T., Lewentin, C.R. & Gilbert, M.W. An Intrduction to Genetic Analysis, 2005 (8th ed.), W.H. Freeman & Company.

10. Brown, T.A. Genomes, 1999, John Wiley & Sons.

11. Brown, T.A. Genomes 3, 2007, Garland Science Publishing.

12. Snustad, D.P. & Simmons, M.J. Principles of Genetics (2nd ed.), 2000, (4th ed.), 2006, John Wiley & Sons.

13. Klug, W.S. & Cummings, M.R. Concepts of Genetics, 2003, Pearson Education.

14. Gerald Karp. Cell Biology. 2013. 7th Ed. International Student Version. Wiley.

15. Hawkins, J.D. Gene Structure & Expression (3rd ed.), 1996, Cambridge University Press.

16. Becker, M.W., Klemsmith, L.J. & Hardin, J. The World of the Cell (5th ed.), 2003, Pearson Education.

17. Cooper, G.M. The Cell, A molecular approach (2nd ed.), 2000, ASM Press.

18. Weaver, R.F. Molecular Biology (2nd ed./3rd ed.), 2002/2005, McGraw Hill.

19. Malacinski, G.M. Freifelder, Essentials of Molecular Biology (4th ed.), 2003, Narosa Publishing House.

20. Sambamurty, A.V.S.S. Genetics (2nd ed.), 2005, Narosa publishing House.

21. Sharma, A. & Sen, S. Chromosome Botany, 2002, Oxford & IBH Publishing.

22. Sen, S. & Kar, D.K. Cytology& Genetics, 2005, Narosa Publishing House.

23. Miglani. G.S. Advanced Genetics, 2002, Naroas Publishing House.

24. Gupta, P.K. Genetics, 2007, Rastogi Publications.

25. Jain, H.K. Genetics, 1999, Oxford & IBH Publishing Company.

26. Swanson, C.P., Merz, T. & Young, W.J. Cytogenetics, 1981, Prentice Hall.

27. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K. & Walter, P. Molecular Biology of the Cell, 2002 (4th ed.), Garland Sciences.

28. Gardner, E.J., Simmons, M.J. & Snustad, D.P. Principles of Genetics (8th ed.) 1991, John Wiley & Sons.

29. Kar, D.K. and Halder, S. Cell Biology, Genetics and Molecular Biology 2008, New Central Book Agency.

30. Roy, S.C. and De, K.K. Cell Biology, 1997, New Central Book Agency.

31. Bruce Alberts, Alexander Johnson, Julian Lewis, David Morgan, Martin Raff, Keith Roberts, Peter Walter. Molecular Biology of the Cell. 2015. 6th Ed: Garland Science.

17. Plant Breeding & Biometry

1. Chaudhuri, H.K. Elementary Principles of Plant Breeding, Latest Ed., Oxford & IBH.

2. Allaed, R.W. Principles of Plant Breeding, 1960, John Wiley & Sons.

3. Singh, B.D. Plant Breeding, Principles & Methods (7th ed.), 2005, Kalyani Publishers.

4. Roy, D. Plant Breeding: Analysis & Exploitation of Variation, 2000, Narosa Publishing House.

5. Kar, D.K. and Halder, S. Plant Breeding & Biometry, 2006, New Central Book Agency.

6. Dutta, Animesh K. Basic Biostatistics & its Application 2006, New Central Book Agency.

18. Plant Biotechnology

1. Chawla, H.S. An Introduction to Plant Biotechnology (2nd ed.), 2002,Oxford & IBH

2. Walker, J.M. & Rapley, R. Molecular Biology & Biotechnology, 2000, Royal Society of Chemistry Publishing House

3. Dubey, R.C. Biotechnology, Latest Ed., S.Chand & Company Pvt. Ltd.

4. Bhojwani, S.S. & Razdan, M.I. Plant Tissue Culture: Theory and Practise, Elsevier

5. Rajdan, M.K. An Introduction to Plant Tissue Culture, Latest Ed., Oxford & IBH

6. Jha, T.B. & Ghosh, B. Plant Tissue Culture, 2003, Universities Press

7. Singh, B.D. Biotechnology Latest ed., Kalyani Publishers.

8. Kar, D.K. & Halder, S. Plant Breeding, Biometry & Biotechnology, 2010, New Central Book Agency

9. Gupta, P.K. Biotechnology & Genomes, latest Ed., Rastogi Publications

10. Slatter, A., Scott, N. & Fowler, N. Plant Biotechnology, 2003, Oxford University Press

11. Dey, K.K. Plant Tissue Culture, 1992, New Central Book Agency

19. Resource methodology

1. Dawson, C. (2002). Practical research methods. UBS Publishers, New Delhi.

2. Stapleton, P., Yondeowei, A., Mukanyange, J., Houten, H. (1995). Scientific writing for agricultural research scientists – a training reference manual. West Africa Rice Development Association, Hong Kong.

3. Ruzin, S.E. (1999). Plant microtechnique and microscopy. Oxford University Press, New York, U.S.A.

20. Biofertilizers

1. Dubey, R.C., 2005 A Text book of Biotechnology S.Chand & Co, New Delhi.

2. Kumaresan, V. 2005, Biotechnology, Saras Publications, New Delhi.

3. John Jothi Prakash, E. 2004. Outlines of Plant Biotechnology. Emkay Publication, New Delhi.

4. Sathe, T.V. 2004 Vermiculture and Organic Farming. Daya publishers.

5. Subha Rao, N.S. 2000, Soil Microbiology, Oxford & IBH Publishers, New Delhi.

6. Vayas,S.C., Vayas, S. and Modi, H.A. 1998 Bio-fertilizers and organic Farming, Akta Prakashan, Nadiad.

21. Mushroom culture technology

1. Marimuthu, T. Krishnamoorthy, A.S. Sivaprakasam, K. and Jayarajan. R (1991) Oyster Mushrooms, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.

2. Swaminathan, M. (1990) Food and Nutrition. Bappco, The Bangalore Printing and Publishing Co. Ltd., No. 88, Mysore Road, Bangalore - 560018.

3. Tewari, Pankaj Kapoor, S.C., (1988). Mushroom cultivation, Mittal Publications, Delhi.

4. Nita Bahl (1984-1988) Hand book of Mushrooms, II Edition, Vol. I & Vol. II.

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

COURSE CURRICULUM UNDER CHOICE BASED CREDIT SYSTEM

SYLLABUS

FOR

BACHELOR
IN CHEMISTRY (HONOURS)

UNIVERSITY OF CALCUTTA

Course Structure

Course Credits

	Theory+ Practical
Core Course (CC)	
Theory (14 Papers of 4 credits each)	14×4= 56
Practical (14 Papers of 2 credits each)	14×2=28
Discipline Specific ElectiveCourse*(DSE)	
Theory (4 Papers of 4 credits each)	4×4=16
Practical(4 Papers of 2 credits each)	4×2=8
Generic Elective (GE)	
Theory (4 Papers of 4 credits each)	4×4=16
Practical(4 Papers of 2 credits each)	4×2=8
Ability Enhancement Compulsory Course (AECC)	
(2 Papers of 2 credits each)	2×2=4
Environmental Science	
English/MIL Communication	
SkillEnhancement Elective Course(SEC)	
(2 Papers of 2 credits each)	2×2=4
Total credit	**140**

***Optional Dissertation or project work in place of one Discipline Specific Elective paper (6 credits) in 6th Semester**

CORE COURSES FOR B. SC. HONOURS (CHEMISTRY)

SEM	CODE*	PAPER	BRIEF DESCRIPTION
1	CEMA-CC-1-1-TH	INORGANIC CHEMISTRY-1 ORGANIC CHEMISTRY -1A	Acid-base and redox reactions Basics of Organic Chemistry
	CEMA-CC-1-1- P	PRACTICALS**	
	CEMA-CC-1-2-TH	PHYSICAL CHEMISTRY-1 ORGANIC CHEMISTRY -1B	Kinetic theory, Chemical kinetics Stereochemistry
	CEMA-CC-1-2-P	PRACTICALS	
2	CEMA-CC-2-3-TH	ORGANIC CHEMISTRY -2	Reaction Mechanism
	CEMA-CC-2-3-P	PRACTICALS	
	CEMA-CC-2-4-TH	INORGANIC CHEMISTRY-2	Chemical Bonding
	CEMA-CC-2-4-P	PRACTICALS	
3	CEMA-CC-3-5-TH	PHYSICAL CHEMISTRY-2	Chemical Thermodynamics
	CEMA-CC-3-5-P	PRACTICALS	
	CEMA-CC-3-6-TH	INORGANIC CHEMISTRY-3	s and p Block Elements
	CEMA-CC-3-6-P	PRACTICALS	
	CEMA-CC-3-7-TH	ORGANIC CHEMISTRY -3	Alkenes, Alkynes, Carbonyls
	CEMA-CC-3-7-P	PRACTICALS	
4	CEMA-CC-4-8-TH	ORGANIC CHEMISTRY - 4	Organic Synthesis, Spectroscopy
	CEMA-CC-4-8-P	PRACTICALS	
	CEMA-CC-4-9-TH	PHYSICAL CHEMISTRY- 3	Applications of Thermodynamics, Quantum Mechanics
	CEMA-CC-4-9-P	PRACTICALS	
	CEMA-CC-4-10-TH	INORGANIC CHEMISTRY-4	Coordination Chemistry, d & f elements
	CEMA-CC-4-10-P	PRACTICALS	
5	CEMA-CC-5-11-TH	PHYSICAL CHEMISTRY -4	Quantum Chemistry, Statistical Thermodynamics
	CEMA-CC-5-11-P	PRACTICALS	
	CEMA-CC-5-12-TH	ORGANIC CHEMISTRY -5	Cyclic Compounds, Biomolecules
	CEMA-CC-5-12-P	PRACTICALS	
6	CEMA-CC-6-13-TH	INORGANIC CHEMISTRY-5	Bioinorganic and Organometallic Chemistry
	CEMA-CC-6-13-P	PRACTICALS	
	CEMA-CC-6-14-TH	PHYSICAL CHEMISTRY -5	Molecular Spectroscopy, Photochemistry
	CEMA-CC-6-14-P	PRACTICALS	

*** The Course code indicates subject-type of course-semester number-paper number-theory /practical [e.g. CEMA-CC-1-1-TH/P stands for Chemistry HonoursCore Course- First Semester- Paper 1- Theoretical /Practical]**

**** Practicals are based on the corresponding theoretical papers.**

Discipline Specific Courses (DSE)
For Semester 5

Any One from the following

DSE-A1:MOLECULAR MODELLING & DRUG DESIGN

DSE-A2: APPLICATIONS OF COMPUTERS IN CHEMISTRY

Any One from the following

DSE-B1: INORGANIC MATERIALS OF INDUSTRIALIMPORTANCE

DSE-B2: NOVEL INORGANIC SOLIDS

For Semester 6

Any One from the following

DSE-A3: GREEN CHEMISTRY AND CHEMISTRY OF NATURAL PRODUCTS

DSE-A4: ANALYTICAL METHODS IN CHEMISTRY

Any One from the following

DSE-B3:POLYMER CHEMISTRY

DSE-B4: DISSERTATION

SKILL ENHANCEMENT COURSES (SEC)

SEC-A For Semester 3 [Any one]

SEC 1 – MATHEMATICS AND STATISTICS FOR CHEMISTS
SEC 2 – ANALYTICAL CLINICAL BIOCHEMISTRY

SEC-B For Semester 4 [Any one]

SEC 3 – PHARMACEUTICALS CHEMISTRY
SEC4 - PESTICIDE CHEMISTRY

Important Guidelines

- **General Electives (GE) are to be taken preferably from Physics and Mathematics disciplines.**
- **All graphs for Physical / Inorganic Courses must be done using standard Spreadsheet Software**
- **Each college should take necessary measures to ensure they should have the following facilities:**

  1. UV-VIS Spectrophotometer with printer.
  2. FT-IR spectrophotometer with printer.
  3. Internet facility.
  4. Requisite number of computers (One computer for 3-4 students).

For proper maintenance of above mentioned facilities, clean & dry AC rooms are mandatory.

- **Each lecture is of 1 hr duration for both theory and practical classes.**

CORE COURSES (HONOURS) IN CHEMISTRY[CEM-A]

SEMESTER-1

CEMA-CC-1-1-TH :

(Credits: Theory-04, Practicals-02)

INORGANIC CHEMISTRY-1

Theory: 40 Lectures

Extra nuclear Structure of atom (14 Lectures)

Quantum numbers and their significance, Schrödinger's wave equation, significance of ψ and ψ^2. Radial and angular wave functions for hydrogen atom. Radial and angular distribution curves. Shapes of *s*, *p*, *d* and *f* orbitals. Pauli's Exclusion Principle, Hund's rules and multiplicity, Exchange energy, Aufbau principle and its limitations, Ground state Term symbols of atoms and ions for atomic number upto 30.

Acid-Base reactions (12 Lectures)

Acid-Base concept: Arrhenius concept, theory of solvent system (in H_2O, NH_3, SO_2 and HF), Bronsted-Lowry's concept, relative strength of acids, Pauling's rules. Lux-Flood concept, Lewis concept, group characteristics of Lewis acids, solvent levelling and differentiating effects.Thermodynamic acidity parameters, Drago-Wayland equation.Superacids, Gas phase acidity and proton affinity; HSAB principle.Acid-base equilibria in aqueous solution (Proton transfer equilibria in water), pH, buffer.Acid-base neutralisation curves; indicator, choice of indicators.

Redox Reactions (14 Lectures)

Ion-electron method of balancing equation of redox reaction.Elementary idea on standard redox potentials with sign conventions, Nernst equation (without derivation).Influence of complex formation, precipitation and change of pH on redox potentials; formal potential.Feasibility of a redox titration, redox potential at the equivalence point, redox indicators.Redox potential diagram (Latimer and Frost diagrams) of common elements and their applications.Disproportionation and comproportionation reactions (typical examples).

Electroanalytical methods: Basic principle of pH metric, potentiometric and conductometric titrations. Techniques used for the determination of equivalence points. Techniques used for the determination of pKa values

Solubility and solubility effect – common ion effect and their applications to the precipitation and separation of common metallic ions as hydroxides, sulfides, phosphates, carbonates, sulfates and halides.

Reference Books

1. Lee, J. D. *Concise Inorganic Chemistry*,5th Ed., Wiley India Pvt. Ltd., 2008.
2. Douglas, B.E. and McDaniel, D.H. *Concepts & Models of Inorganic Chemistry* Oxford, 1970.
3. Day, M.C. and Selbin, J. *Theoretical Inorganic Chemistry*, ACS Publications, 1962.
4. Atkin, P. *Shriver & Atkins' Inorganic Chemistry*, 5th Ed., Oxford University Press (2010).
5. Cotton, F.A., Wilkinson, G. and Gaus, P.L., *Basic Inorganic Chemistry 3rdEd.;* Wiley India.
6. Sharpe, A.G., *Inorganic Chemistry*, 4th Indian Reprint (Pearson Education) 2005.
7. Huheey, J. E.; Keiter, E.A, & Keiter, R.L. *Inorganic Chemistry, Principles ofStructure and Reactivity 4th Ed.*, Harper Collins 1993, Pearson,2006.
8. Atkins, P.W. & Paula, J. *Physical Chemistry*, Oxford Press, 2006.
9. Mingos, D.M.P., *Essential trends in inorganic chemistry*. Oxford University Press (1998).
10. Winter, M. J., The Orbitron, http://winter.group.shef.ac.uk/orbitron/ (2002). An illustrated gallery of atomic and molecular orbitals.
11. Burgess, J., *Ions in solution: basic principles of chemical interactions.* Ellis Horwood (1999).

ORGANIC CHEMISTRY-1A

Theory: 20 Lectures

Basics of Organic Chemistry

Bonding and Physical Properties **(18 Lectures)**

Valence Bond Theory: concept of hybridisation, shapes of molecules, resonance (including hyperconjugation); calculation of formal charges and double bond equivalent (DBE); orbital pictures of bonding (sp^3, sp^2, sp: C-C, C-N & C-O systems and *s-cis* and *s-trans* geometry for suitable cases).
Electronic displacements: inductive effect, field effect, mesomeric effect, resonance energy; bond polarization and bond polarizability; electromeric effect; steric effect, steric inhibition of resonance.
MO theory: qualitative idea about molecular orbitals, bonding and antibonding interactions, idea about σ, σ^*, π, π^*, n – MOs; concept of HOMO, LUMO and SOMO; sketch and energy levels of π MOs of i) acyclic p orbital system (C=C, conjugated diene, triene, allyl and pentadienyl systems) ii) cyclic p orbital system (neutral systems: [4], [6] annulenes; charged systems: 3-,4-,5-membered ring systems); Hückel's rules for aromaticity up to [8] annulene (including mononuclear heterocyclic compounds up to 6-membered ring); concept of antiaromaticity and homoaromaticity; non-aromatic molecules; Frost diagram (qualitative drawing).
Physical properties: influence of hybridization on bond properties: bond dissociation energy (BDE) and bond energy; bond distances, bond angles; concept of bond angle strain; melting point/boiling point and solubility of common organic compounds in terms of covalent & non-covalent intermolecular forces; polarity of molecules and

dipole moments; relative stabilities of isomeric hydrocarbons in terms of heat of hydrogenation and heat of combustion data.

General Treatment of Reaction Mechanism I (02 Lectures)

Mechanistic classification: ionic, radical and pericyclic (definition and example); reaction type: addition, elimination and substitution reactions (definition and example); nature of bond cleavage and bond formation: homolytic and heterolytic bond fission, homogenic and heterogenic bond formation; curly arrow rules in representation of mechanistic steps; reagent type: electrophiles and nucleophiles (elementary idea).

Reference Books

1. Finar, I. L. *Organic Chemistry (Volume 1),* Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
2. Morrison, R. N. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
3. Sykes, P. *A guidebook to Mechanism in Organic Chemistry*, Pearson Education, 2003.
4. Carey, F. A., Guiliano, R. M.*Organic Chemistry*, Eighth edition, McGraw Hill Education, 2012.

CEMA-CC-1-1-P(45 Lectures)

**** During examination marks of the experiments will be set in 2:1 ratio for Inorganic and Organic experiments respectively.**

1) INORGANIC CHEMISTRY: I (1) LAB (30 Lectures)

Acid and Base Titrations: (DEMO ONLY)

1. Estimation of carbonate and hydroxide present together in mixture
2. Estimation of carbonate and bicarbonate present together in a mixture.
3. Estimation of free alkali present in different soaps/detergents.

Oxidation-Reduction Titrations:

1. Estimation of Fe(II) using standardized $KMnO_4$ solution
2. Estimation of oxalic acid OR sodium oxalate in a given mixture
3. Estimation of Fe(II) and Fe(III) in a given mixture using $K_2Cr_2O_7$ solution.
4. Estimation of Fe(III) and Mn(II) in a mixture using standardized $KMnO_4$ solution
5. Estimation of Fe(III) and Cu(II) in a mixture using $K_2Cr_2O_7$.

6. Estimation of Fe(III) and Cr(III) in a mixture using $K_2Cr_2O_7$.

Reference Books

1. Mendham, J., *A. I. Vogel's Quantitative Chemical Analysis* 6th Ed., Pearson, 2009.
2. *Practical Workbook Chemistry (Honours), UGBS, Chemistry*, University of Calcutta, 2015

2) ORGANIC CHEMISTRY: O (1A) LAB (15 Lectures)

Separation based upon solubility, by using common laboratory reagents like water (cold,hot), dil. HCl, dil. NaOH, dil. $NaHCO_3$, *etc*., of components of a binary solid mixture; purification of **any one** of the separated components by crystallization and determination of its melting point. The composition of the mixture should be of the following types **[ANY THREE]**: *p*-Nitrobenzoic acid/*p*-Aminobenzoic acid; *p*-Nitrotolune/*p*-Anisidine; benzoic acid/naphthalene; urea/phenyl benzoate; *p*-toluidine/benzophenone; *p*-chlorobenzoic acid/ benzophenone, Benzoic acid/Anthracene; Glucose/Biphenyl; Benzoic acid/Benzophenone; Urea/Benzophenone. **Use of pH paper** is recommended.

Reference Books

1. Bhattacharyya, R. C, *A Manual of Practical Chemistry.*
2. Vogel, A. I. *Elementary Practical Organic Chemistry*, Part 2: *Qualitative Organic Analysis*, CBS Publishers and Distributors.
3. Mann, F.G. & Saunders, B.C. *Practical Organic Chemistry*, Pearson Education (2009).
4. Furniss, B.S., Hannaford, A.J., Smith, P.W.G., Tatchell, A.R. *Practical Organic Chemistry*,*5th Ed.*, Pearson (2012).
5. Dutta, S, *B. Sc. Honours Practical Chemistry*, Bharati Book Stall.

CEMA-CC-1-2-TH :

(Credits: Theory-04, Practicals-02)

PHYSICAL CHEMISTRY-1

Theory(40 Lectures)

Kinetic Theory and Gaseous state (20 Lectures)

Kinetic Theory of gases: Concept of pressure and temperature; Collision of gas molecules; Collision diameter; Collision number and mean free path; Frequency of binary collisions (similar and different molecules); Wall collision and rate of effusion

Maxwell's distribution of speed and energy: Nature of distribution of velocities, Maxwell's distribution of speeds in one, two and three dimensions; Kinetic energy distribution in one, two and three dimensions, calculations of average, root mean square and most probable values in each case; Calculation of number of molecules having energy $\geq \varepsilon$, Principle of equipartition of energy and its application to calculate the classical limit of molar heat capacity of gases

Real gas and virial equation: Deviation of gases from ideal behavior; compressibility factor; Boyle temperature; Andrew's and Amagat's plots; van der Waals equation and its features; its derivation and application in explaining real gas behaviour, other equations of state (Berthelot, Dietrici); Existence of critical state, Critical constants in terms of van der Waals constants; Law of corresponding states; virial equation of state; van der Waals equation expressed in virial form and significance of second virial coefficient; Intermolecular forces (Debye, Keesom and London interactions; Lennard-Jones potential - elementary idea)

Transport processes (08 Lectures)

Diffusion : Fick's law, Flux, force, phenomenological coefficients & their inter-relationship (general form), different examples of transport properties

Viscosity: General features of fluid flow (streamline flow and turbulent flow); Newton's equation, viscosity coefficient; Poiseuille's equation (with derivation); principle of determination of viscosity coefficient of liquids by falling sphere method and using Ostwald's viscometer. Temperature variation of viscosity of liquids and comparison with that of gases.Relation between viscosity coefficient of a gas and mean free path.

Chemical kinetics (12 Lectures)

Rate law, order and molecularity: Introduction of rate law, Extent of reaction; rate constants, order; Forms of rates of First, second and nth order reactions; Pseudo first order reactions (example using acid catalyzed hydrolysis of methyl acetate); Determination of order of a reaction by half-life and differential method; Rate-determining step and steady-state approximation – explanation with suitable examples;) Opposing reactions, consecutive reactions and parallel reactions (with explanation of kinetic and thermodynamic control of products; all steps first order)

Role of Temperature : Temperature dependence of rate constant; Arrhenius equation, energy of activation;

Homogeneous catalysis: Homogeneous catalysis with reference to acid-base catalysis; Enzyme catalysis; Michaelis-Menten equation, Lineweaver-Burk plot, turn-over number.

Reference Books

1. **Levine, I. N. *Physical Chemistry*, 6th Edition McGraw-Hill India**
2. **Castellan, G. W. *Physical Chemistry*, Narosa**
3. **McQuarrie, D. A. & Simons, J. D. *Physical Chemistry: A Molecular Approach*, Viva Press**
4. **Kapoor K.L, A Text Book Of Physical Chemistry , McGraw Hill India**

5. Engel, T. & Reid, P. *Physical Chemistry*, 3rd Edition Pearson India
6. Atkins, P. W. & Paula, J. de *Atkins' Physical Chemistry*, 10th Edition Oxford University Press
7. Maron, S. & Prutton *Physical Chemistry*
8. Ball, D. W. *Physical Chemistry*, Thomson Press
9. Mortimer, R. G. *Physical Chemistry*, Elsevier
10. Laidler, K. J. *Chemical Kinetics*, Pearson
11. Glasstone, S. & Lewis, G.N. *Elements of Physical Chemistry*
12. Rakshit, P.C., *Physical Chemistry* Sarat Book House
13. Moore, W. J. *Physical Chemistry*, Orient Longman

ORGANIC CHEMISTRY-IB

Theory (20 Lectures)

Stereochemistry I (17 Lectures)

Bonding geometries of carbon compounds and representation of molecules: tetrahedral nature of carbon and concept of asymmetry; Fischer, sawhorse, flying wedge and Newman projection formulae and their inter translations.

Concept of chirality and symmetry: symmetry elements, molecular chirality and centre of chirality; asymmetric and dissymmetric molecules; enantiomers and diastereomers; concept of stereogenicity, chirotopicity and pseudoasymmetry; chiral centres and number of stereoisomerism: systems involving 1/2/3-chiral centre(s) (AA, AB, ABA and ABC types).

Relative and absolute configuration: D/L and *R/S* descriptors; *erythro/threo* and *meso* nomenclature of compounds; *syn/anti* nomenclatures for aldols; *E*/*Z* descriptors for C=C, conjugated diene, triene, C=N and N=N systems; combination of *R/S*- and *E/ Z*-isomerisms.

Optical activity of chiral compounds: optical rotation, specific rotation and molar rotation; racemic compounds, racemisation (through cationic, anionic, radical intermediates and through reversible formation of stable achiral intermediates); resolution of acids, bases and alcohols *via* diastereomeric salt formation; optical purity and enantiomeric excess; invertomerism of chiral trialkylamines.

General Treatment of Reaction Mechanism II (03 Lectures)

Reactive intermediates: carbocations (carbenium and carbonium ions), non-classical cabocations, carbanions, carbon radicals, carbenes: generation and stability, structure using orbital picture and electrophilic/nucleophilic behavior of reactive intermediates (elementary idea).

Reference Books

1. Finar, I. L. *Organic Chemistry (Volume 1)*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
2. Morrison, R. N. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).

3. Sykes, P. *A guidebook to Mechanism in Organic Chemistry*, Pearson Education, 2003.
4. Carey, F. A., Guiliano, R. M. *Organic Chemistry*, Eighth edition, McGraw Hill Education, 2012.
5. Eliel, E. L. & Wilen, S. H. *Stereochemistry of Organic Compounds*, Wiley: London, 1994.
6. Nasipuri, D. *Stereochemistry of Organic Compounds*, Wiley Eastern Limited.
7. Clayden, J., Greeves, N. & Warren, S. *Organic Chemistry*, Second edition, Oxford University Press, 2012.
8. Keeler, J., Wothers, P. *Chemical Structure and Reactivity – An Integrated approach*, Oxford University Press.
9. Smith, J. G. *Organic Chemistry*, Tata McGraw-Hill Publishing Company Limited.
10.Fleming, I. *Molecular Orbitals and Organic Chemical Reactions*, Reference/Student Edition, Wiley, 2009.
11. James, J., Peach, J. M. *Stereochemistry at a Glance*, Blackwell Publishing, 2003.
12. Robinson, M. J. T., *Stereochemistry*, Oxford Chemistry Primer, OxfordUniversity Press, 2005.

CEMA-CC-1-2-P:

(45 Lectures)

**** During examination marks of the experiments will be set in 2:1 ratio for Physical and Organic experiments respectively.**

1) PHYSICAL CHEMISTRY: P (1) LAB (30 Lectures)

Experiment 1: Study of kinetics of decomposition of H_2O_2

Experiment 2: Study of kinetics of acid-catalyzed hydrolysis of methyl acetate

Experiment 3: Study of viscosity of unknown liquid (glycerol, sugar) with respect to water.

Experiment 4: Study of the variation of viscosity with the concentration of the solution

Experiment 5: Determination of solubility of sparingly soluble salt in water, in electrolyte with common ions and in neutral electrolyte (using common indicator)

Reference Books

1. Viswanathan, B., Raghavan, P.S. *Practical Physical Chemistry* Viva Books (2009)
2. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson
3. Harris, D. C. *Quantitative Chemical Analysis*. 9th Ed., Freeman (2016)
4. Palit, S.R., De, S. K. *Practical Physical Chemistry* Science Book Agency
5. Levitt, B. P. edited *Findlay's Practical Physical Chemistry* Longman Group Ltd.

6. Gurtu, J. N., Kapoor, R., *Advanced Experimental Chemistry* S. Chand & Co. Ltd.
7. *Practical Workbook Chemistry (Honours), UGBS, Chemistry*, University of Calcutta, 2015

2) ORGANIC CHEMISTRY: O (1B) LAB (15 Lectures)

Determination of boiling point of common organic liquid compounds [**ANY FIVE**]*n*-butyl alcohol, cyclohexanol, ethyl methyl ketone, cyclohexanone, acetylacetone,isobutyl methyl ketone, isobutyl alcohol, acetonitrile, benzaldehyde and acetophenone. [Boiling points of the chosen organic compounds should preferably be within 180^0C].

SEMESTER-2

CEMA-CC-2-3-TH :

(Credits: Theory-04, Practicals-02)

ORGANIC CHEMISTRY-2

Theory: 60 Lectures

StereochemistryII (20 Lectures)

Chirality arising out of stereoaxis: stereoisomerism of substituted cumulenes with even and odd number of double bonds; chiral axis in allenes, spiro compounds, alkylidenecycloalkanes and biphenyls;related configurational descriptors ($R_a/S_{a)}$; atropisomerism; racemisation of chiral biphenyls.

Concept of prostereoisomerism: prostereogenic centre; concept of (*pro*)^n-*chirality*: topicity of ligands and faces (elementary idea); *pro-R/pro-S*, *pro-E/pro-Z* and *Re/Si* descriptors;*pro-r* and *pro-s* descriptors of ligands on propseudoasymmetric centre.

Conformation*:* conformational nomenclature: eclipsed, staggered, *gauche*, *syn*and *anti*; dihedral angle, torsion angle;Klyne-Prelog terminology; *P/M* descriptors; energy barrier of rotation, concept of torsional and steric strains; relative stability of conformers on the basis of steric effect, dipole-dipole interaction and H-bonding; *butane gauche* interaction; conformational analysis of ethane, propane, *n*-butane, 2-methylbutane and 2,3-dimethylbutane; haloalkane, 1,2-dihaloalkanes and 1,2-diols (up to four carbons); 1,2-halohydrin; conformation of conjugated systems (*s-cis* and*s-trans*).

General Treatment of Reaction Mechanism III (20 lectures)

Reaction thermodynamics*:*free energy and equilibrium, enthalpy and entropy factor, calculation of enthalpy change *via* BDE, intermolecular & intramolecular reactions.

*Concept of organic acids and bases:*effect of structure, substituent and solvent on acidityand basicity; proton sponge; comparison between nucleophilicity and basicity; application of thermodynamic principles in acid-base equilibria.

Tautomerism*:*prototropy (keto-enol, nitro - *aci*-nitro, nitroso-oximino, diazo-amino and enamine-imine systems); valence tautomerism and ring-chain tautomerism; composition of the equilibrium in different systems (simple carbonyl; 1,2- and 1,3-dicarbonyl systems, phenols and related systems), factors affecting keto-enol tautomerism; application of thermodynamic principles in tautomeric equilibria.

Reaction kinetics*:* rate constant and free energy of activation; free energy profiles for one-step, two-step and three-step reactions; catalyzed reactions: electrophilic and nucleophilic catalysis; kinetic control and thermodynamic control of reactions; isotope effect: primary and β-secondary kinetic isotopic effect (k_H /k_D); principle of microscopic reversibility; Hammond's postulate.

Substitution and Elimination Reactions (20 Lectures)

Free-radical substitution reaction*:* halogentaion of alkanes, mechanism (with evidence) and stereochemical features; reactivity-selectivity principle in the light of Hammond's postulate.

Nucleophilic substitution reactions*:* substitution at sp^3 centre[systems: alkyl halides, allyl halides, benzyl halides, alcohols, ethers, epoxides, α-halocarbonyls]:mechanisms (with evidence),relative rates& stereochemical features: S_N1, S_N2, S_N2', S_N1' (allylic rearrangement) and S_Ni; effectsof solvent, substrate structure, leaving group and nucleophiles (including ambident nucleophiles, cyanide & nitrite); substitutions involving NGP (with hetero atoms and aryl groups); role of crown ethers and phase transfer catalysts.

Elimination reactions*:* E1, E2, E1cB and Ei (pyrolytic *syn* eliminations); formation of alkenes and alkynes; mechanisms (with evidence), reactivity, regioselectivity (Saytzeff/Hofmann)and stereoselectivity; comparison between substitution and elimination.

Reference Books

1. Finar, I. L. *Organic Chemistry (Volume 1)*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
2. Morrison, R. N. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
3. Sykes, P. *A guidebook to Mechanism in Organic Chemistry*, Pearson Education, 2003.
4. Carey, F. A., Guiliano, R. M.*Organic Chemistry*, Eighth edition, McGraw Hill Education, 2012.
5. Eliel, E. L. &Wilen, S. H. *Stereochemistry of Organic Compounds*, Wiley: London, 1994.
6**.** Nasipuri, D.*Stereochemistry of Organic Compounds,* Wiley Eastern Limited.
7. Clayden, J., Greeves, N. &Warren, S. *Organic Chemistry*, Second edition, Oxford UniversityPress, 2012.
8. Keeler, J., Wothers, P.*Chemical Structure and Reactivity – An Integrated approach*, Oxford University Press.
9. Smith, J. G. *Organic Chemistry*, Tata McGraw-Hill Publishing Company Limited.
10.Fleming, I. *Molecular Orbitals and Organic Chemical Reactions*, Reference/StudentEdition,Wiley, 2009.
11. James, J., Peach, J. M. *Stereochemistry at a Glance*, Blackwell Publishing, 2003.
12. Robinson, M. J. T., *Stereochemistry*, Oxford Chemistry Primer, OxfordUniversity Press, 2005.
13. Maskill, H., *Mechanisms of Organic Reactions*, Oxford Chemistry Primer, OxfordUniversity Press.

CEMA-CC-2-3-P:

(45Lectures)

Organic Preparations

A.The following reactions **(any eight)**are to be performed, noting the yield of the crude product:

1. Nitration of aromatic compounds
2. Condensation reactions
3. Hydrolysis of amides/imides/esters
4. Acetylation of phenols/aromatic amines
5. Brine mediated benzoylation of amines/amino acids.
6. Side chain oxidation of aromatic compounds
7. Diazo coupling reactions of aromatic amines
8. Bromination of anilides using green approach (Bromate-Bromide method)
9. Redox reaction including solid-phase method
10. Green 'multi-component-coupling' reaction
11. Selective reduction of *m*-dinitrobenzene to *m*-nitroaniline

Students must also calculate percentage yield, based upon isolated yield (crude) and theoretical yield.

B. Purification of the crude product is to be made by crystallisation from water/alcohol, crystallizationafter charcoal treatment, or sublimation, whichever is applicable.

C. Melting point of the purified product is to be noted.

Reference Books

1. Vogel, A. I. *Elementary Practical Organic Chemistry*, Part 1: *Small scale Preparations*, CBS Publishers and Distributors.

2. Mann, F.G. & Saunders, B.C. *Practical Organic Chemistry*, Pearson Education(2009).
3. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. & Tatchell, A.R. *Practical Organic Chemistry, 5th Ed.* Pearson (2012).
4. Ahluwalia, V.K. & Aggarwal, R. *Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis*, University Press (2000).
5. *Practical Workbook Chemistry (Honours), UGBS, Chemistry*, University of Calcutta, 2015.

CEMA-CC-2-4-TH :

(Credits: Theory-04, Practicals-02)

INORGANIC CHEMISTRY-2

Theory: 60 Lectures

Chemical Bonding-I **(20 Lectures)**

(i) *Ionic bond:* General characteristics, types of ions, size effects, radius ratio rule and its application and limitations. Packing of ions in crystals.Born-Landé equation with derivation and importance of Kapustinskii expression for lattice energy.Madelung constant, Born-Haber cycle and its application, Solvation energy.Defects in solids (elementary idea). Solubility energetics of dissolution process

(ii) *Covalent bond:* Polarizing power and polarizability, ionic potential,Fazan's rules. Lewis structures, formal charge. Valence Bond Theory. The hydrogen molecule (Heitler-London approach), directional character of covalent bonds, hybridizations, equivalent and non-equivalent hybrid orbitals, Bent's rule, Dipole moments, VSEPR theory, shapes of molecules and ions containing lone pairs and bond pairs (examples from main groups chemistry) and multiple bonding (σ and π bond approach).

Chemical Bonding-II **(30 Lectures)**

(i) Molecular orbital concept of bonding (The approximations of the theory, Linear combination of atomic orbitals (LCAO)) (elementary pictorial approach): sigma and pi-bonds and delta interaction, multiple bonding. Orbital designations: *gerade*, *ungerade*, HOMO, LUMO. Orbital mixing,. MO diagrams of H_2, Li_2, Be_2, B_2, C_2, N_2, O_2, F_2, and their ions wherever possible; Heteronuclear molecular orbitals: CO, NO, NO^+, CN^-, HF, BeH_2, CO_2 and H_2O. Bond properties: bond orders, bond lengths.
(ii) *Metallic Bond:* Qualitative idea of valence bond and band theories. Semiconductors and insulators, defects in solids.
(iii) *Weak Chemical Forces:* Hydrogen bonding (theories of hydrogen bonding, valence bond treatment), receptor-guest interactions, Halogen bonds. Effects of chemical force, melting and boiling points.

Radioactivity **(10 Lectures)**

Nuclear stability and nuclear binding energy. Nuclear forces: meson exchange theory. Nuclear models (elementary idea): Concept of nuclear quantum number, magic numbers. Nuclear Reactions: Artificial radioactivity, transmutation of elements, fission, fusion and spallation. Nuclear energy and power generation.Separation and uses of isotopes. Radio chemical methods: principles of determination of age of rocks and minerals, radio carbon dating, hazards of radiation and safety measures.

Reference Books

1. Lee, J. D. *Concise Inorganic Chemistry, 5th Ed.*, Wiley India Pvt. Ltd., 2008.
2. Huheey, J. E.; Keiter, E.A. & Keiter, R.L. *Inorganic Chemistry, Principles ofStructure and Reactivity 4th Ed.*, Harper Collins 1993, Pearson, 2006.
3. Douglas, B.E. and McDaniel, D.H. *Concepts & Models of Inorganic Chemistry* Oxford, 1970.
4. Porterfield, H. W., *Inorganic Chemistry,* Second Edition, Academic Press, 2005.
5. Purecell, K.F. and Kotz, J.C., *An Introduction toInorganic Chemistry*, Saunders: Philadelphia, 1980.
6. Cotton, F.A., Wilkinson, G., & Gaus, P.L. *Basic Inorganic Chemistry 3rd Ed.;* Wiley India.
7. Gillespie, R. J. and Hargittai, I., The VSEPR Model of Molecular Geometry, Prentice Hall (1992).
8. Albright, T., *Orbital interactions in chemistry*, John Wiley and Sons (2005).
9. Mingos, D.M.P., *Essential trends in inorganic chemistry*. Oxford University Press (1998).
10. Miessler, G. L., Fischer, P. J., Tarr, D. A., *Inorganic Chemistry*, Pearson, 5th Edition.
11. Kaplan, I., *Nuclear Physics*, Addison-Wesley Publishing Company Inc. London, 1964.
12. Friedlander, G., Kennedy, J. W., Macias, E. S. And Miller, J. M., *Nuclear and Radiochemistry*, Wiley, 1981.

CEMA-CC-2-4-P:(45 Lectures)

Iodo-/ Iodimetric Titrations

1. Estimation of Vitamin C
2. Estimation of (i) arsenite and (ii) antimony iodimetrically
3. Estimation of available chlorine in bleaching powder.

Estimation of metal content in some selective samples

1. Estimation of Cu in brass.
2. Estimation of Cr and Mn in Steel.
3. Estimation of Fe in cement.

Reference Books

1. Mendham, J., *A. I. Vogel's Quantitative Chemical Analysis* 6th Ed., Pearson, 2009.
2. *Practical Workbook Chemistry (Honours), UGBS, Chemistry*, University of Calcutta, 2015

SEMESTER-3

CEMA-CC-3-5-TH :

(Credits: Theory-04, Practicals-02)

PHYSICAL CHEMISTRY-2

Theory: 60 Lectures

Chemical Thermodynamics I (10 Lectures)

1st law of Thermodynamics: Intensive and extensive variables; state and path functions; isolated, closed and open systems; zeroth law of thermodynamics;Concept of heat, work, internal energy and statement of first law; enthalpy, *H*; relation between heat capacities, calculations of *q*, *w*, Δ*U* and Δ*H* for reversible, irreversible and free expansion of gases (ideal and van der Waals) under isothermal and adiabatic conditions; Joule's experiment and its consequence

Thermochemistry:Standard states; Heats of reaction; enthalpy of formation of molecules and ions and enthalpy of combustion and its applications; Laws of thermochemistry; bond energy, bond dissociation energy and resonance energy from thermochemical data, Kirchhoff's equations ; Adiabatic flame temperature.

Chemical Thermodynamics II (20 Lectures)

Second Law:Need for a Second law; statement of the second law of thermodynamics; Concept of heat reservoirs and heat engines; Carnot cycle; Carnot engine and refrigerator; Kelvin – Planck and Clausius statements and equivalence of the two statements with entropic formulation; Carnot's theorem; Values of §dQ/T and Clausius inequality;Physical concept of Entropy; Entropy is a measure of the microscopic disorder of the system. Entropy change of systems and surroundings for various processes and transformations; Entropy and unavailable work; Auxiliary state functions (G and A) and their variation with T, P and V. Criteria for spontaneity and equilibrium.

Thermodynamic relations: Maxwell's relations; Gibbs- Helmholtz equation, Joule-Thomson experiment and its consequences; inversion temperature; Joule-Thomson coefficient for a van der Waals gas; General heat capacity relations

Systems of Variable Composition:

Partial molar quantities, dependence of thermodynamic parameters on composition; Gibbs-Duhem equation, chemical potential of ideal mixtures, change in thermodynamic functions inmixing of ideal gases. Activities and activity coefficients.Fugacity and fugacity coefficient.

Applications of Thermodynamics – I (06 Lectures)

Chemical Equilibrium:

Thermodynamic conditions for equilibrium, degree of advancement; van't Hoff's reaction isotherm (deduction from chemical potential); Variation of free energy with degree of advancement; Equilibrium constant and standard Gibbs free energy change; Van't Hoff's reaction isobar and isochore from different standard states; Le Chatelier's principle and its derivation, variation of equilibrium constant under different conditions Nernst's distribution law; Application- (eg. dimerization of benzene in benzoic acid). Solvent Extraction.

ELECTROCHEMISTRY: (24 Lectures)

(i) Conductance and transport number

Ion conductance; Conductance and measurement of conductance, cell constant, specific conductance and molar conductance; Variation of specific and equivalent conductance with dilution for strong and weak electrolytes; Kohlrausch's law of independent migration of ions; Equivalent and molar conductance at infinite dilution and their determination for strong and weak electrolytes; Debye –Huckel theory of Ion atmosphere (qualitative)-asymmetric effect, relaxation effect and electrophoretic effect; Debye-Huckel limiting law-brief qualitative description. Estimation of activity coefficient for electrolytes using Debye-Huckel limiting law. Ostwald's dilution law; Ionic mobility; Application of conductance measurement (determination of solubility product and ionic product of water); Conductometric titrations.Transport number, Principles of Hittorf's and Moving-boundary method; Wien effect, Debye-Falkenhagen effect, Walden's rule

(ii) Ionic equilibrium:

Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect; dissociation constants of mono-, di-and triprotic acids (exact treatment).

Salt hydrolysis- calculation of hydrolysis constant, degree of hydrolysis and pH for different salts (exact Treatment).Determination of hydrolysis constant conductometrically. Buffer solutions; derivation of Henderson equation and its applications; buffer capacity, buffer range, buffer action . Qualitative treatment of acid – base titration curves (calculation of pH at various stages). Theory of acid–base indicators; selection of indicators and their limitations.

Multistage equilibrium in polyelectrolyte systems; hydrolysis and hydrolysis constants

(iii) Electromotive Force: Rules of oxidation/reduction of ions based on half-cell potentials,; Chemical cells, reversible and irreversible cells with examples; Electromotive force of a cell and its measurement, Thermodynamic derivation of Nernst equation; Standard electrode (reduction) potential and its application to different kinds of half-cells. Application of EMF measurements in determining (i) free energy, enthalpy and entropy of a cell reaction, (ii) equilibrium constants, and (iii) pH values, using hydrogen, quinone-hydroquinone and glass electrodes

Concentration cells with and without transference, liquid junction potential; determination of activity coefficients and transference numbers; Potentiometric titrations (acid-base, redox, precipitation)

Reference Books

1. **Levine, I. N. *Physical Chemistry*, 6th Edition , McGraw-Hill India**
2. **Castellan, G. W. *Physical Chemistry*, Narosa**
3. **McQuarrie, D. A. & Simons, J. D. *Physical Chemistry: A Molecular Approach*, Viva Press**
4. **Kapoor K.L, A Text Book Of Physical Chemistry , McGraw Hill India**
5. Engel, T. & Reid, P. *Physical Chemistry*, 3rd Edition ,Pearson India
6. Atkins, P. W. & Paula, J. de *Atkins' Physical Chemistry*, 10th Edition, Oxford University Press
7. Maron, S. & Prutton , *Physical Chemistry*
8. Ball, D. W. *Physical Chemistry*, Thomson Press
9. Mortimer, R. G. *Physical Chemistry*, 2nd Edition, Elsevier
10. Glasstone, S. & Lewis, G.N. *Elements of Physical Chemistry*
11. Rakshit, P.C., *Physical Chemistry*,Sarat Book House
12. Moore, W. J. *Physical Chemistry*, Orient Longman
14. Denbigh, K. *The Principles of Chemical Equilibrium* ,Cambridge
15. Zemansky, M. W. & Dittman, R.H. *Heat and Thermodynamics*, Tata-McGraw-Hil
16. Glasstone, S. An Introduction to Electrochemistry, East-West Press .
17. Klotz, I.M., Rosenberg, R. M.*Chemical Thermodynamics:Basic Concepts and Methods* , 7th Edition, Wiley

CEMA-CC-3-5-P:(45 Lectures)

Experiment 1: Conductometric titration of an acid (strong, weak/ monobasic, dibasic, and acid mixture) against strong base.
Experiment 2: Study of saponification reaction conductometrically
Experiment 3: Verification of Ostwald's dilution law and determination of K_a of weak acid
Experiment 4: Potentiometric titration of Mohr's salt solution against standard $K_2Cr_2O_7$ and $KMnO_4$solution
Experiment 5: Determination of K_{sp} for AgCl by potentiometric titration of $AgNO_3$ solution against standard KCl solution
Experiment 6: Determination of heat of neutralization of a strong acid by a strong base

Reference Books

1. Viswanathan, B., Raghavan, P.S. *Practical Physical Chemistry* Viva Books (2009)
2. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson
3. Harris, D. C. *Quantitative Chemical Analysis*. 9th Ed., Freeman (2016)

4. Palit, S.R., De, S. K. *Practical Physical Chemistry* Science Book Agency
5. Levitt, B. P. edited *Findlay's Practical Physical Chemistry* Longman Group Ltd.
6. Gurtu, J. N., Kapoor, R., *Advanced Experimental Chemistry* S. Chand & Co. Ltd.
7. *Practical Workbook Chemistry (Honours), UGBS, Chemistry*, University of Calcutta, 2015

CEMA-CC-3-6-TH :

(Credits: Theory-04, Practicals-02)

INORGANIC CHEMISTRY-3

Theory: 60 Lectures

Chemical periodicity **(15 Lectures)**

Modern IUPAC Periodic table, Effective nuclear charge, screening effects and penetration, Slater's rules, atomic radii, ionic radii (Pauling's univalent), covalent radii, lanthanide contraction. Ionization potential, electron affinity and electronegativity (Pauling's, Mulliken's and Allred-Rochow's scales) and factors influencing these properties, group electronegativities.Group trends and periodic trends in these properties in respect of s-, p- and d-block elements.Secondary periodicity, Relativistic Effect, Inert pair effect.

Chemistry of *s* and *p* Block Elements **(30 Lectures)**

Relative stability of different oxidation states, diagonal relationship and anomalous behaviour of first member of each group. Allotropy and catenation.Hydrides and their classification ionic, covalent and interstitial.Basic beryllium acetate and nitrate.Study of the following compounds with emphasis on structure, bonding, preparation, properties and uses.Beryllium hydrides and halides.Boric acid and borates, boron nitrides, borohydrides (diborane) and graphitic compounds, silanes, Oxides and oxoacids of nitrogen, phosphorus, sulphur and chlorine.Peroxo acids of sulphur, sulphur-nitrogen compounds, interhalogen compounds, polyhalide ions, pseudohalogens, fluorocarbons and basic properties of halogens.

Noble Gases:
Occurrence and uses, rationalization of inertness of noble gases, Clathrates; preparation and properties of XeF_2, XeF_4 and XeF_6; Nature of bonding in noble gas compounds (Valence bond treatment and MO treatment for XeF_2 and XeF_4). Xenon-oxygen compounds. Molecular shapes of noble gas compounds (VSEPR theory).

Inorganic Polymers:
Types of inorganic polymers, comparison with organic polymers, synthesis, structural aspects and applications of silicones and siloxanes.Borazines, silicates and phosphazenes.

Coordination Chemistry-I **(15 Lectures)**

Coordinate bonding: double and complex salts. Werner's theory of coordination complexes, Classification of ligands, Ambidentate ligands, chelates, Coordination numbers, IUPAC nomenclature of coordination complexes (up to two metal centers), Isomerism in coordination compounds, constitutional and stereo isomerism, Geometrical and optical isomerism in square planar and octahedral complexes.

Reference Books

1. Lee, J. D. *Concise Inorganic Chemistry, 5th Ed.*, Wiley India Pvt. Ltd., 2008.
2. Huheey, J. E.; Keiter, E.A, & Keiter, R.L. *Inorganic Chemistry, Principles ofStructure and Reactivity 4th Ed.*, Harper Collins 1993, Pearson, 2006.
3. Douglas, B.E. and McDaniel, D.H. *Concepts & Models of Inorganic Chemistry* Oxford, 1970.
4. Porterfield, H. W., *Inorganic Chemistry,* Second Edition, Academic Press, 2005.
5. Purecell, K.F. and Kotz, J.C., *An Introduction toInorganic Chemistry*, Saunders: Philadelphia, 1980.
6. Cotton, F.A., Wilkinson, G., & Gaus, P.L. *Basic Inorganic Chemistry 3rd Ed.;* Wiley India.
7. Gillespie, R. J. and Hargittai, I., The VSEPR Model of Molecular Geometry, Prentice Hall (1992).
8. Albright, T., *Orbital interactions in chemistry*, John Wiley and Sons (2005).
9. Mingos, D.M.P., *Essential trends in inorganic chemistry*. Oxford University Press (1998).
10. Miessler, G. L., Fischer, P. J., Tarr, D. A., *Inorganic Chemistry,* Pearson, 5th Edition.
11. Kaplan, I., *Nuclear Physics,* Addison-Wesley Publishing Company Inc. London, 1964.
12. Friedlander, G., Kennedy, J. W., Macias, E. S. And Miller, J. M., *Nuclear and Radiochemistry*, Wiley, 1981.

CEMA-CC-3-6-P:(45 Lectures)

Complexometric titration

1. Zn(II)
2. Zn(II) in a Zn(II) and Cu(II) mixture.
3. Ca(II) and Mg(II) in a mixture.
4. Hardness of water.
5. Al(III) in Fe(III) and Al(III) in a mixture

Chromatography of metal ions

Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions:

1. Ni (II) and Co (II)
2. Fe (III) and Al (III)

Gravimetry

1. Estimation of Ni(II) using Dimethylglyoxime (DMG).
2. Estimation of copper as CuSCN.
3. Estimation of Al(III) by precipitating with oxine and weighing as $Al(oxine)_3$ (aluminiumoxinate).
4. Estimation of chloride.

Reference Books

3. Mendham, J., *A. I. Vogel's Quantitative Chemical Analysis* 6th Ed., Pearson, 2009.
4. *Practical Workbook Chemistry (Honours), UGBS, Chemistry*, University of Calcutta, 2015

CEMA-CC-3-7-TH :

(Credits: Theory-04, Practicals-02)

ORGANIC CHEMISTRY-3

Theory: 60 Lectures

Chemistry of alkenes and alkynes (15 Lectures)

Addition to C=C:mechanism (with evidence wherever applicable), reactivity, regioselectivity (Markownikoff and anti-Markownikoff additions) and stereoselectivity; reactions: hydrogenation, halogenation, hydrohalogenation, hydration, oxymercuration-demercuration, hydroboration-oxidation, epoxidation, *syn* and *anti*-hydroxylation, ozonolysis, addition of singlet and triplet carbenes; Simmons-Smith cyclopropanation reaction; electrophilic addition to diene (conjugated dienes and allene); radical addition: HBr addition; mechanism of allylic and benzylic bromination in competition with brominations across C=C; use of NBS; Birch reduction of benzenoid aromatics; interconversion of *E*- and *Z*- alkenes; contra-thermodynamic isomerization of internal alkenes.

Addition to C≡C (in comparison to C=C*):*mechanism, reactivity, regioselectivity(Markownikoff and anti-Markownikoff addition) and stereoselectivity; reactions:hydrogenation, halogenations, hydrohalogenation, hydration, oxymercuration-demercuration, hydroboration-oxidation, dissolving metal reduction of alkynes (Birch); reactions of terminal alkynes by exploring its acidity; interconversion of terminal and non-terminal alkynes.

Aromatic Substitution (10 Lectures)

Electrophilic aromatic substitution*:*mechanisms and evidences in favour of it; orientation and reactivity; reactions: nitration, nitrosation, sulfonation, halogenation, Friedel-Crafts reaction; one-carbonelectrophiles (reactions: chloromethylation,

Gatterman-Koch, Gatterman, Houben-Hoesch,Vilsmeier-Haack, Reimer-Tiemann, Kolbe-Schmitt); *Ipso* substitituion.

Nucleophilic aromatic substitution*:*addition-elimination mechanism and evidences in favour of it; S_N1 mechanism; cine substitution (benzyne mechanism), structure of benzyne.

Carbonyl and Related Compounds (30 Lectures)

Addition to C=O: structure, reactivity and preparation of carbonyl compounds; mechanism (with evidence), reactivity, equilibrium and kinetic control; formation of hydrates, cyanohydrins and bisulphite adduct; nucleophilic addition-elimination reactions with alcohols, thiolsand nitrogen- based nucleophiles;reactions: benzoin condensation, Cannizzaro and Tischenko reactions, reactions with ylides: Wittig and Corey-Chaykovsky reaction; Rupe rearrangement, oxidations and reductions: Clemmensen, Wolff-Kishner, $LiAlH_4$, $NaBH_4$, MPV, Oppenauer, Bouveault-Blanc, acyloin condensation; oxidation of alcohols with PDC and PCC; periodic acid and lead tetraacetate oxidation of 1,2-diols.

Exploitation of acidity of α-H of C=O*:* formation of enols and enolates; kinetic and thermodynamic enolates; reactions (mechanism with evidence):halogenation of carbonyl compounds under acidic and basic conditions, Hell-Volhard-Zelinsky (H. V. Z.) reaction, nitrosation, SeO_2 (Riley) oxidation; condensations (mechanism with evidence): Aldol,Tollens', Knoevenagel, Claisen-Schmidt, Claisen ester including Dieckmann, Stobbe; Mannich reaction,Perkin reaction, Favorskii rearrangement; alkylation of active methylene compounds; preparation and synthetic applications of diethyl malonate and ethyl acetoacetate; specific enol equivalents (lithium enolates, enamines and silyl enol ethers) in connection with alkylation, acylation and aldol type reaction.

Nucleophilic addition to α,β-unsaturated carbonyl system*:*general principle and mechanism (with evidence); direct and conjugate addition, addition of enolates (Michael reaction), Stetter reaction, Robinson annulation.

Substitution at sp^2 carbon (C=O system): mechanism (with evidence): $B_{AC}2$, $A_{AC}2$, $A_{AC}1$, $A_{AL}1$ (inconnection to acid and ester); acid derivatives: amides, anhydrides & acyl halides (formation and hydrolysis including comparison).

Organometallics(5 Lectures)

Grignard reagent*; Organolithiums; Gilman cuprates:* preparation and reactions (mechanism with evidence); addition of Grignard and organolithium to carbonyl compounds; substitution on -COX; directed ortho metalation of arenes using organolithiums, conjugate addition by Gilman cuprates; Corey-House synthesis; abnormal behaviour of Grignard reagents; comparison of reactivity among Grignard, organolithiums and organocopper reagents; Reformatsky reaction; Blaise reaction; concept of *umpolung.*

Reference Books

1. Finar, I. L. *Organic Chemistry (Volume 1)*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).

2. Morrison, R. N. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
3. Sykes, P. *A guidebook to Mechanism in Organic Chemistry*, Pearson Education, 2003.
4. Carey, F. A., Guiliano, R. M.*Organic Chemistry*, Eighth edition, McGraw Hill Education, 2012.
5. Loudon, G. M. *Organic Chemistry*, Fourth edition, Oxford University Press, 2008.
6. Norman, R.O. C., Coxon, J. M. *Principles of Organic Synthesis*, Third Edition, Nelson Thornes, 2003.
7. Clayden, J., Greeves, N. &Warren, S. *Organic Chemistry*, Second edition, Oxford UniversityPress, 2012.
8. Graham Solomons, T.W., Fryhle, C. B. *Organic Chemistry*, John Wiley & Sons, Inc.
9. Smith, J. G. *Organic Chemistry*, Tata McGraw-Hill Publishing Company Limited.
10. March, J. *Advanced Organic Chemistry*, Fourth edition, Wiley.
11. Jenkins, P. R., *Organometallic Reagents in Synthesis*, Oxford Chemistry Primer, Oxford University Press.
12. Ward, R. S., *Bifunctional Compounds*, Oxford Chemistry Primer, Oxford University Press.

CEMA-CC-3-7-P:(45 Lectures)

A. Identification of a Pure Organic Compound

Solid compounds: oxalic acid, tartaric acid, citric acid, succinic acid, resorcinol, urea, glucose, cane sugar, benzoic acid and salicylic acid

Liquid Compounds: formic acid, acetic acid, methyl alcohol, ethyl alcohol, acetone, aniline, dimethylaniline, benzaldehyde, chloroform and nitrobenzene

B. Quantitative Estimations:

Each student is required to perform all the experiments [Any**FIVE** will be set in the examination]
1. Estimation of glycine by Sörensen's formol method
2. Estimation of glucose by titration using Fehling's solution
3. Estimation of sucrose by titration using Fehling's solution
4. Estimation of aromatic amine (aniline) by bromination (Bromate-Bromide) method
5. Estimation of acetic acid in commercial vinegar
6. Estimation of urea (hypobromite method)
7. Estimation of saponification value of oil/fat/ester

Reference Books

1. Bhattacharyya, R. C, *A Manual of Practical Chemistry.*
2. Vogel, A. I. *Elementary Practical Organic Chemistry*, Part 2: *Qualitative Organic Analysis*, CBS Publishers and Distributors.
3. Mann, F.G. & Saunders, B.C. *Practical Organic Chemistry*, Pearson Education (2009).

4. Furniss, B.S., Hannaford, A.J., Smith, P.W.G., Tatchell, A.R. *Practical Organic Chemistry,5th Ed.*, Pearson (2012).
5. Dutta, S, *B. Sc. Honours Practical Chemistry*, Bharati Book Stall.
6. Arthur, I. Vogel, *Quantitative Organic Analysis*, Pearson
7. *Practical Workbook Chemistry (Honours), UGBS, Chemistry*, University of Calcutta, 2015

SEMESTER-4

CEMA-CC-4-8-TH :

(Credits: Theory-04, Practicals-02)

ORGANIC CHEMISTRY-4

Theory: 60 Lectures

Nitrogen compounds(12 Lectures)

Amines: Aliphatic & Aromatic*:*preparation, separation (Hinsberg's method) and identification of primary, secondary and tertiary amines; reaction (with mechanism): Eschweiler–Clarke methylation,diazo coupling reaction, formation and reactions of phenylenediamines, diazomethane and diazoacetic ester.

Nitro compounds (aliphatic and aromatic): preparation and reaction (with mechanism): reduction under different conditions; Nef carbonyl synthesis, Henry reaction and conjugate addition of nitroalkane anion.

Alkylnitrile and isonitrile: preparation and reaction (with mechanism): Thorpe nitrile condensation, von Richter reaction.

Diazonium salts and their related compounds: reactions (with mechanism) involving replacement of diazo group; reactions: Gomberg, Meerwein, Japp-Klingermann.

Rearrangements(14 Lectures)

Mechanism with evidence and stereochemical features for the following:

Rearrangement to electron-deficient carbon: Wagner-Meerwein rearrangement, pinacol rearrangement, dienone-phenol; Wolff rearrangement in Arndt-Eistert synthesis, benzil-benzilic acid rearrangement, Demjanov rearrangement, Tiffeneau–Demjanov rearrangement.

Rearrangement to electron-deficient nitrogen: rearrangements: Hofmann, Curtius, Lossen, Schmidt and Beckmann.

Rearrangement to electron-deficient oxygen: Baeyer-Villiger oxidation, cumene hydroperoxide-phenol rearrangement and Dakin reaction.

Aromatic rearrangements:Migration from oxygen to ring carbon: Fries rearrangement and Claisen rearrangement.

Migration from nitrogen to ring carbon: Hofmann-Martius rearrangement**,** Sommelet Hauser rearrangement, Fischer-Hepp rearrangement, *N*-azo to *C*-azo rearrangement, Bamberger rearrangement, Orton rearrangement and benzidine rearrangement.

The Logic of Organic Synthesis(14 Lectures)

*Retrosynthetic analysis:*disconnections; synthons, donor and acceptor synthons; natural reactivity and *umpolung*; latent polarity in bifunctional compounds: illogical electrophiles and nucleophiles; synthetic equivalents; functional group interconversion and addition (FGI and FGA); C-C disconnections and synthesis: one-group and two-group (1,2- to 1,5-dioxygenated compounds), reconnection (1,6-dicarbonyl);protection-deprotection strategy (alcohol, amine, carbonyl, acid).
*Strategy of ring synthesis:*thermodynamic and kinetic factors; synthesis of large rings, application of high dilution technique.
Asymmetric synthesis: stereoselective and stereospecific reactions; diastereoselectivity and enantioselectivity (only definition); diastereoselectivity: addition of nucleophiles to C=O adjacent to a stereogenic centre: Felkin-Anh model.

Organic Spectroscopy **(20 Lectures)**

UV Spectroscopy: introduction;types of electronic transitions, end absorption; transition dipole moment and allowed/forbidden transitions; chromophores and auxochromes; Bathochromic andHypsochromic shifts; intensity of absorptions (Hyper-/Hypochromic effects); application of Woodward's Rules for calculation of λ_{max} for the following systems: conjugated diene, *α,β*-unsaturated aldehydes and ketones(alicyclic, homoannular and heteroannular); extended conjugated systems (dienes, aldehydes and ketones); relative positions of λ_{max} considering conjugative effect, steric effect, solvent effect, effect of pH; effective chromophore concentration: keto-enol systems; benzenoid transitions.
IR Spectroscopy: introduction;modes of molecular vibrations(fundamental and non-fundamental);IR active molecules; application of Hooke's law, force constant; *fingerprint region* and its significance; effect of deuteration; overtone bands; vibrational coupling in IR; characteristic and diagnostic stretching frequencies of C-H, N-H, O-H, C-O, C-N, C-X, C=C (including skeletal vibrations of aromatic compounds), C=O, C=N, N=O, C≡C, C≡N; characteristic/diagnostic bending vibrations are included; factors affecting stretching frequencies: effect of conjugation, electronic effects, mass effect, bond multiplicity, ring-size, solvent effect, H-bonding on IR absorptions; application in functional group analysis.
*NMR Spectroscopy:*introduction;nuclear spin;NMR active molecules;basic principles of Proton Magnetic Resonance; choice of solvent and internal standard; equivalent and non-equivalent protons; chemical shift and factors influencing it; ring current effect;significance of the terms: up-/downfield, shielded and deshielded protons; spin coupling and coupling constant (1st order spectra); relative intensities of *first-order* multiplets: Pascal's triangle; chemical and magnetic equivalence in NMR ; anisotropic effects in alkene, alkyne, aldehydes and aromatics; NMR peak area, integration; relative peak positions with coupling patterns of common organic compounds (both aliphatic and benzenoid-aromatic); rapid proton exchange; interpretation of NMR spectra of simple compounds.
Applications of IR, UV and NMR spectroscopy for identification of simple organic molecules.

Reference Books

1. Finar, I. L. *Organic Chemistry (Volume 1),* Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
2. Finar, I. L. *Organic Chemistry* (*Volume 2: Stereochemistry and the Chemistry of Natural Products*), Dorling Kindersley (India) Pvt. Ltd.(Pearson Education).
3. Norman, R.O. C., Coxon, J. M. *Principles of Organic Synthesis*, Third Edition, Nelson Thornes, 2003.
4. Clayden, J., Greeves, N., Warren, S., *Organic Chemistry*, Second edition, Oxford University Press 2012.
5. Silverstein, R. M., Bassler, G. C., Morrill, T. C. *Spectrometric Identification of Organic Compounds*, John Wiley and Sons, INC, Fifth edition.
6. Kemp, W. *Organic Spectroscopy*, Palgrave.
7. Pavia, D. L. *et al. Introduction to Spectroscopy*, 5th Ed. Cengage Learning India Ed. (2015). 8. Dyer, J. *Application of Absorption Spectroscopy of Organic Compounds*, PHI Private Limited
9. March, J. *Advanced Organic Chemistry*, Fourth edition, Wiley.
10. Harwood, L. M., *Polar Rearrangements*, Oxford Chemistry Primer, Oxford University Press.
11. Bailey, Morgan, Organonitrogen Chemistry, Oxford Chemistry Primer, Oxford University Press.
12. Warren, S. *Organic Synthesis the Disconnection Approach*, John Wiley and Sons.
13. Warren, S., *Designing Organic Synthesis*, Wiley India, 2009.
14. Carruthers, W. *Modern methods of Organic Synthesis*, Cambridge University Press.
15. Willis, C. A., Wills, M., *Organic Synthesis*, Oxford Chemistry Primer, Oxford University Press

CEMA-CC-4-8-P:(45 Lectures)

Experiment: Qualitative Analysis of Single Solid Organic Compounds

1. Detection of special elements (N, S, Cl, Br) by Lassaigne's test
2. Solubility and classification (solvents: H_2O, 5% HCl, 5% NaOH and 5% $NaHCO_3$)
3. Detection of the following functional groups by systematic chemical tests: aromatic amino ($-NH_2$), aromatic nitro ($-NO_2$), amido ($-CONH_2$, including imide), phenolic –OH, carboxylic acid (-COOH), carbonyl (distinguish between -CHO and >C=O); only one test for each functional group is to be reported.
4. Melting point of the given compound
5. Preparation, purification and melting point determination of a crystalline derivative of the given compound.
6. Identification of the compound through literature survey.

Each student, during laboratory session, is required to carry out qualitative chemical tests for all the special elements and the functional groups with relevant derivatisation in known and unknown (**at least six)** organic compounds.

Reference Books

1. Vogel, A. I. *Elementary Practical Organic Chemistry*, Part 2: *Qualitative Organic Analysis*, CBS Publishers and Distributors.

2. Mann, F.G. & Saunders, B.C. *Practical Organic Chemistry*, Pearson Education (2009).
3. Furniss, B.S., Hannaford, A.J., Smith, P.W.G., Tatchell, A.R. *Practical Organic Chemistry*, 5th Ed., Pearson (2012).
4. Clarke, H. T., *A Handbook of Organic Analysis (Qualitative and Quantitative)*, Fourth Edition, CBS Publishers and Distributors (2007). 5. *Practical Workbook Chemistry (Honours), UGBS, Chemistry*, University of Calcutta, 2015.

CEMA-CC-4-9-TH :

(Credits: Theory-04, Practicals-02)

PHYSICAL CHEMISTRY 3

Theory: 60 Lectures

Application of Thermodynamics – II (20 lectures)

Colligative properties: Vapour pressure of solution; Ideal solutions, ideally diluted solutions and colligative properties; Raoult's law; Thermodynamic derivation using chemical potential to derive relations between the four colligative properties [(i) relative lowering of vapour pressure, (ii) elevation of boiling point, (iii) Depression of freezing point, (iv) Osmotic pressure] and amount of solute. Applications in calculating molar masses of normal, dissociated and associated solutes in solution;Abnormal colligative properties.

Phase Equilibrium: Definitions of phase, component and degrees of freedom; Phase rule and its derivations; Definition of phase diagram; Phase diagram for water, CO_2, Sulphur.
First order phase transition and Clapeyron equation; Clausius-Clapeyron equation - derivation and use; Ehrenfest Classification of phase transition.
Binary solutions: Liquid vapour equilibrium for two component systems Ideal solution at fixed temperature and pressure; Principle of fractional distillation; Duhem-Margules equation; Henry's law; Konowaloff's rule; Positive and negative deviations from ideal behaviour; Azeotropic solution; Liquid-liquid phase diagram using phenol- water system; Solid-liquid phase diagram; Eutectic mixture
Three component systems, water-chloroform-acetic acid system, triangular plots

Foundation of Quantum Mechanics (25 Lectures)

Beginning of Quantum Mechanics: Black body radiation (Concept only) Wave-particle duality, light as particles: photoelectric and Compton effects; electrons as waves and the de Broglie hypothesis; Uncertainty relations (without proof)
Wave function: Postulates of Quantum Mechanics, Schrodinger time-independent equation; nature of the equation, acceptability conditions for the wave functions and probability interpretations of wave function Vector representation of wave function. Orthonormality of wave function.

Concept of Operators: Elementary concepts of operators, eigenfunctions and eigenvalues; Linear operators; Commutation of operators, commutator and uncertainty relation; Expectation value; Properties of Hermitian operator; Complete set of Eigenfunctions.Expansion of Eigenfunctions.

Particle in a box: Setting up of Schrodinger equation for one-dimensional box and its solution; Comparison with free particle eigenfunctions and eigenvalues. Properties of PB wave functions (normalisation, orthogonality, probability distribution); Expectation values of x, x^2, p_x and p_x^2 and their significance in relation to the uncertainty principle; Extension of the problem to two and three dimensions and the concept of degenerate energy levels.

Crystal Structure ***(15 Lectures)***

Bravais Lattice and Laws of Crystallography: Types of solid, Bragg's law of diffraction; Laws of crystallography (Haüy's law and Steno's law); Permissible symmetry axes in crystals; Lattice, space lattice, unit cell, crystal planes, Bravais lattice. Packing of uniform hard sphere, close packed arrangements (fcc and hcp); Tetrahedral and octahedral voids. Void space in p-type, F-type and I-type cubic systems

Crystal planes: Distance between consecutive planes [cubic, tetragonal and orthorhombic lattices]; Indexing of planes, Miller indices; calculation of d_{hkl}; Relation between molar mass and unit cell dimension for cubic system; Bragg's law (derivation).Determination of crystal structure: Powder method; Structure of NaCl and KCl crystals.

Specific heat of solid: Coefficient of thermal expansion, thermal compressibility of solids; Dulong –Petit's law; Perfect Crystal model, Einstein's theory – derivation from partition function, limitations; Debye's T^3 law – analysis at the two extremes

Reference Books

1. **Levine, I. N. *Physical Chemistry*, 6th Edition , McGraw-Hill India**
2. **Castellan, G. W. *Physical Chemistry*, Narosa**
3. **McQuarrie, D. A. & Simons, J. D. *Physical Chemistry: A Molecular Approach*, Viva Press**
4. **Kapoor K.L, A Text Book Of Physical Chemistry , McGraw Hill India**
5. Engel, T. & Reid, P. *Physical Chemistry*, 3rd Edition ,Pearson India
6. Atkins, P. W. & Paula, J. de *Atkins' Physical Chemistry*, 10th Edition, Oxford University Press
7. Maron, S. & Prutton , *Physical Chemistry*
8. Ball, D. W. *Physical Chemistry*, Thomson Press
9. Mortimer, R. G. *Physical Chemistry*, 2nd Edition, Elsevier
10. Atkins, P. W. *Molecular Quantum Mechanics*, 5th edition ,Oxford
11. Levine, I. N. *Quantum Chemistry*, 7th Edition, Pearson India
12. Sannigrahi A.B, Quantum Chemistry,2nd Edition, Books and Allied Pvt Ltd.
13. Denbigh, K. *The Principles of Chemical Equilibrium* Cambridge University Press
14. Zemansky, M. W. & Dittman, R.H. *Heat and Thermodynamics*, Tata-McGraw-Hil

CEMA-CC-4-9-P :(45 Lectures)

Experiment 1: Kinetic study of inversion of cane sugar using a Polarimeter (Preferably Digital)

Experiment 2: Study of Phase diagram of Phenol-Water system.

Experiment 3: Determination of partition coefficient for the distribution of I_2 between water and CCl_4

Experiment 4: Determination of pH of unknown solution (buffer), by colour matching method

Experiment 5: pH-metric titration of acid (mono- and di-basic) against strong base

Experiment 6 : pH-metric titration of a tribasic acidagainst strong base.

Reference Books

1. Viswanathan, B., Raghavan, P.S. *Practical Physical Chemistry* Viva Books (2009)
2. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson
3. Harris, D. C. *Quantitative Chemical Analysis*. 9th Ed., Freeman (2016)
4. Palit, S.R., De, S. K. *Practical Physical Chemistry* Science Book Agency
5. Levitt, B. P. edited *Findlay's Practical Physical Chemistry* Longman Group Ltd.
6. Gurtu, J. N., Kapoor, R., *Advanced Experimental Chemistry* S. Chand & Co. Ltd.
7. *Practical Workbook Chemistry (Honours), UGBS, Chemistry,* University of Calcutta, 2015

CEMA-CC-4-10-TH

(Credits: Theory-04, Practicals-02)

INORGANIC CHEMISTRY-4

Theory: 60 Lectures

Coordination Chemistry-II

(30 Lectures)

VB description and its limitations. Elementary Crystal Field Theory: splitting of d^n configurations in octahedral, square planar and tetrahedral fields, crystal field stabilization energy (CFSE) in weak and strong fields; pairing energy. Spectrochemical series.Jahn- Teller distortion.Octahedral site stabilization energy (OSSE).Metal-ligand bonding (MO concept, elementary idea), sigma- and pi-bonding in octahedral complexes (qualitative pictorial approach) and their effects on the oxidation states of transitional metals (examples). Magnetism and Colour: Orbital and spin magnetic moments, spin only moments of d^n ions and their correlation with effective magnetic

moments, including orbital contribution; quenching of magnetic moment: super exchange and antiferromagnetic interactions (elementary idea with examples only); d-d transitions; L-S coupling; qualitative Orgel diagrams for $3d^1$ to $3d^9$ ions. Racah parameter. Selection rules for electronic spectral transitions; spectrochemical series of ligands; charge transfer spectra (elementary idea).

Chemistry of d- and f- block elements (15 Lectures)

Transition Elements:
General comparison of 3d, 4d and 5d elements in term of electronic configuration, oxidation states, redox properties, coordination chemistry.

Lanthanoids and Actinoids:
General Comparison on Electronic configuration, oxidation states, colour, spectral and magnetic properties; lanthanide contraction, separation of lanthanides (ion-exchange method only).

Reaction Kinetics and Mechanism (15 Lectures)

Introduction to inorganic reaction mechanisms. Substitution reactions in square planar complexes, Trans- effect and its application in complex synthesis, theories of trans effect, Mechanism of nucleophilic substitution in square planar complexes, Thermodynamic and Kinetic stability, Kinetics of octahedral substitution, Ligand field effects and reaction rates, Mechanism of substitution in octahedral complexes.

Reference Books

1. Huheey, J. E.; Keiter, E.A. & Keiter, R.L. *Inorganic Chemistry, Principles ofStructure and Reactivity 4th Ed.*, Harper Collins 1993, Pearson,2006.
2. Greenwood, N.N. & Earnshaw A. *Chemistry of the Elements*, Butterworth-Heinemann, 1997.
3. Cotton, F.A., Wilkinson, G., Murrillo, C. A., Bochmann, M., *Advanced Inorganic Chemistry 6th Ed. 1999.*,Wiley.
4. Miessler, G. L. & Donald, A. Tarr. *Inorganic Chemistry* 4th Ed., Pearson, 2010.
5. Purecell, K.F. and Kotz, J.C., *An Introduction toInorganic Chemistry*, Saunders: Philadelphia, 1980.
6. Mingos, D.M.P., *Essential trends in inorganic chemistry*. Oxford University Press (1998).

CEMA-CC-4-10-P (45 Lectures)

Inorganic preparations

1. $[Cu(CH_3CN)_4]PF_6/ClO_4$
2. *Cis* and *trans* $K[Cr(C_2O_4)_2\ (H_2O)_2]$

3. Potassium diaquadioxalatochromate(III)
4. Tetraamminecarbonatocobalt (III) ion
5. Potassium tris(oxalato)ferrate(III)
6. Tris-(ethylenediamine) nickel(II) chloride.
7. $[Mn(acac)_3]$ and $Fe(acac)_3]$ (acac= acetylacetonate)

Instrumental Techniques

1. Measurement of 10Dq by spectrophotometric method.
2. Determination of λ_{max} of $[Mn(acac)_3]$ and $[Fe(acac)_3]$ complexes.

Reference Books

1. Mendham, J., *A. I. Vogel's Quantitative Chemical Analysis* 6th Ed., Pearson, 2009.
2. *Inorganic Synthesis*, Vol. 1-10.

SEMESTER-5

CEMA-CC-5-11-TH :

(Credits: Theory-04, Practicals-02)

PHYSICAL CHEMISTRY - 4

Theory: 60 Lectures

Quantum Chemistry II **(30 Lectures)**

Simple Harmonic Oscillator:Setting up of One dimensional Schrödinger equation and discussion of solution and wave functions. Classical turning points, Expectation values of x, x^2, p_x and p_x^2 .

Angular momentum: Commutation rules, quantization of square of total angular momentum and z-component; Rigid rotator model of rotation of diatomic molecule; Schrödinger equation, transformation to spherical polar coordinates; Separation of variables. Spherical harmonics; Discussion of solution

Hydrogen atom and hydrogen-like ions: Setting up of Schrödinger equation in spherical polar coordinates, Separation of variables, Solution of angular Part (φ part only), quantization of energy (only final energy expression); Real wave functions. Average and most probable distances of electron from nucleus; Setting up of Schrödinger equation for many-electron atoms (He, Li)Need for approximation methods. Statement of variation theorem and application to simple systems(particle-in-a-box, harmonic oscillator, hydrogen atom).

LCAO :Born-Oppenheimer approximation. Covalent bonding, valence bond and molecular orbital approaches, LCAO-MO treatment of H_2^+; Bonding and antibonding orbitals; Qualitative extension to H_2; Comparison of LCAO-MO and VB treatments of H_2 and their limitations.(only wavefunctions, detailed solutionnot required) and their limitations.

Statistical Thermodynamics **(20 Lectures)**

Configuration: Macrostates, microstates and configuration; calculation with harmonic oscillator; variation of W with E; equilibrium configuration

Boltzmann distribution: Thermodynamic probability, entropy and probability, Boltzmann distribution formula (with derivation); Applications to barometric distribution; Partition function, concept of ensemble - canonical ensemble and grand canonical ensembles

Partition function: molecular partition function and thermodynamic properties,

3^{rd} law: Absolute entropy, Plank's law, Calculation of entropy, Nernst heat theorem

Adiabatic demagnetization: Approach to zero Kelvin, adiabatic cooling, demagnetization, adiabatic demagnetization – involved curves

Numerical Analysis **(10 Lectures)**

Roots of Equation:Numerical methods for finding the roots of equations: Quadratic Formula, Iterative Methods (e.g., Newton Raphson Method).
Least-Squares Fitting.Numerical Differentiation.Numerical Integration(Trapezoidal and Simpson's Rule)

Reference Books

1. **Levine, I. N. *Physical Chemistry*, 6th Edition McGraw-Hill India**
2. **Castellan, G. W. *Physical Chemistry*, Narosa**
3. **McQuarrie, D. A. & Simons, J. D. *Physical Chemistry: A Molecular Approach*, Viva Press**
4. **Kapoor K.L, A Text Book Of Physical Chemistry , McGraw Hill India**
5. Engel, T. & Reid, P. *Physical Chemistry*, 3rd Edition Pearson India
6. Atkins, P. W. & Paula, J. de *Atkins' Physical Chemistry*, 10th Edition Oxford University Press
7. Levine, I. N. *Quantum Chemistry*, 7th Edition,Pearson India
8. Maron, S. & Prutton *Physical Chemistry*
9. Ball, D. W. *Physical Chemistry*, Thomson Press
10. Mortimer, R. G. *Physical Chemistry*, Elsevier
11. Glasstone, S. & Lewis, G.N. *Elements of Physical Chemistry*
12. Rakshit, P.C., *Physical Chemistry* Sarat Book House
14. Klotz, I.M., Rosenberg, R. M. *Chemical Thermodynamics:Basic Concepts and Methods* , Wiley
15. Sannigrahi A.B, Quantum Chemistry,2nd Edition, Books and Allied Pvt Ltd.
16. Atkins, P. W. *Molecular Quantum Mechanics*, 5th edition ,Oxford
17. Moore, W. J. *Physical Chemistry*, Orient Longman
18. Nash, L. K. *Elements of Statistical Thermodynamics*, Dover
19. V. Rajaraman, Computer Oriented Numerical Methods, PHI Learning, 2013
20. V. Rajaraman, Computer Programming in FORTRAN 77, Prentice Hall, 1997
21. Martin Cwiakala, Schaum's Outline of Programming with FORTRAN 77, 1995

CEMA-CC-5-11-P :(45 Lectures)

Computer programs(Using FORTRAN or C or C ++) based on numerical methods :

Programming 1: Roots of equations: (e.g. volume of van der Waals gas and comparison with ideal gas, pH of a weak acid)

Programming 2: Numerical differentiation (e.g., change in pressure for small change in volume of a van der Waals gas, Potentiometric titrations)

Programming 3: Numerical integration (e.g. entropy/ enthalpy change from heat capacity data), probability distributions (gas kinetic theory) and mean values

Reference Books

1. McQuarrie, D. A. *Mathematics for PhysicalChemistry*. University Science Books (2008)

2. Mortimer, R. *Mathematics for Physical Chemistry*. 3rd Ed. Elsevier (2005)
3. Yates, P. *Chemical Calculations*. 2nd Ed. CRC Press (2007)
4. Harris, D. C. *Quantitative Chemical Analysis*. 6th Ed., Freeman (2007) Chapters 3-5
5. Let us C, Yashvant Kanetkar, BPB Publication, 15th Edition, 2016

CEMA-CC-5-12-TH :

(Credits: Theory-04, Practicals-02)

ORGANIC CHEMISTRY - 5

Theory: 60 Lectures

Carbocyles and Heterocycles **(16 lectures)**

*Polynuclear hydrocarbonsand their derivatives:*synthetic methods include Haworth, Bardhan-Sengupta, Bogert-Cook and other useful syntheses (with mechanistic details);fixation of double bonds and Fries rule;reactions (with mechanism) of naphthalene, anthraceneand phenanthrene and their derivatives.
*Heterocyclic compounds:*Biological importance of heterocycles referred in the syllabus; 5- and 6-membered rings with one heteroatom; reactivity, orientation and important reactions (with mechanism) of furan, pyrrole,thiophene and pyridine; synthesis (including retrosynthetic approach and mechanistic details): pyrrole: Knorr synthesis, Paal-Knorr synthesis, Hantzsch; furan: Paal-Knorr synthesis, Feist-Benary synthesis and its variation; thiophenes: Paal-Knorr synthesis, Hinsberg synthesis; pyridine: Hantzsch synthesis;benzo-fused 5-and 6-membered rings with one heteroatom: reactivity, orientation and important reactions (with mechanistic details) of indole, quinoline and isoquinoline; synthesis (including retrosynthetic approachand mechanistic details): indole: Fischer,quinoline: Skraup, isoquinoline: Bischler-Napieralski synthesis.

Cyclic Stereochemistry **(10 Lectures)**

*Alicyclic compounds:*concept of I-strain (Baeyer's strain theory); conformational analysis: cyclohexane, mono and disubstituted cyclohexane; symmetry properties and optical activity; topomerisation; ring size and ease of cyclisation; conformation & reactivity in cyclohexane system: consideration of steric and stereoelectronic requirements; elimination (E2, E1), nucleophilic substitution (S_N1, S_N2, S_Ni, NGP), merged substitution-elimination; rearrangements; oxidation of cyclohexanol, esterification, saponification, lactonisation, epoxidation, pyrolytic *syn* elimination and fragmentation reactions.

Pericyclic reactions **(08 Lectures)**

Mechanism, stereochemistry, regioselectivity in case of

Electrocyclic reactions: FMO approach involving 4π- and 6π-electrons (thermal and photochemical) and corresponding cycloreversion reactions.
Cycloaddition reactions: FMOapproach, Diels-Alder reaction, photochemical [2+2] cycloadditions.
*Sigmatropic reactions:*FMO approach,sigmatropic shifts and their order; [1,3] and [1,5] H shifts and [3,3] shifts with reference to Claisen and Cope rearrangements.

Carbohydrates (14 Lectures)

Monosaccharides: Aldoses up to 6 carbons; structure of D-glucose & D-fructose (configuration & conformation); ring structure of monosaccharides (furanose and pyranose forms): Haworth representations and non-planar conformations; anomeric effect (including stereoelectronic explanation); mutarotation; epimerization; reactions (mechanisms in relevant cases): Fischer glycosidation, osazone formation, bromine-water oxidation, HNO_3 oxidation, selective oxidation of terminal $–CH_2OH$ of aldoses, reduction to alditols, Lobry de Bruyn-van Ekenstein rearrangement; stepping–up (Kiliani-Fischer method) and stepping–down (Ruff's &Wohl's methods) of aldoses; end-group-interchange of aldoses; acetonide (isopropylidene and benzylidene protections; ring size determination; Fischer's proof of configuration of (+)-glucose.
Disaccharides: Glycosidic linkages, concept of glycosidic bond formation by glycosyl donor-acceptor, structure of sucrose, inversion of cane sugar.

Biomolecules (12 Lectures)

*Aminoacids:*synthesis with mechanistic details: Strecker, Gabriel; acetamido malonic ester, azlactone, Bücherer hydantoin synthesis, synthesis involving diketopiperizine, isoelectric point, zwitterions; electrophoresis, reaction (with mechanism): ninhydrin reaction, Dakin-West reaction; resolution of racemic amino acids.
*Peptides:*peptide linkage and its geometry; syntheses (with mechanistic details) of peptides using *N*-protection & C-protection, solid-phase (Merrifield) synthesis; peptide sequence: *C*-terminal and *N*-terminal unit determination (Edman, Sanger and 'dansyl'methods); partial hydrolysis; specific cleavage of peptides; use of CNBr.
*Nucleic acids:*pyrimidine and purine bases (only structure & nomenclature); nucleosides and nucleotides corresponding to DNA and RNA;mechanism for acid catalysed hydrolysis of nucleosides (both pyrimidine and purine types); comparison of alkaline hydrolysis of DNA and RNA; elementary idea of double helical structure of DNA (Watson-Crick model); complimentary base–pairing in DNA.

Reference Books

1. Clayden, J., Greeves, N., Warren, S. *Organic Chemistry*, Second edition, Oxford University Press 2012.
2. Eliel, E. L. & Wilen, S. H. *Stereochemistry of Organic Compounds*, Wiley: London.
3. Nasipuri, D. *Stereochemistry of Organic Compounds*, Wiley Eastern Limited.
4. Fleming, I. *Molecular Orbitals and Organic Chemical reactions*, Reference/Student Edition, Wiley, 2009.
5. Fleming, I. *Pericyclic Reactions*, Oxford Chemistry Primer, Oxford University Press.

6. Gilchrist, T. L. & Storr, R. C. *Organic Reactions and Orbital symmetry*, Cambridge University Press.
7. Finar, I. L. *Organic Chemistry (Volume 1),* Dorling Kindersley (India) Pvt. Ltd.(Pearson Education).
8. Finar, I. L. *Organic Chemistry* (*Volume 2: Stereochemistry and the Chemistry of Natural Products*), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
9. Morrison, R. T. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
10. Loudon, G. M. *Organic Chemistry*, Fourth edition, Oxford University Press.
11. James, J., Peach, J. M. *Stereochemistry at a Glance*, Blackwell Publishing, 2003.
12. Robinson, M. J. T., *Stereochemistry*, Oxford Chemistry Primer, Oxford University Press, 2005.
13. Davis, B. G., Fairbanks, A. J., *Carbohydrate Chemistry*, Oxford Chemistry Primer, Oxford University Press.
14. Joule, J. A. Mills, K. *Heterocyclic Chemistry*, Blackwell Science.
15. Acheson, R.M. *Introduction to the Chemistry of Heterocyclic compounds*, John Wiely & Sons (1976).
16. Gilchrist, T. L. *Heterocyclic Chemistry*, 3rd edition, Pearson.
17. Davies, D. T., *Heterocyclic Chemistry*, Oxford Chemistry Primer, Oxford University Press

CEMA-CC-5-12-P:(45 Lectures)

A. Chromatographic Separations

1. TLC separation of a mixture containing 2/3 amino acids
2. TLC separation of a mixture of dyes (fluorescein and methylene blue)
3.Column chromatographic separation of mixture of dyes
4.Paper chromatographic separation of a mixture containing 2/3 amino acids
5. Paper chromatographic separation of a mixture containing 2/3 sugars

B. **Spectroscopic Analysis of Organic Compounds**

1. Assignment of labelled peaks in the ^{1}H NMR spectra of the known organic compounds explaining the relative δ-values and splitting pattern.
2. Assignment of labelled peaks in the IR spectrum of the same compound explaining the relative frequencies of the absorptions (C-H, O-H, N-H, C-O, C-N, C-X, C=C, C=O, N=O, C≡C, C≡N stretching frequencies; **characteristic bending vibrations are included**).
3. The students must record full spectral analysis of **at least 15 (fifteen)** compounds from the following list:

(i) 4′-Bromoacetanilide (ii) 2-Bromo-4'-methylacetophenone (iii) Vanillin (iv) 2′-Methoxyacetophenone (v) 4-Aminobenzoic acid (vi) Salicylamide (vii) 2′-Hydroxyacetophenone (viii) 1,3-Dinitrobenzene (ix) *trans*-Cinnamic acid (x) Diethyl fumarate (xi) 4-Nitrobenzaldehyde (xii) 4′-Methylacetanilide (xiii) Mesityl oxide (xiv) 2-Hydroxybenzaldehyde (xv) 4-Nitroaniline (xvi) 2,3-Dimethylbenzonitrile (xvii) Pent-

1-yn-3-ol (xviii) 3-Nitrobenzaldehyde (xix) 3-Aminobenzoic acid (xx) Ethyl 3-aminobenzoate (xxi) Ethyl 4-aminobenzoate (xxii) 3-nitroanisole.

Reference Books

1. *Practical Workbook Chemistry (Honours), UGBS, Chemistry*, University of Calcutta, 2015

2. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. *Practical Organic Chemistry, 5th Ed.*, Pearson (2012).

3. Mann, F.G. & Saunders, B.C. *Practical Organic Chemistry*, Pearson Education.

SEMESTER- 6

CEMA-CC-6-13-TH:

(Credits: Theory-04, Practicals-02)

INORGANIC CHEMISTRY-5

Theory: 60 Lectures

Theoretical Principles in Qualitative Analysis (10 Lectures)

Basic principles involved in analysis of cations and anions and solubility products, commonion effect. Principles involved in separation of cations into groups and choice of group reagents. Interfering anions (fluoride, borate, oxalate and phosphate) and need to remove them after Group II.

Bioinorganic Chemistry (25 Lectures)

Elements of life: essential and beneficial elements, major, trace and ultratrace elements. Basic chemical reactions in the biological systems and the role of metal ions (specially Na^+, K^+, Mg^{2+}, Ca^{2+}, $Fe^{3+/2+}$, $Cu^{2+/+}$, and Zn^{2+}). Metal ion transport across biological membrane Na^+/ K^+-ion pump. Dioxygen molecule in life. Dioxygen management proteins: Haemoglobin, Myoglobin, Hemocyanine and Hemerythrin. Hydrolytic enzymes: carbonate bicarbonate buffering system and carbonic anhydrase and carboxyanhydrase A. Toxic metal ions and their effects, chelation therapy (examples only), Pt and Au complexes as drugs (examples only), metal dependent diseases (examples only)

Organometallic Chemistry (25 Lectures)

Definition and classification of organometallic compounds on the basis of bond type.Concept of hapticity of organic ligands.18-electron and 16-electron rules (pictorial MO approach).Applications of 18-electron rule to metal carbonyls, nitrosyls, cyanides. General methods of preparation of mono and binuclear carbonyls of 3d series. Structures of mononuclear and binuclear carbonyls.pi-acceptor behaviour of CO, synergic effect and use of IR data to explain extent of back bonding. Zeise's salt: Preparation, structure, evidences of synergic effect. Ferrocene: Preparation and reactions (acetylation, alkylation, metallation, Mannich Condensation). Reactions of organometallic complexes: substitution, oxidative addition, reductive elimination and insertion reactions.

Catalysis by Organometallic Compounds

Study of the following industrial processes

1. Alkene hydrogenation (Wilkinson's Catalyst)
2. Hydroformylation
3. Wacker Process
4. Synthetic gasoline (Fischer Tropsch reaction)

5. Ziegler-Natta catalysis for olefin polymerization.

Reference Books

1. Lippard, S.J. & Berg, J.M. *Principles of Bioinorganic Chemistry* Panima Publishing Company 1994.
2. Huheey, J. E.; Keiter, E.A. & Keiter, R.L. *Inorganic Chemistry, Principles ofStructure and Reactivity 4th Ed.*, Harper Collins 1993, Pearson,2006.
3. Greenwood, N.N. & Earnshaw A. *Chemistry of the Elements*, Butterworth-Heinemann, 1997.
4. Cotton, F.A., Wilkinson, G., Murrillo, C. A., Bochmann, M., *Advanced Inorganic Chemistry 6th Ed. 1999.*,Wiley.
5. Bertini, I., Gray, H. B., Lippard, S.J., Valentine, J. S., Viva, 2007.
6. Basolo, F, and Pearson, R.C. *Mechanisms of Inorganic Chemistry*, John Wiley & Sons, NY, 1967.
7. Purecell, K.F. and Kotz, J.C., *An Introduction toInorganic Chemistry*, Saunders: Philadelphia, 1980.
8. Powell, P. *Principles of Organometallic Chemistry*, Chapman and Hall, 1988.
9. Collman, J. P. *et al. Principles and Applications of Organotransition MetalChemistry*. Mill Valley, CA: University Science Books, 1987.
10. Crabtree, R. H. *The Organometallic Chemistry of the Transition Metals*. New York, NY: John Wiley, 2000.

CEMA-CC-6-13-P: (45 Lectures)

Qualitative semimicro analysis of mixtures containing not more than three radicals. Emphasis should be given to the understanding of the chemistry of different reactions.

Cation Radicals: Na^{+},K^{+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Al^{3+}, Cr^{3+}, Mn^{2+}/Mn^{4+}, Fe^{3+}, Co^{2+}/Co^{3+}, Ni^{2+}, Cu^{2+}, Zn^{2+}, Pb^{2+}, Cd^{2+} (Demo), Bi^{3+} (Demo), Sn^{2+}/Sn^{4+}, As^{3+}/As^{5+}, $Sb^{3+/5+}$ (Demo), NH_4^{+}, Mg^{2+} (Demo).

Anion Radicals: F^{-}, Cl^{-}, Br^{-}, BrO_3^{-}, I^{-}, IO_3^{-}, SCN^{-}, S^{2-}, SO_4^{2-}, NO_3^{-}, NO_2^{-}, PO_4^{3-}, AsO_4^{3--}, BO_3^{3-}, CrO_4^{2-} / $Cr_2O_7^{2-}$, $Fe(CN)_6^{4-}$, $Fe(CN)_6^{3-}$.

Insoluble Materials: Al_2O_3(ig), Fe_2O_3(ig), Cr_2O_3(ig), SnO_2, $SrSO_4$, $BaSO_4$, CaF_2, $PbSO_4$.

Reference Books

1. Svehla, G., *Vogel's Qualitative Inorganic Analysis*, Pearson Education, 2012.*2. Practical Workbook Chemistry (Honours), UGBS, Chemistry*, University of Calcutta, 2015

CEMA-CC-6-14-TH:

(Credits: Theory-04, Practicals-02)

PHYSICAL CHEMISTRY-5

Theory: 60 Lectures

Molecular Spectroscopy (25 Lectures)

Interaction of electromagnetic radiation with molecules and various types of spectra;
Rotation spectroscopy: Selection rules, intensities of spectral lines, determination of bond lengths of diatomic and linear triatomic molecules, isotopic substitution
Vibrational spectroscopy: Classical equation of vibration, computation of force constant, amplitude of diatomic molecular vibrations, anharmonicity, Morse potential, dissociation energies, fundamental frequencies, overtones, hot bands, degrees of freedom for polyatomic molecules, modes of vibration, Diatomic vibrating rotator, P, Q, R branches
Electronic Spectroscopy: Potential energy curves (diatomic molecules), Frank-Condon principle and vibrational structure of electronic spectra; Frank Condon factor. Bond dissociation and principle of determination of dissociation energy (ground state); Decay of excited states by radiative and non-radiative paths; Pre-dissociation; Fluorescence and phosphorescence, Jablonskii diagram;

Raman spectroscopy: Classical Treatment. Rotational Raman effect; Vibrational Raman spectra, Stokes and anti-Stokes lines; their intensity difference, rule of mutual exclusion

Photochemistry and Theory of reaction rate: (15 Lectures)

Lambert-Beer's law: Characteristics of electromagnetic radiation, Lambert-Beer's law and its limitations, physical significance of absorption coefficients; Laws of photochemistry, Stark-Einstein law of photochemical equivalence quantum yield, actinometry, examples of low and high quantum yields
Rate of Photochemical processes: Photochemical equilibrium and the differential rate of photochemical reactions, Photostationary state; HI decomposition, H_2-Br_2 reaction, dimerisation of anthracene; photosensitised reactions, quenching; Role of photochemical reactions in biochemical processes, chemiluminescence

Collision theory of reaction rate (detailed treatment). Lindemann theory of unimolecular reaction; Outline of Transition State theory (classical treatment) . Primary Kinetic Salt Effect.

Surface phenomenon (15 Lectures)

Surface tension and energy:

Surface tension, surface energy, excess pressure, capillary rise and surface tension; Work of cohesion and adhesion, spreading of liquid over other surface; Vapour pressure over curved surface; Temperature dependence of surface tension

Adsorption:

Physical and chemical adsorption; Freundlich and Langmuir adsorption isotherms; multilayer adsorption and BET isotherm (no derivation required); Gibbs adsorption isotherm and surface excess; Heterogenous catalysis (single reactant);

Colloids:

Lyophobic and lyophilic sols, Origin of charge and stability of lyophobic colloids, Coagulation and Schultz-Hardy rule, Zeta potential and Stern double layer (qualitative idea), Tyndall effect; Electrokinetic phenomena (qualitative idea only); Stability of colloids and zeta potential; Micelle formation

Dipole moment and polarizability: **(05 Lectures)**

Polarizability of atoms and molecules, dielectric constant and polarisation, molar polarisation for polar and non-polar molecules; Clausius-Mosotti equation and Debye equation (both without derivation) and their application; Determination of dipole moments

Reference Books

1. **Levine, I. N. *Physical Chemistry*, 6th Edition , McGraw-Hill India**
2. **Castellan, G. W. *Physical Chemistry*, Narosa**
3. **McQuarrie, D. A. & Simons, J. D. *Physical Chemistry: A Molecular Approach*, Viva Press**
4. **Kapoor K.L, A Text Book Of Physical Chemistry , McGraw Hill India**
5. Engel, T. & Reid, P. *Physical Chemistry*, 3rd Edition ,Pearson India
6. Atkins, P. W. & Paula, J. de *Atkins' Physical Chemistry*, 10th Edition, Oxford University Press
7. Maron, S. & Prutton , *Physical Chemistry*
8. Ball, D. W. *Physical Chemistry*, Thomson Press
9. Mortimer, R. G. *Physical Chemistry*, 2nd Edition, Elsevier
10. Banwell, C. N. Fundamentals of Molecular Spectroscopy, Tata-McGraw-Hill
11. Barrow, G. M. Molecular Spectroscopy, McGraw-Hill
12. Hollas, J.M. Modern Spectroscopy, Wiley India
13. McHale, J. L. Molecular Spectroscopy, Pearson Education
14. Wayne, C. E. & Wayne, R. P. Photochemistry, OUP
15. Brown, J. M. Molecular Spectroscopy, OUP

CEMA-CC-6-14-P: (45 Lectures)

Experiment 1: Determination of surface tension of a liquid using Stalagmometer
Experiment 2: Determination of the indicator constant of an acid base indicator spectrophotometrically
Experiment 3: Verification of Beer and Lambert's Law for $KMnO_4$ and $K_2Cr_2O_7$ solution
Experiment 4: Study of kinetics of $K_2S_2O_8$ + KI reaction, spectrophotometrically
Experiment 5: Determination of pH of unknown buffer, spectrophotometrically
Experiment 6: Determination of CMC of a micelle from Surface Tension Measurement.

Reference Books

1. Viswanathan, B., Raghavan, P.S. *Practical Physical Chemistry* Viva Books (2009)
2. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson
3. Harris, D. C. *Quantitative Chemical Analysis*. 6th Ed., Freeman (2007)
4. Palit, S.R., De, S. K. *Practical Physical Chemistry* Science Book Agency
5. Levitt, B. P. edited *Findlay's Practical Physical Chemistry* Longman Group Ltd.
6. Gurtu, J. N., Kapoor, R., *Advanced Experimental Chemistry* S. Chand & Co. Ltd.

DISCIPLINE SPECIFIC ELECTIVE COURSES

Semester 5

1. Any one from DSEA-1 and DSEA-2
2. Any one from DSEB-1 and DSEB-2

Semester 6

3. Any one from DSEA-3 and DSEA-4
4. Any one from DSEB-3 and DSEB-4

DSE-A

DSE A-1: MOLECULAR MODELLING AND DRUG DESIGN

(Credits: Theory-04, Practicals-02)
Theory: 60 Lectures

Introduction to Molecular Modelling: (8 Lectures)
Introduction. Useful Concepts in Molecular Modelling: Coordinate Systems. Potential Energy Surfaces. Molecular Graphics Surfaces.

Force Fields: (12 Lectures)
Bond Stretching.Angle Bending.Introduction to nonbonded interactions. Electrostatic interactions.van der Waals Interactions. Hydrogen bonding in Molecular Mechanics.Force Field Models for the Simulation of Liquid Water.

Energy Minimization and Computer Simulation: (12 Lectures)
Minimization and related methods for exploring the energy surface. Non-derivative method, First and second order minimization methods. Computer simulation methods.Simple thermodynamic properties and Phase Space Boundaries. Analyzing the results of a simulation and estimating Errors

Molecular Dynamics & Monte Carlo Simulation: (16 Lectures)
Molecular Dynamics Simulation Methods.Molecular Dynamics using simple models. Molecular Dynamics with continuous potentials. Molecular Dynamics at constant temperature and pressure. Metropolis method.Monte Carlo simulation of molecules.

Structure Prediction and Drug Design: (12 Lectures)
Structure prediction - Introduction to comparative Modeling.Sequence alignment. Constructing and evaluating a comparative model. Predicting protein structures by 'Threading', Molecular docking. Structure based de novo ligand design, QSAR.

Reference Books:

1. A.R. Leach, Molecular Modelling Principles and Application, Longman, 2001.
2. J.M. Haile, Molecular Dynamics Simulation Elementary Methods, John Wiley and Sons, 1997.
3. Satya Prakash Gupta, QSAR and Molecular Modeling, Springer - Anamaya Publishers, 2008.

PRACTICAL- DSE A-1: MOLECULAR MODELLING & DRUG DESIGN

(45 Lectures)

i. Compare the optimized C-C bond lengths in ethane, ethene, ethyne and benzene. Visualize the molecular orbitals of the ethane σ bonds and ethene, ethyne, benzene and pyridine π bonds.
ii. (a) Perform a conformational analysis of butane. (b) Determine the enthalpy of isomerization of *cis* and *trans* 2-butene.
iii. Visualize the electron density and electrostatic potential maps for LiH, HF, N2, NO and CO and comment. Relate to the dipole moments. Animate the vibrations of these molecules.
iv. (a) Relate the charge on the hydrogen atom in hydrogen halides with their acid character. (b) Compare the basicities of the nitrogen atoms in ammonia, methylamine, dimethylamine and trimethylamine.
v. (a) Compare the shapes of the molecules: 1-butanol, 2-butanol, 2-methyl-1-propanol, and 2-methyl-2-propanol. Note the dipole moment of each molecule. (b) Show how the shapes affect the trend in boiling points: (118 ºC, 100 ºC, 108 ºC, 82 ºC, respectively).
vi. Build and minimize organic compounds of your choice containing the following functional groups. Note the dipole moment of each compound: (a) alkyl halide (b) aldehyde (c) ketone (d) amine (e) ether (f) nitrile (g) thiol (h) carboxylic acid (i) ester (j) amide.
vii. (a) Determine the heat of hydration of ethylene. (b) Compute the resonance energy of
benzene by comparison of its enthalpy of hydrogenation with that of cyclohexene.
viii. Arrange 1-hexene, 2-methyl-2-pentene, (*E*)-3-methyl-2-pentene, (*Z*)-3-methyl-2-pentene, and 2,3-dimethyl-2-butene in order of increasing stability.
ix. (a) Compare the optimized bond angles H2O, H2S, H2Se. (b) Compare the HAH bond
angles for the second row dihydrides and compare with the results from qualitative MO theory.
Note: Software: ChemSketch, ArgusLab (www.planaria-software.com), TINKER 6.2 (dasher.wustl.edu/ffe), WebLab Viewer, Hyperchem, VMD, or any similar software.

Reference Books:

1) A.R. Leach, Molecular Modelling Principles and Application, Longman, 2001.
2) J.M. Haile, Molecular Dynamics Simulation Elementary Methods, John Wiley and Sons, 1997.

3) Satya Prakash Gupta, QSAR and Molecular Modeling, Springer - Anamaya Publishers, 2008.

DSE-A-2: APPLICATIONS OF COMPUTERS IN CHEMISTRY

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

Computer Programming Basics (FORTRAN): (Lectures: 20)

Elements ofFORTRAN Language.FORTRAN Keywords and commands, Logical and Relational Operators, iteration, Array variables, Matrix addition and multiplication.Function and Subroutine.

Introduction to Spreadsheet Software(MS Excel): (Lectures 25)

Creating a Spreadsheet, entering and formatting information, basic functions and formulae, creating charts, tables and graphs. Incorporating tables and graphs into word processing documents, simple calculations.

Solution of simultaneous equations(for eg: in chemical Equilibrium problems) using Excel **SOLVER** Functions. Use of Excel **Goal Seek** function.

Numerical Modelling: Simulation of pH metric titration curves, Excel functions **LINEST** and Least Squares. Numerical Curve Fitting, Regression, Numerical Differentiation and Integration

Statistical Analysis: (Lectures: 15)

Gaussian Distribution and Errors in Measurement and their effect on data sets. Descriptive Statistics using Excel, Statistical Significance Testing, the T test and the F test.

Reference Books

1. McQuarrie, D. A. Mathematics for Physical Chemistry University Science Books (2008).
2. Mortimer, R. Mathematics for Physical Chemistry. 3rd Ed. Elsevier (2005).
3. Steiner, E. The Chemical Maths Book Oxford University Press (1996).
4. Yates, P. Chemical calculations. 2nd Ed. CRC Press (2007).
5. Harris, D. C. Quantitative Chemical Analysis. 6th Ed., Freeman (2007) Chapters 3-5.

6. Levie, R. de, How to use Excel in analytical chemistry and in general scientific data analysis, Cambridge Univ. Press (2001)
7. Noggle, J. H. Physical chemistry on a Microcomputer. Little Brown & Co. (1985).
8. S. R. Crouch, F. J. Holler, Applications of MS Excel in Analytical Chemistry, Thomson, 2004.
9. V. Rajaraman, Computer Programming in FORTRAN 77, Prentice Hall, 1997
10. Martin Cwiakala, Schaum's Outline of Programming with FORTRAN 77, 1995

PRACTICALS DSE-A-2: APPLICATIONS OF COMPUTERS IN CHEMISTRY

(45 Lectures)

(At least 10 experiments are to be performed.)

1. Plotting of Graphs using a spreadsheet. (Planck's Distribution Law, Maxwell Boltzmann Distribution Curves as a function of temperature and molecular weight)
2. Determination of vapour pressure from Van der Waals Equation of State.
3. Determination of rate constant from Concentration-time data using **LINEST** function.
4. Determination of Molar Extinction Coefficient from Absorbent's data using **LINEST** function.
5. Determination of concentration simultaneously using Excel **SOLVER** Function.(For eg: Determination of $[OH^-]$, $[Mg^{2+}]$ and $[H_3O^+]$ from K_{sp} and K_w data of $Mg(OH)_2$.)
6. Simultaneous Solution of Chemical Equilibrium Problems to determine the equilibrium compositions from the Equilibrium Constant data at a given Pressure and Temperature.
7. Determination of Molar Enthalpy of Vaporization using Linear and Non Linear Least squares fit.
8. Calculation and Plotting of a Precipitation Titration Curve with MS Excel.
9. Acid-Base Titration Curve using Excel **Goal Seek** Function.
10. Plotting of First and Second Derivative Curve for pH metric and Potentiometric titrations .
11. Use of spreadsheet to solve the 1D Schrodinger Equation(Numerov Method).
12. Michaelis-Menten Kinetics for Enzyme Catalysis using Linear and Non - Linear Regression

Reference Books

1. Levie, R. de, How to use Excel in analytical chemistry and in general scientific data analysis, Cambridge Univ. Press (2001)
2. S. R. Crouch, F. J. Holler, Applications of MS Excel in Analytical Chemistry, Thomson, 2004.
3. Levine, I. N. Physical Chemistry, Tata McGraw-Hill ,6th Edition

DSE-A-3: GREEN CHEMISTRY AND CHEMISTRY OF NATURAL PRODUCTS

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

Introduction to Green Chemistry: (04 Lectures)

What is Green Chemistry? Need for Green Chemistry.Goals of Green Chemistry. Limitations/ Obstacles in the pursuit of the goals of Green Chemistry

Principles of Green Chemistry and Designing a Chemical synthesis: (16 Lectures)

Twelve principles of Green Chemistry with their explanations and examples and special emphasis on the following:

- Designing a Green Synthesis using these principles; Prevention of Waste/ byproducts; maximum incorporation of the materials used in the process into the final products , Atom Economy, calculation of atom economy of the rearrangement, addition, substitution and elimination reactions.
- Prevention/ minimization of hazardous/toxic products reducingtoxicity.

- Green solvents–supercritical fluids, water as a solvent for organic reactions, ionic liquids, PEG, solventless processes.
- Energy requirements for reactions – alternative sources of energy: use of microwaves and ultrasonic energy.
- Use of catalytic reagents (wherever possible) in preference to stoichiometric reagents; catalysis and green chemistry.

Examples of Green Synthesis/ Reactions and some real world cases: (20lectures)

1. Green Synthesis of the following compounds: adipic acid, catechol, disodium iminodiacetate (alternative to Strecker synthesis)
2. Microwave assisted reactions in water: Hofmann Elimination, methyl benzoate to benzoic acid, oxidation of toluene and alcohols; microwave assisted reactions in organic solvents: Diels-Alder reaction and Decarboxylation reaction
3. Ultrasound assisted reactions: sonochemical Simmons-Smith Reaction (Ultrasonic alternative to Iodine)
4. Green counterpart of common organic reactions: Aldol, Friedel-Crafts, Michael, Knoevenagel, Cannizzaro, benzoin condensation and Dieckmann condensation.
5. Rearrangement reactions by green approach: Fries rearrangement, Claisen rearrangement, Beckmann rearrangement, Baeyer-Villiger oxidation.

Future Trends in Green Chemistry: (12 Lectures)

Oxidation reagents and catalysts; Biomimetic, multifunctional reagents; Combinatorial green chemistry; Proliferation of solventless reactions.Green chemistry in sustainable development.

Alkaloids **(5 Lectures)**

Hoffmann's exhaustive methylation, Emde's modification, Structure elucidation Natural occurrence, General structural features, Isolation and their physiological action.Synthesis of Hygrine.Medicinal importance of Nicotine, Hygrine, Quinine, Morphine, Cocaine and Reserpine.

Terpenes **(3 Lectures)**

Occurrence, classification, isoprene rule; Elucidation of stucture and synthesis of Citral.

Reference Books

1. Anastas, P.T. & Warner, J.K.: *Green Chemistry - Theory and Practical*, Oxford University Press (1998).
2. Matlack, A.S. *Introduction to Green Chemistry*, Marcel Dekker (2001).
3. Cann, M.C. & Connely, M.E. *Real-World cases in Green Chemistry*, American Chemical Society, Washington (2000).
4.Ryan, M.A. & Tinnesand, M. *Introduction to Green Chemistry*, American Chemical Society, Washington (2002).
5. Lancaster, M. *Green Chemistry: An Introductory Text* RSC Publishing, 2nd Edition, 2010.
6. Ahluwalia, V. K & Kidwai, M. R. New Trends in Green Chemistry, Anamalaya Publishers, 2005.
7. Finar, I. L. *Organic Chemistry* (*Volume 2*), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).

PRACTICALS-DSE-A-3: GREEN CHEMISTRY

(45 Lectures)

(Any **SIX** of the following list)

1. Acetylation of primary amine (preparation of acetanilide).
2. [4+2] Cycloaddition reaction (Diels-Alder reaction between furan and maleic anhydride).
3. Preparation of biodiesel from vegetable/waste cooking oil.
4. Photoreduction of benzophenone to benzopinacol in the presence of sunlight.
5. Pinacol-pinacolone rearrangement reaction (preparation of benzopinacolone).
6. Solid state synthesis of benzilic acid from benzil.
7. Benzoin condensation using thiamine hydrochloride as a catalyst instead of potassium cyanide.
8. Green multicomponent synthesis (three component coupling).
9. Base catalysed aldol condensation (synthesis of dibenzal propanone from benzaldehyde and acetone).
10. Bromination of *trans*-stilbene using bromide/bromate mixture.
11. Preparation and characterization of gold nanoparticles using tea leaves.
12. Extraction of D-limonene from orange peel using liquid carbon dioxide.

13. Electrophilic aromatic substitution reaction (nitration of salicylic acid).
14. Green radical coupling reaction.

Reference Books

1. Anastas, P.T & Warner, J.C. *Green Chemistry: Theory and Practice,*OxfordUniversity Press (1998).
2. Kirchoff, M. & Ryan, M.A. *Greener approaches to undergraduate chemistryexperiment*. American Chemical Society, WashingtonDC (2002).
3. Ryan, M.A. *Introduction to Green Chemistry*, Tinnesand; (Ed), American Chemical Society, WashingtonDC (2002).
4. Sharma, R.K.; Sidhwani, I.T. & Chaudhari, M.K. I.K. *Green Chemistry Experiment:A monograph International Publishing House Pvt Ltd. New Delhi*. Bangalore CISBN978-93-81141-55-7 (2013).
5. Cann, M.C. & Connelly, M. E. *Real world cases in Green Chemistry*, American Chemical Society (2008).
6. Cann, M. C. & Thomas, P. *Real world cases in Green Chemistry*, American Chemical Society (2008).
7. Lancaster, M. *Green Chemistry: An Introductory Text* RSC Publishing, 2nd Edition, 2010.
8. Pavia, D.L., Lampman, G.M., Kriz, G.S. & Engel, R.G. *Introduction to OrganicLaboratory Techniques: A Microscale and Macro Scale Approach,* W.B.Saunders,1995.

DSE-A4: ANALYTICAL METHODS IN CHEMISTRY

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

Optical methods of analysis: (30 Lectures)

Origin of spectra, interaction of radiation with matter, fundamental laws of spectroscopy and selection rules, validity of Beer-Lambert's law.

UV-Visible Spectrometry: Basic principles of instrumentation (choice of source,monochromator and detector) for single and double beam instrument;
Basic principles of quantitative analysis: estimation of metal ions from aqueous solution,geometrical isomers, keto-enol tautomers. Determination of composition of metal complexes using Job's method of continuous variation and mole ratio method.
Infrared Spectrometry: Basic principles of instrumentation (choice of source, monochromator& detector) for single and double beam instrument; sampling techniques.

Structural illustration through interpretation of data, Effect and importance of isotope substitution.

Flame Atomic Absorption and Emission Spectrometry: Basic principles of instrumentation(choice of source, monochromator, detector, choice of flame and Burner designs. Techniques of atomization and sample introduction; Method of background correction, sources of chemical interferences and their method of removal. Techniques for the quantitative estimation of trace level of metal ions from water samples.

Thermal methods of analysis: (8 Lectures)

Theory of thermogravimetry (TG), basic principle of instrumentation.
Techniques for quantitative estimation of Ca and Mg from their mixture.

Electroanalytical methods: (7 Lectures)

Classification of electroanalytical methods, basic principle of pH metric, potentiometric and conductometric titrations. Techniques used for the determination of equivalence points. Techniques used for the determination of pKa values.

Separation techniques: (15 Lectures)

Solvent extraction: Classification, principle and efficiency of the technique.

Mechanism of extraction: extraction by solvation and chelation.
Technique of extraction: batch, continuous and counter current extractions.

Qualitative and quantitative aspects of solvent extraction: extraction of metal ions from aqueous solution, extraction of organic species from the aqueous and nonaqueous media.

Chromatography: Classification, principle and efficiency of the technique.
Mechanism of separation: adsorption, partition & ion exchange.
Development of chromatograms: frontal, elution and displacement methods.

Qualitative and quantitative aspects of chromatographic methods of analysis: IC, GLC, GPC, TLC and HPLC.

Stereoisomeric separation and analysis: Measurement of optical rotation, calculation of Enantiomeric excess (ee)/ diastereomeric excess (de) ratios and determination of enantiomeric composition using NMR, Chiral solvents and chiral shift reagents. Chiral chromatographic techniques using chiral columns (GC and HPLC).

Role of computers in instrumental methods of analysis.

Reference Books

1. Mendham, J., *A. I. Vogel's Quantitative Chemical Analysis 6thEd.,* Pearson, 2009.
2. Willard, H.H. *et al.*: *Instrumental Methods of Analysis*, 7th Ed. Wardsworth Publishing Company, Belmont, California, USA, 1988.

3. Christian, G.D. *Analytical Chemistry*, 6th Ed. John Wiley & Sons, New York, 2004.
4. Harris, D.C.: *Exploring Chemical Analysis*, 9th Ed. New York, W.H. Freeman, 2016.
5. Khopkar, S.M. *Basic Concepts of Analytical Chemistry*. New Age International Publisher, 2009.
6. Skoog, D.A. Holler F.J. & Nieman, T.A. *Principles of Instrumental Analysis*, Cengage Learning India Ed.
7. Mikes, O. *Laboratory Hand Book of Chromatographic & Allied Methods*, Elles Harwood Series on Analytical Chemistry, John Wiley & Sons, 1979.
8. Ditts, R.V. Analytical Chemistry; Methods of separation, van Nostrand, 1974.

PRACTICALS-DSE-A-4: ANALYTICAL METHODS IN CHEMISTRY

(45 Lectures)

I. Separation Techniques by:

Chromatography:

(a) Separation and identification of the monosaccharides present in the given mixture (glucose & fructose) by paper chromatography. Reporting the R_f values.

(b)Separate a mixture of Sudan yellow and Sudan Red by TLC technique and identify them on the basis of their R_f values.

(c) Chromatographic separation of the active ingredients of plants, flowers and juices by TLC

Solvent Extractions:

To separate a mixture of Ni^{2+}& Fe^{2+} by complexation with DMG and extracting the Ni^{2+}-DMG complex in chloroform, and determine its concentration by spectrophotometry.

II. Analysis of soil:

(i) Determination of pH of soil.
(ii) Estimation of calcium, magnesium, phosphate

III. Ion exchange:

Determination of exchange capacity of cation exchange resins and anion exchange resins.

IV. Spectrophotometry

1. Determination of pKa values of indicator using spectrophotometry.
2. Determination of chemical oxygen demand (COD).
3. Determination of Biological oxygen demand (BOD).

Reference Books

1. Mendham, J., *A. I. Vogel's Quantitative Chemical Analysis 6thEd.,* Pearson, 2009.
2. Willard, H.H. *et al.*: *Instrumental Methods of Analysis*, 7th Ed. Wardsworth Publishing Company, Belmont, California, USA, 1988.
3. Christian, G.D. *Analytical Chemistry*, 6th Ed. John Wiley & Sons, New York, 2004.
4. Harris, D.C.*Exploring Chemical Analysis*, 9th Ed. New York, W.H. Freeman, 2016.
5. Khopkar, S.M. *Basic Concepts of Analytical Chemistry*. New Age International Publisher, 2009.
6. Skoog, D.A. Holler F.J. and Nieman, T.A. *Principles of Instrumental Analysis*, Cengage Learning India Edition.
7. Mikes, O. & Chalmes, R.A. *Laboratory Handbook of Chromatographic & AlliedMethods*, Elles Harwood Ltd. London.
8. Ditts, R.V. *Analytical Chemistry: Methods of separation.*Van Nostrand, New York, 1974.

DSE-B

DSE-B-1: INORGANIC MATERIALS OF INDUSTRIALIMPORTANCE

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

Silicate Industries: (16 Lectures)

Glass: Glassy state and its properties, classification (silicate and non-silicate glasses).Manufacture and processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass.

Ceramics: Important clays and feldspar, ceramic, their types and manufacture. Hightechnology ceramics and their applications, superconducting and semiconducting oxides, fullerenes carbon nanotubes and carbon fibre.

Cements: Classification of cement, ingredients and their role, Manufacture of cement and thesetting process, quick setting cements.

Fertilizers: (8 Lectures)

Different types of fertilizers. Manufacture of the following fertilizers: Urea, ammonium nitrate, calcium ammonium nitrate, ammonium phosphates; polyphosphate, superphosphate, compound and mixed fertilizers, potassium chloride, potassium sulphate.

Surface Coatings: (10 Lectures)

Objectives of coatings surfaces, preliminary treatment of surface, classification of surface coatings.Paints and pigments-formulation, composition and related properties. Oil paint, Vehicle, modified oils, Pigments, toners and lakes pigments, Fillers, Thinners, Enamels, emulsifying agents. Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint), Dyes, Wax polishing, Water and Oil paints, additives, Metallic coatings (electrolytic and electroless), metal spraying and anodizing.

Batteries: (6 Lectures)

Primary and secondary batteries, battery components and their role, Characteristics of Battery.Working of following batteries: Pb acid, Li-Battery, Solid state electrolyte battery.Fuel cells, Solar cell and polymer cell.

Alloys: **(10 Lectures)**

Classification of alloys, ferrous and non-ferrous alloys, Specific properties of elements in alloys. Manufacture of Steel (removal of silicon decarbonization, demanganization, desulphurization dephosphorisation) and surface treatment (Arand heat treatment, nitriding, carburizing). Composition and properties of different types of steels.

Catalysis: **(6 Lectures)**

General principles and properties of catalysts, homogenous catalysis (catalytic steps and examples) and heterogenous catalysis (catalytic steps and examples) and their industrial applications, Deactivation or regeneration of catalysts.

Phase transfer catalysts, application of zeolites as catalysts.

Chemical explosives: **(4 Lectures)**

Origin of explosive properties in organic compounds, preparation and explosive properties of lead azide, PETN, cyclonite (RDX).Introduction to rocket propellants.

Reference Books

1. E. Stocchi: *Industrial Chemistry*, Vol-I, Ellis Horwood Ltd. UK.
2. R. M. Felder, R. W. Rousseau: *Elementary Principles of Chemical Processes*, Wiley Publishers, New Delhi.
3. W. D. Kingery, H. K. Bowen, D. R. Uhlmann: *Introduction to Ceramics*, Wiley Publishers, New Delhi.
4. J. A. Kent: Riegel's *Handbook of Industrial Chemistry*, CBS Publishers, New Delhi.
5. P. C. Jain, M. Jain: *Engineering Chemistry*, Dhanpat Rai & Sons, Delhi.
6. R. Gopalan, D. Venkappayya, S. Nagarajan: *Engineering Chemistry*, Vikas Publications, New Delhi.
7. Sharma, B.K. & Gaur, H. *Industrial Chemistry*, Goel Publishing House, Meerut (1996).

PRACTICALS-DSE B-1: INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE

(45 Lectures)

1. Determination of free acidity in ammonium sulphate fertilizer.
2. Estimation of Calcium in Calcium ammonium nitrate fertilizer.
3. Estimation of phosphoric acid in superphosphate fertilizer.
4. Electroless metallic coatings on ceramic and plastic material.
5. Determination of composition of dolomite (by complexometric titration).
6. Analysis of (Cu, Ni); (Cu, Zn) in alloy or synthetic samples.
7. Analysis of Cement.

8. Preparation of pigment (zinc oxide).

Reference Books

1. E. Stocchi: *Industrial Chemistry*, Vol-I, Ellis Horwood Ltd. UK.
2. R. M. Felder, R. W. Rousseau: *Elementary Principles of Chemical Processes*, Wiley Publishers, New Delhi.
3. W. D. Kingery, H. K. Bowen, D. R. Uhlmann: *Introduction to Ceramics*, Wiley Publishers, New Delhi.
4. J. A. Kent: Riegel's *Handbook of Industrial Chemistry*, CBS Publishers, New Delhi.
5. P. C. Jain, M. Jain: *Engineering Chemistry*, Dhanpat Rai & Sons, Delhi.
6. R. Gopalan, D. Venkappayya, S. Nagarajan: *Engineering Chemistry*, Vikas
7. Publications, New Delhi.
8. Sharma, B.K. & Gaur, H. *Industrial Chemistry*, Goel Publishing House, Meerut (1996).

DSE B-2: NOVEL INORGANIC SOLIDS

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

Synthesis and modification of inorganic solids: (10 Lectures)

Conventional heat and beat methods, Co-precipitation method, Sol-gel methods,Hydrothermal method, Ion-exchange and Intercalation methods.

Inorganic solids of technological importance: (10 Lectures)

Solid electrolytes – Cationic, anionic, mixed Inorganic pigments – coloured solids, white and
black pigments.
Molecular material and fullerides, molecular materials & chemistry – one-dimensionalmetals, molecular magnets, inorganic liquid crystals.

Nanomaterials: (10 Lectures)

Overview of nanostructures and nanomaterials: classification.
Preparation of gold and silver metallic nanoparticles, self-assembled nanostructures-control
of nanoarchitecture-one dimensional control. Carbon nanotubes and inorganic nanowires.Bio-inorganic nanomaterials, DNA and nanomaterials, natural and antisical nanomaterials,
bionano composites.

Introduction to engineering materials for mechanical construction: (10 Lectures)

Composition, mechanical and fabricating characteristics and applications of various types of
cast irons, plain carbon and alloy steels, copper, aluminum and their alloys like duralumin,
brasses and bronzes cutting tool materials, super alloys thermoplastics, thermosets andcomposite materials.

Composite materials(10 Lectures)

Introduction, limitations of conventional engineering materials, role of matrix in composites,classification, matrix materials, reinforcements, metal-matrix composites, polymer-matrixcomposites, fibre-reinforced composites, environmental effects on composites, applicationsof composites.

Speciality polymers: (10 Lectures)

Conducting polymers - Introduction, conduction mechanism, polyacetylene,
polyparaphenylene and polypyrole, applications of conducting polymers, Ion-exchange resins
and their applications. Ceramic & Refractory: Introduction, classification, properties, raw
materials, manufacturing and applications.

Reference Books:

• Shriver & Atkins. Inorganic Chemistry, Peter Alkins, Tina Overton, Jonathan Rourke, Mark Weller and Fraser Armstrong, 5th Edition, Oxford University Press (2011-2012)
• Adam, D.M. Inorganic Solids: An introduction to concepts in solid-state structural chemistry.
• Frank J. Ovens, Introduction to Nanotechnology

PRACTICAL – DSEB-2: NOVEL INORGANIC SOLIDS

(45 Lectures)

1. Determination of cation exchange method
2. Determination of total difference of solids.
3. Synthesis of hydrogel by co-precipitation method.
4. Synthesis of silver and gold metal nanoparticle

Reference Book

• Fahan, *Materials Chemistry*, Springer (2004).

DSE-B-3: POLYMER CHEMISTRY

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

Introduction and history of polymeric materials: (04 Lectures)

Different schemes of classification of polymers, Polymer nomenclature, Molecular forces and chemical bonding in polymers, Texture of Polymers.

Functionality and its importance: (08 Lectures)
Criteria for synthetic polymer formation, classification of polymerization processes, Relationships between functionality, extent of reaction and degree of polymerization.Bi-functional systems, Poly-functional systems.

Kinetics of Polymerization: (08 Lectures)

Mechanism and kinetics of step growth, radical chain growth, ionic chain (both cationic and anionic) and coordination polymerizations, Mechanism and kinetics of copolymerization, polymerization techniques.

Crystallization and crystallinity: (04 Lectures)

Determination of crystalline melting point and degree of crystallinity, Morphology of crystalline polymers, Factors affecting crystalline melting point.

Nature and structure of polymers: **(04 Lectures)**

Structure Property relationships.

Determination of molecular weight of polymers: (08 Lectures)
(*Mn*,*Mw*, etc) by end group analysis,viscometry, light scattering and osmotic pressure methods. Molecular weight distribution and its significance.Polydispersity index.

Glass transition temperature (Tg) and determination of Tg: **(08 Lectures)**
Free volume theory, WLFequation, Factors affecting glass transition temperature (Tg).

Polymer Solution: (08 Lectures)
Criteria for polymer solubility, Solubility parameter, Thermodynamicsof polymer solutions, entropy, enthalpy, and free energy change of mixing of polymers solutions, Flory- Huggins theory, Lower and Upper critical solution temperatures.

Properties of Polymer: **(08 Lectures)**
(Physical, thermal, Flow & Mechanical Properties).

Brief introduction to preparation, structure, properties and application of the following

polymers: polyolefins, polystyrene and styrene copolymers, poly(vinyl chloride) and related polymers, poly(vinyl acetate) and related polymers, acrylic polymers, fluoro polymers,
polyamides and related polymers. Phenol formaldehyde resins (Bakelite, Novalac), polyurethanes, silicone polymers, polydienes,

Polycarbonates, Conducting Polymers, [polyacetylene, polyaniline, poly(p-phenylene sulphide polypyrrole, polythiophene)].

Reference Books

1. R.B. Seymour & C.E. Carraher: *Polymer Chemistry: An Introduction,* Marcel Dekker, Inc. New York, 1981.
2. G. Odian: *Principles of Polymerization*, 4th Ed. Wiley, 2004.
3. F.W. Billmeyer: *Textbook of Polymer Science*, 2nd Ed. Wiley Interscience, 1971.
4. P. Ghosh: Polymer Science & Technology, Tata McGraw-Hill Education, 1991.
5. R.W. Lenz: *Organic Chemistry of Synthetic High Polymers.* Interscience Publishers, New York, 1967.

PRACTICALS – DSE- B-3: POLYMER CHEMISTRY

(45 Lectures)

Polymer synthesis

1. Free radical solution polymerization of styrene (St) / Methyl Methacrylate (MMA) / Methyl Acrylate (MA) / Acrylic acid (AA).
   a) Purification of monomer
   b) Polymerization using benzoyl peroxide (BPO) / 2,2'-azo-bis-isobutylonitrile (AIBN)
2. Preparation of nylon 66/6
3. Interfacial polymerization, preparation of polyester from isophthaloyl chloride (IPC) and phenolphthalein
4. Redox polymerization of acrylamide
5. Precipitation polymerization of acrylonitrile
6. Preparation of urea-formaldehyde resin
7. Preparations of novalac resin/ resold resin.
8. Microscale Emulsion Polymerization of Poly(methylacrylate).

Polymer characterization

1. Determination of molecular weight by viscometry:
   (a) Polyacrylamide-aq.$NaNO_2$ solution
   (b) (Poly vinyl proplylidine (PVP) in water
2. Determination of the viscosity-average molecular weight of poly(vinyl alcohol) (PVOH) and the fraction of "head-to-head" monomer linkages in the polymer.
3. Determination of molecular weight by end group analysis: Polyethylene glycol (PEG) (OH group).
4. Testing of mechanical properties of polymers.
5. Determination of hydroxyl number of a polymer using colorimetric method.

Polymer analysis

1. Estimation of the amount of HCHO in the given solution by sodium sulphite method
2. Instrumental Techniques
3. IR studies of polymers
4. DSC analysis of polymers
5. Preparation of polyacrylamide and its electrophoresis

*at least 7 experiments to be carried out.

Reference Books

1. M.P. Stevens, *Polymer Chemistry: An Introduction*, 3rd Ed., OxfordUniversity Press, 1999.
2. H.R. Allcock, F.W. Lampe & J.E. Mark, *Contemporary Polymer Chemistry*, 3rd ed. Prentice-Hall (2003)
3. F.W. Billmeyer, *Textbook of Polymer Science*, 3rd ed. Wiley-Interscience (1984)
4. J.R. Fried, *Polymer Science and Technology*, 2nd ed. Prentice-Hall (2003)
5. P. Munk & T.M. Aminabhavi, *Introduction to Macromolecular Science*, 2nd ed. John Wiley & Sons (2002)
6. L. H. Sperling, *Introduction to Physical Polymer Science*, 4th ed. John Wiley & Sons (2005)
7. M.P. Stevens, *Polymer Chemistry: An Introduction* 3rd ed. OxfordUniversity Press (2005).
8. Seymour/ Carraher's Polymer Chemistry, 9th ed. by Charles E. Carraher, Jr. (2013).

DSE B-4 : Dissertation

(Credits: 06)

In a total of 105 lecture hours, a student has to carry out research /review on a topic as assigned by the respective college. A project report and digital presentation will be required for the assessment of the student at the end of the semester.

SKILL ENHANCEMENT COURSES

SEC-A [SEMESTER 3]

SEC 1 – Mathematics and Statistics for Chemists

(Credits: 2 Lectures: 30)

1.Functions, limits, derivative, physical significance, basic rules of differentiation, maxima and minima, applications in chemistry,Error function, Gamma function, exact and inexact differential, Taylor and McLaurin series, Fourier series and Fourier Transform, Laplace transform, partial differentiation, rules of integration, definite and indefinite integrals. **(08 Lectures)**

2.**Differential equations**: Separation of variables, homogeneous, exact, linearequations, equations of second order, series solution method.

(04 Lectures)

3**. Probability**:Permutations, combinations and theory of probability**(03 Lectures)**

4.**Vectors, matrices and determinants:** Vectors, dot, cross and triple products, introduction to matrix algebra, addition and multiplication of matrices, inverse, adjoint and transpose of matrices, unit and diagonal matrices.

(04 Lectures)

5. **Qualitative and quantitative aspects of analysis:**
Sampling, evaluation of analytical data, errors, accuracy and precision, methods of their expression, normal law of distribution if indeterminate errors, statistical test of data; F, Q and t test, rejection of data, and confidence intervals. **(03 Lectures)**

6. **Analysis and Presentation of Data***:* Descriptive statistics. Choosing and using statistical tests.Chemometrics. Analysis of variance (ANOVA), Correlation and regression, fitting of linear equations, simple linear cases, weighted linear case, analysis

of residuals, general polynomial fitting, linearizing transformations, exponential function fit. Basic aspects of multiple linear regression analysis. **(08 Lectures)**

Reference Books

1.The Chemical Maths Book, E. Steiner, Oxford University Press (1996).
2. Hibbert, D. B. & Gooding, J. J. (2006) *Data analysis for chemistry*.
OxfordUniversity Press.
3. Higher Engineering Mathematics, Grewal B.S., Khanna Publishers, 43rd Edition.
4. Advanced Engineering Mathematics, Kreyszig Erwin, Wiley, 10th Edition

SEC 2 – ANALYTICAL CLINICAL BIOCHEMISTRY

(Credits: 2 Lectures:30)

Carbohydrates: Biological importance of carbohydrates, Metabolism, Cellular currency of energy (ATP), Glycolysis, Alcoholic and Lactic acid fermentations, Krebs cycle.
Isolation and characterization of polysachharides.
Proteins: Classification, biological importance; Primary and secondary and tertiary structures of proteins: α-helix and β- pleated sheets, Isolation, characterization, denaturation of proteins.
Enzymes: Nomenclature, Characteristics (mention of Ribozymes), and Classification; Active site, Mechanism of enzyme action, Stereospecificity of enzymes, Coenzymes and cofactors, Enzyme inhibitors, Introduction to Biocatalysis: Importance in "Green Chemistry" and Chemical Industry.
Lipids: Classification. Biological importance of triglycerides and phosphoglycerides and cholesterol; Lipid membrane, Liposomes and their biological functions and underlying applications.
Lipoproteins: Properties, functions and biochemical functions of steroid hormones. Biochemistry of peptide hormones.
Structure of DNA (Watson-Crick model) and RNA, Genetic Code, Biological roles of DNA and RNA: Replication, Transcription and Translation, Introduction to Gene therapy.
Biochemistry of disease: A diagnostic approach by blood/ urine analysis.
Blood: Composition and functions of blood, blood coagulation. Blood collection and preservation of samples.Anaemia, Regulation, estimation and interpretation of data for blood sugar, urea, creatinine, cholesterol and bilirubin.
Urine: Collection and preservation of samples. Formation of urine.Composition and estimation of constituents of normal and pathological urine.

Hands On Practical
Identification and estimation of the following:
1. Carbohydrates – qualitative and quantitative.
2. Lipids – qualitative.
3. Determination of the iodine number of oil.
4. Determination of the saponification number of oil.
5. Determination of cholesterol using Liebermann- Burchard reaction.

6. Proteins – qualitative.
7. Isolation of protein.
8. Determination of protein by the Biuret reaction.
9. Determination of nucleic acids

Reference Books

1. Cooper, T.G. Tool of Biochemistry. Wiley-Blackwell (1977).
2. Wilson, K. & Walker, J. Practical Biochemistry. Cambridge University Press (2009).
3. Varley, H., Gowenlock, A.H & Bell, M.: Practical Clinical Biochemistry, Heinemann, London (1980).
4. Devlin, T.M., Textbook of Biochemistry with Clinical Correlations, John Wiley & Sons, 2010.
5. Berg, J.M., Tymoczko, J.L. & Stryer, L. Biochemistry, W.H. Freeman, 2002.
6. Talwar, G.P. & Srivastava, M. Textbook of Biochemistry and Human Biology, 3rd Ed. PHI Learning.
7. Nelson, D.L. & Cox, M.M. Lehninger Principles of Biochemistry, W.H. Freeman, 2013.
8. O. Mikes, R.A. Chalmers: Laboratory Handbook of Chromatographic Methods, D. Van Nostrand & Co., 1961.

SEC-B [SEMESTER 4]

SEC 3 – PHARMACEUTICALS CHEMISTRY

(Credits: 2 Lectures: 30)

Drugs & Pharmaceuticals

Drug discovery, design and development; Basic Retrosynthetic approach. Synthesis of the representative drugs of the following classes: analgesics agents, antipyretic agents, anti-inflammatory agents (Aspirin, paracetamol, lbuprofen); antibiotics (Chloramphenicol); antibacterial and antifungal agents (Sulphonamides; Sulphanethoxazol, Sulphacetamide, Trimethoprim); antiviral agents (Acyclovir), Central Nervous System agents (Phenobarbital, Diazepam),Cardiovascular (Glyceryl trinitrate), antilaprosy (Dapsone), HIV-AIDS related drugs (AZT- Zidovudine).

Fermentation

Aerobic and anaerobic fermentation. Production of (i) Ethyl alcohol and citric acid, (ii) Antibiotics; Penicillin, Cephalosporin, Chloromycetin and Streptomycin, (iii) Lysine, Glutamic acid, Vitamin B2, Vitamin B12 and Vitamin C.

Hands On Practical

1. Preparation of Aspirin and its analysis.
2. Preparation of magnesium bisilicate (Antacid).

Reference Books

1. Patrick, G. L. Introduction to Medicinal Chemistry, Oxford University Press, UK, 2013.
2. Singh, H. & Kapoor, V.K. Medicinal and Pharmaceutical Chemistry, Vallabh Prakashan, Pitampura, New Delhi, 2012.
3. Foye, W.O., Lemke, T.L. & William, D.A.: Principles of Medicinal Chemistry, 4th ed., B..I. Waverly Pvt. Ltd. New Delhi.

SEC-4 PESTICIDE CHEMISTRY

(Credits: 02, 30 Lectures)

General introduction to pesticides (natural and synthetic), benefits and adverse effects, changing concepts of pesticides, structure activity relationship, synthesis and technical manufacture and uses of representative pesticides in the following classes:Organochlorines(DDT, Gammexene,); Organophosphates (Malathion, Parathion); Carbamates (Carbofuranand carbaryl); Quinones (Chloranil), Anilides (Alachlor and Butachlor).

Hands on Practicals

1 To calculate acidity/alkalinity in given sample of pesticide formulations as per BIS specifications.

2 Preparation of simple organophosphates, phosphonates and thiophosphates

Reference Book:

• R. Cremlyn: *Pesticides*, John Wiley.

GENERAL ELECTIVE COURSE IN CHEMISTRY

Course Structure (B.Sc. General)

Course Credits

	Theory+ Practical
Core Course (CC)	
Theory (12 Papers of 4 credits each)	12×4=48
Practical (12 Papers of 2 credits each)	12×2=24
Discipline Specific Elective Course*(DSE)	
Theory (6 Papers of 4 credits each)	6×4=24
Practical(6 Papers of 2 credits each)	6×2=12
Ability Enhancement Compulsory Course (AECC)	
(2 Papers of 2 credits)	2×2=4
Environmental Science	
English/MIL Communication	
Skill Enhancement Elective Course (SEC)	
(4 Papers of 2 credits)	4×2=8
Total credit	**120**

B.SC. (GENERAL) CHEMISTRY [CEM-G]

CORE /GENERIC COURSES

SEM	COURSE CODE [CEM-G]	PAPER
1	CC1/GE1	PAPER 1
2	CC2/GE2	PAPER 2
3	CC3/GE3	PAPER 3
4	CC4/GE4	PAPER 4

DISCIPLINE SPECIFIC ELECTIVE [DSE] COURSES

DSE- A

DSEA-1 : Novel Inorganic Solids
DSEA-2: Inorganic Materials of Industrial Importance

DSE-B

DSEB-1 : Green Chemistry and Chemistry of Natural Products
DSEB-2: Analytical Methods in Chemistry

SKILL ENHANCEMENT COURSES [SEC]

SEC(A): (Any one either in semester III or V)
SEC1 : Basic Analytical Chemistry
SEC2– Analytical Clinical Biochemistry

SEC(B) (Any one either in semester IV or VI)

SEC 3 – PHARMACEUTICALS CHEMISTRY
SEC 4 - PESTICIDE CHEMISTRY

CC1/ GE 1:

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

Kinetic Theory of Gases and Real gases

Concept of pressure and temperature; Collision of gas molecules; Collision number and mean free path. Nature of distribution of velocities, Maxwell's distribution of speed and kinetic energy; Average velocity, root mean square velocity and most probable velocity; Principle of equipartition of energy Deviation of real gases from ideal behavior; compressibility factor; Boyle temperature; Andrew's and Amagat's plots; van der Waals equation and its features; Existence of critical state, Critical constants in terms of van der Waals constants; Law of corresponding states.

Liquids

Definition of Surface tension, its dimension and principle of its determination using stalagmometer; Viscosity of a liquid and principle of determination of coefficient of viscosity using Ostwald viscometer; Effect of temperature on surface tension and coefficient of viscosity of a liquid (qualitative treatment only)

Chemical Kinetics

Introduction of rate law, Order and molecularity; Extent of reaction; rate constants; Rates of First, second and nth order reactions and their Differential and integrated forms (with derivation); Pseudo first order reactions; Determination of order of a reaction by halfhalf-life and differential method. Temperature dependence of rate constant; Arrhenius equation, energy of activation;

Atomic Structure

Bohr's theory for hydrogen atom (simple mathematical treatment), atomic spectra of hydrogen and Bohr's model, Sommerfeld's model, quantum numbers and their significance, Pauli's exclusion principle, Hund's rule, electronic configuration of many-electron atoms, *Aufbau* principle and its limitations.

Chemical Periodicity

Classification of elements on the basis of electronic configuration: general characteristics of s-, p-, d- and f-block elements. Positions of hydrogen and noble gases. Atomic and ionic radii, ionization potential, electron affinity, and electronegativity; periodic and group-wise variation of above properties in respect of s- and p- block elements.

Acids and bases

Brönsted–Lowry concept, conjugate acids and bases, relative strengths of acids and bases, effects of substituent and solvent, differentiating and leveling solvents. Lewis acid-base concept, classification of Lewis acids and bases, Lux-Flood concept and solvent system concept. Hard and soft acids and bases (HSAB concept), applications of HSAB process.

Fundamentalsof Organic Chemistry

Electronic displacements: inductive effect, resonance and hyperconjugation; nucleophiles and electrophiles; reactive intermediates: carbocations, carbanions and free radicals.

Stereochemistry

Different types of isomerism; geometrical and optical isomerism; concept of chirality and optical activity (upto two carbon atoms); asymmetric carbon atom; interconversion of Fischer and Newman representations; enantiomerism and diastereomerism, *meso* compounds; *threo* and

erythro, D and L, *cis* and *trans* nomenclature; CIP Rules: *R/S* (only one chiral carbon atoms) and *E/Z* nomenclature.

Nucleophilic Substitution and Elimination Reactions
Nucleophilic substitutions: S_N1 and S_N2 reactions; eliminations: E1 and E2 reactions (elementary mechanistic aspects); Saytzeff and Hofmann eliminations.

CC1/GE 1 Practical: 45 Lectures

1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.

2. Estimation of oxalic acid by titrating it with $KMnO_4$.

3. Estimation of water of crystallization in Mohr's salt by titrating with $KMnO_4$.

4. Estimation of Fe (II) ions by titrating it with $K_2Cr_2O_7$ using internal indicator.

5. Estimation of Cu (II) ions iodometrically using $Na_2S_2O_3$.

6.Estimation of Fe(II) and Fe(III) in a given mixture using $K_2Cr_2O_7$ solution.

CC2/GE 2:

(Credits: Theory-04, Practicals-02)
Theory: 60 Lectures

Chemical Thermodynamics:
Intensive and extensive variables; state and path functions; isolated, closed and open systems; zeroth law of thermodynamics; Concept of heat, work, internal energy and statement of first law; enthalpy, H; relation between heat capacities, calculations of q, w, ΔU and ΔH for reversible, irreversible and free expansion of gases.
Standard states; Heats of reaction; enthalpy of formation of molecules and ions and enthalpy of combustion and its applications; Laws of thermochemistry, Kirchhoff's equations. Statement of the second law of thermodynamics; Concept of heat reservoirs and heat engines; Carnot cycle; Physical concept of Entropy; Entropy change of systems and surroundings for various processes and transformations; Auxiliary state functions (G and A) and Criteria for spontaneity and equilibrium.

Chemical Equilibrium:
Thermodynamic conditions for equilibrium, degree of advancement; Variation of free energy with degree of advancement; Equilibrium constant and standard Gibbs free energy change; Definitions of K_P, K_C and K_X and relation among them; van't Hoff's reaction isotherm, isobar and isochore from different standard states; Shifting of equilibrium due to change in external parameters e.g. temperature and pressure; variation of equilibrium constant with addition to inert gas; Le Chatelier's principle

Solutions
Ideal solutions and Raoult's law, deviations from Raoult's law – non-ideal solutions; Vapour pressure-composition and temperature-composition curves of ideal and non-ideal solutions; Distillation of solutions; Lever rule; Azeotropes
Nernst distribution law and its applications, solvent extraction

Phase Equilibria
Phases, components and degrees of freedom of a system, criteria of phase equilibrium; Gibbs Phase Rule; Derivation of Clausius – Clapeyron equation and its importance in phase equilibria; Phase diagrams of one-component systems (water and CO_2)

Solids
Forms of solids, crystal systems, unit cells, Bravais lattice types, Symmetry elements; Laws of Crystallography - Law of constancy of interfacial angles, Law of rational indices; Miller indices of different planes and interplanar distance, Bragg's law;

Aliphatic Hydrocarbons
Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structures.
Alkanes: (up to 5 Carbons). *Preparation:* catalytic hydrogenation, Wurtz reaction, Kolbe's synthesis.
Alkenes: (up to 5 Carbons). *Preparation:* elimination reactions: dehydration of alcohols and dehydrohalogenation of alkyl halides; *cis* alkenes (partial catalytic hydrogenation) and *trans* alkenes (Birch reduction). *Reactions:* addition of bromine, addition of HX [Markownikoff's (with mechanism) and anti-Markownikoff's addition], hydration, ozonolysis.
Alkynes: (up to 5 Carbons). *Preparation:* acetylene from CaC_2; by dehalogenation of tetra halides and dehydrohalogenation of vicinal dihalides.

Reactions: formation of metal acetylides, hydration reaction.

Error Analysis and Computer Applications
*Error analysis***:** accuracy and precision of quantitative analysis, determinate, indeterminate, systematic and random errors; methods of least squares and standard deviations.
Computer applications: general introduction to computers, different components of a computer; hardware and software; input and output devices; binary numbers and arithmetic; Introduction to computer languages.

Redox reactions
Ion-electron method of balancing equation of redox reaction. Elementary idea on standard redox potentials with sign conventions, Nernst equation (without derivation). Influence of complex formation, precipitation and change of pH on redox potentials; formal potential. Feasibility of a redox titration, redox potential at the equivalence point, redox indicators

CC2/GE 2 Practical: 45 Lectures

Experiment 1: Study of kinetics of acid-catalyzed hydrolysis of methyl acetate

Experiment 2: Study of kinetics of decomposition of H_2O_2 (Clock Reaction)

Experiment 3: Study of viscosity of unknown liquid (glycerol, sugar) with respect to water.

Experiment 4: Determination of solubility of sparingly soluble salt in water, in electrolyte with common ions and in neutral electrolyte (using common indicator)

Experiment 5:Preparation of buffer solutions and find the pH of an unknown buffer solution by colour matching method

Experiment 6: Determination of surface tension of a liquid using Stalagmometer

CC3/GE 3:

(Credits: Theory-04, Practicals-02)
Theory: 60 Lectures

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Chemical Bonding and Molecular Structure
Ionic Bonding: General characteristics of ionic bonding. Energy considerations in ionic bonding, lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds. Statement of Born-Landé equation for calculation of lattice energy, Born-Haber cycle and its applications, polarizing power and polarizability. Fajan's rules, ionic character in covalent compounds, bond moment, dipole moment and percentage ionic character.

Covalent bonding: VB Approach: Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements.
Concept of resonance and resonating structures in various inorganic and organic compounds.

MO Approach: Rules for the LCAO method, bonding and antibonding MOs and their characteristics for *s-s*, *s-p* and *p-p* combinations of atomic orbitals, nonbonding combination of orbitals, MO treatment of homonuclear diatomic molecules of 1st and 2nd periods. (including idea of *s- p* mixing) and heteronuclear diatomic molecules such as CO, NO and NO^+. Comparison of VB and MO approaches.

Comparative study of p-block elements:
Group trends in electronic configuration, modification of pure elements, common oxidation states, inert pair effect, and their important compounds in respect of the following groups of elements:
i) B-Al-Ga-In-Tl
ii) C-Si-Ge-Sn-Pb
iii) N-P-As-Sb-Bi
iv) O-S-Se-Te
v) F-Cl-Br-I

Transition Elements (3*d* series)
General group trends with special reference to electronic configuration, variable valency, colour, magnetic and catalytic properties, ability to form complexes and stability of various oxidation states (Latimer diagrams) for Mn, Fe and Cu.
Lanthanoids and actinoids: Electronic configurations, oxidation states, colour, magnetic properties, lanthanide contraction, separation of lanthanides (ion exchange method only).

Coordination Chemistry
Werner's coordination theory, Valence Bond Theory (VBT): Inner and outer orbital complexes of Cr, Fe, Co, Ni and Cu (coordination numbers 4 and 6). Structural and stereoisomerism in complexes with coordination numbers 4 and 6. Drawbacks of VBT. IUPAC system of nomenclature

ELECTROCHEMISTRY

1) Ionic Equilibria
Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water; Ionization of weak acids and bases, pH scale, common ion effect; Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts; Buffer solutions; Solubility and solubility product of sparingly soluble salts – applications of solubility product principle

2) Conductance
Conductance, cell constant, specific conductance and molar conductance; Variation of specific and equivalent conductance with dilution for strong and weak electrolytes; Kohlrausch's law of independent migration of ions; Equivalent and molar conductance at infinite dilution and their determination for strong and weak electrolytes; Ostwald's dilution
law; Application of conductance measurement (determination of solubility product and ionic product of water); Conductometric titrations (acid-base)
Transport Number and principles Moving-boundary method

3) Electromotive force
Faraday's laws of electrolysis, rules of oxidation/reduction of ions based on half-cell potentials, applications of electrolysis in metallurgy and industry; Chemical cells, reversible and irreversible cells with examples; Electromotive force of a cell and its measurement, Nernst equation; Standard electrode (reduction) potential; Electrochemical series;

Concentration cells with and without transference, liquid junction potential; pH determinationusing hydrogen electrode and quinhydrone; Qualitative discussion of potentiometric titrations (acid-base, redox, precipitation)

Aromatic Hydrocarbons
Benzene: Preparation: from phenol, by decarboxylation, from acetylene. *Reactions*: electrophilic substitution reaction (general mechanism); nitration (with mechanism), halogenations (chlorination and bromination), and Friedel-Crafts reaction (alkylation and acylation) (up to 4 carbons on benzene).

Organometallic Compounds
Introduction; *Grignard reagents*: *Preparations* (from alkyl and aryl halide); Reformatsky reaction.

Aryl Halides
Preparation: (chloro- and bromobenzene): from phenol, Sandmeyer reactionand effect of nitro substituent (activated nucleophilic substitution

CC3/GE 3 Practical: 45 Lectures

Qualitative semimicro analysis of mixtures containing two radicals. Emphasis should be given to the understanding of the chemistry of different reactions.

Cation Radicals: Na^{+},K^{+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Al^{3+}, Cr^{3+}, Mn^{2+}/Mn^{4+}, Fe^{3+}, Co^{2+}/Co^{3+}, Ni^{2+}, Cu^{2+}, Zn^{2+}, Pb^{2+}, Sn^{2+}/Sn^{4+}, NH_4^{+}.
Anion Radicals: F^{-}, Cl^{-}, Br^{-}, BrO_3^{-}, I^{-}, IO_3^{-}, SCN^{-}, S^{2-}, SO_4^{2-}, NO_3^{-}, NO_2^{-}, PO_4^{3-}, AsO_4^{3--}, BO_3^{3-}, CrO_4^{2-} / $Cr_2O_7^{2}$

CC4/GE 4:
(Credits: Theory-04, Practicals-02)
Theory: 60 Lectures

Alcohols, Phenols and Ethers
Alcohols: (up to 5 Carbons).
Preparation: 1°-, 2°- and 3°- alcohols: using Grignard reagent, reduction of aldehydes, ketones, carboxylic acid and esters; *Reactions:* With sodium, oxidation (alkaline $KMnO_4$, acidic dichromate).
Diols: Pinacol- pinacolone rearrangement (with mechanism) (*with symmetrical diols* only).
Phenols: Preparation: cumene hydroperoxide method, from diazonium salts; acidic nature of phenols; *Reactions:* electrophilic substitution: nitration and halogenations; Reimer -Tiemann reaction, Schotten –Baumann reaction, Fries rearrangementand Claisen rearrangement.
Ethers: Preparation: Williamson's ether synthesis; *Reaction*: cleavage of ethers with HI.

Carbonyl Compounds
Aldehydes and Ketones (aliphatic and aromatic): (Formaldehye, acetaldehyde, acetone and benzaldehyde): *Preparation:* from acid chlorides, from nitriles and from Grignard reagents; general properties of aldehydes and ketones; *Reactions:* with HCN, $NaHSO_3$, NH_2-G derivatives and with Tollens' and Fehling's reagents; iodoform test; aldol condensation (with mechanism);

Cannizzaro reaction (with mechanism), Wittig reaction, benzoin condensation; Clemmensen reduction, Wolff- Kishner reduction

Carboxylic Acids and Their Derivatives

Carboxylic acids (aliphatic and aromatic): strength of organic acids: comparative study with emphasis on factors affecting pK values; *Preparation:* acidic and alkaline hydrolysis of esters ($B_{Ac}2$ and $A_{AC}2$ mechanisms only) and from Grignard reagents.

*Carboxylic acid derivatives (*aliphatic*):* (up to 5 carbons). *Preparation:* acid chlorides, anhydrides, esters and amides from acids; *Reactions:* Interconversion among acid derivatives. *Reactions:*Claisen condensation; Perkin reaction.

Amines and Diazonium Salts

Amines (aliphatic and aromatic): strength of organic bases; *Preparation*: from alkyl halides, Hofmann degradation;

Reactions: with HNO_2 (distinction of 1°-, 2°- and 3°- amines), Schotten – Baumann reaction , Diazo coupling reaction (with mechanism).

Diazonium salts: Preparation: from aromatic amines; *Reactions:* conversion to benzene, phenol, benzoic acid and nitrobenzene.

Nitro compounds (aromatic): reduction under different conditions (acidic, neutral and alkaline).

Amino Acids and Carbohydrates

Amino Acids: Preparations (glycine and alanine only)*:* Strecker synthesis, Gabriel's phthalimide synthesis; general properties; zwitterion, isoelectric point.

Carbohydrates: classificationand general properties; glucose and fructose: constitution; osazone formation; oxidation-reduction reactions; ascending (Kiliani –Fischer method) and descending (Ruff's method) in monosaccharides (aldoses only); mutarotation

Crystal Field Theory

Crystal field effect, octahedral symmetry. Crystal field stabilization energy (CFSE), Crystal field effects for weak and strong fields. Tetrahedral symmetry. Factors affecting the magnitude of D. Spectrochemical series. Comparison of CFSE for O_h and T_d complexes, Tetragonal distortion of octahedral geometry.

Jahn-Teller distortion, Square planar coordination

Quantum Chemistry & Spectroscopy

Spectroscopy and its importance in chemistry. Wave-particle duality. Link between spectroscopy and quantum chemistry. Electromagnetic radiation and its interaction with matter. Types of spectroscopy. Difference between atomic and molecular spectra

Postulates of quantum mechanics, quantum mechanical operators.

Free particle. Particle in a 1-D box (complete solution), quantization, normalization of wave functions, concept of zero-point energy.

Rotational Motion: Schrödinger equation of a rigid rotator and brief discussion of its results (solution not required). Quantization of rotational energy levels.

Microwave (pure rotational) spectra of diatomic molecules. Selection rules. Structural information derived from rotational spectroscopy.

Vibrational Motion: Schrödinger equation of a linear harmonic oscillator and brief discussion of its results (solution not required). Quantization of vibrational energy levels. Selection rules, IR spectra of diatomic molecules.

CC4/GE 4 Practical: 45 Lectures

1.Qualitative Analysis of Single Solid Organic Compound(s)

Experiment A: Detection of special elements (N, Cl, and S) in organic compounds.
Experiment B: Solubility and Classification (solvents: H_2O, dil. HCl, dil. NaOH)
Experiment C: Detection of functional groups: Aromatic-NO_2, Aromatic -NH_2, -COOH, carbonyl (no distinction of –CHO and >C=O needed), -OH (phenolic) in solid organic compounds.
Experiments A - C with unknown (at least 6) solid samples containing not more than two of the above type of functional groups should be done.

2.Identification of a pure organic compound

Solid compounds: oxalic acid, tartaric acid, succinic acid, resorcinol, urea, glucose, benzoic acid and salicylic acid.
Liquid Compounds:methyl alcohol, ethyl alcohol, acetone, aniline, dimethylaniline, benzaldehyde, chloroform and nitrobenzene

Reference Books

1. Kotz, J.C., Treichel, P.M. & Townsend, J.R. *General Chemistry* Cengage Learning India Pvt. Ltd., New Delhi (2009).
2. Mahan, B.H. *University Chemistry* 3rd Ed. Narosa (1998). 3. Petrucci, R.H. *General Chemistry* 5th Ed. Macmillan Publishing Co.: New York (1985).
4. Chugh, K.L., Agnish, S.L. *A Text Book of Physical Chemistry* Kalyani Publishers
5. N. G. Mukherjee *Quantum Chemistry, molecular Spectroscopy and Photochemistry*.Archana Publishing Center,(2010*).*
6. Bahl, B.S., Bahl, A., Tuli, G.D., *Essentials of Physical Chemistry* S. Chand & Co. ltd.
7. Palit, S. R., *Elementary Physical Chemistry* Book Syndicate Pvt. Ltd.
8. N. G. Mukherjee, *Elementary Physical Chemistry* Archana Publishing Center,(2014*).*
9. Mandal, A. K. *Degree Physical and General Chemistry* Sarat Book House
10. Pahari, S., *Physical Chemistry* New Central Book Agency
11. Palit, S.R., *Practical Physical Chemistry* Science Book Agency
12. Mukherjee, N.G., *Selected Experiments in Physical Chemistry* J. N. Ghose & Sons
13. Dutta, S.K., *Physical Chemistry Experiments* Bharati Book Stall
14.*Practical Workbook Chemistry (Honours), UGBS, Chemistry*, University of Calcutta, 2015
15. Banerjee, S. P. *A Text Book of Analytical Chemistry*, The New Book Stall.
16. Gangopadhyay, P. K. *Application Oriented Chemistry*, Book Syndicate.
17. Mondal, A. K & Mondal, S. *Degree Applied Chemistry*, Sreedhar Publications
18. Khosla, B. D.; Garg, V. C. & Gulati, A. *Senior Practical Physical Chemistry,* R. Chand & Co.: New Delhi (2011).
19. Ghosal, Mahapatra & Nad, *An Advanced Course in Practical Chemistry,* New Central
20. Sethi, A. *Conceptual Organic Chemistry;* New Age International Publisher.
21. Parmar, V. S. *A Text Book of Organic Chemistry*, S. Chand & Sons.
22. Madan, R. L. *Organic Chemistry*, S. Chand & Sons.
23. Wade, L. G., Singh, M. S., *Organic Chemistry, Pearson.*

24. Finar, I. L. *Organic Chemistry* (*Volume 1*), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
25. Morrison, R. T. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
26. Bahl, A. & Bahl, B.S. *Advanced Organic Chemistry*, S. Chand, 2010.
27. Cotton, F.A. & Wilkinson, G. *Basic Inorganic Chemistry*, Wiley.
28. Shriver, D.F. & Atkins, P.W. *Inorganic Chemistry*, Oxford University Press.
29. Wulfsberg, G. *Inorganic Chemistry*, Viva Books Pvt. Ltd.
30. Rodgers, G.E. *Inorganic & Solid State Chemistry*, Cengage Learning India Ltd., 2008.

DSE (A)

Any one from the following

DSE A-1: NOVEL INORGANIC SOLIDS

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

Synthesis and modification of inorganic solids: (10 Lectures)

Conventional heat and beat methods, Co-precipitation method, Sol-gel methods, Hydrothermal method, Ion-exchange and Intercalation methods.

Inorganic solids of technological importance: (10 Lectures)

Solid electrolytes – Cationic, anionic, mixed Inorganic pigments – coloured solids, white and black pigments.
Molecular material and fullerides, molecular materials & chemistry – one-dimensionalmetals, molecular magnets, inorganic liquid crystals.

Nanomaterials: (10 Lectures)

Overview of nanostructures and nanomaterials: classification.
Preparation of gold and silver metallic nanoparticles, self-assembled nanostructures-control of nanoarchitecture-one dimensional control. Carbon nanotubes and inorganic nanowires.Bio-inorganic nanomaterials, DNA and nanomaterials, natural and antisical nanomaterials, bionano composites.

Introduction to engineering materials for mechanical construction: (10 Lectures)

Composition, mechanical and fabricating characteristics and applications of various types of cast irons, plain carbon and alloy steels, copper, aluminum and their alloys like duralumin, brasses and bronzes cutting tool materials, super alloys thermoplastics, thermosets andcomposite materials.

Composite materials (10 Lectures)

Introduction, limitations of conventional engineering materials, role of matrix in composites,classification, matrix materials, reinforcements, metal-matrix composites, polymer-matrixcomposites, fibre-reinforced composites, environmental effects on composites, applicationsof composites.

Speciality polymers: (10 Lectures)

Conducting polymers - Introduction, conduction mechanism, polyacetylene, polyparaphenylene and polypyrole, applications of conducting polymers, Ion-exchange resins and their applications. Ceramic & Refractory: Introduction, classification, properties, raw

materials, manufacturing and applications.

Reference Books:

• Shriver & Atkins. Inorganic Chemistry, Peter Alkins, Tina Overton, Jonathan Rourke, Mark Weller and Fraser Armstrong, 5th Edition, Oxford University Press (2011-2012)
• Adam, D.M. Inorganic Solids: An introduction to concepts in solid-state structural chemistry.
• Frank J. Ovens, Introduction to Nanotechnology

PRACTICAL – DSEA-1 : NOVEL INORGANIC SOLIDS

(45 Lectures)

1. Determination of cation exchange method
2. Determination of total difference of solids.
3. Synthesis of hydrogel by co-precipitation method.
4. Synthesis of silver and gold metal nanoparticle

Reference Book

• Fahan, *Materials Chemistry*, Springer (2004).

DSE-A-2: INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

Silicate Industries: (16 Lectures)

Glass: Glassy state and its properties, classification (silicate and non-silicate glasses).Manufacture and processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass.

Ceramics: Important clays and feldspar, ceramic, their types and manufacture. Hightechnology ceramics and their applications, superconducting and semiconducting oxides, fullerenes carbon nanotubes and carbon fibre.

Cements: Classification of cement, ingredients and their role, Manufacture of cement and thesetting process, quick setting cements.

Fertilizers: (8 Lectures)

Different types of fertilizers. Manufacture of the following fertilizers: Urea, ammonium nitrate, calcium ammonium nitrate, ammonium phosphates; polyphosphate, superphosphate, compound and mixed fertilizers, potassium chloride, potassium sulphate.

Surface Coatings: (10 Lectures)

Objectives of coatings surfaces, preliminary treatment of surface, classification of surface coatings. Paints and pigments-formulation, composition and related properties. Oil paint, Vehicle, modified oils, Pigments, toners and lakes pigments, Fillers, Thinners, Enamels, emulsifying agents. Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint), Dyes, Wax polishing, Water and Oil paints, additives, Metallic coatings (electrolytic and electroless), metal spraying and anodizing.

Batteries: (6 Lectures)

Primary and secondary batteries, battery components and their role, Characteristics of Battery. Working of following batteries: Pb acid, Li-Battery, Solid state electrolyte battery. Fuel cells, Solar cell and polymer cell.

Alloys: (10 Lectures)

Classification of alloys, ferrous and non-ferrous alloys, Specific properties of elements in alloys. Manufacture of Steel (removal of silicon decarbonization, demanganization, desulphurization dephosphorisation) and surface treatment (Arand heat treatment, nitriding, carburizing). Composition and properties of different types of steels.

Catalysis: (6 Lectures)

General principles and properties of catalysts, homogenous catalysis (catalytic steps and examples) and heterogenous catalysis (catalytic steps and examples) and their industrial applications, Deactivation or regeneration of catalysts.

Phase transfer catalysts, application of zeolites as catalysts.

Chemical explosives: (4 Lectures)

Origin of explosive properties in organic compounds, preparation and explosive properties of lead azide, PETN, cyclonite (RDX). Introduction to rocket propellants.

Reference Books

1. E. Stocchi: *Industrial Chemistry*, Vol-I, Ellis Horwood Ltd. UK.
2. R. M. Felder, R. W. Rousseau: *Elementary Principles of Chemical Processes*, Wiley Publishers, New Delhi.
3. W. D. Kingery, H. K. Bowen, D. R. Uhlmann: *Introduction to Ceramics*, Wiley Publishers, New Delhi.
4. J. A. Kent: Riegel's *Handbook of Industrial Chemistry*, CBS Publishers, New Delhi.
5. P. C. Jain, M. Jain: *Engineering Chemistry*, Dhanpat Rai & Sons, Delhi.
6. R. Gopalan, D. Venkappayya, S. Nagarajan: *Engineering Chemistry*, Vikas

Publications, New Delhi.
7. Sharma, B.K. & Gaur, H. *Industrial Chemistry,* Goel Publishing House, Meerut (1996).

PRACTICALS-DSE A2 LAB INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE

(45 Lectures)

1. Determination of free acidity in ammonium sulphate fertilizer.
2. Estimation of Calcium in Calcium ammonium nitrate fertilizer.
3. Estimation of phosphoric acid in superphosphate fertilizer.
4. Electroless metallic coatings on ceramic and plastic material.
5. Determination of composition of dolomite (by complexometric titration).
6. Analysis of (Cu, Ni); (Cu, Zn) in alloy or synthetic samples.
7. Analysis of Cement.
8. Preparation of pigment (zinc oxide).

Reference Books

1. E. Stocchi: *Industrial Chemistry,* Vol-I, Ellis Horwood Ltd. UK.
2. R. M. Felder, R. W. Rousseau: *Elementary Principles of Chemical Processes*, Wiley Publishers, New Delhi.
3. W. D. Kingery, H. K. Bowen, D. R. Uhlmann: *Introduction to Ceramics,* Wiley Publishers, New Delhi.
4. J. A. Kent: Riegel's *Handbook of Industrial Chemistry*, CBS Publishers, New Delhi.
5. P. C. Jain, M. Jain: *Engineering Chemistry*, Dhanpat Rai & Sons, Delhi.
6. R. Gopalan, D. Venkappayya, S. Nagarajan: *Engineering Chemistry,* Vikas
7. Publications, New Delhi.
8. Sharma, B.K. & Gaur, H. *Industrial Chemistry,* Goel Publishing House, Meerut (1996).

DSE(B)

Any one from the following

DSE-B1: GREEN CHEMISTRY AND CHEMISTRY OF NATURAL PRODUCTS

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

Introduction to Green Chemistry: (04 Lectures)

What is Green Chemistry? Need for Green Chemistry. Goals of Green Chemistry. Limitations/ Obstacles in the pursuit of the goals of Green Chemistry

Principles of Green Chemistry and Designing a Chemical synthesis: (16 Lectures)

Twelve principles of Green Chemistry with their explanations and examples and special emphasis on the following:

- Designing a Green Synthesis using these principles; Prevention of Waste/ byproducts; maximum incorporation of the materials used in the process into the final products , Atom Economy, calculation of atom economy of the rearrangement, addition, substitution and elimination reactions.
- Prevention/ minimization of hazardous/toxic products reducingtoxicity.

- Green solvents–supercritical fluids, water as a solvent for organic reactions, ionic liquids, PEG, solventless processes.
- Energy requirements for reactions – alternative sources of energy: use of microwaves and ultrasonic energy.
- Use of catalytic reagents (wherever possible) in preference to stoichiometric reagents; catalysis and green chemistry.

Examples of Green Synthesis/ Reactions and some real world cases: (20lectures)

1. Green Synthesis of the following compounds: adipic acid, catechol, disodium iminodiacetate (alternative to Strecker synthesis)
2. Microwave assisted reactions in water: Hofmann Elimination, methyl benzoate to benzoic acid, oxidation of toluene and alcohols; microwave assisted reactions in organic solvents: Diels-Alder reaction and Decarboxylation reaction
3. Ultrasound assisted reactions: sonochemical Simmons-Smith Reaction (Ultrasonic alternative to Iodine)
4. Green counterpart of common organic reactions: Aldol, Friedel-Crafts, Michael, Knoevenagel, Cannizzaro, benzoin condensation and Dieckmann condensation.
5. Rearrangement reactions by green approach: Fries rearrangement, Claisen rearrangement, Beckmann rearrangement, Baeyer-Villiger oxidation.

Future Trends in Green Chemistry: (12 Lectures)

Oxidation reagents and catalysts; Biomimetic, multifunctional reagents; Combinatorial green chemistry; Proliferation of solventless reactions. Green chemistry in sustainable development.

Alkaloids **(5 Lectures)**

Hoffmann's exhaustive methylation, Emde's modification, Structure elucidation Natural occurrence, General structural features, Isolation and their physiological action. Synthesis of Hygrine. Medicinal importance of Nicotine, Hygrine, Quinine, Morphine, Cocaine and Reserpine.

Terpenes **(3 Lectures)**

Occurrence, classification, isoprene rule; Elucidation of stucture and synthesis of Citral.

Reference Books

1. Anastas, P.T. & Warner, J.K.: *Green Chemistry - Theory and Practical*, Oxford University Press (1998).
2. Matlack, A.S. *Introduction to Green Chemistry*, Marcel Dekker (2001).
3. Cann, M.C. & Connely, M.E. *Real-World cases in Green Chemistry*, American Chemical Society, Washington (2000).
4. Ryan, M.A. & Tinnesand, M. *Introduction to Green Chemistry*, American Chemical Society, Washington (2002).
5. Lancaster, M. *Green Chemistry: An Introductory Text* RSC Publishing, 2nd Edition, 2010.
6. Ahluwalia, V. K & Kidwai, M. R. New Trends in Green Chemistry, Anamalaya Publishers, 2005.

PRACTICALS-DSE-B1 LAB GREEN CHEMISTRY

(45 Lectures)

1. Acetylation of primary amine (preparation of acetanilide).
2. [4+2] Cycloaddition reaction (Diels-Alder reaction between furan and maleic anhydride).
3. Preparation of biodiesel from vegetable/waste cooking oil.
4. Photoreduction of benzophenone to benzopinacol in the presence of sunlight.
5. Pinacol-pinacolone rearrangement reaction (preparation of benzopinacolone).
6. Solid state synthesis of benzilic acid from benzil.
7. Benzoin condensation using thiamine hydrochloride as a catalyst instead of potassium cyanide.
8. Green multicomponent synthesis (three component coupling).
9. Base catalysed aldol condensation (synthesis of dibenzal propanone from benzaldehyde and acetone).
10. Bromination of *trans*-stilbene using bromide/bromate mixture.
11. Preparation and characterization of gold nanoparticles using tea leaves.
12. Extraction of D-limonene from orange peel using liquid carbon dioxide.
13. Electrophilic aromatic substitution reaction (nitration of salicylic acid).
14. Green radical coupling reaction.

Reference Books

1. Anastas, P.T & Warner, J.C. *Green Chemistry: Theory and Practice,* Oxford University Press (1998).
2. Kirchoff, M. & Ryan, M.A. *Greener approaches to undergraduate chemistryexperiment*. American Chemical Society, WashingtonDC (2002).
3. Ryan, M.A. *Introduction to Green Chemistry*, Tinnesand; (Ed), American Chemical Society, WashingtonDC (2002).
4. Sharma, R.K.; Sidhwani, I.T. & Chaudhari, M.K. I.K. *Green Chemistry Experiment:A monograph International Publishing House Pvt Ltd. New Delhi*. Bangalore CISBN978-93-81141-55-7 (2013).
5. Cann, M.C. & Connelly, M. E. *Real world cases in Green Chemistry*, American Chemical Society (2008).
6. Cann, M. C. & Thomas, P. *Real world cases in Green Chemistry*, American Chemical Society (2008).
7. Lancaster, M. *Green Chemistry: An Introductory Text* RSC Publishing, 2nd Edition, 2010.
8. Pavia, D.L., Lampman, G.M., Kriz, G.S. & Engel, R.G. *Introduction to OrganicLaboratory Techniques: A Microscale and Macro Scale Approach*, W.B.Saunders,1995.
9. Finar, I. L. *Organic Chemistry* (*Volume 1*), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).

DSE-B2: ANALYTICAL METHODS IN CHEMISTRY

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

Optical methods of analysis: (30 Lectures)

Origin of spectra, interaction of radiation with matter, fundamental laws of spectroscopy and selection rules, validity of Beer-Lambert's law.

UV-Visible Spectrometry: Basic principles of instrumentation (choice of source,monochromator and detector) for single and double beam instrument;
Basic principles of quantitative analysis: estimation of metal ions from aqueous solution,geometrical isomers, keto-enol tautomers. Determination of composition of metal complexes using Job's method of continuous variation and mole ratio method.
Infrared Spectrometry: Basic principles of instrumentation (choice of source, monochromator& detector) for single and double beam instrument; sampling techniques.

Structural illustration through interpretation of data, Effect and importance of isotope substitution.

Flame Atomic Absorption and Emission Spectrometry: Basic principles of instrumentation(choice of source, monochromator, detector, choice of flame and Burner

designs. Techniques of atomization and sample introduction; Method of background correction, sources of chemical interferences and their method of removal. Techniques for the quantitative estimation of trace level of metal ions from water samples.

Thermal methods of analysis: (8 Lectures)

Theory of thermogravimetry (TG), basic principle of instrumentation.
Techniques for quantitative estimation of Ca and Mg from their mixture.

Electroanalytical methods: (7 Lectures)

Classification of electroanalytical methods, basic principle of pH metric, potentiometric and conductometric titrations. Techniques used for the determination of equivalence points. Techniques used for the determination of pKa values.

Separation techniques: (15 Lectures)

Solvent extraction: Classification, principle and efficiency of the technique.

Mechanism of extraction: extraction by solvation and chelation.
Technique of extraction: batch, continuous and counter current extractions.

Qualitative and quantitative aspects of solvent extraction: extraction of metal ions from aqueous solution, extraction of organic species from the aqueous and nonaqueous media.

Chromatography: Classification, principle and efficiency of the technique.
Mechanism of separation: adsorption, partition & ion exchange.
Development of chromatograms: frontal, elution and displacement methods.

Qualitative and quantitative aspects of chromatographic methods of analysis: IC, GLC, GPC, TLC and HPLC.

Stereoisomeric separation and analysis: Measurement of optical rotation, calculation of Enantiomeric excess (ee)/ diastereomeric excess (de) ratios and determination of enantiomeric composition using NMR, Chiral solvents and chiral shift reagents. Chiral chromatographic techniques using chiral columns (GC and HPLC).

Role of computers in instrumental methods of analysis.

Reference Books

1. Mendham, J., *A. I. Vogel's Quantitative Chemical Analysis 6thEd.*, Pearson, 2009.
2. Willard, H.H. *et al.*: *Instrumental Methods of Analysis*, 7th Ed. Wardsworth Publishing Company, Belmont, California, USA, 1988.
3. Christian, G.D. *Analytical Chemistry*, 6th Ed. John Wiley & Sons, New York, 2004.
4. Harris, D.C.: *Exploring Chemical Analysis*, 9th Ed. New York, W.H. Freeman, 2016.
5. Khopkar, S.M. *Basic Concepts of Analytical Chemistry*. New Age International Publisher, 2009.
6. Skoog, D.A. Holler F.J. & Nieman, T.A. *Principles of Instrumental Analysis*, Cengage Learning India Ed.
7. Mikes, O. *Laboratory Hand Book of Chromatographic & Allied Methods*, Elles

Harwood Series on Analytical Chemistry, John Wiley & Sons, 1979.
8. Ditts, R.V. Analytical Chemistry; Methods of separation, van Nostrand, 1974.

PRACTICALS- DSE-B-2: ANALYTICAL METHODS IN CHEMISTRY

(45 Lectures)

I. Separation Techniques by:

Chromatography:

(a) Separation and identification of the monosaccharides present in the given mixture (glucose & fructose) by paper chromatography. Reporting the R_f values.

(b)Separate a mixture of Sudan yellow and Sudan Red by TLC technique and identify them on the basis of their R_f values.

(c) Chromatographic separation of the active ingredients of plants, flowers and juices by TLC

Solvent Extractions:

To separate a mixture of Ni^{2+}& Fe^{2+} by complexation with DMG and extracting the Ni^{2+}-DMG complex in chloroform, and determine its concentration by spectrophotometry.

II. Analysis of soil:

(i) Determination of pH of soil.
(ii) Estimation of calcium, magnesium, phosphate

III. Ion exchange:

Determination of exchange capacity of cation exchange resins and anion exchange resins.

IV. Spectrophotometry

1. Determination of pKa values of indicator using spectrophotometry.
2. Determination of chemical oxygen demand (COD).
3. Determination of Biological oxygen demand (BOD).

Reference Books

1. Mendham, J., *A. I. Vogel's Quantitative Chemical Analysis 6thEd.*, Pearson, 2009.
2. Willard, H.H. *et al.*: *Instrumental Methods of Analysis*, 7th Ed. Wardsworth Publishing Company, Belmont, California, USA, 1988.
3. Christian, G.D. *Analytical Chemistry*, 6th Ed. John Wiley & Sons, New York, 2004.
4. Harris, D.C.*Exploring Chemical Analysis*, 9th Ed. New York, W.H. Freeman, 2016.
5. Khopkar, S.M. *Basic Concepts of Analytical Chemistry*. New Age International Publisher, 2009.
6. Skoog, D.A. Holler F.J. and Nieman, T.A. *Principles of Instrumental Analysis*, Cengage Learning India Edition.
7. Mikes, O. & Chalmes, R.A. *Laboratory Handbook of Chromatographic & AlliedMethods*, Elles Harwood Ltd. London.
8. Ditts, R.V. *Analytical Chemistry: Methods of separation.*Van Nostrand, New York, 1974.

SKILL ENHANCEMENT COURSES (SEC)

SEC(A)

SEC1 : Basic Analytical Chemistry

(Credits 2 , 30 lectures)

Introduction: Introduction to Analytical Chemistry and its interdisciplinary nature. Concept of sampling. Importance of accuracy, precision and sources of error in analytical measurements. Presentation of experimental data and results, from the point of view of significant figures.

Analysis of soil: Composition of soil, Concept of pH and pH measurement, Complexometric titrations, Chelation, Chelating agents, use of indicators

a. Determination of pH of soil samples.

b. Estimation of Calcium and Magnesium ions as Calcium carbonate by complexometric titration.

Analysis of water: Definition of pure water, sources responsible for contaminating water, water sampling methods, water purification methods.

a. Determination of pH, acidity and alkalinity of a water sample.

b. Determination of dissolved oxygen (DO) of a water sample.

Analysis of food products: Nutritional value of foods, idea about food processing and food preservations and adulteration.

a. Identification of adulterants in some common food items like coffee powder, asafoetida, chilli powder, turmeric powder, coriander powder and pulses, etc.

b. Analysis of preservatives and colouring matter.

Chromatography: Definition, general introduction on principles of chromatography, paper chromatography, TLC etc.

a. Paper chromatographic separation of mixture of metal ion (Fe3+ and Al3+).

b. To compare paint samples by TLC method.

Ion-exchange: Column, ion-exchange chromatography etc.

Determination of ion exchange capacity of anion / cation exchange resin (using batch procedure if use of column is not feasible).

Analysis of cosmetics: Major and minor constituents and their function

a. Analysis of deodorants and antiperspirants, Al, Zn, boric acid, chloride, sulphate.

b. Determination of constituents of talcum powder: Magnesium oxide, Calcium oxide, Zinc oxide and Calcium carbonate by complexometric titration.

Suggested Applications (Any one):

a. To study the use of phenolphthalein in trap cases.

b. To analyze arson accelerants.

c. To carry out analysis of gasoline.

Suggested Instrumental demonstrations:

a. Estimation of macro nutrients: Potassium, Calcium, Magnesium in soil samples by flame photometry.

b. Spectrophotometric determination of Iron in Vitamin / Dietary Tablets.

c. Spectrophotometric Identification and Determination of Caffeine and Benzoic Acid in Soft Drink.

Reference Books:

1. Willard, H. H. *Instrumental Methods of Analysis*, CBS Publishers.

2. Skoog & Lerry. *Instrumental Methods of Analysis*, Saunders College Publications, New

York.
3. Skoog, D.A.; West, D.M. & Holler, F.J. *Fundamentals of Analytical Chemistry 6th Ed.*, Saunders College Publishing, Fort Worth (1992).
4. Harris, D. C. *Quantitative Chemical Analysis*, W. H. Freeman.
5. Dean, J. A. *Analytical Chemistry Notebook*, McGraw Hill.
6. Day, R. A. & Underwood, A. L. *Quantitative Analysis*, Prentice Hall of India.
7. Freifelder, D. Physical Biochemistry *2nd Ed.*, W.H. Freeman and Co., N.Y. USA (1982).
8. Cooper, T.G. *The Tools of Biochemistry*, John Wiley and Sons, N.Y. USA. 16 (1977).
9. Vogel, A. I. *Vogel's Qualitative Inorganic Analysis 7th Ed.*, Prentice Hall.
10. Vogel, A. I. Vogel's *Quantitative Chemical Analysis 6th Ed.*, Prentice Hall.
11. Robinson, J.W. *Undergraduate Instrumental Analysis 5th Ed.*, Marcel Dekker, Inc., New York

SEC2 – ANALYTICAL CLINICAL BIOCHEMISTRY

(Credits: 2 Lectures:30)

Carbohydrates: Biological importance of carbohydrates, Metabolism, Cellular currency of energy (ATP), Glycolysis, Alcoholic and Lactic acid fermentations, Krebs cycle.
Isolation and characterization of polysachharides.
Proteins: Classification, biological importance; Primary and secondary and tertiary structures of proteins: α-helix and β- pleated sheets, Isolation, characterization, denaturation of proteins.
Enzymes: Nomenclature, Characteristics (mention of Ribozymes), and Classification; Active site, Mechanism of enzyme action, Stereospecificity of enzymes, Coenzymes and cofactors, Enzyme inhibitors, Introduction to Biocatalysis: Importance in "Green Chemistry" and Chemical Industry.
Lipids: Classification. Biological importance of triglycerides and phosphoglycerides and cholesterol; Lipid membrane, Liposomes and their biological functions and underlying applications.
Lipoproteins: Properties, functions and biochemical functions of steroid hormones. Biochemistry of peptide hormones.
Structure of DNA (Watson-Crick model) and RNA, Genetic Code, Biological roles of DNA and RNA: Replication, Transcription and Translation, Introduction to Gene therapy.
Biochemistry of disease: A diagnostic approach by blood/ urine analysis.
Blood: Composition and functions of blood, blood coagulation. Blood collection and preservation of samples. Anaemia, Regulation, estimation and interpretation of data for blood sugar, urea, creatinine, cholesterol and bilirubin.
Urine: Collection and preservation of samples. Formation of urine. Composition and estimation of constituents of normal and pathological urine.

Reference Books

1. Cooper, T.G. Tool of Biochemistry. Wiley-Blackwell (1977).
2. Wilson, K. & Walker, J. Practical Biochemistry. Cambridge University Press (2009).
3. Varley, H., Gowenlock, A.H & Bell, M.: Practical Clinical Biochemistry, Heinemann, London (1980).
4. Devlin, T.M., Textbook of Biochemistry with Clinical Correlations, John Wiley & Sons, 2010.
5. Berg, J.M., Tymoczko, J.L. & Stryer, L. Biochemistry, W.H. Freeman, 2002.
6. Talwar, G.P. & Srivastava, M. Textbook of Biochemistry and Human Biology, 3rd Ed. PHI Learning.
7. Nelson, D.L. & Cox, M.M. Lehninger Principles of Biochemistry, W.H. Freeman, 2013.

8. O. Mikes, R.A. Chalmers: Laboratory Handbook of Chromatographic Methods, D. Van Nostrand & Co., 1961.

SEC(B)

SEC 3 – PHARMACEUTICALS CHEMISTRY

(Credits: 2 Lectures: 30)

Drugs & Pharmaceuticals

Drug discovery, design and development; Basic Retrosynthetic approach. Synthesis of the representative drugs of the following classes: analgesics agents, antipyretic agents, anti-inflammatory agents (Aspirin, paracetamol, lbuprofen); antibiotics (Chloramphenicol); antibacterial and antifungal agents (Sulphonamides; Sulphanethoxazol, Sulphacetamide, Trimethoprim); antiviral agents (Acyclovir), Central Nervous System agents (Phenobarbital, Diazepam),Cardiovascular (Glyceryl trinitrate), antilaprosy (Dapsone), HIV-AIDS related drugs (AZT- Zidovudine).

Fermentation

Aerobic and anaerobic fermentation. Production of (i) Ethyl alcohol and citric acid, (ii) Antibiotics; Penicillin, Cephalosporin, Chloromycetin and Streptomycin, (iii) Lysine, Glutamic acid, Vitamin B2, Vitamin B12 and Vitamin C.

Reference Books

1. Patrick, G. L. Introduction to Medicinal Chemistry, Oxford University Press, UK, 2013.
2. Singh, H. & Kapoor, V.K. Medicinal and Pharmaceutical Chemistry, Vallabh Prakashan, Pitampura, New Delhi, 2012.
3. Foye, W.O., Lemke, T.L. & William, D.A.: Principles of Medicinal Chemistry, 4th ed., B..I. Waverly Pvt. Ltd. New Delhi.

SEC 4 - PESTICIDE CHEMISTRY

(Credits: 02)

30 Lectures

General introduction to pesticides (natural and synthetic), benefits and adverse effects, changing concepts of pesticides, structure activity relationship, synthesis and technical manufacture and uses of representative pesticides in the following classes: Organochlorines (DDT, Gammexene,); Organophosphates (Malathion, Parathion); Carbamates (Carbofuran and carbaryl); Quinones (Chloranil), Anilides (Alachlor and Butachlor).

Reference Book:

• R. Cremlyn: *Pesticides*, John Wiley.

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

UNIVERSITY OF CALCUTTA

B.A./B.Sc. ECONOMICS
(HONOURS AND GENERAL)
SYLLABUS UNDER CHOICE BASED CREDIT SYSTEM

To be effective from the academic session 2018-19

BA/BSc ECONOMICS (HONOURS) SYLLABUS,
UNIVERSITY OF CALCUTTA, UNDER
CHOICE BASED CREDIT SYSTEM
To be effective from the academic session 2018-19

Table 1: Marks and Paper distributions with credit

		Credits	
Course Type	**Total Papers**	**Credit**	**Marks**
Core Courses (CC)	14	14*6=84	14*100=1400
Discipline Specific Electives (DSE)	4	4*6 =24	4*100 = 400
Generic Electives (GE) [Covering Two Disciplines with two courses each. Any discipline in any semester]	4	4*6=24	4*100= 400
Ability Enhancement Compulsory Courses-AECC [Consisting of two Ability Enhancement Compulsory Courses – AECC-1 and AECC-2]	2 [AECC-1 is Communicating English/ Modern Indian Languages(MIL) and AECC-2 is Environmental Studies (ENVS)]	2*2=4	100*2= 200
Skill Enhancement Courses (SEC)	2	2*2=4	100*2=200
Totals	26	140	2600

- **Continuous Internal Assessment and Students" Attendance: For each paper 10% will be reserved for continuous internal assessment (CIA) and 10% will be reserved for attendance of the students.** ***CIA may take the form of written examination/s, take-home assignments, viva-voce; presentation etc depending on the course instructor. As per definition CIA will be assessed fully internally by the course instructor.***

Types of tutorials: Tutorial classes are introduced per course (except for AEC and SEC) to give the students an idea of detailed understanding of the course and also to build their confidence on the subject in terms of (i) solving problems, (ii) presenting a paper in terms of board work or power point,(iii) preparation of term paper etc. A tutorial class also helps a teacher to clarify any topic in detail to the students. A tutorial contact hour has been meant to promote teacher-student academic interaction. The norm of examination for this part of the course will be decided later. ***Unlike all other Science subjects Economics should not be treated as a laboratory–based subject.*** After all it is a subject under Social Science and so there is limited scope for introducing practical part for each course. **Only under Discipline Specific Elective-A,**

5th Semester/6th Semester, for the Courses "Applied Econometrics" and "Issues in Indian Economy" (under DSE A) there will be a *practical part* of 30 marks (2 credits) instead of tutorial part of 15 marks (1 credit). Practical classes in case of ―Applied Econometrics‖ will be conducted on the basis of laboratory-based specified softwares (STATA or R). Practical classes for the course ―Issues in Indian economy‖

Method followed for coding the Courses

Economics Honours Core Course 1, 1st semester (Theory): ECO-A-CC-1-1-TH

Economics Honours Core Course 1, 1st semester (Tutorial): ECO-A-CC-1-1TU

Table 2 :Course structure semester-wise: Economics (Honours)

Table 2A :Semester –I (July to December)

Type of Course	Name of the Course	Credit	Marks
Economics Core Course –I (ECO-A-CC-1-1-TH-TU)	Introductory Microeconomics[Theory plus Tutorial]	5+1=6	100
Economics Core Course –II (ECO-A-CC-1-2-TH-TU)	Mathematical Methods for Economics-I [Theory plus Tutorial]	5+1=6	100

Table 2B :Semester –II (January to June)

Type of Course	Name of the Course	Credit	Marks
Economics Core Course –III (ECO-A-CC-2-3-TH-TU)	Introductory Macroeconomics [Theory plus Tutorial]	5+1=6	100
Economics Core Course –IV (ECO-A-CC-2-4.TH-TU)	Mathematical Methods for Economics-II [Theory plus Tutorial]	5+1=6	100

Table 2C :**Semester –III (July to December)**

Type of Course	Name of the Course	Credit	Marks
Economics Core Course –V (ECO-A-CC-3-5-TH-TU)	Intermediate Microeconomics-I [Theory plus Tutorial]	5+1=6	100
Economics Core Course –VI (ECO-A-CC-3-6-TH-TU)	Intermediate Macroeconomics-I [Theory plus Tutorial]	5+1=6	100
Economics Core Course –VII (ECO-A-CC-3-7-TH-TU)	Statistics for Economics [Theory plus Tutorial]	5+1=6	100
Skill Enhancement Course-I (A Group) (ECO-A-SEC-3-1A-TH)	Data Analysis [Theory]/ Rural Development [Theory] [A-Group of SEC consists of two courses. Students will have to select *any one* of the two]	2	100

Table 2D : Semester-IV (January to June)

Type of Course	Name of the Course	Credit	Marks
Economics Core Course –VIII (ECO-A-CC-4-8-TH-TU)	Intermediate Microeconomics-II[Theory plus Tutorial]	5+1=6	100
Economics Core Course –IX (ECO-A-CC-4-9-TH-TU)	Intermediate Macroeconomics-II [Theory plus Tutorial]	5+1=6	100
Economics Core Course –X (ECO-A-CC-4-10-TH-TU)	Introductory Econometrics[Theory plus Tutorial]	5+1=6	100
Skill Enhancement Course-II (B Group) (ECO-A-SEC-4-2B-TH)	Research Methodology [Theory]/ Managerial Economics [Theory] [B-Group of SEC consists of two courses. Students will have to select *any one* of the two]	2	100

Table 2E: Semester –V (July to December)

Type of Course	Name of the Course	Credit	Marks
Economics Core Course –XI (ECO-A-CC-5-11-TH-TU)	International Economics [Theory plus Tutorial]	5+1=6	100
Economics Core Course –XII (ECO-A-CC-5-12-TH-TU)	Indian Economy [Theory plus Tutorial based Term Paper]	5+1=6	100
Two Discipline Specific Elective (DSE) Courses: DSE-A and DSE- B In Semester V these two courses are denoted as DSE-A(1) and DSE-B(1) One out of two courses from : DSE-A(1) One out of two courses from: DSE-B(1) (ECO-A-DSE-5-A(1)-TH-TU/P) and (ECO-A-DSE-5-B(1)-TH-TU)	DSE-A(1) consists of two courses out of which students will have to select *any one* and DSE-B(1) consists of two courses out of which students have to select *any one.* <u>The two courses under DSE-A(1) are</u> Applied Econometrics (AE) : 4(Th) +2 (P)= 6 Economic History of India (1857-1947) (EHI) : 5(Th) +1(Tu) = 6 [Students will have to select any one] <u>The two courses under DSE-B(1) are</u> Comparative Economic Development (1850-1950) (CED): 5(Th) +1(Tu) = 6 Financial Economics (FE) : 5 (Th) + 1 (Tu) =6 [Students will have to select any one]	(5+1)= 6 (5+1)= 6 [Or one (4+2)= 6 and one (5+1)= 6]	100+ 100

Table 2F: Semester –VI (January to June)

Type of Course	Name of the Course	Credit	Marks
Economics Core Course –XIII (ECO-A-CC-6-13-TH-TU)	Public Economics [Theory plus Tutorial]	5+1=6	100
Economics Core Course –XIV (ECO-A-CC-6-14-TH-TU)	Development Economics [Theory plus Tutorial]	5+1=6	100
Two Discipline Specific Elective (DSE) Courses: DSE-A and DSE- B In Semester VI these two courses are denoted as DSE-A(2) and DSE-B(2) One out of two courses from : DSE-A(2) One out of two courses from: DSE-B(2) (ECO-A-DSE-6-A(2)-TH-TU/P) and (ECO-A-DSE-6-B(2)-TH-TU)	DSE-A(2) consists of two courses out of which students will have to select *any one* and DSE-B(2) consists of two courses out of which students have to select *any one.* <u>The two courses under DSE-A(2) are</u> Money and Financial Markets (MFM) : 5(Th) + 1(Tu) =6 Issues in Indian Economy (IIE) : 4(Th) +2 (P)= 6 [Students will have to select any one] <u>The two courses under DSE-B(2) are</u> Environmental Economics (EE) : 5 (Th) +1 (Tu) =6 Issues in Development Economics (IDE) : 5 (Th) +1 (Tu) =6 [Students will have to select any one]	(5+1)= 6 (5+1)=6 [Or one (4+2)=6 and one (5+1)= 6]	100 + 100
Total		**24**	**400**

- **In framing this syllabus the centralized structure of Calcutta University is followed.**
- **<u>Special Note</u>**

(i) *The four Generic Elective papers (courses) for Economics (Honours) students* ***will be from any two subjects other than Economics with the condition that Mathematics is to be one of the Generic Elective Subjects for Economics(Honours) students.*** *Thus students having Economics Honours will select two other disciplines of 200 marks each under Generic Elective and one of the two disciplines should be Mathematics .* ***Students will have to select two courses on Mathematics <u>in any two of the four semesters</u> 1,2, 3 and 4 (where we find Generic Elective Courses). <u>Thus two courses on Mathematics is compulsory for Economics (Honours).</u>*** *The other Discipline can be any other subject. For example, an Economics (Honours) student may opt for Mathematics as Generic Elective in 1st and 3rd semesters and Political Science (or Statistics) in 2nd and 4th Semesters.*

(ii) *Similarly Economics as Generic Elective will be offered to students having Honours in any subject other than Economics.* ***<u>The Generic Elective papers in Economics for Honours students (for students having Honours in any subject other than Economics) will be treated as Core Papers in Economics for General students (for BA/BSc General students having Economics as a Core paper under the General stream).</u> [This has been explained clearly in the context of the syllabus for BA/BSc Economics (General)].<u>Students having Honours in any subject other than Economics will select any two Disciplines or Subjects for the four Generic Elective papers offered.</u>***

Economics Core Course-I: ECO-A-CC-1-1-TH-TU

Introductory Microeconomics

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours (Theory): 75, No. of Tutorial contact hours:15

[For Semester-I]

ECO-A-CC-1-1-TH

Unit 1: Exploring the subject matter of Economics **10 lecture hours**

1.1 Scope and Method of Economics: Wants, Scarcity, Competing Ends and Choice - Defining Economics, Thinking like an economist: Basic Economics Questions, Microeconomics and Macroeconomics, Normative Economics and Positive Economics

1.2Principles of Microeconomics – principles of individual decision making and principles of economic interactions – Introduce trade off, opportunity cost, efficiency, marginal changes and cost-benefit, trade, market economy, property rights, market failure, externality and market power.

1.3 Interdependence and the Gains from Trade- production possibilities frontier and increasing costs, absolute and comparative advantage, comparative advantage and gains from trade.

1.4 Reading and working with graphs

Unit 2: Demand and Supply: How Markets Work **10 lecture hours**

2.1Elementary theory of Demand: Determinants of household demand and market demand, movement along and shift of the demand curve

2.2 Elementary theory of Supply: factors influencing supply, the supply curve, movement along and shift of the supply curve

2.3 The Elementary theory of market price: Determination of equilibrium price in a competitive market.

2.4 Market Adjustment without Government (with illustrations):the effect of shifts in demand and supply, the excess demand function, existence, uniqueness and stability of equilibrium

Unit 3: Market and Adjustments **10 lecture hours**

3.1 The Evolution of Market Economies, Price System and the Invisible Hand

3.2 The Decision-takers - households, firms and central authorities

3.3 The Concepts of Markets- individual market, separation of individual markets, interlinking of individual markets. Difference among markets- competitiveness, goods and factor markets, free and controlled markets. Market and non-market sectors, public and private sectors, economies- free market, command and mixed.

3.4 Different goods: Public goods, Private goods, Common resources and Natural Monopolies.

Unit 4: Market Sensitivity and Elasticity **12 lecture hours**

4.1 Importance of Elasticity in Choice-Decisions

4.2 Method of Calculation- Arc Elasticity, Point Elasticity-definition

4.3 Demand and supply Elasticities-types of elasticity and factors affecting elasticity, Demand Elasticity and Revenue, Long run and Short run elasticities of Demand and Supply

4.4 Income and Cross Price Elasticity

4.5 Applications: Case studies – OPEC and Oil Price, Illegal Drugs

Unit 5: Government Intervention **8 lecture hours**

5.1 The Economic Role of Government with respect to Market: (i) Price Ceiling, Price Floor and Market Adjustment (with short case studies of agricultural administered price, minimum wage and rent control); (ii) Black Market; (iii) Tax and market adjustment ; (iv) Elasticity and Tax incidence

5.2 Comparison of markets with and without government

Unit 6: Utilitarian Approach **25 lecture hours**

(Focus on intuitive explanation and diagrams. Learning to analyze without using calculus a must)

6.1 The History of Utility Theory – From Cardinal to Ordinal Approach.

6.2 Utility in Cardinal Approach- Utility and choice, Total Utility and Marginal Utility, Utility and choice-maximization, marginal utility, theory of demand

6.3 Ordinal utility: Assumptions on preference ordering, indifference curve, marginal rate of substitution and convexity of IC, budget constraint, consumers' equilibrium-interior and corner, Derivation of Demand Curves from ICs, composite good convention. Application: Cash subsidy versus subsidy in kind

6.4 Price consumption curve, Income consumption curveand Engel curve. Price effect - Income and Substitution effect (Hicks and Slutsky),inferior goods and Giffen goods, Marshallian and compensated demand curves

ECO-A-CC-1-1-TU

Tutorial Contact Hours: 15

Texts

1. G.Mankiw. 2007, Economics: Principles and Applications, India edition by South Western, Cengage Learning
2. R.G. Lipsey. An Introduction to Positive Economics, ELBS (6^{th} edition)
3. Lipsey, R. and Chrystal, A. 2007 Economics, OUP
4. Pindyck, Rubinfeld and Mehta, Microeconomics, Pearson
5. G.S.Maddala and E. Miller, 1989, Microeconomics, Prentice Hall, McGraw Hill International Editions

References

1. Karl e Case and Ray C Fair, Principles of Economics, Pearson Education, 8th Edition, 2007
2. P Samuelson and W.Nordhaus, Economics, McGraw hill International Edition (14th edition or later edition)
3. J.E.Stiglitz and C.E.Walsh, Principles of Economics, WW Norton and Company, NY, (3rd edition or later edition)
4. Hal. R Varian , Intermediate Microeconomics, A modern Approach, WW Norton and Company, 8th edition, 2010 (T)
5. Gravelle, H. and Rees,R. , Microeconomics, Prentice Hall
6. Ryan, W.J.L. and Pearce : Price Theory and Applications , Macmillan Education, UK
7. Ferguson, C.E. and Gould, J.P. : Microeconomic Theory, Aitbs Publishers and Distributors, New Delhi.
8. Satya Chakrabarty, Microeconomics, Allied Publishers

Economics Core Course II: ECO-A-CC-1-2-TH-TU

Mathematical Methods in Economics-I

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[For Semester-I]

ECO-A-CC-1-2-TH

1. Preliminaries 10 lectures hours

- Sets and set operations; functions and their properties; number systems.
- Convex sets; geometric properties of functions: convex functions, their characterizations, properties and applications; further geometric properties of functions: quasi-convex functions, quasi-concave functions, their characterizations, properties and applications.
- Limit and continuity-Different Limit Theorems with proof-concept of first principle.
- Uses of the concept of continuity.

2. Functions of one real variable 10 lecture hours

- Continuous functions of different types and their graphs- quadratic, polynomial, power, exponential, and logarithmic.
- Concept of derivatives. Limits and derivatives. L' Hospital's rule .Graphical meaning of derivatives. Derivatives of first and second order and their properties; convex, concave and linear function.
- Application in economics- concept of marginal. Concept of elasticity. Concept of average function

3. Single variable optimization **10 lecture hours**

- Local and global optima; Geometric characterizations; characterizations using calculus. Significance of first and second order conditions.
- Interpretation of necessary and sufficient conditions with examples.
- Applications in Economics- profit maximization and cost minimization.

4. Integration of functions **10 lecture hours**

- Integration of different types of functions;
- Methods of Substitution and integration by parts.
- Applications in economics- obtaining total from the marginal.

5. **Matrix Algebra** **20 lecture hours**

- Matrix: its elementary operations; different types of matrix.
- Rank of a matrix.
- Determinants and inverse of a square matrix.
- Solution of system of linear equations-Cramer‘s rule; Eigen values and Eigen vectors.
- System of nonlinear equations- Jacobian determinant and existence of solution.
- The concept of comparative statics
- Applications of Matrix Algebra in input-output analysis-the Leontief Static Open Model (LSOM) - the Hawkins-Simon conditions.

6. Game Theory **15 lecture hours**

- Concept of a game, strategies and payoffs
- Zero-sum games- maxmin and minmax solutions
- Dominant Strategy Equilibrium
- Nash equilibrium
- Nash equilibrium in the context of some common games – Prisoners‘ Dilemma, Battle of Sexes, Matching Pennies

ECO-A-CC-1-2-TU

Tutorial contact hours :15

Texts :

- Alpha C. Chiang and Kavin Wainwright : Fundamental Methods of Mathematical Economics, Mc Graw Hill, 2005.

References

1. K. Sydsaeter and P. Hammond, Mathematics for Economic Analysis, Pearson Educational Asia: Delhi, 2002.

2. Gibbons R. Game Theory for Applied Economists.
3. Mukherji and S. Guha: Mathematical Methods and Economic Theory, Oxford University Press, 2011.
4. Hands, D. W.: Introductory Mathematical Economics, Second Edition, 2004.
5. Silberberg ,E. and Suen, W.: The Structure of Economics : A Mathematical Analysis, Third edition, Mc-Graw Hill, 2001.
6. Apostol T.M. : Calculus, Volume 1, One-variable calculus, with an introduction to linear algebra, (1967) Wiley, ISBN 0-536-00005-0, ISBN 978-0-471-00005-1.
7. K. G. Binmore, Mathematical analysis, Cambridge University Press, 1991.
8. Archibald, G.C. and Lipsey, R.G. , An Introduction to Mathematical Treatment of Economics, 1967, Weidenfeld and Nicolson
9. Henderson, J.M. and Quandt, R.E., Microeconomic Theory : A Mathematical Approach, McGrawHill,1980
10. Dorfman, R., Samuelson, P.A. and Solow, R.M. , Linear Programming and Economic Analysis, McGraw-Hill, 1958.
11. Hadley, G. , Linear Algebra, Addison-Wesley Publishing Company, 1977

Economics Core Course III: ECO-A-CC-2-3-TH-TU

Introductory Macroeconomics

Total Marks: 100 [Theory (Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[For Semester-II]

ECO-A-CC-2-3-TH

1. National Income Accounting 20 lecture hours

Macroeconomic data- Basic concepts of National Income accounting. The circular flow. Concepts of GNP, GDP, NNP, and NDP at market price and at factor cost. The measurement of National Income-Value Added Method and Expenditure Method. The problem of double counting. The role of Government. Concepts of Corporate Income, Corporate Savings, Personal Income, Personal Disposable Income and Personal Savings. Saving-Investment gap and its relation with budget deficit and trade surplus. National Income accounting and cost of living. Basic idea of India‘s national income.

2. Income Determination in the Short Run (Part-I) :The Simple Keynesian Model in a Closed Economy 18 lecture hours

The Simple Keynesian Model (SKM) in a Closed Economy without Government- the Keynesian

Consumption Function; the Keynesian Saving Function; income determination in SKM; stability of equilibrium; the concept of effective demand- the concept of demand-determined output ; the Simple Keynesian Multiplier; the paradox of thrift; the SKM in a Closed Economy with Government; government expenditure and tax; the government expenditure multiplier and the tax rate multiplier; the balanced budget multiplier; the budget surplus; effects of tax changes and government purchases on budget surplus; the full employment budget surplus.

3. The Classical system 18 lecture hours

Basic ideas of Classical Macroeconomics; Say's Law and Quantity Theory of Money, Loanable fund theory; the Classical Theory of Income and Employment determination; full Employment and wage-price flexibility; Classical Dichotomy and Neutrality of Money.

4. Macroeconomic Foundations -I 19 lecture hours

- The bond market as the mirror image of the money market-the Walras' Law. Relationship between bond price and rate of interest- the concept of Keynesian liquidity preference schedule-speculative demand for money and liquidity trap.
- Investment function: Concepts of Marginal productivity of capital, marginal efficiency of capital (MEC) and marginal efficiency of investment (MEI)- Jorgenson's neo-classical theory- Acceleration principle- fixed and variable. Multiplier-accelerator interaction.

ECO-A-CC-2-3-TU

Tutorial Contact hours: 15

Textbooks:

1. Dornbusch, Fischer and Startz, Macroeconomics, McGraw Hill, 11th edition, 2010.
2. N. Gregory Mankiw. Principles of Macroeconomics, Indian Imprint of South Western by Cengage India, 6th edition, 2015.
3. N. Gregory Mankiw. Macroeconomics, Worth Publishers, 2010.
4. Ghosh Chandana and Ghosh Ambar, Macroeconomics, PHI Learning Pvt Ltd, 2014.

References

1. Richard T. Froyen, Macroeconomics, Pearson Education Asia, 2nd edition, 2005.
2. Andrew B. Abel and Ben S. Bernanke, Macroeconomics, Pearson Education, Inc., 7th edition, 2011.
3. Venieris, Y.P. and Sebold F.D., Macroeconomics: Models and Policy, John Wiley and Sons, 1977.
4. Ackley Gardner (old), Macroeconomic Theory, Macmillan, 1961
5. Ackley Gardner(new), Macroeconomics : Theory and Policy : Macmillan,1978

6. Ghosh Chandana and Ghosh Ambar, Indian Economy : A Macro-theoretic Analysis, PHI Learning Pvt Ltd, 2016.
7. J.R.Hicks. The Social Framework: An Introduction to Economics, Clarendon Press, 3rd edition, 1960.
8. Sikdar Soumyen, Principles of Macroeconomics, Oxford University Press.
9. Economic Survey , Government of India, various issues.

Economics Core Course IV: ECO-A-CC-2-4-TH-TU

Mathematical Methods in Economics-II

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours:15

[For Semester-II]

ECO-A-CC-2-4-TH

1. Function of several variables **14 lecture hours**

- Continuous and differentiable functions: partial derivatives and Hessian matrix. Homogeneous and homothetic functions.
- Euler's theorem, implicit function theorem (without proof) and its application to comparative statics problems.
- Economic applications- the idea of level curves, theories of consumer behaviour and theory of production.

2. Multi-variable optimization **35 lecture hours**

- Optimization of nonlinear functions: Convex, concave, and quasi-concave functions; Unconstrained optimization.
- Constrained optimization with equality constraints- Lagrangian multiplier method; role of Hessian determinant.
- Inequality constraints and Kuhn-Tucker Conditions.
- Value function and Envelope theorem; Economic applications – consumer behaviour and theory of production.
- Optimization of linear function: Linear programming; concept of slack and surplus variables (graphical solution only). Concept of convex set. The Duality Theorem
- Economic Applications of Linear programming

3. Difference Equations **12 lecture hours**

- Finite difference; Equations of first and 2nd orders and their solutions
- Application in Economics- Cobweb model, Multiplier-Accelerator model.

4. Differential Equations **14 lecture hours**

- Solution of Differential equations of first order and second order of linear differential equations.
- Economic application-price dynamics in a single market- multimarket supply demand model with two independent markets.
- Qualitative graphic solution to 2x2 linear simultaneous non-linear differential equation system- phase diagram, fixed point and stability. Economic applications in microeconomics and macroeconomics

ECO-A-CC-2-4-TU

Tutorial Contact hours: 15

Text:

- Alpha C. Chiang and Kavin Wainwright: Fundamental Methods of Mathematical Economics, Mc Graw Hill, 2005.

References:

1. K. Sydsaeter and P. Hammond, Mathematics for Economic Analysis, Pearson Educational Asia: Delhi, 2002.
2. Carl Simon and Lawrence Blume. Mathematics for Economists, W. W. Norton and Company, 1994
3. A. Mukherji and S. Guha: Mathematical Methods and Economic Theory, Oxford University Press, 2011.
4. Hands, D. W.: Introductory Mathematical Economics, Second Edition,2004.
5. Silberberg, E. and Suen, W.: The Structure of Economics : A Mathematical Analysis, Third edition, Mc-Graw Hill, 2001.
6. K. G. Binmore, Mathematical analysis, Cambridge University Press, 1991.
7. Archibald, G.C. and Lipsey, R.G. , An Introduction to Mathematical Treatment of Economics, 1967, Weidenfeld and Nicolson
8. Henderson, J.M. and Quandt, R.E., Microeconomic Theory : A Mathematical Approach, McGrawHill,1980.
9. Intrilligator, M.D., Mathematical Optimization and Economic Theory, Society for Industrial and Applied Mathematics, Philadelphia, 1971.
10. Allen, R.G.D., Mathematical Analysis for Economists, McMillan, London, 1967

11. Dorfman, R., Samuelson, P.A. and Solow, R.M. , Linear Programming and Economic Analysis, McGraw-Hill, 1958.
12. Dixit, A.K., Optimization in Economic Theory, Oxford University Press, 1976.

Economics Core Course V: ECO-A-CC-3-5-TH-TU

Intermediate Microeconomics –I

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours:15

[For Semester- III]

ECO-A-CC-3-5-TH

Unit 1: Theories of Consumer Behaviour and Applications 17 lecture hours

1.1 Inter-temporal choice (saving and borrowing)

1.2Revealed preference

1.3. Choice under uncertainty – utility function and expected utility, risk aversion and risk preference

1.4 Applications of Consumer Behaviour in Construction of Price Indices – Laspeyers and Paasche‘s indices

2. Unit 2: Production and Costs 20 lecture hours

2.1 Technology – general concept of Production Function, production with one and two variable inputs,total average and marginal products, short run and long run, returns to factor and returns to scale, Isoquants, marginal rate of technical substitution, isocost line and firm‘s equilibrium, elasticity of substitution

2.2 Types of production functions- Cobb-Douglas, fixed-coefficient and CES functions

2.3 Cost structure- implicit cost, explicit cost, accounting cost, sunk cost, economic cost, fixed cost, variable cost, total, average and marginal cost. Determinants of short run cost, cost curves, cost minimization and expansion path, short versus long run cost curves, economies of scale.

3. Unit 3: The Firm and Perfect Market Structure 20 lecture hours

3.1 Organization, Firms and Profit Maximization

3.2 Marginal Revenue, Marginal Cost and Profit Maximization

3.3 Perfect competition- short run competitive equilibrium of the firm, short run supply curve of firm and industry, Output choice and competitive equilibrium in long run, Economic rent and profit, long-run industry supply- constant, increasing and decreasing cost.

3.4 Consumer and Producer surplus, welfare and efficiency of competitive equilibrium. Government intervention and dead weight loss, Application- Minimum prices and price supports (price ceiling and price floors)

4. Unit 4: Input Market in Perfect Competition 18 lecture hours

4.1 Basic concepts- derived demand, productivity of an input, marginal product of an input, marginal revenue product

4.2 Marginal productivity theory of distribution

4.3 Labor market-supply of labor, competitive labor markets

4.4 Land markets and rent

ECO-A-CC-3-5-TU

Tutorial Contact hours: 15

Text

1. Pindyck, Rubinfeld and Mehta, Microeconomics, Pearson

2. G.S.Maddala and E. Miller, 1989, Microeconomics, Prentice Hall, McGraw Hill International Editions

3. Goon, A.M., Gupta, M.K. and Dasgupta, B.: Fundamentals of Statistics Vol.2,The World Press Pvt. Ltd., Kolkata. (For index number only)

References

1. Hal. R Varian , Intermediate Microeconomics, A modern Approach, WW Norton and Company, 8th edition, 2010 (T)

2. Gravelle, H. and Rees ,R., Microeconomics, Prentice Hall

3. Anindya Sen, Microeconomics, OUP

4. Satya Chakrabarty, Microeconomics, Allied Publishers

5. Ferguson, C. E. and Gould, J.P., Microeconomic Theory, Aitbs Publishers and Distributors, New Delhi.

6. Lipsey, R. and Chrystal, A., 2007, Economics, OUP

Economics Core Course VI: ECO-A-CC-3-6-TH-TU

Intermediate Macroeconomics-I

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[For Semester- III]

ECO-A-CC-3-6-TH

1. Income Determination in the Short-run (Part-II) : The IS-LM Model

14 lecture hours

- IS-LM Model - equilibrium, stability and comparative statics. Crowding out .Effects of fiscal and monetary policies.

2. Aggregate Demand and Aggregate Supply- the Complete Keynesian Model

14 lecture hours

- Derivation of aggregate demand curve.
- Derivation of aggregate supply curves both in the presence and absence of wage rigidity.
- Equilibrium, stability, and comparative statics-effects of monetary and fiscal policies. Effects of wage cut.
- Unemployment equilibrium and its causes- possible solutions including real balance effect.

3. Keynes vs. Classics **10 lecture hours**

- Keynesian vs classical system.
- Hybrid models under Classical/Keynesian framework.
- Friedman‘s restatement of classical ideas

4. Money Supply, Monetary Policy and Government Budgetary Operations

17 lecture hours

- Measures of money supply with special reference to India (M_1,M_2, M_3 and M_4)
- Balance sheet view of money supplied by the banking sector as a whole
- High powered money –definition
- Balance sheet of Reserve Bank of India and High powered money
- Balance sheet of Commercial banks and basic ideas of money multiplier theory.
- Deposit multiplier, currency multiplier, reserve multiplier, credit multiplier and money multiplier in the context of the theory of money supply
- Interest sensitivity of money supply and the slope of the LM curve.

- Monetary policy – Open Market Operations, Statutory Liquidity Ratio, Bank rate, variable reserve ratio, repo rate.
- Government Budget Deficit and Deficit Financing-Indian illustration. Deficit financing and monetary policy.

5. Inflation, Unemployment and Expectations **20 lecture hours**

- The concept of Inflationary Gap.
- Demand pull vs. Cost push inflation
- Mark-up inflation
- The concept of stagflation
- Central Bank's role in controlling inflation: Monetary policy.
- Inflation and unemployment trade-off.
- Four models of aggregate supply: The Sticky-Wage Model, The Worker-Misperception Model, The Imperfect Information Model and The Sticky-Price Model.
- Deriving the Phillips Curve from Aggregate Supply Curve.
- Short run and long- run Phillips curve – role of adaptive expectations and rational expectations.
- Disinflation, Sacrifice Ratio and policy ineffectiveness.

ECO-A-CC-3-6-TU

Tutorial Contact hours: 15

Textbooks:

- Dornbusch, Fischer and Startz, Macroeconomics, McGraw Hill, 11th edition, 2010.
- N. Gregory Mankiw. Macroeconomics, Worth Publishers, 2010

References

- Richard T. Froyen, Macroeconomics, Pearson Education Asia, 2nd edition, 2005.
- Ackley Gardner (old), Macroeconomic Theory, Macmillan, 1961
- Ackley Gardner(new), Macroeconomics : Theory and Policy : Macmillan,1978
- Ghosh Chandana and Ghosh Ambar, Macroeconomics, PHI Learning Pvt Ltd, 2014
- Andrew B. Abel and Ben S. Bernanke, Macroeconomics, Pearson Education, Inc., 7th edition, 2011.
- Venieris, Y.P. and Sebold F.D. , Macroeconomics: Models and Policy, John Wiley and Sons, 1977
- Richard T. Froyen, Macroeconomics, Pearson Education Asia, 10th edition, 2016.
- William Branson. Macroeconomic Theory and Policy, Indian reprint, East West Press, 3rd edition, 2014.
- Levacic Rosalind and Rebmann Alexander, Macroeconomics: An Introduction to Keynesian and Neo-Keynesian Controversies, Palgrave Macmillan, 1982.

- Sikdar Soumyen, Principles of Macroeconomics, Oxford University Press
- Blaug Mark , Economic Theory in Retrospect, 5th Edition, Cambridge University Press, 1997
- Mueller, M. (edited), Readings in Macroeconomics, London: Holt, Rinehart and Winston, 1973.

Economics Core Course VII: ECO-A-CC-3-7-TH-TU

Statistical Methods for Economics

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[For Semester III]

ECO-A-CC-3-7-TH

1. Introduction and Overview **6 lecture hours**

- Subject-matter - the distinction between population and sample *[1 lecture hour]*
- Representation of data- graphical (line diagram, bar diagram, pie chart) and tabular method *[2 lecture hours]*
- Frequency Distribution *[3 lecture hours]*

2. Descriptive Statistics **13 lecture hours**

- Measures of central tendency(arithmetic mean, geometric mean, harmonic mean, median and mode, and their properties, Quartiles,Deciles and Percentiles) *[3 lecture hours]*
- Dispersion(range, quartile deviation, mean deviation, standard deviation, coefficient of variation, coefficient of mean deviation, coefficient of quartile deviation, Lorenz curve and Gini coefficient) *[4 lecture hours]*
- Moments, Skewness and Kurtosis (definition, computation) *[2 lecture hours]*
- Correlation and Regression (definition, computation, properties) *[4 lecture hours]*

3. Elementary Probability Theory **10 lecture hours**

- Sample spaces and events (concepts and definitions using set theory) *[2 lecture hours]*
- Axiomatic definition of probability and properties, theorem of total probability *[3 lecture hours]*
- Conditional probability, theorem of compound probability *[3 lecture hours]*
- Bayes' theorem and its applications. *[2 lecture hours]*

4. Probability Distributions **18 lecture hours**

- Random variable(discrete and continuous) *[1 lecture hour]*
- Probability distributions (pmf, pdf. Distribution functions) *[2 lecture hours]*

- Expected values of random variables (mean,variance, raw moment, central moment, moment generating functions) *[3 lecture hours]*
- Properties of commonly used discrete and continuous distributions:

  Binomial -(derivation of pmf, mean,variance, moments, moment generating functions, problems) *[3 lecture hours]*

  Poisson - (derivation of pmf, mean, variance, moments, moment generating functions, problems) *[3 lecture hours]*

  Normal - (derivation of pdf, mean, variance, moments, moment generating functions, problems) *[3 lecture hours]*
- Joint distribution functions of random variables (discrete and continuous) - joint pdf (pmf), marginal pdf (pmf)., conditional pdf (pmf) *[3 lecture hours]*

5. Sampling **14 lecture hours**

- Principal steps in a sample survey (concepts of population, sample, parameter, statistic) *[2 lecture hours]*
- Methods of sampling-

  SRSWR, SRSWOR(use of random sampling numbers) *[2 lecture hours]*

  Stratified sampling (basic concepts only) *[1 lecture hour]*

  Multi-staged sampling (basic concepts only) *[1 lecture hour]*
- Sampling distribution of sample mean and sample proportion

  Mean and standard error both inSRSWR and SRSWOR *[4 lecture hours]*

  Standard normal, chi-square, Student‘s t and F distributions – definitions, important properties (mean and variance) *[4 lecture hours]*

6. Statistical inference **14 lecture hours**

- Point estimation-Properties of a good estimator; *[4 lecture hours]*
- Basic principles of

  Ordinary Least Square, *[2 lecture hours]*

  Maximum Likelihood Method *[1 lecture hour]*

  Method of Moments; *[1 lecture hour]*
- Interval estimation.*[2 lecture hours]*
- Testing of hypothesis (basic conceptsof null hypothesis, alternative hypothesis, type I and Type II errors, power of a test, p-value) *[4 lecture hours]*

ECO-A-CC-3-7-TU

Tutorial contact hours: 15 [for revision, doubt clearing, solving problems]

Text books

- Goon, A. M, Gupta, M. K, and Dasgupta, B. Fundamentals of Statistics (Volume One, Volume two), The World Press Private Ltd
- William G. Cochran, Sampling Techniques, John Wiley, 2007

Reference books

- John E. Freund, Mathematical Statistics, Prentice Hall, 1992.
- Mood, A.M., F. A. Graybill and D.C. Boes, Introduction to the theory of statistics, McGraw Hill, 1974.

Skill Enhancement Course I: ECO-A-SEC-3-A(1)-TH

Data Analysis [DA]

Total Marks: 100 [Theory (Th) 80 + Internal Assessment 10+Attendance: 10]

Total Credits: 2,

No. of Lecture hours: 30

[For Semester III]

Unit 1: Collection and representation of data **12 lecture hours**

1.1 Collection of data (some methodological issues) *[4 lecture hours]*

1.1.1 Census

1.1.2 Sample survey

1.2 Representation of data *[2 lecture hours]*

1.3 The basics of data management in Stata / R / Eviews / SPSS / MS Excel *[6 lecture hours]*

Unit 2: Indian Official Statistics (Basic concepts) **18 lecture hours**

1. Central Statistical Office (CSO) – National Accounts Statistics (NAS), Industrial Statistics (ASI, IIP) *[6 lecture hours]*
2. National Sample Survey Office (NSSO) – Household Consumer Expenditure Survey Rounds, Employment and Unemployment Survey Rounds *[6 lecture hours]*
3. Census of India – Population Census 2011 *[4 lecture hours]*
4. Reserve Bank of India (RBI) – Handbook of Statistics on Indian Economy (Selected parts) *[2 lecture hours]*

Suggested Readings:

1. Goon, A. M, Gupta, M. K, and Dasgupta, B. *Fundamentals of Statistics (Volume One)*, The World Press Private Ltd
2. GOI, *Note on Sample Design and Estimation Procedure of NSS 68th Round*, National Sample Survey Office, Ministry of Statistics and Programme Implementation.
3. GOI, *SRS Statistical Report 2016*, Office of the Registrar General & Census Commissioner, India

Suggested Websites

www.mospi.nic.in

www.censusindia.gov.in

www.rbi.org.in

Skill Enhancement Course I: ECO-A-SEC-3-A(1)-TH

Rural Development [RD]

Total Marks: 100 [Theory(Th) 80 + Internal Assessment 10+Attendance: 10]

Total Credits: 2,

No. of Lecture hours: 30

[For Semester III]

1. **Aspects of Rural Development** **6 lecture hours**

- Concept of Rural Development
- Rural Development vs. Agricultural Development
- Role of NGOs in Rural Development
- Rural Non Farm Sector and Rural Development

2. **Panchayats and Rural Development** **5 lecture hours**

- Decentralized Planning and Participatory Development
- Role of Panchayats in Decentralized Rural Development
- Participatory Rural Appraisal
- Panchayats and Rural Development in West Bengal

3. **Rural Credit and Self Help Groups(SHGs)** **11 lecture hours**

- Role National Bank for Agriculture and Rural Development (NABARD) for promoting Rural Development
- Constraints of micro-enterprises in rural areas
- Credit needs for rural non farm sector.
- The concept of Micro credit
- Micro credit and the role of Grameen Bank
- Need for SHG for formation and features of SHG
- SHGs in India

4. **Critical Evaluation of Selected Government Programmes and Rural Development** **8 lecture hours**

- Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and Rural Development
- Child labour and school drop-out in rural areas. Mid-day Meal and Rural Development
- National Rural Health Mission (NRHM) and Rural Development

- Pradhan Mantri Gram Sadak Yojana (PMGSY) and Rural Development

References

1. Katar Singh , Rural Development : Principles, Policies and Management, Sage Publications, New Delhi
2. K.G. Karmakar, Rural Credit and Self-Help Groups, Sage Publications, New Delhi
3. S.Sau, Rural Industrialization –Development Trajectory in India, Farma K.L.M., Kolkata
4. Misra D. and Puri K. Indian Economy, Himalaya Publishing House
5. Datt and Sundharam (Revised by G.Datt and A. Mahajan) , Indian Economy, 70th edition, S. Chand

13. N. Narayanasami, Participatory Rural Appraisal: Principle, Methods and Applications, Sage Publications, New Delhi, 2009.
14. Vasant Desai, A Study of Rural Economics, Himalaya Publishing House, New Delhi.
15. Mahi Pal, ―Panchayati Raj and Rural governance‖, Economic and Political Weekly, Jan. 10-16, vol. XXXIX, 2004,No.2, p.13
16. Raghava, D. V. Rao, Panchayats and Rural Development, Ashish Publishing House, New Delhi, 1980.
17. Ram Reddy, Pattern of Panchayati Raj in India, Heritage Publishers, New Delhi, 2005.
18. Latest Reports on Panchayati Raj Development in West Bengal

Economics Core Course VIII: ECO-A-CC-4-8-TH-TU

Intermediate Microeconomics II

Total Marks: 100 [Theory (Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[For Semester IV]

ECO-A-CC-4-8-TH

Unit 1: Imperfect Market Structure **40 lecture hours**

1.1 Monopoly and barriers to entry- output determination and price rule, measure and sources of monopoly power, social costs of monopoly power-deadweight loss

1.2 Pricing with market power- first, second and third degree price discrimination, multiplant monopoly

1.3 Monopolistic competition- short run and long run equilibrium, excess capacity

1.4 Oligopoly- Oligopoly equilibrium as Nash equilibrium, Cournot, Bertrand and Stackelberg Model- use of isoprofit curves and simple game theoretic interpretation. Sweezy‘s kinked demand

curve model and non-collusive equilibrium. Competition versus collusion- the Prisoners' Dilemma. Collusive Oligopoly –Cartels and Price Leadership

Unit 2: Input market under Imperfect Competition 5 lecture hours

2.1 Monopsony, bilateral monopoly in labour market

Unit 3: General Equilibrium, Efficiency and Welfare 30 lecture hours

3.1 General Equilibrium and Economic Efficiency- Exchange, production and welfare, Pareto Optimality, Edgeworth box and contract curve, Pareto efficiency and perfect competition

3.2 Reasons for Market failure, Pareto efficiency and market failure (externalities and public goods), property right and Coase Theorem

3.3 Markets with asymmetric information-adverse selection, moral hazards, agency problems (concepts only) **ECO-A-**

CC-4-8-TU Tutorial

Contact Hours: 15

Text

- Pindyck, Rubinfeld and Mehta, Microeconomics, Pearson

References

1. Hal. R Varian , Microeconomic Analysis, WW Norton and Company, 3rd edition, 2013
2. J Tirole, Theory of Industrial Organisation, MIT Press, 1988
3. K Binmore, Fun and Games: A text on Game Theory, OUP,1991
4. Anindya Sen, Microeconomics, OUP
5. C. Snyder and W. Nicholson, Fundamentals of Microeconomics, Cengage Learning, 2010
6. Satya Chakrabarty, Microeconomics, Allied Publishers
7. Ferguson, C. E. and Gould, J.P., Microeconomic Theory, Aitbs Publishers and Distributors, New Delhi.
8. Cohen, K.J. and Cyert, R.M. , ―Theory of the Firms: Resource Allocation in a Market Economy‖ , Prentice Hall India,1981
9. Chauhan, S.P.S. , – Microeconomics- An Advanced Treatise‖, Prentice Hall India, 2009.

Economics Core Course IX: ECO-A-CC-4-9-TH-TU

Intermediate Macroeconomics II

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[For Semester IV]

ECO-A-CC-4-9-TH

1. Basic Tenets of New Classical and New Keynesian Theories 20 lecture hours

- New Classical Theory-The concept of rational expectations and the theory of real business cycle-introductory ideas
- New Keynesian Theory- nominal rigidities and real rigidities, rigidities in interest rates and credit rationing-introductory ideas

2. Macroeconomic Foundations -II 20 lecture hours

- Consumption: Keynesian consumption function; Fisher‘s theory of optimal intertemporal choice; life-cycle and permanent income hypotheses; Dusenberry‘s relative income hypothesis; rational expectations and random-walk of consumption expenditure.
- Demand for money: Regressive Expectations and Tobin‘s portfolio choice models; Baumol‘s inventory theoretic money demand.

3. Economic Growth 35 lecture hours

- Harrod and Domar models of economic growth.
- Solow one sector growth model-golden rule- -dynamic efficiency.
- Technological progress ,
- Elements of endogenous growth theory-basic ideas-the AK model

ECO-A-CC-4-9-TU

Tutorial Contact hours: 15

Textbooks:

- N. Gregory Mankiw. Macroeconomics, Worth Publishers, 2010
- Ghosh Chandana and Ghosh Ambar, Macroeconomics, PHI Learning Pvt Ltd, 2014

References

- Richard T. Froyen, Macroeconomics, Pearson Education Asia, 2nd edition, 2005.
- Romer David , Advanced Macroeconomics, McGraw Hill Education, 4th edition, 2011.
- Ghosh Chandana and Ghosh Ambar, Economics of the Public Sector, PHI Learning Pvt Ltd, 2008

- Andrew B. Abel and Ben S. Bernanke, Macroeconomics, Pearson Education, Inc., 7th edition, 2011.
- Richard T. Froyen, Macroeconomics, Pearson Education Asia, 10th edition, 2016.
- Steven M. Sheffrin, Rational Expectations, Cambridge University Press, 2nd edition, 1996.
- William Branson. Macroeconomics , Harper and Row, 3rd edition, 1989
- Snowdon and Vane (ed), A Macroeconomics Reader, Routledge, Taylor and Francis Group.
- R. Barro. Macroeconomics, 5th edition, The MIT Press, 1989
- A.K.Sen (ed). Growth Economics, Penguin, 1970
- Barro, R.J. and Xavier Sala-i-Martin , Economic Growth,
- Errol D'Souza. Macroeconomics, Pearson Education (New Delhi), 2009.
- Dornbusch, Fischer and Startz, Macroeconomics, McGraw Hill, 11th edition, 2010.
- Laidler, E.W. ,The Demand for Money : Theories and Evidence, Dun-Donnelley Publishing Corporation, New York, 1978.

Economics Core Course X: ECO-A-CC-4-10-TH-TU

Introductory Econometrics

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[For Semester IV]

ECO-A-CC-4-10-TH

1. Nature and Scope of Econometrics 4 lecture hours

1.1 Distinction between Economic Model and Econometric model *[1 lecture hour]*

1.2 Concept of stochastic relation, Role of random disturbance in econometric model *[1 lecture hour]*

1.3 Types of data *[1 lecture hour]*

1.4 Application of Econometrics in different branches of social science *[1 lecture hour]*

2. Classical Linear Regression Model (Simple linear regression and multiple linear regression): part 1 15 lecture hours

2.1 The classical assumptions (basic interpretation) *[1 lecture hour]*

2.2 Concepts of population regression function and sample regression function *[3 lecture hours]*

2.3 Estimation of model by method of ordinary least squares (Derivation in simple linear model (SLRM) and multiple linear model (MLRM) with two regressors only) *[6 lecture hours]*

2.4. Simple correlation, partial correlation and multiple correlation (Definition, and interpretation in the context of SLRM and MLRM) *[2 lecture hours]*

2.5 Limitations of SLRM and additional complications in MLRM *[2 lecture hours]*

2.6 Economic interpretations of the estimated model *[1 lecture hour]*

3. Classical Linear Regression Model (Simple linear regression and multiple linear regression): part 2 10 lecture hours

3.1 Properties of the Least Squares Estimators (BLUE) in SLRM- Gauss-Markov theorem *[4 lecture hours]*

3.2 Qualitative (dummy) independent variables – intercept dummy and slope dummy (only interpretation of the model) *[3 lecture hours]*

3.3 Forecasting - Ex-post forecast and Ex-ante forecast, forecast error (only for two variable model) *[3 lecture hours]*

4. Statistical inference in linear regression model 26 lecture hours

4.1 Use of standard normal, chi2, t, and F statistics in linear regression model *[9 lecture hours]*

4.2 Testing hypothesis *[12 lecture hours]*

Single test (t test and chi2 test)

Joint test (F test)

4.3 Goodness of fit (in terms of R^2, adjusted R^2 and F statistic), Analysis of Variance (ANOVA) *[3 lecture hours]*

4.4 Statistical significance and economic importance *[2 lecture hours]*

5. Violations of Classical Assumptions 12 lecture hours

5.1 Multicollinearity - Consequences, Detection (Variance Inflationary Factor (VIF)) and Remedies *[4 lecture hours]*

5.2 Heteroscedasticity - Consequences, Detection (Lagrange Multiplier test) and Remedies *[4 lecture hours]*

5.3 Autocorrelation - Consequences, Detection (Durbin-Watsontest) and Remedies *[4 lecture hours]*

6. Specification Analysis 8 lecture hours

6.1 Omission of a relevant variable *[2 lecture hours]*

6.2 Inclusion of irrelevant variable *[2 lecture hours]*

6.3 Tests of specification errors *[2 lecture hours]*

6.4 Testing for linearity and normality assumptions *[2 lecture hours]*

ECO-A-CC-4-10-TU

Tutorial Contact hours: 15

Text Books

1. Gujarati, Damodar (2004), *Basic Econometrics*, McGraw-Hill

2. Wooldridge, Jeffrey M. (2013), *Introductory Econometrics* – A Modern Approach, CENGAGE learning

Reference Books

1. Maddala, G. S. (2002), *Introduction to Econometrics*, Macmillan Publishing Company
2. Goon, A. M, Gupta, M. K, and Dasgupta, B., *Fundamentals of Statistics* (Volume One), The World Press Private Ltd

Skill Enhancement Course II: ECO-A-SEC-4-B(2)-TH

Research Methodology

Total Marks: 100 [Theory (Th) 80 + Internal Assessment 10+Attendance: 10]

Total Credits: =2,

No. of Lecture hours: 30,

[For Semester IV]

Unit 1 : Methodological Issues 1 **10 lecture hours**

- Locating the basic issues- theme based literature survey and motivation behind any study-objectives of the study-development of writing skills
- Designing the sampling frame in case of field survey- the role of pilot survey
- The role of random numbers in drawing random sample
- Methods behind preparation of questionnaire in case of field survey
- Data entry after field survey
- Tabular representation of data and graphs for data interpretation

Unit 2: Methodological Issues 2 **20 lecture hours**

- Theoretical and Empirical Research in Economics.
- Common sections of an ideal research paper in Economics.
- Illustrations of empirical research work. Reporting the regression results and interpretation of the results: the role of statistical inference.[The course instructor should focus on framing the testable hypothesis and the role of statistical inference in empirical research]
- Illustrations of theoretical research: specification of the model, closing the model, checking stability of the model for meaningful comparative static results. [The course instructor should focus on the role of stability analysis in theoretical models by showing the method of linearizing non-linear differential equations. Illustrations can be made from IS-LM model by using trace and determinant conditions of the Jacobian matrix-the role of phase diagrams]
- Role of footnotes or end notes in a research paper
- Bibliography, reference and citation

- Writing the abstract of a research paper
- Key words and JEL Classification
- Presentation of a research paper through power point. Basic rules to be followed for a good presentation. Role of diagrams, graphs, pictures and charts.

Suggested Readings

1. Goon, A. M, Gupta, M. K, and Dasgupta, B. Fundamentals of Statistics (Volumes One and Two),The World Press Private Ltd
2. C.R. Kothari : Research Methodology : Methods and Techniques (second revised edition), New Age India (P) Ltd Publishers.
3. Alpha C. Chiang and Kavin WainWright : Fundamental Methods of Mathematical Economics, McGraw Hill, 2005.[For stability analysis]

Skill Enhancement Course II: ECO-A-SEC-4-B(2)-TH

Managerial Economics

Total Marks: 100 [Theory (Th) 80 + Internal Assessment 10+Attendance: 10]

Total Credits: =2,

No. of Lecture hours: 30,

[For Semester IV]

1. Demand, Cost and Profit Analysis 6 lecture hours

- Demand for durable and non durable products, demand forecasting techniques
- Cost estimation
- Cost-volume-profit analysis (break even analysis)- objectives and assumptions; determination of breakeven point, limitations of c-v-p analysis

2. Pricing Policies and practices 3 lecture hours

- Factors governing prices, price discounts and differentials, price forecasting

3. Capital Budgeting 8 lecture hours

- What is capital budgeting, need for capital budgeting, different steps in capital budgeting, Capital budgeting appraisal methods – payback method, accounting rate of return method, net present value method, interest rate of return method, benefit cost ratio method. Capital rationing, alternative methods of financing investments

4. Cost of capital 5 lecture hours

- Cost of debt capital, cost of share capital, cost of equity capital, cost of retained earnings

5. Inventory Management **8 lecture hours**

- Inventory costs, concepts of average inventory, various inventory models- economic order quantity, optimum number of orders per year, optimum number of days supply per order.

References

- Varshney R.L., and Maheshwari K.L. – Managerial Economics, Sulatn Chand, N Delhi
- Keat P. G. and Young P.K.Y – Manegerial Economics, Pearson Education, N Delhi]
- Mehta P.L - – Managerial Economics, Sulatn Chand, N Delhi
- Samuelson W.F and Marks S,G - – Managerial Economics, Wiley Student Education
- Clarke T. International Corporate Governance, Routledge.

Economics Core Course XI: ECO-A-CC-5-11-TH-TU

International Economics

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours:15

[Semester V]

ECO-A-CC-5-11-TH

1. Absolute and Comparative Advantages of Trade **9 lecture hours**

- Adam Smith's theory of absolute advantage.
- David Ricardo's theory of comparative advantage.
- Arbitrage as the basis and direction of trade; fundamental sources of cross-country price differences and arbitrage-concept of comparative advantage; externalities, regulation and perverse comparative advantage
- One factor economy, production possibility frontier, relative demand and relative supply, terms of trade, trade in the Ricardian world, determination of intermediate TOT, complete vs incomplete specialization, complete specialization and gains from trade.

2. The Building Blocks of Trade Theory **14 lecture hours**

- The concept of community indifference curve-Justification and properties.
- The need for trade indifference curves, derivation of trade indifference curves, properties of trade indifference map, Offer curves and its properties. Three important elasticities- the elasticity of offer curves, the elasticity of demand for imports, the elasticity of supply of exports. International equilibrium and offer curves, terms of trade (TOT) and stability, the Marshall-Lerner condition,
- Gains from Trade (GFT) theorem, illustration of GFT, decomposition of GFT, substitution possibilities and magnitude of GFT.

- Production structure for neo-classical trade models, role of constant returns to scale, the concept of unit isoquants, duality in the production structure, significance of the envelope condition in trade models

3. Factor Endowment and Trade (Heckscher-Ohlin-Samuelson Model) 15 lecture hours

- Heckscher-Ohlin (HO)theorem and price vs physical definitions of relative factor abundance.
- Role of homotheticity of tastes in the context of physical definition
- Factor Intensity Reversal in the context of price and physical definitions and invalidity of HO Theorem.
- Factor intensity ranking, one-to-one correspondence between commodity price ratio & factor price ratio (Stolper-Samuelson theorem), One to one correspondence between endowment ratio and production proportion (Rybczyski theorem) .
- The Factor Price Equalization Theorem. Factor price equalization and complete specialization.
- Incomplete Specialization, Factor price equalization and Factor Intensity Reversal
- Empirical studies- Leontief Paradox.

4. Applications of Neo-classical Trade Models for developing countries 10 lecture hours

- Jones (1965) Heckscher-Ohlin type 2x2(two factors-two commodities) full employment model for small open developing economies. Basic structure –significance of the assumption of constant returns to scale- the decomposability property-the capital intensity condition in physical and value terms- Implications of Stolper-Samuelson and Rybczynski theorems-the price and output magnification effects.
- Jones (1971) 3x2(three factors-two commodities) specific-factor model. Basic structure-significance of the assumption of constant returns to scale-the indecomposability property. Implications of price magnification effects in specific factor model.

5. Trade Policy 12 lecture hours

- Partial Equilibrium Analysis of Tariff - cost–benefit, Quota, Quota- Tariff equivalence & non-equivalence, monopoly effects of quota, subsidy and voluntary export restraint.
- General Equilibrium Analysis- distinction between large and small economy, welfare effects of a tariff on small country and large country. Tariff ridden offer curve, Tariff war, Optimum tariff for large economy, Metzler‘s Paradox.

6. Open Economy Macroeconomics and Balance of Payments 15 lecture hours

- Determination of equilibrium income in open economy. Foreign Trade Multiplier with & without repercussion effects.

- Balance of Payment accounts in an open economy. Autonomous and accommodating transactions.
- Fixed &Flexible Exchange Rates: adjustment of demand and supply of Foreign Exchange, Effect of devaluation, The Mundel-Fleming Model (IS LM BP model)

ECO-A-CC-5-11-TU

Tutorial Contact hours: 15

Texts

1. P. Krugman and M. Obstfeld- International Economics (8th Edition) ; Pearson Education
2. R. Caves, J. Frankel and R.W. Jones – World Trades & Payments (9th Ed); Pearson Education.
3. Rajat Acharyya- International Economics; Oxford University Press

References

- J.R. Markusen, J.R. Melvin, W.H. Kaempfer, K.E. Maskus – International Trade – Theory and Evidence, McGraw Hill
- B. Sodersten, and G. Reed (1994) : International Economics , Macmillan, London, 3rd edition.
- M. Chacoliades (1978) : International Trade: Theory and Policy, New York, McGraw- Hill
- R. Dornbusch : Open Economy Macroeconomics, Basic Books, Inc. Publishers, New York**.**
- Jones, R.W. : ‒ The Structure of Simple General Equilibrium Models‖, Journal of Political Economy, Vol 73, 1965, pp 551-572
- Jones, R.W. : ‒ A Three Factor Model in Theory, Trade and History‖, in Bhagwati. J. et al (eds) Trade, Balance of Payments and Growth, 1971, North Holland, Amsterdam.
- Chaudhuri, S. and Mukhopadhyay, U.: Foreign Direct Investment in Developing Countries: A Theoretical Evaluation, Springer, Chapter 2 only, 2014.

Economics Core Course XII: ECO-A-CC-5-12-TH-TU

Indian Economy

Total Marks: 100

[Theory (Th) 65 + Tutorial Based Term Paper (Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial Based Term Paper contact hours: 15

[Semester V]

ECO-A-CC-5-12-TH

1. Economic Development since Independence 20 lecture hours

- Growth and development under different policy regimes (from planning to market based development)
  - Objectives, achievements and failures of Planning *[4 lecture hours]*
  - Economic crisis during the late 1980s *[3 lecture hours]*

- Economic Reforms –Critical Analysis *[3 lecture hours]*

- Structural changes in the post-reforms period *[5 lecture hours]*
- Regional variation of growth and development *[5 lecture hours]*

2. Population and Human Development **15 lecture hours**

- Demographic trends and issues *[6 lecture hours]*
- Education and health:Basic problems and Government measures, Right to Education (RTE) Act 2009 *[9 lecture hours]*

3. Growth and Distribution **20 lecture hours**

- Trends in GDP and per capita GDP *[5 lecture hours]*
- Growth, poverty and inequality *[5 lecture hours]*
- Youth unemployment (School Transition to Work) *[5 lecture hours]*
- Policy perspectives in growth and distribution *[5 lecture hours]*

4. **Economic Reforms in India** **20 lecture hours**

- Banking sector reforms *[5 lecture hours]*
- Reforms in tax policy *[5 lecture hours]*
- Reforms in the external sector *[5 lecture hours]*
- Reforms in Labour market *[5 lecture hours]*

ECO-A-CC-5-12-TU

Tutorial Based Term Paper Contact Hours: 15 (for review classes, presentation by the students)

A term paper is to be prepared by the student under Tutorial Based Term Paper on any topic under the four broad themes covering the syllabus for the tutorial. Term paper should cover a literature survey of the topic along with a critical evaluation of the policy measures undertaken in the Indian context to tackle the specified problem. It should be prepared under a full time teacher of the subject belonging to the institution. All total 15 hours are allotted for a term paper. It is to be evaluated (all total 15 marks) jointly by an internal and an external examiner(if it is permitted under University rules) on the basis of the content of the term paper along with viva-voce on the term paper.

References

- Jean Dreze and AmartyaSen, 2013. An Uncertain Glory: India and its Contradictions, Princeton University Press.
- Jean Dreze and Amartya Sen: Economic Development and social opportunity, OUP

- Mihir Rakshit, 2011, Macroeconomics of Post-Reform India, OUP
- Sukhomoy Chakraborty: Development Planning: The Indian Experience, OUP
- Uma Kapila: Indian Economy since independence, Academic Foundation
- Ahluwalia and Little (ed): India‘s Economic Reforms and Development, OUP
- Joshi and Little: India‘s Economic Reforms, OUP
- Pulapre Balakrishnan, 2007, the Recovery of India: Economic Growth in the Nehru Era, Economic and Political Weekly, November.
- Panchanan Das. (2012), Wage Inequality in India - Decomposition by Sector, Gender and Activity Status, Economic and Political Weekly, 47(50), pp. 58-64
- Rakesh Mohan, 2008, ―Growth Record of Indian Economy: 1950-2008. A Story of Sustained Savings and Investment, Economic and Political Weekly, May.
- S.L. Shetty, 2007, ―India‗s Savings Performance since the Advent of Planning, in K.L. Krishna and A. Vaidyanathan, editors, Institutions and Markets in India‘s Development.
- Himanshu, 2010, Towards New Poverty Lines for India, Economic and Political Weekly, January.
- Jean Dreze and Angus Deaton, 2009, Food and Nutrition in India: Facts and Intepretations, Economic and Political Weekly, February.
- Himanshu. 2011, ―Employment Trends in India: A Re-examination, Economic and Political Weekly, September.
- Rama Baru et al, 2010, ―Inequities in Access to Health Services in India: Caste, Class and Region, Economic and Political Weekly, September.
- Geeta G. Kingdon, 2007, ―The Progress of School Education in India, Oxford Review of Economic Policy
- J.B.G. Tilak, 2007, ―Post Elementary Education, Poverty and Development in India, International Journal of Educational Development.
- T. Dyson, 2008, ―India‗s Demographic Transition and its Consequences for Development‖ in Uma Kapila, editor, Indian Economy Since Independence, 19th edition, Academic Foundation.
- Kaushik Basu, 2009, ―China and India: Idiosyncratic Paths to High Growth, Economic and Political Weekly, September.
- K. James, 2008, ―Glorifying Malthus: Current Debate on Demographic Dividend in India Economic and Political Weekly, June.
- Reetika Khera, 2011, ―India‗s Public Distribution System: Utilisation and Impact Journal of Development Studies.
- Aniruddha Krishna and DevendraBajpai, 2011, ―Lineal Spread and Radial Dissipation: Experiencing Growth in Rural India, 1992-2005, Economic and Political Weekly, September.
- Kaushik Basu and A. Maertens, Eds, 2013, The New Oxford Companion to Economics, Oxford University Press.

Discipline Specific Elective – A(1):

ECO-A-DSE-5-A(1)-TH-P Applied

Econometrics [AE] *Total Marks: 100*

[Theory (Th) 50+ Practical (P) 30 + Internal Assessment 10 + Attendance: 10]

Total Credits: [4(Th)+2(P)]=6 ,

No. of Lecture hours: 60, No. of Practical hours: 60/No. Of Practical classes: 30

[Semester –V]

ECO-A-DSE-5- A(1) –TH

1. Steps in empirical research **10 lecture hours**

1.1 Use of econometric models in empirical research – some basic concepts *[5 lecture hours]*

1.2 The basic commands in Stata / R *[5 lecture hours]*

2. Regression Diagnostics and Specification **20 lecture hours**

2.1 Misspecification *[4 lecture hours]*

2.2 Functional forms *[4 lecture hours]*

2.3 Model selection *[4 lecture hours]*

2.4 Application with Stata / R *[8 lecture hours]*

3. Application of Regression Analysis **30 lecture hours**

3.1 Cross section analysis – Linear regression model with two regressors (by using survey data like NSSO with Stata / R) *[6 lecture hours]*

3.2 Time series analysis (very preliminary level) – Basic concepts of time series, Estimating linear trend (by using NAS with Stata / R) *[12 lecture hours]*

3.3 Panel data analysis – basic concepts of fixed effects model; random effects model – (Application with Indian Official Statistics using Stata / R) *[12 lecture hours]*

ECO-A-DSE-5-A(1)-P

Total Practical Hours: 60, No of Practical Classes: 30

Applications of use of softwares STATA or R will be demonstrated in the computer laboratory in practical classes and the practical examination will be conducted in the usual manner as mentioned in CSR.

Text Books

1. Christopher F. Baum, (2006), An Introduction to Modern Econometrics Using Stata, Stata Press

2. Maddala, G. S. (2002), Introduction to Econometrics, Macmillan Publishing Company

3. Wooldridge, Jeffrey M. (2013), Introductory Econometrics – A Modern Approach, CENGAGE learning

4. Hamilton L. Statistics with Stata

References

STATA USER'S GUIDE RELEASE 13, https://www.stata.com/manuals13/u.pdf

Discipline Specific Elective – A(1):

ECO-A-DSE-5-A(1)-TH-TU

Economic History of India (1857-1947) [EHI]

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[Semester- V]

ECO-A-DSE-5-A(1) –TH

1. Impact of British rule on India **30 lecture hours**

- Deindustrialization
- Commercialization of agriculture
- Economic Drain

2. Aspects of Economic Policies in British India **45 lecture hours**

- Land policy
- Policy of Discriminating Protection
- Early Industrial Development and Managing Agency System
- Currency and monetary policy
- Development of Infrastructure – Railways

ECO-A-DSE-5-A(1)-TU

Tutorial contact hours: 15

References

1. Lakshmi Subramanian, ―History of India 1707-1857‖, Orient Blackswan, 2010, Chapter 4.
2. SumitGuha, 1991, Mortality decline in early 20th century India‟, Indian Economic and Social History Review (IESHR), pp 371-74 and 385-87.
3. Tirthankar Roy, The Economic History of India 1857-1947, Oxford University Press, 3rd edition, 2011.
4. B. Chandra B. (2010): Rise and Growth of Economic Nationalism in India, HarAnand Publications,
5. J. Krishnamurty, Occupational Structure, Dharma Kumar (editor), The Cambridge Economic History of India, Vol. II, (henceforth referred to as CEHI), 2005, Chapter 6.
6. IrfanHabib, Indian Economy 1858-1914, A People‟s History of India, Vol.28, Tulika, 2006.

7. Ira Klein, 1984, ―When Rains Fail: Famine relief and mortality in British India‖, IESHR 21.
8. Jean Dreze, Famine Prevention in India in Dreze and Sen (eds.) Political Economy of Hunger, WIDER Studies in Development Economics, 1990, pp.13- 35.
9. John Hurd, Railways, CEHI, Chapter 8, pp.737-761.
10. Rajat Ray (ed.), Entrepreneurship and Industry in India, 1994.
11. AK Bagchi, ―Deindustrialization in India in the nineteenth century: Some theoretical implications Journal of Development Studies, 1976.
12. MD Morris, Emergence of an Industrial Labour Force in India, OUP 1965, Chapter 11, Summary and Conclusions.
13. K.N. Chaudhuri, Foreign Trade and Balance of Payments, CEHI, Chapter 10.
14. B.R. Tomlison, 1975, India and the British Empire 1880-1935, IESHR, Vol.XII.
15. Dharma Kumar, The Fiscal System, CEHI, Chapter 12.
16. Basudev Chatterjee, Trade, Tariffs and Empire, OUP 1992, Epilogue.
17. Daniel Thorner, Agrarian Prospect in India, 1977.
18. Visaria and P. Visaria, Population. CEHI, Chapter

Discipline Specific Elective-B(1):
ECO-A-DSE-5-B(1)-TH-TU
Comparative Economic Development (1850-1950) [CED]

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[Semester-V]

ECO-A-DSE-5-B(1)-TH

1. Strategies and Policies for Economic Development 30 lecture hours

- Laissez-faire and free trade
- Strategy of industrialization in Soviet Union.

- Ha-Joon Chang. 2002. *Kicking Away the Ladder—Development Strategy in Historical Perspective*. London: Anthem Press. Chapter 2 (excluding NICs).
- Alec Nove. 1992. *An Economic History of the USSR 1917-1991*, London: Penguin 1992, chapter 8.

2. Regions of contemporary development 45 lecture hours

- Success stories of Asia : Japan, South East Asia and China
- Crisis and failures of Latin America and Africa

- Ha-Joon Chang. 2002. *Kicking Away the Ladder—Development Strategy in Historical Perspective*. London: Anthem Press. Chapter 2, 46-51.

- Ha-Joon Chang. 2004. ―The East Asian Development Experience‖, in *Rethinking Development Economics*, edited by Ha-Joon Chang, pp. 107-124. London: Anthem Press.
- PranabBardhan, ―What Makes a Miracle: Some Myths About the Rise of China and India‖, *Boston Review*, January/February 2008; and ―Introduction: The Myths Floating Around the Giants‖, in *Awakening Giants, Feet of Clay: Assessing the Economic Rise of China and India* (Princeton: Princeton University Press, 2010.
- Gabriel Palma. 2004. ―Latin America During the Second Half of the Twentieth Century – From the ‗Age of Extremes' to the Age of ‗End-of-History' Uniformity‖, in *Rethinking Development Economics*, edited by Ha-Joon Chang, pp. 125-151. London: Anthem Press.
- Kwan Kim. 2005. ―Development Crisis in Sub-Saharan Africa: Globalization, Adjustment and the Roles of International Institutions‖, in *Global Development and Poverty Reduction*, edited by John-ren Chen and David Sapsford, pp. 294-320. Cheltenham and Northampton: Edward Elgar, 2005.

ECO-A-DSE-5-B(1)-TU

Tutorial Contact hours: 15

General References

- Ha-Joon Chang. 2003. "Kicking Away the Ladder: The "Real" History of Free Trade", *Foreign Policy*, 30 December
- Alice Amsden. Ch. 6 of *Escape from Empire: The Developing Worlds Journey through Heaven and Hell*, MIT Press.
- World Bank, ―Overview‖, in *World Development Report 2001: Attacking Poverty*, pp. 1-12.
- World Bank, ―Overview‖, in *World Development Report 2002: Building Institutions for Markets*, pp. 1-12.
- Barry Naughton. 2006. *The Chinese Economy: Transitions and Growth*. MIT Press.
- Kay, Cristobal. 2002. Why East Asia overtook Latin America: Agrarian Reform, Industrialisation and Development, *Third World Quarterly*, Vol 23.
- Mark Weisbrot, *Latin America: The End of an Era*, Center for Economic and Policy Research, December 2006
- Keith Griffin. 1999. *Alternative Strategies for Economic Development*, chapter 2, Palgrave Macmillan.
- T. Nakamura, Economic Growth in Pre-War Japan, Tr. by Robert A Feldman, Yale University Press, 1983.
- Okochi, Karsh and Levine, Workers and Employees in Japan, The Japanese Employment Relations System, University of Tokyo, 1965.
- Y. Hayami, A Century of Agricultural Growth in Pre-War Japan: Its Relevance to Asian Development, University of Minnesota Press, 1975.

- Chalmers Johnson, MITI and the Japanese Miracle: The Growth of Industrial Policy 1925-1975, Stanford University Press, 1982.
- W.W. Lockwood, Economic Development of Japan, Expanded edition, Princeton University Press, 1966.
- Dobb M., Soviet Economic Development since 1917, Universal Book Stall, New Delhi, 1995.
- Paul R. Gregory and Robert C. Stuart, Soviet Economic Structure and Performance, Harper & Row, 3rd edition, 1986.
- Rodrik D. 2007. Industrial Policy for the 21st Century, in *One Economics, Many Recipes: Globalization, Institutions, and Economic Growth*, Princeton University Press.

Discipline Specific Elective-B(1):

ECO-A-DSE-5-B(1)-TH-TU

Financial Economics [FE]

Total Marks: 100 [Theory(Th) 65+ Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[Semester-V]

ECO-A-DSE-5-B(1)-TH

1. Investment Theory and Portfolio Analysis 35 lecture hours

- Deterministic cash-flow streams: Basic theory of interest; discounting and present value; internal rate of return; evaluation criteria; fixed-income securities; bond prices and yields; interest rate sensitivity and duration; immunisation; the term structure of interest rates; yield curves; spot rates and forward rates.
- Single-period random cash flows: Random asset returns; portfolios of assets; portfolio mean and variance; feasible combinations of mean and variance; mean-variance portfolio analysis: the Markowitz model and the two-fund theorem; risk-free assets and the one-fund theorem.
- CAPM: The capital market line; the capital asset pricing model; the beta of an asset and of a portfolio; security market line; use of the CAPM model in investment analysis and as a pricing formula.

2. Options and Derivatives 20 lecture hours

- Introduction to derivatives and options; forward and futures contracts; options; other derivatives; forward and future prices; stock index futures; interest rate futures; the use of futures for hedging; duration-based hedging strategies; option markets; call and put options; factors affecting option

prices; put-call parity; option trading strategies: spreads; straddles; strips and straps; strangles; the principle of arbitrage; discrete processes and the binomial tree model; risk-neutral valuation.

3. Corporate Finance **20 lecture hours**

- Patterns of corporate financing: common stock; debt; preferences; convertibles; Capital structure and the cost of capital; corporate debt and dividend policy; the Modigliani- Miller theorem.

ECO-A-DSE-5-B(1)-TU

Tutorial Contact hours: 15

Text

Hull, John C., Options, Futures and Other Derivatives, Pearson Education, 6th edition, 2005.

References

- David G. Luenberger, Investment Science, Oxford University Press, USA, 1997.
- Thomas E. Copeland, J. Fred Weston and KuldeepShastri, Financial Theory and Corporate Policy, Prentice Hall, 4th edition, 2003.
- Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance, McGraw-Hill, 7th edition, 2002.
- Stephen A. Ross, Randolph W. Westerfield and Bradford D. Jordan, Fundamentals of Corporate Finance. McGraw-Hill, 7th edition, 2005.
- Burton G. Malkiel, A Random Walk Down Wall Street, W.W. Norton & Company, 2003.
- William Sharpe, Gordon Alexander and Jeffery Bailey, Investments, Prentice Hall of India, 6th edition, 2003.

Economics Core Course XIII: ECO-A-CC-6-13-TH-TU

Public Economics

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[Semester VI]

ECO-A-CC-6-13-TH

Unit 1. Government in a Market Economy **15 lecture hours**

- Market failure and externalities; public and merit goods;
- Government intervention;
- Public Expenditure for financing development

Unit 2. Choice and Public Economics **20 lecture hours**

- Characteristics of Pure Public Good; Distinction between Pure Public Good and Private Good;

- Market Failure in case of Pure Public Good Optimal provision of Public Goods - Private Provision and Public Provision of Public Goods,
- Lindahl Equilibrium,
- Voting Equilibrium.

Unit 3. The Revenue and Expenditure of the Government **20 lecture hours**

- Classification of Taxes; Canons of Taxation;
- Principles of Taxation - Benefit Principle, Equal Sacrifice Principle, Ability to Pay Principle;
- Incidence and Burden of Taxes;
- Effects of taxation on income distribution, work efforts, and on savings,
- The Laffer curve;
- Comparison between direct and indirect taxes – income and substitution effects;
- Optimal Taxation

Unit 4. Public Finance **20 lecture hours**

- Meaning and Classification of Public Expenditure - government budget and its types, government expenditure and tax multipliers, balanced budget multiplier;
- Meaning of Public Debt; Sources of Public Borrowings: internal and external borrowing; Effects of Public Debt.
- Indian Public Finance – Fiscal Federalism in India

ECO-A-CC-6-13-TU

Tutorial contact hours: 15

References:

- J. F. Due and A. F. Friedlander. Government Finance-Economics of Public Sector, AITBS Publishers and Distributors, 1994
- J. Hindriks and G. D. Myles. Intermediate Public Economics, The MIT Press; Annotated Edition, 2006.
- R.A. Musgrave and P.B. Musgrave, Public Finance in Theory & Practice, McGraw Hill Publications, 5th edition, 1989.
- Amaresh Bagchi (ed), Readings in Public Finance, OUP
- 5. J. E. Stiglitz. Economics of Public Sector,W. W Norton and Company, 3rd Edition, 2000.
- A Ghosh and C. Ghosh, Economics of the Public Sector, Prentice Hall India Learning Private Limited; 2nd Revised edition (2014)

Economics Core Course XIV: ECO-A-CC-6-14-TH-TU

Development Economics

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[Semester VI]

ECO-A-CC-6-14-TH

1. Meaning of Economic Development **10 lecture hours**

- Income Approach and Capability Approach,
- Construction and interpretation of HDI; international variations in development measures; comparing development trajectories across nations and within them.
- Dependency school of development.

2. Poverty and Inequality **15 lecture hours**

- Inequality axioms; a comparison of commonly used inequality measures.
- Gender Inequality, connections between inequality and development.
- Poverty measurement, HPI; poverty traps and path dependence of growth processes.
- Vicious Circle of Poverty Hypothesis

3. Dual Economy Models **20 lecture hours**

- The concept of surplus labour and disguised unemployment
- Peasants and Dualism with and without surplus labour
- Interdependence of agriculture and Industry (Lewis model, Ranis-Fei model)
- Rural-Urban Migration (Harris- Todaro model)

4. Population Growth and Economic Development **10 lecture hours**

- Basic concepts (Birth and Death Rates, mortality, fertility)
- Demographic transition theory
- Cost of children, externalities
- Low Level Equilibrium Trap models and their criticism-critical minimum effort theory (Nelson and Leibenstein).

5. Development Strategies **10 lecture hours**

- Balanced vs. Unbalanced Growth Theories
- Choice of Techniques

6. Political Institutions and the State **10 lecture hours**

- Definition of institutions, Evolution of Political and Economic Institutions.
- The determinants of democracy.
- Alternative institutional trajectories and their relationship with economic performance.
- Within-country differences in the functioning of state institutions. State ownership and regulation. Government failures and corruption.

ECO-A-CC-6-14-TU

Tutorial Contact hours: 15

Texts

1. Todaro and Smith: Economic Development, Pearson Education, 2009
2. Debraj Ray, Development Economics, Oxford University Press, 2009.
3. Kaushik Basu, Analytical Development Economics, OUP

References

- ParthaDasgupta, Economics, a Very Short Introduction, Oxford University Press, 2007.
- Abhijit Banerjee, Roland Benabou and Dilip Mookerjee, Understanding Poverty, Oxford University Press, 2006.
- KaushikBasu, The Oxford Companion to Economics in India, OUP, 2007.
- AmartyaSen, Development as Freedom, OUP, 2000.
- Daron Acemoglu and James Robinson, Economic Origins of Dictatorship and Democracy, Cambridge University Press, 2006.
- Robert Putnam, Making Democracy Work: Civic Traditions in Modern Italy, Princeton University Press, 1994
- Meier and Rauch (ed)- Leading Issues in Development Economics, OUP
- Hayami and Godo, Development Economics, OUP
- Thirlwall; Growth and Development. 5th Edition

Discipline Specific Elective –A(2):

ECO-A-DSE-6-A(2)-TH-TU

Money and Financial Markets [MFM]

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[Semester-VI]

ECO-A-DSE-6-A(2)-TH

1. Introduction to money and Money and Banking **5 lecture hours**

- Concept, functions, measurement; theories of money supply determination**.**

2. Financial Institutions, Markets, Instruments and Financial Innovations 17 lecture hours

- Role of financial markets and institutions; problem of asymmetric information – adverse selection and moral hazard; financial crises.
- Money and capital markets: organization, structure and reforms in India; role of financial derivatives and other innovations.
- Why banks are special Institutions? How banks act as a leveraging mechanism?

3. Financial Markets and Interest Rates Behaviour 18 lecture hours

- Determination; sources of interest rate differentials;
- Theories of term structure of interest rates; interest rates in India.

4. Banking System 20 lecture hours

- Balance sheet and portfolio management;
- Multiple Deposit Creation,
- Determinants of the Money Supply.
- Indian banking system- Changing role and structure- banking sector reforms

5. Central Banking and Monetary Policy 15 lecture hours

- Functions, balance sheet; goals, targets, indicators and instruments of monetary control;
- Monetary management in an open economy; current monetary policy of India**.**

ECO-A-DSE-6-A(2)- TU

Tutorial Contact hours: 15

Text

- F. S. Mishkin and S. G. Eakins, Financial Markets and Institutions, Pearson Education, 6th edition, 2009.

References

- F. J. Fabozzi, F. Modigliani, F. J. Jones, M. G. Ferri, Foundations of Financial Markets and Institutions, Pearson Education, 3rd edition, 2009.
- M. R. Baye and D. W. Jansen, Money, Banking and Financial Markets, AITBS, 1996.
- Rakesh Mohan, Growth with Financial Stability- Central Banking in an Emerging Market, Oxford University Press, 2011.
- L. M. Bhole and J. Mahukud, Financial Institutions and Markets, Tata McGraw Hill, 5th edition, 2011.
- M. Y. Khan, Indian Financial System, Tata McGraw Hill, 7th edition, 2011.
- N. Jadhav, Monetary Policy, Financial Stability and Central Banking in India, Macmillan, 2006.

- R.B.I. – Report of the Working Group: Money Supply Analytics and Methodology of Compilation, 1998.
- R.B.I. Bulletin, Annual Report and Report on Currency and Finance (latest).

Discipline Specific Elective-A(2):

ECO-A-DSE-6-A(2)-TH-P

Issues in Indian Economy [IIE]

Total Marks: 100

[Theory (Th) 50 + Practical (P) 30 + Internal Assessment 10+Attendance: 10]

Total Credits: [4(Th)+2(P)]=6 ,

No. of Lecture hours: 60, No. of Practical hours: 30/No. of Practical classes: 30

[Semester-VI]

ECO-A-DSE-6-A(2)-TH

1. Growth and structural changes **4 lecture hours**

- Trends in national income and per capita income- Analysis with official statistics *[2 lecture hours]*
- Structural Composition of national income and employment with NAS and NSSO data *[2 lecture hours]*

2. Macroeconomic Policies and Their Impact **15 lecture hours**

- Fiscal Policy *[3 lecture hours]*
- Trade and investment policy *[3 lecture hours]*
- Financial and monetary policies *[3 lecture hours]*
- Inflation and measures to control inflation *[3 lecture hours]*
- Labour laws and regulation *[3 lecture hours]*

3. Policies and Performance in Agriculture **15 lecture hours**

- Growth; productivity; agrarian structure and technology, capital formation *[3 lecture hours]*
- Agricultural marketing *[3 lecture hours]*
- Food security and food policy *[3 lecture hours]*
- Pricing and procurement *[3 lecture hours]*
- WTO and Indian agriculture *[3 lecture hours]*

4. Policies and Performance in Industry **12 lecture hours**

- Output, employment and productivity growth *[2 lecture hours]*
- Regional variation of industrial growth *[2 lecture hours]*
- Small scale industries- problems and prospects *[2 lecture hours]*

- Public sector; competition policy *[2 lecture hours]*
- Foreign direct investment in industry *[2 lecture hours]*
- Economic reforms and industry *[2 lecture hours]*

5. Trends and Performance in Services **14 lecture hours**

- Formal and informal sectors *[5 lecture hours]*
- Banking and insurance *[5 lecture hours]*
- Trade in services *[4 lecture hours]*

ECO-A-DSE-6-A(2)-P

Total Practical Hours: 60, Number of Practical classes: 30

Students will have to take help of primary or secondary data and will have to make statistical/econometric analysis of any problem on Indian economy as mentioned in this course (i.e. the topic will not be outside the course) on the basis of the use of statistical softwares like SPSS/STATA/R/E-VIEWS .A project report is to be prepared by the candidate analysing the results obtained from the use of any one of the above-mentioned statistical softwares. Though there is a project report, basically it is a computer laboratory based practical on the basis of which the project report will be constructed. Use of computer laboratory is essential for running the above-mentioned statistical softwares and also for handling the data. In this sense the project work is to be interpreted as a Practical (it is not a separate project paper).The project should be supervised by a full time teacher of the subject belonging to the institution. All total 60 hours (30 Practical classes) have been allotted for the practical part of the course. The norm of the examination will be similar to that of a practical examination. To be more specific, the practical examination of the project is to be conducted jointly by the supervisor and an external examiner on the basis of the content of the project report, use of the above-mentioned statistical softwares in the computer laboratory (in the form of running the regressions used in the project or by determining the various measures of descriptive statistics used in the project in front of the examiners just like that of a practical examination) and also on the basis of a viva-voce based on the candidate"s knowledge about the data set (especially data sources in case of secondary data) along with economic interpretation of the regression results. In case the student uses primary data it should be related to one of the topics covered in the course and *why primary data is used instead of secondary data* is to be justified by the student. In case of use of primary data students should have good knowledge about the sampling procedure used in collecting data. *On the day of the practical examination students should carry with them soft copy of the data set used in the project.*

References

- Shankar Acharya, 2010, ―Macroeconomic Performance and Policies 2000-8,‖ in Shankar Acharya and Rakesh Mohan, editors, India‘s Economy: Performances and Challenges: Development and Participation, Oxford University Press.
- Rakesh Mohan, 2010, ―India‗s Financial Sector and Monetary Policy Reforms in Shankar Acharya and Rakesh Mohan, editors, India‘s Economy: Performances and Challenges: Development and Participation, Oxford University Press.
- Pulapre Balakrishnan, Ramesh Golait and Pankaj Kumar, 2008, ―Agricultural Growth in India Since 1991, RBI DEAP Study no. 27.
- B.N. Goldar and S.C. Aggarwal, 2005, ―Trade Liberalisation and Price-Cost Margin in Indian Industries, The Developing Economics, September.
- P. Goldberg, A. Khandelwal, N. Pavcnik and P. Topalova, 2009, ―Trade Liberalisation and New Imported Inputs, American Economic Review, Papers and Proceedings, May.
- KunalSen, 2010, ―Trade, Foreign Direct Investment and Industrial Transformation in India, ïn Premachandra Athukorala, editor, The Rise of Asia, Routledge.
- A. Ahsan, C. Pages and T. Roy, 2008, ―Legislation, Enforcement and Adjudication in Indian Labour Markets: Origins, Consequences and the Way Forward, in D. Mazumdar and S. Sarkar, editors, Globalization, Labour Markets and Inequality in India, Routledge.
- Dipak Mazumdar and SandeepSarkar, 2009, ―The Employment Problem in India and the Phenomenon of the MissingMiddle‖, Indian Journal of Labour Economics.
- J. Dennis Rajakumar, 2011, ―Size and Growth of Private Corporate Sector in Indian Manufacturing, Economic and Political Weekly, April.
- Ramesh Chand, 2010,- ―Understanding the Nature and Causes of Food Inflation,‖ Economic and Political Weekly, February.
- Bishwanath Goldar, 2011, ―Organised Manufacturing Employment: Continuing the Debate‖, Economic and Political Weekly, April.
- Panchanan Das. (2007), Economic Reform, Output and Employment Growth in Registered Manufacturing Industries in India: Testing Kaldor‘s Hypotheses, Economic and Political Weekly, 42 (39), pp. 3978-3985.
- KaushikBasu and A. Maertens, eds, 2013, The New Oxford Companion to Economics in India, Oxford University Press.
- A. Raychaudhury and P De, International Trade in Services in India: Implications for Growth and Inequality in a Globalizing World, OUP, 2012.
- India Development Reports, IGIDR

Discipline Specific Elective- B(2) :

ECO-A-DSE-6-B(2)-TH-TU

Environmental Economics [EE]

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[Semester- VI]

ECO-A-DSE-6-B(2)-TH

Unit 1. Introduction **7 lecture hours**

1.1 What is environmental economics;

1.2 Review of microeconomics and welfare economics.

1.3 Interlinkages between the economy and environment

Reference for unit 1:

Hanley N, Shogren J.F. & White B. *Environmental Economics in Theory and Practice*, Macmillan

Unit 2. Efficiency and Market Failure **18 lecture hours**

2.1 Pareto optimality and market failure in the presence of externalities

2.2 Property rights and the Coase theorem

2.3 Public goods/ bads and market failure

Reference for unit 2:

Kolstad C, *Environmental Economics*, OUP

Unit 3. The Design and Implementation of Environmental Policy **20 lecture hours**

3.1 Pigouvian Fees – Single Polluter, Multiple Polluters, Fees vs Subsidies

3.2 Regulating Pollution : Command and Control, Economic Incentives

3.3 The Basic Theory of Tradeable Pollution Permits

Reference for unit 3:

Kolstad C, *Environmental Economics*, OUP

Hanley N, Shogren J.F. & White B. *Environmental Economics in Theory and Practice*, Macmillan

Unit 4. International Environmental Problems **13 lecture hours**

4.1 Transboundary Pollution – Transboundary Pollution as a problem of international externalities

4.2 International Trade and Environment – Pollution Havens

4.3 International Environmental Agreements – Basic idea about Montereal and Kyoto Protocol and Talks on Climate Change

Reference for unit 4:

Hanley N, Shogren J.F. & White B. *Environmental Economics in Theory and Practice*, Macmillan

Kolstad C, *Environmental Economics*, OUP

Internet on Recent Environmental Agreements

Unit 5. Measuring the values of Environmental Costs and Benefits 17 lecture hours

5.1 Concepts of Willingness to pay (WTP) and Willingness to accept compensation (WTAC), Difference between the two concepts

5.2 Direct and Indirect Methods of Valuation – Contingent valuation, Travel Cost, hedonic Pricing – basic concepts only (no econometric techniques) – when they should be used, what are the advantages and disadvantages of these methods.

Reference for unit 5:

Hanley N, Shogren J.F. & White B. *Environmental Economics in Theory and Practice*, Macmillan

ECO-A-DSE-6-B(2)-TU

Tutorial Contact hours: 15

Discipline Specific Elective –B(2):

ECO-A-DSE-6-B(2)-TH-TU

Issues in Development Economics [IDE]

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[Semester- VI]

ECO-A-DSE-6-B(2)-TH

1. Demography and Development 10 lecture hours

- Demographic concepts; birth and death rates, age structure, fertility and mortality
- Demographic transitions during the process of development; gender bias in preferences and outcomes and evidence on unequal treatment within households
- Connections between income, mortality, fertility choices and human capital accumulation
- Migration.

2. Land, Labor and Credit Markets 20 lecture hours

- The distribution of land ownership; land reform and its effects on productivity
- Contractual relationships between tenants and landlords
- Land acquisition; nutrition and labor productivity
- Iinformational problems and credit contracts

- Microfinance
- Inter- linkages between rural factor markets.

3. Individuals, Communities and Collective Outcomes **15 lecture hours**

- Individual behavior in social environments
- Multiple social equilibria;
- Governance in organizations and in communities;
- Individual responses to organizational inefficiency.

4. Environment and Sustainable Development **15 lecture hours**

- Defining sustainability for renewable resources
- A brief history of environmental change;
- Common-pool resources;
- Environmental externalities and state regulation of the environment;
- Market based instruments, economic activity and climate change.

5. Globalization **15 lecture hours**

- Globalization in historical perspective
- the economics and politics of multilateral agreements;
- Trade, production patterns and world inequality
- Financial instability in a globalized world.
- India in the context of global economy

ECO-A-DSE-6-B(2)-TU

Tutorial contact hours: 15

Text

- Debraj Ray, Development Economics, Oxford University Press, 2009.

References

- ParthaDasgupta, Economics, a Very Short Introduction, Oxford University Press, 2007.
- Abhijit Banerjee, Roland Benabou and Dilip Mookerjee, Understanding Poverty, Oxford University Press, 2006.
- Thomas Schelling, Micromotives and Macrobehavior, W. W. Norton, 1978.
- Albert O. Hirschman, Exit, Voice and Loyalty: Responses to Decline in Firms, Organizations and States, Harvard University Press, 1970.
- Raghuram Rajan, Fault Lines: How Hidden Fractures Still Threaten the World Economy, 2010.

- Elinor Ostrom, Governing the Commons: The Evolution of Institutions for Collective Action, CambridgeUniversity Press, 1990.
- DaniRodrik, The Globalization Paradox: Why Global Markets, States and Democracy Can‘t Coexist, Oxford University Press, 2011.
- Michael D. Bordo, Alan M. Taylor and Jeffrey G. Williamson (ed.), Globalization in Historical Perspective, University of Chicago Press, 2003

BA/BSc ECONOMICS (GENERAL) SYLLABUS,

UNIVERSITY OF CALCUTTA, UNDER CHOICE BASED CREDIT SYSTEM

[AS ON 24-05-2018]

To be effective from the academic session 2018-19

Preamble

- As the subject Economics falls under both BA and BSc two types of structures are proposed for BA/BSc Economics (General). One for BA Economics (General) and the other for BSc Economics (General).
- For any student with Honours in a subject other than Economics (say Sociology (Honours) or Political Science (Honours) or Statistics (Honours)) may opt for Economics as a Generic Elective subject. So provisions are to be kept for Economics Generic Elective for four courses (papers).
- For any BA (General) student with Core subjects other than Economics [say Political Science as Core paper (under General) and History as Core paper (under General)] may opt for Economics as a Generic Elective Course [two Generic Elective courses are to be chosen from any discipline other than the Core. Thus provision should be kept for two courses of any subject other than the Core, say Economics]. This should be treated as Generic Elective Course for BA (General) student.
- Regarding skill-enhancement course there are two groups. Group A for odd semesters like semester III and semester V and Group B for even semesters like semester IV and semester VI. As part of skill-enhancement Course under BA/BSc Economics (General) provision should be kept for two skill-enhancement courses under each of the two groups (so all total provision is to be kept for 4 courses).
- The conversion of credit to lecture hours is same as that of the Honours course. **For *five credits* of lecture hours (theory) per course there will be *five hours of teaching per week* so that for fifteen weeks all total there will be 75 lecture hours for theory classes per semester. For 1 credit tutorial classes (each of one hour) there will be all total 15 hours of tutorial classes for 15 weeks (one can refer to it a 15 tutorial contact hours). We can club „lecture hours" and „tutorial contact hours" and can refer to it as „teaching hours " . Thus for a 5 credit (Theory)+1 credit(Tutorial)= 6 credit course for 15 weeks we have 75+15=90 teaching hours.** Similarly for a 2 credit course (only theory) the teaching hours or lecture hours all total is 30. Within each course the total marks of 100 has been subdivided in the following manner. For 90 hours of teaching (Theory plus tutorial) we have

  80 marks. The remaining part (20 marks) has been divided into two equal parts: 10 marks is reserved for ***continuous internal assessment (CIA)*** and the remaining 10 marks for

attendance. Out of 80 for written examination 65 marks has been allotted and the remaining 15 marks has been allotted for tutorial examination.

- We first focus on BSc Economics (General). To illustrate the structure we start from a hypothetical example. Suppose the three general subjects opted by a student for BSc (General) are Economics, Mathematics and Statistics. Then the syllabus for Economics should be treated as the syllabus for BSc Economics (General) and it would be based on the following structure.

Table 3: Structure for BSc (General) Course covering three subjects

. Type of Course	Total Number of Courses	Number of Courses for Economics out of total number of Courses	Credit for each course	Total Credit	Total Marks
Core Course (CC)	12	4	5(Th) +1 (Tu)=6 for each course or 4(Th) +2(P) =6 for each course	Total credit for12 courses = 72	2. 12x100 =1200
Discipline Specific Elective (DSE)	6	2	5(Th) +1 (Tu)=6 for each course or 4(Th) +2(P) =6 for each course	Total credit for 6 courses =36	6x100 =600
Ability Enhancement Compulsory course (AECC)	2	Nil	2 (Th) for each course	Total credit for 2 courses =4	2x100 =200
Skill Enhancement Elective Course (SEC)	4	2	2 (Th) for each course	Total credit for 4 courses =8	4x100 =400
Total	**24**	**8**		**120**	**2400**

- In case of BSc (General) for each CC we have 100 marks, for each DSE we have 100 marks, for each AECC we have 100 marks, for each SEC we have 100 marks so that all total we have 2400 marks for BSc (General) stream (as shown in Table 3). For each semester we have 400 marks as shown in table 3.In the above table Th stands for Theory, Tu stands for tutorial and P stands for Practical.
- We next focus on BA Economics (General). To illustrate the structure we start from a hypothetical example. Suppose the two general subjects opted by a student for BA (General) are Political Science and Economics. Then the syllabus for Economics should be treated as the syllabus for BA Economics (General) and it would be based on the structure shown in table 4
- In Language Core Course (LCC) as per decision of the University there will 2 English Courses and 2 MIL Courses.
- Ability Enhancement Courses can be conducted along with the Honours students in 1st and 2nd semesters.

Table 4: Structure for BA (General) Course covering two subjects (with two different subjects under Generic Elective)

. Type of Course	Total Number of Courses	Number of Courses for Economics out of total number of Courses	Credit for each course	Total Credit	Total Marks
Core Course (CC)	8	4	5(Th) +1 (Tu)=6 for each course	. Total credit for 8 courses = 48	8x100 =800
ϑ. Language Core Course (LCC)	4	Nil	5(Th) +1 (Tu)=6 for each course	. Total credit for 4 courses = 24	4x100 =400
. Generic Elective (GE) [From any other subject other than Core]	2	. 2 GE Economics (provided none of the two Core general subjects is Economics)	5(Th) +1 (Tu)=6 for each course	. Total credit for 2 courses = 12	2x100 =200
Discipline Specific Elective (DSE)	4	. 2 can be offered from Economics from each of the two groups A and B. Candidate will have to select one from each of the two groups	5(Th) +1 (Tu)=6 for each course	. Total credit for 4 courses =24	4x100 =400
Ability Enhancement Compulsory course (AECC)	2	Nil	2 (Th) for each course	. Total credit for 2 courses =4	2x100 =200
Skill Enhancement Elective Course (SEC)	4	. 2 can be offered from Economics from each of the two groups A and B	2 (Th) for each course	. Total credit for 4 courses =8	4x100 =400
Total	**24**	**8 (without considering GE courses) + 2 GE Courses (if the general Core subjects are other than Economics)**		**120**	**2400**

- We now consider semester-wise break-up of BSc (General) and BA (General) Courses:

Table 5 : Semester-wise Break-up of BSc (General) Course covering three subjects

Semester	Types of Courses [Course codes are in bold within brackets]	Economics Course	Total Credit for all Courses for each semester	Total Marks
I	3 CC**(CC-1)**, 1AECC**(AECC-1)**	1 CC	20	400
II	3CC**(CC-2)**, 1AECC**(AECC-2)**	1CC	20	400
III	3CC**(CC-3)**, 1 SEC**(SEC-A(1))**	1CC plus 1 SEC (if any candidate considers SEC-A(1) as Economics)	20	400
IV	3CC**(CC-4)**, 1 SEC**(SEC-B(1))**	1CC plus 1 SEC (if any candidate considers SEC-B(1) as Economics)	20	400
V	3DSE**[DSE-A (1A+2A+3A)]** , 1SEC **(SEC-A(2))**	1DSE plus 1SEC(if any candidate considers SEC-A(2) as Economics)	20	400
VI	3DSE**[DSE-B (1B+2B+3B)]**, 1 SEC **(SEC-B(2))**	1DSE plus 1SEC (if any candidate considers SEC-B(2) as Economics)	20	400
Total	**24Courses**	**4 CC +2 DSE under DSE A (candidate will select one) + 2 DSE under DSE B (candidate will select one) + 2 SEC under SEC A (candidate will select one) + 2 SEC under SEC B (candidate will select one)**	**120**	**2400**

Table 6 : Semester-wise Break-up of BA (General) Course covering two subjects

Semester	Types of Courses . [Course codes are in bold within brackets]	Economics Course	Total Credit for all Courses for each semester	. Total Marks
I	2 CC **(CC-1)** , 1 GE **(GE-1)** and 1AECC **(AECC-1)**	1 CC plus 1GE(if the core is other than Economics)	20	400
II	. 2CC **(CC-2)** ,1 GE **(GE-2)**, 1AECC **(AECC-2)**	1CC plus 1GE(if the core is other than Economics)	20	400
III	2CC **(CC-3)**, 1 LCC **(L1(1))** ,1 SEC **(SEC-A(1))**	1CC plus 1 SEC (if any candidate considers SEC-A(1) as Economics)	20	400
IV	2CC **(CC-4)** , 1LCC **(L2(1))**, 1 SEC **(SEC-B(1))**	1CC plus 1 SEC (if any candidate considers SEC-B(1) as Economics	20	400
V	1 LCC **(L1(2))**, 2DSE **[DSE-A (1A+2A)],** 1SEC **(SEC-A(2))**	1DSE plus 1SEC (if any candidate considers SEC-A(2) as Economics)	20	400
VI	1 LCC**(L1(2))** , 2DSE**[DSE-B (1B+2B)]** , 1 SEC **(SEC-B(2))**	1DSE plus 1SEC (if any candidate considers SEC-B(2) as Economics)	20	400
Total	**24Courses**	**4 CC +2 DSE under DSE A (candidate will select one) + 2 DSE under DSE B (candidate will select one) + 2 SEC under SEC A (candidate will select one) + 2 SEC under SEC B (candidate will select one) + 2 GE (in case if the Core Course is other than Economics– the candidate will select one)**	**120**	**2400**

- AECC-1 refers to Communicative English/MIL. AECC-2 refers to Environmental Studies
- LCC: L1 –English Courses; L2- MIL courses. Two courses each
- SEC - Two courses from two subjects
- DSE- Two courses from two subjects in case of BA (General) .Two Courses from three subjects in case of BSc (General).[One course from each subject under each semester].
- In case of BA (General) for each CC we have 100 marks, for each LCC we have 100 marks, for each GE we have 100 marks, for each DSE we have 100 marks, for each AECC we have 100 marks and for each SEC we have 100 marks (as shown in table 4) so that all total we

have 2400 marks for BA (General) stream. For each semester we have 400 marks as shown in table 6.

- If a candidate selects one Economics paper under group-A in case of SEC then the candidate can opt for 3rd or 5th semester. If a candidate selects one Economics paper under group-B in case of SEC then the candidate can opt for 4th or 6th semester. These are shown in terms of tables 5 and 6. [See the explanations regarding DSE and SEC after table 10]
- Economics as Generic Elective can be offered for students having Honours in any subject other than Economics. The semester break-up of the course is as follows

Table 7: Semester-wise break-up of Generic Elective for students having Honours in subject other than Economics

Semester	Course
I	Generic Elective Course I (GE-I)
II	Generic Elective Course II(GE-II)
III	Generic Elective Course III(GE-III)
IV	Generic Elective Course IV (GE-IV)

- The four GE courses for students having Honours in any subject other than Economics can be treated as Core courses (CC) in first four semesters for students under BA/BSc General Courses.
- We have thus the following classification of GE and CC:

Table 8 : Semester-wise distribution of CC and GE

Semester	Name of the Course	Core Course (CC) for BA/BSc General students	GE Course for students who have Honours in sny subject other than Economics	GE (Economics) Course for BA (General) students who have Core papers other than Economics
I	Introductory Microeconomics	Core Course 1(Econ)-CC-1 (ECO-G-CC-1-1-TH-TU)	Generic Elective Course I (ECO-GE- 1-1-TH-TU)	Generic Elective Course I (ECO-G-GE-1-1-TH-TU)
II	Introductory Macroeconomics	Core Course 2(Econ)-CC-2 (ECO-G-CC-2-2-TH-TU)	Generic Elective Course II (ECO-GE-2-2-TH-TU)	Generic Elective Course II (ECO-G-GE-2-2-TH-TU)
III	Issues in Economic Development and India	Core Course 3(Econ)-CC-3 (ECO-G-CC-3-3-TH-TU)	Generic Elective Course III (ECO-GE-3-3-TH-TU)	Not Applicable
IV	. Indian Economic Policies	Core Course 4(Econ)-CC-4 (ECO-G-CC-4-4-TH-TU)	Generic Elective Course IV (ECO-GE-4-4-TH-TU)	Not Applicable

- In table 8 the last column implies the two Generic Elective Courses for BA (General) students that will be offered to students who have Core Courses other than Economics. In such case the student may opt for the two Courses in Economics in the First Semester and in the Second Semester (it matches with the two Core Courses in Economics for the first two semesters). The student may take two such courses from Economics in the first and second semesters

provided his/her Core papers in BA (General) are other than Economics. No separate option has been provided for the students in choosing the courses. They will have to select from the Core papers of Economics (General) Courses provided in the First and Second Semesters.

- For the two Discipline Specific Elective (DSE) courses we suggest the following :

Table 9 : Options for two DSE (Economics) Courses –Group A and Group-B
BA (General) and BSc (General)

Name of Courses under DSE-A [Candidate will have to select only one] [Relevant for 5th Semester]	**Name of the Courses under DSE-B [Candidate will have to select only one] [Relevant for 6th Semester]**
Money and Banking (MB) ECO-G-DSE-5-1A/2A-TH-TU	Public Finance (PF) ECO-G-DSE-6-1B/2B-TH-TU
Sustainable Development (SD) ECO-G-DSE-5-1A/2A-TH-TU	Economic History of India (1857-1947) (EHI) ECO-G-DSE-6-1B/2B-TH-TU

Table 10 : Options for two SEC (Economics) Courses –Group A and Group-B:
BA (General) and BSc (General)

Name of the Course under SEC-A [Candidate will have to select only one] [Relevant for 3rd or 5th Semesters]	**Name of the Course for SEC-B [Candidate will have to select only one] [Relevant for 4th or 6th Semesters]**
Introductory Methods of Field Survey (IMFS) ECO-G-SEC-3-1A-TH/ECO-G-SEC-5-2A-TH	. Economic Data Analysis and Report Writing (EDARW) ECO-G-SEC-4-1B-TH/ECO-G-SEC-6-2B-TH
Elementary Rural Development (ERD) ECO-G-SEC-3-1A-TH/ECO-G-SEC-5-2A-TH	Entrepreneurship and Development (ED) ECO-G-SEC-4-1B-TH/ECO-G-SEC-6-2B-TH

- In case of semester 5 for DSE A at least two options from each discipline are to be given. Similarly in case of semester 6 for DSE-B at least two options from each discipline are to be given. In case of Economics we have given exactly two options for each group A and B. In case of BSc (General) a candidate will have to select one option from three different disciplines from each group (i.e. DSE-A ad DSE-B). These are referred to as courses DSE-A: 1A, 2A and 3A and DSE-B: 1B, 2B and 3B. [Here 1 ,2 and 3 are disciplines like Economics, Mathematics, Statistics whereas A and B are the groups]

- The structure is similar in case of BA (General) except that here a candidate will have to select one option from two different disciplines (instead of three different disciplines). These are referred to as courses DSE-A: 1A and 2A (for semester 5) and DSE-B : 1B and 2B (for semester 6) . [Here again 1 and 2 are disciplines like Economics and History whereas A and B are the groups]

- In Table 10 we have specified the options under Group A and Group B. As an example we can say that in case of BA (General) suppose the disciplines as Core Courses are History and Economics. In this case two options are given for Economics under Skill Enhancement

Course (SEC) in the form of SEC-A and SEC-B. In case of SEC-A, suppose two options from Economics and two from History are offered. Similarly, two options from Economics and two options from History are also offered under SEC-B. If a candidate opts for History from SEC- A in semester 3 then he /she must opt for Economics (any one of the two Economics options) from SEC-A in case of semester-5. Similarly if a candidate opts for Economics from SEC-B (any one of the two Economics options) in semester 4 then he/she must opt for History from SEC-B in semester 6.

- ***The SEC-A courses will be offered twice .The same courses will be taught twice: once in the 3rd Semester and again in the 5th Semester. Similarly SEC-B courses will be offered twice. The same courses will be taught twice: once in the 4th Semester and again in the 6th Semester. Examinations will be conducted both for 3rd and 5th semester students for the same Economics courses under SEC-A. Similarly, examinations will be conducted both for 4th and 6th semester students for the same Economics courses under SEC-B.***

- Based on the above-mentioned structure we have framed the syllabus in the following manner.

Core Course 1 (CC 1) BA/BSc (General) / Generic Elective Course I (GE -1) for BA/BSc Honours students [other than students having Economics (Honours)]/BA (General) Generic Elective Course I (GE-I) for students not having Economics as Core Course

Name of the Course: Introductory Microeconomics

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours (Theory): 75, No. of Tutorial contact hours: 15

[For Semester-I]

ECO-G-CC-1-1-TH-TU/ ECO--GE-1-1-TH-TU/ECO-G-GE-1-1-TH-TU

ECO-G-CC-1-1-TH/ ECO--GE-1-1-TH /ECO-G-GE-1-1-TH

1. **Exploring the subject matter of Economics** **5 lecture hours**

Why study economics? Scope and method of economics; the economic problem: scarcity and choice; the question of what to produce, how to produce and how to distribute output; science of economics; the basic competitive model; prices, property rights and profits; incentives and information; rationing; opportunity sets; economic systems; reading and working with graphs.

2. **Supply and Demand: How Markets Work, Markets and Welfare**

16 lecture hours

Markets and competition; determinants of individual demand/supply; demand/supply schedule and demand/supply curve; law of demand and law of supply; market versus individual

demand/supply; shifts in the demand/supply curve, demand and supply together; how prices allocate resources; elasticity of demand - own price, cross price and income elasticity of demand- total revenue, average revenue, marginal revenue and price elasticity of demand; elasticity and its application; controls on prices; taxes and the costs of taxation; consumer surplus; producer surplus and the efficiency of the markets.

3. The Households 18 lecture hours

- Utility maximization-the cardinal approach. Total utility and marginal utility-law of diminishing marginal utility-relation between law of demand and law of diminishing marginal utility
- Utility maximization-the ordinal approach. Consumption decision and the budget constraint, consumption and income/price changes, description of preferences (representing preferences with indifference curves); properties of indifference curves; consumer s optimum choice; the price consumption curve and the income consumption curve; derivation of the demand curve from price consumption curve; income and substitution effects.

4. The Firm and Perfect Market Structure 18 lecture hours

- Production function of a firm; total product, average product and marginal product; concept of isoquant ; returns to scale; behaviour of profit maximizing firms and the production process; the cost function, short run costs and output decisions; costs and output in the long run.
- Features of a perfectly competitive market. Short run equilibrium under perfect competition. Supply curve of a firm. Long run equilibrium under perfect competition.

5. Imperfect Market Structure 8 lecture hours

Monopoly equilibrium- differences with perfect competition. Basic ideas of price-discriminating monopolist .

6. Input Markets 10 lecture hours

The labour market - basic concepts - derived demand, productivity of an input; marginal productivity of labour, marginal revenue product); the land market- concepts of rent and quasi rent.

ECO-G-CC-1-1-TU/ ECO--GE-1-1-TU /ECO-G-GE-1-1-TU

Tutorial Contact Hours: 15

Text

- R.G. Lipsey. An Introduction to Positive Economics, ELBS (6^{th} edition)

Reference Books

- Mankiw, N.G. : Economics: Principles and Applications, India edition by South Western, Cengage Learning India Private Limited, 4th edition, 2007.
- Samuelson, P.A. and Nordhaus, W.D. :Economics, 19^{th} edition, McGraw Hill
- Stonier, A.W. and Hague, D.C. : A Textbook of Economic Theory, Longman Group, London.

Core Course 2 (CC 2) BA/BSc (General) / Generic Elective Course II (GE -II) for BA/BSc Honours students [other than students having Economics (Honours)]/ BA (General) Generic Elective Course II (GE-II) for students not having Economics as Core Course

Name of the Course: Introductory Macroeconomics

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours (Theory): 75, No. of Tutorial contact hours: 15

[For Semester-II]

ECO-G-CC-2-2-TH-TU/ ECO--GE-2-2-TH-TU/ECO-G-GE-2-2-TH-TU

ECO-G-CC-2-2-TH / ECO--GE-2-2-TH /ECO-G-GE-2-2-TH

1. Introduction to Macroeconomics and National Income Accounting 14 lecture hours

Basic issues of macroeconomics; measurement of gross domestic product; distinction of gross domestic product with gross national product; net domestic product and net national product; net domestic product at market price and at factor cost-the concept of national income. Measurement of national income- income method and the expenditure method- circular flow of income; the concept of value added and the value added method of measuring national income; real versus nominal GDP.

2. The Simple Keynesian Model in a Closed Economy 14 lecture hours

The Keynesian consumption function and the Keynesian saving function. The Simple Keynesian Model of Income determination- the concept of effective demand-the Simple Keynesian Multiplier-the role of the government in Simple Keynesian Model

3. The Classical System 11 lecture hours

Basic ideas of classical system-Say‘s Law and Quantity Theory of Money- classical theory of income and employment determination.

4. Money Supply and Money Demand 11 lecture hours

- Supply of money; measures of money supply; high powered money, credit creation by commercial banks, tools of monetary policy.
- Demand for money-demand for money in the classical system and in the Keynesian system-the liquidity preference schedule.

5. Inflation 13 lecture hours

Demand pull and cost push inflation; inflation and its social costs; hyperinflation; trade off between inflation and unemployment –basic ideas of the Phillips Curve; anti-inflationary

monetary and fiscal policies.

6. The External Sector **12 lecture hours**

- Basis of trade: concepts of absolute advantage and comparative advantage; arguments for free trade; arguments for protection
- Balance of Payments-accounting and equilibrium; disequilibrium in balance of payments and devaluation-the role of the Marshall-Lerner condition

ECO-G-CC-2-2-TU / ECO--GE-2-2-TU /ECO-G-GE-2-2-TU

Tutorial Contact Hours: 15

Text

Sikdar Soumyen, Principles of Macroeconomics, Oxford University Press

Reference Books

- Stonier, A.W. and Hague, D.C. : A Textbook of Economic Theory, Longman Group, London
- Mankiw, N.G.: Elementary Macroeconomics, Worth Publishers, 7th edition, 2010.
- Errol D_Souza, Macroeconomics, Pearson Education, 2009.

Core Course 3 (CC 3) BA/BSc (General) / Generic Elective Course III (GE-III) for BA/BSc Honours students [other than students having Economics (Honours)]:

Name of the Course: Issues in Economic Development and India

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours (Theory): 75, No. of Tutorial contact hours: 15

[For Semester-III]

ECO-G-CC-3-3-TH-TU/ ECO--GE-3-3-TH-TU

ECO-G-CC-3-3-TH / ECO--GE-3-3-TH

1. Meaning of Economic Development **25 lecture hours**

Meaning of economic development; growth vs. development; concept of human development and its measurement, population and human development; education and health sectors in India; features and causes of underdevelopment of the Indian economy; growth and development of Indian economy under different policy regimes.

2. Poverty , Inequality and Development **20 lecture hours**

Basic issues of poverty and inequality; basic ideas about measurement of poverty and inequality- the poverty line; trends and policies to eradicate poverty and income inequality in India

3. Development of the Dual Economy and Development Strategies 15 lecture hours

- Surplus labour and disguised unemployment-basic concepts; the Lewis model of economic development with unlimited supply of labour.
- Balanced and unbalanced growth as development strategies

4. International Organizations and Economic Development 15 lecture hours

- Functions of IMF and World Bank and their roles in economic development
- The World Trade Organization (WTO) and its functions. India and the WTO

ECO-G-CC-3-3-TU / ECO--GE-3-3-TU

Tutorial Contact Hours: 15

Text

- Todaro and Smith: Economic Development, Pearson Education, 2009
- Misra D. and Puri K. Indian Economy, Himalaya Publishing House

References

- Thirlwall, Growth and Development, 5th Edition
- Rakesh Mohan, 2008, ―Growth Record of Indian Economy: 1950-2008. A Story of Sustained Savings and Investment, Economic and Political Weekly, May.
- Datt and Sundharam (Revised by G. Datt and A. Mahajan) , Indian Economy, 70th edition, S. Chand
- T. Dyson, 2008, ―India‗s Demographic Transition and its Consequences for Development in Uma Kapila, editor, Indian Economy Since Independence, 19th edition, Academic Foundation.
- Agarwala, A.N. and Singh, S.P. : Economics of Underdevelopment (eds), Oxford University Press, London.
- Mukherjee, Debes : Development Policies, Problems and Institutions, New Central Book Agency, Kolkata.

Core Course 4 (CC 4) BA/BSc (General) / Generic Elective Course IV (GE-IV) for BA/BSc Honours students [other than students having Economics (Honours)]:

Name of the Course: Indian Economic Policies

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours (Theory): 75, No. of Tutorial contact hours: 15

[For Semester-IV]

ECO-G-CC-4-4-TH-TU/ ECO--GE-4-4-TH-TU

ECO-G-CC-4-4-TH / ECO--GE-4-4-TH

1. **Macroeconomic Policies and their Impact** **15 lecture hours**

   Fiscal Policy; trade and investment policy; financial and monetary policies; labour regulation.

2. **Policies and Performance in Agriculture** **21 lecture hours**

   Growth; productivity; agrarian structure and technology; capital formation; trade; pricing and procurement.

3. **Policies and Performance in Industry** **21 lecture hours**

   Growth; productivity; diversification; small scale industries; public sector; competition policy; foreign investment

4. **Policies and Performance of Indian Foreign Trade** **18 lecture hours**

   India‘s foreign trade: change in volume and direction of India‘s foreign trade in the post-liberalization period; Balance of Payments position of India in recent years; India‘s export and import policies.

ECO-G-CC-4-4-TU / ECO--GE-4-4-TU

Tutorial Contact Hours: 15

Text

- Misra D. and Puri K. Indian Economy, Himalaya Publishing House
- Datt and Sundharam (Revised by G.Datt and A. Mahajan) , Indian Economy, 70th edition, S. Chand

References

- Shankar Acharya, 2010, ―Macroeconomic Performance and Policies 2000-8,‖ in Shankar Acharya and Rakesh Mohan, editors, India‘s Economy: Performances and Challenges: Development and Participation, Oxford University Press.
- Rakesh Mohan, 2010, ―India_s Financial Sector and Monetary Policy Reforms, ‖ in Shankar Acharya and Rakesh Mohan, editors, India‘s Economy: Performances and Challenges: Development and Participation, Oxford University Press.

Discipline Specific Elective Course [Economics] (DSE -A) BA/BSc (General)

Name of the Course: Money and Banking (MB)

Total Marks: 100 [Theory(Th) 65+ Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours (Theory): 75, No. of Tutorial contact hours: 15

[For Semester-V]

ECO-G-DSE-5-1A/2A-TH-TU

ECO-G-DSE-5-1A/2A-TH

25 lecture hours

1. Money Supply and Banking System with reference to India

efinition of money supply in the Indian context (M_1, M_2, M_3 and M_4) , Balance sheet of the banking sector and accounting of money supply; balance sheet of the Reserve Bank of India and the accounting interpretation of High powered money; definition of high powered money; the money multiplier theory and balance sheet of commercial banks, sterilization by Central Banks. Indian banking system-changing role and structure; Indian banking sector reforms.

2. Financial Institutions and Financial Markets 22 lecture hours

- Role of financial markets and institutions in economic development- Indian examples
- Money and capital markets: organization, structure and reforms in India; role of financial derivatives and other innovations.

3. Interest Rates 12 lecture hours

Determination; sources of interest rate differentials; theories of term structure of interest rates; interest rates in India.

4. Central Banking and Monetary Policy 16 lecture hours

Instruments of monetary control with special reference to India; concepts of statutory liquidity ratio(SLR), cash reserve ratio(CRR) and repo rate as instruments of monetary control; monetary management in an open economy; current monetary policy of India, demonetization and its impact on the Indian economy.

ECO-G-DSE-5-1A/2A-TU

Tutorial Contact Hours: 15

Texts

- F. S. Mishkin and S. G. Eakins, Financial Markets and Institutions, Pearson Education, 6th edition, 2009.
- F. J. Fabozzi, F. Modigliani, F. J. Jones, M. G. Ferri, Foundations of Financial Markets and Institutions, Pearson Education, 3rd edition, 2009.
- M. R. Baye and D. W. Jansen, Money, Banking and Financial Markets, AITBS, 1996.
- Gupta, S.B.: Monetary Planning in India, Oxford University Press, Delhi.

References

- Rakesh Mohan, Growth with Financial Stability- Central Banking in an Emerging Market,

Oxford University Press, 2011.

- L. M. Bhole and J. Mahukud, Financial Institutions and Markets, Tata McGraw Hill, 5th edition, 2011.
- M. Y. Khan, Indian Financial System, Tata McGraw Hill, 7th edition, 2011.
- N. Jadhav, Monetary Policy, Financial Stability and Central Banking in India, Macmillan, 2006.
- R.B.I. – Report of the Working Group: Money Supply Analytics and Methodology of Compilation, 1998.
- R.B.I. Bulletin, Annual Report and Report on Currency and Finance (latest).
- Economic Survey 2016-17, Government of India.

Discipline Specific Elective Course [Economics] (DSE -A) BA/BSc (General)

Name of the Course: Sustainable Development (SD)

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours (Theory): 75, No. of Tutorial contact hours: 15

[For Semester-V]

ECO-G-DSE-5-1A/2A-TH-TU

ECO-G-DSE-5-1A/2A-TH

1. The Approach Towards Sustainability-Introductory ideas 15 lecture hours

Key environmental issues and problems, economic way of thinking about these problems, circular flow of environmental pollutants and waste recycling-laws of thermodynamics, renewable and non-renewable resources-the issue of sustainability

2. The meaning of Sustainable Development 25 lecture hours

Different definitions of sustainable development, rules of sustainable development, measures of sustainable development, sustainable management of resources-the role of property rights, stakeholders associated with sustainble management of different types of renewable resources-fishery, forestry and water, the concept of sustainable livelihood in the context of sustainable resource management.

3. Trans-boundary pollution, climate change and sustainable development

15 lecture hours

Implementation of environmental policies in developing countries and international experience; transboundary environmental problems-international meetings, protocols and treaties; economics

of climate change-basic ideas of the carbon credit market-clean development mechanism and international emission trading.

4. Sustainable Resource Management Policies in India **20 lecture hours**

Water policy, forestry policy and fishery policy of India. Basic objectives of the policies along with goals and visions.

ECO-G-DSE-5-1A/2A-TU

Tutorial Contact Hours: 15

Texts

Rabindranath Bhattacharya : ―Environmental Economics : An Indian Perspective‖, Oxford University Press.

Pearce and Turner : ‗Environmental and Natural Resource Economics', John Hopkins University Press,1991

References

- Roger Perman, Yue Ma, Michael Common, David Maddison and James McGilvray, ―Natural Resource and Environmental Economics‖, Pearson Education/Addison Wesley, 4th edition, 2011.
- Charles Kolstad, ―Intermediate Environmental Economics‖, Oxford University Press, 2nd edition, 2010.
- IPCC (Intergovernmental Panel on Climate Change), Fifth Assessment Report , 2014.
- National Water Policy 2012, Ministry of Water Resources, Government of India.
- National Forest Policy 2016 : Ministry of Environment and Forests, Government of India
- National Policy on Marine Fisheries, 2017: Ministry of Animal Husbandry, Dairying and Fisheries, Government of India.

Discipline Specific Elective Course [Economics] (DSE-B) BA/BSc (General)

Name of the Course: Public Finance (PF)

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours (Theory): 75, No. of Tutorial contact hours: 15

[For Semester-VI]

ECO-G-DSE-6-1B/2B-TH-TU

ECO-G-DSE-6-1B/2B-TH

1. Theory of Public Finance **40 lecture hours**

- Overview of Fiscal Functions, Tools of Normative Analysis, Pareto Efficiency, Equity and

the Social Welfare.

- Market Failure, Public Good and Externalities.
- Elementary Theories of Product and Factor Taxation (Excess Burden and Incidence).

2. Issues from Indian Public Finance **35 lecture hours**

- Current Issues of India‘s Tax System.
- Working of Monetary and Fiscal Policies.
- Analysis of Budget and Deficits
- Fiscal Federalism in India
- State and Local Finances

ECO-G-DSE-6-1B/2B-TU

Tutorial Contact Hours: 15

Text

- Ganguly Subrata , Public Finance : A Normative Approach, Nababharat Publishers

References

- Musgrave, R.A. and P.B. Musgrave, Public Finance in Theory and Practice, Mc- Graw Hill, 1989.
- M.M Sury, Government Budgeting in India, Commonwealth Publishers, 1990.
- Shankar Acharya, ―Thirty years of tax reform‖ in India, Economic and Political Weekly, May 2005.
- Government of India, Report of the 13th Finance Commission.
- Economic Survey, Government of India (latest).
- State Finances: A Study of Budgets, Reserve Bank of India (latest).

Discipline Specific Elective Course [Economics] (DSE-B) BA/BSc (General)

Name of the Course: Economic History of India (1857-1947) (EHI)

Total Marks: 100 [Theory(Th) 65+ Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours (Theory): 75, No. of Tutorial contact hours: 15

[For Semester-VI]

ECO-G-DSE-6-1B/2B-TH-TU

ECO-G-DSE-6-1B/2B-TH

- **Colonial India: Background and Introduction** **10 lecture hours**

  Overview of the colonial economy

- **Macro Trends** **13 lecture hours**

National Income; population; occupational structure.

- **Agriculture** **17 lecture hours**

Agrarian structure and land relations; agricultural markets and institutions – credit, commerce and technology; trends in performance and productivity; famines.

- **Railways and Industry** **20 lecture hours**

Railways; the de-industrialisation debate; evolution of entrepreneurial and industrial structure; nature of industrialisation in the interwar period; constraints to industrial breakthrough; labor relations.

- **Economy and State in the Imperial Context** **15 lecture hours** The imperial priorities and the Indian economy; drain of wealth; international trade, capital flows and the colonial economy – changes and continuities; government and fiscal policy.

ECO-G-DSE-6-1B/2B-TU

Tutorial Contact Hours: 15

Text

- Bhattacharya, Dhiresh, A Concise History of Indian Economy, Progressive Publishers, 1972

References

- Irfan Habib, Indian Economy 1858-1914, A People_s History of India, Vol.28, Tulika, 2006.
- B.R. Tomlison, 1975, India and the British Empire 1880-1935, IESHR, Vol.XII.
- Dharma Kumar, the Fiscal System, CEHI, Chapter 12.
- Basudev Chatterjee, Trade, Tariffs and Empire, OUP 1992, Epilogue.
- Daniel Thorner, Agrarian Prospect in India, 1977
- Amiya Kumar Bagchi , Private Investment in India 1900-1939, Taylor and Francis, 2000.

Skill Enhancement Course [Economics] -A Group (SEC-A) BA/BSc (General)

Name of the Course: Introductory Methods of Field Survey (IMFS)

Total Marks: 100 [Theory(Th) 80 + Internal Assessment 10+Attendance: 10]

Total Credits: 2,

No. of Lecture hours: 30

ECO-G-SEC-3-1A-TH/ECO-G-SEC-5-2A-TH

[For Semester III or Semester V]

1. **Basic ideas of economic data** **8 lecture hours**
    - Types of data-cross section, time series , pooled data, panel data etc.
    - Nature of field survey data – types of cross section data
    - Advantages and disadvantages of field survey data

- Importance of field survey data for economic analysis
- Role of pilot survey

2. Methodologies of collection of data 15 lecture hours

- Complete enumeration vs. sample survey
- Sampling techniques : basic ideas of simple random sampling (with and without replacement), stratified random sampling, circular sampling, sampling proportional to size (mathematical proof/mathematical demonstration not required for any type of sampling)
- Practical methods of drawing random sample using random number tables.
- Prerequisites for field survey –preparation of blank tables
- Preparation of questionnaire depending on nature of survey- illustrations on the basis of preparation of hypothetical questionnaire

3. Recording of data 7 lecture hours

- How to record data after completion of survey : use of manual methods and recording through the use of computers
- Tabular representation of data collected
- Cross checking of data after tabular representation
- Role of units of measurement

References

- Goon, A. M, Gupta, M. K, and Dasgupta, B. Fundamentals of Statistics (Volumes One and Two),The World Press Private Ltd
- Kapur J.N. and Saxena H.C. , Mathematical Statistics, Sultan Chand Publishing

Skill Enhancement Course [Economics] -A Group (SEC-A) BA/BSc (General)

Name of the Course: Elementary Rural Development (ERD)

Total Marks: 100 [Theory(Th) 80 + Internal Assessment 10+Attendance: 10]

Total Credits: 2,

No. of Lecture hours: 30

ECO-G-SEC-3-1A-TH/ECO-G-SEC-5-2A-TH

[For Semester III or Semester V]

1. Basic Issues in Rural Development 12 lecture hours

- Rural Development vs. Agricultural Development
- Decentralized Planning and Participatory Development-the role of Panchayats
- Panchayat and Rural Development in West Bengal
- Role of NGOs in Rural Development

2. Rural Credit and Self Help Groups (SHGs) 12 lecture hours

- Constraints of micro-enterprises in rural areas
- The rural non farm sector –credit needs for rural non farm sector.
  - Concept of micro credit and the role of Grameen Bank
  - Need for SHG for formation-features of SHG
  - SHGs in India

3. Selected Government Programmes and Rural Development 6 lecture hours

- Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
- Mid-day Meal
- Pradhan Mantri Gram Sadak Yojana (PMGSY)

References

1. Katar Singh , Rural Development : Principles, Policies and Management, Sage Publications, New Delhi.
2. K.G. Karmakar, Rural Credit and Self-Help Groups, Sage Publications, New Delhi
3. S.Sau, Rural Industrialization –Development Trajectory in India, Farma K.L.M., Kolkata
4. Misra D. and Puri K. Indian Economy, Himalaya Publishing House
5. Datt and Sundharam (Revised by G.Datt and A. Mahajan) , Indian Economy, 70th edition, S. Chand

Skill Enhancement Course [Economics] -B -Group (SEC-B) BA/BSc (General)

Name of the Course: Economic Data Analysis and Report Writing (EDARW)

Total Marks: 100 [Theory(Th) 80 + Internal Assessment 10+Attendance: 10]

Total Credits: 2,

No. of Lecture hours: 30

ECO-G-SEC-4-1B-TH/ECO-G-SEC-6-2B-TH

[For Semester IV or Semester VI]

1. Tabular and Graphical representation of Statistical Data 6 lecture hours

- Tabular representation of data for analysis
- Graphical representation of data-use of line diagram, bar chart, divided bar chart, pie chart etc.
- Frequency distribution table: uses and implications
- Pictorial descriptions of frequency table: frequency polygon, histogram, ogive etc.

2. Basic Descriptive Statistics and its role in Data Analysis 16 lecture hours

- Measures of Central Tendency-Concept of arithmetic mean, geometric mean and harmonic mean-their uses (explicit mathematical proof of the properties of different types mean are not required).The concept of median and mode-their uses in analyzing economic data. Comparison of mean, median and mode as measures of central tendency
- Measures of dispersion: range, mean deviation, standard deviation and quartile deviation. Properties of various measures and their implications (explicit proof of properties is not required). Comparison of various measures of dispersion. Significance of the concept of coefficient of variation. Use of range, standard deviation and coefficient of variation in measuring income inequality. Basic concept of Gini coefficient and Lorenz curve.
- Introductory ideas of correlation and regression analysis.

3. Elements of Report writing 8 lecture hours

- Locating the basic issues- theme based literature survey and motivation behind any study- objectives of the study-development of writing skills
- Methodological issues: Use of tables and graphs. Use of various measures of central tendency and dispersion in analyzing the results.
- Insertion of footnotes or end notes.
- Preparation of Bibliography

References

- Goon, A. M, Gupta, M. K, and Dasgupta, B. Fundamentals of Statistics (Volume One), The World Press Private Ltd.
- A.L. Nagar and R.K. Das : Basic Statistics, 2nd edition, Oxford University Press.
- C.R. Kothari: Research Methodology: Methods and Techniques (second revised edition), New Age India (P) Ltd Publishers.

Skill Enhancement Course [Economics] -B -Group (SEC-B) BA/BSc (General)

Name of the Course: Entrepreneurship and Development (ED)

Total Marks: 100 [Theory(Th) 80 + Internal Assessment 10+Attendance: 10]

Total Credits: 2,

No. of Lecture hours: 30

ECO-G-SEC-4-1B-TH/ECO-G-SEC-6-2B-TH

[For Semester IV or Semester VI]

1. Basic issues of Entrepreneurship and Economic Development 10 lecture hours

- Basic features of Entrepreneurship
- Entrepreneurship and its linkages with economic development

- Growth of entrepreneurship in India—Role of Entrepreneurship in Economic Development.

- Planning Commission's guidelines for formulating a project report by an entrepreneur
- Problem of Rural entrepreneurship in India

2. Financial resources for new ventures of an entrepreneur 7 lecture hours

- Sources of finance---capital structure.
- Institutional support to enterprises—national small industries board – state small industries development corporation--- district industries center--- industrial estates-Indian experience

3. Growth strategies in small business 7 lecture hours

- Stages of growth,
- Types of growth strategies-Expansion, Diversification, Joint Venture, Merger and Subcontracting

4. Sickness in Small Business 6 lecture hours

- Concept of industrial sickness
- Symptoms of sickness in small business
- Causes and consequences of sickness in small business

References

- S.S Khanka--- Entrepreneurial Development, S.Chand & Company Ltd
- Bill Bolton and John Thompson ---- Entrepreneurs: Talent, Temperament and Technique, Butterworth and Heinemann.
- .David .H Holt---Entrepreneurship New Venture Creation
- Poornima M. Charantimath: Entrepreneurship Development and Small Business Enterprises (2nd Edition) Pearson.
- Misra D. and Puri K. Indian Economy, Himalaya Publishing House
- Datt and Sundharam (Revised by G.Datt and A. Mahajan) , Indian Economy, 70th edition, S. Chand

UNIVERSITY OF CALCUTTA

NotificationNo.CSR/05/2022

It is notified for information of all concerned that the Syndicate in its meeting held on 08.12.2021 (vide Item No.46), approved & confirmed the new revised syllabus for **"Bio-Mathematics (MTMA-DSE-A-5-1-TH/TU) and " Boolean Algebra & Automata Theory (MTMA-DSE-B-5-1-TH/TU)"** , both taught at Semester-5 of Mathematics-Honours. (vide CSR/12/2018, dt. 04.6.2018) Courses of Studies under CBCS, in this University, as laid down in the accompanying pamphlet.

The above will take effect from Odd-Semester examination, 2022.

Prof.(Dr.) Debasis Das

Registrar

SENATE HOUSE

KOLKATA-700 073

The 22nd February, 2022

Bio-Mathematics syllabus

Unit-1

[25 classes]

Mathematical biology and the modeling process: an overview.

Simple single-species continuous population models: Malthus model - deduction, analytic solution, behavior of population size as $t \to \infty$, limitations.

Logistic model: formulation, analytic solution, behavior of population size as $t \to \infty$ for different initial population size, carrying capacity.

Gompertz model: deduction, analytic solution.

Qualitative analysis of continuous models: Autonomous first order differential equations - steady states (or fixed points or stationary points or equilibrium points). Biological interpretation of steady states. Stability and asymptotic stability of a steady state. Geometrical analysis. Linearization and stability analysis.

Stability analysis of the steady states of the Malthus model, logistic model and other single-species models.

Allee effect: Basic idea and discussion with the model $\frac{dx}{dt} = rx\left(1 - \frac{x}{K}\right)\left(\frac{x}{K_0} - 1\right)$, stability analysis of steady states.

Harvesting problems of a single natural population: Constant-yield harvesting, constant-effort harvesting.

Non-dimensionalisation and reparametrisation in a model: Necessity and application.

Bifurcation: Saddle-node, transcritical and pitchfork bifurcations in one-dimensional case.

Insect outbreak model: The spruce budworm model – deduction, analysis of steady states, presence of saddle-node bifurcation.

Unit-2

[30 classes]

Interacting populations: Predator-prey systems and Lotka-Volterra model – deduction, analytic solution.

Qualitative analysis of continuous models: Two-dimensional nonlinear systems - steady states, nullclines. Linearisation and stability analysis of a steady state, Routh-Hurwitz criteria.

Steady states and linear stability analysis of biologically meaningful steady states of Lotka-Volterra predator-prey model.

Different types of functional responses - Holling type –I, II, III growths.

Improved predator-prey model introducing the logistic growth term for the prey and other predator-prey models, their steady states and linear stability analysis.

Periodic solutions and limit cycles: Statement of Poincaré-Bendixson theorem, Bendixson's negative criterion, Dulac criterion, Hopf bifurcation and Hopf bifurcation theorem (statement only). Examples in the context of biological scenario.

The chemostat: Bacterial growth in a chemostat. Michaelis-Menten kinetics. Formulation of model and steady states.

Populations in competition: Lotka-Volterra competition model, steady states and linear stability analysis.

Epidemic models: Basic terminologies.

SI, Kermack-McKendrick SIR, SIRS models: Formulation of the models. Basic reproduction number.

Unit-3

[15 classes]

Discrete single-species models: Linear models, growth models, decay models, discrete logistic model.

Overview of nonlinear difference equations: Steady states and linear stability analysis. Graphical solution of difference equations - cobwebbing.

Systems of two difference equations: Concepts of steady states and linear stability analysis.

Discrete predator-prey model: Model formulation.

Host-parasitoid systems: Nicholson-Bailey model- formulation.

Stability of discrete nonlinear systems: Linear stability analysis of biologically meaningful steady states of discrete predator-prey model and Nicholson-Bailey model.

Reference:

[1] L.E. Keshet, Mathematical Models in Biology, SIAM, 1988.

[2] J. D. Murray, Mathematical Biology, Springer, 1993.

[3] Y.C. Fung, Biomechanics, Springer-Verlag, 1990.

[4] F. Brauer, P.V.D. Driessche and J. Wu, Mathematical Epidemiology, Springer, 2008.

[5] M. Kot, Elements of Mathematical Ecology, Cambridge University Press, 2001.

[6] F. Brauer and C. Castillo-Chavez, Mathematical Models in Population Biology and Epidemiology, Springer, 2012.

[7] S. H. Strogatz, Nonlinear Dynamics and Chaos, Perseus Books, 1994.

[8] N. F. Britton, Essential Mathematical Biology, Springer, 2003.

DSE-B-1 BOOLEAN ALGEBRA AND AUTOMATA THEORY MTMA SEM V

UNIT 1

- Mathematical preliminaries: Set theory (Russell's paradox and a brief introduction to the axiomatic approach toset theory), Relations (including transitive and reflexive-transitive closure needed for derivations), Mapping, Basics of Graph Theory (up to Tree and Rooted Tree, needed for drawing transition diagram and parse trees).

UNIT 2

- Definition, examples and basic properties of ordered sets, maps between ordered sets, duality principle, lattices as ordered sets, lattices as algebraic structures, sublattices, products and homomorphisms, definition, examples and properties of modular and distributive lattices, a brief introduction to Hasse diagram.

UNIT 3

- Boolean algebras, Boolean polynomials and their minimal and maximal forms, Karnaugh diagrams, relation between lattice and Boolean algebra, Logic gates, switching circuits and their applications.

UNIT 4

- Alphabet, strings and their properties (union, concatenation etc.), languages and different types of grammars (a short introduction to Chomsky Hierarchy).
- Finite State Machine (transition table, transition diagram, input/output strings-definitions and examples).
- Regular language and Regular Expression, closure properties of Regular language (emphasis should be given to different examples), Pumping Lemma (Statement and its applications).
- Finite Automata: Difference between FSM and FA, Deterministic and non-deterministic finite automata and their relations with regular language and regular expression, acceptance/rejection of different strings by finite automata, conversion of DFA to NDFA (examples).

UNIT 5

- Context Free Grammar (CFG) and Pushdown Automata (PDA): CFG, parse trees and their applications in detecting ambiguities in CFG, PDA and languages accepted by PDA, Deterministic and Non-deterministic PDA, properties of Context Free Language (CFL), Chomsky Normal Form and Conversion of CFG to CNF, Properties of CFL and closure properties, Pumping Lemma for CFL (statement and its applications).

UNIT 6

- A short introduction to Philosophy of Mathematics and historical background of Turing Machines (TM) (students should learn the role of mathematicians in

constructing an Abstract Machine as an Algebraic Structure, which came earlier than the computers used today).

- Introduction to concept of Algorithm in the context of attempts to solve Hilbert's tenth problem (proposed in ICM, 1900).
- TM as a model of computation, variants of TM and their equivalence.
- Recursive and Recursively Enumerable Languages.
  Undecidability, Solvability and Computability: Undecidable problems about Turing Machine (TM) and CFGs, Post Correspondence Problem and application of PCP through examples, Halting Problem.

PROPOSED MARKS DISTRIBUTION FOR THEORY (Full marks – 65)

- MCQ: This section should cover the whole syllabus(20).
- 1 question is to be answered out of 2 questions from UNIT 1,1 question out of 2 from UNIT 2 and 1 question out of 2 from UNIT 3, each question should carry 4 marks.
- 2 questions out of 3 from UNIT 4, each carrying 7 marks ;
- 2 questions out of 3 from UNIT 5, each carrying 6marks;
- 1 question out of 2 from UNIT 6, each carrying 7 marks ;
- Total marks from UNIT 3, 4,5,6 should be 33.

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

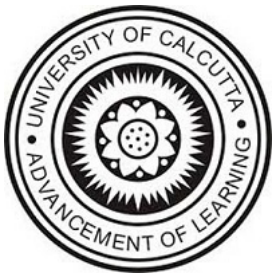
List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar



University of Calcutta

Syllabus for three-year B.Sc. in Mathematics

(Honours)

under

CBCS System

2018

1. Credit Distribution across Courses

Course Type	Total Papers	Credits		
		Theory + Tutorial	Theory + Practical	Total
Core Courses	14	$13 \times 5 = 65$ $13 \times 1 = 13$	$1 \times 4 = 4$ $1 \times 2 = 2$	84
Discipline Specific Electives	4	$4 \times 5 = 20$ $4 \times 1 = 4$	—	24
Generic Electives	4	$4 \times 6 = 24$	—	24
Ability Enhancement Language Courses	2	$2 \times 2 = 4$	—	4
Skill Enhancement Courses	2	$2 \times 2 = 4$	—	4
Totals	26	134	6	140

2. Course Structure : Semester-wise distribution of Courses

Semester	Course Name	Course Detail	Credits	Page No.
1	Ability Enhancement Compulsory Course-1	AECC(1)	2	
	Core Course-1	Calculus, Geometry & Vector Analysis	6	4
	Core Course-2	Algebra	6	6
	Generic Elective-1	GE(1)/CC(1) *	6	
		Total	**20**	
2	Ability Enhancement Compulsory Course-2	AECC(2)	2	
	Core Course-3	Real Analysis	6	8
	Core Course-4	Group Theory-I	6	10
	Generic Elective-2	GE(2)/CC(2) *	6	
		Total	**20**	
3	Core Course-5	Theory of Real Functions	6	11
	Core Course-6	Ring Theory & Linear Algebra-I	6	13
	Core Course-7	ODE & Multivariate Calculus-I	6	14
	Skill Enhancement Course-A	See SEC A	2	3
	Generic Elective-3	GE(3)/CC(3) *	6	
		Total	**26**	
4	Core Course-8	Riemann Integration & Series of Functions	6	16
	Core Course-9	PDE & Multivariate Calculus-II	6	18
	Core Course-10	Mechanics	6	20
	Skill Enhancement Course-B	See SEC B	2	3
	Generic Elective-4	GE(4)/CC(4) *	6	
		Total	**26**	
5	Core Course-11	Probability & Statistics	6	22
	Core Course-12	Group Theory-II & Linear Algebra-II	6	24
	Discipline Specific Elective- A	See DSE A(1)	6	3
	Discipline Specific Elective-B	See DSE B (1)	6	3
		Total	**24**	
6	Core Course-13	Metric Space & Complex Analysis	6	26
	Core Course-14	Numerical Methods	4	28
	Core Course-14 Practical	Numerical Methods Lab	2	30
	Discipline Specific Elective- A	See DSE A(2)	6	3
	Discipline Specific Elective-B	See DSE B(2)	6	3
		Total	**24**	
		Grand Total	**140**	

*These courses are to be taken by the students of **other discipline.** These are the 4 **Core Courses** of **General Courses** of other disciplines.

Course Structure | Credit Distribution | DSE | SEC | GE

3. Choices for Discipline Specific Electives (DSE)

DSE-A(1)	DSE-B(1)	DSE-A(2)	DSE-B(2)
For Semester -5	**For Semester-5**	**For Semester-6**	**For Semester-6**
Advanced Algebra [31]	Discrete Mathematics [35]	Differential Geometry [41]	Point Set Topology [46]
Bio Mathematics [32]	Linear Programming & Game Theory [37]	Mathematical Modelling [43]	Astronomy & Space Science [47]
Industrial Mathematics [34]	Boolean Algebra & Automata Theory [39]	Fluid Statics [44] & Elementary Fluid Dynamics	Advanced Mechanics [49]

The number within the bracket [ ] refers to page number. A student has to opt for any one of the subjects in DSE-A(1) and any one in DSE-B(1) in Semester 5. The student has to opt for any one of the subjects in DSE-A(2) and any one in DSE-B(2) in Semester 6.

Course Structure | Credit Distribution | SEC

4. Choices for Skill Enhancement Courses (SEC)

SEC-A (for Semester 3)	SEC-B (for Semester 4)
C Programming Language [51]	Mathematical Logic [53]
Object Oriented Programming in C++ [52]	Scientific computing with SageMath & R [54]

The number within the bracket [ ] refers to page number. A student has to opt for any one of the subjects available under each category.

Course Structure | Credit Distribution | DSE

Calculus, Geometry & Vector Analysis

Semester : 1 Core Course-1 Paper Code(Theory): MTM-A-CC-1-1-TH Paper Code (Tutorial):MTM-A-CC-1-1-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1 : Calculus [25 classes]

- Hyperbolic functions, higher order derivatives, Leibnitz rule and its applications to problems of type $e^{ax+b}\sin x$, $e^{ax+b}\cos x$, $(ax+b)^n\sin x$, $(ax+b)^n\cos x$, curvature, concavity and points of inflection, envelopes, rectilinear asymptotes (Cartesian & parametric form only), curve tracing in Cartesian coordinates, tracing in polar coordinates of standard curves, L'Hospital's rule, applications in business, economics and life sciences.
- Reduction formulae, derivations and illustrations of reduction formulae of the type $\int \sin^n x dx$, $\int \cos^n x dx$, $\int \tan^n x dx$, $\int \sec^n x dx$, $\int (\log x)^n dx$, $\int \sin^n x \sin mx dx$, $\int \sin^n x \cos^m x dx$. Parametric equations, parametrizing a curve, arc length of a curve, arc length of parametric curves, area under a curve, area and volume of surface of revolution.

Unit-2 : Geometry [30 classes]

- Rotation of axes and second degree equations, classification of conics using the discriminant, tangent and normal, polar equations of conics.
- Equation of Plane : General form, Intercept and Normal forms. The sides of a plane. Signed distance of a point from a plane. Equation of a plane passing through the intersection of two planes. Angle between two intersecting planes. Parallelism and perpendicularity of two planes.
- Straight lines in 3D: Equation (Symmetric & Parametric form). Direction ratio and direction cosines. Canonical equation of the line of intersection of two intersecting planes. Angle between two lines. Distance of a point from a line. Condition of coplanarity of two lines. Equation of skew lines. Shortest distance between two skew lines.
- Spheres. Cylindrical surfaces. Central conicoids, paraboloids, plane sections of conicoids, generating lines, classification of quadrics, illustrations of graphing standard quadric surfaces like cone, ellipsoid. Tangent and normals of conicoids.

Unit-3 : Vector Analysis [15 classes]

- Triple product, vector equations, applications to geometry and mechanics — concurrent forces in a plane, theory of couples, system of parallel forces. Introduction to vector functions, operations with vector-valued functions, limits and continuity of vector functions, differentiation and integration of vector functions of one variable.

Graphical Demonstration (Teaching Aid**) [5 classes]

- Plotting of graphs of function e^{ax+b}, $\log(ax+b)$, $1/(ax+b)$, $\sin(ax+b)$, $\cos(ax+b)$, $|ax+b|$ and to illustrate the effect of a and b on the graph.

- Plotting the graphs of polynomial of degree 4 and 5, the derivative graph, the second derivative graph and comparing them.
- Sketching parametric curves (Eg. trochoid, cycloid, epicycloids, hypocycloid).
- Obtaining surface of revolution of curves.
- Tracing of conics in cartesian coordinates/ polar coordinates.
- Sketching ellipsoid, hyperboloid of one and two sheets, elliptic cone, elliptic, paraboloid, and hyperbolic paraboloid using cartesian coordinates.

** **Preferably by free softwares but can be taught through drawing on black board/white board etc. in case of unavailability.**

References

[1] G.B. Thomas and R.L. Finney, Calculus, 9th Ed., Pearson Education, Delhi, 2005.

[2] M.J. Strauss, G.L. Bradley and K. J. Smith, Calculus, 3rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007.

[3] H. Anton, I. Bivens and S. Davis, Calculus, 7th Ed., John Wiley and Sons (Asia) P. Ltd., Singapore, 2002.

[4] R. Courant and F. John, Introduction to Calculus and Analysis (Volumes I & II), Springer- Verlag, New York, Inc., 1989.

[5] T. Apostol, Calculus, Volumes I and II.

[6] S. Goldberg, Calculus and mathematical analysis.

[7] Marsden, J., and Tromba, Vector Calculus, McGraw Hill.

[8] M.R. Speigel, SchaumÃââs outline of Vector Analysis.

[9] S. L. Loney, Co-ordinate Geometry.

[10] Robert J. T. Bell, Co-ordinate Geometry of Three Dimensions.

Course Structure | DSE | SEC | Credit Distribution

Algebra

Semester : 1 Core Course-2 Paper Code(Theory): MTM-A-CC-1-2-TH Paper Code (Tutorial):MTM-A-CC-1-2-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[30 classes]

- Polar representation of complex numbers, n-th roots of unity, De Moivre's theorem for rational indices and its applications. Exponential, logarithmic, trigonometric and hyperbolic functions of complex variable.
- Theory of equations : Relation between roots and coefficients, transformation of equation, Descartes rule of signs, Sturm's theorem, cubic equation (solution by Cardan's method) and biquadratic equation (solution by Ferrari's method).
- Inequality : The inequality involving $AM \geq GM \geq HM$, Cauchy-Schwartz inequality.
- Linear difference equations with constant coefficients (up to 2nd order).

Unit-2

[30 classes]

- Relation : equivalence relation, equivalence classes & partition, partial order relation, poset, linear order relation.
- Mapping : injective, surjective, one to one correspondence, invertible mapping, composition of mappings, relation between composition of mappings and various set theoretic operations. Meaning and properties of $f^{-1}(B)$, for any mapping $f : X \to Y$ and $B \subseteq Y$.
- Well-ordering property of positive integers, Principles of Mathematical induction, division algorithm, divisibility and Euclidean algorithm. Prime numbers and their properties, Euclid's theorem. Congruence relation between integers. Fundamental Theorem of Arithmetic. Chinese remainder theorem. Arithmetic functions, some arithmetic functions such as ϕ, τ, σ and their properties.

Unit-3

[15 classes]

- Rank of a matrix, inverse of a matrix, characterizations of invertible matrices.
- Systems of linear equations, row reduction and echelon forms, vector equations, the matrix equation $AX = B$, solution sets of linear systems, applications of linear systems.

References

[1] Titu Andreescu and Dorin Andrica, Complex Numbers from A to Z, Birkhauser, 2006.

[2] Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, 3rd Ed., Pearson Education (Singapore) P. Ltd., Indian Reprint, 2005.

[3] David C. Lay, Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007.

[4] K. Hoffman, R. Kunze, Linear algebra.

[5] W.S. Burnstine and A.W. Panton, Theory of equations.

Course Structure | DSE | SEC | Credit Distribution

Real Analysis

Semester : 2 Core Course-3 Paper Code(Theory): MTM-A-CC-2-3-TH Paper Code (Tutorial):MTM-A-CC-2-3-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[30 classes]

- Intuitive idea of real numbers. Mathematical operations and usual order of real numbers revisited with their properties (closure, commutative, associative, identity, inverse, distributive). Idea of countable sets, uncountable sets and uncountability of $\mathbb{R}$. Concept of bounded and unbounded sets in $\mathbb{R}$. L.U.B. (supremum), G.L.B. (infimum) of a set and their properties. L.U.B. axiom or order completeness axiom. Archimedean property of $\mathbb{R}$. Density of rational (and Irrational) numbers in $\mathbb{R}$.
- Intervals. Neighbourhood of a point. Interior point. Open set. Union, intersection of open sets. Limit point and isolated point of a set. Bolzano-Weirstrass theorem for sets. Existence of limit point of every uncountable set as a consequence of Bolzano-Weirstrass theorem. Derived set. Closed set. Complement of open set and closed set. Union and intersection of closed sets as a consequence. No nonempty proper subset of $\mathbb{R}$ is both open and closed. Dense set in $\mathbb{R}$ as a set having non-empty intersection with every open intervals. $\mathbb{Q}$ and $\mathbb{R} \setminus \mathbb{Q}$ are dense in $\mathbb{R}$.

Unit-2

[30 classes]

- Real sequence. Bounded sequence. Convergence and non-convergence. Examples. Boundedness of convergent sequence. Uniqueness of limit. Algebra of limits.
- Relation between the limit point of a set and the limit of a convergent sequence of distinct elements. Monotone sequences and their convergence. Sandwich rule. Nested interval theorem. Limit of some important sequences : $\left\{n^{\frac{1}{n}}\right\}_n$, $\{x^n\}_n$, $\left\{x^{\frac{1}{n}}\right\}_n$, $\{x_n\}_n$ with $\frac{x_{n+1}}{x_n} \to l$ and $|l| < 1$, $\left\{\left(1+\frac{1}{n}\right)^n\right\}_n$, $\left\{1+\frac{1}{1!}+\frac{1}{2!}+\cdots+\frac{1}{n!}\right\}_n$, $\{a^{x_n}\}_n\,(a>0)$. Cauchy's first and second limit theorems.
- Subsequence. Subsequential limits, $\limsup$ as the L.U.B. and $\liminf$ as the G.L.B of a set containing all the subsequential limits. Alternative definition of limsup and liminf of a sequence using inequality or as $\limsup x_n = \inf_n \sup\{x_n, x_{n+1}, \ldots,\}$ and $\liminf x_n = \sup_n \inf\{x_n, x_{n+1}, \ldots,\}$ [Equivalence between these definitions is assumed]. A bounded sequence $\{x_n\}$ is convergent if and only if $\limsup x_n = \liminf x_n$. Every sequence has a monotone subsequence. Bolzano-Weirstrass theorem for sequence. Cauchy's convergence criterion. Cauchy sequence.

Unit-3

[10 classes]

- Infinite series, convergence and non-convergence of infinite series, Cauchy criterion, tests for convergence : comparison test, limit comparison test, ratio test, Cauchy's n-th root test, Kummer's test and Gauss test (statements only). Alternating series, Leibniz test. Absolute and conditional convergence.

Graphical Demonstration (Teaching aid**)

[5 classes]

- Plotting of recursive sequences.

- Study the convergence of sequences through plotting.
- Verify Bolzano-Weierstrass theorem through plotting of sequences and hence identify convergent subsequences from the plot.
- Study the convergence/divergence of infinite series by plotting their sequences of partial sum.
- Cauchy's root test by plotting n-th roots.
- Ratio test by plotting the ratio of n-th and $(n+1)$-th term.

** **Preferably by computer softwares but can be taught through drawing on black board/white board etc. in case of unavailability.**

References

[1] R.G. Bartle and D. R. Sherbert, Introduction to Real Analysis, 3rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.

[2] Gerald G. Bilodeau , Paul R. Thie, G.E. Keough, An Introduction to Analysis, 2nd Ed., Jones & Bartlett, 2010.

[3] Brian S. Thomson, Andrew. M. Bruckner and Judith B. Bruckner, Elementary Real Analysis,Prentice Hall, 2001.

[4] S.K. Berberian, a First Course in Real Analysis, Springer Verlag, New York, 1994.

[5] T. Apostol, Mathematical Analysis, Narosa Publishing House

[6] Courant and John, Introduction to Calculus and Analysis, Vol I, Springer

[7] W. Rudin, Principles of Mathematical Analysis, Tata McGraw-Hill

[8] C. C. Pugh, Real Mathematical Analysis, Springer, 2002.

[9] Terence Tao, Analysis I, Hindustan Book Agency, 2006.

[10] S. Goldberg, Calculus and mathematical analysis.

[11] Horst R. Beyer, Calculus and Analysis, Wiley, 2010.

Course Structure | DSE | SEC | Credit Distribution

Group Theory-I

Semester : 2 Core Course-4 Paper Code(Theory): MTM-A-CC-2-4-TH Paper Code (Tutorial):MTM-A-CC-2-4-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Mark are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[30 classes]

- Symmetries of a square, definition of group, examples of groups including permutation groups, dihedral groups and quaternion groups (through matrices), elementary properties of groups, examples of commutative and non-commutative groups. Subgroups and examples of subgroups, necessary and sufficient condition for a nonempty subset of a group to be a subgroup. Normalizer, centralizer, center of a group, product of two subgroups.

Unit-2

[25 classes]

- Properties of cyclic groups, classification of subgroups of cyclic groups. Cycle notation for permutations, properties of permutations, even and odd permutations, alternating group, properties of cosets, order of an element, order of a group. Lagrange's theorem and consequences including Fermat's Little theorem.

Unit-3

[20 classes]

- Normal subgroup and its properties. Quotient group. Group homomorphisms, properties of homomorphisms, correspondence theorem and one one correspondence between the set of all normal subgroups of a group and the set of all congruences on that group, Cayley's theorem, properties of isomorphisms. First, Second and Third isomorphism theorems.

References

[1] John B. Fraleigh, A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.

[2] M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.

[3] Joseph A. Gallian, Contemporary Abstract Algebra, 4th Ed., Narosa Publishing House, New Delhi, 1999.

[4] Joseph J. Rotman, An Introduction to the Theory of Groups, 4th Ed., Springer Verlag, 1995.

[5] I.N. Herstein, Topics in Algebra, Wiley Eastern Limited, India, 1975.

[6] D.S. Malik, John M. Mordeson and M.K. Sen, Fundamentals of abstract algebra.

Course Structure | DSE | SEC | Credit Distribution

Theory of Real Functions

Semester : 3 Core Course-5 Paper Code(Theory): MTM-A-CC-3-5-TH Paper Code (Tutorial):MTM-A-CC-3-5-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1 : Limit & Continuity of functions [40 classes]

- Limits of functions ($\epsilon - \delta$ approach), sequential criterion for limits. Algebra of limits for functions, effect of limit on inequality involving functions, one sided limits. Infinite limits and limits at infinity. Important limits like $\frac{\sin x}{x}$, $\frac{\log(1+x)}{x}$, $\frac{a^x-1}{x}$ $(a > 0)$ as $x \longrightarrow 0$.
- Continuity of a function on an interval and at an isolated point. Sequential criteria for continuity. Concept of oscillation of a function at a point. A function is continuous at x if and only if its oscillation at x is zero. Familiarity with the figures of some well known functions : $y = x^a$ $(a = 2, 3, \frac{1}{2}, -1)$, $|x|$, $\sin x$, $\cos x$, $\tan x$, $\log x$, e^x. Algebra of continuous functions as a consequence of algebra of limits. Continuity of composite functions. Examples of continuous functions. Continuity of a function at a point does not necessarily imply the continuity in some neighbourhood of that point.
- Bounded functions. Neighbourhood properties of continuous functions regarding boundedness and maintenance of same sign. Continuous function on $[a, b]$ is bounded and attains its bounds. Intermediate value theorem.
- Discontinuity of functions, type of discontinuity. Step functions. Piecewise continuity. Monotone functions. Monotone functions can have only jump discontinuity. Monotone functions can have atmost countably many points of discontinuity. Monotone bijective function from an interval to an interval is continuous and its inverse is also continuous.
- Uniform continuity. Functions continuous on a closed and bounded interval is uniformly continuous. A necessary and sufficient condition under which a continuous function on a bounded open interval I will be uniformly continuous on I. A sufficient condition under which a continuous function on an unbounded open interval I will be uniformly continuous on I(statement only). Lipschitz condition and uniform continuity.

Unit-2 : Differentiability of functions [35 classes]

- Differentiability of a function at a point and in an interval, algebra of differentiable functions. Meaning of sign of derivative. Chain rule.
- Darboux theorem, Rolle's theorem, Mean value theorems of Lagrange and Cauchy — as an application of Rolle's theorem. Taylor's theorem on closed and bounded interval with Lagrange's and Cauchy's form of remainder deduced from Lagrange's and Cauchy's mean value theorem respectively. Expansion of e^x, $\log(1 + x)$, $(1 + x)^m$, $\sin x$, $\cos x$ with their range of validity (assuming relevant theorems). Application of Taylor's theorem to inequalities.
- Statement of L' Hospital's rule and its consequences. Point of local extremum (maximum, minimum) of a function in an interval. Sufficient condition for the existence of a local maximum/minimum of a function at a point (statement only). Determination of local extremum using first order derivative. Application of the principle of maximum/minimum in geometrical problems.

References

[1] R.G. Bartle and D. R. Sherbert, Introduction to Real Analysis, 3rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.

[2] Gerald G. Bilodeau , Paul R. Thie, G.E. Keough, An Introduction to Analysis, 2nd Ed., Jones & Bartlett, 2010.

[3] Brian S. Thomson, Andrew. M. Bruckner and Judith B. Bruckner, Elementary Real Analysis,Prentice Hall, 2001.

[4] S.K. Berberian, a First Course in Real Analysis, Springer Verlag, New York, 1994.

[5] T. Apostol, Mathematical Analysis, Narosa Publishing House

[6] Courant and John, Introduction to Calculus and Analysis, Vol I, Springer

[7] W. Rudin, Principles of Mathematical Analysis, Tata McGraw-Hill

[8] C. C. Pugh, Real Mathematical Analysis, Springer, 2002.

[9] Terence Tao, Analysis I, Hindustan Book Agency, 2006.

[10] S. Goldberg, Calculus and mathematical analysis.

[11] Horst R. Beyer, Calculus and Analysis, Wiley, 2010.

Course Structure | DSE | SEC | Credit Distribution

Ring Theory & Linear Algebra-I

Semester : 3 Core Course-6 Paper Code(Theory): MTM-A-CC-3-6-TH Paper Code (Tutorial):MTM-A-CC-3-6-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1 : Ring theory [35 classes]

- Definition and examples of rings, properties of rings, subrings, necessary and sufficient condition for a nonempty subset of a ring to be a subring, integral domains and fields, subfield, necessary and sufficient condition for a nonempty subset of a field to be a subfield, characteristic of a ring. Ideal, ideal generated by a subset of a ring, factor rings, operations on ideals, prime and maximal ideals. Ring homomorphisms, properties of ring homomorphisms. First isomorphism theorem, second isomorphism theorem, third isomorphism theorem, Correspondence theorem, congruence on rings, one-one correspondence between the set of ideals and the set of all congruences on a ring.

Unit-2 : Linear algebra [40 classes]

- Vector spaces, subspaces, algebra of subspaces, quotient spaces, linear combination of vectors, linear span, linear independence, basis and dimension, dimension of subspaces. Subspaces of $\mathbb{R}^n$, dimension of subspaces of $\mathbb{R}^n$. Geometric significance of subspace.
- Linear transformations, null space, range, rank and nullity of a linear transformation, matrix representation of a linear transformation, change of coordinate matrix. Algebra of linear transformations. Isomorphisms. Isomorphism theorems, invertibility and isomorphisms. Eigen values, eigen vectors and characteristic equation of a matrix. Cayley-Hamilton theorem and its use in finding the inverse of a matrix,

References

[1] John B. Fraleigh, A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.

[2] M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.

[3] Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence, Linear Algebra, 4th Ed., Prentice- Hall of India Pvt. Ltd., New Delhi, 2004.

[4] Joseph A. Gallian, Contemporary Abstract Algebra, 4th Ed., Narosa Publishing House, New Delhi, 1999.

[5] S. Lang, Introduction to Linear Algebra, 2nd Ed., Springer, 2005.

[6] Gilbert Strang, Linear Algebra and its Applications, Thomson, 2007.

[7] S. Kumaresan, Linear Algebra- A Geometric Approach, Prentice Hall of India, 1999.

[8] Kenneth Hoffman, Ray Alden Kunze, Linear Algebra, 2nd Ed., Prentice-Hall of India Pvt. Ltd., 1971.

[9] D.A.R. Wallace, Groups, Rings and Fields, Springer Verlag London Ltd., 1998.

[10] D.S. Malik, John M. Mordeson and M.K. Sen, Fundamentals of abstract algebra.

Course Structure | DSE | SEC | Credit Distribution

Ordinary Differential Equation & Multivariate Calculus-I

Semester : 3 Core Course-7 Paper Code(Theory): MTM-A-CC-3-7-TH Paper Code (Tutorial):MTM-A-CC-3-7-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1 : Ordinary differential equation [40 classes]

- First order differential equations : Exact differential equations and integrating factors, special integrating factors and transformations, linear equations and Bernoulli equations, the existence and uniqueness theorem of Picard (Statement only).
- Linear equations and equations reducible to linear form. First order higher degree equations solvable for x, y and p. Clairaut's equations and singular solution.
- Basic Theory of linear systems in normal form, homogeneous linear systems with constant coefficients: Two Equations in two unknown functions.
- Linear differential equations of second order, Wronskian : its properties and applications, Euler equation, method of undetermined coefficients, method of variation of parameters.
- System of linear differential equations, types of linear systems, differential operators, an operator method for linear systems with constant coefficients.
- Planar linear autonomous systems : Equilibrium (critical) points, Interpretation of the phase plane and phase portraits.
- Power series solution of a differential equation about an ordinary point, solution about a regular singular point (up to second order).

Unit-2 : Multivariate Calculus-I [35 classes]

- Concept of neighbourhood of a point in R^n (n $>$ 1), interior point, limit point, open set and closed set in R^n (n $>$ 1).
- Functions from R^n($n > 1$) to R^m($m \geq 1$), limit and continuity of functions of two or more variables. Partial derivatives, total derivative and differentiability, sufficient condition for differentiability. Chain rule for one and two independent parameters, directional derivatives, the gradient, maximal and normal property of the gradient, tangent planes. Extrema of functions of two variables, method of Lagrange multipliers, constrained optimization problems.

References

[1] D.A. Murray, Introductory course in Differential Equations, Orient and Longman

[2] H.T. H.Piaggio, Elementary Treaties on Differential Equations and their applications, C.B.S Publisher & Distributors, Delhi,1985.

[3] G.F.Simmons, Differential Equations, Tata Mc Graw Hill

[4] S.L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons, India, 2004.

[5] M.R. Speigel, Schaum's outline of Laplace Transform

[6] Horst R. Beyer, Calculus and Analysis, Wiley, 2010.

Course Structure | DSE | SEC | Credit Distribution

Riemann Integration & Series of Functions

Semester : 4 Core Course-8 Paper Code(Theory): MTM-A-CC-4-8-TH Paper Code (Tutorial):MTM-A-CC-4-8-TU	Credits : 5+1*=6 Full Marks 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1 : Riemann integration [35 classes]

- Partition and refinement of partition of a closed and bounded interval. Upper Darboux sum $U(P, f)$ and lower Darboux sum $L(P, f)$ and associated results. Upper integral and lower integral. Darboux's theorem. Darboux's definition of integration over a closed and bounded interval. Riemann's definition of integrability. Equivalence with Darboux definition of integrability (statement only). Necessary and sufficient condition for Riemann integrability.
- Concept of negligible set (or zero set) defined as a set covered by countable number of open intervals sum of whose lengths is arbitrary small. Examples of negligible sets : any subset of a negligible set, finite set, countable union of negligible sets. A bounded function on closed and bounded interval is Riemann integrable if and only if the set of points of discontinuity is negligible. Example of Riemann integrable functions.
- Integrability of sum, scalar multiple, product, quotient, modulus of Riemann integrable functions. Properties of Riemann integrable functions arising from the above results.
- Function defined by definite integral $\int_a^x f(t)dt$ and its properties. Antiderivative (primitive or indefinite integral). Properties of Logarithmic function defined as the definite integral $\int_1^x \frac{dt}{t},\ x > 0$.
- Fundamental theorem of Integral Calculus. First Mean Value theorem of integral calculus.

Unit-2 : Improper integral [10 classes]

- Range of integration, finite or infinite. Necessary and sufficient condition for convergence of improper integral in both cases.
- Tests of convergence : Comparison and M-test. Absolute and non-absolute convergence and inter-relations. Statement of Abel's and Dirichlet's test for convergence on the integral of a product.
- Convergence and working knowledge of Beta and Gamma function and their interrelation $\Big[\Gamma(n)\Gamma(1-n) = \frac{\pi}{\sin n\pi}, 0 < n < 1$, to be assumed$\Big]$. Computation of the integrals $\int_0^{\pi/2} \sin^n x dx$, $\int_0^{\pi/2} \cos^n x dx$, $\int_0^{\pi/2} \tan^n x dx$ when they exist (using Beta and Gamma function).

Unit-3 : Series of functions [30 classes]

- Sequence of functions defined on a set, Pointwise and uniform convergence. Cauchy criterion of uniform convergence. Weirstrass' M-test. Boundedness, continuity, integrability and differentiability of the limit function of a sequence of functions in case of uniform convergence.

- Series of functions defined on a set, Pointwise and uniform convergence. Cauchy criterion of uniform convergence. Weierstrass' M-test. Passage to the limit term by term. Boundedness, continuity, integrability, differentiability of a series of functions in case of uniform convergence.
- Power series : Fundamental theorem of power series. Cauchy-Hadamard theorem. Determination of radius of convergence. Uniform and absolute convergence of power series. Properties of sum function. Differentiation and integration of power series. Abel's limit theorems. Uniqueness of power series having sum function.
- Fourier series : Trigonometric series. Statement of sufficient condition for a trigonometric series to be a Fourier series. Fourier coefficients for periodic functions defined on $[-\pi, \pi]$. Statement of Dirichlet's condition of convergence. Statement of theorem of sum of Fourier series.

References

[1] R.G. Bartle and D. R. Sherbert, Introduction to Real Analysis, 3rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.

[2] Gerald G. Bilodeau , Paul R. Thie, G.E. Keough, An Introduction to Analysis, 2nd Ed., Jones & Bartlett, 2010.

[3] Brian S. Thomson, Andrew. M. Bruckner and Judith B. Bruckner, Elementary Real Analysis,Prentice Hall, 2001.

[4] S.K. Berberian, a First Course in Real Analysis, Springer Verlag, New York, 1994.

[5] T. Apostol, Mathematical Analysis, Narosa Publishing House

[6] Courant and John, Introduction to Calculus and Analysis, Vol I, Springer

[7] W. Rudin, Principles of Mathematical Analysis, Tata McGraw-Hill

[8] C. C. Pugh, Real Mathematical Analysis, Springer, 2002.

[9] Terence Tao, Analysis I, Hindustan Book Agency, 2006.

[10] S. Goldberg, Calculus and mathematical analysis.

[11] Horst R. Beyer, Calculus and Analysis, Wiley, 2010.

Course Structure | DSE | SEC | Credit Distribution

Partial differential equation & Multivariate Calculus-II

Semester : 4 Core Course-9 Paper Code(Theory): MTM-A-CC-4-9-TH Paper Code (Tutorial):MTM-A-CC-4-9-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1 : Partial differential equation [40 classes]

- Partial differential equations of the first order, Lagrange's solution, non linear first order partial differential equations, Charpit's general method of solution, some special types of equations which can be solved easily by methods other than the general method.
- Derivation of heat equation, wave equation and Laplace equation. Classification of second order linear equations as hyperbolic, parabolic or elliptic. Reduction of second order linear equations to canonical forms.
- The Cauchy problem, Cauchy-Kowalewskaya theorem, Cauchy problem of finite and infinite string. Initial boundary value problems. Semi-infinite string with a fixed end, semi-infinite string with a free end. Equations with non-homogeneous boundary conditions. Non-homogeneous wave equation. Method of separation of variables, solving the vibrating string problem. Solving the heat conduction problem.

Unit-2 : Multivariate Calculus-II [35 classes]

- Multiple integral: Concept of upper sum, lower sum, upper integral, lower-integral and double integral (no rigorous treatment is needed). Statement of existence theorem for continuous functions. Iterated or repeated integral, change of order of integration. Triple integral. Cylindrical and spherical coordinates. Change of variables in double integrals and triple integrals. Transformation of double and triple integrals (problems only). Determination of volume and surface area by multiple integrals (problems only). Differentiation under the integral sign, Leibniz's rule (problems only).
- Definition of vector field, divergence and curl. Line integrals, applications of line integrals : mass and work. Fundamental theorem for line integrals, conservative vector fields, independence of path.
- Green's theorem, surface integrals, integrals over parametrically defined surfaces. Stoke's theorem, The Divergence theorem.

References

[1] G.B. Thomas and R.L. Finney, Calculus, 9th Ed., Pearson Education, Delhi, 2005.

[2] M.J. Strauss, G.L. Bradley and K. J. Smith, Calculus, 3rd Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi, 2007.

[3] E. Marsden, A.J. Tromba and A. Weinstein, Basic Multivariable Calculus, Springer (SIE), 2005.

[4] James Stewart, Multivariable Calculus, Concepts and Contexts, 2nd Ed., Brooks /Cole, Thomson Learning, USA, 2001

[5] T. Apostol, Mathematical Analysis, Narosa Publishing House.

[6] Courant and John, Introduction to Calculus and Analysis, Vol II, Springer

[7] W. Rudin, Principles of Mathematical Analysis, Tata McGraw-Hill.

[8] Horst R. Beyer, Calculus and Analysis, Wiley, 2010.

[9] Ian Sneddon, Elements of Partial Differential equations, Mcgraw-Hill International Edition, 1957.

[10] M.D. Raisinghania, Ordinary and Partial Differential Equations, S. Chand Higher Academic, 19th Edition, 2017.

[11] K.Sankara Rao, Introduction to Partial Differential Equations, PHI, Third Edition, 2015.

Course Structure | DSE | SEC | Credit Distribution

Mechanics

Semester : 4 Core Course- 10 Paper Code(Theory): MTM-A-CC-4-10-TH Paper Code (Tutorial):MTM-A-CC-4-10-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial **20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[15 classes]

- **Coplanar forces in general :** Resultant force and resultant couple, Special cases, Varignon's theorem, Necessary and sufficient conditions of equilibrium. Equilibrium equations of the first, second and third kind.
- **An arbitrary force system in space :** Moment of a force about an axis, Varignon's theorem. Resultant force and resultant couple, necessary and sufficient conditions of equilibrium. Equilibrium equations, Reduction to a wrench, Poinsot's central axis, intensity and pitch of a wrench, Invariants of a system of forces. Statically determinate and indeterminate problems.
- **Equilibrium in the presence of sliding Friction force :** Contact force between bodies, Coulomb's laws of static Friction and dynamic friction. The angle and cone of friction, the equilibrium region.

Unit-2

[10 classes]

- **Virtual work :** Workless constraints - examples, virtual displacements and virtual work. The principle of virtual work, Deductions of the necessary and sufficient conditions of equilibrium of an arbitrary force system in plane and space, acting on a rigid body.
- **Stability of equilibrium :** Conservative force field, energy test of stability, condition of stability of a perfectly rough heavy body lying on a fixed body. Rocking stones.

Unit-3

[20 classes]

- **Kinematics of a particle :** velocity, acceleration, angular velocity, linear and angular momentum. Relative velocity and acceleration. Expressions for velocity and acceleration in case of rectilinear motion and planar motion - in Cartesian and polar co-ordinates, tangential and normal components. Uniform circular motion.
- **Newton laws of motion and law of gravitation :** Space, time, mass, force, inertial reference frame, principle of equivalence and g. Vector equation of motion.

  Work, power, kinetic energy, conservative forces - potential energy. Existence of potential energy function. Energy conservation in a conservative field. Stable equilibrium and small oscillations: Approximate equation of motion for small oscillation. Impulsive forces

Unit-4

[20 classes]

- **Problems in particle dynamics :** Rectilinear motion in a given force field - vertical motion under uniform gravity, inverse square field, constrained rectilinear motion, vertical motion under gravity in a resisting medium, simple harmonic motion, Damped and forced oscillations, resonance of an oscillating system, motion of elastic strings and springs.

- **Planar motion of a particle :** Motion of a projectile in a resisting medium under gravity, orbits in a central force field, Stability of nearly circular orbits. Motion under the attractive inverse square law, Kepler's laws on planetary motion. Slightly disturbed orbits, motion of artificial satellites. Constrained motion of a particle on smooth and rough curves. Equations of motion referred to a set of rotating axes.
- **Motion of a particle in three dimensions :** Motion on a smooth sphere, cone, and on any surface of revolution.

Unit-5

[10 classes]

- **Many particles system**

  The linear momentum principle : Linear momentum, linear momentum principle, motion of the centre of mass, conservation of linear momentum.
- **The angular momentum principle :** Moment of a force about a point, about an axis. Angular momentum about a point, about an axis. Angular momentum principle about centre of mass. Conservation of angular momentum (about a point and an axis). Impulsive forces.
- **The energy principle :** Configurations and degrees of freedom of a multi-particle system, energy principle, energy conservation.

  Rocket motion in free space and under gravity, collision of elastic bodies. The two-body problem.

References

[1] Gregory R.D., Classical mechanics, Cambridge UP

[2] K. R. Symon, Mechanics, Addison Wesley

[3] Mary Lunn; A First Course in Mechanics, OUP

[4] J. L. Synge, B. A. Griffith, Principles of Mechanics, Mcgraw Hill

[5] T. W. B. Kibble, F. H. Berkshire, Classical Mechanics, Imperial College Press

[6] D. T. Greenwood, Principle of Dynamics, PHI

[7] Chorlton, F., Textbook of Dynamics.

[8] D. Kleppner & R. Kolenkow, Introduction to Mechanics, Tata Mcgraw Hill

[9] A. P. French, Newtonian Mechanics, Viva Books

[10] Timoshenko and Young, Engineering Mechanics, Mcgraw Hill

[11] D. Chernilevski, E. Lavrova, V. Romanov, Mechanics for Engineers, MIR Publishers

[12] I.H. Shames and G. Krishna Mohan Rao, Engineering Mechanics: Statics and Dynamics, (4th Ed.), Dorling Kindersley(India) Pvt. Ltd. (Pearson Education), Delhi, 2009.

[13] R.C. Hibbeler and Ashok Gupta, Engineering Mechanics: Statics and Dynamics, 11th Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi.

[14] Loney, S. L., An Elementary Treatise on the Dynamics of particle and of Rigid Bodies, Loney Press .

[15] Loney, S. L., An Elementary Treatise on Statics

[16] Verma, R. S., A Textbook on Statics, Pothishala, 1962

[17] Ramsey, A. S., Dynamics (Part I & II).

Course Structure | DSE | SEC | Credit Distribution

Probability & Statistics

Semester : 5 Core Course-11 Paper Code(Theory): MTM-A-CC-5-11-TH Paper Code (Tutorial):MTM-A-CC-5-11-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[20 classes]

- Random experiment, σ-field, Sample space, probability as a set function, probability axioms, probability space. Finite sample spaces. Conditional probability, Bayes theorem, independence. Real random variables (discrete and continuous), cumulative distribution function, probability mass/density functions, mathematical expectation, moments, moment generating function, characteristic function. Discrete distributions : uniform, binomial, Poisson, geometric, negative binomial, Continuous distributions : uniform, normal, exponential.

Unit-2

[15 classes]

- Joint cumulative distribution function and its properties, joint probability density functions, marginal and conditional distributions, expectation of function of two random variables, moments, covariance, correlation coefficient, independent random variables, joint moment generating function (jmgf) and calculation of covariance from jmgf, characteristic function. Conditional expectations, linear regression for two variables, regression curves. Bivariate normal distribution.

Unit-3

[5 classes]

- Markov and Chebyshev's inequality, Convergence in Probability, statement and interpretation of weak law of large numbers and strong law of large numbers. Central limit theorem for independent and identically distributed random variables with finite variance.

Unit-4

[15 classes]

- Sampling and Sampling Distributions : Populations and Samples, Random Sample, distribution of the sample, Simple random sampling with and without replacement. Sample characteristics.
- Sampling Distributions : Statictic, Sample moments. Sample variance, Sampling from the normal distributions, Chi-square, t and F-distributions, sampling distribution of $\overline{X}$, s^2, $\frac{\sqrt{n}}{s}(\overline{X}-\mu)$
- Estimation of parameters : Point estimation. Interval Estimation- Confidence Intervals for mean and variance of Normal Population. Mean-squared error. Properties of good estimators - unbiasedness, consistency, sufficiency, Minimum-Variance Unbiased Estimator (MVUE).
- Method of Maximum likelihood : likelihood function, ML estimators for discrete and continuous models.

Unit-5

[15 classes]

- Statistical hypothesis : Simple and composite hypotheses, null hypotheses, alternative hypotheses, one-sided and two-sided hypotheses. The critical region and test statistic, type I error and type II error, level of significance. Power function of a test, most powerful test. The p-value (observed level of significance), Calculating p-values.

- Simple hypothesis versus simple alternative : Neyman-Pearson lemma (Statement only).
- Bivariate frequency Distribution : Bivariate data, Scatter diagram, Correlation, Linear Regression, principle of least squares and fitting of polynomials and exponential curves.

Graphical Demonstration (Teaching Aid**) [5 classes]

- Graphical representation of data - how to load data, plot a graph viz. histograms (equal class intervals and unequal class intervals), frequency polygon, pie chart, ogives with graphical summaries of data.
- Measures of central tendency and measures of dispersion ,moments, skewness and kurtosis.
- Karl Pearson correlation coefficient.
- Correlation coefficient for a bivariate frequency distribution.
- Lines of regression, angle between lines and estimated values of variables.
- Fitting of polynomials, exponential curves by method of least squares.
- Confidence interval for the parameters of a normal distribution (one sample and two sample problems).

** **Preferably by free softwares (e.g. R/ Python / SageMath etc.) but can be taught through black board/white board / square sheet etc. in case of unavailability.**

References

[1] William Feller, An introduction to Probability Theory and its Application, Volume 1, 3e.

[2] Robert V. Hogg, Joseph W. McKean and Allen T. Craig, Introduction to Mathematical Statistics, Pearson Education, Asia, 2007.

[3] Irwin Miller and Marylees Miller, John E. Freund, Mathematical Statistics with Applications, 7th Ed., Pearson Education, Asia, 2006.

[4] Sheldon Ross, Introduction to Probability Models, 9th Ed., Academic Press, Indian Reprint, 2007.

[5] Alexander M. Mood, Franklin A. Graybill and Duane C. Boes, Introduction to the Theory of Statistics, 3rd Ed., Tata McGraw- Hill, Reprint 2007

[6] A.M. Goon, M.K.Gupta and B.Dasgupta, Fundamental of Statistics, Vol 1 & Vol 2, World Press.

[7] A. Gupta, Ground work of Mathematical Probability and Statistics, Academic publishers .

Course Structure | DSE | SEC | Credit Distribution

Group Theory-II & Linear Algebra-II

Semester : 5 Core Course-12 Paper Code(Theory): MTM-A-CC-5-12-TH Paper Code (Tutorial):MTM-A-CC-5-12-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1 : Group theory [35 classes]

- Automorphism, inner automorphism, automorphism groups, automorphism groups of finite and infinite cyclic groups, applications of factor groups to automorphism groups.
- External direct product and its properties, the group of units modulo n as an external direct product, internal direct product, converse of Lagrange's theorem for finite abelian group, Cauchy's theorem for finite abelian group, Fundamental theorem of finite abelian groups.

Unit-2 : Linear algebra [40 classes]

- Inner product spaces and norms, Gram-Schmidt orthonormalisation process, orthogonal complements, Bessel's inequality, the adjoint of a linear operator and its basic properties.
- Bilinear and quadratic forms, Diagonalisation of symmetric matrices, Second derivative test for critical point of a function of several variables, Hessian matrix, Sylvester's law of inertia. Index, signature.
- Dual spaces, dual basis, double dual, transpose of a linear transformation and its matrix in the dual basis, annihilators. Eigenspaces of a linear operator, diagonalizability, invariant subspaces and Cayley-Hamilton theorem, the minimal polynomial for a linear operator, canonical forms (Jordan & rational).

References

[1] John B. Fraleigh, A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.

[2] M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.

[3] Joseph A. Gallian, Contemporary Abstract Algebra, 4th Ed., Narosa Publishing House, New Delhi, 1999.

[4] Joseph J. Rotman, An Introduction to the Theory of Groups, 4th Ed., Springer Verlag, 1995.

[5] I.N. Herstein, Topics in Algebra, Wiley Eastern Limited, India, 1975.

[6] D.S. Malik, John M. Mordeson and M.K. Sen, Fundamentals of abstract algebra.

[7] Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence, Linear Algebra, 4th Ed., Prentice- Hall of India Pvt. Ltd., New Delhi, 2004.

[8] S. Lang, Introduction to Linear Algebra, 2nd Ed., Springer, 2005.

[9] Gilbert Strang, Linear Algebra and its Applications, Thomson, 2007.

[10] S. Kumaresan, Linear Algebra- A Geometric Approach, Prentice Hall of India, 1999.

[11] Kenneth Hoffman, Ray Alden Kunze, Linear Algebra, 2nd Ed., Prentice-Hall of India Pvt. Ltd., 1971.

[12] D.A.R. Wallace, Groups, Rings and Fields, Springer Verlag London Ltd., 1998.

Course Structure | DSE | SEC | Credit Distribution

Metric Space & Complex Analysis

Semester : 6 Core Course-13 Paper Code(Theory): MTM-A-CC-6-13-TH Paper Code (Tutorial):MTM-A-CC-6-13-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1 : Metric space [40 classes]

- Definition and examples of metric spaces. Open ball. Open set. Closed set as complement of open set. Interior point and interior of a set. Limit point and closure of a set. Boundary point and boundary of a set. Properties of interior, closure and boundary. Bounded set and diameter of a set. Distance between two sets. Subspace of a metric space.
- Convergent sequence. Cauchy sequence. Every convergent sequence is Cauchy and bounded, but the converse is not true. Completeness. Cantor's intersection theorem. $\mathbb{R}$ is a complete metric space. $\mathbb{Q}$ is not complete.
- Continuous mappings, sequential criterion of continuity. Uniform continuity.
- Compactness, Sequential compactness, Heine-Borel theorem in $\mathbb{R}$. Finite intersection property, continuous functions on compact sets.
- Concept of connectedness and some examples of connected metric space, connected subsets of $\mathbb{R}, \mathbb{C}$.
- Contraction mappings, Banach Fixed point Theorem and its application to ordinary differential equations.

Unit-2 : Complex analysis [35 classes]

- Stereographic projection. Regions in the complex plane. Limits, limits involving the point at infinity. Continuity of functions of complex variable.
- Derivatives, differentiation formulas, Cauchy-Riemann equations, sufficient conditions for differentiability. Analytic functions, exponential function, logarithmic function, trigonometric functions, hyperbolic functions. Möbius transformation.
- Power series : Cauchy-Hadamard theorem. Determination of radius of convergence. Uniform and absolute convergence of power series. Analytic functions represented by power series. Uniqueness of power series.
- Contours, complex integration along a contour and its examples, upper bounds for moduli of contour integrals. Cauchy- Goursat theorem (statement only) and its consequences, Cauchy integral formula.

References

[1] Satish Shirali and Harikishan L. Vasudeva, Metric Spaces, Springer Verlag, London, 2006.

[2] S. Kumaresan, Topology of Metric Spaces, 2nd Ed., Narosa Publishing House, 2011.

[3] P. K. Jain and K. Ahmad, Metric Spaces, Narosa Publishing House.

[4] G.F. Simmons, Introduction to Topology and Modern Analysis, McGraw-Hill, 2004.

[5] James Ward Brown and Ruel V. Churchill, Complex Variables and Applications, 8th Ed., McGraw Ãâåœ Hill International Edition, 2009.

[6] Joseph Bak and Donald J. Newman, Complex Analysis, 2nd Ed., Undergraduate Texts in Mathematics, Springer-Verlag New York, Inc., NewYork, 1997.

[7] S. Ponnusamy, Foundations of complex analysis.

[8] E. M. Stein and R. Shakrachi, Complex Analysis, Princeton University Press.

Course Structure | DSE | SEC | Credit Distribution

Numerical Methods

Semester : 6 Core Course-14 Paper Code(Theory): MTM-A-CC-6-14-TH	Credits : 4 Full Marks : 50+20**=70
Number of classes required : 55	
***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[5 classes]

- Representation of real numbers, Machine Numbers - floating point and fixed point. Sources of Errors, Rounding of numbers, significant digits and Error Propagation in machine arithmetic operations. Numerical Algorithms - stability and convergence.

Unit-2

[15 classes]

- Approximation : Classes of approximating functions, Types of approximations- polynomial approximation, The Weierstrass polynomial approximation theorem (statement only).
- Interpolation : Lagrange and Newton's methods. Error bounds. Finite difference operators. Newton (Gregory) forward and backward difference interpolation.
- Central Interpolation : Stirling's and Bessel's formulas. Different interpolation zones, Error estimation. Hermite interpolation.

Unit-3

[10 classes]

- Numerical differentiation : Methods based on interpolations, methods based on finite differences.
- Numerical Integration : Newton Cotes formula, Trapezoidal rule, Simpson's $\frac{1}{3}$-rd rule, Simpson's $\frac{3}{8}$-th rule, Weddle's rule, Boole's Rule, midpoint rule. Composite trapezoidal rule, composite Simpson's $\frac{1}{3}$-rd rule, composite Weddle's rule. Gaussian quadrature formula.

Unit-4

[10 classes]

- Transcendental and polynomial equations : Bisection method, Secant method, Regula-falsi method, fixed point iteration, Newton-Raphson method. Condition of convergence (if any), Order of convergence, Rate of convergence of these methods. Modified Newton-Raphson method for multiple roots, Complex roots of an algebraic equation by Newton-Raphson method.

  Numerical solution of system of nonlinear equations - Newton's method.

Unit-5

[10 classes]

- System of linear algebraic equations :
  Direct methods : Gaussian elimination and Gauss Jordan methods, Pivoting strategies.
- Iterative methods : Gauss Jacobi method, Gauss Seidel method and their convergence analysis. LU decomposition method (Crout's LU decomposition method).
- Matrix inversion : Gaussian elimination and LU decomposition method (Crout's LU decomposition method) (operational counts).
- The algebraic eigen value problem : Power method.

Unit-6

[5 classes]

- Ordinary differential equations : Single-step difference equation methods- error, convergence. The method of successive approximations (Picard), Euler's method, the modified Euler method, Runge-Kutta methods of orders two and four.

References

[1] Brian Bradie, A Friendly Introduction to Numerical Analysis, Pearson Education, India, 2007.

[2] M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering

[3] Computation, 6th Ed., New age International Publisher, India, 2007.

[4] C.F. Gerald and P.O. Wheatley, Applied Numerical Analysis, Pearson Education, India, 2008.

[5] Uri M. Ascher and Chen Greif, A First Course in Numerical Methods, 7th Ed., PHI Learning Private Limited, 2013.

[6] John H. Mathews and Kurtis D. Fink, Numerical Methods using Matlab, 4th Ed., PHI Learning Private Limited, 2012.

[7] Scarborough, James B., Numerical Mathematical Analysis, Oxford and IBH publishing co.

[8] Atkinson, K. E., An Introduction to Numerical Analysis, John Wiley and Sons, 1978.

[9] Yashavant Kanetkar, Let Us C, BPB Publications.

Course Structure | DSE | SEC | Credit Distribution

Numerical Methods Lab

Semester : 6 Core Course-14 Practical Paper Code(Practical): MTM-A-CC-6-14-P	Credits : 2 Full Marks : 30
Number of contact hours required : 50	

Course Structure | DSE | SEC | Credit Distribution

List of practicals (using C/ C++/ FORTRAN 90)

1. Calculate the sum $\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \cdots + \frac{1}{N}$
2. Enter 100 integers into an array and sort them in an ascending order.
3. Solution of transcendental and algebraic equations by
   i) Bisection method
   ii) Newton Raphson method (Simple root, multiple roots, complex roots).
   iii) Secant method.
   iv) Regula Falsi method.
4. Solution of system of linear equations
   i) LU decomposition method
   ii) Gaussian elimination method
   iii) Gauss-Jacobi method
   iv) Gauss-Seidel method
5. Interpolation
   i) Lagrange Interpolation
   ii) Newton's forward, backward and divided difference interpolations
6. Numerical Integration
   i) Trapezoidal Rule
   ii) Simpson's one third rule
   iii) Weddle's Rule
   iv) Gauss Quadrature
7. Method of finding Eigenvalue by Power method (up to 4×4)
8. Fitting a Polynomial Function (up to third degree)
9. Solution of ordinary differential equations
   i) Euler method
   ii) Modified Euler method
   iii) Runge Kutta method (order 4)
   iv) The method of successive approximations (Picard)

Note : For any of the CAS (Computer aided software), Data types-simple data types, floating data types, character data types, arithmetic operators and operator precedence, variables and constant declarations, expressions, input/output, relational operators, logical operators and logical expressions, control statements and loop statements, Arrays should be introduced to the students.

Course Structure | DSE | SEC | Credit Distribution

Advanced Algebra

Semesters : 5 Discipline Specific Elective- DSE-A (1) Paper Code(Theory):MTM-A-DSE-A-5-1-TH Paper Code(Tutorial):MTM-A-DSE-A-5-1-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1: Group Theory [25 classes]

- Group actions, stabilizers, permutation representation associated with a given group action, Applications of group actions: Generalized Cayley's theorem, Index theorem.
- Groups acting on themselves by conjugation, class equation and consequences, conjugacy in S_n, p-groups, Sylow's theorems and consequences, Cauchy's theorem, Simplicity of A_n for $n \geq 5$, non-simplicity tests.

Unit-2: Ring Theory [50 classes]

- Principal ideal domain, principal ideal ring, prime element, irreducible element, greatest common divisor (gcd), least common multiple (lcm), expression of gcd, examples of a ring R and a pair of elements $a, b \in R$ such that $\gcd(a, b)$ does not exist, Euclidean domain, relation between Euclidean domain and principal ideal domain.
- Polynomial rings, division algorithm and consequences, factorization domain, unique factorization domain, irreducible and prime elements in a unique factorization domain, relation between principal ideal domain, unique factorization domain, factorization domain and integral domain, Eisenstein criterion and unique factorization in $\mathbb{Z}[x]$.
- Ring embedding and quotient field, regular rings and their examples, properties of regular ring, ideals in regular rings.

References

[1] John B. Fraleigh, A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.

[2] M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.

[3] Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence, Linear Algebra, 4th Ed., Prentice- Hall of India Pvt. Ltd., New Delhi, 2004.

[4] Joseph A. Gallian, Contemporary Abstract Algebra, 4th Ed., Narosa Publishing House, New Delhi, 1999.

[5] D.A.R. Wallace, Groups, Rings and Fields, Springer Verlag London Ltd., 1998.

[6] D.S. Malik, John M. Mordeson and M.K. Sen, Fundamentals of abstract algebra.

Course Structure | DSE | SEC | Credit Distribution

Bio Mathematics

Semesters : 5 Discipline Specific Elective- DSE-A(1) Paper Code(Theory):MTM-A-DSE-A-5-1-TH Paper Code(Tutorial):MTM-A-DSE-A-5-1-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[25 classes]

- Mathematical biology and the modeling process: an overview. Continuous models: Malthus model, logistic growth, Allee effect, Gompertz growth, Michaelis-Menten Kinetics, Holling type growth, bacterial growth in a chemostat, harvesting a single natural population, Prey predator systems and Lotka-Volterra equations, populations in competitions, epidemic models (SI, SIR, SIRS, SIC)

Unit-2

[30 classes]

- Activator-inhibitor system, insect outbreak model: Spruce Budworm. Numerical solution of the models and its graphical representation. Qualitative analysis of continuous models: Steady state solutions, stability and linearization, multiple species communities and Routh-Hurwitz Criteria. Phase plane methods and qualitative solutions, bifurcations and limit cycles with examples in the context of biological scenario. Spatial models: One species model with diffusion. Two species model with diffusion, conditions for diffusive instability, spreading colonies of microorganisms, Blood flow in circulatory system, travelling wave solutions, spread of genes in a population.

Unit-3

[15 classes]

- Discrete models : Overview of difference equations, steady state solution and linear stability analysis. Introduction to discrete models, linear models, growth models, decay models, drug delivery problem, discrete prey-predator models, density dependent growth models with harvesting, host-parasitoid systems (Nicholson- Bailey model), numerical solution of the models and its graphical representation. case studies. Optimal exploitation models, models in genetics, stage structure models, age structure models.

Graphical Demonstration (Teaching Aid)[using any software]

[5 classes]

- Growth model (exponential case only).
- Decay model (exponential case only).
- Lake pollution model (with constant/seasonal flow and pollution concentration).
- Case of single cold pill and a course of cold pills.
- Limited growth of population (with and without harvesting).
- Predatory-prey model (basic Volterra model, with density dependence, effect of DDT, two prey one predator).
- Epidemic model of influenza (basic epidemic model, contagious for life,disease with carriers).
- Battle model (basic battle model, jungle warfare, long range weapons).

References

[1] L.E. Keshet, Mathematical Models in Biology, SIAM, 1988.

[2] J. D. Murray, Mathematical Biology, Springer, 1993.

[3] Y.C. Fung, Biomechanics, Springer-Verlag, 1990.

[4] F. Brauer, P.V.D. Driessche and J. Wu, Mathematical Epidemiology, Springer, 2008.

[5] M. Kot, Elements of Mathematical Ecology, Cambridge University Press, 2001.

Course Structure | DSE | SEC | Credit Distribution

Industrial Mathematics

Semester : 5 Discipline Specific Elective-A(1) Paper Code(Theory):MTM-A-DSE-A-5-1-TH Paper Code(Tutorial):MTM-A-DSE-A-5-1-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[20 classes]

- Medical Imaging and Inverse Problems. The content is based on Mathematics of X-ray and CT scan based on the knowledge of calculus, elementary differential equations, complex numbers and matrices.

Unit-2

[20 classes]

- Introduction to Inverse problems: Why should we teach Inverse Problems? Illustration of Inverse problems through problems taught in Pre-Calculus, Calculus, Matrices and differential equations. Geological anomalies in Earth's interior from measurements at its surface (Inverse problems for Natural disaster) and Tomography.

Unit-3

[10 classes]

- X-ray: Introduction, X-ray behavior and Beers Law (The fundamental question of image construction) Lines in the place

Unit-4

[05 classes]

- Radon Transform: Definition and Examples, Linearity, Phantom (Shepp - Logan Phantom - Mathematical phantoms).

Unit-5

[05 classes]

- Back Projection: Definition, properties and examples.

Unit-6

[15 classes]

- CT Scan: Revision of properties of Fourier and inverse Fourier transforms and applications of their properties in image reconstruction. Algorithms of CT scan machine. Algebraic reconstruction techniques abbreviated as ART with application to CT scan.

References

[1] Timothy G. Feeman, The Mathematics of Medical Imaging, A Beginners Guide, Springer Under graduate Text in Mathematics and Technology, Springer, 2010.

[2] C.W. Groetsch, Inverse Problems, Activities for Undergraduates, The Mathematical Association of America, 1999.

[3] Andreas Kirsch, An Introduction to the Mathematical Theory of Inverse Problems, 2nd Ed., Springer, 2011

Course Structure | DSE | SEC | Credit Distribution

Discrete Mathematics

Semesters : 5 Discipline Specific Elective-DSE-B(1) Paper Code(Theory):MTM-A-DSE-B-5-1-TH Paper Code(Tutorial):MTM-A-DSE-B-5-1-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1 : Graph Theory [40 classes]

- Definition of undirected graphs, Using of graphs to solve different puzzles and problems. Multigraphs. Walks, Trails, Paths, Circuits and cycles, Eulerian circuits and paths. Eulerian graphs, example of Eulerian graphs. Hamiltonian cycles and Hamiltonian graphs.
- Weighted graphs and Travelling salespersons Problem. Dijkstra's algorithm to find shortest path.
- Definition of Trees and their elementary properties. Definition of Planar graphs, Kuratowski's graphs.
- Partial Order relations and lattices, Chains and antichains. Pigeon hole Principle.

Unit-2 : Number Theory [35 classes]

- Application of techniques of groups and rings to prove some theorems in number theory : Fermat's Theorem, Euler's Theorem, Willson's Theorem, Chinese Remainder Theorem.
- The Arithmetic of $\mathbb{Z}_p$, p a prime, pseudo prime and Carmichael Numbers, Fermat Numbers, Perfect Numbers, Mersenne Numbers.
- Primitive roots, the group of units $\mathcal{Z}_n^*$, the existence of primitive roots, applications of primitive roots, the algebraic structure of $\mathcal{Z}_n^*$.
- Quadratic residues and non quadratic residues, Legendre symbol, proof of the law of quadratic reciprocity, Jacobi symbols.
- Arithmetic functions, Multiplicative functions, definitions and examples.

References

[1] N. Deo; Graph Theory with Application to Engineering and Computer Science; Prentice Hall of India, New Delhi, 1990.

[2] John Clark and Derek Allan Holton; A First Look at Graph Theory; World Scientific, New Jersey, 1991.

[3] F. Harary; Graph Theory; Narosa Publishing House, New Delhi, 2001.

[4] J. A. Bondy and U. S. R. Murty; Graph theory and related topics; Academic Press, New York, 1979.

[5] Adhikari M R and Adhikari A: Basic Modern Algebra with Applications, Springer, 2014.

[6] Gareth A Jones and J Mary Jones : Elementary Number Theory, Springer International Edition.

[7] Neal Koblitz : A course in number theory and cryptography, Springer-Verlag, 2nd edition.

[8] D. M. Burton : Elementary Number Theory, Wm. C. Brown Publishers, Dulreque, Lowa, 1989.

[9] Kenneth. H. Rosen : Elementary Number Theory & Its Applications, AT&T Bell Laboratories, Addition-Wesley Publishing Company, 3rd Edition.

[10] Kenneth Ireland & Michael Rosen : A Classical Introduction to Modern Number Theory, 2nd edition, Springer-verlag.

[11] Richard A Mollin : Advanced Number Theory with Applications, CRC Press, A Chapman & Hall Book.

Course Structure | DSE | SEC | Credit Distribution

Linear Programming & Game Theory

Semesters : 5 Discipline Specific Elective- DSE-B(1) Paper Code(Theory):MTM-A-DSE-B-5-1-TH Paper Code(Tutorial):MTM-A-DSE-B-5-1-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[15 classes]

- Definition of Linear Programming Problem (L.P.P.). Formation of L.P.P. from daily life involving inequations. Graphical solution of L.P.P. Basic solutions and Basic Feasible Solution (B.F.S) with reference to L.P.P. Matrix formulation of L.P.P. Degenerate and Non-degenerate B.F.S.
- Hyperplane, Convex set, Cone, extreme points, convex hull and convex polyhedron. Supporting and Separating hyperplane. The collection of a feasible solutions of an L.P.P. constitutes a convex set. The extreme points of the convex set of feasible solutions correspond to its B.F.S. and conversely. The objective function has its optimal value at an extreme point of the convex polyhedron generated by the set of feasible solutions (the convex polyhedron may also be unbounded). In the absence of degeneracy, if the L.P.P. admits of an optimal solution then at least one B.F.S. must be optimal. Reduction of a F.S. to a B.F.S.

Unit-2

[20 classes]

- Slack and surplus variables. Standard form of L.P.P. theory of simplex method. Feasibility and optimality conditions.
- The algorithm. Two phase method. Degeneracy in L.P.P. and its resolution.

Unit-3

[10 classes]

- Duality theory: The dual of dual is the primal. Relation between the objective values of dual and the primal problems. Relation between their optimal values. Complementary slackness, Duality and simplex method and their applications.

Unit-4

[30 classes]

- Transportation and Assignment problems. Mathematical justification for optimality criterion. Hungarian method. Traveling Salesman problem.
- Concept of game problem. Rectangular games. Pure strategy and Mixed strategy. Saddle point and its existence. Optimal strategy and value of the game. Necessary and sufficient condition for a given strategy to be optimal in a game. Concept of Dominance. Fundamental Theorem of rectangular games. Algebraic method. Graphical method and Dominance method of solving Rectangular games. Inter-relation between theory of games and L.P.P.

References

[1] Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, Linear Programming and Network Flows, 2nd Ed., John Wiley and Sons, India, 2004.

[2] F.S. Hillier and G.J. Lieberman, Introduction to Operations Research, 9th Ed., Tata McGraw Hill, Singapore, 2009.

[3] Hamdy A. Taha, Operations Research, An Introduction, 8th Ed., Prentice-Hall India, 2006.

[4] G. Hadley, Linear Programming, Narosa Publishing House, New Delhi, 2002.

Course Structure | DSE | SEC | Credit Distribution

Boolean Algebra & Automata Theory

Semester : 5 Discipline Specific Elective-B(1) Paper Code(Theory):MTM-A-DSE-B-5-1-TH Paper Code(Tutorial):MTM-A-DSE-B-5-1-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[10 classes]

- Definition, examples and basic properties of ordered sets, maps between ordered sets, duality principle, lattices as ordered sets, lattices as algebraic structures, sublattices, products and homomorphisms.

Unit-2

[15 classes]

- Definition, examples and properties of modular and distributive lattices, Boolean algebras, Boolean polynomials, minimal and maximal forms of Boolean polynomials, Quinn-McCluskey method, Karnaugh diagrams, Logic gates, switching circuits and applications of switching circuits.

Unit-3

[15 classes]

- Introduction : Alphabets, strings, and languages. Finite automata and regular languages: deterministic and non-deterministic finite automata, regular expressions, regular languages and their relationship with finite automata, pumping lemma and closure properties of regular languages.

Unit-4

[15 classes]

- Context free grammars and pushdown automata : Context free grammars (CFG), parse trees, ambiguities in grammars and languages, pushdown automaton (PDA) and the language accepted by PDA, deterministic PDA, Non-deterministic PDA, properties of context free languages; normal forms, pumping lemma, closure properties, decision properties.

Unit-5

[10 classes]

- Turing Machines : Turing machine as a model of computation, programming with a Turing machine, variants of Turing machine and their equivalence.

Unit-6

[10 classes]

- Undecidability : Recursively enumerable and recursive languages, undecidable problems about Turing machines: halting problem. Post correspondence problem, and undecidability problems about CFGs.

References

[1] B A. Davey and H. A. Priestley, Introduction to Lattices and Order, Cambridge University Press, Cambridge, 1990.

[2] Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, (2nd Ed.), Pearson Education (Singapore) P.Ltd., Indian Reprint 2003.

[3] Rudolf Lidl and G$\ddot{u}$nter Pilz, Applied Abstract Algebra, 2nd Ed., Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.

[4] J. E. Hopcroft, R. Motwani and J. D. Ullman, Introduction to Automata Theory, Languages, and Computation, 2nd Ed., Addison-Wesley, 2001.

[5] H.R. Lewis, C.H. Papadimitriou, C. Papadimitriou, Elements of the Theory of Computation, 2nd Ed., Prentice-Hall, NJ, 1997.

[6] J.A. Anderson, Automata Theory with Modern Applications, Cambridge University Press, 2006

Course Structure | DSE | SEC | Credit Distribution

Differential Geometry

Semesters : 6 Discipline Specific Elective- DSE-A(2) Paper Code(Theory):MTM-A-DSE-A-6-2-TH Paper Code(Tutorial):MTM-A-DSE-A-6-2-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[10 classes]

- Tensor : Different transformation laws, Properties of tensors, Metric tensor, Riemannian space, Covariant Differentiation, Einstein space.

Unit-2

[35 classes]

- Theory of space curves : Space curves. Planer curves, curvature, torsion and Serret-Frenet formula. Osculating circles, osculating circles and spheres. Existence of space curves. Evolutes and involutes of curves.
- Theory of surfaces : Parametric curves on surfaces. Direction coefficients. First and second Fundamental forms. Principal and Gaussian curvatures. Lines of curvature, Euler's theorem. Rodrigue's formula. Conjugate and asymptotic lines.

Unit-3

[30 classes]

- Developables : Developable associated with space curves and curves on surfaces. Minimal surfaces. Geodesics: Canonical geodesic equations. Nature of geodesics on a surface of revolution. Clairaut's theorem. Normal property of geodesics. Torsion of a geodesic. Geodesic curvature. Gauss-Bonnet theorem.

References

[1] T.J. Willmore, An Introduction to Differential Geometry, Dover Publications, 2012.

[2] B. O'Neill, Elementary Differential Geometry, 2nd Ed., Academic Press, 2006.

[3] C.E. Weatherburn, Differential Geometry of Three Dimensions, Cambridge University Press 2003.

[4] D.J. Struik, Lectures on Classical Differential Geometry, Dover Publications, 1988.

[5] S. Lang, Fundamentals of Differential Geometry, Springer, 1999.

[6] B. Spain, Tensor Calculus: A Concise Course, Dover Publications, 2003.

[7] An Introduction to Differential Geometry (with the use of tensor Calculus), L. P. Eisenhart, Princeton University Press, 1940.

[8] Tensor Analysis, Theory and Applications to Geometry and Mechanics of Continua, 2nd Edition, I. S. Sokolnikoff, John Wiley and Sons., 1964.

Mathematical Modelling

Semesters : 6 Discipline Specific Elective-DSE-A(2) Paper Code(Theory):MTM-A-DSE-A-6-2-TH Paper Code(Tutorial):MTM-A-DSE-A-6-2-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[20 classes]

- Power series solution of Bessel's equation and Legendre's equation, Laplace transform and inverse transform, application to initial value problem up to second order.

Unit-2

[45 classes]

- Monte Carlo simulation modelling: simulating deterministic behavior (area under a curve, volume under a surface), generating random numbers: middle square method, linear congruence, queuing models: harbor system, morning rush hour, Overview of optimization modelling. Linear programming model: geometric solution algebraic solution, simplex method, sensitivity analysis

Graphical demonstration (Teaching aid **)

[10 classes]

- Plotting of Legendre polynomial for n = 1 to 5 in the interval [0,1]. Verifying graphically that all the roots of $P_n(x)$ lie in the interval [0,1].
- Automatic computation of coefficients in the series solution near ordinary points.
- Plotting of the Bessel's function of first kind of order 0 to 3.
- Automating the Frobenius Series Method.
- Random number generation and then use it for one of the following (a) Simulate area under a curve (b) Simulate volume under a surface.
- Programming of either one of the queuing model (a) Single server queue (e.g. Harbor system) (b) Multiple server queue (e.g. Rush hour).
- Programming of the Simplex method for 2/3 variables.

** **Preferably by free softwares e.g. R / SageMath / Python etc.**

References

[1] TynMyint-U and Lokenath Debnath, Linear Partial Differential Equation for Scientists and Engineers, Springer, Indian reprint, 2006.

[2] Frank R. Giordano, Maurice D. Weir and William P. Fox, A First Course in Mathematical Modeling, Thomson Learning, London and New York, 2003.

Course Structure | DSE | SEC | Credit Distribution

Fluid Statics & Elementary Fluid Dynamics

Semester : 6 Discipline Specific Elective-A(2) Paper Code(Theory):MTM-A-DSE-A-6-2-TH Paper Code(Tutorial):MTM-A-DSE-A-6-2-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[20 classes]

- **Introduction and Fundamental Concepts:**
  Definition of Fluid, Distinction Between Solid and Fluid, Concept of Continuum, Fluid Properties : Density, Specific Weight, Specific Volume, Specific Gravity. Stress field [(Normal stress: $\sigma_n = lim_{\delta A_n \to 0}(\delta F_n / \delta A_n)$ and Shear stress: $\tau_n = lim_{\delta A_n \to 0}(\delta F_t / \delta A_n)$], Viscosity, Vapor pressure,. Newtonian fluid, Non-Newtonian Fluids. Ideal Fluid, Compressibility, Distinction between an Incompressible and a Compressible Flow, Surface Tension of Liquids.

  Forces on Fluid Elements: Definition of Fluid Elements, Body Force, Surface Force, Normal Stress in a Stationary Fluid, Pascal's Law of Hydrostatics, Fundamental Equation of Fluid Statics: $\vec{\nabla} p = \rho \vec{F}$, Fundamental Fluid Static Equations in Scalar Form: $\frac{\partial p}{\partial z} = \rho g$, Constant Density Solution.

Unit-2

[25 classes]

- **Hydrostatics**
  Hydrostatic Thrusts on Submerged Plane Surface: Centre of pressure, determination of coordinates of centre of pressure. Hydrostatic Thrusts on Submerged Curved Surfaces. Buoyancy: Center of the buoyancy. Archimedes principle. Stability of Unconstrained Submerged Bodies in Fluid: Stable Equilibrium, Unstable Equilibrium, Neutral Equilibrium. Stability of Floating Bodies in Fluid: Metacentre, Metacentric height.
- **Gas**
  Pressure of gases, The Atmosphere, Relation between pressure, density and temperature, Pressure in an isothermal atmosphere, Atmosphere in convective equilibrium.

Unit-3

[15 classes]

- **Kinematics of Fluid:**
  Scalar and Vector Fields, flow field, Description of Fluid Motion: Lagrangian Method, Eulerian Method, Relation between Eulerian and Lagrangian Method, Variation of Flow Parameters in Time and Space: Steady and Unsteady Flow, Uniform and Non-uniform Flows. Material Derivative and Acceleration: temporal derivative, convective derivative

Unit-4

[15 classes]

- **Conservation Equations:**
  Control Mass System, Control Volume System, Isolated System. Conservation of Mass - The Continuity Equation: Differential Form and Vector Form, Integral form. Conservation of Momentum: Momentum Theorem, Reynolds Transport Theorem. Conservation of energy.

References

[1] Fox and McDonalds INTRODUCTION TO FLUID MECHANICS (8th edition) Philips J. Pritchard, JOHN WILEY AND SONS INC .

[2] Fluid Mechanics (7th edition) Frank M. White, McGraw Hill.

[3] An Elementary Text-Book on Hydrostatics: William Briggs and G.H. Bryan , London: W.B.Clive.

[4] Hydrostatics : A.S.Ramsey, Cambridge University Press, 2017.

[5] Hydrostatics : J.M.Kar, Krishna Prakashan, India.

[6] Elementary Fluid Dynamics : D.J.Acheson, Oxford Applied Mathematics and Computing Science Series.

[7] Introduction to Mathematical Fluid Dynamics : Richard E.Meyer, Dover Publication.

Course Structure | DSE | SEC | Credit Distribution

Point Set Topology

Semesters : 6 Discipline Specific Elective-DSE-B(2) Paper Code(Theory):MTM-A-DSE-B-6-2-TH Paper Code(Tutorial):MTM-A-DSE-B-6-2-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[35 classes]

- Topological spaces, basis and subbasis for a topology, neighbourhoods of a point, interior points, limit points, derived set, boundary of a set, closed sets, closure and interior of a set, dense subsets, subspace topology, finite Product topology, Continuous functions, open maps, closed maps, homeomorphisms, topological invariants, metric topology, isometry and metric invariants.

Unit-2

[15 classes]

- First countability, T_1 and T_2 separation axioms of topological spaces, convergence and cluster point of a sequence in topological spaces and some related concepts on first countable as well as on T_2 spaces. Heine's continuity criterion.

Unit-3

[25 classes]

- Connected spaces, connected sets in $\mathbb{R}$, components, Compact spaces, compactness and T_2, compact sets in $\mathbb{R}$, Heine-Borel Theorem for $\mathbb{R}^n$, real valued continuous function on connected and compact spaces, the concept of compactness in metric space, sequentially compactness of a metric space X and the Bolzano-Weiertrass property of X are equivalent.

References

[1] Munkres, J.R., Topology, A First Course, Prentice Hall of India Pvt.Ltd.,New Delhi, 2000.

[2] Dugundji, J., Topology, Allyn and Bacon, 1966.

[3] Simmons, G.F., Introduction to Topology and Modern Analysis, McGraw Hill, 1963.

[4] Kelley, J.L., General Topology, Van Nostrand Reinhold Co., New York,1995.

[5] Hocking, J., Young, G., Topology, Addison-Wesley Reading, 1961.

[6] Steen, L., Seebach, J., Counter Examples in Topology, Holt, Reinhart andWinston, New York, 1970.

Course Structure | DSE | SEC | Credit Distribution

Astronomy & Space Science

Semesters : 6 Discipline Specific Elective-DSE-B(2) Paper Code(Theory):MTM-A-DSE-B-6-2-TH Paper Code(Tutorial):MTM-A-DSE-B-6-2-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[25 classes]

- Celestial Sphere, various Coordinate Systems, transformation formulae among various coordinate systems, formulae of spherical triangle : cosine formula, sine formula, four parts formula , analogous cosine formula, hour angle, sidereal day, sidereal time, equation of time. Exercises.

Unit-2

[10 classes]

- Light and its properties, Optical , absorption, emission and continuous spectra, radio and Hubble Space Telescopes (HST), Photometry, Spectrometry, Spectrophotometry (definitions only), magnification, resolution, f/a ratio , refractors and reflectors. Exercises.

Unit-3

[10 classes]

- Various magnitudes of stars: apparent, absolute, photovisual, photographic, bolometric etc. Distance measurements of stars: Parallax method, Statistical Palallax Method, Moving Cluster Method. Radial and proper motion. Exercises.
- Morphological structure of Sun, solar cycles, sunspots, solar corona, solar wind, solar neutrino puzzle (Merely descriptive models). Solar system.

Unit-4

[5 classes]

- Interstellar matter, elastic collisions and kinetic equilibrium, Jeans Mass for gravitational collapse, radiative process (statement only).

Unit-5

[10 classes]

- Morphological classification of galaxies, rotation curves and mass modelling, missing mass and dark matter, distance determination by various methods. Our Galaxy. Exercises.

Unit-6

[15 classes]

- Space agencies around the world – The history of space agencies – Indian space exploration – First missions – Remarkable achievements.
- Rocket Propulsion; Rocket Equation and Staging, Optimal Rocket. Element of Aerodynamics; Aerodynamics Force and Moment, Fluid dynamics (Governing equations: Interpretations and Statements only), Flow regime, Continuum Flow, Continuum Viscous Flow and Boundary Layer, Rarefied Flow. Airbreathing Propulsion; Ideal Momentum Theory, Propeller Engine, Jet Engine.

References

[1] T. Padmanabhan, Theoretical Astrophysics, vols. 1-3, Cambridge University Press, 2002.

[2] S. Weinberg, Gravitation and Cosmology, Wiley, 2001.

[3] J.V. Narlikar, Introduction to Cosmology, Cambridge University Press, 2002.

[4] J.V. Narlikar, An Introduction to Relativity, Cambridge University Press, 2010.

[5] B.Basu, T.Chattopadhyay and S.N.Biswas, An Introduction to Astrophysics, Prentice Hall of India, 2010.

[6] Physical Processes in the Interstellar Medium, Lyman Spitzer, Jr. Wiley, 1998.

[7] Astrophysics for Physicists, Arnab Rai Choudhuri, Cambridge University Press, 2010.

[8] Extragalactic Astronomy and Cosmology: An Introduction, Peter Scineider, Springer, 2006.

[9] Textbook on Spherical Astronomy, W.M. Smart , Cambridge University Press.

[10] A Text Book on Astronomy, K.K. De, Books Syndicate (P) Ltd. 2013.

[11] Twentieth-century Space And Astronomy: A History of Notable Research And Discovery (Twentieth-Century Science): Marianne J. Dyson.

[12] International Space Olympiad: NASA.

[13] Rönnmark, Kjell Space Physics from the Sun to the Aurora.

[14] https://ocw.mit.edu/courses/aeronautics-and-astronautics/16-522-space-propulsion-spring-2015/lecture-notes/
(Online tutorial, assignments and lecture notes).

[15] Tewari A (2007), Atmospheric and Space Flight Dynamics : Birkhäuser Basel.

[16] Schmidt L. V. (1998), Introduction to Aircraft Flight Dynamics, AIAA Education Series.

[17] Francis J, Hale (1994) Introduction to Spaceflight.

Course Structure | DSE | SEC | Credit Distribution

Advanced Mechanics

Semester : 6 Discipline Specific Elective-B(2) Paper Code(Theory):MTM-A-DSE-B-6-2-TH Paper Code(Tutorial):MTM-A-DSE-B-6-2-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Number of classes required : 75	
*1 Credit for Tutorial	
**15 Marks are reserved for Tutorial ***20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[20 classes]

- Degrees of freedom, reactions due to constraints. D' Alembert's principle; Lagranges first kind equations; Generalized coordinates; Generalized forces; Lagrangian; Second kind Lagrange's equations of motion; cyclic coordinates; velocity dependent potential; Principle of energy; Rayleigh's dissipation function.

Unit-2

[20 classes]

- Action Integral; Hamilton's principle; Lagrange's equations by variational methods; Hamilton's principle for non-holonomic system; Symmetry properties and conservation laws; Noether's theorem. Canonically conjugate coordinates and momenta; Legendre transformation; Routhian approach; Hamiltonian.

Unit-3

[15 classes]

- Hamilton's equations from variational principle; Poincare-Cartan integral invariant; Principle of stationary action; Fermat's principle;

Unit-4

[20 classes]

- Canonical transformation; Generating function; Poisson Bracket; Equations of motion; Action-angle variables; Hamilton-Jacobi's equation; Hamilton's principal function; Hamilton's characteristics function; Liouville's theorem.

References

[1] H. Goldstein, Classical Mechanics, Narosa Publ., New Delhi, 1998.

[2] N.C. Rana and P.S. Joag, Classical Mechanics, Tata McGraw Hill, New Delhi, 2002.

[3] E.T. Whittaker, A Treatise of Analytical Dynamics of Particles and Rigid Bodies, Cambridge Univ. Press, Cambridge, 1977.

[4] F. Gantmacher, Lectures in Analytical Mechanics, Mir Publ., 1975.

[5] T.W.B. Kibble and F.H. Berkshire, Classical Mechanics, 4th ed., Addison-Wesley Longman, 1996.

[6] V.I. Arnold, Mathematical Methods of Classical Mechanics, 2nd ed., Springer-Verlag, 1997.

[7] N.G. Chetaev, Theoretical Mechanics, Springer-Verlag, 1990.

[8] M. Calkin, Lagrangian and Hamiltonian Mechanics, World Sci. Publ., Singapore, 1996.

[9] J.L. Synge and B.A. Griffith, Principles of Mechanics, McGraw Hill, Singapore, 1970.

[10] E.C.G. Sudarshan and N. Mukunda, Classical Dynamics: A Modern Perspectives, John Wiley & Sons, 1974.

[11] J.R. Taylor, Classical Mechanics, University Science Books, California, 2005.

[12] L.D. Landau and E.M. Lifshitz, Mechanics, 3rd ed., Pergamon Press, 1982.

C Programming Language

Semester : 3 Skill Enhancement Course- SEC A Paper Code (Theory) : MTM-A-SEC-A-TH	Credits : 2 Full Marks : 100 (=80+20*)
Number of contact hours required : 50 *20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

[30 classes]

- An overview of theoretical computers, history of computers, overview of architecture of computer, compiler, assembler, machine language, high level language, object oriented language, programming language and importance of C programming.
- Constants, Variables and Data type of C-Program : Character set. Constants and variables data types, expression, assignment statements, declaration.
- Operation and Expressions : Arithmetic operators, relational operators, logical operators.
- Decision Making and Branching : decision making with if statement, if-else statement, Nesting if statement, switch statement, break and continue statement.
- Control Statements : While statement, do-while statement, for statement.
- Arrays : One-dimension, two-dimension and multidimensional arrays, declaration of arrays, initialization of one and multi-dimensional arrays.
- User-defined Functions : Definition of functions, Scope of variables, return values and their types, function declaration, function call by value, Nesting of functions, passing of arrays to functions, Recurrence of function.
- Introduction to Library functions: stdio.h, math.h, string.h stdlib.h, time.h etc.
- **Some hands on examples should be included.**

References

[1] B. W. Kernighan and D. M. Ritchi : The C-Programming Language, 2nd Edi.(ANSI Refresher), Prentice Hall, 1977.

[2] E. Balagurnsamy : Programming in ANSI C, Tata McGraw Hill, 2004.

[3] Y. Kanetkar : Let Us C ; BPB Publication, 1999.

[4] C. Xavier : C-Language and Numerical Methods, New Age International.

[5] V. Rajaraman : Computer Oriented Numerical Methods, Prentice Hall of India, 1980.

Course Structure | DSE | SEC | Credit Distribution

Object Oriented Programming in C++

Semester : 3 Skill Enhancement Course - SEC A Paper Code(Theory): MTM-A-SEC-A-TH	Credits : 2 Full Marks : 100(=80+20*)
Number of contact hours required : 50 *20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[10 classes]

- Programming paradigms, characteristics of object oriented programming languages, brief history of C++, structure of C++ program, differences between C and C++, basic C++ operators, Comments, working with variables, enumeration, arrays and pointer.

Unit-2

[10 classes]

- Objects, classes, constructor and destructors, friend function, inline function, encapsulation, data abstraction, inheritance, polymorphism, dynamic binding, operator overloading, method overloading, overloading arithmetic operator and comparison operators.

Unit-3

[10 classes]

- Template class in C++, copy constructor, subscript and function call operator, concept of namespace and exception handling.
- **List of hands on examples (using C++)**
  1. Calculate the sum $\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \cdots + \frac{1}{N}$
  2. Enter 100 integers into an array and sort them in an ascending order.
  3. HCF and LCM of three positive integers.
  4. Separate even and odd numbers from first N natural numbers.
  5. Find all the prime numbers between 1 and N (N being a positive integer).
  6. Find the binary representation of a decimal number (up to 3 digits).
  7. Addition , subtraction, multiplication of two matrices (order up to 4×4).
  8. Compute the value of the determinant of a square matrix (order up to 4×4).

References

[1] Arnold Robbins, Linux Programming by Examples The Fundamentals, 2nd Ed., Pearson Education, 2008.

[2] Cox K, Red Hat Linux Administrator's Guide, PHI, 2009.

[3] R. Stevens, UNIX Network Programming, 3rd Ed., PHI, 2008.

[4] Sumitabha Das, UNIX Concepts and Applications, 4th Ed., TMH, 2009.

[5] Ellen Siever, Stephen Figgins, Robert Love, Arnold Robbins, Linux in a Nutshell, 6th Ed.,O'Reilly Media, 2009.

[6] Neil Matthew, Richard Stones, Alan Cox, Beginning Linux Programming, 3rd Ed., 2004.

Course Structure | DSE | SEC | Credit Distribution

Mathematical Logic

Semester : 4 Skill Enhancement Course- SEC-B Paper Code (Theory): MTM-A-SEC-B-TH	Credits : 2 Full Marks : 100 (=80+20*)
Number of classes required : 50 *20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[5 classes]

- Introduction, propositions, truth table, negation, conjunction and disjunction. Implications, biconditional propositions, converse, contra positive and inverse propositions and precedence of logical operators.
- General Notions : Formal language, object and meta language, general definition of a Formal Theory/Formal Logic.

Unit-2

[15 classes]

- Propositional Logic : Formal theory for propositional calculus, derivation, proof, theorem, deduction theorem, conjunctive and disjunctive normal forms, semantics, truth tables, tautology, adequate set of connectives, applications to switching circuits, logical consequence, consistency, maximal consistency, Leindenbaum lemma, soundness and completeness theorems, algebraic semantics.

Unit-3

[10 classes]

- Predicate Logic : First order language, symbolizing ordinary sentences into first order formulae, free and bound variables, interpretation and satisfiability, models, logical validity, formal theory for predicate calculus, theorems and derivations, deduction theorem, equivalence theorem, replacement theorem, choice rule, Prenex normal form, soundness theorem, completeness theorem, compactness theorem, First Order Theory with equality, examples of First Order Theories (groups, rings, fields etc.).

References

[1] Elliott Mendelson; Introduction to mathematical logic; Chapman & Hall; London(1997)

[2] Angelo Margaris; First order mathematical logic; Dover publications, Inc, New York (1990).

[3] S.C.Kleene; Introduction to Metamathematics; Amsterdam; Elsevier (1952).

[4] J.H.Gallier; Logic for Computer Science; John.Wiley & Sons (1987).

[5] H.B.Enderton; A mathematical introduction to logic; Academic Press; New York (1972).

Course Structure | DSE | SEC | Credit Distribution

Scientific computing with SageMath & R

Semester : 4 Skill Enhancement Course- SEC B Paper Code (Theory): MTM-A-SEC-B-TH	Credits : 2 Full Marks : 100 (=80 + 20*)
Number of contact hours required : 50 *20 Marks are reserved for Internal Assessment & Attendance (10 marks for each)	

Course Structure | DSE | SEC | Credit Distribution

[30 classes]

- Introduction to SageMath and R , Installation Procedure, Use of SageMath & R as a Calculator, Numerical and symbolic computations using mathematical functions such as square root, trigonometric functions, logarithms, exponentiations etc.
- Graphical representations of few functions through plotting in a given interval, like plotting of polynomial functions, trigonometric functions, Plots of functions with asymptotes, superimposing multiple graphs in one plot like plotting a curve along with a tangent on that curve (if it exists), polar plotting of curves.
- SageMath & R commands for differentiation, higher order derivatives, plotting $f(x)$ and $f'(x)$ together, integrals, definite integrals etc.
- Introduction to Programming in SageMath & R , relational and logical operators, conditional statements, loops and nested loops, without using inbuilt functions write programs for average of integers, mean, median, mode, factorial, checking primes, checking next primes, finding all primes in an interval, finding gcd, lcm, finding convergence of a given sequence, etc.
- Use of inbuilt functions that deal with matrices, determinant, inverse of a given real square matrix (if it exists), solving a system of linear equations, finding roots of a given polynomial, solving differential equations.
- **Some hands on examples should be included.**

  Note : The goal of this course is to introduce students to the fundamental commands and structure of SageMath & R The course covers the basic syntax and semantics of SageMath & R , including basic data types, variables, control structures and functions or similar concepts, and visualization of results and processed data.

References

[1] An Introduction to R: W. N. Venables, D. M. Smith and the R Core Team (available online).

[2] https://www.datacamp.com/courses/free-introduction-to-r (Online tutorial on R)

[3] https://www.datacamp.com/community/open-courses/kaggle-r-tutorial-on-machine-learning (Online PDF tutorial)

[4] http://data.princeton.edu/R/introducingR.pdf (Online PDF: Princeton University)

[5] M. Crawley, Basic Statistics: An Introduction using R

[6] P. Dalgaard, Introductory Statistics with R

[7] B.S. Everitt T. Hothorn, A Handbook of Statistical Analyses Using R (2nd ed.) **

[8] J.J. Faraway, Linear Models with R

[9] J.J. Faraway, Extending the Linear Model with R: Generalized Linear, Mixed Effects and Nonparametric Regression Models

[10] J. Maindonald J. Braun, Data Analysis and Graphics Using R: An Example-based Approach

[11] An Introduction to SAGE Programming : With Applications to SAGE, Razvan A. Mezei, Wiley,

[12] http://doc.sagemath.org/pdf/en/tutorial/SageTutorial.pdf

Course Structure | DSE | SEC | Credit Distribution

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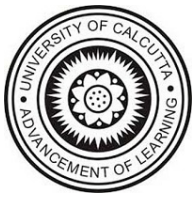
University of Calcutta

Syllabus for three-year B.Sc. in Mathematics

(General)

Under

CBCS System



2018

1. Credit Distribution across Courses

Course Type	Total Papers	Credits		
		Theory + Tutorial	Theory + Practical	Total
Core Courses	4 (Mathematics)	$4 \times 5 + 4 \times 1 = 24$	—	72
	8 (Other disciplines)	To be decided	To be decided	
Discipline Specific Electives	2 (Mathematics)	$2 \times 5 + 2 \times 1 = 12$	—	36
	4 (Other disciplines)	To be decided	To be decided	
Ability Enhancement Language Courses	2	$2 \times 2 = 4$	—	4
Skill Enhancement Courses	4 (at least one from each discipline)	$4 \times 2 = 8$	—	8
Totals	24			120

2. Course Structure : Semester-wise distribution of Courses

Semester	Course Name	Course Detail	Credits	Page No.
1	Ability Enhancement Compulsory Course-I	AECC(1)	2	
	Core Course-1A	Mathematics-CC1/GE1	6	4
	Core Course-2A	Other Discipline	6	
	Core Course-3A	Other Discipline	6	
		Total	**20**	
2	Ability Enhancement Compulsory Course-2	AECC(2)	2	
	Core Course-1B	Mathematics- CC2/GE2	6	7
	Core Course-2B	Other Discipline	6	
	Core Course-3B	Other Discipline	6	
		Total	**20**	
3	Core Course-1C	Mathematics- CC3/GE3	6	9
	Core Course-2C	Other Discipline	6	
	Core Course-3C	Other Discipline	6	
	Skill Enhancement Course-1	For Mathematics Course see SEC-A *	2	3
		Total	**20**	
4	Core Course-1D	Mathematics- CC4/GE4	6	11
	Core Course-2D	Other Discipline	6	
	Core Course-3D	Other Discipline	6	
	Skill Enhancement Course-2	For Mathematics Course see SEC-B *	2	3
		Total	**20**	
5	Skill Enhancement Course-3	For Mathematics Course see SEC-A *	2	3
	Discipline Specific Elective-1A	Mathematics-5 (See DSE-A)	6	3
	Discipline Specific Elective-2A	Other Discipline	6	
	Discipline Specific Elective-3A	Other Discipline	6	
		Total	**20**	
6	Skill Enhancement Course-4	For Mathematics Course see SEC-B *	2	3
	Discipline Specific Elective-1B	Mathematics-6 (See DSE-B)	6	??
	Discipline Specific Elective-2B	Other Discipline	6	
	Discipline Specific Elective-3B	Other Discipline	6	
		Total	**20**	
		Grand Total	**120**	

* A student has to opt for 4 Skill Enhancement Courses in four Semesters (3rd to 6th) taking **at least one Course from each discipline.**

Course Structure | Credit Distribution | DSE | SEC

3. Choices for Skill Enhancement Courses in Mathematics (SEC)

	Course Detail
Skill Enhancement Course (Semester 3)-SEC A	C Programming Language [13]
Skill Enhancement Course (Semester 4)-SEC B	Mathematical Logic [14]
Skill Enhancement Course (Semester 5) -SEC A	Object Oriented Programming in C++ [15]
Skill Enhancement Course (Semester 6)-SEC B	Boolean Algebra [16]

The number within the bracket [ ] refers to page number.

Course Structure | Credit Distribution | DSE

4. Choices for Discipline Specific Electives
. DSE-A & B (Mathematics)

DSE-A: (Semesters 5/6)	**DSE-B: (Semesters 5/6)**
Particle Dynamics [17]	Advanced Calculus [19]
Graph Theory [18]	Mathematical Finance [20]

The number within the bracket [ ] refers to page number. A student has to opt for at least one of the subjects available under each category.

Course Structure | Credit Distribution | SEC

Mathematics - CC1/GE1

Semester : 1 Core Course-CC1/GE1 Paper Code (Theoretical) : MTM-G-CC-1-1-TH / MTM-G-GE-1-1-TH Paper Code (Tutorial):MTM-G-CC-1-1-TU / MTM-G-GE-1-1-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Minimum number of classes required : 60	
*1 Credit for Tutorial	
**15 Mark is reserved for Tutorial ***20 Mark is reserved for Internal Assessment & Attendance of 10 mark each	

Course Structure | SEC | DSE | Credit Distribution

Unit-1 : Algebra-I (15 Marks) [10 classes]

- Complex Numbers : De Moivre's Theorem and its applications. Exponential, Sine, Cosine and Logarithm of a complex number. Definition of a^z $(a \neq 0)$. Inverse circular and Hyperbolic functions.
- Polynomials : Fundamental Theorem of Algebra (Statement only). Polynomials with real coefficients, the n-th degree polynomial equation has exactly n roots. Nature of roots of an equation (surd or complex roots occur in pairs). Statement of Descarte's rule of signs and its applications.
- Statements of : (i) If a polynomial $f(x)$ has opposite signs for two real values a and b of x, the equation $f(x) = 0$ has odd number of real roots between a and b. If $f(a)$ and $f(b)$ are of same sign, either no real root or an even number of roots lies between a and b.

  (ii) Rolle's Theorem and its direct applications. Relation between roots and coefficients, symmetric functions of roots, transformations of equations. Cardan's method of solution of a cubic equation.
- Rank of a matrix : Determination of rank either by considering minors or by sweep-out process. Consistency and solution of a system of linear equations with not more than 3 variables by matrix method.

Unit-2 : Differential Calculus-I (25 Marks) [20 classes]

- Rational numbers, Geometrical representations, Irrational number, Real number represented as point on a line — Linear Continuum. Acquaintance with basic properties of real number (No deduction or proof is included).
- Real-valued functions defined on an interval, limit of a function (Cauchy's definition). Algebra of limits. Continuity of a function at a point and in an interval. Acquaintance (on proof) with the important properties of continuous functions no closed intervals. Statement of existence of inverse function of a strictly monotone function and its continuity.
- Derivative - its geometrical and physical interpretation. Sign of derivative-Monotonic increasing and decreasing functions. Relation between continuity and derivability. Differential - application in finding approximation.
- Successive derivative - Leibnitz's theorem and its application.
- Functions of two and three variables : their geometrical representations. Limit and Continuity (definitions only) for function of two variables. Partial derivatives. Knowledge and use of chain Rule. Exact differentials (emphasis on solving problems only). Functions of two variables - Successive partial Derivatives : Statement of Schwarz's Theorem on Commutative property of mixed derivatives. Euler's Theorem on homogeneous function of two and three variables.

- Applications of Differential Calculus : Curvature of plane curves. Rectilinear Asymptotes (Cartesian only). Envelope of family of straight lines and of curves (problems only). Definitions and examples of singular points (Viz. Node. Cusp, Isolated point).

Unit-3 : Differential Equation-I (15 Marks) [10 classes]

- Order, degree and solution of an ordinary differential equation (ODE) in presence of arbitrary constants, Formation of ODE.
- First order equations : (i) Exact equations and those reducible to such equation. (ii) Euler's and Bernoulli's equations (Linear). (iii) Clairaut's Equations : General and Singular solutions.
- Second order linear equations : Second order linear differential equation with constant coefficients. Euler's Homogeneous equations.
- Second order differential equation : (i) Method of variation of parameters, (ii) Method of undetermined coefficients.

Unit-4 : Coordinate Geometry (25 Marks) [20 classes]

- Transformations of Rectangular axes : Translation, Rotation and their combinations. Invariants.
- General equation of second degree in x and y : Reduction to canonical forms. Classification of conic.
- Pair of straight lines : Condition that the general equation of 2nd degree in x and y may represent two straight lines. Point of intersection of two intersecting straight lines. Angle between two lines given by $ax^2 + 2hxy + by^2 = 0$. Equation of bisectors. Equation of two lines joining the origin to the points in which a line meets a conic.
- Equations of pair of tangents from an external point, chord of contact, poles and polars in case of General conic : Particular cases for Parabola, Ellipse, Circle, Hyperbola.
- Polar equation of straight lines and circles. Polar equation of a conic referred to a focus as pole. Equation of chord joining two points. Equations of tangent and normal.
- Sphere and its tangent plane. Right circular cone.

Course Structure | SEC | DSE | Credit Distribution

Mathematics - CC2/GE2

Semester : 2 Core Course-CC2/GE2 Paper Code (Theoretical) : MTM-G-CC-2-2-TH / MTM-G-GE-2-2-TH Paper Code (Tutorial):MTM-G-CC-2-2-TU / MTM-G-GE-2-2-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Minimum number of classes required : 60	
*1 Credit for Tutorial	
**15 Mark is reserved for Tutorial ***20 Mark is reserved for Internal Assessment & Attendance of 10 mark each	

Course Structure | SEC | DSE | Credit Distribution

Unit-1 : Differential Calculus-II (20 Marks) [15 classes]

- Sequence of real numbers : Definition of bounds of a sequence and monotone sequence. Limit of a sequence. Statements of limit theorems. Concept of convergence and divergence of monotone sequences-applications of the theorems, in particular, definition of e. Statement of Cauchy's general principle of convergence and its application.
- Infinite series of constant terms; Convergence and Divergence (definitions). Cauchy's principle as applied to infinite series (application only). Series of positive terms : Statements of comparison test. D.AIembert's Ratio test. Cauchy's nth root test and Raabe's test Applications. Alternating series. Statement of Leibnitz test and its applications.
- Real-Valued functions defined on an interval: Statement of Rolle's Theorem and its geometrical interpretation. Mean value theorems of Lagrange and Cauchy. Statements of Taylor's and Maclaurin's Theorems with Lagrange's and Cauchy's from of remainders. Taylor's and Maclaurin's Infinite series of functions like $e^x, \sin x, \cos x, (1+x)^n, \log(1+x)$ with restrictions wherever necessary.
- Indeterminate Forms : L'Hospital's Rule : Statement and Problems only.
- Application of the principle of Maxima and Minima for a function of single variable in geometrical, physical and to other problems.
- Maxima and minima of functions of not more than three variables Lagrange's Method of undetermined multiplier - Problems only.

Unit-2 : Differential Equation-II (15 Marks) [10 classes]

- Linear homogeneous equations with constant coefficients, Linear non-homogeneous equations, The method of variation of parameters, The Cauchy-Euler equation, Simultaneous differential equations, Simple eigenvalue problem.
- Order and degree of partial differential equations, Concept of linear and non-linear partial differential equations, Formation of first order partial differential equations, Linear partial differential equation of first order, Lagrange's method, Charpit's method.

Unit-3 : Vector Algebra (15 Marks) [10 classes]

- Addition of Vectors, Multiplication of a Vector by a Scalar. Collinear and Coplanar Vectors. Scalar and Vector products of two and three vectors. Simple applications to problems of Geometry. Vector equation of plane and straight line. Volume of Tetrahedron. Applications to problems of Mechanics (Work done and Moment).

Unit-4 : Discrete Mathematics (30 Marks) [25 classes]

- Integers : Principle of Mathematical Induction. Division algorithm. Representation of integer in an arbitrary base. Prime Integers. Some properties of prime integers. Fundamental theorem of Arithmetic. Euclid's Theorem. Linear Diophantine equations. [Statement of Principle of Mathematical Induction, Strong form of Mathematical induction. Applications in different problems. Proofs of division algorithm. Representation of an integer uniquely in an arbitrary base, change of an integer from one base to another base. Computer operations with integers â“ Divisor of an integer, g.c.d. of two positive integers, prime integer, Proof of Fundamental theorem, Proof of Euclid's Theorem. To show how to find all prime numbers less than or equal to a given positive integer. Problems related to prime number. Linear Diophantine equation â“ when such an equation has solution, some applications.]
- Congruences : Congruence relation on integers, Basic properties of this relation. Linear congruences, Chinese Remainder Theorem. System of Linear congruences. [Definition of Congruence â“ to show it is an equivalence relation, to prove the following : $a \equiv b$ (mod m) implies
(i) $(a + c) \equiv (b + c)$ (mod m)
(ii) $ac \equiv bc$ (mod m)
(iii) $a^n \equiv b^n$ (mod m), for any polynomial $f(x)$ with integral coefficients $f(a) \equiv f(b)$ (mod m) etc. Linear Congruence, to show how to solve these congruences, Chinese remainder theorem â“ Statement and proof and some applications. System of linear congruences, when solution exists â“ some applications.]
- Application of Congruences : Divisibility tests. Check-digit and an ISBN, in Universal product Code, in major credit cards. Error detecting capability. [Using Congruence, develop divisibility tests for integers based on their expansions with respect to different bases, if d divides $(b - 1)$ then $n = (a_k a_{k-1} a_1 b)$ is divisible by d if and only if the sum of the digits is divisible by d etc. Show that congruence can be used to schedule Round-Robin tournaments. Check digits for different identification numbers â“ International standard book number, universal product code etc. Theorem regarding error detecting capability.]
- Congruence Classes : Congruence classes, addition and multiplication of congruence classes. Fermat's little theorem. Euler's theorem. Wilson's theorem. Some simple applications. [Definition of Congruence Classes, properties of Congruence classes, addition and multiplication, existence of inverse. Fermat's little theorem. Euler's theorem. Wilson's theorem - Statement, proof and some applications.]
- Boolean algebra : Boolean Algebra, Boolean functions, Logic gates, Minimization of circuits.

Course Structure | SEC | DSE | Credit Distribution

Mathematics - CC3/GE3

Semester : 3 Core Course-CC3/GE3 Paper Code (Theoretical) : MTM-G-CC-3-3-TH / MTM-G-GE-3-3-TH Paper Code (Tutorial):MTM-G-CC-3-3-TU / MTM-G-GE-3-3-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Minimum number of classes required : 60	
*1 Credit for Tutorial	
**15 Mark is reserved for Tutorial ***20 Mark is reserved for Internal Assessment & Attendance of 10 mark each	

Course Structure | SEC | DSE | Credit Distribution

Unit-1 : Integral Calculus (20 Marks) [10 classes]

- Evaluation of definite integrals.
- Integration as the limit of a sum (with equally spaced as well as unequal intervals).
- Reduction formulae of $\int \sin^n x \cos^m x dx$, $\int \frac{\sin^m x}{\cos^n x} dx$, $\int \tan^n x dx$ and associated problems (m and n are non-negative integers).
- Definition of Improper Integrals : Statements of (i) μ-test (ii) Comparison test (Limit from excluded) - Simple problems only. Use of Beta and Gamma functions (convergence and important relations being assumed).
- Working knowledge of double integral.
- Applications : Rectification, Quadrature, volume and surface areas of solids formed by revolution of plane curve and areas problems only.

Unit-2 : Numerical Methods (30 Marks) [25 classes]

- Approximate numbers, Significant figures, Rounding off numbers. Error : Absolute, Relative and percentage.
- Operators - Δ, ∇ and E (Definitions and some relations among them).
- Interpolation : The problem of interpolation Equispaced arguments Difference Tables, Deduction of Newton's Forward Interpolation Formula, remainder term (expression only). Newton's Backward interpolation Formula (Statement only) with remainder term. Unequally- spaced arguments Lagrange's Interpolation Formula (Statement only). Numerical problems on Interpolation with both equally and unequally spaced arguments.
- Numerical Integration : Trapezoidal and Simpson's $\frac{1}{3}$-rd formula (statement only). Problems on Numerical Integration.
- Solution of Numerical Equation : To find a real root of an algebraic or transcendental equation. Location of root (tabular method), Bisection method, Newton-Raphson method with geometrical significance, Numerical Problems. (Note : Emphasis should be given on problems)

Unit-3 : Linear Programming (30 Marks) [25 classes]

- Motivation of Linear Programming problem. Statement of L.P.P. Formulation of L.P.P. Slack and Surplus variables. L.P.P. is matrix form. Convex set, Hyperplane, Extreme points, convex Polyhedron, Basic solutions and Basic Feasible Solutions (B.F.S.). Degenerate and Non-degenerate B.F.S.
- The set of all feasible solutions of an L.P.P. is a convex set. The objective function of an L.P.P. assumes its optimal value at an extreme print of the convex set of feasible solutions, A.B.F.S. to an L.P.P. corresponds to an extreme point of the convex set of feasible solutions.
- Fundamental Theorem of L.P.P. (Statement only) Reduction of a feasible solution to a B.F.S. Standard form of an L.P.P. Solution by graphical method (for two variables), by simplex method and method of penalty. Concept of Duality. Duality Theory. The dual of the dual is the primal. Relation between the objective values of dual and the primal problems. Dual problems with at most one unrestricted variable, one constraint of equality. Transportation and Assignment problem and their optimal solutions.

Course Structure | SEC | DSE | Credit Distribution

Mathematics - CC4/GE4

Semester : 4 Core Course-CC4/GE4 Paper Code (Theoretical) : MTM-G-CC-4-4-TH / MTM-G-GE-4-4-TH Paper Code (Tutorial):MTM-G-CC-4-4-TU / MTM-G-GE-4-4-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Minimum number of classes required : 60	
*1 Credit for Tutorial	
**15 Mark is reserved for Tutorial ***20 Mark is reserved for Internal Assessment & Attendance of 10 mark each	

Course Structure | SEC | DSE | Credit Distribution

Unit-1 : Algebra-II (20 Marks) [10 classes]

- Introduction of Group Theory : Definition and examples taken from various branches (example from number system, roots of Unity, 2×2 real matrices, non singular real matrices of a fixed order). Elementary properties using definition of Group. Definition and examples of sub- group - Statement of necessary and sufficient condition and its applications.
- Definitions and examples of (i) Ring, (ii) Field, (iii) Sub-ring, (iv) Sub- field.
- Concept of Vector space over a Field : Examples, Concepts of Linear combinations, Linear dependence and independence of a finite number of vectors, Sub- space, Concepts of generators and basis of a finite-dimensional vector space. Problems on formation of basis of a vector space (No proof required).
- Real Quadratic Form involving not more than three variables (problems only).
- Characteristic equation of square matrix of order not more than three determination of Eigen Values and Eigen Vectors (problems only). Statement and illustration of Cayley-Hamilton Theorem.

Unit-2 : Computer Science & Programming (30 Marks) [25 classes]

- Computer Science and Programming : Historical Development, Computer Generation, Computer Anatomy Different Components of a computer system. Operating System, hardware and Software.
- Positional Number System. Binary to Decimal and Decimal to Binary. Other systems. Binary Arithmetic. Octal, Hexadecimal, etc. Storing of data in a Computer - BIT, BYTE, WORD etc. Coding of a data- ASCII, etc.
- Programming Language : Machine language, Assembly language and High level language, Compiler and interpreter. Object Programme and source Programme. Ideas about some HLL– e.g. BASIC, FORTRAN, C, C++, COBOL, PASCAL, etc.
- Algorithms and Flow Charts– their utilities and important features, Ideas about the complexities of an algorithm. Application in simple problems. FORTRAN 77/90: Introduction, Data Type– Keywords, Constants and Variables - Integer, Real, Complex, Logical, character, subscripted variables, Fortran Expressions.

Unit-3 : Probability & Statistics (30 Marks) [25 classes]

- Elements of probability Theory : Random experiment, Outcome, Event, Mutually Exclusive Events, Equally likely and Exhaustive. Classical definition of probability, Theorems of Total Probability, Conditional probability and Statistical Independence. Baye's Theorem. Problems, Shortcoming of the classical definition. Axiomatic approach problems, Random Variable and its Expectation, Theorems on mathematical expectation. Joint distribution of two random variables.

- Theoretical Probability Distribution Discrete and Continuous (p.m.f., p.d.f.) Binomial, Poisson and Normal distributions and their properties.
- Elements of Statistical Methods. Variables, Attributes. Primary data and secondary data, Population and sample. Census and Sample Survey. Tabulation Chart and Diagram, Graph, Bar diagram, Pie diagram etc. Frequency Distribution Un-grouped and grouped cumulative frequency distribution. Histogram, Frequency curve, Measures of Central tendencies. Averages : AM,; GM, HM, Mean, Median and Mode (their advantages and disadvantages). Measures of Dispersions - Range, Quartile Deviation, Mean Deviation, Variance / S.D., Moments, Skewness and Kurtosis.
- Sampling Theory : Meaning and objects of sampling. Some ideas about the methods of selecting samples, Statistic and parameter, Sampling Proportion. Four fundamental distributions, derived from the normal: (i) standard Normal Distribution, (ii) Chi-square distribution (iii) Student's distribution (iv) Snedecor's F-distribution. Estimation and Test of Significance. Statistical Inference. Theory of estimation Point estimation and Interval estimation. Confidence Interval / Confidence Limit. Statistical Hypothesis - Null Hypothesis and Alternative Hypothesis. Level of significance. Critical Region. Type I and II error. Problems.
- Bivariate Frequency Distribution. Scatter Diagram, Co-relation co-efficient Definition and properties. Regression lines.

Course Structure | SEC | DSE | Credit Distribution

C Programming Language

Semester : 3 Skill Enhancement Course- SEC A Paper Code (Theory) : MTM-G-SEC-A-TH	Credits : 2 Full Marks : 100 (= 80 + 20*)
Minimum number of classes required : 30 *20 Mark is reserved for Internal Assessment & Attendance of 10 mark each	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[30 classes]

- An overview of theoretical computers, history of computers, overview of architecture of computer, compiler, assembler, machine language, high level language, object oriented language, programming language and importance of C programming.
- Constants, Variables and Data type of C-Program : Character set. Constants and variables data types, expression, assignment statements, declaration.
- Operation and Expressions : Arithmetic operators, relational operators, logical operators.
- Decision Making and Branching : decision making with if statement, if-else statement, Nesting if statement, switch statement, break and continue statement.
- Control Statements : While statement, do-while statement, for statement.
- Arrays : One-dimension, two-dimension and multidimensional arrays, declaration of arrays, initialization of one and multi-dimensional arrays.
- User-defined Functions : Definition of functions, Scope of variables, return values and their types, function declaration, function call by value, Nesting of functions, passing of arrays to functions, Recurrence of function.
- Introduction to Library functions: stdio.h, math.h, string.h stdlib.h, time.h etc.

References

[1] B. W. Kernighan and D. M. Ritchi : The C-Programming Language, 2nd Edi.(ANSI Refresher), Prentice Hall, 1977.

[2] E. Balagurnsamy : Programming in ANSI C, Tata McGraw Hill, 2004.

[3] Y. Kanetkar : Let Us C ; BPB Publication, 1999.

[4] C. Xavier : C-Language and Numerical Methods, New Age International.

[5] V. Rajaraman : Computer Oriented Numerical Methods, Prentice Hall of India, 1980.

Course Structure | DSE | SEC | Credit Distribution

Mathematical Logic

Semester : 4 Skill Enhancement Course-SEC B Paper Code (Theory) :MTM-G-SEC-B-TH	Credits : 2 Full Marks : 100 (=80+20*)
Minimum number of classes required : 30 *20 Mark is reserved for Internal Assessment & Attendance of 10 mark each	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[5 classes]

- Introduction, propositions, truth table, negation, conjunction and disjunction. Implications, biconditional propositions, converse, contra positive and inverse propositions and precedence of logical operators.
- General Notions : Formal language, object and meta language, general definition of a Formal Theory/Formal Logic.

Unit-2

[15 classes]

- Propositional Logic : Formal theory for propositional calculus, derivation, proof, theorem, deduction theorem, conjunctive and disjunctive normal forms, semantics, truth tables, tautology, adequate set of connectives, applications to switching circuits, logical consequence, consistency, maximal consistency, Leindenbaum lemma, soundness and completeness theorems, algebraic semantics.

Unit-3

[10 classes]

- Predicate Logic : First order language, symbolizing ordinary sentences into first order formulae, free and bound variables, interpretation and satisfiability, models, logical validity, formal theory for predicate calculus, theorems and derivations, deduction theorem, equivalence theorem, replacement theorem, choice rule, Prenex normal form, soundness theorem, completeness theorem, compactness theorem, First Order Theory with equality, examples of First Order Theories (groups, rings, fields etc.).

References

[1] Elliott Mendelson; Introduction to mathematical logic; Chapman & Hall; London(1997)

[2] Angelo Margaris; First order mathematical logic; Dover publications, Inc, New York (1990).

[3] S.C.Kleene; Introduction to Metamathematics; Amsterdam; Elsevier (1952).

[4] J.H.Gallier; Logic for Computer Science; John.Wiley & Sons (1987).

[5] H.B.Enderton; A mathematical introduction to logic; Academic Press; New York (1972).

Course Structure | DSE | SEC | Credit Distribution

Object Oriented Programming in C++

Semester : 5 Skill Enhancement Course-SEC A Paper Code (Theory): MTM-G-SEC-A-TH	Credits : 2 Full Marks : 100 (=80 +20*)
Minimum number of classes required : 30 *20 Mark is reserved for Internal Assessment & Attendance of 10 mark each	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[10 classes]

- Programming paradigms, characteristics of object oriented programming languages, brief history of C++, structure of C++ program, differences between C and C++, basic C++ operators, Comments, working with variables, enumeration, arrays and pointer.

Unit-2

[10 classes]

- Objects, classes, constructor and destructors, friend function, inline function, encapsulation, data abstraction, inheritance, polymorphism, dynamic binding, operator overloading, method overloading, overloading arithmetic operator and comparison operators.

Unit-3

[10 classes]

- Template class in C++, copy constructor, subscript and function call operator, concept of namespace and exception handling.

References

[1] Arnold Robbins, Linux Programming by Examples The Fundamentals, 2nd Ed., Pearson Education, 2008.

[2] Cox K, Red Hat Linux Administrator's Guide, PHI, 2009.

[3] R. Stevens, UNIX Network Programming, 3rd Ed., PHI, 2008.

[4] Sumitabha Das, UNIX Concepts and Applications, 4th Ed., TMH, 2009.

[5] Ellen Siever, Stephen Figgins, Robert Love, Arnold Robbins, Linux in a Nutshell, 6th Ed.,O'Reilly Media, 2009.

[6] Neil Matthew, Richard Stones, Alan Cox, Beginning Linux Programming, 3rd Ed., 2004.

Course Structure | DSE | SEC | Credit Distribution

Boolean Algebra

Semester : 6 Skill Enhancement Course- SEC B Paper Code (Theory) : MTM-G-SEC-B-TH	Credits : 2 Full Marks : 100 (= 80+20*)
Minimum number of classes required : 30 *20 Mark is reserved for Internal Assessment & Attendance of 10 mark each	

Course Structure | DSE | SEC | Credit Distribution

[30 classes]

- Definition, examples and basic properties of ordered sets, maps between ordered sets, duality principle, maximal and minimal elements, lattices as ordered sets, complete lattices, lattices as algebraic structures, sublattices, products and homomorphisms. Definition, examples and properties of modular and distributive lattices, Boolean algebras.
- Boolean polynomials, minimal forms of Boolean polynomials, Quinn-McCluskey method, Karnaugh diagrams, switching circuits and minimization of switching circuits using Boolean algebra.

References

[1] B A. Davey and H. A. Priestley, Introduction to Lattices and Order, Cambridge University Press, Cambridge, 1990.

[2] Rudolf Lidl and Günter Pilz, Applied Abstract Algebra, 2nd Ed., Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.

Course Structure | DSE | SEC | Credit Distribution

Particle Dynamics

Semesters : 5/6 Discipline Specific Elective-DSE-A Paper Code (Theory): MTM-G-DSE-A-TH Paper Code (Tutorial)MTM-G-DSE-A-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Minimum number of classes required : 60	
*1 Credit for Tutorial	
**15 Mark is reserved for Tutorial ***20 Mark is reserved for Internal Assessment & Attendance of 10 mark each	

Course Structure | DSE | SEC | Credit Distribution

[60 classes]

- Velocity and Acceleration of a particle. Expressions for velocity and acceleration in rectangular Cartesian and polar co-ordinates for a particle moving in a plane. Tangential and normal components of velocity and acceleration of a particle moving along a plane curve.
- Concept of Force : Statement and explanation of Newton's laws of motion. Work, power and energy. Principles of conservation of energy and momentum. Motion under impulsive forces. Equations of motion of a particle (i) moving in a straight line, (ii) moving in a plane.
- Study of motion of a particle in a straight line under (i) constant forces, (ii) variable forces (S.H.M., Inverse square law, Damped oscillation, Forced and Damped oscillation, Motion in an elastic string). Equation of Energy. Conservative forces.
- Motion in two dimensions : Projectiles in vacuum and in a medium with resistance varying linearly as velocity. Motion under forces varying as distance from a fixed point.
- Central orbit. Kepler's laws of motion. Motion under inverse square law.

References

[1] Loney, S. L., An Elementary Treatise on the Dynamics of particle and of Rigid Bodies, Loney Press.

[2] A.S. Ramsey; Dynamics, Part-II; ELBS.

Course Structure | DSE | SEC | Credit Distribution

Graph Theory

Semesters : 5/6 Discipline Specific Elective-DSE-A Paper Code (Theory): MTM-G-DSE-A-TH Paper Code (Tutorial):MTM-G-DSE-A-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Minimum number of classes required : 60	
*1 Credit for Tutorial	
**15 Mark is reserved for Tutorial ***20 Mark is reserved for Internal Assessment & Attendance of 10 mark each	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[60 classes]

- Definition, examples and basic properties of graphs, pseudographs, complete graphs, bi-partite graphs, isomorphism of graphs
- Paths and circuits, Eulerian circuits, Hamiltonian cycles, the adjacency matrix, weighted graph, travelling salesman's problem, shortest path, Dijkstra's algorithm, Floyd-Warshall algorithm.
- Definition of Trees and their elementary properties. Definition of Planar graphs, Kuratowski's graphs.

References

[1] Robin J. Wilson; Introduction to Graph Theory; 4th edition, Pearson, 2007.

[2] Edgar G. Goodaire and Michael M. Parmenter; Discrete Mathematics with Graph Theory 2nd Ed.; Pearson Education (Singapore) P. Ltd., Indian Reprint, 2003.

[3] Rudolf Lidl and Günter Pilz; Applied Abstract Algebra, 2nd Ed.; Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.

Course Structure | DSE | SEC | Credit Distribution

Advanced Calculus

Semesters : 5/6 Discipline Specific Elective: DSE-B Paper Code (Theory): MTM-G-DSE-B-TH Paper Code (Tutorial)MTM-G-DSE-B-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Minimum number of classes required : 60	
*1 Credit for Tutorial	
**15 Mark is reserved for Tutorial ***20 Mark is reserved for Internal Assessment & Attendance of 10 mark each	

Course Structure | DSE | SEC | Credit Distribution

[60 classes]

- Concept of Point-wise and Uniform convergence of sequence of functions and series of functions with special reference of Power Series. Statement of Weierstrass M-Test for Uniform convergence of sequence of functions and of series of functions. Simple applications. Statement of important properties like boundedness, continuity, differentiability and integrability of the limit function of uniformly convergent sequence of functions and of the sum function of uniformly convergent series of functions. Determination of Radius of convergence of Power Series. Statement of properties of continuity of sum function power series. Term by term integration and Term by term differentiation of Power Series. Statements of Abel's Theorems on Power Series. Convergence of Power Series. Expansions of elementary functions such as $e^x, \sin x, \log(1+x), (1+x)^n$. Simple problems.
- Periodic Fourier series on $(-\pi, \pi)$: Periodic function. Determination of Fourier coefficients. Statement of Dirichlet's conditions of convergence and statement of the theorem on convergence of Fourier Sine and Cosine series.
- Laplace Transform and its application to ordinary differential equation. Laplace Transform and Inverse Laplace Transform. Statement of Existence theorem. Elementary properties of Laplace Transform and its Inverse. Application to the solution of ordinary differential equation of second order with constant coefficients.

References

[1] David Widder; Advance Calculus; Prentice Hall.

[2] Angus E. Taylor and W. Robert Mann; Advanced Calculus (3rd Edition); John Wiley & Sons, Inc.

[3] Robert C. Wrede and Murray Spiegel; Advanced Calculus, (Schaum's outline series); McGraw - Hill.

Course Structure | DSE | SEC | Credit Distribution

Mathematical Finance

Semesters : 5/6 Discipline Specific Elective: DSE-B Paper Code (Theory): MTM-G-DSE-B-TH Paper Code (Tutorial)MTM-G-DSE-B-TU	Credits : 5+1*=6 Full Marks : 65+15**+20***=100
Minimum number of classes required : 60	
*1 Credit for Tutorial	
**15 Mark is reserved for Tutorial ***20 Mark is reserved for Internal Assessment & Attendance of 10 mark each	

Course Structure | DSE | SEC | Credit Distribution

Unit-1

[60 classes]

- Basic principles: Comparison, arbitrage and risk aversion, Interest (simple and compound, discrete and continuous), time value of money, inflation, net present value, internal rate of return (calculation by bisection and Newton-Raphson methods)
- Comparison of NPV and IRR. Bonds, bond prices and yields. Floating-rate bonds, immunization. Asset return, short selling, portfolio return, (brief introduction to expectation, variance, covariance and correlation), random returns, portfolio mean return and variance, diversification, portfolio diagram, feasible set, Markowitz model (review of Lagrange multipliers for 1 and 2 constraints).

References

[1] David G. Luenberger; Investment Science; Oxford University Press, Delhi, 1998.

[2] John C. Hull; Options, Futures and Other Derivatives, 6th Ed.; Prentice-Hall India, Indian reprint, 2006.

[3] Sheldon Ross; An Elementary Introduction to Mathematical Finance, 2nd Ed.; Cambridge University Press, USA, 2003.

Course Structure | DSE | SEC | Credit Distribution

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

Semester Wise Microbiology Courses for B. Sc. (Honours)

	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6
Core Courses (CC)	**CC1 & 2** 2Th+2P (2X4+2X2=12 Credits) **CC1:** Introduction to microbiology and microbial diversity **CC2:** Bacteriology	**CC3 & 4** 2Th+2P (2X4+2X2=12 Credits) **CC3:** Biochemistry **CC4:** Cell Biology	**CC5,6 & 7** 3Th+3P (3X4+3X2=18 Credits) **CC5**: Virology **CC6:** Microbial physiology and metabolism **CC7:**Molecular Biology	**CC-8,9 &10** 3Th+3P (3X4+3X2=18 Credits) **CC8:**Microbial Genetics **CC9:**Environmental Microbiology **CC10:**Recombinant DNA Technology	**CC11 & 12** 2T+2P (2X4+2X2=12 Credits) **CC11**:Food and Dairy Microbiology **CC12**:Industrial Microbiology	**CC-13 & 14** 2T+2P (2X4+2X2=12 Credits) **CC13**:Immunology **CC14**:Medical Microbiology
Elective Courses:						
i) Generic Elective (GE)	1Th+1P **GE1** (1X4+1X2=6 Credits)	1Th+1P **GE2** (1X4+1X2=6 Credits)	1Th+1P **GE3** (1X4+1X2=6 Credits)	1Th+1P **GE4** (1X4+1X2=6 Credits)		
ii) Discipline Specific Elective Courses					**DSE-A*** 2Th+2P **Any two:** (2X4+2X2=12 Credits) A1. Microbial Biotechnology A2. Advances in Microbiology **DSE-B*** B1. Inheritance Biology B2.Microbes in Sustainable Agriculture and Development	**DSE-A*** 2Th+2P **Any two:** (2X4+2X2=12 Credits) A3.Plant Pathology nstrumentation and Biotechniques A4. Biomathematics and Biostatistics **DSE-B*** B3. Instrumentation and Biotechniques B4. Project Work

Ability Enhance-ment Compulsory Course (AECC)	1Th+0P **AECC-1: Communicative English** (2 Credits)	1Th+0P **AECC-2: Environmental Studies** (2 Credits)				
Skill Enhance-ment Courses (SEC)			1Th+0P **SEC-A** (1X2=2 Credits) **Any one** 1.Microbial Quality Control in Food and Pharmaceutical Industries 2. Biofertilizers and Biopesticides	1Th+0P **SEC-B** (1X2=2Credits) **Any one** 1. Food Fermentation Techniques 2. Microbiological Analysis of Air and Water		
Total No. of Courses and Marks	**4 X 100=400**	**4 X 100=400**	**5 X 100=500**	**5 X 100=500**	**4 X 100=400**	**4 X 100=400**
Total Credit 140	**20 Credits**	**20 Credits**	**26 Credits**	**26 Credits**	**24 Credits**	**24 Credits**

***DSE-A: Any one to be chosen in the 5th Semester and another one to be chosen in the 6th Semester.**

***DSE-B: Any one to be chosen in the 5th Semester and another one to be chosen in the 6th Semester.**

These choices must be made by the students before 5th Semester begins.

Semester wise Courses for B.Sc. Microbiology (General)

	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6
Core Courses (CC)/GE	3Th+3P (3X4+3X2=18 Credits) **CC1:** Introduction and Scope of microbiology, Bacteriology	3Th+3P (3X4+3X2=18 Credits) **CC2:**Bacteriology and Virology,	3Th+3P (3X4+3X2=18 Credits) **CC3:**Biomolecules and Microbial metabolism	3Th+3P (3X4+3X2=18 Credits) **CC4:**Microbial Genetics and Molecular Biology		
Elective Courses						
I) Generic elective						
Discipline Specific Elective Courses (DSE)					3Th+3P (3X4+3X2=18 Credits) **DSE-A** Any **one** from 1. Genetic Engineering and Biotechnology 2. Microbes in Environment	3T+3P (3X4+3X2=18 Credits) **DSE-B** Any **one** from 1. Medical Microbiology and Immunology 2. Industrial Microbiology and Food Microbiology
Ability Enhancement Compulsory Course (AECC)	1 Th + 0 P **AECC-1 Communicative English/MIL**	1 Th + 0 P **AECC-2 Environmental Studies**				
Skill Enhance-ment Elective(SEC)			1Th+0P (1X2=2 Credits) **SEC-A**	1T+0P (1X2=2Credits) **SEC-B**	1T+0P (1X2=2 Credits) **SEC-A**	1T+0P (1X2=2 Credits) **SEC-B**

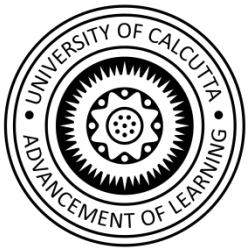
			(any one: either in Sem-3 or in Sem-5 1.Biofertilizers and Biopesticides 2.Microbial Quality Control in Food and Pharmaceutical Industries	**(any one: either in Sem-4 or in Sem-6)** 1.Microbiological Analysis of Air and Water 2. Food Fermentation Techniques	**(any one: either in Sem-3 or in Sem-5)** 1.Biofertilizers and Biopesticides 2. Microbial Quality Control in Food and Pharmaceutical Industries	**(any one: either in Sem-4 or in Sem-6)** 1. Microbiological Analysis of Air and Water 2. Food Fermentation Techniques
Total No. of Courses and Marks	**4 X 100 =400**	**4 X 100 = 400**	**4 X 100 = 400**	**4 X 100 = 400**	**4 X 100 = 400**	**4 X 100 = 400**
Total Credit 120	**20 Credits**	**20 Credits**	**20 Credits**	**20 Credits**	**20 Credits**	**20 Credits**

UNIVERSITY OF CALCUTTA

CBCS SYLLABUS

F
O
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THREE-YEAR HONOURS
DEGREE COURSE OF STUDIES



MICROBIOLOGY

2018

Structure of B. Sc. Honours Microbiology under CBCS

Core Course: CC

CC-1: **Introduction to Microbiology and Microbial Diversity**

CC-2: **Bacteriology**

CC-3: **Biochemistry**

CC-4: **Cell Biology**

CC-5: **Virology**

CC-6: **Microbial Physiology and Metabolism**

CC-7:Molecular Biology

CC-8: **Microbial Genetics**

CC-9:Environmental Microbiology

CC-10: **Recombinant DNA Technology**

CC-11: **Food and Dairy Microbiology**

CC-12: **Industrial Microbiology**

CC-13: **Immunology**

CC-14: **Medical Microbiology**

Discipline Specific Elective (DSE) (Any Four)

DSE-A*(Any Two)

A1. Microbial Biotechnology

A2. Advances in Microbiology

A3. Plant Pathology

A4. Biomathematics and Biostatistics

***DSE-A: Any one to be chosen in the 5th Semester and another one to be chosen in the 6th Semester.**

DSE-B *(Any Two)

B1. Inheritance Biology

B2. Microbes in Sustainable Agriculture and Development

B3. Instrumentation and Biotechniques

B4. Project Work

***DSE-B: Any one to be chosen in the 5th Semester and another one to be chosen in the 6th Semester.**

These choices must be made by the students before 5th Semester begins.

Skill Enhancement Elective Courses (SEC) (Any Two)

SEC-A (Any One)

A1. Microbial Quality Control in Food and Pharmaceutical Industries

A2. Biofertilizers and Biopesticides

SEC-B (Any One)

B1. Food Fermentation Techniques

B2. Microbiological Analysis of Air and Water

SUBJECT/PAPER CODE FORMAT

1. **Subject Code: MCB**
2. **Honours Code: A**
3. **Course Code: a) Core Course:CC**

   b) Discipline Specific Elective: DSE-A/DSE-B

   c) Skill Enhancement Course: SEC-A/SEC-B
4. **Semester Code: 1/2/3/4/5/6**
5. **Paper No. Code: 1/2/3…../14**
6. **Paper Component Code: a) Theory:TH, b) Practical: P**

SEMESTER –1

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
CC-1: INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY (THEORY)

MCB-A-CC-1-1-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 History of Development of Microbiology **No. of Hours: 15**

Development of microbiology as a discipline, Spontaneous generation *vs*. biogenesis. Contributions of Anton von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Alexander Fleming
Role of microorganisms in fermentation, Germ theory of disease, Development of various microbiological techniques and golden era of microbiology, Development of the field of soil microbiology: Contributions of Martinus W. Beijerinck, Sergei N. Winogradsky, Selman A.Waksman Establishment of fields of medical microbiology and immunology through the work of Paul Ehrlich, Elie Metchnikoff, Edward Jenner

Unit 2 Diversity of Microbial World **No. of Hours: 30**

A. Systems of classification

Binomial Nomenclature, Whittaker's five kingdom and Carl Woese's three kingdom classification systems and their utility. Difference between prokaryotic and eukaryotic microorganisms

B. General characteristics of different groups:**Acellular**microorganisms (Viruses, Viroids, Prions)and **Cellular** microorganisms (Bacteria, Algae, Fungi and Protozoa) with emphasis on distribution and occurrence, morphology, mode of reproduction and economic importance.

• **Algae**

History of phycology with emphasis on contributions of Indian scientists; General characteristics of algae including occurrence, thallus organization, algae cell ultra-structure, pigments, flagella, eyespot food reserves and vegetative, asexual and sexual reproduction. Different types of life cycles in algae with suitable examples: Haplobiontic, Haplontic, Diplontic, Diplobiontic and Diplohaplontic life cycles. Applications of algae in agriculture, industry, environment and food.

• **Fungi**

Historical developments in the field of Mycology including significant contributions of eminent mycologists. General characteristics of fungi including habitat, distribution, nutritional requirements, fungal cell ultra- structure, thallus organization and aggregation, fungal wall structure and synthesis, asexual reproduction, sexual reproduction, heterokaryosis, heterothallism and parasexual mechanism. Economic importance of fungi with examples in agriculture, environment, Industry, medicine, food, biodeterioration and mycotoxins.

• **Protozoa**

General characteristics with special reference to *Amoeba, Paramecium, Plasmodium, Leishmania andGiardia*

Unit 3 An overview of Scope of Microbiology **No. of Hours: 5**

SEMESTER –1

CC-1: INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY (PRACTICALS)
MCB-A-CC-1-1-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Microbiology Good Laboratory Practices and Biosafety.
2. To study the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter) used in the microbiology laboratory.
3. Preparation of culture media for bacterial cultivation.
4. Sterilization of medium using Autoclave and assessment for sterility
5. Sterilization of glassware using Hot Air Oven and assessment for sterility
6. Sterilization of heat sensitive material by membrane filtration and assessment for sterility
7. Demonstration of the presence of microflora in the environment by exposing nutrient agar plates to air.
8. Study of *Rhizopus*, *Penicillium*, *Aspergillus* using temporary mounts
9. Study of *Spirogyra* and *Chlamydomonas*, *Volvox* using temporary Mounts
10. Study of the following protozoans using permanent mounts/photographs: *Amoeba*, *Entamoeba*, *Paramecium* and *Plasmodium*

SUGGESTED READING

1. Tortora GJ, Funke BR and Case CL. (2008). Microbiology: An Introduction. 9th edition. Pearson Education

2. Madigan MT, Martinko JM, Dunlap PV and Clark DP. (2014). Brock Biology of Microorganisms. 14th edition. Pearson International Edition

3. Cappucino J and Sherman N. (2010). Microbiology: A Laboratory Manual. 9th edition. Pearson Education Limited

4.Wiley JM, Sherwood LM and Woolverton CJ. (2013) Prescott's Microbiology. 9th Edition. McGraw Hill International.

5. Atlas RM. (1997). Principles of Microbiology. 2nd edition. WM.T.Brown Publishers.

6. Pelczar MJ, Chan ECS and Krieg NR. (1993). Microbiology. 5th edition. McGraw Hill Book Company.

7. Stanier RY, Ingraham JL, Wheelis ML, and Painter PR. (2005). GeneralMicrobiology. 5thedition. McMillan.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)

CC-2: BACTERIOLOGY (THEORY)

SEMESTER –1

MCB-A-CC-1-2-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Cell organization **No. of Hours: 10**

Cell size, shape and arrangement, glycocalyx, capsule, flagella, endoflagella, fimbriae and pili. Cell-wall: Composition and detailed structure of Gram-positive and Gram-negative cell walls, Archaebacterial cell wall, Gram and acid fast staining mechanisms, lipopolysaccharide (LPS), sphaeroplasts, protoplasts, and L-forms. Effect of antibiotics and enzymes on the cell wall.
Cell Membrane: Structure, function and chemical composition of bacterial and archaeal cell membranes.
Cytoplasm: Ribosomes, mesosomes, inclusion bodies, nucleoid, chromosome and plasmids
Endospore: Structure, formation, stages of sporulation.

Unit 2 Bacteriological techniques **No. of Hours: 5**

Pure culture isolation: Streaking, serial dilution and plating methods; cultivation, maintenance and preservation/stocking of pure cultures; cultivation of anaerobic bacteria, and accessing non-culturable bacteria.

Unit 3 Microscopy No. of Hours: 6 Bright Field Microscope, Dark Field Microscope, Phase Contrast Microscope, Fluoresence Microscope, Confocal microscopy, Scanning and Transmission Electron Microscope

Unit 4 Growth and nutrition **No. of Hours: 8**

Nutritional requirements in bacteria and nutritional categories;
Culture media: components of media, natural and synthetic media, chemically defined media, complex media, selective, differential, indicator, enriched and enrichment media
Physical methods of microbial control: heat, low temperature, high pressure, filtration, desiccation,osmotic pressure, radiation
Chemical methods of microbial control: disinfectants, types and mode of action

Unit 5 Reproduction in Bacteria **No. of Hours: 3**

Asexual methods of reproduction, logarithmic representation of bacterial populations, phases of growth, calculation of generation time and specific growth rate

Unit 6 Bacterial Systematics **No. of Hours: 8**

Aim and principles of classification, systematics and taxonomy, concept of species, taxa, strain; conventional, molecular and recent approaches to polyphasic bacterial taxonomy, evolutionary chronometers, rRNA oligonucleotide sequencing, signature sequences, and protein sequences. Differences between eubacteria and archaebacteria

Unit 7 Important archaeal and eubacterial groups **No. of Hours: 10**

Archaebacteria: General characteristics, phylogenetic overview, genera belonging to Nanoarchaeota(*Nanoarchaeum*), Crenarchaeota (*Sulfolobus, Thermoproteus*) and Euryarchaeota [Methanogens (*Methanobacterium, Methanocaldococcus*), thermophiles (*Thermococcus, Pyrococcus, Thermoplasma*), and Halophiles (*Halobacterium, Halococcus*)]
Eubacteria: Morphology, metabolism, ecological significance and economic importance of followinggroups:
Gram Negative:
Non proteobacteria: General characteristics with suitable examples
Alpha proteobacteria: General characteristics with suitable examples
Beta proteobacteria: General characteristics with suitable examples
Gamma proteobacteria: General characteristics with suitable examples

Delta proteobacteria: General characteristics with suitable examples
Epsilon proteobacteria: General characteristics with suitable examples Zeta proteobacteria: General characteristics with suitable examples ***Gram Positive:***
Low G+ C (Firmicutes): General characteristics with suitable examples
High G+C (Actinobacteria): General characteristics with suitable examples
***Cyanobacteria*:**An Introduction

CC-2: BACTERIOLOGY (PRACTICAL)
SEMESTER –1
MCB-A-CC-1-2-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Preparation of different media: synthetic media CzapekDox media and /or BG-11, Complex media-Nutrient agar, McConkey agar, EMB agar.
2. Simple staining
3. Negative staining
4. Gram's staining
5. Acid fast staining-permanent slide only.
6. Capsule staining
7. Endospore staining.
8. Isolation of pure cultures of bacteria by streaking method.
9. Preservation of bacterial cultures by various techniques.
10. Estimation of CFU count by spread plate method/pour plate method.
11. Motility by hanging drop method.

SUGGESTED READINGS

1. Atlas RM. (1997). Principles of Microbiology. 2nd edition. WM.T.Brown Publishers.
2. Black JG. (2008). Microbiology: Principles and Explorations. 7th edition. Prentice Hall
3. Madigan MT, and Martinko JM. (2014). Brock Biology of Micro-organisms. 14th edition. Parker J. Prentice Hall International, Inc.
4. PelczarJr MJ, Chan ECS, and Krieg NR. (2004). Microbiology. 5th edition Tata McGraw Hill.
5. Srivastava S and Srivastava PS. (2003). Understanding Bacteria. Kluwer Academic Publishers, Dordrecht
6. Stanier RY, Ingraham JL, Wheelis ML and Painter PR. (2005). General Microbiology. 5th edition McMillan.
7. Tortora GJ, Funke BR, and Case CL. (2008). Microbiology: An Introduction. 9th edition Pearson Education.
8. Willey JM, Sherwood LM, and Woolverton CJ. (2013). Prescott's Microbiology. 9th edition. McGraw Hill Higher Education.
9. Cappucino J and Sherman N. (2010). Microbiology: A Laboratory Manual. 9th edition. Pearson Education Limited

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
CC-3: BIOCHEMISTRY (THEORY)
SEMESTER –2
MCB-A-CC-2-3-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Bioenergetics **No. of Hours: 6**

First and second laws of Thermodynamics. Definitions of Gibb's Free Energy, enthalpy,and Entropy and mathematical relationship among them, Standard free energy change and equilibrium constant Coupled reactions and additive nature of standard free energy change, Energy rich compounds: Phosphoenolpyruvate, 1,3- Bisphosphoglycerate, Thioesters, ATP

Unit 2 Carbohydrates **No. of Hours: 10**

Families of monosaccharides: aldoses and ketoses, trioses, tetroses, pentoses, and hexoses. Stereo isomerism of monosaccharides, epimers, Mutarotation and anomers of glucose.Furanose and pyranose forms of glucose and fructose, Haworth projection formulae for glucose; chair and boat forms of glucose, Sugar derivatives, glucosamine, galactosamine, muramic acid, N- acetyl neuraminic acid, Disaccharides; concept of reducing and non-reducing sugars, occurrence and Haworth projections of maltose, lactose, and sucrose, Polysaccharides, storage polysaccharides, starch and glycogen. Structural Polysaccharides, cellulose, peptidoglycan and chitin

Unit 3 Lipids **No. of Hours: 10**

Definition and major classes of storage and structural lipids.Storage lipids.Fatty acids structure and functions.Essential fatty acids.Triacylglycerols structure, functions and properties. Saponification Structural lipids.Phosphoglycerides: Building blocks, General structure, functions and properties. Structure of phosphatidylethanolamine and phosphatidylcholine, Sphingolipids: building blocks, structure of sphingosine, ceramide. Special mention of sphingomyelins, cerebrosides and gangliosides Lipid functions: cell signals, cofactors, prostaglandins, Introduction of lipid micelles, monolayers, bilayers

Unit 4 Proteins **No. of Hours: 10**

Functions of proteins, Primary structures of proteins: Amino acids, the building blocks of proteins. General formula of amino acid and concept of zwitterion. Titration curve of amino acid and its Significance, Classification, biochemical structure and notation of standard protein amino acids Ninhydrinreaction.Natural modifications of amino acids in proteins hydrolysine, cystine and hydroxyproline, Non protein amino acids: Gramicidin, beta-alanine, D-alanine and D- glutamic acid Oligopeptides: Structure and functions of naturally occurring glutathione and insulin and synthetic aspartame, Secondary structure of proteins: Peptide unit and its salient features. The alpha helix, the beta pleated sheet and their occurrence in proteins, Tertiary and quaternary structures of proteins. Forces holding the polypeptide together. Human haemoglobin structure, Quaternary structures of proteins

Unit 5. Enzymes **No. of Hours: 10**

Structure of enzyme: Apoenzyme and cofactors, prosthetic group-TPP, coenzyme NAD,metal cofactors, Classification of enzymes, Mechanism of action of enzymes: active site, transition state complex and activation energy. Lock and key hypothesis, and Induced Fit hypothesis. Significance of hyperbolic, double reciprocal plots of enzyme activity, Km, and allosteric mechanism Definitions of terms – enzyme unit, specific activity and turnover number, Multienzymecomplex : pyruvate dehydrogenase; isozyme: lactate dehydrogenase, Effect of pH and temperature on enzyme activity. Enzyme inhibition: competitive- sulfa drugs; non-competitive-heavy metal salts

Unit 6. Vitamins **No. of Hours: 4**

Classification and characteristics with suitable examples, sources and importance

CC-3: BIOCHEMISTRY (PRACTICALS)
SEMESTER –2
MCB-A-CC-2-3-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Properties of water, Concept of pH and buffers, preparation of buffers and Numerical problems to explain the concepts
2. Numerical problems on calculations of Standard Free Energy Change and Equilibrium constant
3. Standard Free Energy Change of coupled reactions
4. Qualitative/Quantitative tests for carbohydrates, reducing sugars, non reducing sugars
5. Qualitative/Quantitative tests for lipids and proteins
6. Study of protein secondary and tertiary structures with the help of models
7. Study of enzyme kinetics – calculation of V_{max} , Km, Kcat values
8. Study effect of temperature, pH and Heavy metals on enzyme activity
9. Estimation of any one vitamin

SUGGESTED READING

1. Campbell, MK (2012) Biochemistry, 7th ed., Published by Cengage Learning
2. Campbell, PN and Smith AD (2011) Biochemistry Illustrated, 4th ed., Published by Churchill Livingstone
3. Tymoczko JL, Berg JM and Stryer L (2012) Biochemistry: A short course, 2nd ed., W.H.Freeman
4. Berg JM, Tymoczko JL and Stryer L (2011) Biochemistry, W.H.Freeman and Company
5. Nelson DL and Cox MM (2008) Lehninger Principles of Biochemistry, 5th Edition., W.H. Freeman and Company,
6. Willey MJ, Sherwood, LM &Woolverton C J (2013) Prescott, Harley and Klein's Microbiology by. 9th Ed., McGrawHill
7. Voet,D. and Voet J.G (2004) Biochemistry 3rd edition, John Wiley and Sons,

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
CC-4: CELL BIOLOGY (THEORY)
SEMESTER –2

MCB-A-CC-2-4-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Structure and organization of Cell **No. of Hours: 12**

Cell Organization – Eukaryotic (Plant and animal cells) and prokaryotic
Plasma membrane: Structure and transport of small molecules
Cell Wall: Eukaryotic cell wall, Extra cellular matrix and cell matrix interactions, Cell-Cell Interactions - adhesion junctions, tight junctions, gap junctions, and plasmodesmata (only structural aspects)
Mitochondria, chloroplasts and peroxisomes
Cytoskeleton: Structure and organization of actin filaments, association of actin filaments with plasma membrane, cell surface protrusions, intermediate filaments, microtubules

Unit 2 Nucleus **No. of Hours: 4**

Nuclear envelope, nuclear pore complex and nuclear lamina
Chromatin – Molecular organization
Nucleolus

Unit 3 Protein Sorting and Transport **No. of Hours: 12**

Ribosomes, Endoplasmic Reticulum – Structure, targeting and insertion of proteins in the ER, protein folding, processing and quality control in ER, smooth ER and lipid synthesis, export of proteins and lipids
Golgi Apparatus – Organization, protein glycosylation, protein sorting and export from Golgi Apparatus
Lysosomes

Unit 4 Cell Signalling **No. of Hours: 10**

Signalling molecules and their receptors
Function of cell surface receptors
Pathways of intra-cellular receptors **–** Cyclic AMP pathway, cyclic GMP and MAP kinase pathway

Unit 5 Cell Cycle, Cell Death and Cell Renewal **No. of Hours: 12**

Eukaryotic cell cycle and its regulation, Mitosis and Meiosis
Development of cancer, causes and types
Programmed cell death
Stem cells
Embryonic stem cell, induced pleuripotent stem cells

CC-4: CELL BIOLOGY (PRACTICAL)
SEMESTER –2

MCB-A-CC-2-4-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Study a representative plant and animal cell by microscopy.
2. Study of the structure of cell organelles through electron micrographs
3. Cytochemical staining of DNA – Feulgen
4. Demonstration of the presence of mitochondria in striated muscle cells/ cheek epithelial cell using vital stain Janus Green B
5. Study of polyploidy in Onion root tip by colchicine treatment.

6. Identification and study of cancer cells by photomicrographs.
7. Study of different stages of Mitosis.
8. Study of different stages of Meiosis.

SUGGESTED READING

1. Hardin J, Bertoni G and Kleinsmith LJ. (2010). Becker's World of the Cell. 8th edition. Pearson.
2. Karp G. (2010) Cell and Molecular Biology: Concepts and Experiments. 6th edition. John Wiley & Sons. Inc.
3. De Robertis, EDP and De Robertis EMF. (2006). Cell and Molecular Biology. 8th edition. Lipincott Williams and Wilkins, Philadelphia.
4. Cooper, G.M. and Hausman, R.E. (2009). The Cell: A Molecular Approach. 5th Edition. ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, MA.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
CC-5: VIROLOGY (THEORY)
SEMESTER –3

MCB-A-CC-3-5-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Nature and Properties of Viruses **No. of Hours: 10**

Introduction: Discovery of viruses, nature and definition of viruses, general properties, concept of viroids, virusoids, satellite viruses and Prions. Theories of viral origin
Structure of Viruses: Capsid symmetry, enveloped and non-enveloped viruses Isolation, purification and cultivation of viruses
Viral taxonomy: Classification and nomenclature of different groups of viruses

Unit 2 Bacteriophages **No. of Hours**: **10**

Diversity, classification, one step multiplication curve, lytic and lysogenic phages (lambda phage) concept of early and late proteins, regulation of transcription in lambda phage

Unit 3 Viral Transmission, Salient features of viral nucleic acids and Replication
No. of Hours: **14**

Modes of viral transmission: Persistent, non-persistent, vertical and horizontal
Salient features of viral Nucleic acid : Unusual bases (TMV,T4 phage), overlapping genes (ϕX174, Hepatitis B virus), alternate splicing (HIV), terminal redundancy (T4 phage), terminal cohesive ends (lambda phage), partial double stranded genomes (Hepatitis B), long terminal repeats (retrovirus), segmented (Influenza virus), and non-segmented genomes (picornavirus), capping and tailing (TMV) Viral multiplication and replication strategies: Interaction of viruses with cellular receptors and entry of viruses. Replication strategies of viruses as per Baltimore classification (phi X 174, Retroviridae, Vaccinia, Picorna) , Assembly, maturation and release of virions

Unit 4 Viruses and Cancer **No. of Hours: 6**

Introduction to oncogenic viruses
Types of oncogenic DNA and RNA viruses: Concepts of oncogenes and proto-oncogenes

Unit 5 Prevention & control of viral diseases **No. of Hours: 6**

Antiviral compounds and their mode of action
Interferon and their mode of action
General principles of viral vaccination

Unit 6 Applications of Virology **No. of Hours: 4**

Use of viral vectors in cloning and expression, Gene therapy and Phage display

CC-5: VIROLOGY (PRACTICAL)
SEMESTER –3

MCB-A-CC-3-5-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Study of the structure of important animal viruses (rhabdo, influenza, paramyxo hepatitis B and retroviruses) using electron micrographs
2. Study of the structure of important plant viruses (caulimo, Gemini, tobacco ring spot, cucumber mosaic and alpha-alpha mosaic viruses) using electron micrographs
3. Study of the structure of important bacterial viruses (ϕX 174, T4, λ) using electron micrograph.
4. Isolation and enumeration of bacteriophages (PFU) from water/sewage sample using double agar layer technique

5. Studying isolation and propagation of animal viruses by chick embryo technique
6. Study of cytopathic effects of viruses using photographs
7. Perform local lesion technique for assaying plant viruses.

SUGGESTED READING

1. Dimmock, NJ, Easton, AL, Leppard, KN (2007). Introduction to Modern Virology. 6th edition, Blackwell Publishing Ltd.
2. Carter J and Saunders V (2007). Virology: Principles and Applications. John Wiley and Sons.
3. Flint SJ, Enquist, LW, Krug, RM, Racaniello, VR, Skalka, AM (2004). Principles of Virology, Molecular biology, Pathogenesis and Control. 2nd edition. ASM press Washington DC.
4. Levy JA, Conrat HF, Owens RA. (2000). Virology. 3rd edition. Prentice Hall publication, New Jersey.
5. Wagner EK, Hewlett MJ. (2004). Basic Virology. 2nd edition. Blackwell Publishing.
6. Mathews. (2004). Plant Virology. Hull R. Academic Press, New York.
7. Nayudu MV. (2008). Plant Viruses. Tata McGraw Hill, India.
8. Bos L. (1999) Plant viruses-A text book of plant virology by. Backhuys Publishers.
9. Versteeg J. (1985). A Color Atlas of Virology. Wolfe Medical Publication.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
CC-6: MICROBIAL PHYSIOLOGY AND METABOLISM
(THEORY)
SEMESTER –3

MCB-A-CC-3-6-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Microbial Growth and Effect of Environment on Microbial Growth **No. of Hours: 10**

Definitions of growth, measurement of microbial growth, Batch culture, Continuous culture, generation time and specific growth rate, synchronous growth, diauxic growth curve

Microbial growth in response to environment -Temperature (psychrophiles, mesophiles, thermophiles, extremophiles, thermodurics, psychrotrophs), pH (acidophiles, alkaliphiles), solute and water activity (halophiles, xerophiles, osmophilic), Oxygen (aerobic, anaerobic, microaerophilic, facultative aerobe, facultative anaerobe),barophilic.

Microbial growth in response to nutrition and energy – Autotroph/Phototroph, heterotrophy, Chemolithoautotroph, Chemolithoheterotroph, Chemoheterotroph, Chemolithotroph, photolithoautotroph, Photoorganoheterotroph.

Unit 2 Nutrient uptake and Transport **No. of Hours: 8**

Passive and facilitated diffusion

Primary and secondary active transport, concept of uniport, symport and antiport

Group translocation

Iron uptake

Unit 3 Chemoheterotrophic Metabolism - Aerobic Respiration **No. of Hours: 10**

Concept of aerobic respiration, anaerobic respiration and fermentation

Sugar degradation pathways i.e. EMP, ED, Pentose phosphate pathway

TCA cycle

Electron transport chain: components of respiratory chain, comparison of mitochondrial and bacterial ETC, electron transport phosphorylation, uncouplers and inhibitors

Unit 4 Chemoheterotrophic Metabolism- Anaerobic respiration and fermentation **No. of Hours: 6**

Anaerobic respiration with special reference to dissimilatory nitrate reduction (Denitrification; nitrate /nitrite and nitrate/ammonia respiration; fermentative nitrate reduction)

Fermentation - Alcohol fermentation and Pasteur effect; Lactate fermentation (homofermentative and heterofermentative pathways), concept of linear and branched fermentation pathways

Unit 5 Chemolithotrophic and Phototrophic Metabolism **No. of Hours: 10**

Introduction to aerobic and anaerobic chemolithotrophy with an example each. Hydrogen oxidation (definition and reaction) and methanogenesis (definition and reaction) Introduction to phototrophic metabolism - groups of phototrophic microorganisms,

anoxygenic*vs.* oxygenic photosynthesis with reference to photosynthesis in green bacteria, purple bacteria and cyanobacteria

Unit 6 Nitrogen Metabolism - an overview **No. of Hours: 6**

Introduction to biological nitrogen fixation

Ammonia assimilation

Assimilatory nitrate reduction, dissimilatory nitrate reduction, denitrification

CC-6: MICROBIAL PHYSIOLOGY AND METABOLISM (PRACTICAL)
SEMESTER –3
MCB-A-CC-3-6-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Study and plot the growth curve of *E. coli* by turbidometric and standard plate count methods.
2. Calculations of generation time and specific growth rate of bacteria from the graph plotted with the given data
3. Effect of temperature on growth of *E. coli*
4. Effect of pH on growth of *E. coli*
5. Effect of carbon and nitrogen sources on growth of *E.coli*
6. Effect of salt on growth of *E. coli*
7. Demonstration of alcoholic fermentation
8. Demonstration of the thermal death time and decimal reduction time of *E. coli.*

SUGGESTED READINGS

1. Madigan MT, and Martinko JM (2014). Brock Biology of Microorganisms. 14th edition. Prentice Hall International Inc.
2. Moat AG and Foster JW. (2002). Microbial Physiology. 4th edition. John Wiley & Sons
3. Reddy SR and Reddy SM. (2005). Microbial Physiology. Scientific Publishers India
4. Gottschalk G. (1986). Bacterial Metabolism. 2nd edition. Springer Verlag
6. Stanier RY, Ingrahm JI, Wheelis ML and Painter PR. (1987). General Microbiology. 5th edition, McMillan Press.
7. Willey JM, Sherwood LM, and Woolverton CJ. (2013). Prescott's Microbiology. 9th edition. McGraw Hill Higher Education.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
CC-7: MOLECULAR BIOLOGY (THEORY)
SEMESTER –3

MCB-A-CC-3-7-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Structures of DNA and RNA / Genetic Material **No. of Hours: 10**

DNA Structure: Miescher to Watson and Crick- historic perspective, DNA structure, Salient features of double helix, Types of DNA, Types of genetic material, denaturation and renaturation, cot curves. DNA topology - linking number, topoisomerases; Organization of DNA Prokaryotes,Viruses, Eukaryotes.RNA Structure, Organelle DNA -- mitochondria and chloroplast DNA.

Unit 2 Replication of DNA (Prokaryotes and Eukaryotes) **No. of Hours: 8**
Bidirectional and unidirectional replication, semi- conservative, semi- discontinuous replication
Mechanism of DNA replication: Enzymes and proteins involved in DNA replication –DNA polymerases, DNA ligase, primase, telomerase – for replication of linear ends
Various models of DNA replication including rolling circle, D- loop (mitochondrial), Θ (theta) mode of replication and other accessory protein, Mismatch and excision repair

Unit 3 Transcription in Prokaryotes and Eukaryotes **No. of Hours: 8**
Transcription: Definition, difference from replication, promoter - concept and strength of promoter RNA Polymerase and the transcription unit
Transcription in Eukaryotes: RNA polymerases, general Transcription factors

Unit 4 Post-Transcriptional Processing **No. of Hours: 6**
Split genes, concept of introns and exons, RNA splicing, spliceosome machinery**,** concept of alternative splicing, Polyadenylation and capping, Processing of rRNA, RNA interference: si RNA, miRNA and its significance

Unit 5 Translation (Prokaryotes and Eukaryotes) **No. of Hours: 8**
Translational machinery, Charging of tRNA, aminoacyltRNA synthetases, Mechanisms of initiation, elongation and termination of polypeptides in both prokaryotes and eukaryotes, Fidelity of translation, Inhibitors of protein synthesis in prokaryotes and eukaryote

Unit 6 Regulation of gene Expression in Prokaryotes and Eukaryotes **No. of Hours: 10**
Principles of transcriptional regulation, regulation at initiation with examples from *lac* and *trp* operons, Sporulation in *Bacillus,*Yeast mating type switching , Changes in Chromatin Structure - DNA methylation and Histone Acetylation mechanisms.

CC-7: MOLECULAR BIOLOGY (PRACTICAL)
SEMESTER –3
MCB-A-CC-3-7-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Study of different types of DNA and RNA using micrographs and model / schematic representations
2. Study of semi-conservative replication of DNA through micrographs / schematic representations
3. Isolation of genomic DNA from *E. coli*
4. Estimation of salmon sperm / calf thymus DNA using colorimeter (diphenylamine

reagent) or UV spectrophotometer (A_{260} measurement)
5. Estimation of RNA using colorimeter (orcinol reagent) or UV spectrophotometer (A_{260} measurement)
6. Resolution and visualization of DNA by Agarose Gel Electrophoresis.
7. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS-PAGE).

SUGGESTED READINGS

1. Watson JD, Baker TA, Bell SP, Gann A, Levine M and Losick R (2008) Molecular Biology of the Gene, 6th edition, Cold Spring Harbour Lab. Press, Pearson Publication
2. Becker WM, Kleinsmith LJ, Hardin J and Bertoni GP (2009) The World of the Cell, 7th edition, Pearson Benjamin Cummings Publishing, San Francisco
3. De Robertis EDP and De Robertis EMF (2006) Cell and Molecular Biology, 8th edition. Lippincott Williams and Wilkins, Philadelphia
4. Karp G (2010) Cell and Molecular Biology: Concepts and Experiments, 6th edition, John Wiley & Sons. Inc.
5. Sambrook J and Russell DW. (2001). Molecular Cloning: A Laboratory Manual. 4th Edition, Cold Spring Harbour Laboratory press.
6. Krebs J, Goldstein E, Kilpatrick S (2013). Lewin's Essential Genes, 3rd Ed., Jones and Bartlett Learning
7. Gardner EJ, Simmons MJ, Snustad DP (2008). Principles of Genetics. 8th Ed. Wiley-India

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
CC-8: MICROBIAL GENETICS (THEORY)
SEMESTER –4

MCB-A-CC-4-8-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Genome Organization and Mutations **No. of Hours: 14**

Genome organization: *E. coli, Saccharomyces, Tetrahymena*

Mutations and mutagenesis: Definition and types of Mutations; Physical and chemical mutagens; Molecular basis of mutations; Functional mutants (loss and gain of function mutants); Uses of mutations

Reversion and suppression: True revertants; Intra- and inter-genic suppression; Ames test; Mutator genes

Unit 2 Plasmids **No. of Hours: 8**

Types of plasmids – F plasmid, R Plasmids, colicinogenic plasmids, Ti plasmids, linear plasmids, yeast- 2 μ plasmid, Plasmid replication and partitioning, Host range, plasmid-incompatibility, plasmid amplification, Regulation of copy number, curing of plasmids

Unit 3 Mechanisms of Genetic Exchange Transformation - **No. of Hours: 10**

Discovery, mechanism of natural competence

Conjugation - Discovery, mechanism, Hfr and F' strains, Interrupted mating technique and time of entry mapping

Transduction - Generalized transduction, specialized transduction, LFT & HFT lysates, Mapping by recombination and co-transduction of markers

Unit 4 Phage Genetics **No. of Hours: 8**

Features of T4 genetics , Genetic basis of lytic *versus* lysogenic switch of phage lambda

Unit 5 Transposable elements **No. of Hours: 10**

Prokaryotic transposable elements – Insertion Sequences, composite and non-composite transposons, Replicative and Non replicative transposition, Mu transposon

Eukaryotic transposable elements - Yeast (Ty retrotransposon), Drosophila (P elements), Maize (Ac/Ds)

Uses of transposons and transposition

CC-8: MICROBIAL GENETICS (PRACTICAL)
SEMESTER –4

MCB-A-CC-4-8-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Preparation of Master and Replica Plates
2. Study the effect of chemical (HNO_2) and physical (UV) mutagens on bacterial cells
3. Study survival curve of bacteria after exposure to ultraviolet (UV) light
4. Isolation of Plasmid DNA from *E.coli*
5. Study different conformations of plasmid DNA through Agaraose gel electrophoresis.
6. Demonstration of Bacterial Conjugation
7. Demonstration of bacterial transformation and transduction
8. Demonstration of AMES test

SUGGESTED READING

1. Klug WS, Cummings MR, Spencer, C, Palladino, M (2011). Concepts of Genetics, 10th Ed., Benjamin Cummings
2. Krebs J, Goldstein E, Kilpatrick S (2013). Lewin's Essential Genes, 3rd Ed., Jones and Bartlett Learning
3. Pierce BA (2011) Genetics: A Conceptual Approach, 4th Ed., Macmillan Higher Education Learning
4. Watson JD, Baker TA, Bell SP et al. (2008) Molecular Biology of the Gene, 6th Ed., Benjamin Cummings
5. Gardner EJ, Simmons MJ, Snustad DP (2008). Principles of Genetics. 8th Ed. Wiley-India
6. Russell PJ. (2009). *i* Genetics- A Molecular Approach. 3rd Ed, Benjamin Cummings
7. Sambrook J and Russell DW. (2001). Molecular Cloning: A Laboratory Manual. 4th Edition, Cold Spring Harbour Laboratory press.
8. Maloy SR, Cronan JE and Friefelder D(2004) Microbial Genetics 2nd EDITION., Jones and Barlett Publishers

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
CC-9: ENVIRONMENTAL MICROBIOLOGY (THEORY)
SEMESTER –4

MCB-A-CC-4-9-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Microorganisms and their Habitats **No. of Hours: 10**

Structure and function of ecosystems
Terrestrial Environment: Soil profile and soil microflora
Aquatic Environment: Microflora of fresh water and marine habitats
Atmosphere: Aeromicroflora and dispersal of microbes
Animal Environment: Microbes in/on human body (Microbiomics) & animal (ruminants) body.
Extreme Habitats: Extremophiles: Microbes thriving at high & low temperatures, pH, high hydrostatic & osmotic pressures, salinity, & low nutrient levels. Microbial succession in decomposition of plant organic matter

Unit 2 Microbial Interactions **No. of Hours: 10**

Microbe interactions: Mutualism, synergism, commensalism, competition, amensalism, parasitism, predation
Microbe-Plant interaction: Symbiotic and non symbiotic interactions
Microbe-animal interaction: Microbes in ruminants, nematophagus fungi and symbiotic luminescent bacteria

Unit 3 Biogeochemical Cycling **No. of Hours: 10**

Carbon cycle: Microbial degradation of cellulose, hemicelluloses, lignin and chitin
Nitrogen cycle: Nitrogen fixation, ammonification, nitrification, denitrification and nitrate reduction
Phosphorus cycle: Phosphate immobilization and solubilisation
Sulphur cycle: Microbes involved in sulphur cycle
Other elemental cycles: Iron and manganese

Unit 4 Waste Management **No. of Hours: 10**

Solid Waste management: Sources and types of solid waste, Methods of solid waste disposal (composting and sanitary landfill)
Liquid waste management: Composition and strength of sewage (BOD and COD), Primary, secondary (oxidation ponds, trickling filter, activated sludge process and septic tank) and tertiary sewage treatment

Unit 5 Microbial Bioremediation **No. of Hours: 5**

Principles and degradation of common pesticides, organic (hydrocarbons, oil spills) and inroganic (metals) matter, biosurfactants

Unit 6 Water Potability **No. of Hours: 5**

Treatment and safety of drinking (potable) water, methods to detect potability of water samples: (a) standard qualitative procedure: presumptive test/MPN test, confirmed and completed tests for faecal coliforms (b) Membrane filter technique and (c) Presence/absence tests

CC-9: ENVIRONMENTAL MICROBIOLOGY (PRACTICAL)
SEMESTER –4
MCB-A-CC-4-9-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Analysis of soil - pH, moisture content, water holding capacity, percolation, capillary action.
2. Isolation of microbes (bacteria & fungi) from soil (28ºC & 45ºC).
3. Isolation of microbes (bacteria & fungi) from rhizosphere and rhizoplane.
4. Assessment of microbiological quality of water.
5. Determination of BOD of waste water sample.
6. Study the presence of microbial activity by detecting (qualitatively) enzymes (dehydrogenase, amylase, urease) in soil.
7. Isolation of *Rhizobium* from root nodules.

SUGGESTED READINGS

1. Atlas RM and Bartha R. (2000). Microbial Ecology: Fundamentals & Applications. 4th edition. Benjamin/Cummings Science Publishing, USA
2. Madigan MT, Martinko JM and Parker J. (2014). Brock Biology of Microorganisms. 14th edition. Pearson/ Benjamin Cummings
3. Maier RM, Pepper IL and Gerba CP. (2009). Environmental Microbiology. 2nd edition, Academic Press
4. Okafor, N (2011). Environmental Microbiology of Aquatic & Waste systems. 1st edition, Springer, New York
5. Singh A, Kuhad, RC & Ward OP (2009). Advances in Applied Bioremediation. Volume 17, Springer-Verlag, Berlin Hedeilberg
6. Barton LL & Northup DE (2011). Microbial Ecology. 1st edition, Wiley Blackwell, USA
Campbell RE. (1983). Microbial Ecology. Blackwell Scientific Publication, Oxford, England.
7. Coyne MS. (2001). Soil Microbiology: An Exploratory Approach. Delmar Thomson Learning.
8. Lynch JM &Hobbie JE. (1988). Microorganisms in Action: Concepts & Application in Microbial Ecology. Blackwell Scientific Publication, U.K.
9. Martin A. (1977). An Introduction to Soil Microbiology. 2nd edition. John Wiley & Sons Inc. New York & London.
10. Stolp H. (1988). Microbial Ecology: Organisms Habitats Activities. Cambridge University Press, Cambridge, England.
11. SubbaRao NS. (1999). Soil Microbiology. 4th edition. Oxford & IBH Publishing Co. New Delhi.
12. Willey JM, Sherwood LM, and Woolverton CJ. (2013). Prescott's Microbiology. 9th edition. McGraw Hill Higher Education.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
CC-10: RECOMBINANT DNA TECHNOLOGY (THEORY)
SEMESTER –4
MCB-A-CC-4-10-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Introduction to Genetic Engineering **No. of Hours: 2**

Milestones in genetic engineering and biotechnology

Unit 2 Molecular Cloning- Tools and Strategies **No. of Hours: 15**

Cloning Tools; Restriction modification systems: Types I, II and III. Mode of action, nomenclature, applications of Type II restriction enzymes in genetic engineering
DNA modifying enzymes and their applications: DNA polymerases. Terminal deoxynucleotidyl transferase, kinases and phosphatases, and DNA ligases Cloning Vectors: Definition and Properties
Plasmid vectors: pBR and pUC series
Bacteriophage lambda and M13 based vectors
Cosmids, BACs, YACs
Use of linkers and adaptors
Expression vectors: *E.coli* lac and T7 promoter-based vectors, yeast YIp, YEp and YCp vectors, Baculovirus based vectors, mammalian SV40-based expression vectors

Unit 3 Methods in Molecular Cloning **No. of Hours: 12**

Transformation of DNA: Chemical method, Electroporation,
Gene delivery: Microinjection, electroporation, biolistic method (gene gun), liposome and viral-mediated delivery, *Agrobacterium* - mediated delivery
DNA, RNA and Protein analysis: Agarose gel electrophoresis, Southern - and Northern - blotting techniques, dot blot, DNA microarray analysis, SDS-PAGE and Western blotting.

Unit4 DNA Amplification and DNA sequencing **No. of Hours: 9**

PCR: Basics of PCR, RT-PCR, Real-Time PCR
Sanger's method of DNA Sequencing: traditional and automated sequencing
Primer walking and shotgun sequencing

Unit 5 Construction and Screening of Genomic and cDNA libraries **No. of Hours: 6**

Genomic and cDNA libraries: Preparation and uses, Screening of libraries: Colony hybridization and colony PCR, Chromosome walking and chromosome jumping

Unit 6 Applications of Recombinant DNA Technology **No. of Hours: 6**

Products of recombinant DNA technology: Products of human therapeutic interest - insulin, hGH, antisense molecules. Bt transgenic - cotton, brinjal, Gene therapy, recombinant vaccines, protein engineering and site directed mutagensis

CC-10: RECOMBINANT DNA TECHNOLOGY (PRACTICAL)
SEMESTER –4
MCB-A-CC-4-10-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Preparation of competent cells for transformation
2. Demonstration of Bacterial Transformation and calculation of transformation efficiency.
3. Digestion of DNA using restriction enzymes and analysis by agarose gel electrophoresis
4. Ligation of DNA fragments
5. Cloning of DNA insert and Blue white screening of recombinants.
6. Interpretation of sequencing gel electropherograms
7. Designing of primers for DNA amplification
8. Amplification of DNA by PCR
9. Demonstration of Southern blotting

SUGGESTED READING

1. Brown TA. (2010). Gene Cloning and DNA Analysis. 6th edition. Blackwell Publishing, Oxford, U.K.
2. Clark DP and Pazdernik NJ. (2009). Biotechnology: Applying the Genetic Revolution. Elsevier Academic Press, USA
3. Primrose SB and Twyman RM. (2006). Principles of Gene Manipulation and Genomics, 7th edition. Blackwell Publishing, Oxford, U.K.
4. Sambrook J and Russell D. (2001). Molecular Cloning-A Laboratory Manual. 3rd edition. Cold Spring Harbor Laboratory Press
5. Wiley JM, Sherwood LM and Woolverton CJ. (2008). Prescott, Harley and Klein's Microbiology. McGraw Hill Higher Education
6. Brown TA. (2007). Genomes-3. Garland Science Publishers
7. Primrose SB and Twyman RM. (2008). Genomics: Applications in human biology. Blackwell Publishing, Oxford, U.K.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
CC-11: FOOD AND DAIRY MICROBIOLOGY (THEORY)
SEMESTER –5
MCB-A-CC-5-11-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Foods as a substrate for microorganisms **No. of Hours: 6**
Intrinsic and extrinsic factors that affect growth and survival of microbes in foods, natural flora and source of contamination of foods in general.

Unit 2 Microbial spoilage of various foods **No. of Hours: 8**
Principles, Spoilage of vegetables, fruits, meat, eggs, milk and butter, bread, canned Foods

Unit 3 Principles and methods of food preservation **No. of Hours: 8**
Principles, physical methods of food preservation: temperature (low, high, canning, drying), irradiation, hydrostatic pressure, high voltage pulse, microwave processing and aseptic packaging, chemical methods of food preservation: salt, sugar, organic acids, SO2, nitrite and nitrates, ethylene oxide, antibiotics and bacteriocins

Unit 4 Fermented foods **No. of Hours: 8**
Dairy starter cultures, fermented dairy products: yogurt, acidophilus milk, kumiss, kefir, dahi and cheese, other fermented foods: dosa, sauerkraut, soy sauce and tampeh, Probiotics: Health benefits, types of microorganisms used, probiotic foods available in market.

Unit 5 Food borne diseases (causative agents, foods involved, symptoms and preventive measures) **No. of Hours: 10**
Food intoxications: *Staphylococcus aureus*, *Clostridium botulinum* and mycotoxins;
Food infections: *Bacillus cereus*, *Vibrio parahaemolyticus*, *Escherichia coli*, Salmonellosis, Shigellosis, *Yersinia enterocolitica*, *Listeria monocytogenes* and *Campylobacter jejuni*

Unit 6 Food sanitation and control **No. of Hours: 5**
HACCP, Indices of food sanitary quality and sanitizers

Unit 7 Cultural and rapid detection methods of food borne pathogens in foods and introduction to predictive microbiology. **No. of Hours: 5**

C-11: FOOD AND DAIRY MICROBIOLOGY (PRACTICAL)
SEMESTER –5
MCB-A-CC-5-11-P

TOTAL HOURS: 60 **CREDITS: 2**

1. MBRT of milk samples and their standard plate count.
2. Alkaline phosphatase test to check the efficiency of pasteurization of milk.
3. Isolation of any food borne bacteria from food products.
4. Isolation of spoilage microorganisms from spoiled vegetables/fruits.
5. Isolation of spoilage microorganisms from bread.
6. Preparation of Yogurt/Dahi.

SUGGESTED READINGS

1. Adams MR and Moss MO. (1995). Food Microbiology. 4th edition, New Age International (P) Limited Publishers, New Delhi, India.
2. Banwart JM. (1987). Basic Food Microbiology. 1st edition. CBS Publishers and Distributors, Delhi, India.
3. Davidson PM and Brannen AL. (1993). Antimicrobials in Foods. Marcel Dekker, New York.
4. Dillion VM and Board RG. (1996). Natural Antimicrobial Systems and Food Preservation. CAB International, Wallingford, Oxon.
5. Frazier WC and Westhoff DC. (1992). Food Microbiology. 3rd edition. Tata McGraw-Hill Publishing Company Ltd, New Delhi, India.
6. Gould GW. (1995). New Methods of Food Preservation. Blackie Academic and Professional, London.
7. Jay JM, Loessner MJ and Golden DA. (2005). Modern Food Microbiology. 7^{th} edition, CBS Publishers and Distributors, Delhi, India.
8. Lund BM, Baird Parker AC, and Gould GW. (2000). The Microbiological Safety and Quality of Foods. Vol. 1-2, ASPEN Publication, Gaithersberg, MD.
9. Tortora GJ, Funke BR, and Case CL. (2008). Microbiology: An Introduction. 9^{th} edition. Pearson Education.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
CC-12: INDUSTRIAL MICROBIOLOGY (THEORY)
SEMESTER –5

MCB-A-CC-5-12-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Introduction to industrial microbiology **No. of Hours: 2**
Brief history and developments in industrial microbiology

Unit 2 Isolation of industrially important microbial strains and fermentation media
No. of Hours: 10
Sources of industrially important microbes and methods for their isolation, preservation and maintenance of industrial strains, strain improvement, Crude and synthetic media; molasses, corn-steep liquor, sulphite waste liquor, whey, yeast extract and protein hydrolysates

Unit 3 Types of fermentation processes, bio-reactors and measurement of fermentation parametersNo. of Hours: 12
Types of fermentation processes - Solid-state and liquid-state (stationary and submerged) fermentations; batch, fed-batch (eg. baker's yeast) and continuous fermentations
Components of a typical bio-reactor, Types of bioreactors-Laboratory, pilot- scale and production fermenters, constantly stirred tank and air-lift fermenters, Measurement and control of fermentation parameters - pH, temperature, dissolved oxygen, foaming and aeration

Unit 4 Down-stream processing **No. of Hours: 6**
Cell disruption, filtration, centrifugation, solvent extraction, precipitation, lyophilization and spray drying

Unit 5 Microbial production of industrial products (micro-organisms involved, media, fermentation conditions, downstream processing and uses) **No. of Hours: 18**

Citric acid, ethanol, penicillin, glutamic acid, Vitamin B12 Enzymes (amylase, protease, lipase)

Wine, beer

Unit 6 Enzyme immobilization **No. of Hours: 4**
Methods of immobilization, advantages and applications of immobilization, large scale applications of immobilized enzymes (glucose isomerase and penicillin acylase)

CC-12: INDUSTRIAL MICROBIOLOGY (PRACTICAL)
SEMESTER –5

MCB-A-CC-5-12-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Study different parts of fermenter
2. Microbial fermentations for the production and estimation (qualitative and quantitative) of:
   (a) Enzymes: Amylase and Protease
   (b) Amino acid: Glutamic acid
   (c) Organic acid: Citric acid
   (d) Alcohol: Ethanol
3. A visit to any educational institute/industry to see an industrial fermenter, and other downstream processing operations.

SUGGESTED READINGS

1. Patel A.H. (1996). Industrial Microbiology. 1st edition, Macmillan India Limited
2. Okafor N. (2007). Modern Industrial Microbiology and Biotechnology. 1st edition. Bios Scientific Publishers Limited. USA
3. Waites M.J., Morgan N.L., Rockey J.S. and Higton G. (2001). Industrial Microbiology: An Introduction. 1st edition. Wiley – Blackwell
4. Glaze A.N. and Nikaido H. (1995). Microbial Biotechnology: Fundamentals of Applied Microbiology. 1st edition. W.H. Freeman and Company
5. Casida LE. (1991). Industrial Microbiology. 1st edition. Wiley Eastern Limited.
6. Crueger W and Crueger A. (2000). Biotechnology: A textbook of Industrial Microbiology. 2nd edition. Panima Publishing Co. New Delhi.
7. Stanbury PF, Whitaker A and Hall SJ. (2006). Principles of Fermentation Technology. 2nd edition, Elsevier Science Ltd.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
CC-13: IMMUNOLOGY (THEORY)
SEMESTER –6

MCB-A-CC-6-13-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Introduction **No. of Hours: 2**
Concept of Innate and Adaptive immunity; Contributions of following scientists to the development of field of immunology - Edward Jenner, Karl Landsteiner, Robert Koch, Paul Ehrlich, Elie Metchnikoff, Peter Medawar, MacFarlane Burnet, Neils K Jerne, Rodney Porter and Susumu Tonegawa

Unit 2 Immune Cells and Organs **No. of Hours: 6**
Structure, Functions and Properties of: Immune Cells – Stem cell, T cell, B cell, NK cell, Macrophage, Neutrophil, Eosinophil, Basophil, Mast cell, Dendritic cell; and Immune Organs – Bone Marrow, Thymus, Lymph Node, Spleen, GALT, MALT, CALT

Unit 3 Antigens **No. of Hours: 4**
Characteristics of an antigen (Foreignness, Molecular size and Heterogeneity); Haptens; Epitopes (T & B cell epitopes); T-dependent and T-independent antigens; Adjuvants

Unit 4 Antibodies **No. of Hours: 6**
Structure, Types, Functions and Properties of antibodies; Antigenic determinants on antibodies (Isotypic, allotypic, idiotypic); VDJ rearrangements; Monoclonal and Chimeric antibodies

Unit 5 Major Histocompatibility Complex **No. of Hours: 4**
Organization of MHC locus (Mice & Human); Structure and Functions of MHC I & II molecules; Antigen processing and presentation (Cytosolic and Endocytic pathways)

Unit 6 Complement System **No. of Hours: 2**
Components of the Complement system; Activation pathways (Classical, Alternative and Lectin pathways); Biological consequences of complement Activation

Unit 7 Generation of Immune Response **No. of Hours: 8**
Primary and Secondary Immune Response; Generation of Humoral Immune Response (Plasma and Memory cells); Generation of Cell Mediated Immune Response (Self MHC restriction, T cell activation, Co- stimulatory signals); Killing Mechanisms by CTL and NK cells, Introduction to tolerance

Unit 8 Immunological Disorders and Tumor Immunity **No. of Hours: 8**
Types of Autoimmunity and Hypersensitivity with examples; Immunodeficiencies - Animal models (Nude and SCID mice), SCID, DiGeorge syndrome, Chediak- Higashi syndrome, Leukocyte adhesion deficiency, CGD; Types of tumors, tumor Antigens, causes and therapy for cancers.

Unit 9 Immunological Techniques **No. of Hours: 10**
Principles of Precipitation, Agglutination, Immunodiffusion, Immunoelectrophoresis, ELISA, ELISPOT, Western blotting, Immunofluoresence, Flow cytometry, Immunoelectron microscopy.

CC-13: IMMUNOLOGY (PRACTICAL)
SEMESTER –6
MCB-A-CC-6-13-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Identification of human blood groups.
2. Perform Total Leukocyte Count of the given blood sample.
3. Perform Differential Leukocyte Count of the given blood sample.
4. Separate serum from the blood sample (demonstration).
5. Perform immunodiffusion by Ouchterlony method.
6. Perform DOT ELISA.
7. Perform immunoelectrophoresis.

SUGGESTED READINGS

1. Abbas AK, Lichtman AH, Pillai S. (2007). Cellular and Molecular Immunology. 6th edition Saunders Publication, Philadelphia.
2. Delves P, Martin S, Burton D, Roitt IM. (2006). Roitt's Essential Immunology.11th edition Wiley-Blackwell Scientific Publication, Oxford.
3. Goldsby RA, Kindt TJ, Osborne BA. (2007). Kuby's Immunology. 6th edition W.H. Freeman and Company, New York.
4. Murphy K, Travers P, Walport M. (2008). Janeway'sImmunobiology. 7th edition Garland Science Publishers, New York.
5. PeakmanM, and Vergani D. (2009). Basic and Clinical Immunology. 2nd edition Churchill Livingstone Publishers, Edinberg.
6. Richard C and Geiffrey S. (2009). Immunology. 6th edition. Wiley Blackwell Publication.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
CC-14: MEDICAL MICROBIOLOGY (THEORY)
SEMESTER –6
MCB-A-CC-6-14-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Normal microflora of the human body and host pathogen interaction
No. of Hours: 7

Normal microflora of the human body: Importance of normal microflora, normal microflora of skin, throat, gastrointestinal tract, urogenital tract
Host pathogen interaction: Definitions - Infection, Invasion, Pathogen, Pathogenicity, Virulence, Toxigenicity, Carriers and their types, Opportunistic infections, Nosocomial infections. Transmission of infection, Pathophysiologic effects of LPS

Unit 2 Sample collection, transport and diagnosis **No. of Hours: 5**

Collection, transport and culturing of clinical samples, principles of different diagnostic tests (ELISA, Immunofluorescence, Agglutination based tests,Complement fixation, PCR, DNA probes).

Unit 3 Bacterial diseases **No. of Hours: 10**

List of diseases of various organ systems and their causative agents. The following diseases in detail with Symptoms, mode of transmission, prophylaxis and control
Respiratory Diseases: *Streptococcus pyogenes, Haemophilusinfluenzae, Mycobacterium tuberculosis*
Gastrointestinal Diseases: *Escherichia coli, Salmonella typhi, Vibrio cholerae, Helicobacter pylori*
Others: *Staphylococcus aureus, Bacillus anthracis, Clostridium tetani, Treponemapallidum,Clostridium difficie*

Unit 4 Viral diseases **No. of Hours: 10**

List of diseases of various organ systems and their causative agents. The following diseases in detail with Symptoms, mode of transmission, prophylaxis and control
Polio, Herpes, Hepatitis, Rabies, Dengue, AIDS, Influenza with brief description of swine flu, Ebola, Chikungunya, Japanese Encephalitis

Unit 5 Protozoan diseases **No. of Hours: 5**

List of diseases of various organ systems and their causative agents. The following diseases in detail with Symptoms, mode of transmission, prophylaxis and control Malaria, Kala-azar

Unit 6 Fungal diseases **No. of Hours: 5**

Brief description of each of the following types of mycoses and one representative disease to be studied with respect to transmission, symptoms and prevention
Cutaneous mycoses: Tineapedis (Athlete's foot)
Systemic mycoses: Histoplasmosis
Opportunistic mycoses: Candidiasis

Unit 7 Antimicrobial agents: General characteristics and mode of action **No. of Hours: 8**

Antibacterial agents: Five modes of action with one example each: Inhibitor of nucleic acid synthesis; Inhibitor of cell wall synthesis; Inhibitor of cell membrane function; Inhibitor of protein synthesis; Inhibitor of metabolism
Antifungal agents: Mechanism of action of Amphotericin B, Griseofulvin
Antiviral agents: Mechanism of action of Amantadine, Acyclovir, Azidothymidine Antibiotic resistance, MDR, XDR, MRSA, NDM-1

CC-14: MEDICAL MICROBIOLOGY (PRACTICAL)
SEMESTER –6
MCB-A-CC-6-14-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Identify bacteria (any three of *E. coli, Salmonella, Pseudomonas, Staphylococcus, Bacillus*) using laboratory strains on the basis of cultural, morphological and biochemical characteristics: IMViC, TSI, nitrate reduction, urease production and catalase tests
2. Study of composition and use of important differential media for identification of bacteria: EMB Agar, McConkey agar, Mannitol salt agar, Deoxycholate citrate agar, TCBS
3. Study of bacterial flora of skin by swab method
4. Perform antibacterial sensitivity by Kirby-Bauer method
5. Determination of minimal inhibitory concentration (MIC) of an antibiotic.
6. Study symptoms of the diseases with the help of photographs: Polio, anthrax, herpes, chicken pox, HPV warts, AIDS (candidiasis), dermatomycoses (ring worms)
7. Study of various stages of malarial parasite in RBCs using permanent mounts.

SUGGESTED READING

1. Ananthanarayan R. and Paniker C.K.J. (2009) Textbook of Microbiology. 8th edition, University Press Publication
2. Brooks G.F., Carroll K.C., Butel J.S., Morse S.A. and Mietzner, T.A. (2013) Jawetz, Melnick and Adelberg's Medical Microbiology. 26th edition. McGraw Hill Publication
3. Goering R., Dockrell H., Zuckerman M. and Wakelin D. (2007) Mims' Medical Microbiology. 4th edition. Elsevier
4. Willey JM, Sherwood LM, and Woolverton CJ. (2013) Prescott, Harley and Klein's Microbiology. 9th edition. McGraw Hill Higher Education
5. Madigan MT, Martinko JM, Dunlap PV and Clark DP. (2014). Brock Biology of Microorganisms. 14th edition.Pearson International Edition.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)

DSE-A:

1. MICROBIAL BIOTECHNOLOGY (THEORY)

SEMESTER –5

MCB-A-DSE-A-5-1-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Microbial Biotechnology and its Applications **No. of Hours: 8**

Microbial biotechnology: Scope and its applications in human therapeutics, agriculture (Biofertilizers, PGPR, Mycorrhizae), environmental, and food technology

Use of prokaryotic and eukaryotic microorganisms in biotechnological applications

Genetically engineered microbes for industrial application: Bacteria and yeast

Unit 2 Therapeutic and Industrial Biotechnology **No. of Hours: 8**

Recombinant microbial production processes in pharmaceutical industries - Streptokinase, recombinant vaccines (Hepatitis B vaccine)

Microbial polysaccharides and polyesters, Microbial production of bio-pesticides, bioplastics Microbial biosensors

Unit 3 Applications of Microbes in **No. of Hours: 6**

BiotransformationsMicrobial based transformation of steroids and sterols

Bio-catalytic processes and their industrial applications: Production of high fructose syrup and production of cocoa butter substitute

Unit 4 Microbial Products and their Recovery **No. of Hours: 8**

Microbial product purification: filtration, ion exchange & affinity chromatography techniques

Immobilization methods and their application: Whole cell immobilization

Unit 5 Microbes for Bio-energy and Environment **No. of Hours: 10**

Bio-ethanol and bio-diesel production: commercial production from lignocellulosic waste and algal biomass, Biogas production: Methane and hydrogen production using microbial culture.

Microorganisms in bioremediation: Degradation of xenobiotics, mineral recovery, removal of heavy metals from aqueous effluents

Unit 6 RNAiNo. of Hours: 6

RNAi and its applications in silencing genes, drug resistance, therapeutics and host pathogen interactions

Unit 7 Intellectual Property Rights **No. of Hours: 4**

Patents, Copyrights, Trademarks

DSE-A: 1. MICROBIAL BIOTECHNOLOGY (PRACTICAL)

SEMESTER –5

MCB-A-DSE-A-5-1-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Study yeast cell immobilization in calcium alginate gels
2. Study enzyme immobilization by sodium alginate method
3. Pigment production from fungi (*Trichoderma* / *Aspergillus* / *Penicillium*)
4. Isolation of xylanase or lipase producing bacteria
5. Study of algal Single Cell Proteins

SUGGESTED READING

1. Ratledge, C and Kristiansen, B. (2001). Basic Biotechnology, 2nd Edition, Cambridge University Press.
2. Demain, A. L and Davies, J. E. (1999). Manual of Industrial Microbiology and Biotechnology, 2nd Edition, ASM Press.
3. Swartz, J. R. (2001). Advances in Escherichia coli production of therapeutic proteins. Current Opinion in Biotechnology, 12, 195–201.
4. Prescott, Harley and Klein's Microbiology by Willey JM, Sherwood LM, Woolverton CJ (2014), 9th edition, McGraw Hill Publishers.
5. Gupta PK (2009) Elements of Biotechnology 2nd edition, Rastogi Publications,
6. Glazer AN and Nikaido H (2007) Microbial Biotechnology, 2nd edition, Cambridge University Press
7. Glick BR, Pasternak JJ, and Patten CL (2010) Molecular Biotechnology 4th edition, ASM Press,
8. Stanbury PF, Whitaker A, Hall SJ (1995) Principles of Fermentation Technology 2nd edition., Elsevier Science
9. Crueger W, Crueger A (1990) Biotechnology: A text Book of Industrial Microbiology 2nd edition Sinauer associates, Inc.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE) DSE-A:
2. ADVANCES IN MICROBIOLOGY (THEORY)
SEMESTER –5

MCB-A-DSE-A-5-2-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Evolution of Microbial Genomes **No. of Hours: 10**

Salient features of sequenced microbial genomes, core genome pool, flexible genome pool and concept of pangenome, Horizontal gene transfer (HGT), Evolution of bacterial virulence - Genomic islands, Pathogenicity islands (PAI) and their characteristics

Unit 2 Metagenomics **No. of Hours: 15**

Brief history and development of metagenomics, Understanding bacterial diversity using metagenomics approach, Prospecting genes of biotechnological importance using metagenomics Basic knowledge of viral metagenome, metatranscriptomics, metaproteomics and metabolomics.

Unit 3 Molecular Basis of Host-Microbe Interactions **No. of Hours: 15**

Epiphytic fitness and its mechanism in plant pathogens, Hypersensitive response (HR) to plant pathogens and its mechanism, Type three secretion systems (TTSS) of plant and animal pathogens, Biofilms: types of microorganisms, molecular aspects and significance in environment, health care, virulence and antimicrobial resistance

Unit 4 Systems and Synthetic Biology **No. of Hours: 10**

Networking in biological systems, Quorum sensing in bacteria, Co-ordinated regulation of bacterial virulence factors, Basics of synthesis of poliovirus in laboratory, Future implications of synthetic biology with respect to bacteria and viruses

DSE-A: 2.ADVANCES IN MICROBIOLOGY (PRACTICAL)
SEMESTER –5
MCB-A-DSE-A-5-2-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Extraction of metagenomic DNA from soil
2. Understand the impediments in extracting metagenomic DNA from soil
3. PCR amplification of metagenomic DNA using universal 16s ribosomal gene primers
4. Case study to understand how the poliovirus genome was synthesized in the laboratory
5. Case study to understand how networking of metabolic pathways in bacteria takes place

SUGGESTED READING

1. Fraser CM, Read TD and Nelson KE. Microbial Genomes, 2004, Humana Press
2. Miller RV and Day MJ. Microbial Evolution- Gene establishment, survival and exchange, 2004, ASM Press
3. Bull AT. Microbial Diversity and Bioprospecting, 2004, ASM Press
4. Sangdun C. Introduction to Systems Biology, 2007, Humana Press
5. Klipp E, Liebermeister W. Systems Biology – A Textbook, 2009, Wiley –VCH Verlag
6. Caetano-Anolles G. Evolutionary Genomics and Systems Biology, 2010, John Wiley and Sons
7. Madigan MT, Martink JM, Dunlap PV and Clark DP (2014) Brook's Biology of Microorganisms, 14th edition, Pearson-Bejamin Cummings
8. Wilson BA, Salyers AA Whitt DD and Winkler ME (2011)Bacterial Pathogenesis- A molecular Approach, 3rd edition, ASM Press,
9. Bouarab K, Brisson and Daayf F (2009) Molecular Plant-Microbe interaction CAB International
10. Voit EO (2012) A First Course in Systems Biology, Istedition,Garland Science

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
DSE-A:
3. PLANT PATHOLOGY (THEORY)
SEMESTER –5

MCB-A-DSE-A-5-3-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Introduction and History of plant pathology **No. of Hours: 5**

Concept of plant disease- definitions of disease, disease cycle & pathogenicity, symptoms associated with microbial plant diseases, types of plant pathogens, economic losses and social impact of plant diseases. Significant landmarks in the field of plant pathology- Contributions of Anton DeBary, Millardet, Burrill, E. Smith, Adolph Mayer, Ivanowski, Diener, Stakman, H.H. Flor, Van Der Plank, molecular Koch's postulates. Contributions of eminent Indian plant pathologists.

Unit 2 Stages in development of a disease **No. of Hours: 2**

Infection, invasion, colonization, dissemination of pathogens and perennation.

Unit 3 Plant disease epidemiology **No. of Hours: 5**

Concepts of monocyclic, polycyclic and polyetic diseases, disease triangle & disease pyramid, forecasting of plant diseases and its relevance in Indian context.

Unit 4 Host Pathogen Interaction **No. of Hours: 15**

A. *Microbial Pathogenicity*
Virulence factors of pathogens: enzymes, toxins (host specific and non specific) growth regulators, virulence factors in viruses (replicase, coat protein, silencing suppressors) in disease development. Effects of pathogens on host physiological processes (photosynthesis, respiration, cell membrane permeability, translocation of water and nutrients, plant growth and reproduction). B. *Genetics of Plant Diseases*
Concept of resistance (R) gene and avirulence (avr) gene; gene for gene hypothesis, types of plant resistance: true resistance– horizontal & vertical, apparent resistance. C. *Defense Mechanisms in Plants*
Concepts of constitutive defense mechanisms in plants, inducible structural defenses (histological-cork layer, abscission layer, tyloses, gums), inducible biochemical defenses [hypersensitive response (HR), systemic acquired resistance (SAR), phytoalexins, pathogenesis related (PR) proteins, plantibodies, phenolics, quinones, oxidative bursts].

Unit 5 Control of Plant Diseases **No. of Hours: 8**

Principles & practices involved in the management of plant diseases by different methods, *viz.*
regulatory - quarantine, crop certification, avoidance of pathogen, use of pathogen free propagative material
cultural - host eradication, crop rotation, sanitation, polyethylene traps and mulches chemical - protectants and systemic fungicides, antibiotics, resistance of pathogens to chemicals.
biological - suppressive soils, antagonistic microbes-bacteria and fungi, trap plants
genetic engineering of disease resistant plants- with plant derived genes and pathogen derived genes

Unit 6 Specific Plant diseases **No. of Hours: 15**

Study of some important plant diseases giving emphasis on its etiological agent, symptoms, epidemiology and control
A. Important diseases caused by fungi
White rust of crucifers - *Albugo candida*
Downy mildew of onion - *Peronospora destructor*
Late blight of potato - *Phytophthorainfestans*
Powdery mildew of wheat - *Erysiphegraminis*
Ergot of rye - *Clavicepspurpurea*

Black stem rust of wheat - *Pucciniagraministritici*
Loose smut of wheat - *Ustilagonuda*
Wilt of tomato - *Fusariumoxysporum*f.sp. *lycopersici*
Red rot of sugarcane - *Colletotrichumfalcatum*
Early blight of potato - *Alternariasolani*
B. Important diseases caused by phytopathogenic bacteria: Angular leaf spot of cotton, bacterial leaf blight of rice, crown galls, bacterial cankers of citrus
C. Important diseases caused by phytoplasmas: Aster yellow, citrus stubborn
D. Important diseases caused by viruses: Papaya ring spot, tomato yellow leaf curl, banana bunchy top, rice tungro
E. Important diseases caused by viroids: Potato spindle tuber, coconut cadangcadang

DSE-A:
3.PLANT PATHOLOGY (PRACTICAL)
SEMESTER –5
MCB-A-DSE-A-5-3-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Demonstration of Koch's postulates in fungal, bacterial and viral plant pathogens.
2. Study of important diseases of crop plants by cutting sections of infected plant material - *Albugo,Puccinia,Ustilago, Fusarium, Colletotrichum.*

SUGGESTED READINGS

1. Agrios GN. (2006). Plant Pathology. 5th edition. Academic press, San Diego,
2. Lucas JA. (1998). Plant Pathology and Plant Pathogens. 3rd edition. Blackwell Science, Oxford.
3. Mehrotra RS. (1994). Plant Pathology. Tata McGraw-Hill Limited.
4. Rangaswami G. (2005). Diseases of Crop Plants in India. 4th edition. Prentice Hall of India Pvt. Ltd., New Delhi.
5. Singh RS. (1998). Plant Diseases Management. 7th edition. Oxford & IBH, New Delhi.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
DSE-A:
4. BIOMATHEMATICS AND BIOSTATISTICS (THEORY)
SEMESTER –5

MCB-A-DSE-A-5-4-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Biomathematics **No of Hours: 25**

Sets. Functions and their graphs : polynomial, sine, cosine, exponential and logarithmic functions. Motivation and illustration for these functions through projectile motion, simple pendulum, biological rhythms, cell division, muscular fibres etc.
Simple observations about these functions like increasing, decreasing and, periodicity.
Sequences to be introduced through the examples arising in Science beginning with finite sequences, followed by concepts of recursion and difference equations.For instance, the Fibonacci sequence arising from branching habit of trees and breeding habit of rabbits.Intuitive idea of algebraic relationships and convergence.
Infinite Geometric Series.Series formulas for ex, log (1+x), sin x, cos x. Step function.Intuitive idea of discontinuity, continuity and limits.
Differentiation.Conception to be motivated through simple concrete examples as given above from Biological and Physical Sciences.Use of methods of differentiation like Chain rule, Product rule and Quotient rule. Second order derivatives of above functions. Integration as reverse process of differentiation.
Integrals of the functions introduced above. Differential Equations of first order, Linear Differential Equations.
Points in plane and space and coordinate form.Examples of matrices arising in Biological Sciences and Biological networks. Sum and Produce of matrices upto order 3.

Unit 2 Biostatistics **No of Hours: 25**

Measures of central tendency, Measures of dispersion; skewness, kurtosis; Elementary Probability and basic laws; Discrete and Continuous Random variable, Mathematical Expectation; Curve Fitting; Correlation and Regression. Emphasis on examples from Biological Sciences;
Mean and Variance of Discrete and Continuous Distributions namely Binomial, Poisson, Geometric, Weibull, Logistic and Normal distribution. Fitting of Distributions;
Statistical methods: Scope of statistics: utility and misuse. Principles of statistical analysis of biological data.Sampling parameters.Difference between sample and Population, Sampling Errors,Censoring, difference between parametric and non-parametric statistics;
Sampling Distributions, Standard Error, Testing of Hypothesis, Level of Significance and Degree of Freedom;
Large Sample Test based on Normal Distribution, Small sample test based on t-test, Z- test and F test; Confidence Interval; Distribution-free test - Chi-square test;Basic introduction to Multivariate statistics, etc.

DSE-A:

4. BIOMATHEMATICS AND BIOSTATISTICS (PRACTICAL)

SEMESTER –5

MCB-A-DSE-A-5-4-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Word Problems based on Differential Equations
2. Mean, Median, Mode from grouped and ungrouped Data set
3. Standard Deviation and Coefficient of Variation
4. Skewness and Kurtosis
5. Curve fitting
6. Correlation
7. Regression
8. Finding area under the curve using normal probability
9. Testing of Hypothesis- Normal Distribution, t-test and Chi-Square-test
10. Confidence Interval

SUGGESTED READINGS

1. H. S. Bear: Understanding Calculus, John Wiley and Sons (Second Edition); 2003.
2. E. Batschelet : Introduction to Mathematics for Life Scientists,SpringerVerlag, International Student Edition, Narosa Publishing House, New Delhi (1971, 1975)
3. A. Edmondson and D. Druce : Advanced Biology Statistics, Oxford University Press; 1996.
4. W. Danial : Biostatistics : A foundation for Analysis in Health Sciences, John Wiley and Sons Inc; 2004.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE) DSE-B:
1. INHERITANCE BIOLOGY (THEORY)
SEMESTER 6

MCB-A-DSE-B-6-1-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Introduction to Genetics **No. of Hours: 5**

Historical developments

Model organisms in genetic analyses and experimentation: *Escherichia coli, Saccharomycescerevisiae, Neurospora crassa, Caenorhabditiselegans Drosophila melanogaster, Arabidopsis thaliana*

Unit 2 Mendelian Principles **No. of Hours: 8**

Mendel's Laws: Dominance, segregation, independent assortment, deviation from Mendelian inheritance, Rediscovery of Mendel's principles, Chromosome theory of inheritance: Allele, multiple alleles, pseudoallele, complementation tests, Extensions of Mendelian genetics: Allelic interactions, concept of dominance, recessiveness, Incomplete dominance and co-dominance, Multiple alleles, Epistasis, penetrance and expressivity

Unit 3 Linkage and Crossing over **No. of Hours: 6**

Linkage and recombination of genes, Cytological basis of crossing over, Crossing over at four-strand stage, Molecular mechanism of crossing over, mapping

Unit 4 Extra-Chromosomal Inheritance **No. of Hours: 7**

Rules of extra nuclear inheritance, Organelle heredity - Chloroplast mutations in *Chlamydomonas*, mitochondrial, mutations in *Saccharomyces*, Maternal effects – Shell coiling in *Limnaeaperegra* Infectious heredity - Kappa particles in *Paramecium*

Unit 5 Characteristics of Chromosomes **No. of Hours: 15**

Structural organization of chromosomes - centromeres, telomeres and repetitive DNA, Packaging DNA molecules into chromosomes, Concept of euchromatin and heterochromatin, Normal and abnormal karyotypes of human chromosomes, Chromosome banding, Giant chromosomes: Polytene and lampbrush chromosomes, Variations in chromosome structure: Deletion, duplication, inversion and translocation, Variation in chromosomal number and structural abnormalities - Klinefelter syndrome, Turner syndrome, Down syndrome

Unit 6 Recombination **No. of Hours: 3**

Homologous and non-homologous recombination, including transposition, site-specific recombination.

Unit 7 Human genetics **No. of Hours: 3**

Pedigree analysis, lod score for linkage testing, karyotypes, genetic disorders.

Unit 8 Quantitative genetics **No. of Hours: 3**

Polygenic inheritance, heritability and its measurements, QTL mapping.

DSE-B:

1. INHERITANCE BIOLOGY (PRACTICAL)

SEMESTER –6

MCB-A-DSE-B-6-1-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Mendelian deviations in dihybrid crosses
2. Studying Barr Body with the temporary mount of human cheek cells
3. Studying *Rhoeo* translocation with the help of photographs
4. Karyotyping with the help of photographs
5. Chi-Square Analysis
6. Study of polytene chromosomes using temporary mounts of salivary glands of *Chiromonas /Drosophila* larvae
7. Study of pedigree analysis
8. Analysis of a representative quantitative trait

SUGGESTED READING

1. Gardner EJ, Simmons MJ, Snustad DP (2008). Principles of Genetics. 8th Ed. Wiley-India
2. Snustad DP, Simmons MJ (2011). Principles of Genetics. 6th Ed. John Wiley and Sons Inc.
3. Weaver RF, Hedrick PW (1997). Genetics. 3rd Ed. McGraw-Hill Education
4. Klug WS, Cummings MR, Spencer CA, Palladino M (2012). Concepts of Genetics. 10th Ed. Benjamin Cummings
5. Griffith AJF, Wessler SR, Lewontin RC, Carroll SB. (2007). Introduction to Genetic Analysis. 9th Ed. W.H.Freeman and Co., New York
6. Hartl DL, Jones EW (2009). Genetics: Analysis of Genes and Genomes. 7th Ed, Jones and Bartlett Publishers
7. Russell PJ. (2009). *i* Genetics - A Molecular Approach. 3rd Ed, Benjamin Cummings

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
DSE-B:
2. MICROBES IN SUSTAINABLE AGRICULTURE AND DEVELOPMENT (THEORY)
SEMESTER –6

MCB-A-DSE-B-6-2-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Soil Microbiology **No of Hours: 6**
Soil as Microbial Habitat, Soil profile and properties, Soil formation, Diversity and distribution of microorganisms in soil

Unit 2 Mineralization of Organic & Inorganic Matter in Soil **No of Hours: 6**
Mineralization of cellulose, hemicelluloses, lignocelluloses, lignin and humus, phosphate, nitrate, silica, potassium

Unit 3 Microbial Activity in Soil and Green House Gases **No of Hours: 5**
Carbon dioxide, methane, nitrous oxide, nitric oxide – production and control

Unit 4 Microbial Control of Soil Borne Plant Pathogens **No of Hours: 7**
Biocontrol mechanisms and ways, Microorganisms used as biocontrol agents against Microbial plant pathogens, Insects, Weeds

Unit 5 Biofertilization, Phytostimulation, Bioinsecticides **No of Hours: 12**
Plant growth promoting bateria, biofertilizers – symbiotic (*Bradyrhizobium, Rhizobium, Frankia*), Non Symbiotic (*Azospirillum, Azotobacter*, Mycorrhizae, MHBs, Phosphate solubilizers, algae), Novel combination of microbes as biofertilizers, PGPRs

Unit 6 Secondary Agriculture Biotechnology **No of Hours: 8**
Biotech feed, Silage, Biomanure, biogas, biofuels – advantages and processing parameters

Unit 7 GM crops No of Hours: 6
Advantages, social and environmental aspects, Bt crops, golden rice, transgenic animals.

DSE-B:
2.MICROBES IN SUSTAINABLE AGRICULTURE AND DEVELOPMENT (PRACTICAL)
SEMESTER –6

MCB-A-DSE-B-6-2-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Study soil profile
2. Study microflora of different types of soils
3. *Rhizobium* as soil inoculants characteristics and field application
4. *Azotobacter*as soil inoculants characteristics and field application
5. Design and functioning of a biogas plant
6. Isolation of cellulose degrading organisms

SUGGESTED READINGS

1. Agrios GN. (2006). Plant Pathology.5th edition. Academic press, San Diego,
2. Singh RS. (1998). Plant Diseases Management. 7th edition. Oxford & IBH, New Delhi.
3. Glick BR, Pasternak JJ, and Patten CL (2010) Molecular Biotechnology 4th edition, ASM Press,

4. Atlas RM and Bartha R. (2000). Microbial Ecology: Fundamentals & Applications. 4th edition. Benjamin/Cummings Science Publishing, USA
5. Maier RM, Pepper IL and Gerba CP. (2009). Environmental Microbiology. 2nd edition, Academic Press
6. Barton LL & Northup DE (2011). Microbial Ecology. 1st edition, Wiley Blackwell, USA
7. Campbell RE. (1983). Microbial Ecology. Blackwell Scientific Publication, Oxford, England.
8. Coyne MS. (2001). Soil Microbiology: An Exploratory Approach. Delmar Thomson Learning.
9. Altman A (1998). Agriculture Biotechnology, Ist edition, Marcel decker Inc.
10. Mahendra K. Rai (2005). Hand Book of Microbial Biofertilizers, The Haworth Press, Inc. New York.
11. Reddy, S.M. et. al. (2002). Bioinoculants for Sustainable Agriculture and Forestry, Scientific Publishers.
12. Saleem F and Shakoori AR (2012) Development of Bioinsecticide, Lap Lambert Academic Publishing GmbH KG

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
DSE-B:
3. INSTRUMENTATION AND BIOTECHNIQUES (THEORY)
SEMESTER-6

MCB-A-DSE-B-6-3-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Microscopy **No. of Hours: 10**

Brightfield and darkfield microscopy, Fluorescence Microscopy, Phase contrast Microscopy, Confocal Microscopy, Electron Microscopy (Scanning and Transmission Electron Microscopy) and Micrometry.

Unit 2 Chromatography **No. of Hours: 10**

Principles and applications of paper chromatography (including Descending and 2-D), Thin layer chromatography. Column packing and fraction collection. Gel filtration chromatography, ion-exchange chromatography and affinity chromatography, GLC, HPLC.

Unit 3 Electrophoresis **No. of Hours: 10**

Principle and applications of native polyacrylamide gel electrophoresis, SDS- polyacrylamide gel electrophoresis, 2D gel electrophoresis, Isoelectric focusing, Zymogram preparation and Agarose gel electrophoresis.

Unit 4 Spectrophotometry **No. of Hours: 10**

Principle and use of study of absorption spectra of biomolecules.Analysis of biomolecules using UV and visible range.Colorimetry and turbidometry.

Unit 5 Centrifugation **No. of Hours: 10**

Preparative and analytical centrifugation, fixed angle and swinging bucket rotors.RCF and sedimentation coefficient, differential centrifugation, density gradient centrifugation and ultracentrifugation.

DSE-B:

3. INSTRUMENTATION AND BIOTECHNIQUES (PRACTICAL)

SEMESTER –6

MCB-A-DSE-B-6-3-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Study of fluorescent micrographs to visualize bacterial cells.
2. Ray diagrams of phase contrast microscopy and Electron microscopy.
3. Separation of mixtures by paper / thin layer chromatography.
4. Demonstration of column packing in any form of column chromatography.
5. Separation of protein mixtures by any form of chromatography.
6. Separation of protein mixtures by Polyacrylamide Gel Electrophoresis (PAGE).
7. Determination of λ_{max} for an unknown sample and calculation of extinction coefficient.
8. Separation of components of a given mixture using a laboratory scale centrifuge.
9. Understanding density gradient centrifugation with the help of pictures.

SUGGESTED READINGS

1. Wilson K and Walker J. (2010). Principles and Techniques of Biochemistry and Molecular Biology. 7th Ed., Cambridge University Press.
2. Nelson DL and Cox MM. (2008). Lehninger Principles of Biochemistry, 5th Ed., W.H. Freeman and Company.
3. Willey MJ, Sherwood LM &Woolverton C J. (2013). Prescott, Harley and Klein's Microbiology. 9th Ed., McGraw Hill.
4. Karp G. (2010) Cell and Molecular Biology: Concepts and Experiments. 6th edition. John Wiley & Sons. Inc.
5. De Robertis EDP and De Robertis EMF. (2006). Cell and Molecular Biology. 8th edition. Lipincott Williams and Wilkins, Philadelphia.
6. Cooper G.M. and Hausman R.E. (2009). The Cell: A Molecular Approach. 5th Edition. ASM Press & Sunderland, Washington D.C., Sinauer Associates, MA.
7. Nigam A and Ayyagari A. 2007. Lab Manual in Biochemistry, Immunology and Biotechnology. Tata McGraw Hill.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
SEC-A:
1. Microbial Quality Control in Food and Pharmaceutical Industries
SEMESTER – 3
MCB-A-SEC-A-3-1

TOTAL HOURS: 30 **CREDITS: 2**

Unit 1 Microbiological Laboratory and Safe Practices **No. of Hours: 8**

Good laboratory practices - Good laboratory practices, Good microbiological practices
Biosafety cabinets – Working of biosafety cabinets, using protective clothing, specification for BSL-1, BSL-2, BSL-3. Discarding biohazardous waste – Methodology of Disinfection, Autoclaving & Incineration

Unit 2 Determining Microbes in Food / Pharmaceutical Samples **No. of Hours: 10**

Culture and microscopic methods - Standard plate count, Most probable numbers, Direct microscopic counts, Biochemical and immunological methods: Limulus lysate test for endotoxin, gel diffusion, sterility testing for pharmaceutical products
Molecular methods - Nucleic acid probes, PCR based detection, biosensors.

Unit 3 Pathogenic Microorganisms of Importance in Food & Water **No. of Hours: 8**

Enrichment culture technique, Detection of specific microorganisms - on XLD agar, Salmonella Shigella Agar, Manitol salt agar, EMB agar, McConkey Agar, Saboraud Agar
Ascertaining microbial quality of milk by MBRT, Rapid detection methods of microbiological quality of milk at milk collection centres (COB, 10 min Resazurin assay)

Unit 4 HACCP for Food Safety and Microbial Standards **No. of Hours: 4**

Hazard analysis of critical control point (HACCP) - Principles, flow diagrams, limitations
Microbial Standards for Different Foods and Water – BIS standards for common foods and drinking water

SUGGESTED READING

1. Harrigan WF (1998) Laboratory Methods in Food Microbiology, 3rd ed. Academic Press
2. Garg N, Garg KL and Mukerji KG (2010) Laboratory Manual of Food Microbiology I K International Publishing House Pvt. Ltd.
3. Jay JM, Loessner MJ, Golden DA (2005) Modern Food Microbiology, 7th edition. Springer
4. Baird RM, Hodges NA and Denyer SP (2005) Handbook of Microbiological Quality control in Pharmaceutical and Medical Devices, Taylor and Francis Inc.

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
SEC-A:
2. BIOFERTILIZERS AND BIOPESTICIDES
SEMESTER – 3

MCB-A-SEC-A-3-2

TOTAL HOURS: 30 **CREDITS: 2**

Unit 1 Biofertilizers **No of Hours: 10**

General account of the microbes used as biofertilizers for various crop plants and their advantages over chemical fertilizers.
Symbiotic N2 fixers: *Rhizobium* - Isolation, characteristics, types, inoculum production and field application, legume/pulses plants
Frankia- Isolation, characteristics, Alder, Casurina plants, non-leguminous crop symbiosis.Cyanobacteria, *Azolla* - Isolation, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.

Unit 2 Non - Symbiotic Nitrogen Fixers **No of Hours: 4**

Free living *Azospirillum*, *Azotobacter* - free isolation, characteristics, mass inoculums, production and field application.

Unit 3 Phosphate Solubilizers **No of Hours: 4**

Phosphate solubilizing microbes - Isolation, characterization, mass inoculum production, field application

Unit 4 MycorrhizalBiofertilizers **No of Hours: 5**

Importance of mycorrizal inoculum, types of mycorrhizae and associated plants, Mass inoculum production of VAM, field applications of Ectomycorrhizae and VAM.

Unit 5 Bioinsecticides **No of Hours: 7**

General account of microbes used as bioinsecticides and their advantages over synthetic pesticides, *Bacillus thuringiensis*, production, Field applications, Viruses – cultivation and field applications.

Suggested Readings

1. Kannaiyan, S. (2003). Bioetchnology of Biofertilizers, CHIPS, Texas.
2. Mahendra K. Rai (2005). Hand book of Microbial biofertilizers, The Haworth Press, Inc. New York.
3. Reddy, S.M. et. al. (2002). Bioinoculants for sustainable agriculture and forestry, Scientific Publishers.
4. SubbaRao N.S (1995) Soil microorganisms and plant growth Oxford and IBH publishing co. Pvt. Ltd. NewDelhi.
5. Saleem F and Shakoori AR (2012) Development of Bioinsecticide, Lap Lambert Academic Publishing GmbH KG
6. Aggarwal SK (2005) Advanced Environmental Biotechnology, APH publication

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)

SEC-B:

1. FOOD FERMENTATION TECHNIQUES

SEMESTER – 4

MCB-A-SEC-B-4-1

TOTAL HOURS: 30 **CREDITS: 2**

Unit 1 Fermented Foods **No of Hours: 4**

Definition, types, advantages and health benefits

Unit 2 Milk Based Fermented Foods **No of Hours: 8**

Dahi, Yogurt, Buttermilk (Chach) and cheese: Preparation of inoculums, types of microorganisms and production process

Unit 3 Grain Based Fermented Foods **No of Hours: 6**

Soy sauce, Bread, Idli and Dosa: Microorganisms and production process

Unit 4 Vegetable Based Fermented Foods **No of Hours: 4**

Pickels, Saeurkraut: Microorganisms and production process

Unit 5 Fermented Meat and Fish **No of Hours: 4**

Types, microorganisms involved, fermentation process

Unit 6 Probiotic Foods **No of Hours: 4**

Definition, types, microorganisms and health benefits

Suggested Readings

1. Hui YH, Meunier-Goddik L, Josephsen J, Nip WK, Stanfield PS (2004) Handbook of food and fermentation technology, CRC Press
2. Holzapfel W (2014) Advances in Fermented Foods and Beverages, Woodhead Publishing.
3. Yadav JS, Grover, S and Batish VK (1993) A comprehensive dairy microbiology, Metropolitan
4. Jay JM, Loessner MJ, Golden DA (2005) Modern Food Microbiology, 7th edition. Springer

B.Sc (HONOURS) MICROBIOLOGY (CBCS STRUCTURE)
SEC-B:
2. MICROBIOLOGICAL ANALYSIS OF AIR AND WATER
SEMESTER – 4

MCB-A-SEC-B-4-2

TOTAL HOURS: 30 **CREDITS: 2**

Unit 1 Aeromicrobiology **No of Hours: 4**

Bioaerosols, Air borne microorganisms (bacteria, Viruses, fungi) and their impact on human health and environment, significance in food and pharma industries and operation theatres, allergens

Unit 2 Air Sample Collection and Analysis **No of Hours: 7**
Bioaerosol sampling, air samplers, methods of analysis, CFU, culture media for bacteria and fungi, Identification characteristics

Unit 3 Control Measures **No of Hours: 4**
Fate of bioaerosols, inactivation mechanisms – UV light, HEPA filters, desiccation, Incineration

Unit 4 Water Microbiology **No of Hours: 4**
Water borne pathogens, water borne diseases

Unit 5 Microbiological Analysis of Water **No of Hours: 7**
Sample Collection, Treatment and safety of drinking (potable) water, methods to detect potability ofwater samples: (a) standard qualitative procedure: presumptive/MPN tests, confirmed and completed tests for faecal coliforms (b) Membrane filter technique and (c) Presence/absence tests

Unit 6 Control Measures **No of Hours: 4**
Precipitation, chemical disinfection, filtration, high temperature, UV light

Suggested Reading

1. da Silva N, Taniwaki MH, Junqueira VC, Silveira N, Nascimento MS, Gomes RAR (2012) Microbiological Examination Methods of Food and WaterA Laboratory Manual, CRC Press
2. Atlas RM and Bartha R. (2000). Microbial Ecology: Fundamentals & Applications. 4th edition. Benjamin/Cummings Science Publishing, USA
3. Maier RM, Pepper IL and Gerba CP. (2009). Environmental Microbiology. 2nd edition, Academic Press
4. Hurst CJ, Crawford RL, Garland JL, Lipson DA (2007) Manual of Environmental Microbiology, 3rd edition, ASM press

UNIVERSITY OF CALCUTTA

CBCS SYLLABUS

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THREE-YEAR GENERAL COURSE OF STUDIES IN

MICROBIOLOGY

2018

Structure of B. Sc. General Microbiology under CBCS

Core Course: CC

CC-1/GE1: Introduction and Scope of microbiology, Bacteriology
CC-2/GE2: Bacteriology and Virology
CC-3/GE3: Biomolecules and Microbial metabolism
CC-4/GE4: Microbial Genetics and Molecular Biology

Discipline Specific Elective (DSE)

DSE-A (Any One)

1. Genetic Engineering and Biotechnology
2. Microbes in Environment

DSE-B (Any One)

1. Medical Microbiology and Immunology
2. Industrial Microbiology and Food Microbiology

Skill Enhancement Elective Courses (SEC)

SEC-A

1. Microbial Quality Control in Food and Pharmaceutical Industries
2. Biofertilizers and Biopesticides

SEC-B

1. Food Fermentation Techniques
2. Microbiological Analysis of Air and Water

SUBJECT/PAPER CODE FORMAT

1. **Subject Code: MCB**
2. **Honours Code: A**
3. **Course Code: a) Core Course:CC**
   b) Discipline Specific Elective: DSE-A/DSE-B
   c) Skill Enhancement Course: SEC-A/SEC-B
4. **Semester Code: 1/2/3/4/5/6**
5. **Paper No. Code: 1/2/3…../14**
6. **Paper Component Code: a) Theory:TH, b) Practical: P**

Semester Wise Microbiology General Courses

Semester-1

Core Course

B.Sc (General) MICROBIOLOGY (CBCS STRUCTURE)
CC-1/GE1: INTRODUCTION AND SCOPE OF MICROBIOLOGY
(THEORY)
MCB-G-CC-1-1-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 History of Development of Microbiology **No. of Hours: 8**

Development of microbiology as a discipline, Spontaneous generation *vs*. biogenesis. Contributions of Anton von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Alexander Fleming
Role of microorganisms in fermentation, Germ theory of disease, Development of various microbiological techniques and golden era of microbiology, Development of the field of soil microbiology: Contributions of Martinus W. Beijerinck, Sergei N. Winogradsky, Selman A.Waksman Establishment of fields of medical microbiology and immunology through the work of Paul Ehrlich, Elie Metchnikoff, Edward Jenner

Unit 2 Diversity of Microorganisms **No. of Hours: 8**

Systems of classification : Binomial nomenclature, Whittaker's five kingdom and Carl Woese's three kingdom classification systems and their utility
General characteristics of different groups: Acellular microorganisms (Viruses, Viroids, Prions) and Cellular microorganisms (Prokarya: Archaea and Bacteria, Eukarya : Algae, Fungi and Protozoa) giving definitions and citing examples
Protozoa : Methods of nutrition, locomotion & reproduction - Amoeba, *Paramecium* and *Plasmodium*

Unit 3 Microscopy No. of Hours: 5

Bright Field Microscope, Dark Field Microscope, Phase Contrast Microscope, FluoresenceMicroscope,Transmission Electron Microscope, Scanning Electron Microscope

Unit 4 Sterilization **No. of Hours: 5**

Moist Heat, Autoclave, Dry Heat, Hot Air Oven, Tyndallization, Filteration.

Unit 5 Microbes in Human Health & Environment **No. of Hours: 8**

Medical microbiology and immunology: List of important human diseases and their causativeagents of various human systems. Definitions of immunity (active/passive), primary and secondary immune response, antigen, antibody and their types
Environmental microbiology: Definitions and examples of important microbial interactions – mutualism, commensalism, parasitism, Definitions and microorganisms used as biopesticides, biofertilizers, in biodegradation, biodeterioration and bioremediation (*e.g.* hydrocarbons in oil spills)

Unit 6 Industrial Microbiology **No. of Hours: 8**

Definition of fermentation, primary and secondary metabolites, types of fermentations and fermenters and microbes producing important industrial products through fermentation.

Unit 7 Food and Dairy Microbiology **No. of Hours: 8**

Microorganisms as food (SCP), microorganisms in food fermentations (dairy and non dairy based fermented food products) and probiotics.Microorganisms in food spoilage and food borne infections.

CC-1/GE1: INTRODUCTION AND SCOPE OF MICROBIOLOGY (PRACTICALS)
SEMESTER –1

MCB-G-CC-1-1-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Microbiology Laboratory Management and Biosafety.
2. To study the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter) used in the microbiology laboratory
3. Preparation of culture media for bacterial cultivation
4. Sterilization of medium using Autoclave and assessment for sterility
5. Sterilization of glassware using Hot Air Oven and assessment for sterility
6. Sterilization of heat sensitive material by filtration and assessment for sterility
7. Demonstration of presence of microflora in the environment by exposing nutrient agar plates to air.
8. Study of different shapes of bacteria using permanent slides
9. Study of *Rhizopus* and *Penicillium* using permanent mounts
10. Study of *Spirogyra* and *Chlamydomonas* using permanent Mounts
11. Study of the following protozoans using permanent mounts/photographs: *Amoeba*, *Entamoeba*, *Paramecium* and *Plasmodium*

SUGGESTED READING

1. Tortora GJ, Funke BR and Case CL. (2008). Microbiology: An Introduction. 9th edition. Pearson Education
2. Madigan MT, Martinko JM, Dunlap PV and Clark DP. (2014). Brock Biology of Microorganisms. 14th edition. Pearson International Edition
3. Cappucino J and Sherman N. (2010). Microbiology: A Laboratory Manual. 9th edition. Pearson Education Limited
4. Wiley JM, Sherwood LM and Woolverton CJ. (2013) Prescott's Microbiology. 9th Edition. McGraw Hill International.
5. Atlas RM. (1997). Principles of Microbiology. 2nd edition. WM.T.Brown Publishers.
6. Pelczar MJ, Chan ECS and Krieg NR. (1993). Microbiology. 5th edition. McGraw Hill Book Company.
7. Stanier RY, Ingraham JL, Wheelis ML, and Painter PR. (2005). GeneralMicrobiology. 5thedition. McMillan.

Semester-2

Core Course

CC-2/GE2: BACTERIOLOGY AND VIROLOGY (THEORY) MCB-G-CC-2-2-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Cell organization **No. of Hours: 10**

Cell size, shape and arrangements, capsule, flagella and pili, Composition and detailed structure of gram- positive and gram- negative cell wall and archaeal cell wall, Structure, chemical composition and functions of bacterial and archaeal cell membranes, Ribosomes, inclusions, nucleoid, plasmids, structure, formation and stages of sporulation

Unit 2 Bacterial growth and control **No. of Hours: 8**

Culture media: Components of media, Synthetic or defined media, Complex media, enriched media, selective media, differential media, enrichment culture media
Pure culture isolation: Streaking, serial dilution and plating methods, cultivation, maintenance and stocking of pure cultures, cultivation of anaerobic bacteria Growth: Binary fission, phases of growth

Unit 3 Bacterial Systematics and Taxonomy **No. of Hours: 8**

Taxonomy, nomenclature, systematics, types of classifications
Morphology, ecological significance and economic importance of the following groups:
Archaea: methanogens, thermophiles and halophiles
Eubacteria: Gram negative and Gram positive
Gram negative:
Non-proteobacteria– *Deinococcus, Chlamydiae,* Spirochetes
Alpha proteobacteria- *Rickettsia, Rhizobium, Agrobacterium*
Gamma proteobacteria –*Escherichia,Shigella,Pseudomonas*
Gram positive: Low G+C: *Mycoplasma, Bacillus, Clostridium, Staphylococcus* High G+C: *Streptomyces, Frankia*

Unit 4 Introduction to Viruses **No. of Hours: 8**

Properties of viruses; general nature and important features
Subviral particles; viroids, prions and their importance
Isolation and cultivation of viruses

Unit 5 Structure, and multiplication of viruses **No. of Hours: 8**

Morphological characters: Capsid symmetry and different shapes of viruses with examples
Viral multiplication in the Cell: Lytic and lysogenic cycle
Description of important viruses: salient features of the viruses infecting different hosts - Bacteriophages (T4 & Lambda); Plant (TMV & Cauliflower Mosaic Virus), Human (HIV & Hepatitis viruses)

Unit 6 Role of Viruses in Disease and its prevention **No. of Hours: 8**

Viruses as pathogens: Role of viruses in causing diseases
Prevention and control of viruses: Viral vaccines, interferons and antiviral compounds

CC-2/GE2: BACTERIOLOGY AND VIROLOGY (PRACTICAL)

MCB-G-CC-2-2-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Preparation of different media: Nutrient agar, Nutrient broth
2. To perform simple staining and Gram's staining of the bacterial smear
3. To perform spore staining
4. Isolation of pure cultures of bacteria by streaking method
5. Enumeration of colony forming units (CFU) count by spread plate method/pour plate
7. Study the morphological structures of viruses (DNA and RNA) and their important characters using electron micrographs

8. Study of the methods of isolation and propagation of plant viruses
9. Study of cytopathic effects of viruses using photographs

SUGGESTED READING

1. Atlas RM. (1997). Principles of Microbiology. 2nd edition. WM.T.Brown Publishers
2. Madigan MT, Martinko JM, Dunlap PV and Clark DP (2014). Brock Biology of Micro-organisms.

14th edition. Pearson Education, Inc.

3. Stanier RY, Ingraham JL, Wheelis ML and Painter PR. (2005). General Microbiology. 5th edition. McMillan

4. Carter J and Saunders V(2007). Virology; principles and Applications. John Wiley and Sons
5. Flint SJ, Enquist, LW, Krug, RM, Racaniello, VR Skalka, AM (2004) Principles of Virology, Molecular Biology, Pathogenesis and Control.2nd edition.ASM Press
6. Shors Teri (2013) Understanding Viruses 2nd edition Jones and Bartlett Learning Burlington USA

7. PelczarJr MJ, Chan ECS, and Krieg NR. (2004). Microbiology. 5th edition Tata McGraw Hill.
8. Tortora GJ, Funke BR, and Case CL. (2008). Microbiology: An Introduction. 9th edition Pearson Education.

9. Willey JM, Sherwood LM, and Woolverton CJ. (2013). Prescott's Microbiology. 9th edition. McGraw Hill Higher Education.
10. Dimmock, NJ, Easton, AL, Leppard, KN (2007). Introduction to Modern Virology. 6th edition, Blackwell Publishing Ltd.

11. Cann AJ (2012) Principles of Molecular Virology, Academic Press Oxford UK

Semester-3

Core Course

CC-3/GE3: MICROBIAL METABOLISM (THEORY)
MCB-G-CC-3-3-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Microbial Growth and Effect of Environment on Microbial Growth **No. of Hours: 10**

Definitions of growth, Batch culture, Continuous culture, generation time and specific growth rate
Temperature and temperature ranges of growth
pH and pH ranges of growth
Effect of solute and water activity on growth
Effect of oxygen concentration on growth
Nutritional categories of microorganisms

Unit 2 Nutrient uptake and Transport **No. of Hours: 10**

Passive and facilitated diffusion
Primary and secondary active transport, concept of uniport, symport and antiport
Group translocation
Iron uptake

Unit 3 Chemoheterotrophic Metabolism - Aerobic Respiration **No. of Hours: 8**

Concept of aerobic respiration, anaerobic respiration and fermentation
Sugar degradation pathways i.e. EMP, ED, Pentose phosphate pathway
TCA cycle
Electron transport chain: components of respiratory chain, comparison of mitochondrial and bacterial ETC, electron transport phosphorylation, uncouplers and inhibitors

Unit 4 Chemoheterotrophic Metabolism- Anaerobic respiration and fermentation **No. of Hours: 6**

Anaerobic respiration with special reference to dissimilatory nitrate reduction (Denitrification; nitrate /nitrite and nitrate/ammonia respiration; fermentative nitrate reduction)
Fermentation - Alcohol fermentation and Pasteur effect; Lactate fermentation (homofermentative and heterofermentative pathways), concept of linear and branched fermentation pathways

Unit 5 Chemolithotrophic and Phototrophic Metabolism **No. of Hours: 10**

Introduction to aerobic and anaerobic chemolithotrophy with an example each. Hydrogen oxidation (definition and reaction) and methanogenesis (definition and reaction)
Introduction to phototrophic metabolism - groups of phototrophic microorganisms, anoxygenic*vs.* oxygenic photosynthesis with reference to photosynthesis in green bacteria and cyanobacteria

Unit 6 Nitrogen Metabolism - an overview **No. of Hours: 6**

Introduction to biological nitrogen fixation
Ammonia assimilation
Assimilatory nitrate reduction

CC-3/GE3: MICROBIAL METABOLISM (PRACTICAL)

MCB-G-CC-3-3-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Study and plot the growth curve of *E. coli* by tubidiometric and standard plate count methods.
2. Calculations of generation time and specific growth rate of bacteria from the graph plotted with the given data
3. Effect of temperature on growth of *E. coli*
4. Effect of pH on growth of *E. coli*
5. Effect of Nitrogen and Carbon sources on *E. Coli*
6. Effect of salt on growth of *E. coli*
7. Demonstration of alcoholic fermentation
8. Demonstration of the thermal death time and decimal reduction time of *E. coli.*

SUGGESTED READINGS

1. Madigan MT, and Martinko JM (2014). Brock Biology of Microorganisms. 14th edition. Prentice Hall International Inc.
2. Moat AG and Foster JW. (2002). Microbial Physiology. 4th edition. John Wiley & Sons
3. Reddy SR and Reddy SM. (2005). Microbial Physiology. Scientific Publishers India
4. Gottschalk G. (1986). Bacterial Metabolism. 2nd edition. Springer Verlag
5. Stanier RY, Ingrahm JI, Wheelis ML and Painter PR. (1987). General Microbiology. 5th edition, McMillan Press.
6. Willey JM, Sherwood LM, and Woolverton CJ. (2013). Prescott's Microbiology. 9th edition. McGraw Hill Higher Education.

SEMESTER-4

Core Course

CC-4/GE4: MICROBIAL GENETICS AND MOLECULAR BIOLOGY (THEORY)

MCB-G-CC-4-4-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Structures of DNA and RNA / Genetic Material **No. of Hours: 6**

DNA structure, Salient features of double helix, Types of DNA, denaturation and renaturation, topoisomerases; Organization of DNA Prokaryotes,Viruses, Eukaryotes. RNA Structure

Unit 2 Replication of DNA **No. of Hours: 5**

Bidirectional and unidirectional replication, semi- conservative, semi- discontinuous replication Mechanism of DNA replication: Enzymes and proteins involved in DNA replication –DNA polymerases, DNA ligase, primase, telomerase – for replication of linear ends

Unit 3 Transcription **No. of Hours: 5**

Transcription: Definition, promoter - concept and strength of promoter. Transcriptional Machinery and Mechanism of transcription.

Unit 4 Translation **No. of Hours: 5**

Genetic code, Translational machinery, Charging of tRNA, aminoacyltRNA synthetases, Mechanisms of initiation, elongation and termination of polypeptides.

Unit 5 Regulation of gene Expression **No. of Hours: 5**

Principles of transcriptional regulation, regulation at initiation with examples from *lac* and *trp* operons

Unit 6 Mutations **No. of Hours: 8**

Mutations and mutagenesis: Definition and types of Mutations; Physical and chemical mutagens; Uses of mutations, DNA repair mechanisms

Unit 7 Mechanisms of Genetic Exchange Transformation - Discovery, mechanism of natural competence Conjugation - Discovery, mechanism, Hfr and F' strains Transduction - Generalized transduction, specialized transduction **No. of Hours: 8**

Unit 8 Plasmids and Transposable Elements **No. of Hours: 8**

Property and function of plasmids, Types of plasmids.Prokaryotic transposable elements – Insertion Sequences, composite and non-composite transposons, Replicative and Non replicative transposition, Uses of transposons and transposition.

CC-4/GE4: MICROBIAL GENETICS AND MOLECULAR BIOLOGY (PRACTICAL)
SEMESTER – 4

MCB-G-CC-4-4-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Study of different types of DNA and RNA using micrographs and model / schematic representations
2. Study of semi-conservative replication of DNA through micrographs / schematic representations
3. Estimation of salmon sperm / calf thymus DNA using colorimeter (diphenylamine reagent) or UV spectrophotometer (A260 measurement)

4. Resolution and visualization of DNA by Agarose Gel Electrophoresis.
5. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS-PAGE).
6. Study the effect of chemical (HNO2) and physical (UV) mutagens on bacterial cells
7. Study survival curve of bacteria after exposure to ultraviolet (UV) light
8. Demonstration of Bacterial Transformation and calculation of transformation efficiency.

SUGGESTED READINGS

1. Watson JD, Baker TA, Bell SP, Gann A, Levine M and Losick R (2008) Molecular Biology of the Gene, 6th edition, Cold Spring Harbour Lab. Press, Pearson Publication

2. Becker WM, Kleinsmith LJ, Hardin J and Bertoni GP (2009) The World of the Cell, 7th edition, Pearson Benjamin Cummings Publishing, San Francisco
3. De Robertis EDP and De Robertis EMF (2006) Cell and Molecular Biology, 8th edition. Lippincott Williams and Wilkins, Philadelphia

4. Karp G (2010) Cell and Molecular Biology: Concepts and Experiments, 6th edition, John Wiley & Sons. Inc.

5. Sambrook J and Russell DW. (2001). Molecular Cloning: A Laboratory Manual. 4th Edition, Cold Spring Harbour Laboratory press.

6. Krebs J, Goldstein E, Kilpatrick S (2013). Lewin's Essential Genes, 3rd Ed., Jones and Bartlett Learning

7. Gardner EJ, Simmons MJ, Snustad DP (2008). Principles of Genetics. 8th Ed. Wiley-India

8. Klug WS, Cummings MR, Spencer, C, Palladino, M (2011). Concepts of Genetics, 10th Ed., Benjamin Cummings
9. Maloy SR, Cronan JE and FriefelderD(2004) Microbial Genetics 2nd EDITION., Jones and Barlett Publishers

10. Russell PJ. (2009). i Genetics- A Molecular Approach. 3rd Ed, Benjamin Cumming

Skill Enhancement Elective Courses (SEC)

SEC-A

(A candidate has to opt any one from SEC-A either in Semester-3 or in Semester-5)

1: BIOFERTILIZERS AND BIOPESTICIDES
MCB-G-SEC-A-3/5-1-TH

TOTAL HOURS: 30 **CREDITS: 2**

Unit 1 Biofertilizers **No of Hours: 10**

General account of the microbes used as biofertilizers for various crop plants and their advantages over chemical fertilizers.
Symbiotic N2 fixers: *Rhizobium* - Isolation, characteristics, types, inoculum production and field application, legume/pulses plants
Frankia- Isolation, characteristics, Alder, Casurina plants, non-leguminous crop symbiosis.Cyanobacteria, *Azolla* - Isolation, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.

Unit 2 Non - Symbiotic Nitrogen Fixers **No of Hours: 4**

Free living *Azospirillum, Azotobacter* - free isolation, characteristics, mass inoculums, production and field application.

Unit 3 Phosphate Solubilizers **No of Hours: 4**

Phosphate solubilizing microbes - Isolation, characterization, mass inoculum production, field application

Unit 4 MycorrhizalBiofertilizers **No of Hours: 5**

Importance of mycorrizal inoculum, types of mycorrhizae and associated plants, Mass inoculum production of VAM, field applications of Ectomycorrhizae and VAM.

Unit 5 Bioinsecticides **No of Hours: 7**

General account of microbes used as bioinsecticides and their advantages over synthetic pesticides, *Bacillus thuringiensis*, production, Field applications, Viruses – cultivation and field applications.

Suggested Readings

1. Kannaiyan, S. (2003). Bioetchnology of Biofertilizers, CHIPS, Texas.
2. Mahendra K. Rai (2005). Hand book of Microbial biofertilizers, The Haworth Press, Inc. New York.
3. Reddy, S.M. et. al. (2002). Bioinoculants for sustainable agriculture and forestry, Scientific Publishers.
4. SubbaRao N.S (1995) Soil microorganisms and plant growth Oxford and IBH publishing co. Pvt. Ltd. NewDelhi.

5. Saleem F and Shakoori AR (2012) Development of Bioinsecticide, Lap Lambert Academic Publishing GmbH KG
6. Aggarwal SK (2005) Advanced Environmental Biotechnology, APH publication.

2.Microbial Quality Control in Food and Pharmaceutical Industries
MCB-G-SEC-A-3/5-3-TH

TOTAL HOURS: 30 **CREDITS: 2**

Unit 1 Microbiological Laboratory and Safe Practices **No. of Hours: 8**

Good laboratory practices - Good laboratory practices, Good microbiological practices
Biosafety cabinets – Working of biosafety cabinets, using protective clothing, specification for BSL-1, BSL-2, BSL-3. Discarding biohazardous waste – Methodology of Disinfection, Autoclaving & Incineration

Unit 2 Determining Microbes in Food / Pharmaceutical Samples **No. of Hours: 10**

Culture and microscopic methods - Standard plate count, Most probable numbers, Direct microscopic counts, Biochemical and immunological methods: Limulus lysate test for endotoxin, gel diffusion, sterility testing for pharmaceutical products
Molecular methods - Nucleic acid probes, PCR based detection, biosensors.

Unit 3 Pathogenic Microorganisms of Importance in Food & Water **No. of Hours: 8**

Enrichment culture technique, Detection of specific microorganisms - on XLD agar, Salmonella Shigella Agar, Manitol salt agar, EMB agar, McConkey Agar, Saboraud Agar
Ascertaining microbial quality of milk by MBRT, Rapid detection methods of microbiological quality of milk at milk collection centres (COB, 10 min Resazurin assay)

Unit 4 HACCP for Food Safety and Microbial Standards **No. of Hours: 4**

Hazard analysis of critical control point (HACCP) - Principles, flow diagrams, limitations
Microbial Standards for Different Foods and Water – BIS standards for common foods and drinking water

SUGGESTED READING

1. Harrigan WF (1998) Laboratory Methods in Food Microbiology, 3rd ed. Academic Press
2. Garg N, Garg KL and Mukerji KG (2010) Laboratory Manual of Food Microbiology I K International Publishing House Pvt. Ltd.
3. Jay JM, Loessner MJ, Golden DA (2005) Modern Food Microbiology, 7th edition. Springer
4. Baird RM, Hodges NA and Denyer SP (2005) Handbook of Microbiological Quality control in Pharmaceutical and Medical Devices, Taylor and Francis Inc.

SEC-B

(A candidate has to opt any one from SEC-B either in Semester-4 or in Semester-6)

1. MICROBIOLOGICAL ANALYSIS OF AIR AND WATER

MCB-G-SEC-B-4/6-2-TH

TOTAL HOURS: 30 **CREDITS: 2**

Unit 1 Aeromicrobiology **No of Hours: 4**

Bioaerosols, Air borne microorganisms (bacteria, Viruses, fungi) and their impact on human health and environment, significance in food and pharma industries and operation theatres, allergens

Unit 2 Air Sample Collection and Analysis **No of Hours: 7**

Bioaerosol sampling, air samplers, methods of analysis, CFU, culture media for bacteria and fungi, Identification characteristics

Unit 3 Control Measures **No of Hours: 4**

Fate of bioaerosols, inactivation mechanisms – UV light, HEPA filters, desiccation, Incineration

Unit 4 Water Microbiology **No of Hours: 4**

Water borne pathogens, water borne diseases

Unit 5 Microbiological Analysis of Water **No of Hours: 7**

Sample Collection, Treatment and safety of drinking (potable) water, methods to detect potability ofwater samples: (a) standard qualitative procedure: presumptive/MPN tests, confirmed and completed tests for faecal coliforms (b) Membrane filter technique and (c) Presence/absence tests

Unit 6 Control Measures **No of Hours: 4**

Precipitation, chemical disinfection, filtration, high temperature, UV light

Suggested Reading

1. da Silva N, Taniwaki MH, Junqueira VC, Silveira N, Nascimento MS, Gomes RAR (2012) Microbiological Examination Methods of Food and WaterA Laboratory Manual, CRC Press
2. Atlas RM and Bartha R. (2000). Microbial Ecology: Fundamentals & Applications. 4th edition. Benjamin/Cummings Science Publishing, USA
3. Maier RM, Pepper IL and Gerba CP. (2009). Environmental Microbiology. 2nd edition, Academic Press
4. Hurst CJ, Crawford RL, Garland JL, Lipson DA (2007) Manual of Environmental Microbiology, 3rd edition, ASM press

2. FOOD FERMENTATION TECHNIQUES

MCB-G-SEC-B-4/6-4-TH

TOTAL HOURS: 30 **CREDITS: 2**

Unit 1 Fermented Foods **No of Hours: 4**

Definition, types, advantages and health benefits

Unit 2 Milk Based Fermented Foods **No of Hours: 8**

Dahi, Yogurt, Buttermilk (Chach) and cheese: Preparation of inoculums, types of microorganisms and production process

Unit 3 Grain Based Fermented Foods **No of Hours: 6**

Soy sauce, Bread, Idli and Dosa: Microorganisms and production process

Unit 4 Vegetable Based Fermented Foods **No of Hours: 4**

Pickels, Saeurkraut: Microorganisms and production process

Unit 5 Fermented Meat and Fish **No of Hours: 4**

Types, microorganisms involved, fermentation process

Unit 6 Probiotic Foods **No of Hours: 4**

Definition, types, microorganisms and health benefits

Suggested Readings

1. Hui YH, Meunier-Goddik L, Josephsen J, Nip WK, Stanfield PS (2004) Handbook of food and fermentation technology, CRC Press
2. Holzapfel W (2014) Advances in Fermented Foods and Beverages, Woodhead Publishing.
3. Yadav JS, Grover, S and Batish VK (1993) A comprehensive dairy microbiology, Metropolitan
4. Jay JM, Loessner MJ, Golden DA (2005) Modern Food Microbiology, 7th edition. Springer

Elective Course (Any One from DSE-A)

Semester-5

DSE-A:
1. GENETIC ENGINEERING AND BIOTECHNOLOGY (THEORY)

MCB-G-DSE-A-5-1-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Introduction to genetic engineering **No. of Hours: 12**

Milestones in genetic engineering and biotechnology

Restriction modification systems: Mode of action, applications of Type II restriction enzymes in genetic engineering

DNA modifying enzymes and their applications: DNA polymerases. Terminal deoxynucleotidyl transferase, kinases and phosphatases, and DNA ligases Cloning: Use of linkers and adaptors

Transformation of DNA: Chemical method, Electroporation

Methods of DNA, RNA and Protein analysis: Agarose gel electrophoresis, Southern - and Northern - blotting techniques, dot blot, DNA microarray analysis, SDS-PAGE and Western blotting.

Unit 2 Vectors **No. of Hours: 14**

Cloning Vectors: Definition and Properties

Plasmid vectors: pBR and pUC series

Bacteriophage lambda and M13 based vectors

Cosmids, BACs, YACs

Expression vectors: *E.coli* lac and T7 promoter-based vectors, yeast YIp, YEp and YCp vectors, Baculovirus based vectors, mammalian SV40-based expression vectors

Unit 3 DNA Amplification and DNA sequencing **No. of Hours: 8**

PCR: Basics of PCR, RT-PCR, Real-Time PCR

Genomic and cDNA libraries: Preparation and uses, Genome sequencing

Sanger's method of DNA Sequencing: traditional and automated sequencing

Unit 4 Application of Genetic Engineering and Biotechnology **No. of Hours: 12**

Gene delivery: Microinjection, electroporation, biolistic method (gene gun), liposome and viral-mediated delivery, *Agrobacterium* - mediated delivery

Products of recombinant DNA technology: Products of human therapeutic interest - insulin, hGH, antisense molecules. Bt transgenic - cotton, brinjal, flavosavo tomato, Gene therapy, recombinant vaccine, protein engineering

Unit 5 Intellectual Property Rights **No. of Hours: 4**

Patents, Copyrights, Trademarks

DSE-A:

1. GENETIC ENGINEERING AND BIOTECHNOLOGY (PRACTICAL)

SEMESTER –5

MCB-G-DSE-A-5-1-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Isolation of Plasmid DNA from *E.coli*
2. Digestion of DNA using restriction enzymes and analysis by agarose gel electrophoresis
3. Ligation of DNA fragments
4. Interpretation of sequencing gel electropherograms
5. Designing of primers for DNA amplification
6. Amplification of DNA by PCR
7. Demonstration of Southern blotting

SUGGESTED READING

1. Brown TA. (2010). Gene Cloning and DNA Analysis. 6th edition. Blackwell Publishing, Oxford, U.K.
2. Clark DP and Pasternik NJ. (2009). Biotechnology: Applying the Genetic Revolution. Elsevier Academic Press, USA
3. Primrose SB and Twyman RM. (2006). Principles of Gene Manipulation and Genomics, 7th edition. Blackwell Publishing, Oxford, U.K.
4. Sambrook J and Russell D. (2001). Molecular Cloning-A Laboratory Manual. 3rd edition. Cold Spring Harbor Laboratory Press
5. Wiley JM, Sherwood LM and Woolverton CJ. (2013). Prescott, Harley and Klein's Microbiology. 8th edition, McGraw Hill Higher Education
6. Brown TA. (2007). Genomes-3. Garland Science Publishers
7. Primrose SB and Twyman RM. (2008). Genomics: Applications in human biology. Blackwell Publishing, Oxford, U.K.

DSE-A:
2. MICROBES IN ENVIRONMENT (THEORY)

SEMESTER – 5

MCB-G-DSE-A-5-2-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Microorganisms and their Habitats **No. of Hours: 12**

Structure and function of ecosystems
Terrestrial Environment: Soil profile and soil microflora
Aquatic Environment: Microflora of fresh water and marine habitats
Atmosphere: Aeromicroflora and dispersal of microbes
Animal Environment: Microbes in/on human body (Microbiomics) & animal (ruminants) body.
Extreme Habitats: Extremophiles: Microbes thriving at high & low temperatures, pH, high hydrostatic & osmotic pressures, salinity, & low nutrient levels.

Unit 2 Microbial Interactions **No. of Hours: 08**

Microbe interactions: Mutualism, synergism, commensalism, competition, amensalism, parasitism, predation
Microbe-Plant interaction: Symbiotic and non symbiotic interactions
Microbe-animal interaction: Microbes in ruminants, nematophagus fungi and symbiotic luminescent bacteria

Unit 3 Biogeochemical Cycling **No. of Hours: 10**

Carbon cycle: Microbial degradation of cellulose, hemicelluloses, lignin and chitin
Nitrogen cycle: Nitrogen fixation, ammonification, nitrification, denitrification and nitrate reduction
Phosphorus cycle: Phosphate immobilization and solubilisation
Sulphur cycle: Microbes involved in sulphur cycle
Other elemental cycles: Iron and manganese

Unit 4 Waste Management **No. of Hours: 10**

Solid Waste management: Sources and types of solid waste, Methods of solid waste disposal (composting and sanitary landfill)
Liquid waste management: Composition and strength of sewage (BOD and COD), Primary, secondary (oxidation ponds, trickling filter, activated sludge process and septic tank) and tertiary sewage treatment

Unit 5 Microbial Bioremediation **No. of Hours: 5**

Principles and degradation of common pesticides, hydrocarbons (oil spills).

Unit 6 Water Potability **No. of Hours: 5**

Treatment and safety of drinking (potable) water, methods to detect potability of water samples: (a) standard qualitative procedure: presumptive test/MPN test, confirmed and completed tests for faecal coliforms (b) Membrane filter technique and (c) Presence/absence tests

DSE-A:
2. MICROBES IN ENVIRONMENT (PRACTICAL)
SEMESTER –5

MCB-G-DSE-A-5-2-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Analysis of soil - pH, moisture content, water holding capacity, percolation, capillary action.
2. Isolation of microbes (bacteria & fungi) from soil (28ºC & 45ºC).
3. Isolation of microbes (bacteria & fungi) from rhizosphere and rhizoplane.
4. Assessment of microbiological quality of water.
5. Determination of BOD of waste water sample.
6. Study the presence of microbial activity by detecting (qualitatively) enzymes (dehydrogenase, amylase, urease) in soil.
7. Isolation of *Rhizobium* from root nodules.

SUGGESTED READINGS

1. Atlas RM and Bartha R. (2000). Microbial Ecology: Fundamentals & Applications. 4th edition. Benjamin/Cummings Science Publishing, USA
2. Madigan MT, Martinko JM and Parker J. (2014). Brock Biology of Microorganisms. 14th edition. Pearson/ Benjamin Cummings
3. Maier RM, Pepper IL and Gerba CP. (2009). Environmental Microbiology. 2nd edition, Academic Press
4. Okafor, N (2011). Environmental Microbiology of Aquatic & Waste systems. 1st edition, Springer, New York
5. Singh A, Kuhad, RC & Ward OP (2009). Advances in Applied Bioremediation. Volume 17, Springer-Verlag, Berlin Hedeilberg
6. Barton LL & Northup DE (2011). Microbial Ecology. 1st edition, Wiley Blackwell, USA Campbell RE. (1983). Microbial Ecology. Blackwell Scientific Publication, Oxford, England.
7. Coyne MS. (2001). Soil Microbiology: An Exploratory Approach. Delmar Thomson Learning.
8. Lynch JM &Hobbie JE. (1988). Microorganisms in Action: Concepts & Application in Microbial Ecology. Blackwell Scientific Publication, U.K.
9. Martin A. (1977). An Introduction to Soil Microbiology. 2nd edition. John Wiley & Sons Inc. New York & London.
10. Stolp H. (1988). Microbial Ecology: Organisms Habitats Activities. Cambridge University Press, Cambridge, England.
11. SubbaRao NS. (1999). Soil Microbiology. 4th edition. Oxford & IBH Publishing Co. New Delhi.
12. Willey JM, Sherwood LM, and Woolverton CJ. (2013). Prescott's Microbiology. 9th edition. McGraw Hill Higher Education.

Elective Course (Any One from DSE-B)

Semester-6

DSE-B:
1. MEDICAL MICROBIOLOGY AND IMMUNOLOGY (THEORY)

MCB-G-DSE-B-6-1-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Normal microflora of the human body and host pathogen interaction **No. of Hours: 5**

Normal microflora of the human body: Importance of normal microflora, normal microflora of skin, throat, gastrointestinal tract, urogenital tract
Host pathogen interaction: Definitions - Infection, Invasion, Pathogen, Pathogenicity, Virulence, Toxigenicity, Carriers and their types, Opportunistic infections, Nosocomial infections. Transmission of infection,

Unit 2 Sample collection, transport and diagnosis **No. of Hours: 2**

Collection, transport and culturing of clinical samples and their identification characteristics.

Unit 3 Bacterial diseases **No. of Hours: 3**

List of diseases of various organ systems and their causative agents.

Unit 4 Viral diseases **No. of Hours: 3**

List of diseases of various organ systems and their causative agents.

Unit 5 Protozoan diseases **No. of Hours: 2**

List of diseases of various organ systems and their causative agents.

Unit 6 Fungal diseases **No. of Hours: 2**

Brief description of various types of mycoses.

Unit 7 Antimicrobial agents: General characteristics and mode of action **No. of Hours: 6**

Antibacterial agents: Five modes of action with one example each: Inhibitor of nucleic acid synthesis; Inhibitor of cell wall synthesis; Inhibitor of cell membrane function; Inhibitor of protein synthesis; Inhibitor of metabolism
Antifungal agents: Mechanism of action of Amphotericin B, Griseofulvin
Antiviral agents: Mechanism of action of Amantadine, Acyclovir, Azidothymidine

Unit 8 Immune Cells and Organs **No. of Hours: 5**

Structure, Functions and Properties of: Immune Cells – Stem cell, T cell, B cell, NK cell, Macrophage, Neutrophil, Eosinophil, Basophil, Mast cell, Dendritic cell; and Immune Organs – Bone Marrow, Thymus, Lymph Node, Spleen

Unit 9 Antigens and Antibodies **No. of Hours: 6**

Characteristics of an antigen (Foreignness, Molecular size and Heterogeneity); Haptens; Epitopes (T & B cell epitopes), Adjuvants, Structure, Types and Functions of antibodies.

Unit 10 Generation of Immune Response **No. of Hours: 6**

Primary and Secondary Immune Response; Generation of Humoral Immune Response (Plasma and Memory cells); Generation of Cell Mediated Immune Response

Unit 11 Immunological Disorders and Tumor Immunity **No. of Hours: 5**

Types of Autoimmunity and Hypersensitivity with examples; Immunodeficiencies - Animal models (Nude and SCID mice).

Unit 12 Immunological Techniques No. of Hours: 5
Principles of Precipitation, Agglutination, Immunodiffusion, Immunoelectrophoresis, ELISA, ELISPOT.

DSE-B:
1. MEDICAL MICROBIOLOGY AND IMMUNOLOGY (PRACTICAL)

MCB-G-DSE-B-6-1-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Identify bacteria on the basis of cultural, morphological and biochemical characteristics: IMViC, TSI, nitrate reduction, urease production and catalase tests
2. Study of composition and use of important differential media for identification of bacteria: EMB Agar, McConkey agar, Mannitol salt agar, Deoxycholate citrate agar, TCBS
3. Study of bacterial flora of skin by swab method
4. Perform antibacterial sensitivity by Kirby-Bauer method
5. Identification of human blood groups.
6. To perform Total Leukocyte Count of the given blood sample.
7. To perform Differential Leukocyte Count of the given blood sample.
8. To separate serum from the blood sample (demonstration).
9. To perform immunodiffusion by Ouchterlony method.

SUGGESTED READING

1. Ananthanarayan R. and Paniker C.K.J. (2009) Textbook of Microbiology. 8th edition, University Press Publication
2. Brooks G.F., Carroll K.C., Butel J.S., Morse S.A. and Mietzner, T.A. (2013) Jawetz, Melnick and Adelberg's Medical Microbiology. 26th edition. McGraw Hill Publication
3. Goering R., Dockrell H., Zuckerman M. and Wakelin D. (2007) Mims' Medical Microbiology. 4th edition. Elsevier
4. Willey JM, Sherwood LM, and Woolverton CJ. (2013) Prescott, Harley and Klein's Microbiology. 9th edition. McGraw Hill Higher Education
5. Abbas AK, Lichtman AH, Pillai S. (2007). Cellular and Molecular Immunology. 6th edition Saunders Publication, Philadelphia.
6. Delves P, Martin S, Burton D, Roitt IM. (2006). Roitt's Essential Immunology.11th edition Wiley-Blackwell Scientific Publication, Oxford.
7. Goldsby RA, Kindt TJ, Osborne BA. (2007). Kuby's Immunology. 6th edition W.H. Freeman and Company, New York.
8. Richard C and Geiffrey S. (2009). Immunology. 6th edition. Wiley Blackwell Publication.

DSE-B:
2. INDUSTRIAL AND FOOD MICROBIOLOGY (THEORY)

MCB-G-DSE-B-6-2-TH

TOTAL HOURS: 50 **CREDITS: 4**

Unit 1 Introduction to Industrial microbiology **No. of Hours: 10**

Brief history and developments in industrial microbiology
Types of fermentation processes - solid state, liquid state, batch, fed-batch and continuous
Types of fermenters – laboratory, pilot-scale and production fermenters
Components of a typical continuously stirred tank bioreactor

Unit 2 Isolation of Industrial Strains and Fermentation Medium **No. of Hours: 6**

Primary and secondary screening
Preservation and maintenance of industrial strains
Ingredients used in fermentation medium - molasses, corn steep liquor, whey & Yeast extract

Unit 3 Microbial fermentation processes **No. of Hours: 10**

Downstream processing - filtration, centrifugation, cell disruption, solvent extraction.
Microbial production of industrial products - citric acid, ethanol and penicillin.
Industrial production and uses of the enzymes - amylases, proteases, lipases and cellulases

Unit 4 Food as a substrate for microbial growth **No. of Hours: 6**

Intrinsic and extrinsic parameters that affect microbial growth in food
Microbial spoilage of food - milk, egg, bread and canned foods

Unit 5 Principles and methods of food preservation and food sanitation **No. of Hours: 8**

Physical methods - high temperature, low temperature, irradiation, aseptic packaging
Chemical methods - salt, sugar, benzoates, citric acid, ethylene oxide, nitrate and nitrite
Food sanitation and control – HACCP

Unit 6 Dairy products, probiotics and Food-borne Diseases **No. of Hours: 10**

Fermented dairy products - yogurt, acidophilus milk, kefir, dahi and cheese
Probiotics definition, examples and benefits
Food intoxication by *Clostridium botulinum* and *Staphylococcus aureus*
Food infection by *Salmonella* and *E.coli*

DSE-B:
2.INDUSTRIAL AND FOOD MICROBIOLOGY (PRACTICAL)
MCB-G-DSE-B-6-2-P

TOTAL HOURS: 60 **CREDITS: 2**

1. Microbial fermentation for the production and estimation of amylase
2. Microbial fermentation for the production and estimation of citric acid
3. Microbial fermentation for the production and estimation of ethanol
4. Determination of the microbiological quality of milk sample by MBRT
5. Isolation of fungi from spoilt bread/fruits/vegetables
6. Preparation of Yogurt/Dahi

SUGGESTED READING

1. Crueger W and Crueger A. (2000). Biotechnology: A textbook of Industrial Microbiology. 2nd Edition. Panima Publishing Company, New Delhi

2. Patel AH. (1996). Industrial Microbiology .1st Edition. MacMillan India Limited Publishing Company Ltd. New Delhi, India
3. Tortora GJ, Funke BR, and Case CL. (2008). Microbiology: An introduction.9th Edition. Pearson Education
4. Willey JM, Sherwood LM AND Woolverton CJ (2013), Prescott, Harley and Klein's Microbiology.9th Edition. McGraw Hill Higher education
5. Casida LE. (1991). Industrial Microbiology. 1st edition. Wiley Eastern Limited.
6. Stanbury PF, Whitaker A and Hall SJ. (2006). Principles of Fermentation Technology. 2nd edition, Elsevier Science Ltd.
7. Adams MR and Moss MO. (1995). Food Microbiology. 4th edition, New Age International (P) Limited Publishers, New Delhi, India.
8. Banwart JM. (1987). Basic Food Microbiology. 1st edition. CBS Publishers and Distributors, Delhi, India.
9. Frazier WC and Westhoff DC. (1992). Food Microbiology. 3rd edition. Tata McGraw-Hill Publishing Company Ltd, New Delhi, India.
10. Jay JM, Loessner MJ and Golden DA. (2005). Modern Food Microbiology. 7th edition, CBS Publishers and Distributors, Delhi, India.

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

U.G. Syllabus

for

Physics (Honours & General)

University of Calcutta

2018

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1 Scheme of CBCS Curriculum

1.1 Basic Courses Types under CBCS

In CBCS there are some basic types of courses. The ones that are relevant to the B.Sc. curricula have been described below.

1. **Core Course (CC)**: A *discipline specific compulsory* basic course.
2. **Discipline Specific Elective Course (DSE)**: A *discipline specific elective* course which is more advanced or specialized.
3. **Generic Elective Course (GEC)**: An *inter-disciplinary elective* course to be opted from a discipline other than ones main discipline(s) of choice (e.g., a course in a discipline other than in which honours has been taken).
4. **Skill Enhancement Course (SEC)**: A *discipline specific elective* skill enhancement course.
5. **Ability Enhancement Compulsory Course (AECC)**: These are *compulsory* courses. There are two of them. AECC-1 is Communicative English / Modern Indian Language (e.g.:Bengali, Urdu, Hindi.) & AECC-2 is Environmental Science.

1.2 Credit Structure

In CBCS, all courses have credits assigned to them.

For any course, one of the following three modes teaching will be used:

1. Theory + Practical
2. Theory + Tutorial
3. Theory only

The credit structure is described below:

	Theory + Practical		**Theory + Tutorial**		**Theory**	**Total Credits**
	Theory	**Practical**	**Theory**	**Tutorial**	**Theory**	
CC	4	2	5	1		6
DSE	4	2	5	1		6
GE	4	2	5	1		6
SEC					2	2
AECC					2	2

Class Assignments The class assignment for different course segments (theory, practical, tutorial) are as follows:

- **Theory: 1 credit = 1 hour / week**
- **Practical: 1 credit = 2 hours / week**
- **Tutorial: 1 credit = 1 hour / week**

Duration of the Semesters The semesters will comprise **15 to 18 weeks of direct teaching.**

Grading The evaluation and final grading will also depend crucially on the credits of the papers.

A Grade Point Average system will be used. The weight factor (or importance) with which a particular paper will contribute to the final CGPA (Cumulative Grade Point Average) will depend on the credit of the course.

Please refer to the University Regulations for details.

1.3 Selection of DSE

Honours

- A student must choose four DSE papers from his/her honours subject - two papers in the 5th semester and two papers in the 6th semester.
- There are two groups of DSE papers, DSE-A and DSE-B. Each of these groups are further divided into two subgroups DSE-A1, DSE-A2, and DSE-B1, DSE-B2 respectively.
- In the 5th semester a student will be expected to choose one paper from DSE-A1 and one paper from DSE-B1.
- Similarly, in the 6th semester a student will be expected to choose one paper from DSE-A2 and one paper from DSE-B2.

General

- A student must choose six DSE papers.
- For each subject of the student's chosen combination (e.g.: Physics- Chemistry-Mathematics), a student must choose two DSE papers - one in the 5th semester and one in the 6th semester.
- For each subject there will be two groups of DSE papers, DSE-A and DSE-B.
- The DSE paper in the 5th semesters must be chosen from DSE-A and the DSE paper in the 6th semester must be chosen from DSE-B.

1.4 Selection of SEC

Honours

- A student must choose two SEC papers from the honours discipline - one in the 3rd semester and one in the 4th semester.
- For each subject there will be two groups of SEC papers, SEC-A and SEC-B.
- The SEC paper in the 3rd semester must be chosen from Group A and the SEC paper in the 4th semester must be chosen from Group B.

General

- A student must choose four SEC papers - one each in the 3rd, 4th, 5th and 6th semesters.
- The four SEC papers must be chosen from two of the subjects in his/her chosen combination (e.g.: Physics, Chemistry, Mathematics).
- Two of the papers must be chosen from one subject and two from the other.
- For each subject there will be two groups of SEC papers, SEC-A and SEC-B.
- The SEC papers in the 3rd and 5th semesters must be chosen from Group-A of two subjects.
- The SEC papers in the 4th and 6th semesters must be chosen from Group-B of the same subjects as above.

1.5 B.Sc. Honours - Semesterwise Courses

The number of different types of courses to be taken in the different semesters have been specified in the table below.

	Sem-1	**Sem-2**	**Sem-3**	**Sem-4**	**Sem-5**	**Sem-6**	**Total**	**Credits**
CC	2	2	3	3	2	2	14	$14 \times 6 = 84$
DSE					2	2	4	$4 \times 6 = 24$
GE	1	1	1	1			4	$4 \times 6 = 24$
SEC			1	1			2	$2 \times 2 = 4$
AECC	1	1					2	$2 \times 2 = 4$
Total	4	4	5	5	4	4	26	140

Note:

1. **The CC for general course of a subject other than the honours subject is to be treated as GE course.**
2. **The four GE courses must be chosen from two interdisciplinary subjects other than Physics, taking at least one from the Science / Home Science Division (Please see University Regulation). However, any discipline may be chosen in any semester.**

Special Note:
Across all courses (for both, Honours and General) 10 marks will be reserved for Internal Assessment and 10 marks will be reserved for Attendance.

1.6 B.Sc. Honours - Course Details

Core Courses (Honours)

Sem	Course Type	Course Name	Teaching Mode	Credit	Marks
1	CC	Mathematical Physics - I	Theory	4	50
			Practical	2	30
	CC	Mechanics	Theory	4	50
			Practical	2	30
2	CC	Electricity and Magnetism	Theory	4	50
			Practical	2	30
	CC	Waves and Optics	Theory	4	50
			Practical	2	30
3	CC	Mathematical Physics - II	Theory	4	50
			Practical	2	30
	CC	Thermal Physics	Theory	4	50
			Practical	2	30
	CC	Digital Systems and Applications	Theory	4	50
			Practical	2	30
4	CC	Mathematical Physics - III	Theory	4	50
			Practical	2	30
	CC	Elements of Modern Physics	Theory	4	50
			Practical	2	30
	CC	Analog Systems and Applications	Theory	4	50
			Practical	2	30
5	CC	Quantum Mechanics and Applications	Theory	4	50
			Practical	2	30
	CC	Solid State Physics	Theory	4	50
			Practical	2	30
6	CC	Electro-magnetic Theory	Theory	4	50
			Practical	2	30
	CC	Statistical Mechanics	Theory	4	50
			Practical	2	30

Choices for DSE (Honours)

Sem	Course Type - Group	Course Name	Teaching Mode	Credit	Marks
5	DSE-A1 (Any one)	Advanced Mathematical Methods - I	Theory	5	65
			Tutorial	1	15
		Communication Electronics	Theory	4	50
			Practical	2	30
	DSE-B1 (Any one)	Advanced Mathematical Methods - II	Theory	5	65
			Tutorial	1	15
		Nuclear and Particle Physics	Theory	5	65
			Tutorial	1	15
6	DSE-A2 (Any one)	Astronomy and Astrophysics	Theory	5	65
			Tutorial	1	15
		Advanced Dynamics	Theory	4	50
			Practical	2	30
	DSE-B2 (Any one)	General Relativity	Theory	5	65
			Tutorial	1	15
		Nano Materials and Applications	Theory	5	65
			Tutorial	1	15

Choices for SEC (Honours)

Sem	Course Type - Group	Course Name	Teaching Mode	Credit	Marks
3	SEC-A (Any one)	Basics of Programming and Scientific Word Processing	Theory	2	80
		Electrical Circuits and Network Skills	Theory	2	80
4	SEC-B (Any one)	Computer Algebra System and Figure Drawing Skill	Theory	2	80
		Renewable Energy and Energy Harvesting	Theory	2	80

1.7 B.Sc. General - Semesterwise Courses

The number of different types of courses to be taken in the different semesters have been specified in the table below.

	Sem-1	**Sem-2**	**Sem-3**	**Sem-4**	**Sem-5**	**Sem-6**	**Total**	**Credits**
CC	3	3	3	3			12	$12 \times 6 = 72$
DSE					3	3	6	$6 \times 6 = 36$
GE								
SEC			1	1	1	1	4	$2 \times 4 = 8$
AECC	1	1					2	$2 \times 2 = 4$
Total	4	4	4	4	4	4	24	120

Note:

1. **The CC must be chosen from three different disciplines.**
2. **The four SEC must be chosen from two different disciplines.**

1.8 B.Sc. General - Course Details

Core Courses (General)

Sem	Course Type	Course Name	Teaching Mode	Credits	Marks
1	CC	Mechanics	Theory	4	50
			Practical	2	30
2	CC	Electricity and Magnetism	Theory	4	50
			Practical	2	30
3	CC	Thermal Physics	Theory	4	50
			Practical	2	30
4	CC	Waves and Optics	Theory	4	50
			Practical	2	30

Choices for DSE (General)

Sem	Course Type - Group	Course Name	Teaching Mode	Credit	Marks
5	DSE-A (Any one)	Electronics and Instrumentation	Theory	4	50
			Practical	2	30
		Modern Physics	Theory	5	65
			Tutorial	1	15
6	DSE-B (Any one)	Solid State Physics	Theory	4	50
			Practical	2	30
		Nuclear and Particle Physics	Theory	5	65
			Tutorial	1	15

Choices for SEC (General)

Sem	Course Type - Group	Course Name	Teaching Mode	Credit	Marks
3/5	SEC-A (Any one)	Basics of Programming and Scientific Word Processing	Theory	2	80
		Electrical Circuits and Network Skills	Theory	2	80
4/6	SEC-B (Any one)	Computer Algebra System and Figure Drawing Skill	Theory	2	80
		Renewable Energy and Energy Harvesting	Theory	2	80

Part I

Physics Syllabus : Honours Course

2 Syllabi for Core Courses (Honours)

2.1 Semester - 1: Mathematical Physics - I

Mathematical Physics - I (Theory)

Paper: PHS-A-CC-1-1-TH **Credits: 4**

1. Calculus

   (a) Recapitulation: Limits, continuity, average and instantaneous quantities, differentiation. Plotting functions. Intuitive ideas of continuous, differentiable, etc. functions and plotting of curves. Approximation: Taylor and binomial series (statements only).

   (b) First Order and Second Order Differential equations: First Order Differential Equations and Integrating Factor. Homogeneous Equations with constant coefficients. Wronskian and general solution. Statement of existence and Uniqueness Theorem for Initial Value Problems. Particular Integral.

   (c) Calculus of functions of more than one variable: Partial derivatives, exact and inexact differentials. Integrating factor, with simple illustration. Constrained Maximization using Lagrange Multipliers.

2. Vector Algebra and Vector Calculus

   (a) Recapitulation of Vector Algebra. Idea of linear independence, completeness, basis and representation of vectors. Properties of vectors under rotations. Scalar product and its invariance under coordinate rotations. Vector product, Scalar triple product and their interpretation in terms of area and volume respectively.

   (b) Vector Differentiation: Scalar and Vector fields. Directional derivatives and normal derivative. Gradient of a scalar field and its geometrical interpretation. Divergence and curl of a vector field. Del and Laplacian operators. Vector identities.

   (c) Vector Integration: Ordinary Integrals of Vectors. Multiple integrals, Jacobian. Notion of infinitesimal line, surface and volume elements. Line, surface and volume integrals of Vector fields. Flux of a vector field. Gauss' divergence theorem, Green's and Stokes Theorems and their applications (no rigorous proofs).

3. Orthogonal Curvilinear Coordinates

   (a) Orthogonal Curvilinear Coordinates. Derivation of Gradient, Divergence, Curl and Laplacian in Cartesian, Spherical and Cylindrical Coordinate Systems.

4. Matrices

   (a) Addition and Multiplication of Matrices. Null Matrices. Diagonal, Scalar and Unit Matrices. Transpose of a Matrix. Symmetric and Skew-Symmetric Matrices. Conjugate of a Matrix. Hermitian and Skew- Hermitian Matrices. Singular and Non-Singular matrices. Orthogonal and Unitary Matrices. Trace of a Matrix. Inner Product.

   (b) Eigen-values and Eigenvectors. Cayley- Hamiliton Theorem. Diagonalization of Matrices. Solutions of Coupled Linear Ordinary Differential Equations. Functions of a Matrix.

Reference Books

- Mathematical Methods for Physicists, G.B. Arfken, H.J. Weber, F.E. Harris, 2013, 7th Edn., Elsevier.
- An introduction to ordinary differential equations, E.A. Coddington, 2009, PHI learning
- Differential Equations, George F. Simmons, 2007, McGraw Hill.
- Mathematical Tools for Physics, James Nearing, 2010, Dover Publications.
- Mathematical methods for Scientists and Engineers, D.A. McQuarrie, 2003, Viva Book.
- Advanced Engineering Mathematics, D.G. Zill and W.S. Wright, 5 Ed., 2012, Jones and Bartlett Learning.
- Mathematical Physics, Goswami, 1st edition, Cengage Learning
- Engineering Mathematics, S.Pal and S.C. Bhunia, 2015, Oxford University Press
- Advanced Engineering Mathematics, Erwin Kreyszig, 2008, Wiley India.
- Essential Mathematical Methods, K.F.Riley & M.P.Hobson, 2011, Cambridge Univ. Press
- Mathematical methods in the Physical Sciences, M. L. Boas, 2005, Wiley.

Mathematical Physics - I (Practical)

Paper: PHS-A-CC-1-1-P **Credits: 2**

List of Practicals

1. Introduction and Overview
   (a) Computer architecture and organization, memory and Input/output devices.
2. Basics of scientific computing
   (a) Binary and decimal arithmetic, Floating point numbers, algorithms, Sequence, Selection and Repetition, single and double precision arithmetic, underflow &overflow- emphasize the importance of making equations in terms of dimensionless variables, Iterative methods.
3. Errors and error Analysis.
   (a) Truncation and round off errors, Absolute and relative errors, Floating point computations.
4. Introduction to plotting graphs with Gnuplot / QtiPlot (or some other GUI based free software like Grace, Origin etc.)
   (a) Basic 2D graph plotting - plotting functions and data files, fitting data using gnuplot's fit function, polar and parametric plots, modifying the appearance of graphs, exporting plots.
5. Introduction to programming in python:
   (a) Introduction to programming, constants, variables and data types, dynamical typing, operators and expressions, modules, I/O statements, file handling, iterables, compound statements, indentation in python, the if-elif-else block, for and while loops, nested compound statements.
6. Programs
   (a) Elementary calculations with different type of data e.g., area and volume of regular shapes using formulae. Creation and handling one dimensional array. Sum and average of a list of numbers stored in array, finding the largest and lowest number from a list, swapping two data in a list, sorting of numbers in an array using bubble sort, insertion sort method. Calculation of term value in a series and finding the other terms with a seed (value of particular term) and calculation of different quantities with series. Convergence and accuracy of series. Introduction of three dimensional array. Simple calculations of matrices e.g., addition, subtraction, multiplication.

(b) Curve fitting, Least square fit, Goodness of fit, standard deviation

i. Ohms law to calculate R,

ii. Hooke's law to calculate spring constant

Note:

A list of suggestive numerical problems will be circulated from time to time.

Reference Books

- Introduction to Numerical Analysis, S.S. Sastry, 5th Edn. , 2012, PHI Learning Pvt. Ltd.
- Learning with Python-how to think like a computer scientist, J. Elkner, C. Meyer, and A. Downey, 2015, Dreamtech Press.
- Introduction to computation and programming using Python, J. Guttag, 2013, Prentice Hall India.
- Effective Computation in Physics- Field guide to research with Python, A. Scopatz and K.D. Huff, 2015, O'Rielly A first course in Numerical Methods, U.M. Ascher & C. Greif, 2012, PHI Learning.
- Elementary Numerical Analysis, K.E. Atkinson, 3 rd Edn., 2007, Wiley India Edition.
- Numerical Methods for Scientists & Engineers, R.W. Hamming, 1973, Courier Dover Pub.
- An Introduction to computational Physics, T.Pang, 2nd Edn., 2006,Cambridge Univ. Press Computational Physics, Darren Walker, 1st Edn., 2015, Scientific International Pvt. Ltd.

2.2 Semester - 1: Mechanics

Mechanics (Theory)

Paper: PHS-A-CC-1-2-TH **Credits: 4**

1. Fundamentals of Dynamics

   (a) Review of Newtons Laws: Mechanistic view of the Universe. Concepts of Inertial frames, force and mass. Solution of the equations of motion (E.O.M.) in simple force fields in one, two and three dimensions using cartesian, cylindrical polar and spherical polar coordinate systems.

(b) Dynamics of systems of particles: Difficulty of solving the E.O.M. for systems of particles. Newton's third Law. External and Internal forces. Momentum and Angular Momentum of a system. Torque acting on a system. Conservation of Linear and Angular Momentum. Centre of mass and its properties. Two-body problem.

(c) Variable- mass system: motion of rocket.

2. Work and Energy

(a) Work - Kinetic Energy Theorem. Conservative Forces: Force as the gradient of a scalar field - concept of Potential Energy. Other equivalent definitions of a Conservative Force. Conservation of Energy.

(b) Qualitative study of one dimensional motion from potential energy curves. Stable and Unstable equilibrium.

(c) Energy of a system of particles.

3. Gravitation and Central Force Motion

(a) Central Force. Reduction of the two body central force problem to a one-body problem. Setting up the E.O.M. in plane polar coordinates.

(b) Differential equation for the path. Motion under an Inverse-square force. Newton's Law of Gravitation. Inertial and gravitational mass. Kepler's Laws. Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS).

(c) Gravitational potential energy. Potential and field due to spherical shell and solid sphere.

4. Non-Inertial Systems

(a) Galilean transformations and Galilean invariance.

(b) Non-inertial frames and idea of fictitious forces. E.O.M with respect to a uniformly accelerating frame. E.O.M with respect to a uniformly rotating frame - Centrifugal and Coriolis forces. Laws of Physics in a laboratory on the surface of the earth.

5. Rotational Dynamics

(a) The Rigid Body: Constraints defining the rigid body. Degrees of freedom for a rigid body;

(b) Relation between Angular momentum and Angular Velocity - Moment of Inertia Tensor. Calculation of moment of inertia for rectangular, cylindrical and spherical bodies.

(c) E.O.M for rotation about a fixed axis.

(d) Principal Axes transformation. Transformation to a body fixed frame. E.O.M for the rigid body with one point fixed (Euler's equations of motion). General motion of a rigid body - translation plus rotation. Kinetic energy of rotation.

6. Elasticity

   (a) Relation between Elastic constants. Twisting torque on a Cylinder or Wire. Bending of a beam . Internal bending moment. Elastic potential energy.

7. Fluid Motion

   (a) Kinematics of Moving Fluids: Idea of compressible and incompressible fluids, Equation of continuity; streamline and turbulent flow, Reynold's number. Euler's Equation. The special case of fluid statics $\vec{F} = \nabla p$: Simple applications (e.g: Pascal's law and Archimedes principle).

   (b) Poiseuille's equation for Flow of a viscous Liquid through a Capillary Tube.

Reference Books

- An introduction to mechanics, D. Kleppner, R.J. Kolenkow, 1973, McGraw-Hill.
- Mechanics, Berkeley Physics, vol.1, C.Kittel, W.Knight, et.al. 2007, Tata McGraw-Hill.
- Physics, Resnick, Halliday and Walker 8/e. 2008, Wiley. Analytical Mechanics, G.R. Fowles and G.L. Cassiday. 2005, Cengage Learning.
- Feynman Lectures, Vol. I, R.P.Feynman, R.B.Leighton, M.Sands, 2008, Pearson Education
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.

Additional Books for Reference

- Mechanics, D.S. Mathur, S. Chand and Company Limited, 2000 University Physics.
- F.W Sears, M.W Zemansky, H.D Young 13/e, 1986, Addison Wesley

Mechanics (Practical)

Paper: PHS-A-CC-1-2-P **Credits: 2**

List of Practicals

1. To determine the Moment of Inertia of a metallic cylinder / rectangular bar about an axis passing through the C.G. and to determine the Modulus of Rigidity of the suspension wire.

2. To determine the Moment of Inertia of a Flywheel.

3. To determine Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method).

4. Determination of Young's modulus of the material of a beam by the method of flexure.

5. To determine the elastic constants of a material by Searle's method.

6. To determine the value of g using Bar Pendulum.

7. To determine the height of a building using sextant.

General Topics

1. Measurements of length (or diameter) using vernier caliper, screw gauge and traveling microscope.

2. To study the random error in observations.

Reference Books

- Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, Asia Publishing House.

- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.

- A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn, 2011, Kitab Mahal.

- Engineering Practical Physics, S.Panigrahi & B.Mallick, 2015, Cengage Learning India Pvt. Ltd.

- Practical Physics, G.L. Squires, 2015, 4th Edition, Cambridge University Press.

2.3 Semester - 2: Electricity and Magnetism

Electricity and Magnetism (Theory)

Paper: PHS-A-CC-2-3-TH **Credits: 4**

1. Electrostatic Field
   (a) Coulombs law and Principle of superposition leading to the definition of Electrostatic Field. Field lines.
   (b) Divergence of the Electrostatic field. Flux, Gauss's theorem of electrostatics. Applications of Gauss theorem to find Electric field due to charge configurations with spherical, cylindrical and planar symmetry.
   (c) Curl of the Electrostatic Field and its conservative nature. Electric potential. Potential for a uniformly charged spherical shell and solid sphere. Calculation of electric field from potential.
   (d) Laplace's and Poisson equations. Uniqueness Theorems. Method of Images and its application to: (1) Plane Infinite Sheet and (2) Sphere.
   (e) Conductors: Electric field and charge density inside and on the surface of a conductor. Conductors in an electrostatic field. Force per unit area on the surface. Capacitance of a conductor. Capacitance an isolated spherical conductor. Parallel plate condenser.
   (f) Electrostatic energy of system of charges. Electrostatic energy of a charged sphere.
   (g) Energy per unit volume in electrostatic field.
2. Dielectric properties of matter
   (a) Electric potential and field due to an electric dipole. Electric dipole moment. Force and torque on a dipole.
   (b) Electric Fields inside matter: Electric Polarization. Bound charges. Displacement vector. Relations between E, P and D. Gauss's theorem in dielectrics. Linear Dielectric medium. Electric Susceptibility and Permittivity. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric.
3. The Magnetostatic Field
   (a) Biot-Savart's law. Force on a moving point charge due to a magnetic field: Lorentz force law. Application of Biot-Savart's law to determine the magnetic field of a straight conductor, circular coil. Force between two straight current carrying wires.
   (b) Divergence of the magnetic field - its solenoidal nature. Magnetic vector potential.

(c) Curl of the magnetic field. Ampere's circuital law. Its application to (1) Infinite straight wire, (2) Infinite planar surface current, and (3) Solenoid.

4. Magnetic properties of matter.

   (a) Potential and field due to a magnetic dipole. Magnetic dipole moment. Force and torque on a magnetic dipole in a uniform magnetic field.

   (b) Magnetization. Bound currents. The magnetic intensity - H. Relation between B, H and M. Linear media. Magnetic Susceptibility and Permeability. Brief introduction of dia-, para- and ferro-magnetic materials. B-H curve and hysteresis.

5. Electro-magnetic induction

   (a) Ohms law and definition of E.M.F. Faraday's laws of electromagnetic induction, Lenz's law. Self-Inductance and Mutual Inductance. Reciprocity Theorem. Introduction to Maxwell's Equations. Charge conservation. Displacement current and resurrection of Equation of Continuity.

   (b) Energy stored in magnetic field.

6. Electrical circuits

   (a) AC Circuits: Kirchhoff's laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width. Parallel LCR Circuit

7. Network theorems

   (a) Ideal Constant-voltage and Constant-current Sources. Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Applications to dc circuits.

Reference Books

- Introduction to Electrodynamics, D.J. Griffiths, 3rd Edn., 1998, Benjamin Cummings.
- Electricity, Magnetism & Electromagnetic Theory, S. Mahajan and Choudhury, 2012, Tata McGraw Hill.
- Electricity and Magnetism, Edward M. Purcell, 1986 McGraw-Hill Education.
- Feynman Lectures Vol.2, R.P.Feynman, R.B.Leighton, M. Sands, 2008, Pearson Education.

- Elements of Electromagnetics, M.N.O. Sadiku, 2010, Oxford University Press.
- Ellectricity and Magnetism, D.Chattopadhyay and P.C.Rakshit, New Central Book Agency, 2011.
- Electricity and Magnetism, J.H.Fewkes & J.Yarwood. Vol. I, 1991, Oxford Univ. Press.

Electricity and Magnetism (Practical)

Paper: PHS-A-CC-2-3-P **Credits: 2**

List of Practicals

1. To determine an unknown Low Resistance using Potentiometer.
2. To determine an unknown Low Resistance using Carey Foster's Bridge.
3. To verify the Thevenin and Norton theorems.
4. To verify the Superposition, and Maximum power transfer theorems.
5. To study response curve of a Series LCR circuit and determine its (a) Resonant frequency, (b) Impedance at resonance, (c) Quality factor Q, and (d) Band width.
6. To study the characteristics of a series RC Circuit.
7. Determination of horizontal component of the earths magnetic field.

General Topics

1. Using a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, (d) Capacitances, and (e) Checking electrical fuses should be taught in the Practical classes as a general prerequisite.

Note:

- For the sake of brevity, details of ballistic galvanometer have been omitted from the theory course. Some part of the theory may be needed for the experiments. This should be covered as part of Practical.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal.

- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
- Engineering Practical Physics, S.Panigrahi and B.Mallick, 2015, Cengage Learning.
- A Laboratory Manual of Physics for undergraduate classes, D.P.Khandelwal, 1985, Vani Pub.

2.4 Semester - 2: Waves and Optics

Waves and Optics (Theory)

Paper: PHS-A-CC-2-4-TH **Credits: 4**

1. Oscillations
   (a) SHM: Simple Harmonic Oscillations. Differential equation of SHM and its solution. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power dissipation and Quality Factor.
2. Superposition of Harmonic Oscillations
   (a) Superposition of Collinear Harmonic oscillations: Linearity and Superposition Principle. Superposition of two collinear oscillations having (1) equal frequencies and (2) different frequencies (Beats). Superposition of N collinear Harmonic Oscillations with (1) equal phase differences and (2) equal frequency differences.
   (b) Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures with equal an unequal frequency and their uses.
3. Wave motion
   (a) Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Traveling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave.
   (b) Water Waves: Ripple and Gravity Waves
4. Velocity of Waves
   (a) Velocity of Transverse Vibrations of Stretched Strings.
   (b) Velocity of Longitudinal Waves in a Fluid in a Pipe. Newton's Formula for Velocity of Sound. Laplace's Correction.

5. Superposition of Harmonic Waves

   (a) Standing (Stationary) Waves in a String: Fixed and Free Ends. Analytical Treatment. Changes with respect to Position and Time. Energy of Vibrating String. Transfer of Energy. Normal Modes of Stretched Strings. Plucked and Struck Strings. Melde's Experiment.

   (b) Longitudinal Standing Waves and Normal Modes. Open and Closed Pipes.

   (c) Superposition of N Harmonic Waves. Phase and Group Velocities.

6. Wave optics

   (a) Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence.

7. Interference

   (a) Division of amplitude and wavefront. Young's double slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: Measurement of wavelength and refractive index.

8. Interferometers

   (a) Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes.

   (b) Fabry-Perot interferometer.

9. Diffraction and Holography

   (a) Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating.

   (b) Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire.

   (c) Holography: Principle of Holography. Recording and Reconstruction Method. Theory of Holography as Interference between two Plane Waves. Point source holograms.

Reference Books

- Waves: Berkeley Physics Course, vol. 3, Francis Crawford, 2007, Tata McGraw-Hill.
- Fundamentals of Optics, F.A. Jenkins and H.E. White, 1981, McGraw-Hill.
- Principles of Optics, Max Born and Emil Wolf, 7th Edn., 1999, Pergamon Press.
- Optics, Ajoy Ghatak, 2008, Tata McGraw Hill.
- Optics, 4th Edn., Eugene Hecht, Pearson Education Limited, 2014.
- The Physics of Vibrations and Waves, H. J. Pain, 2013, John Wiley and Sons.
- The Physics of Waves and Oscillations, N.K. Bajaj, 1998, Tata McGraw Hill.
- Fundamental of Optics, A. Kumar, H.R. Gulati and D.R. Khanna, 2011, R. Chand Publications.
- A textbook of Optics; N Subramanyam, B. Lal and M.N.Avadhanulu; S.Chand. Publishing.

Waves and Optics (Practical)

PHS-A-CC-2-4-P **Credits: 2**

List of Practicals

1. To determine the frequency of an electric tuning fork by Melde's experiment and verify $\lambda^2 - T$ law.
2. To determine refractive index of the Material of a prism using sodium source.
3. To determine the dispersive power and Cauchy constants of the material of a prism using mercury source.
4. To determine wavelength of sodium light using Fresnel Biprism.
5. To determine wavelength of sodium light using Newton's Rings?
6. To determine the thickness of a thin paper by measuring the width of the interference fringes produced by a wedge-shaped Film.
7. Measurement of the spacing between the adjacent slits in a grating by measuring sin θ vs λ graph of a certain order of grating spectra.

General Topics

1. In the practical classes, students should be thoroughly familiarized with Schuster's focusing for their general proficiency with spectrometers.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
- A Laboratory Manual of Physics for undergraduate classes, D.P.Khandelwal, 1985, Vani Pub.

2.5 Semester - 3: Mathematical Physics - II

Mathematical Physics - II (Theory)

Paper: PHS-A-CC-3-5-TH **Credits: 4**

1. Fourier Series

   (a) Periodic functions. Orthogonality of sine and cosine functions, Dirichlet Conditions (Statement only). Expansion of periodic functions in a series of sine and cosine functions and determination of Fourier coefficients. Complex representation of Fourier series. Expansion of functions with arbitrary period. Expansion of non-periodic functions over an interval. Even and odd functions and their Fourier expansions. Application. Summing of Infinite Series. Term-by-Term differentiation and integration of Fourier Series. Parseval Identity.

2. Frobenius Method and Special Functions

   (a) Singular Points of Second Order Linear Differential Equations and their importance. Frobenius method and its applications to differential equations. Legendre, Bessel, Hermite and Laguerre Differential Equations. Properties of Legendre Polynomials: Rodrigues Formula, Generating Function, Orthogonality. Simple recurrence relations. Expansion of function in a series of Legendre Polynomials. Bessel Functions of the First Kind: Generating Function, simple recurrence relations. Zeros of Bessel Functions (Jo(x) and J1(x))and Orthogonality.

3. Some Special Integrals

   (a) Beta and Gamma Functions and Relation between them. Expression of Integrals in terms of Gamma Functions. Error Function (Probability Integral).

4. Variational calculus in physics

   (a) Functionals. Basic ideas of functionals. Extremization of action as a basic principle in mechanics. Lagrangian fomulation. Euler's equations of motion for simple systems: harmonics oscillators, simple pendulum, spherical pendulum, coupled oscillators. Cyclic coordinates. Symmetries and conservation laws. Legendre transformations and the Hamiltonian formulation of mechanics. Canonical equations of motion. Applications to simple systems.

5. Partial Differential Equations

   (a) Solutions to partial differential equations, using separation of variables: Laplace's Equation in problems of rectangular, cylindrical and spherical symmetry. Wave equation and its solution for vibrational modes of a stretched string, rectangular and circular membranes. Diffusion Equation.

Reference Books

- Mathematical Methods for Physicists: Arfken, Weber, 2005, Harris, Elsevier.
- Fourier Analysis by M.R. Spiegel, 2004, Tata McGraw-Hill.
- Mathematics for Physicists, Susan M. Lea, 2004, Thomson Brooks/Cole.
- Differential Equations, George F. Simmons, 2006, Tata McGraw-Hill.
- Partial Differential Equations for Scientists & Engineers, S.J. Farlow, 1993, Dover Pub.
- Engineering Mathematics, S.Pal and S.C. Bhunia, 2015, Oxford University Press.
- Mathematical methods for Scientists & Engineers, D.A. McQuarrie, 2003, Viva Books.
- Mathematical Physics, P. K. Chattopadhyay, 2014, New Academic Science.

Mathematical Physics - II (Practical)

Paper: PHS-A-CC-3-5-P **Credits: 2**

List of Practicals

1. Introduction to Numerical computation using numpy and scipy.

   (a) Introduction to the python numpy module. Arrays in numpy, array operations, array item selection, slicing, shaping arrays. Basic linear algebra using the linalg submodule. Introduction to online graph plotting using matplotlib. Introduction to the scipy module. Uses in optimization and solution of differential equations.

2. Solution of Linear system of equations by Gauss elimination method and Gauss Seidel method.

3. Diagonalization of matrices, Inverse of a matrix, Eigen vectors, eigen values problems

   (a) Solution of mesh equations of electric circuits (3 meshes)

   (b) Solution of coupled spring mass systems (3 masses)

4. Generation of Special functions using User defined functions

   (a) Generating and plotting Legendre Polynomials Generating and plotting Bessel function (Make use of generating function and recursion formula).

5. Root finding: Bisection and Newton-Raphson method.

6. Interpolation by Lagranges method.

7. Numerical differentiation - forward and backward difference formulae.

8. Numerical integration - trapezoidal and simpsons rule.

9. Solution of ODE: First order Differential equation - Euler's method.

10. Basic 3D graph plotting - plotting functions and data files, parametric plots, Surface and contour plots.

Note:

A list of suggestive numerical problems may be circulated from time to time.

Reference Books

- Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press.
- Complex Variables, A.S. Fokas & M.J. Ablowitz, 8th Ed., 2011, Cambridge Univ. Press.
- Numpy beginners guide, Idris Alba, 2015, Packt Publishing.
- Computational Physics, D.Walker, 1st Edn., 2015, Scientific International Pvt. Ltd.
- Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A.V. Wouwer, P. Saucez, C.V. Fernandez. 2014 Springer.

2.6 Semester - 3: Thermal Physics

Thermal Physics (Theory)

Paper: PHS-A-CC-3-6-TH **Credits: 4**

1. Introduction to Thermodynamics

   (a) Zeroth and First Law of Thermodynamics: Extensive and intensive Thermodynamic Variables, Thermodynamic Equilibrium, Zeroth Law of Thermodynamics & Concept of Temperature. Concept of Work & Heat, State Functions, Internal Energy and First Law of Thermodynamics. Its differential form, First Law & various processes. Applications of First Law: General Relation between CP and CV, Work Done during Isothermal and Adiabatic Processes, Compressibility and Expansion Co-efficient.

   (b) Second Law of Thermodynamics: Reversible and Irreversible process with examples. Conversion of Work into Heat and Heat into Work. Heat Engines. Carnot's Cycle, Carnot engine & efficiency. Refrigerator & coefficient of performance, 2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence.

   (c) Carnot's Theorem. Applications of Second Law of Thermodynamics: Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale.

   (d) Entropy: Concept of Entropy, Clausius Theorem. Clausius Inequality, Second Law of Thermodynamics in terms of Entropy. Entropy of a perfect gas. Principle of Increase of Entropy. Entropy Changes in Reversible and Irreversible processes with examples. Entropy of the Universe. Entropy Changes in Reversible and Irreversible Processes. Principle of Increase of Entropy. Temperature-Entropy diagrams for Cycle. Third Law of Thermodynamics. Unattainability of Absolute Zero.

2. Thermodynamic Potentials

   (a) Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibb's Free Energy. Their Definitions, Properties and Applications. Surface Films and Variation of Surface Tension with Temperature. Magnetic Work, Cooling due to adiabatic demagnetization, First and second order Phase Transitions with examples, Clausius Clapeyron Equation and Ehrenfest equations

   (b) Maxwell's Thermodynamic Relations

   (c) Derivations and applications of Maxwell's Relations, Maxwell's Relations:(1) Clausius Clapeyron equation, (2) Values of Cp-Cv, (3) TdS Equations, (4) Joule-Kelvin coefficient for Ideal and Van der Waal Gases, (5) Energy equations, (6) Change of Temperature during Adiabatic Process.

3. Kinetic Theory of Gases

   (a) Distribution of Velocities: Maxwell-Boltzmann Law of Distribution of Velocities in an Ideal Gas and its Experimental Verification. Doppler Broadening of Spectral Lines and Stern's Experiment. Mean, RMS and Most Probable Speeds. Degrees of Freedom. Law of Equipartition of Energy (No proof required). Specific heats of Gases.

   (b) Molecular Collisions: Mean Free Path. Collision Probability. Estimates of Mean Free Path. Transport Phenomenon in Ideal Gases: (1) Viscosity, (2) Thermal Conductivity and (3) Diffusion. Brownian Motion and its Significance.

   (c) Real Gases: Behavior of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO2 Gas. Critical Constants. Continuity of Liquid and Gaseous State. Vapour and Gas. Boyle Temperature. Van der Waal's Equation of State for Real Gases. Values of Critical Constants. Law of Corresponding States. Comparison with Experimental Curves. P-V Diagrams. Joule's Experiment. Free Adiabatic Expansion of a Perfect Gas. Joule-Thomson Porous Plug Experiment. Joule- Thomson Effect for Real and Van der Waal Gases. Temperature of Inversion. Joule-Thomson Cooling.

4. Conduction of Heat

   (a) Thermal conductivity, diffusivity. Fourier's equation for heat conduction – its solution for rectilinear flow of heat.

Reference Books

- Heat and Thermodynamics, M.W. Zemansky, Richard Dittman, 1981, McGraw-Hill.

- Thermal Physics, S. Garg, R. Bansal and Ghosh, 2nd Edition, 1993, Tata McGraw-Hill.
- Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer.
- Thermodynamics, Kinetic Theory & Statistical Thermodynamics, Sears & Salinger. 1988, Narosa.
- Concepts in Thermal Physics, S.J. Blundell and K.M. Blundell, 2nd Ed., 2012, Oxford University Press
- Thermodynamics and an introduction to thermostatistics, H. B. Callen, 1985, Wiley.
- Thermal Physics, A. Kumar and S.P. Taneja, 2014, R. Chand Publications.

Thermal Physics (Practical)

Paper: PHS-A-CC-3-6-P **Credits: 2**

List of Practicals

1. Verification of Stefan's law using a torch bulb.
2. Determination of the coefficient of thermal expansion of a metallic rod using an optical lever.
3. Calibration of a thermocouple by direct measurement of the thermo-emf using operational amplifier and the constants. [One end in ice and another end at water bath which to be heated.]
4. Calibration of a thermocouple by direct measurement of the thermo-emf using potentiometer and the constants. [one end in ice and another end at water bath which to be heated.
5. Calibration of thermocouple [one end at room temperature other end in the oil bath] and determination of boiling point of water.
6. To determine the Coefficient of Thermal Conductivity of a bad conductor by Lee and Charlton's disc method.
7. To determine the Temperature Coefficient of Resistance by Platinum Resistance Thermometer (PRT).

Reference Books

- Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
- A Laboratory Manual of Physics for undergraduate classes, D. P. Khandelwal, 1985, Vani Pub.

2.7 Semester - 3: Digital Systems and Applications

Digital Systems and Applications (Theory)

Paper: PHS-A-CC-3-7-TH **Credits: 4**

1. Integrated Circuits
   (a) Active & Passive components. Discrete components. Wafer. Chip. Advantages and drawbacks of ICs. Scale of integration: SSI, MSI, LSI and VLSI (basic idea and definitions only). Classification of ICs. Examples of Linear and Digital lCs.
2. Digital Circuits
   (a) Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion. BCD, Octal and Hexadecimal numbers. AND, OR and NOT Gates (realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates and application as Parity Checkers.
3. Boolean algebra
   (a) De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Idea of Minterms and Maxterms. Conversion of a Truth table into Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map.
4. Data processing circuits
   (a) Basic idea of Multiplexers, De-multiplexers, Decoders, Encoders.
5. Circuits
   (a) Arithmetic Circuits: Binary Addition. Binary Subtraction using 2's Complement. Half and Full Adders. Half & Full Subtractors, 4-bit binary Adder/Subtractor.

6. Sequential Circuits: SR, D, and JK Flip-Flops. Clocked (Level and Edge Triggered) Flip-Flops. Preset and Clear operations. Race-around conditions in JK Flip-Flop. M/S JK Flip-Flop.

7. Timers

   (a) IC 555: block diagram and applications: Astable multivibrator and Monostable multivibrator.

8. Shift registers

   (a) Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits).

9. Counters (4 bits)

   (a) Ring Counter. Asynchronous counters, Decade Counter. Synchronous Counter.

10. Computer Organization

    (a) Input/Output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map.

Reference Books

- Digital Principles and Applications, A.P. Malvino, D. P. Leach and Saha, 7th Ed., 2011, Tata McGraw
- Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
- Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
- Digital Electronics G K Kharate ,2010, Oxford University Press
- Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001, PHI Learning
- Logic circuit design, Shimon P. Vingron, 2012, Springer.
- Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
- Digital Electronics, S.K. Mandal, 2010, 1st edition, McGraw Hill
- Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.

Digital Systems and Applications (Practical)

Paper: PHS-A-CC-3-7-P **Credits: 2**

List of Practicals

1. To design OR & AND logic with diode and resistor. Basic logic gates with Transistors. To verify the logics by any type of universal gate NAND/NOR.
2. Formation of different combinational problems by construction of Truth Table and implementation using basic logic gates.
3. Construction of half adder and full adder
4. Construction of half subtractor, full subtractor, adder-subtractor using full adder IC
5. Construction of FF circuits using NAND gates.
6. Construction of 4 bit shift registers (serial & parallel) using D type FF IC.
7. Construction of astable multivibrator using 555 Timer.

Reference Books

- Modern Digital Electronics, R.P. Jain, 4th Edition, 2010, Tata McGraw Hill.
- Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.

2.8 Semester - 4: Mathematical Physics - III

Mathematical Physics - III (Theory)

Paper: PHS-A-CC-4-8-TH **Credits: 4**

1. Complex Analysis
   (a) Brief Revision of Complex Numbers. and their Graphical Representation. Euler's formula, Roots of Complex Numbers. Functions of Complex Variables. Analyticity and Cauchy-Riemann Conditions. Examples of analytic functions. Singular functions: poles and branch points, order of singularity, branch cuts. Integration of a function of a complex variable. Cauchy's Inequality. Cauchy's Integral formula. Simply and multiply connected region. Laurent and Taylor's expansion. Residues and Residue Theorem. Application in solving Definite Integrals.

2. Integrals Transforms

   (a) Fourier Transforms: Fourier Integral theorem. Fourier Transform. Examples. Fourier transform of trigonometric, Gaussian, finite wave train & other functions. Representation of Dirac delta function as a Fourier Integral. Fourier transform of derivatives, Inverse Fourier transform, Convolution theorem. Properties of Fourier transforms (translation, change of scale, complex conjugation, etc.). Three dimensional Fourier transforms with examples. Application of Fourier Transforms to differential equations: One dimensional Wave and Diffusion/Heat Flow Equations.

3. Introduction to probability

   (a) Independent random variables: Sample space and Probability distribution functions. Binomial, Gaussian, and Poisson distribution with examples. Mean and variance.

4. Special theory of Relativity

   (a) Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity. Relativistic Dynamics. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Transformation of Energy and Momentum.

   (b) Relativity in Four Vector Notation: Four-vectors, Lorentz Transformation and Invariant interval, Space-time diagrams. Proper time and Proper velocity. Relativistic energy and momentum - Four momentum. Conservation of four momentum and applications to collisions. Minkowski Force.

Reference Books

- Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press.
- Mathematics for Physicists, P. Dennery and A.Krzywicki, 1967, Dover Publications.
- Complex Variables, A.S.Fokas & M.J.Ablowitz, 8th Ed., 2011, Cambridge Univ. Press.
- Complex Variables, A.K. Kapoor, 2014, Cambridge Univ. Press.
- Complex Variables and Applications, J.W. Brown & R.V. Churchill, 7th Ed. 2003, Tata McGraw-Hill.
- First course in complex analysis with applications, D.G. Zill and P.D. Shanahan, 1940, Jones & Bartlett.

- Relativity - The Special and General Theory, A. Einstein, Methuen & Co. Ltd., 1920.
- Introduction to Special Relativity, R. Resnick, 2010, John Wiley and Sons.
- Introduction to Electrodynamics, D.J. Griffiths, 3rd Ed., 1998, Benjamin Cummings, 1991.

Mathematical Physics - III (Practical)

Paper: PHS-A-CC-4-8-P **Credits: 2**

List of Practicals

1. Solution of ODE/PDE:
   (a) Initial value problem: Modified-Euler and Runge-Kutta second order and fourth order methods.
   (b) Boundary value problems: Finite difference method with fixed step size.

   Application to simple physical problems.
2. Dirac-delta function:

   Evaluate $\frac{1}{\sqrt{2\pi\sigma^2}}\int e^{-\frac{(x-2)^2}{2\sigma^2}}(x+3)\,dx$ for $x = 1, 0.1, 0.01$ and show that it tends to 5.
3. Fourier series
   (a) Program to sum $\sum_{n=0}^{\infty}(0.2)^n$
   (b) Evaluate the fourier coefficients of a given periodic function (square wave).
4. Frobenius method and special functions.
   (a) $\int_{-1}^{+1} P_n(\mu) P_m(\mu)\,d\mu = \delta_{nm}$
   (b) Plot $P_n(x)$, $j_\nu(x)$
   (c) show recursion relation.
5. Evaluation of trigonometric functions e.g. $\sin\theta$. Given Bessel's function at N points find its value at an intermediate point.
6. Complex analysis:
   (a) Integrate $\int_0^{\infty}\frac{\sin x}{x}dx$ numerically and check with computer integration

(b) Root finding:

i. Compute the nth roots of unity for n = 2, 3, and 4.

ii. Find the two square roots of $-5 + 12i$.

7. Integral transform: FT of e^{-x^2}

8. Introduction to OCTAVE.

Note:

A list of suggestive numerical problems may be circulated from time to time.

Reference Books

- Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press.
- Mathematics for Physicists, P. Dennery and A. Krzywicki, 1967, Dover Publications.
- Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernanndez. 2014 Springer ISBN: 978-3319067896.
- A Guide to MATLAB, B.R. Hunt, R.L. Lipsman, J.M. Rosenberg, 2014, 3rd Edn., Cambridge University Press.
- https://web.stanford.edu/ boyd/ee102/laplace_ckts.pdf.
- https://ocw.nthu.edu.tw/ocw/upload/12/244/12handout.pdf.

2.9 Semester - 4: Elements of Modern Physics

Elements of Modern Physics (Theory)

Paper: PHS-A-CC-4-9-TH **Credits: 4**

1. Unit 1

   (a) Blackbody Radiation, Planck's quantum, Planck's constant. Photoelectric effect and Compton scattering - light as a collection of photons. Davisson-Germer experiment. De- Broglie wavelength and matter waves. Wave-particle duality. Wave description of particles by wave packets. Group and Phase velocities and relation between them. Probability interpretation: Normalized wave functions as probability amplitudes.

   (b) Two-Slit experiment with photons and electrons. Linear superposition principle as a consequence.

(c) Position measurement- gamma ray microscope thought experiment. Heisenberg uncertainty principle (Statement with illustrations). Impossibility of a particle following a trajectory.

2. Unit 2

   (a) Postulates of Quantum Mechanics: States as normalized vectors (normalized wave functions). Dynamical variables as linear Hermitian operators. Predictions of quantum mechanics from solving the eigenvalue equation for the observables. Illustration using two and three level systems. Expectation values of observables.

   (b) Time evolution: Schrodinger equation for non-relativistic particles. Stationary states. Solution of Schrodinger's equation using expansion in stationary states. Time evolution of expectation values.

   (c) Application to one dimensional systems. Particle moving in one dimension: Position, Momentum and Energy operators. Probability and probability current densities in one dimension. Boundary conditions on wave functions. Ehrenfest theorem. Particle in a one dimensional infinitely rigid box: energy eigenvalues and eigenfunctions, normalization. Quantum dot. Quantum mechanical scattering and tunneling in one dimension across a step potential & rectangular potential barrier.

   (d) Simultaneous measurements: Compatible and incompatible observables and their relation to commutativity. Heisenberg's uncertainty relation for a pair of incompatible observables. Complete and incomplete measurements - degeneracy. Ilustration of the ideas using the Angular momentum operators.

3. Unit 3

   (a) Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle.

   (b) Nature of nuclear force, NZ graph.

   (c) Nuclear Models: Liquid Drop model. semi-empirical mass formula and binding energy. Nuclear Shell Model. Magic numbers.

4. Unit 4

   (a) Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus.

(b) Fission and fusion: mass deficit, relativity and generation of energy. Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions)

(c) Lasers: Einstein's A and B coefficients. Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion. Three-Level and Four-Level Lasers. Ruby Laser and He-Ne Laser. Basic lasing.

Reference Books

- Concepts of Modern Physics, Arthur Beiser, 2002, McGraw-Hill.
- Primer of Quantum Mechanics; M. Chester; John Wiley & Sons, 1987.
- Introduction to Quantum Mechanics, David J. Griffith, 2005, Pearson Education.
- Physics for scientists and Engineers with Modern Physics, Jewett and Serway, 2010, Cengage Learning.
- Modern Physics, G.Kaur and G.R. Pickrell, 2014, McGraw Hill.
- Quantum Mechanics: Theory & Applications, A.K.Ghatak & S.Lokanathan, 2004, Macmillan

Additional Books for Reference

- Modern Physics, J.R. Taylor, C.D. Zafiratos, M.A. Dubson, 2004, PHI Learning.
- Theory and Problems of Modern Physics, Schaum's outline, R. Gautreau and W. Savin, 2nd Edn, Tata McGraw-Hill Publishing Co. Ltd.
- Quantum Physics, Berkeley Physics, Vol.4. E.H.Wichman, 1971, Tata McGraw-Hill Co.
- Basic ideas and concepts in Nuclear Physics, K.Heyde, 3rd Edn., Institute of Physics Pub.
- Nuclear Physics; S.N.Ghosal; S. Chand Publishing.
- Laser Physics and Spectroscopy, P.N.Ghosh, Levant Books, India, 2016.
- Six Ideas that Shaped Physics: Particle Behave like Waves, T.A.Moore, 2003, McGraw Hill.

Elements of Modern Physics (Practical)

Paper: PHSA-CC-4-9-P **Credits: 2**

List of Practicals

1. Measurement of Plank constant using LED
2. Determination of ionization potential of Mercury
3. Determination of e/m by using bar magnet.
4. To study the photoelectric effect: variation of photocurrent versus intensity and wavelength of light.
5. To determine the wavelength of H-alpha emission line of Hydrogen atom.
6. To show the tunneling effect in tunnel diode using I-V characteristics.
7. To determine (1) wavelength and (2) angular spread of He-Ne laser/ solid state laser using plane diffraction grating.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
- A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn, 2011,Kitab Mahal.

2.10 Semester - 4: Analog Systems and Applications

Analog Systems and Applications (Theory)

Paper: PHS-A-CC-4-10-TH **Credits: 4**

1. Semiconductor Diodes
   (a) P and N type semiconductors. Energy Level Diagram. Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. Current Flow Mechanism in Forward and Reverse Biased Diode.

2. Two-terminal Devices and their Applications.

   (a) Rectifier Diode: Half-wave Rectifiers. Centre-tapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, C-filter.

   (b) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode and (3) Solar Cell.

3. Bipolar Junction transistors n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β Relations between α and β. Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions.

4. Field Effect transistors Basic principle of operations only.

5. Amplifiers

   (a) Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers. Frequency response of a CE amplifier.

   (b) Coupled Amplifier: Two stage RC-coupled amplifier.

   (c) Feedback in Amplifiers: Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise.

   (d) Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators.

   (e) Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground.

   (f) Applications of Op-Amps: Linear - (1) Inverting and non-inverting amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. Non-linear – (1) inverting and non-inverting comparators, (2) Schmidt triggers.

   (g) Conversion: Resistive network (Weighted and R-2R Ladder). Accuracy and Resolution. A/D Conversion (successive approximation)

Reference Books

- Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.
- Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall. Solid State Electronic Devices, B.G.Streetman & S.K.Banerjee, 6th Edn.,2009, PHI.
- Learning Electronic Devices & circuits, S.Salivahanan & N.S.Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill.
- OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall.
- Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6th Edn., Oxford University Press.
- Electronic circuits: Handbook of design & applications, U.Tietze, C.Schenk,2008, Springer.
- Semiconductor Devices: Physics and Technology, S.M. Sze, 2nd Ed., 2002, Wiley India.
- Microelectronic Circuits, M.H. Rashid, 2nd Edition, Cengage Learning Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India.

Analog Systems and Applications (Practical)

Paper: PHS-A-CC-4-10-P **Credits: 2**

List of Practicals

1. To study the reverse characteristics of Zener diode and study the load and line regulation.
2. To study the static characteristics of BJT in CE Configuration.
3. To design a CE transistor amplifier of a given gain (mid-gain) using voltage divider bias
4. To study the frequency response of the BJT amplifier in CE mode.
5. To study the static characteristics of FET.
6. To study OPAMP - inverting amplifer, non inverting amplifier, adder, substractar, comparator, integrator, differentiator.
7. To design a Wien bridge oscillator for given frequency using an op-amp.

Reference Books

- Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.
- OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall.
- Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill. Electronic Devices & circuit Theory, R.L. Boylestad & L.D.
- Nashelsky, 2009, Pearson.

2.11 Semester - 5: Quantum Mechanics and Applications

Quantum Mechanics and Applications (Theory)

Paper: PHS-A-CC-5-11-TH **Credits: 4**

1. Schrodinger Equation
   (a) Description of a particle using wave packets. Spread of the Gaussian wave-packet for a free particle in one dimension. Fourier transforms and momentum space wavefunction. Position-Momentum uncertainty.
2. General discussion of bound states in an arbitrary potential
   (a) Continuity of wave function, boundary condition and emergence of discrete energy levels. Application to one-dimensional problem - square well potential.
3. Quantum mechanics of simple harmonic oscillator.
   (a) Setting up the eigenvalue equation for the Hamiltonian. Energy levels and energy eigenfunctions in terms of Hermite polynomials (Solution to Hermite differential equation may be assumed). Ground state, zero point energy & uncertainty principle.
4. Quantum theory of hydrogen-like atoms
   (a) Reduction of a two body problem to a one body problem. The time independent Schrodinger equation for a particle moving under a central force - the Schrodinger equation in spherical polar coordinates. Separation of variables. Angular equation and orbital angular momentum. Spherical Harmonics (Solution to Legendre differential equation may be assumed). Radial equation for attractive coulomb interaction - Hydrogen atom. Solution for the radial wavefunctions (Solution to Laguerre differential equation may be assumed). Shapes of the probability densities for ground & first excited states.Orbital angular momentum quantum numbers l and m; s, p, d,shells.

5. Generalized Angular Momenta and Spin.

   (a) Generalized angular momentum. Electron's magnetic Moment and Spin Angular Momentum. Gyromagnetic Ratio and Bohr Magneton and the g - factor. Energy associated with a magnetic dipole placed in magnetic field. Larmor's Theorem. Stern-Gerlach Experiment.

   (b) Addition of angular momenta - statement only. Restriction of eigenvalues from $|j_1 - j_2|$ to $|j_1 + j_2|$.

6. Spectra of Hydrogen atom and its fine structure

   (a) Formula for first order nondegenerate perturbative correction to the eigenvalue - statement only.

   (b) Spin-orbit interaction and relativistic correction to the kinetic energy and Darwin term.

   (c) Fine structure of the hydrogen atom spectrum

7. Atoms in Electric & Magnetic Fields

   (a) Zeeman Effect: Normal and Anomalous Zeeman Effect (Formula for first order perturbative correction to the eigenvalue to be assumed).

   (b) Paschen Back effect & Stark effects (Qualitative Discussion only).

8. Many electron atoms

   (a) Identical particles. Symmetric & Antisymmetric Wave Functions. Pauli's Exclusion Principle. Hund's Rule. Periodic table.

   (b) Fine structure splitting. L-S and J-J coupling scheme. Spectral Notations for Atomic States and Term symbols. Spectra of Alkali Atoms (Na etc.).

Reference Books

- A Text book of Quantum Mechanics, P.M.Mathews and K.Venkatesan, 2nd Ed., 2010, McGraw Hill
- Quantum Mechanics, Robert Eisberg and Robert Resnick, 2nd Edn., 2002, Wiley.
- Introduction to Quantum Mechanics, D.J. Griffith, 2nd Ed. 2005, Pearson Education
- Quantum Mechanics, Leonard I. Schiff, 3rd Edn. 2010, Tata McGraw Hill.
- Quantum Mechanics, G. Aruldhas, 2nd Edn. 2002, PHI Learning of India.
- Quantum Mechanics, Bruce Cameron Reed, 2008, Jones and Bartlett Learning.

- Quantum Mechanics: Foundations & Applications, Arno Bohm, 3rd Edn., 1993, Springer
- Quantum Mechanics for Scientists & Engineers, D.A.B. Miller, 2008, Cambridge University Press

Additional Books for Reference

- Quantum Mechanics, Eugen Merzbacher, 2004, John Wiley and Sons, Inc.
- Quantum Mechanics, Walter Greiner, 4th Edn., 2001, Springer

Quantum Mechanics and Applications (Practical)

Paper: PHS-A-CC-5-11-P **Credits: 2**

List of Practical

1. Solve the s-wave Schrodinger equation for the ground state and the first excited state of the hydrogen atom

$$\frac{d^2y}{dr^2} = A(r)\,u(r)\,, \qquad A(r) = \frac{2m}{\hbar^2}\left(V(r) - E\right), \qquad V(r) = \frac{-e^2}{r}$$

Here, m is the reduced mass of the electron. Obtain the energy eigenvalues and plot the corresponding wavefunctions. Remember that the ground state energy of the hydrogen atom is -13.6 eV. Take e = 3.795 $\left(eV\text{Å}\right)^{\frac{1}{2}}$, $\hbar c = 1973\ \left(eV\text{Å}\right)$ and $m = 0.511 \times 10^6\ \left(\frac{eV}{c^2}\right)$. [nm may be used instead of Å- make necessary conversions].

2. Solve the s-wave radial Schrodinger equation for an atom:

$$\frac{d^2y}{dr^2} = A(r)\,u(r)\,, \qquad A(r) = \frac{2m}{\hbar^2}\left(V(r) - E\right)$$

where m is the reduced mass of the system (which can be chosen to be the mass of an electron), for the screened coulomb potential:

$$V(r) = \frac{-e^2}{r}e^{-\frac{r}{a}}$$

Find the energy (in eV) of the ground state of the atom to an accuracy of three significant digits. Also, plot the corresponding wavefunction. Take e = 3.795 $\left(eV\text{Å}\right)^{\frac{1}{2}}$, $m = 0.511 \times 10^6\ \left(\frac{eV}{c^2}\right)$, and a = 3 Å, 5 Å, 7 Å. In these units $\hbar c = 1973\ \left(eV\text{Å}\right)$. The ground state energy is expected to be above -12 eV in all three cases. [nm may be used instead of Å - make necessary conversions]

3. Solve the s-wave radial Schrodinger equation for a particle of mass m.

$$\frac{d^2y}{dr^2} = A(r)\,u(r)\,, \qquad A(r) = \frac{2m}{\hbar^2}\left(V(r) - E\right)$$

for the anharmonic oscillator potential:

$$V(r) = \frac{1}{2}k^2 + \frac{1}{3}br^3$$

for the ground state energy (in MeV) of particle to an accuracy of three significant digits. Also, plot the corresponding wave function. Choose $m = 940\,\frac{MeV}{c^2}$, $k = 100\;Mev\,fm^{-2}$ $b = 0, 10, 30\;\;Mev\,fm^{-3}$. In these units, $\hbar c = 197.3\;MeV\,, fm$. The ground state energy is expected to lie between 90 and 110 MeV for all three cases.

4. Solve the s-wave radial Schrodinger equation for the vibrations of hydrogen molecule:

$$\frac{d^2y}{dr^2} = A(r)\,u(r)\,, \qquad A(r) = \frac{2\mu}{\hbar^2}\left(V(r) - E\right)$$

where μ is the reduced mass of the two-atom system for the Morse potential:

$$V(r) = D\left(e^{-2\alpha r'} - e^{-\alpha r'}\right), \qquad r' = \frac{r - r_0}{r}$$

Find the lowest vibrational energy (in MeV) of the molecule to an accuracy of three significant digits. Also plot the corresponding wave function. Take $m = 940 \times 10^6\,\frac{eV}{c^2}$, $D = 0.755501\,eV$, $\alpha = 1.44$, $r_0 = 0.131349$ Å

[nm may be used instead of the unit Å- make necessary conversions]

Reference Books

- An introduction to computational Physics, T.Pang, 2nd Edn.,2006, Cambridge Univ.Press
- Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific & Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernandez. 2014, Springer.

2.12 Semester - 5: Solid State Physics

Solid State Physics (Theory)

Paper: PHS-A-CC-5-12-TH **Credits: 4**

1. Crystal Structure

   (a) Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor.

2. Elementary Lattice Dynamics

   (a) Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids. T^3 law

3. Magnetic Properties of Matter

   (a) Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of Dia- and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss.

4. Dielectric Properties of Materials

   (a) Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeir relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons, TO modes.

5. Ferroelectric Properties of Materials

   (a) Structural phase transition, Classification of crystals, Piezoelectric effect, Pyroelectric effect, Ferroelectric effect, Electrostrictive effect, Curie-Weiss Law, Ferroelectric domains, PE hysteresis loop.

6. Elementary band theory

   (a) Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (4 probe method) & Hall coefficient.

7. Superconductivity

   (a) Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation)

Reference Books

- Introduction to Solid State Physics, Charles Kittel, 8th Edition, 2004, Wiley India Pvt. Ltd.
- Elements of Solid State Physics, J.P. Srivastava, 4th Edition, 2015, Prentice-Hall of India
- Introduction to Solids, Leonid V. Azaroff, 2004, Tata Mc-Graw Hill
- Solid State Physics, N.W. Ashcroft and N.D. Mermin, 1976, Cengage Learning
- Solid-state Physics, H. Ibach and H. Luth, 2009, Springer
- Solid State Physics, Rita John, 2014, McGraw Hill
- Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India
- Solid State Physics and Electronics, A.B.Gupta and N.Islam, Books and Allied (P) Ltd.
- Quantum Mechanics, Statistical Machanics and Solid State Physics, 2010, S.Chand & Company.
- Solid State Physics, M.A. Wahab, 2011, Narosa Publications.

Solid State Physics (Practical)

Paper: PHS-A-CC-5-12-P **Credits: 2**

List of Practicals

1. To study PE hysteresis of ferroelectric crystal.
2. To study BH hysteresis of ferromagnetic material.
3. Measurement of susceptibility of paramagnetic solution by Quink"s tube method.
4. Measurement of magnetic susceptibility of solids.
5. Determination of variation of dielectric constant with frequency.
6. Measurement of hall voltage by four probe method.
7. To study temperature coefficient of a semiconductor (NTC thermistor).

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
- A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal.
- Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India.

2.13 Semester - 6: Electromagnetic Theory

Electromagnetic Theory (Theory)

Paper: PHS-A-CC-6-13-TH **Credits: 4**

1. Maxwell Equations

   (a) Review of Maxwell's equations. Vector and Scalar Potentials. Gauge Transformations: Lorentz and Coulomb Gauge. Boundary Conditions at Interface between Different Media. Wave Equations. Plane Waves in Dielectric Media. Poynting Theorem and Poynting Vector. Electromagnetic (EM) Energy Density. Physical Concept of Electromagnetic Field Energy Density, Momentum Density and Angular Momentum Density.

2. EM Wave Propagation in Unbounded Media

   (a) Plane EM waves through vacuum and isotropic dielectric medium, transverse nature of plane EM waves, refractive index and dielectric constant, wave impedance. Propagation through conducting media, relaxation time, skin depth. Wave propagation through dilute plasma, electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth, application to propagation through ionosphere.

3. EM Wave in Bounded Media

   (a) Boundary conditions at a plane interface between two media. Reflection & Refraction of plane waves at plane interface between two dielectric media-Laws of Reflection & Refraction. Fresnel's formulae for perpendicular & parallel polarization cases, Brewster's law. Reflection & Transmission coefficients. Total internal reflection, evanescent waves. Metallic reflection (normal Incidence).

4. Electromagnetic origin of Wave Optics

   (a) Kirchhoff's Integral Theorem, Fresnel-Kirchhoff's Integral formula. (Qualitative discussion only)

   (b) Description of Linear, Circular and Elliptical Polarization. Origin of Double-Refraction: Propagation of E.M. Waves in Anisotropic Media. Symmetric Nature of Dielectric Tensor. Fresnel's Formula.

5. Polarization in uniaxial crystals

   (a) Uniaxial and Biaxial Crystals. Light Propagation in Uniaxial Crystal. Double Refraction. Polarization by Double Refraction. Nicol Prism. Ordinary & extraordinary refractive indices. Phase Retardation Plates: Quarter-Wave and Half-Wave Plates. Production & analysis of polarized light. Babinet Compensator and its Uses.

6. Rotatory polarization.

   (a) Optical Rotation. Biot's Laws for Rotatory Polarization. Fresnel's Theory of optical rotation. Calculation of angle of rotation. Experimental verification of Fresnel's theory. Specific rotation. Laurent's half-shade and biquartz polarimeters.

Reference Books

- Introduction to Electrodynamics, D.J. Griffiths, 3rd Ed., 1998, Benjamin Cummings.
- Optics, E. Hecht, 2016, Pearson.
- Elements of Electromagnetics, M.N.O. Sadiku, 2001, Oxford University Press.
- Introduction to Electromagnetic Theory, T.L. Chow, 2006, Jones & Bartlett Learning
- Fundamentals of Electromagnetics, M.A.W. Miah, 1982, Tata McGraw Hill
- Electromagnetic field Theory, R.S. Kshetrimayun, 2012, Cengage Learning
- Engineering Electromagnetic, Willian H. Hayt, 8th Edition, 2012, McGraw Hill.
- Electromagnetic Field Theory for Engineers & Physicists, G. Lehner, 2010, Springer

Additional Books for Reference

- Electromagnetic Fields & Waves, P.Lorrain & D.Corson, 1970, W.H.Freeman & Co.
- Electromagnetics, J.A. Edminster, Schaum Series, 2006, Tata McGraw Hill.
- Electromagnetic field theory fundamentals, B. Guru and H. Hiziroglu, 2004,Cambridge University Press

Electromagnetic Theory (Practical)

Paper: PHS-A-CC-6-13-P **Credits: 2**

List of Practicals

1. To determine Brewster's angle for air-glass interface using a prism.
2. To study Fresnels law by the reflection on the surface of a prism.
3. To verify the Malus law using a pair of polaroids.
4. To study the specific rotation of opticlly active solution using polarimeter.
5. Determination of wavelength and velocity of ultrasonic waves ion a liquid (kerosene, Xylene etc).
6. To analyze elliptically polarized light by using babinate compensator.
7. To determine dispersive power and resolving power of a plane diffraction grating.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
- Electromagnetic Field Theory for Engineers & Physicists, G. Lehner, 2010, Springer

2.14 Semester - 6: Statistical Mechanics

Statistical Mechanics (Theory)

Paper: PHS-A-CC-6-14-TH **Credits: 4**

1. Classical Statistical Mechanics

   (a) Macrostate & Microstate, Elementary Concept of Ensemble and Ergodic Hypothesis. Phase Space.

   (b) Microcanonical ensemble, Postulate of Equal a-priori probabilities. Boltzmann hypothesis: Entropy and Thermodynamic Probability.

   (c) Canonical ensemble, Partition Function, Thermodynamic Functions of an Ideal Gas, Classical Entropy Expression, Gibbs Paradox.

   (d) Sackur Tetrode equation, Law of Equipartition of Energy (with proof) - Applications to Specific Heat and its Limitations. Thermodynamic Functions of a Two-Energy Level System. Negative Temperature.

   (e) Grand canonical ensemble and chemical potential.

2. Classical Theory of Radiation

   (a) Properties of Thermal Radiation. Blackbody Radiation. Pure temperature dependence. Kirchhoff's law. Stefan-Boltzmann law: Thermodynamic proof. Radiation Pressure. Wien's Displacement law. Wien's Distribution Law. Rayleigh-Jean's Law. Ultraviolet Catastrophe.

3. Quantum Theory of Radiation

   (a) Spectral Distribution of Black Body Radiation. Planck's Quantum Postulates. Planck's Law of Blackbody Radiation: Experimental Verification. Deduction of (1) Wien's Distribution Law, (2) Rayleigh-Jeans Law, (3) Stefan-Boltzmann Law, (4) Wien's Displacement law from Planck's law.

4. Bose-Einstein Statistics:

   (a) B-E distribution law. Thermodynamic functions of a strongly Degenerate Bose Gas, Bose Einstein condensation, properties of liquid He (qualitative description), Radiation as a photon gas and Thermodynamic functions of photon gas. Bose derivation of Planck's law.

5. Fermi-Dirac Statistics:

   (a) Fermi-Dirac Distribution Law. Thermodynamic functions of a Completely and strongly Degenerate Fermi Gas, Fermi Energy, Electron gas in a Metal, Specific Heat of Metals.

Reference Books

- Statistical Mechanics, R.K. Pathria, Butterworth Heinemann: 2nd Ed.,1996, Oxford University Press.
- Statistical Physics, Berkeley Physics Course, F. Reif, 2008, Tata McGraw-Hill.
- Statistical and Thermal Physics, S. Lokanathan and R.S. Gambhir. 1991, Prentice Hall.
- Thermodynamics, Kinetic Theory and Statistical Thermodynamics, Francis W. Sears and Gerhard L. Salinger, 1986, Narosa.
- Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer.
- An Introduction to Statistical Mechanics & Thermodynamics, R.H. Swendsen, 2012, Oxford Univ. Press.
- Statistical Mechanics - an elementary outline, A. Lahiri, 2008, Universities Press.

Statistical Mechanics (Practical)

Paper: PHS-A-CC-6-14-P **Credits: 2**

List of Practicals

1. Computational analysis of the behavior of a collection of particles in a box that satisfy Newtonian mechanics and interact via the Lennard-Jones potential, varying the total number of particles N and the initial conditions:
   (a) Study of local number density in the equilibrium state (i) average; (ii) fluctuations
   (b) Study of transient behavior of the system (approach to equilibrium)
   (c) Relationship of large N and the arrow of time
   (d) Computation of the velocity distribution of particles for the system and comparison with the Maxwell velocity distribution
   (e) Computation and study of mean molecular speed and its dependence on particle mass
   (f) Computation of fraction of molecules in an ideal gas having speed near the most probable speed
2. Computation of the partition function $Z(\beta)$ for examples of systems with a finite number of single particle levels (e.g., 2 level, 3 level, etc.) and a finite number of non-interacting particles N under Maxwell-Boltzmann, Fermi-Dirac and Bose- Einstein statistics:

(a) Study of how $Z(\beta)$, average energy $\langle E \rangle$, energy fluctuation ΔE, specific heat at constant volume C_v, depend upon the temperature, total number of particles N and the spectrum of single particle states.

(b) Ratios of occupation numbers of various states for the systems considered above

(c) Computation of physical quantities at large and small temperature T and comparison of various statistics at large and small temperature T.

3. Plot Planck's law for Black Body radiation and compare it with Raleigh-Jeans Law at high temperature and low temperature.

4. Plot Specific Heat of Solids (a) Dulong-Petit law, (b) Einstein distribution function, (c) Debye distribution function for high temperature and low temperature and compare them for these two cases.

5. Plot the following functions with energy at different temperatures

   (a) Maxwell-Boltzmann distribution

   (b) Fermi-Dirac distribution

   (c) Bose-Einstein distribution

Reference Books

- Elementary Numerical Analysis, K.E.Atkinson, 3 rd Edn . 20 07 , Wiley India Edition

- Statistical Mechanics, R.K. Pathria, Butterworth Heinemann: 2nd Ed., 1996, Oxford University Press.

- Introduction to Modern Statistical Mechanics, D. Chandler, Oxford University Press, 1987

- Thermodynamics, Kinetic Theory and Statistical Thermodynamics, Francis W. Sears and Gerhard L. Salinger, 1986, Narosa.

- Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer

- Statistical and Thermal Physics with computer applications, Harvey Gould and Jan Tobochnik, Princeton University Press, 2010.

- Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernandez. 2014 Springer ISBN: 978-3319067896

3 Syllabi for Discipline Specific Elective Courses (Honours)

3.1 DSE-A1: Advanced Mathematical Methods - I

Advanced Mathematical Methods - I - (Theory)

Paper: PHS-A-DSE-A1-TH **Credits: 5 (+1 for Tutorial)**

1. Preliminaries

   (a) Set, Logical Connectivities, Proof and Function: Notion of set and basic set algebra (Venn diagram should not be used to do set algebra). Definition of OR, AND, NOT and IF-THEN. Example of direct proof, proof by contrapositivity and contradiction. Vacuous proof (as for example null set is a subset of every set).

   (b) Definition of function (distinction should be made between function f and the value of the function $f(x)$ of function f at x). For real or complex valued function definition of zeros of a function and Zero function. Equality of functions. Example of function. Constant function (Mention the fact that function is neither a dependence nor an expression), Dirichlet function (Mention the fact that it does not have any graph) and other examples of standard real and complex valued functions.

   (c) Mathematical Induction (Mention that it requires proof) and its applications.

2. Real Numbers and Complex Numbers

   (a) Axiomatic description of real number, Few applications of axioms to show its power (as for example prove $a.0 = 0$, $a(-b) = -(ab)$ $1 > 0$,etc.). Distinction between real or finite number and infinity and also between undefined quantity (as for example $a/0$) and infinity. Complex numbers (Mention the fact that they are two dimensional vectors as Real numbers are one dimensional vectors and unlike real numbers complex numbers do not admit ordering and finally beyond complex number there is only one infinity not two).

   (b) Sequence, Series and Power Series: Definition of sequence and series (Mention the fact that sums in the series are not real sum but limit of finite sums; they actually mimic some of the properties of actual sum). Limit superior and Limit inferior of a sequence. Convergence of a sequence (Stress should be given on $\epsilon - N$ definition of convergence and show proof of few elementary sequences directly from $\epsilon - N$ definition), Power series, Example of power series, Infinite G.P. series, Uniform convergence of power series, example and Weierstrass M-test (Also mention the fact for uniform convergence of a power series we can differentiate or integrate a power series term by

term), Zero power series and equality of two power series. Radius of convergence of a power series mentioning its relation with the Limit Superior of its coefficients.

3. Basics of Calculus

   (a) Differential Calculus in one variable: Definition of limit (Stress should be given on epsilon-delta definition and show proof of some standard limits using epsilon-delta definition, also mention the fact that limiting value of a function when x approaches a does not depend at all on $f(a)$). Definition of Continuity (Mention the fact that if function is continuous at a and $f(a) > 0$, then there exists an open interval around a where function is entirely positive). Definition of derivative (Emphasis given on the first principle and mention the fact that for any arbitrary curve derivative actually defines tangent i.e. we define derivative via tangent). Rolle's Theorem and Mean value Theorem of Differential Calculus (with proof) and its application.

   (b) Integral Calculus in one variable: Definition of Anti derivative and Riemann (or definite) integral. Fundamental Theorem of Integral Calculus (With proof, mention the fact that although they are different, but we use one of them to calculate another). Riemann integral defines area enclosed by arbitrary curve. Mention sufficient conditions for integrability (as for example continuity or piece-wise continuity or even when set of points of discontinuity is countable, the function is integrable). Mean Value Theorem of Integral Calculus (with proof) and its applications.

4. Linear Algebra.

   (a) Abstract Systems. Binary Operations and Relations. Introduction to Groups and Fields. Vector Spaces over Real and Complex Fields. Subspaces. Homomorphism and Isomorphism of Vector Spaces. Linear Independence and Dependence of Vectors. Completeness of a set of vectors. Basis of a vector space. Replacement theorem - uniqueness of cardinality of different bases - Dimensions of a Vector Space. Change of basis. Isomorphism of every n - dimensional vector space with $\mathbb{C}^n$ - basis dependence of this isomorphism.

   (b) Inner products Space. Norm (defined in terms of inner product). Orthogonality. Orthogonal and Orthonormal sets. Orthonormal basis. Change of orthonormal basis. Gram-Schmidt orthogonalization - proof that an orthonormal basis will always exist. Schwarz inequality. Linear functionals on a vector space. Addition and Multiplication by scalars on linear functionals. Dual Space. Bra and Ket vectors and the Bra-Ket notation. Dual Basis. Construction of bra from ket and vice-versa.

   (c) Linear Transformations and Linear Operators. Consequences of linearity: Specification of the action of an operator on a basis defines the

action on the whole space - Representation of Linear Operators by Matrices. Transformation of representations under change of basis. Algebra of Linear Operators. Singular and Non-singular operators. The Adjoint or Hermitian conjugate of an operator. Hermitian, Orthogonal and Unitary operators. Projection operators.

(d) Eigenvalues and Eigenvectors of an operator. Degeneracy and Eigen spaces. Algebraic and Geometric multiplicity of eigenvalues. Diagonalization and Diagonalizability. Normal operators. Eigen properties of Hermitian and Unitary operators. Commuting operators and its relation to simultaneous diagonalizability. Complete sets of commuting operators.

(e) Tensor Products of Inner product spaces. Tensor products of vectors and operators. Extensions of operators to product spaces.

Reference Books

- *Calculus Volume I and II, Tom Apostol, John Wiley and Sons Inc.*
- *Bartle and Sherbert, Introduction to Real Analysis, Third edition, Wiley-India |item Complex Analysis, V.L Ahlfors, McGraw-Hill Inc.*
- *Finite Dimensional Vector Spaces, P. R.Halmos, Springer.*
- *Introduction To Matrices And Linear Transformations, D.T. Finkbeiner, Courier Corporation.*
- Linear Algebra, S. Lipschutz and M.L.Lipson, Schaums Outline Series, 2009 McGraw Hill.

3.2 DSE-A1: Communication Electronics

Communication Electronics - (Theory)

Paper: PHS-A-DSE-A1-TH **Credits: 4**

1. Electronic communication

   (a) Introduction to communication – means and modes. Need for modulation. Block diagram of an electronic communication system. Brief idea of frequency allocation for radio communication system in India (TRAI). Electromagnetic communication spectrum, band designations and usage. Channels and base-band signals. Concept of Noise, signal-to-noise (S/N) ratio.

2. Analog Modulation

   (a) Amplitude Modulation, modulation index and frequency spectrum. Generation of AM (Emitter Modulation), Amplitude Demodulation

(diode detector), Concept of Single side band generation and detection. Frequency Modulation (FM) and Phase Modulation (PM), modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM using VCO, FM detector (slope detector), Qualitative idea of Super heterodyne receiver.

3. Analog Pulse Modulation

   (a) Channel capacity, Sampling theorem, Basic Principles- PAM, PWM, PPM, modulation and detection technique for PAM only, Multiplexing.

4. Digital Pulse Modulation

   (a) Need for digital transmission, Pulse Code Modulation, Digital Carrier Modulation Techniques, Sampling, Quantization and Encoding. Concept of Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK).

5. Introduction to Communication and Navigation systems:

   (a) Satellite Communication– Introduction, need, Geosynchronous satellite orbits geostationary satellite advantages of geostationary satellites. Satellite visibility, transponders (C - Band), path loss, ground station, simplified block diagram of earth station. Uplink and downlink.

   (b) Mobile Telephony System – Basic concept of mobile communication, frequency bands used in mobile communication, concept of cell sectoring and cell splitting, SIM number, IMEI number, need for data encryption, architecture (block diagram) of mobile communication network, idea of GSM, CDMA, TDMA and FDMA technologies, simplified block diagram of mobile phone handset, 2G, 3G and 4G concepts (qualitative only). GPS navigation system (qualitative idea only).

Reference Books

- Electronic Communications, D. Roddy and J. Coolen, Pearson Education India.
- Advanced Electronics Communication Systems- Tomasi, 6th edition, Prentice Hall.
- Electronic Communication systems, G. Kennedy, 3rd Edn, 1999, Tata McGraw Hill.
- Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill

- Communication Systems, S. Haykin, 2006, Wiley India
- Electronic Communication system, Blake, Cengage, 5th edition.
- Wireless communications, Andrea Goldsmith, 2015, Cambridge University Press

Communication Electronics - (Practical)

Paper: PHS-A-DSE-A1-P **Credits: 2**

List of Practicals

1. To design an Amplitude Modulator using Transistor
2. To study envelope detector for demodulation of AM signal
3. To study FM - Generator and Detector circuit
4. To study AM Transmitter and Receiver
5. To study FM Transmitter and Receiver
6. To study Time Division Multiplexing (TDM)
7. To study Pulse Amplitude Modulation (PAM)

Reference Books

- Electronic Communication systems, G. Kennedy, 1999, Tata McGraw Hill.
- Electronic Communication system, Blake, Cengage, 5th edition.

3.3 DSE-A2: Astronomy and Astrophysics

Astronomy and Astrophysics - (Theory)

Paper: PHS-A-DSE-A2-TH **Credits: 5 (+1 for Tutorial)**

1. Astronomical Scales Astronomical Distance.

   (a) Mass and Time, Scales, Brightness, Radiant Flux and Luminosity, Measurement of Astronomical Quantities Astronomical Distances, Stellar Radii, Masses of Stars, Stellar Temperature. Basic concepts of positional astronomy: Celestial Sphere, Geometry of a Sphere, Spherical Triangle, Astronomical Coordinate Systems, Geographical Coordinate Systems, Horizon System, Equatorial System, Diurnal Motion of the Stars, Conversion of Coordinates. Measurement of Time, Sidereal Time, Apparent Solar Time, Mean Solar Time, Equation of Time, Calendar. Basic Parameters of Stars: Determination

of Distance by Parallax Method; Brightness, Radiant Flux and Luminosity, Apparent and Absolute magnitude scale, Distance Modulus; Determination of Temperature and Radius of a star; Determination of Masses from Binary orbits; Stellar Spectral Classification, Hertzsprung-Russell Diagram.

2. Astronomical techniques

   (a) Basic Optical Definitions for Astronomy (Magnification Light Gathering Power, Resolving Power and Diffraction Limit, Atmospheric Windows), Optical Telescopes (Types of Reflecting Telescopes, Telescope Mountings, Space Telescopes, Detectors and Their Use with Telescopes (Types of Detectors, detection Limits with Telescopes).

3. Physical principles

   (a) Gravitation in Astrophysics (Virial Theorem, Newton versus Einstein), Systems in Thermodynamic Equilibrium.

4. The sun and solar family

   (a) The sun (Solar Parameters, Solar Photosphere, Solar Atmosphere, Chromosphere. Corona, Solar Activity, Basics of Solar Magnetohydrodynamics. Helioseismology). The solar family (Solar System: Facts and Figures, Origin of the Solar System: The Nebular Model, Tidal Forces and Planetary Rings, Extra-Solar Planets. Stellar spectra and classification Structure (Atomic Spectra Revisited, Stellar Spectra, Spectral Types and Their Temperature Dependence, Black Body Approximation, H R Diagram, Luminosity Classification). Main sequence, red giants and white dwarfs, Chandrashekhar mass limit, possibility of Neutron star.

5. The milky way

   (a) Basic Structure and Properties of the Milky Way, Nature of Rotation of the Milky Way (Differential Rotation of the Galaxy and Oort Constant, Rotation Curve of the Galaxy and the Dark Matter, Nature of the Spiral Arms), Stars and Star Clusters of the Milky Way, Properties of and around the Galactic Nucleus.

6. Galaxies

   (a) Galaxy Morphology, Hubble's Classification of Galaxies, Elliptical Galaxies (The Intrinsic Shapes of Elliptical, de Vaucouleurs Law, Stars and Gas). Spiral and Lenticular Galaxies (Bulges, Disks, Galactic Halo) The Milky Way Galaxy, Gas and Dust in the Galaxy, Spiral Arms.

7. Large scale structure & expanding universe

   (a) Cosmic Distance Ladder (An Example from Terrestrial Physics, Distance Measurement using Cepheid Variables), Hubble's Law (Distance-Velocity Relation), Clusters of Galaxies (Virial theorem and Dark Matter).

Reference Books

- Modern Astrophysics, B.W. Carroll & D.A. Ostlie, Addison-Wesley Publishing Co.
- Introductory Astronomy and Astrophysics, M. Zeilik and S.A. Gregory, 4 th Edition, Saunders College Publishing.
- The physical universe: An introduction to astronomy, F.Shu, Mill Valley: University Science Books.
- Fundamentals of Astronomy (Fourth Edition), H. Karttunen et al. Springer
- K.S. Krishnasamy, 'Astro Physics a modern perspective,' Reprint, New Age International (p) Ltd, New Delhi,2002.
- Baidyanath Basu, 'An introduction to Astro physics', Second printing, Prentice - Hall of India Private limited, New Delhi, 2001.
- Textbook of Astronomy and Astrophysics with elements of cosmology, V.B. Bhatia, Narosa Publication

3.4 DSE-A2: Advanced Dynamics

Advanced Dynamics - (Theory)

Paper: PHS-A-DSE-A2-TH **Credits: 4**

1. Small Amplitude Oscillations

   (a) Minima of potential energy and points of stable equilibrium, expansion of the potential energy around a minimum, small amplitude oscillations about the minimum, normal modes of oscillations example of N identical masses connected in a linear fashion to (N -1) - identical springs.

2. Dynamical Systems

   (a) Definition of a continuous first order dynamical system. The idea of phase space, flows and trajectories. Simple mechanical systems as dynamical systems: the free particle, particle under uniform gravity, simple and damped harmonic oscillator, pendulum. Sketching flows and trajectories in phase space; sketching variables as functions of time, relating the equations and pictures to the underlying

physical intuition. Other examples of dynamical systems – In Biology: Population models e.g. exponential growth and decay, logistic growth, species competition, predator-prey dynamics, simple genetic circuits In Chemistry: Rate equations for chemical reactions e.g. auto catalysis, bistability In Economics: Examples from game theory. Illustrative examples from other disciplines. Fixed points, attractors, stability of fixed points, basin of attraction, notion of qualitative analysis of dynamical systems, with applications to the above examples. Computing and visualizing trajectories on the computer using software packages. Discrete dynamical systems. The logistic map as an example.

3. Introduction to Chaos and Fractals

   (a) Examples of 2-dimensional billiard, Projection of the trajectory on momentum space. Sinai Billiard and its variants. Computational visualization of trajectories in the Sinai Billiard. Randomization and ergodicity in the divergence of nearby phase space trajectories, and dependence of time scale of divergence on the size of obstacle. Electron motion in mesoscopic conductors as a chaotic billiard problem. Other examples of chaotic systems; visualization of their trajectories on the computer. Self-similarity and fractal geometry: Fractals in nature – trees, coastlines, earthquakes, etc. Need for fractal dimension to describe self-similar structure. Deterministic fractal vs. self-similar fractal structure. Fractals in dynamics – Serpinski gasket and DLA. Chaos in nonlinear finite-difference equations- Logistic map: Dynamics from time series. Parameter dependence- steady, periodic and chaos states. Cobweb iteration. Fixed points. Defining chaos- aperiodic, bounded, deterministic and sensitive dependence on initial conditions. Period- Doubling route to chaos. Nonlinear time series analysis and chaos characterization: Detecting chaos from return map. Power spectrum, autocorrelation, Lyapunov exponent, correlation dimension.

Reference Books

- Classical Mechanics: A Course of Lectures. A.K. Raychaudhuri, 1983, Oxford University Press.
- Mechanics, L. D. Landau and E. M. Lifshitz, 1976, Pergamon.
- Classical Mechanics, P.S. Joag, N.C. Rana, 1st Edn., McGraw Hall.
- Nonlinear Dynamics and Chaos, S.H. Strogatz, Levant Books, Kolkata, 2007
- Understanding Nonlinear Dynamics, Daniel Kaplan and Leon Glass, Springer.Classical Mechanics, H.Goldstein, C.P. Poole, J.L. Safko, 3rd Edn. 2002, Pearson Education.

Advanced Dynamics - (Practical)

Paper: PHS-A-DSE-A2-P **Credits: 2**

List of Practicals

1. To draw the phase portrait of damped harmonic oscillator using numerical techniques.
2. To draw the phase portrait of a pendulum with different values of energy using numerical techniques.
3. To study logistic growth population model for different parameter values drawing cobweb diagrams (few steps).
4. To study the phenomenon of chaos in logistic growth model using simple computer programs and to estimate the corresponding Lyapunov exponent.
5. Computational visualization of trajectories in the Sinai Billiard.
6. Visualization of fractal nature of the chaotic attractors in logistic map by numerically generating the orbit diagram fractal.
7. Computational visualization of formations of a self-similar fractal structure such as middle third cantor set.

Suggested Demonstrations in Class

1. Motion of a pendulum with large amplitude and the dependence of its time period on the amplitude.
2. Motion of a double pendulum with small amplitudes and large amplitudes and appearance of its irregular (chaotic) behaviour.
3. Computational visualization of fractal formations of Fractals in nature -- trees, coastlines, earthquakes.

Reference Books

- Nonlinear Dynamics and Chaos, Steven H. Strogatz, Levant Books, Kolkata, 2007.
- Chaos An Introduction to Dynamical Systems, K. T. Alligood, T. D. Sauer and J. A. Yorke, Springer.
- Understanding Nonlinear Dynamics, Daniel Kaplan and Leon Glass, Springer.
- Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernández. 2014 Springer ISBN: 978-3319067896

- Scilab by example : M. Affouf, 2012, ISBN: 978-1479203444
- Scilab Image Processing : L.M.Surhone . 2010, Betascript Pub., ISBN: 978-6133459274

3.5 DSE-B1: Advanced Mathematical Methods - II

Advanced Mathematical Methods - II - (Theory)

Paper: PHS-A-DSE-B1-TH **Credits: 5 (+1 for Tutorial)**

1. Tensors
   (a) *Cartesian Tensors.* Transformation of Co-ordinates. Einstein's Summation Convention. Relation between Direction Cosines. Tensors. Algebra of Tensors. Sum, Difference and Product of Two Tensors. Contraction. Quotient Law of Tensors. Symmetric and Anti- symmetric Tensors. Invariant Tensors: Kronecker and Alternating Tensors. Association of Antisymmetric Tensor of Order Two and Vectors. Vector Algebra and Calculus using Cartesian Tensors: Scalar and Vector Products, Scalar and Vector Triple Products. Differentiation. Gradient, Divergence and Curl of Tensor Fields. Vector Identities. Isotropic Tensors. Tensorial Character of Physical Quantities. Moment of Inertia Tensor. Stress and Strain Tensors: Symmetric Nature. Elasticity Tensor. Generalized Hooke's Law. Electric Susceptibility tensor.
   (b) *General Tensors.* Transformation of Co-ordinates. Minkowski Space. Contravariant & Covariant Vectors. Contravariant, Covariant and Mixed Tensors. Kronecker Delta and Permutation Tensors. Algebra of Tensors. Sum, Difference & Product of Two Tensors. Contraction. Quotient Law of Tensors. Symmetric and Anti- symmetric Tensors. Metric Tensor.
2. Group Theory
   (a) Groups: Elementary properties of groups, uniqueness of Identity, Inverse, Rearrangement theorem. Conjugate relations, Classes, Subgroup, Invariant Subgroups, Cosets, Coset multiplication, Factor Groups. Centre of a group. Cyclic group, Permutation groups and Transformation Groups. Homomorphism and Isomorphism of groups, Kernel.
   (b) Matrix Representations of Groups Reducible and Irreducible representations. Schur's lemma. Orthogonality theorems. Character tables and their uses.
   (c) Lie Groups: Definition using metric associated with faithful finite dimensional matrix representation. Connected component and Connected Lie group. Compact Lie group.

(d) Lie Algebra: Definition, Lie Product and Structure constants. Lie Subalgebra, Invariant Lie Subalgebra. Homomorphism and Isomorphism of Lie Algebras. Representations of Lie Algebras.

(e) Connection of Lie Groups with Lie Algebra. The matrix exponential and its properties. Fundamental theorem of Lie Algebra. Analytic curves and Tangent vectors in Lie Groups. One parameter Subgroups and the exponential map connection. Special cases of connected and compact Lie groups. Constructing representations of Lie Algebras using corresponding analytic representations of Lie Groups.

(f) SO(3), SU(2) and SU(3) groups as examples.

Reference Books

- Mathematical Methods for Physicists: Weber and Arfken, 2005, Academic Press.
- Mathematical Methods for Physicists: A Concise Introduction: Tai L. Chow, 2000, Cambridge Univ. Press.
- Elements of Group Theory for Physicists by A. W. Joshi, 1997, John Wiley.
- Group Theory and its Applications to Physical Problems by Morton Hamermesh, 1989, Dover.
- Group Theory in Physics, Volume I & II, J.F.Cornwell, Academic Press, 1984.
- Introduction to Mathematical Physics: Methods & Concepts: Chun Wa Wong, 2012, Oxford University Press.

3.6 DSE-B1: Nuclear and Particle Physics

Nuclear and Particle Physics - (Theory)

Paper: PHS-A-DSE-B1-TH **Credits: 5 (+1 for Tutorial)**

1. Recapitulation of general properties of nuclei, nuclear models and radioactivity.
2. Nuclear Reactions

   (a) Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct Reaction, resonance reaction, Coulomb scattering (Rutherford scattering).

3. Interaction of Nuclear Radiation with matter

   (a) Energy loss due to ionization (Bethe- Block formula), energy loss of electrons, Cerenkov radiation. Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, neutron's interaction with matter.

4. Detector for Nuclear Radiations

   (a) Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector.

5. Particle Accelerators

   (a) Accelerator facility available in India: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons.

6. Particle Physics

   (a) Fundamental particles and their families. Fundamental particle-interactions and their basic features. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm, concept of quark model, color quantum number and gluons. Quark structure of hadrons.

Reference Books

- Introductory nuclear Physics by Kenneth S. Krane (Wiley India Pvt. Ltd., 2008).
- Concepts of nuclear physics by Bernard L. Cohen. (Tata Mcgraw Hill, 1998).
- Introduction to the physics of nuclei & particles, R.A. Dunlap. (Thomson Asia, 2004).
- Introduction to High Energy Physics, D.H. Perkins, Cambridge Univ. Press.
- Introduction to Elementary Particles, D. Griffith, John Wiley & Sons.
- Quarks and Leptons, F. Halzen and A.D. Martin, Wiley India, New Delhi.
- Basic ideas and concepts in Nuclear Physics - An Introductory Approach by K. Heyde (IOP- Institute of Physics Publishing, 2004).
- Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).

- Physics and Engineering of Radiation Detection, Syed Naeem Ahmed (Academic Press, Elsevier, 2007).
- Theoretical Nuclear Physics, J.M. Blatt & V.F.Weisskopf (Dover Pub.Inc., 1991).

3.7 DSE-B2: General Relativity

General Relativity - (Theory)

Paper: PHS-B-DSE-B2-TH **Credits: 5 (+1 for Tutorial)**

1. Review of Special Relativity in Tensor Notation.
2. Non-Euclidean Geometry
   (a) Manifold - Working definition only.
   (b) Affine Space
      i. Parallel transport, Affine Connection and Affine Space. Affine flatness. Covariant derivative of a vector, tensor. Riemann Tensor. Vanishing Riemann Tensor as a characterization of affine flatness (statement only) - Riemann Tensor as an intrinsic characterization of curvature in Affine space. Affine geodesics.
   (c) Riemann space
      i. Metric and Riemann Space. Metric flatness.
      ii. Riemann space with Affine Connection: Demonstration that requirement of preservation of lengths and angles under parallel transport in a Riemann space leads to a unique Connection called the Metric Connection or Christoffel symbols. Vanishing covariant derivative of the metric as a necessary and sufficient condition for the the affine connection to be the metric connection.
      iii. Metric Geodesics. Demonstrating that for the metric connection, metric geodesics are affine geodesics.
      iv. Vanishing Riemann Tensor (now defined in terms of metric connection) as a characterization of metric flatness (statement only) - Riemann Tensor as an intrinsic characterization of curvature also in Riemann space.
3. General Relativity
   (a) Equation of motion (E.O.M.) of a test particle in force free motion in an inertial reference frame. The geodesic equation as E.O.M. of a test particle in force free motion in a non-inertial reference frame. Time-like and light-like geodesics. Observation that fictitious forces are encoded in the metric connection. Local indistinguishability of the fictitious forces from a gravitational field. Principle of equivalence. Principle of General Covariance.

(b) Encoding gravity in the Metric Connection - necessity of a curved space-time.

(c) Reduction of the Geodesic equation of motion to Newton's E.O.M for static, weak fields (quasi-minkowski metric) in the non-relativistic limit by identification of a metric component with the gravitational potential. Gravitational Red Shift.

(d) Einstein's Field Equations:

i. Requirements on the Field equations: i) it is a tensor equation ii) it admits minkowski metric as a particular solution iii) it is quasi-linear (linear in the 2nd derivative in metric) iii) it has the correct classical limit (i.e., it reduces to Poisson's equation).

ii. The Ricci tensor and the field equations in free space: Weakening the condition for gravity free space - vanishing Curvature tensor to vanishing Ricci tensor.

iii. Field equation in the presence of matter: Energy-momentum tensor as the source term. Problem with non-vanishing divergence of the Ricci Tensor. Ricci scalar, Einstein tensor and resolution of the divergence problem. Einstein's field equations and the Cosmological constant.

4. Consequences of Einstein's Equation

(a) Schwarzschild solution and the Schwarzschild metric (to be assumed). Recovery of Newtonian Gravity in the static, weak-field and non relativistic limit. Bending of stellar light near massive celestial objects. Schwarchild black hole and event horizon.

Reference Books

- The Classical Theory of Fields, L.D.Landau and E.M.Lifshitz, Butterworth-Heinemann.
- Introduction to General Relativity, R. Adler, M. Bazin and M. Schiffer, McGraw-Hill Kogakusha Ltd.
- A first Course in General Relativity, B. Schutz, Cambridge University Press.
- Introducing Einstein's Relativity, Ray D'Inverno, Clarendon Press - Oxford.

3.8 DSE-B2: Nano Materials and Applications

Nano Materials and Applications - (Theory)

Paper: PHS-A-DSE-B2-TH **Credits: 5 (+1 for Tutorial)**

1. Nanoscale Systems

   (a) Length scales in physics, Nanostructures: 1D, 2D and 3D nanostructures (nanodots, thin films, nanowires, nanorods), Band structure and density of states of materials at nanoscale, Size Effects in nano systems, Quantum confinement: Applications of Schrodinger equation- Infinite potential well, potential step, potential box, quantum confinement of carriers in 3D, 2D, 1D nanostructures and its consequences.

2. Synthesis of Nanostructure Materials

   (a) Top down and Bottom up approach, Photolithography. Ball milling. Gas phase condensation. Vacuum deposition. Physical vapor deposition (PVD): Thermal evaporation, E-beam evaporation, Pulsed Laser deposition. Chemical vapor deposition (CVD). Sol-Gel. Electro deposition. Spray pyrolysis. Hydrothermal synthesis. Preparation through colloidal methods. MBE growth of quantum dots.

3. Characterization

   (a) X-Ray Diffraction. Optical Microscopy. Scanning Electron Microscopy. Transmission Electron Microscopy. Atomic Force Microscopy. Scanning Tunneling Microscopy.

4. Optical Properties

   (a) Coulomb interaction in nanostructures. Concept of dielectric constant for nanostructures and charging of nanostructure. Quasi-particles and excitons. Excitons in direct and indirect band gap semiconductor nanocrystals. Quantitative treatment of quasi-particles and excitons, charging effects. Radiative processes: General formalization-absorption, emission and luminescence. Optical properties of heterostructures and nanostructures.

5. Electron Transport

   (a) Carrier transport in nanostrucutures. Coulomb blockade effect, thermionic emission, tunneling and hoping conductivity. Defects and impurities: Deep level and surface defects.

6. Applications

   (a) Applications of nanoparticles, quantum dots, nanowires and thin films for photonic devices (LED, solar cells). Single electron transfer devices (no derivation). CNT based transistors. Nanomaterial Devices: Quantum dots heterostructure lasers, optical switching and optical data storage. Magnetic quantum well; magnetic dots -magnetic data storage. Micro Electromechanical Systems (MEMS), Nano Electromechanical Systems (NEMS).

Reference Books

- C.P. Poole, Jr. Frank J. Owens, Introduction to Nanotechnology (Wiley India Pvt. Ltd.).
- S.K. Kulkarni, Nanotechnology: Principles & Practices (Capital Publishing Company).
- K.K. Chattopadhyay and A. N. Banerjee, Introduction to Nanoscience and Technology (PHI Learning Private Limited).
- Richard Booker, Earl Boysen, Nanotechnology (John Wiley and Sons).
- M. Hosokawa, K. Nogi, M. Naita, T. Yokoyama, Nanoparticle Technology Handbook (Elsevier, 2007).
- Introduction to Nanoelectronics, V.V. Mitin, V.A. Kochelap and M.A. Stroscio, 2011, Cambridge University Press.
- Bharat Bhushan, Springer Handbook of Nanotechnology (Springer-Verlag, Berlin, 2004).

4 Syllabi for Skill Enhancement Courses (Honours)

4.1 SEC-A: Basics of Programming and Scientific Word Processing

Basics of Programming and Scientific Word Processing - (Theory)

Paper: PHS-A-SEC-A-TH **Credits: 2**

1. Elements of Programming
   (a) An overview computers: History of computers, overview of architecture of computer, compiler, assembler, machine language, high level language, object oriented language, programming language.
   (b) Algorithms and Flowcharts:
      i. Algorithm - definition, properties and development.
      ii. Flowchart - Concept of flowchart, symbols, guidelines, types.
2. Basic programming in C/FORTRAN
   (a) Constants, Variables and Data types.
   (b) Operation and Expressions - Arithmetic operators, relational operators, logical operators.
   (c) Managing input/output.
   (d) Decision Making and Branching.
   (e) Decision making and Looping.
   (f) Arrays : One-dimension, two-dimension and multidimensional arrays, declaration of arrays, initialization of one and multi-dimensional arrays.
   (g) User-defined Functions.
3. Visualization
   (a) Introduction to graphical analysis and its limitations. Introduction to Gnuplot. importance of visualization of computational and computational data, basic Gnuplot commands: simple plots, plotting data from a file, saving and exporting, multiple data sets per file, physics with Gnuplot (equations, building functions, user defined variables and functions), Understanding data with Gnuplot.
4. Scientific word processing:
   (a) Introduction to LaTeX TeX/LaTeX word processor, preparing a basic LaTeX file, Document classes, Preparing an input file for LaTeX, Compiling LaTeX File, LaTeX tags for creating different environments, Defining LaTeX commands and environments, Changing the type style, Symbols from other languages.

(b) Equation representation: Formulae and equations, Figures and other floating bodies, Lining in columns- Tabbing and tabular environment, Generating table of contents Bibliography and citation, Making an index and glossary, List making environments,

(c) Fonts, Picture environment and colors, errors.

Reference Books

- Introduction to Numerical Analysis, S.S. Sastry, 5th Edn., 2012, PHI Learning Pvt. Ltd.
- Computer Programming in Fortran 77". V. Rajaraman (Publisher: PHI).
- Schaum's Outline of Theory and Problems of Programming with Fortran, S Lipschutz and A Poe, 1986Mc-Graw Hill Book Co.
- Computational Physics: An Introduction, R.C. Verma, et al. New Age International Publishers, New Delhi(1999)
- E. Balagurnsamy, Programming in ANSI C, Tata McGraw Hill, 2004.
- C. Xavier, C-Language and Numerical Methods, New Age International.
- V. Rajaraman, Computer Oriented Numerical Methods, Prentice Hall of India, 1980.
- Gnuplot in action: understanding data with graphs, Philip K Janert, (Manning 2010).
- LaTeX–A Document Preparation System", Leslie Lamport (Second Edition, Addison- Wesley, 1994).

4.2 SEC-A: Electrical Circuits and Network Skills

Electrical Circuits and Network Skills - (Theory)

Paper: PHS-A-SEC-A-TH **Credits: 2**

1. Basic Electricity Principles

   (a) Voltage, Current, Resistance, and Power. Ohm's law. Series, parallel, and series-parallel combinations. AC Electricity and DC Electricity. Familiarization with multimeter, voltmeter and ammeter.

2. Understanding Electrical Circuits

   (a) Main electric circuit elements and their combination. Rules to analyze DC sourced electrical circuits. Current and voltage drop across the DC circuit elements. Single-phase and three-phase alternating current sources. Rules to analyze AC sourced electrical circuits. Real, imaginary and complex power components of AC source. Power factor. Saving energy and money.

3. Electrical Drawing and Symbols

   (a) Drawing symbols. Blueprints. Reading Schematics. Ladder diagrams. Electrical Schematics. Power circuits. Control circuits. Reading of circuit schematics. Tracking the connections of elements and identify current flow and voltage drop.

4. Generators and Transformers

   (a) DC Power sources. AC/DC generators. Inductance, capacitance, and impedance. Operation of transformers.

5. Electric Motors

   (a) Single-phase, three-phase & DC motors. Basic design. Interfacing DC or AC sources to control heaters & motors. Speed & power of ac motor.

6. Solid-State Devices

   (a) Resistors, inductors and capacitors. Diode and rectifiers. Components in Series or in shunt. Response of inductors and capacitors with DC or AC sources.

7. Electrical Protection

   (a) Relays. Fuses and disconnect switches. Circuit breakers. Overload devices. Ground-fault protection.Page 97 Grounding and isolating. Phase reversal. Surge protection. Interfacing DC or AC sources to control elements (relay protection device)

8. Electrical Wiring

   (a) Different types of conductors and cables. Basics of wiring - Star and delta connection. Voltage drop and losses across cables and conductors. Instruments to measure current, voltage, power in DC and AC circuits. Insulation. Solid and stranded cable. Conduit. Cable trays. Splices: wirenuts, crimps, terminal blocks, split bolts, and solder. Preparation of extension board.

Reference Books

- A text book in Electrical Technology - B L Theraja - S Chand & Co.
- A text book of Electrical Technology - A K Theraja.
- Performance and design of AC machines - M G Say ELBS Edn.

4.3 SEC-B: Computer Algebra System & Figure Drawing Skill

Computer Algebra System & Figure Drawing Skill - (Theory)

Paper: PHS-A-SEC-B-TH **Credits: 2**

1. Elementary symbolic computation using some computer algebra system (CAS) like Yacas or Maxima.
   (a) Arithmetic and other operations on numbers,
   (b) Calculus and elementary functions, Simplification of expressions, Solvers, Differential Equations.
   (c) Linear Algebra
   (d) Operations on polynomials
   (e) List operations
   (f) Predicates
   (g) Input/output and plotting
   (h) Probability and Statistics
   (i) Numerical methods using CAS
   (j) Physics specific applications
2. Figure generation using drawing tools like xfig/ latexdraw/ inkscape etc.
   (a) Drawing lines with/without arrows with different line styles.
   (b) Drawing curves with different line styles including brazier curves.
   (c) Drawing different types of shapes including circle, ellipse, polygons etc.
   (d) Changing figure properties like position, colour, orientation, size, shape, line properties, filling properties etc.
   (e) Grouping and ungrouping of figures.
   (f) Exporting the figure into different file formats.

Reference

- https://yacas.readthedocs.io/en/latest/reference_manual/
- The Maxima Book; Paulo Ney de Souza Richard J. Fateman Joel Moses Cliff Yapp; http://maxima.sourceforge.net/docs/maximabook/maximabook-19-Sept-2004.pdf.
- Get Started With Maxima: https://www.whoishostingthis.com/resources/maxima/
- Xfig user manual: http: //mcj.sourceforge.net/

- LaTeXDraw Manual: https://github.com/arnobl/latexdraw/wiki/Manual
- The Book of Inkscape: The Definitive Guide to the Free Graphics Editor (1st ed.), No Starch Press, p. 476, ISBN 1-59327-181-6
- https://www.youtube.com/watch?v=zUIOEXssTS

4.4 SEC-B: Renewable Energy and Energy Harvesting

Renewable Energy and Energy Harvesting - (Theory)

Paper: PHS-A-SEC-B-TH **Credits: 2**

1. Fossil fuels and Alternate Sources of energy
   (a) Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity.
2. Solar energy
   (a) Solar energy, its importance, storage of solar energy, solar pond, non-convective solar pond, applications of solar pond and solar energy, solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems.
3. Wind Energy harvesting
   (a) Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies.
4. Ocean Energy
   (a) Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices. Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass.
5. Geothermal Energy
   (a) Geothermal Resources, Geothermal Technologies.
6. Hydro Energy
   (a) Hydropower resources, hydropower technologies, environmental impact of hydro power sources.

7. Piezoelectric Energy harvesting

   (a) Introduction, Physics and characteristics of piezoelectric effect, materials and mathematical description of piezoelectricity, Piezoelectric parameters and modeling piezoelectric generators, Piezoelectric energy harvesting applications, Human power

8. Electromagnetic Energy Harvesting

   (a) Linear generators, physics mathematical models, recent applications

   (b) Carbon captured technologies, cell, batteries, power consumption.

   (c) Environmental issues and Renewable sources of energy, sustainability.

Reference Books

- Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi.Solar energy - M P Agarwal - S Chand and Co. Ltd.
- Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.
- Godfrey Boyle, "Renewable Energy, Power for a sustainable future", 2004, Oxford University Press, in association with The Open University.
- Dr. P Jayakumar, Solar Energy: Resource Assesment Handbook, 2009.
- J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).
- http://en.wikipedia.org/wiki/Renewable_energy.

Part II

Physics Syllabus : General Course

5 Syllabi for Core Courses (General)

These courses will also serve as Generic Elective (GE) courses for students who have honours in a subject other than Physics.

5.1 Semester - 1: Mechanics

Mechanics (Theory)

Paper: PHS-G-CC-1-1-TH **Credits: 4**

1. Mathematical Methods
   (a) Vector Algebra: Vectors as directed line segments. Addition of vectors and multiplication by a scalar. Scalar and vector products. Basis and representation of vectors.
   (b) Vector Analysis: Derivatives of a vector with respect to a parameter. Gradient, divergence and Curl. Vector integration, line, surface and volume integrals of vector fields. Gauss'-divergence theorem and Stoke's theorem of vectors (Statement only).
2. Laws of Motion
   (a) Laws of Motion: Frames of reference. Newton's Laws of motion. Dynamics of a system of particles. Conservation of momentum. Centre of Mass.
3. Work and Energy
   (a) Work-energy theorem. Conservative forces. Concept of Potential Energy. Conservation of energy.
4. Gravitation
   (a) Motion of a particle in a central force field. Conservation of angular momentum leading to restriction of the motion to a plane and constancy of areal velocity. Newton's Law of Gravitation. Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness.
5. Oscillations
   (a) Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped oscillations. Forced oscillations with harmonic forces. Compound pendulum.

6. Rotational Motion

   (a) Rotation of a rigid body about a fixed axis. Angular velocity and angular momentum. Moment of Inertia. Torque. Conservation of angular momentum.

7. Elasticity

   (a) Hooke's law - Stress-strain diagram. Elastic moduli-relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants.

   (b) Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion. Torsional pendulum.

   (c) Bending of beams.

   (d) Work done in stretching and work done in twisting a wire.

8. Surface Tension

   (a) Synclastic and anticlastic surface - Excess of pressure - Application to spherical drops and bubbles - variation of surface tension with temperature.

9. Viscosity

   (a) Rate flow of liquid in a capillary tube - Poiseuille's formula.

Reference Books

- University Physics. FW Sears, MW Zemansky and HD Young13/e, 1986. Addison- Wesley
- Mechanics Berkeley Physics course,v.1: Charles Kittel, et. Al. 2007, Tata McGraw- Hill.
- Physics - Resnick, Halliday & Walker 9/e, 2010, Wiley.
- Engineering Mechanics, Basudeb Bhattacharya, 2 nd edn., 2015, Oxford University Press.
- Physics for Degree Students (For B.Sc. 1st Year); C.L. Arora & P.S. Hemme; S.Chand Publishing.
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.

Mechanics (Practical)

PHS-G-CC-1-1-P **Credits: 2**

List of Practicals

1. Determination of Moment of inertia of cylinder/bar about axis by measuring the time period, of the cradle and with body of known moment of Inertia.

2. Determination of Y modulus of a metal bar of rectangular cross section by the method of flexure.

3. Determination of rigidity modulus of wire by measuring the time period of torsional oscillation of a metal cylinder attached to it.

4. Determination of Moment of Inertia of a flywheel.

5. Determination gravitational acceleration, g using bar pendulum.

6. To determine the height of a building using sextant.

General Topic

1. Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope.

2. To study the random error in observations.

Reference Books

- Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, Asia Publishing House

- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers

- A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn, 2011, Kitab Mahal

- Engineering Practical Physics, S.Panigrahi & B.Mallick, 2015, Cengage Learning India Pvt. Ltd.

- Practical Physics, G.L. Squires, 2015, 4th Edition, Cambridge University Press.

5.2 Semester - 2: Electricity and Magnetism

Electricity and Magnetism (Theory)

Paper: PHS-G-CC-2-2-TH **Credits: 4**

1. Electrostatics

   (a) Coulombs law. Principle of superposition. Electrostatic Field.

   (b) Divergence of the Electrostatic field. Flux, Gauss's theorem of electrostatics. Applications of Gauss theorem to find Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor.

   (c) Curl of the Electrostatic Field. Electric potential as line integral of electric field. Potential for a uniformly charged spherical shell and solid sphere. Calculation of electric field from potential. Electric potential and field due to an electric dipole. Electric dipole moment. Force and Torque on a dipole.

   (d) Conductors: Electric field and charge density inside and on the surface of a conductor. Force per unit area on the surface. Capacitance of a conductor. Capacitance an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Energy per unit volume in electrostatic field.

   (e) Electric Fields inside matter: Electric Polarisation. Bound charges. Displacement vector. Gauss's theorem in dielectrics. Linear Dielectric medium. Electric Succeptibility and Permittivity. Parallel plate capacitor completely filled with dielectric.

2. Magnetism

   (a) Biot-Savart's law and the Lorentz force law. Application of Biot-Savart's law to determine the magnetic field of a straight conductor, circular coil, solenoid carrying current. Force between two straight current carrying wires.

   (b) Divergence of the magnetic field. Magnetic vector potential.

   (c) Curl of the magnetic field. Ampere's circuital law. Determination of the magnetic field of a straight current carrying wire. Potential and field due to a magnetic dipole. Magnetic dipole moment. Force and torque on a magnetic dipole.

   (d) Magnetic fields inside matter: Magnetization. Bound currents. The magnetic intensity - H. Linear media. Magnetic susceptibility and Permeability. Brief introduction of dia-, para- and ferro-magnetic materials.

3. Electromagnetic Induction

4. Ohms law and definition of E.M.F. Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils. Energy stored in magnetic field.

5. Linear Network

   (a) Impedance of L, C, R and their combinations. Thevenin & Norton's Theorem. Maximum power transfer theorem and superposition theorem. Anderson's bridge.

6. Maxwell's Equations and Electromagnetic Wave Propagation

   (a) Equation of continuity of current, Displacement current, Maxwell's equations, Poynting vector, energy density in electromagnetic field, electromagnetic wave propagation through vacuum and isotropic dielectric medium, transverse nature of EM waves,. Polarization of E.M. waves.

Reference Books

- Itroduction to Electrodynamics, David J Griffiths 3rd Edn, 1998, Benjamin Cummings.
- Electricity and Magnetism, Edward M. Purcell, 1986, McGraw-Hill Education.
- Electricity and Magnetism, J.H. Fewkes & J. Yarwood. Vol. I, 1991, Oxford Univ. Press.
- Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
- Electricity and Magnetism; R.Murugeshan; S. Chand Publishing.

Electricity and Magnetism (Practical)

Paper: PHS-G-CC-2-2-P **Credits: 2**

List of Practicals

1. Determination of unknown resistance by Carey Foster method.
2. Measurement of a current flowing through a register using potentiometer.
3. Determination of the horizontal components of earths magnetic field.
4. Conversion of an ammeter to a voltmeter.

5. Conversion of a voltmeter to an Ammeter.

6. Verification of Thevenin & Norton theorem and superposition theorem.

General topics

1. Use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, (d) Capacitances (e) Checking electrical fuses (f) circuit continuity check and (g) moving coil galvanometer (in dead beat and ballistic mode), etc.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
- A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- Engineering Practical Physics, S.Panigrahi and B.Mallick, 2015, Cengage Learning.
- A Laboratory Manual of Physics for undergraduate classes, D.P.Khandelwal, 1985, Vani Pub.

5.3 Semester - 3: Thermal Physics and Statistical Mechanics

Thermal Physics and Statistical Mechanics (Theory)

Paper: PHS-G-CC-3-3-TH **Credits: 4**

1. Laws of Thermodynamics

   (a) Thermodynamic Description of system: Zeroth Law of thermodynamics and temperature. First law and internal energy, conversion of heat into work, Various Thermodynamical Processes, Applications of First Law: General Relation between C_P and C_v, Work Done during Isothermal and Adiabatic Processes. Compressibility and Expansion Coefficients, Reversible and irreversible processes. Second law and Entropy, Carnot's cycle & Carnot's theorem, Entropy changes in reversible & irreversible processes, Entropy-temperature diagrams, Third law of thermodynamics, unattainability of absolute zero.

2. Thermodynamical Potentials

   (a) Enthalpy, Gibbs, Helmholtz and Internal Energy functions, Maxwell's relations and applications - Joule-Thompson Effect, Clausius- Clapeyron Equation, Expression for $(C_P - C_V)$, C_P/C_V, TdS equations.

3. Kinetic Theory of Gases

   (a) Derivation of Maxwell's law of distribution of velocities and its experimental verification, Mean free path (Zeroth Order), Transport Phenomena: Viscosity, Conduction and Diffusion (for vertical case), Law of equipartition of energy (no derivation) and its applications to specific heat of gases; mono-atomic and diatomic gases.

4. Theory of Radiation

   (a) Blackbody radiation, Spectral distribution, Concept of Energy Density, Derivation of Planck's law, Deduction of Wien's distribution law, Rayleigh- Jeans Law, Stefan Boltzmann Law and Wien's displacement law from Planck's law.

5. Statistical Mechanics

   (a) Phase space, Macrostate and Microstate. Ensemble - Ergodic hypothesis. PEAP, Entropy and Thermodynamic probability - Boltzmann hypothesis. Maxwell-Boltzmann law - distribution of velocity - Quantum statistics (qualitative discussion only) - Fermi-Dirac distribution law (statement only) - electron gas as an example of Fermi gas - Bose-Einstein distribution law (statement only) - photon gas as an example of Bose gas- comparison of three statistics.

Reference Books

- Thermal Physics, S. Garg, R. Bansal and C. Ghosh, 1993, Tata McGraw-Hill.
- A Treatise on Heat, Meghnad Saha, and B.N. Srivastava, 1969, Indian Press.
- Thermodynamics, Enrico Fermi, 1956, Courier Dover Publications.
- Heat and Thermodynamics, M.W.Zemasky and R. Dittman, 1981, McGraw Hill.
- Thermodynamics, Kinetic theory & Statistical thermodynamics, F.W.Sears and G.L. Salinger. 1988, Narosa.
- Heat, Thermodynamics and Statistical Physics; B. Lal, N. Subramanyam and P.S.Hemme; S.Chand Publishing.
- Thermal Physics, A. Kumar and S.P. Taneja, 2014, R. chand Publications.
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.

Thermal Physics and Statistical Mechanics (Practical)

Paper: PHS-G-CC-3-3-P **Credits: 2**

List of Practicals

1. Determination of the coefficient of thermal expansion of a metalic rod using an optical lever.
2. Verification of Stefan's law of radiation by the measurement of voltage and current of a torch bulb glowing it beyond draper point.
3. Calibration of a thermocouple by direct measurement of the thermo emf using operational amplifier.
4. To determine the Coefficient of Thermal Conductivity of a bad conductor by Lee and Charlton's disc method.
5. To determine the Temperature Coefficient of Resistance by Platinum Resistance Thermometer (PRT) using constant current source.
6. Determination of the pressure coefficient of air using Jolly's apparatus.

Reference Books

- Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
- A Laboratory Manual of Physics for undergraduate classes, D. P. Khandelwal, 1985, Vani Pub.

5.4 Semester - 4: Waves and Optics

Waves and Optics (Theory)

Paper: PHS-G-CC-4-4-TH **Credits: 4**

1. Superposition of Two Collinear Harmonic oscillations
   (a) Linearity & Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats).
2. Superposition of Two Perpendicular Harmonic Oscillation
   (a) Graphical and Analytical Methods. Lissajous Figures with equal an unequal frequency and their uses.

3. Wave Motion - General

   (a) Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity.

4. Sound

   (a) Review of SHM, damped & forced vibrations - resonance. Fourier's Theorem - Application to saw tooth wave and square wave. Intensity and loudness of sound - Decibels - Intensity levels. Musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabine's formula - measurement of reverberation time - Acoustic aspects of halls and auditoria.

5. Wave Optics - General

   (a) Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle.

6. Interference

   (a) Interference: Division of amplitude and division of wavefront. Young's Double Slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stoke's treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: measurement of wavelength and refractive index.

7. Michelson's Interferometer

   (a) Idea of form of fringes (no theory needed), Determination of wavelength, Wavelength difference, Refractive index, and Visibility of fringes.

8. Diffraction

   (a) Fraunhofer diffraction- Single slit; Double Slit. Multiple slits and Diffraction grating.

   (b) Fresnel Diffraction: Half-period zones. Zone plate. Fresnel Diffraction pattern of a straight edge, a slit and a wire using half-period zone analysis.

9. Polarization

10. Transverse nature of light waves. Plane polarized light - production and analysis. Circular and elliptical polarization. Optical activity.

Reference Books

- Fundamentals of Optics, F.A Jenkins and H.E White, 1976, McGraw-Hill.
- Principles of Optics, B.K. Mathur, 1995, Gopal Printing.
- University Physics. F.W. Sears, M.W. Zemansky and H.D. Young. 13/e, 1986. Addison-Wesley.
- Fundamentals of Optics, H.R. Gulati and D.R. Khanna, 1991, R. Chand Publications.
- Mechanics; D.S.Mathur and P.S.Hemme; S.Chand Publishing.

Waves and Optics (Practical)

Paper: PHS-G-CC-4-4-P **Credits: 2**

List of Practicals

1. Determination of the refractive index of material of a lens and that of a liquid using a convex lens and a plane mirror.
2. Determination of the focal length of a concave lens by auxiliary lens method.
3. Determination of the frequency of a tuning fork with the help of sonometer using $n - l$ curve.
4. Determination of radius of curvature / wavelength of a monochromatic / quasi monochromatic light using Newtons ring.
5. Measurement of the spacing between the adjacent slits in a grating by measuring $\sin\theta$ vs λ graph of a certain order of grating spectra.
6. Measurement of specific rotation of active solution (e.g., sugar solution) using polarimeter.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
- A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- A Laboratory Manual of Physics for undergraduate classes, D.P.Khandelwal, 1985, Vani Pub.

6 Syllabi for Discipline Specific Elective Courses (General)

6.1 DSE-A: Electronics and Instrumentation

Electronics and Instrumentation - (Theory)

Paper: PHS-G-DSE-A-TH **Credits: 4**

1. Semiconductor Devices and Amplifiers

   (a) Semiconductor Diodes: P and N type semiconductors. Barrier Formation in PN Junction Diode. Qualitative Idea of Current Flow Mechanism in Forward and Reverse Biased Diode. PN junction and its characteristics. Static and Dynamic Resistance. Principle and structure of (1) LEDs, (2) Photodiode, (3) Solar Cell.

   (b) Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Active, Cutoff & Saturation regions Current gains α and β. Relations between α and β. Load Line analysis of Transistors. DC Load line & Q- point. Voltage Divider Bias Circuit for CE Amplifier. H-parameter, Equivalent Circuit. Analysis of single-stage CE amplifier using hybrid Model. Input & output Impedance. Current, Voltage and Power gains. Class A, B & C Amplifiers.

2. Operational Amplifiers

   (a) Characteristics of an Ideal and Practical Op-Amp (IC 741), Open-loop and closed- loop Gain. CMRR, concept of Virtual ground. Applications of Op-Amps: (1) Inverting and non-inverting Amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Zero crossing detector.

   (b) Sinusoidal Oscillators: Barkhausen's Criterion for Self-sustained Oscillations. Determination of Frequency of RC Oscillator.

3. Digital Circuits

   (a) Difference between Analog and Digital Circuits.

   (b) Binary Numbers. Decimal to Binary and Binary to Decimal Conversion.

   (c) AND, OR and NOT Gates (Realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates. De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra.

   (d) Fundamental Products. Minterms and Maxterms. Conversion of a Truth Table into an Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map.

(e) Binary Addition. Binary Subtraction (using 2's Complement Method).

(f) Half Adders and Full Adders and Subtractors, 4-bit binary Adder-Subtractor.

4. Instrumentations

(a) Introduction to CRO: Block Diagram of CRO. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference. Power Supply: Half-wave Rectifiers. Centre-tapped and Bridge. Full-wave Rectifiers Calculation of Ripple Factor and Rectification Efficiency. Basic idea about capacitor filter.

(b) Zener Diode and Voltage Regulation.

(c) Timer IC: IC 555 Pin diagram and its application as Astable and Monostable Multivibrator.

Reference Books

- Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.
- Electronic devices & circuits, S. Salivahanan & N.S. Kumar, 2012, Tata Mc-Graw Hill.
- Microelectronic Circuits, M.H. Rashid, 2nd Edn., 2011, Cengage Learning.
- Modern Electronic Instrumentation and Measurement Tech., Helfrick and Cooper, 1990, PHI Learning
- Digital Principles and Applications, A.P. Malvino, D.P. Leach and Saha, 7th Ed., 2011, Tata McGraw Hill.
- Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6th Edn., Oxford University Press.
- Fundamentals of Digital Circuits, A. Anand Kumar, 2nd Edition, 2009, PHI Learning Pvt. Ltd.
- OP-AMP & Linear Digital Circuits, R.A. Gayakwad, 2000, PHI Learning Pvt. Ltd.

Electronics and Instrumentation - (Practical)

Paper: PHS-G-DSE-A-P **Credits: 2**

List of Practicals

1. To measure (a) Voltage, and (b) Frequency of a periodic waveform using CRO
2. To verify and design AND, OR, NOT and XOR gates using NAND gates.
3. Half adder, Full adder and 4-bit Binary Adder.
4. To design an astable multivibrator of given specifications using 555 Timer.
5. To study the characteristics of a Transistor in CE configuration.
6. To design a CE amplifier of given gain (mid-gain) using voltage divider bias.
7. To design an inverting and a non-inverting amplifier of given gain using Op-amp 741 and to study their frequency response.

Reference Books

- Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.
- Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall.
- OP-Amps & Linear Integrated Circuit, R.A. Gayakwad, 4th Edn, 2000, Prentice Hall.
- Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.

6.2 DSE-A: Modern Physics

Modern Physics - (Theory)

PHS-G-DSE-A-TH **Credits: 5 (+1 for Tutorial)**

1. Special Theory of Relativity
   (a) Michelson-Morley experiment. Lorentz transformation. Time dilation and length contraction. Velocity addition rule.
   (b) Relativistic dynamics. Elastic collision between two particles. Idea of relativistic momentum and relativistic mass. Mass-energy equivalence.

2. Elements of Quantum Mechanics

   (a) Blackbody Radiation, Planck's quantum, Planck's constant. Photoelectric effect and Compton scattering - light as a collection of photons. Davisson-Germer experiment. De Broglie wavelength and matter waves. Wave-particle duality. Wave description of particles by wave packets. Group and Phase velocities and relation between them. Probability interpretation: Normalized wave functions as probability amplitudes. Heisenberg uncertainty principle (Statement with illustrations). Impossibility of a particle following a trajectory.

   (b) Limitations of Ruherford's model of atomic structure. Bohr's model, its successes and limitations.

   (c) Quantum states as normalized functions and observables as linear hermitian operators. Significance of the eigenvalue equations. Application to a particle in one dimension: Position, Momentum and Energy operators.

   (d) Time evolution of the quantum state: Schrodinger's equation. Stationary states. Properties of wave function. Probability and probability current densities in one dimension.

   (e) Bound states: Particle in a one dimensional rigid box. Energy eigenvalues and eigenvectors.

   (f) Scatterring: Scatterring by a step potential and rectangular barrier. Tunnelling.

3. Atomic Physics

   (a) Quantum theory of hydrogen-like atoms

      i. Schrodinger equation in spherical polar coordinates. Separation of variables. Angular equation and orbital angular momentum. (Solution to the differential equations should be assumed). Radial equation for attractive coulomb interaction - Hydrogen atom. Solution for the radial wavefunctions (Solution to the differential equation should be assumed). Shapes of the probability densities for ground & first excited states. Orbital angular momentum quantum numbers l and m; s, p, d,shells.

   (b) Generalized Angular Momenta and Spin.

      i. Generalized angular momentum. Electron's magnetic moment and Spin Angular Momentum. Gyromagnetic Ratio and Bohr Magneton and the g - factor. Energy associated with a magnetic dipole placed in magnetic field. Stern-Gerlach Experiment.

      ii. Addition of angular momenta - statement only. Restriction of eigenvalues from $|j_1 - j_2|$ to $|j_1 + j_2|$.

      iii. Zeeman effect.

(c) Many electron atoms

i. Identical particles. Symmetric & Antisymmetric Wave Functions. Pauli's Exclusion Principle. Hund's Rule. Periodic table.

Reference Books

- Introduction to Special Relativity, R. Resnick, 2005, John Wiley and Sons.
- Special Relativity (MIT Introductory Physics). A.P. French, 2018, CRC Press.
- Concepts of Modern Physics, Arthur Beiser, 2002, McGraw-Hill.
- Introduction to Modern Physics, Rich Meyer, Kennard, Cooper, 2002, Tata McGraw Hill.
- Introduction to Quantum Mechanics, David J. Griffith, 2005, Pearson Education.
- Physics for scientists and Engineers with Modern Physics, Jewett and Serway, 2010, Cengage Learning.
- Modern Physics, G.Kaur and G.R. Pickrell, 2014, McGraw Hill.
- Quantum Mechanics: Theory & Applications, A.K.Ghatak & S.Lokanathan, 2004, Macmillan Additional Books for Reference Modern Physics, J.R. Taylor, C.D. Zafiratos, M.A. Dubson, 2004, PHI Learning.
- Theory and Problems of Modern Physics, Schaum's outline, R. Gautreau and W. Savin, 2nd Edn, Tata McGraw-Hill Publishing Co. Ltd.
- Quantum Physics, Berkeley Physics, Vol.4. E.H.Wichman, 1971, Tata McGraw-Hill Co.
- Basic ideas and concepts in Nuclear Physics, K.Heyde, 3rd Edn., Institute of Physics Pub.
- Modern Physics; R.Murugeshan & K.Sivaprasath; S. Chand Publishing.
- Six Ideas that Shaped Physics: Particle Behave like Waves, T.A.Moore, 2003, McGraw Hill..

6.3 DSE-B: Solid State Physics

Solid State Physics - (Theory)

Paper: PHS-G-DSE-B-TH **Credits: 4**

1. Preliminary Topics

(a) Review of Schrodinger equation in one dimension, stationary states. Maxwell-Boltzman distribution law.

2. Crystal Structure

   (a) Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor.

3. Elementary Lattice Dynamics

   (a) Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids - T^3 law (qualitative discussions only).

4. Magnetic Properties of Matter (qualitative discussions only)

   (a) Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of Dia- and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss .

5. Dielectric Properties of Materials (qualitative discussions only)

   (a) Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeir relations.

6. Elementary band theory (qualitative discussions only)

   (a) Kronig Penny model (results should be assumed - no analysis required). Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility.

Reference Books

- The Oxford Solid State Basics. S. H. Simon, 2013, Oxford.
- Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India.
- Introduction to Solid State Physics, Charles Kittel, 8th Ed., 2004, Wiley India Pvt. Ltd.
- Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India ► Introduction to Solids, Leonid V. Azaroff, 2004, Tata Mc-Graw Hill.
- Solid State Physics, N.W. Ashcroft and N.D. Mermin, 1976, Cengage Learning.

- Solid State Physics, Rita John, 2014, McGraw Hill.
- Solid-state Physics, H. Ibach and H. Luth, 2009, Springer.
- Solid State Physics; R.K.Puri and V.K.Babbar; S. Chand Publishing.
- Solid State Physics, M.A. Wahab, 2011, Narosa Publications.

Solid State Physics - (Practical)

Paper: PHS-G-DSE-B-P **Credits: 2**

List of Practicals

1. To study PE hysteresis of ferroelectric crystal.
2. To study BH hysteresis of ferromagnetic material.
3. Measurement of susceptibility of paramagnetic solution by Quink"s tube method.
4. Measurement of magnetic susceptibility of solids.
5. Determination of variation of dielectric constant with frequency.
6. Measurement of hall voltage by four probe method.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
- A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn., 2011, Kitab Mahal.
- Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India

6.4 DSE-B: Nuclear & Particle Physics

Nuclear & Particle Physics - (Theory)

Paper: PHS-G-DSE-B-TH **Credits: 5 (+1 for Tutorial)**

1. General Properties of Nuclei
   (a) Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excites states.
2. Nuclear Models
   (a) Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies.
   (b) Evidence for nuclear shell structure - nuclear magic numbers. Basic assumptions of shell model, concept of mean field, residual interaction, concept of nuclear force.
3. Radioactivity
   (a) α - decay: basics of α - decay processes. Theory of α - emission, Gamow factor, Geiger Nuttall law, α - decay spectroscopy.
   (b) β - decay: energy and kinematics of β decay, positron emission, electron capture, neutrino hypothesis.
   (c) γ - decay: Gamma ray emission & kinematics, internal conversion.
4. Nuclear Reactions
   (a) Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct Reaction, resonance reaction, Coulomb scattering (Rutherford scattering).
5. Interaction of Nuclear Radiation with matter
   (a) Energy loss due to ionization (Bethe- Block formula), energy loss of electrons, Cerenkov radiation. Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, neutron's interaction with matter.

6. Detector for Nuclear Radiations

   (a) Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector.

7. Particle Accelerators

   (a) Accelerator facility available in India: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons.

8. Particle Physics

   (a) Fundamental particles and their families. Fundamental particle-interactions and their basic features. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm. Quark model, color quantum number and gluons. Quark structure of hadrons.

Reference Books

- Introductory nuclear Physics by Kenneth S. Krane (Wiley India Pvt. Ltd., 2008).
- Concepts of nuclear physics by Bernard L. Cohen. (Tata Mcgraw Hill, 1998).
- Introduction to the physics of nuclei & particles, R.A. Dunlap. (Thomson Asia, 2004).
- Introduction to High Energy Physics, D.H. Perkins, Cambridge Univ. Press.
- Introduction to Elementary Particles, D. Griffith, John Wiley & Sons.
- Quarks and Leptons, F. Halzen and A.D. Martin, Wiley India, New Delhi.
- Basic ideas and concepts in Nuclear Physics - An Introductory Approach by K. Heyde (IOP- Institute of Physics Publishing, 2004).
- Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).
- Physics and Engineering of Radiation Detection, Syed Naeem Ahmed (Academic Press, Elsevier, 2007).
- Theoretical Nuclear Physics, J.M. Blatt & V.F.Weisskopf (Dover Pub.Inc., 1991)

7 Syllabi for Skill Enhancement Courses (General)

7.1 SEC-A: Basics of Programming and Scientific Word Processing

Basics of Programming and Scientific Word Processing - (Theory)

Paper: PHS-G-SEC-A-TH **Credits: 2**

1. Elements of Programming
   (a) An overview computers: History of computers, overview of architecture of computer, compiler, assembler, machine language, high level language, object oriented language, programming language.
   (b) Algorithms and Flowcharts:
      i. Algorithm - definition, properties and development.
      ii. Flowchart - Concept of flowchart, symbols, guidelines, types.
2. Basic programming in C/FORTRAN
   (a) Constants, Variables and Data types.
   (b) Operation and Expressions - Arithmetic operators, relational operators, logical operators.
   (c) Managing input/output.
   (d) Decision Making and Branching.
   (e) Decision making and Looping.
   (f) Arrays : One-dimension, two-dimension and multidimensional arrays, declaration of arrays, initialization of one and multi-dimensional arrays.
   (g) User-defined Functions.
3. Visualization
   (a) Introduction to graphical analysis and its limitations. Introduction to Gnuplot. importance of visualization of computational and computational data, basic Gnuplot commands: simple plots, plotting data from a file, saving and exporting, multiple data sets per file, physics with Gnuplot (equations, building functions, user defined variables and functions), Understanding data with Gnuplot.
4. Scientific word processing:
   (a) Introduction to LaTeX TeX/LaTeX word processor, preparing a basic LaTeX file, Document classes, Preparing an input file for LaTeX, Compiling LaTeX File, LaTeX tags for creating different environments, Defining LaTeX commands and environments, Changing the type style, Symbols from other languages.

(b) Equation representation: Formulae and equations, Figures and other floating bodies, Lining in columns- Tabbing and tabular environment, Generating table of contents Bibliography and citation, Making an index and glossary, List making environments,

(c) Fonts, Picture environment and colors, errors.

Reference Books

- Introduction to Numerical Analysis, S.S. Sastry, 5th Edn., 2012, PHI Learning Pvt. Ltd.
- Computer Programming in Fortran 77". V. Rajaraman (Publisher: PHI).
- Schaum's Outline of Theory and Problems of Programming with Fortran, S Lipsdutz and A Poe, 1986Mc-Graw Hill Book Co.
- Computational Physics: An Introduction, R.C. Verma, et al. New Age International Publishers, New Delhi(1999)
- E. Balagurnsamy, Programming in ANSI C, Tata McGraw Hill, 2004.
- C. Xavier, C-Language and Numerical Methods, New Age International.
- V. Rajaraman, Computer Oriented Numerical Methods, Prentice Hall of India, 1980.
- Gnuplot in action: understanding data with graphs, Philip K Janert, (Manning 2010).
- LaTeX–A Document Preparation System", Leslie Lamport (Second Edition, Addison- Wesley, 1994).

7.2 SEC-A: Electrical Circuits and Network Skills

Electrical Circuits and Network Skills - (Theory)

Paper: PHS-G-SEC-A-TH **Credits: 2**

1. Basic Electricity Principles

   (a) Voltage, Current, Resistance, and Power. Ohm's law. Series, parallel, and series-parallel combinations. AC Electricity and DC Electricity. Familiarization with multimeter, voltmeter and ammeter.

2. Understanding Electrical Circuits

   (a) Main electric circuit elements and their combination. Rules to analyze DC sourced electrical circuits. Current and voltage drop across the DC circuit elements. Single-phase and three-phase alternating current sources. Rules to analyze AC sourced electrical circuits. Real, imaginary and complex power components of AC source. Power factor. Saving energy and money.

3. Electrical Drawing and Symbols

   (a) Drawing symbols. Blueprints. Reading Schematics. Ladder diagrams. Electrical Schematics. Power circuits. Control circuits. Reading of circuit schematics. Tracking the connections of elements and identify current flow and voltage drop.

4. Generators and Transformers

   (a) DC Power sources. AC/DC generators. Inductance, capacitance, and impedance. Operation of transformers.

5. Electric Motors

   (a) Single-phase, three-phase & DC motors. Basic design. Interfacing DC or AC sources to control heaters & motors. Speed & power of ac motor.

6. Solid-State Devices

   (a) Resistors, inductors and capacitors. Diode and rectifiers. Components in Series or in shunt. Response of inductors and capacitors with DC or AC sources.

7. Electrical Protection

   (a) Relays. Fuses and disconnect switches. Circuit breakers. Overload devices. Ground-fault protection.Page 97 Grounding and isolating. Phase reversal. Surge protection. Interfacing DC or AC sources to control elements (relay protection device)

8. Electrical Wiring

   (a) Different types of conductors and cables. Basics of wiring - Star and delta connection. Voltage drop and losses across cables and conductors. Instruments to measure current, voltage, power in DC and AC circuits. Insulation. Solid and stranded cable. Conduit. Cable trays. Splices: wirenuts, crimps, terminal blocks, split bolts, and solder. Preparation of extension board.

Reference Books

- A text book in Electrical Technology - B L Theraja - S Chand & Co.
- A text book of Electrical Technology - A K Theraja.
- Performance and design of AC machines - M G Say ELBS Edn.

7.3 SEC-B: Computer Algebra System & Figure Drawing Skill

Computer Algebra System & Figure Drawing Skill - (Theory)

Paper: PHS-G-SEC-B-TH **Credits: 2**

1. Elementary symbolic computation using some computer algebra system (CAS) like Yacas or Maxima.
   (a) Arithmetic and other operations on numbers.
   (b) Calculus and elementary functions, Simplification of expressions, Solvers, Differential Equations.
   (c) Linear Algebra
   (d) Operations on polynomials
   (e) List operations
   (f) Predicates
   (g) Input/output and plotting
   (h) Probability and Statistics
   (i) Numerical methods using CAS
   (j) Physics specific applications
2. Figure generation using drawing tools like xfig/ latexdraw/ inkscape etc.
   (a) Drawing lines with/without arrows with different line styles.
   (b) Drawing curves with different line styles including brazier curves.
   (c) Drawing different types of shapes including circle, ellipse, polygons etc.
   (d) Changing figure properties like position, colour, orientation, size, shape, line properties, filling properties etc.
   (e) Grouping and ungrouping of figures.
   (f) Exporting the figure into different file formats.

Reference

- https://yacas.readthedocs.io/en/latest/reference_manual/
- The Maxima Book; Paulo Ney de Souza Richard J. Fateman Joel Moses Cliff Yapp; http://maxima.sourceforge.net/docs/maximabook/maximabook-19-Sept-2004.pdf.
- Get Started With Maxima: https://www.whoishostingthis.com/resources/maxima/
- Xfig user manual: http: //mcj.sourceforge.net/

- LaTeXDraw Manual: https://github.com/arnobl/latexdraw/wiki/Manual
- The Book of Inkscape: The Definitive Guide to the Free Graphics Editor (1st ed.), No Starch Press, p. 476, ISBN 1-59327-181-6
- https://www.youtube.com/watch?v=zUIOEXssTSE

7.4 SEC-B: Renewable Energy and Energy Harvesting

Renewable Energy and Energy Harvesting - (Theory)

Paper: PHS-G-SEC-B-TH **Credits: 2**

1. Fossil fuels and Alternate Sources of energy
   (a) Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity.
2. Solar energy
   (a) Solar energy, its importance, storage of solar energy, solar pond, non-convective solar pond, applications of solar pond and solar energy, solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems.
3. Wind Energy harvesting
   (a) Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies.
4. Ocean Energy
   (a) Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices. Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass.
5. Geothermal Energy
   (a) Geothermal Resources, Geothermal Technologies.
6. Hydro Energy
   (a) Hydropower resources, hydropower technologies, environmental impact of hydro power sources.

7. Piezoelectric Energy harvesting

   (a) Introduction, Physics and characteristics of piezoelectric effect, materials and mathematical description of piezoelectricity, Piezoelectric parameters and modeling piezoelectric generators, Piezoelectric energy harvesting applications, Human power

8. Electromagnetic Energy Harvesting

   (a) Linear generators, physics mathematical models, recent applications

   (b) Carbon captured technologies, cell, batteries, power consumption.

   (c) Environmental issues and Renewable sources of energy, sustainability.

Reference Books

- Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi.Solar energy - M P Agarwal - S Chand and Co. Ltd.
- Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.
- Godfrey Boyle, "Renewable Energy, Power for a sustainable future", 2004, Oxford University Press, in association with The Open University.
- Dr. P Jayakumar, Solar Energy: Resource Assesment Handbook, 2009.
- J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).
- http://en.wikipedia.org/wiki/Renewable_energy.

8 Note on Syllabi for Generic Elective Courses

The Core Courses (CC) for the B.Sc. General Curriculum with Physics, provided in section 5 above, are to be treated as Generic Elective Course for students studying an honours course in a subject other than Physics.

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

University of Calcutta

B.Sc.STATISTICS(Hons)

2018

1. Scheme for CBCS Curriculum

1.1 Credit Distribution across Courses

		Credits	
Course Type	Total Papers	Theory + Practical	Theory*
Core Courses	14	14*4 =56 14*2 =28	14*5 =70 14*1=14
Discipline Specific Electives	4	4*4=16 4*2=8	4*5=20 4*1=4
Generic Electives	4	4*4=16 4*2=8	4*5=20 4*1=4
Ability Enhancement Language Courses	2	2*2=4	2*2=4
Skill Enhancement Courses	2	2*2=4	2*2=4
Totals	22	140	140

*Tutorials of 1 Credit will be conducted in case there is no practical component

GE: Covering two other subjects with two courses each; any subject any semester; CC of a different subject in General Course is to be treated as GE for Honours Course.

DSE/SEC: Group (A & B) for specified semesters.

AECC/SEC: Each Course has 2 credits.

AECC-1: Communicative English/ MIL.

AECC-2: Environmental Studies.

1.2 Scheme for CBCS Curriculum

Semester	Course Name	Course Detail	Credits
1	Ability EnhancementCompulsoryCourse–I	English communication / Environmental Science	2
	Corecourse–I	Descriptive Statistics	4
	Corecourse–IPractical	Descriptive Statistics Lab	2
	Corecourse–II	Probability and Probability Distribitions-I	4
	Corecourse–IIPractical	Probability and Probability Distributions-I Lab	2
	GeneticElective–1	TBD	4
	GenericElective–1Practical	TBD	2
2	Ability EnhancementCompulsoryCourse–II	English communication / Environmental Science	2
	Corecourse–III	Mathematical Analysis	5
	Corecourse–III Tutorial	Mathematical Analysis	1
	Corecourse–IV	Probability and Probability Distributions -II	4
	Corecourse–IVPractical	Probability and Probability Distributions -II Lab	2
	GenericElective–2	TBD	4
	GenericElective–2Practical	TBD	2
3	Corecourse–V	Linear Algebra	4
	Corecourse–VPractical	Linear Algebra Lab	2
	Corecourse–VI	Demography and Vital Statistics	4
	Core course – VI Practical	Demography and Vital Statistics Lab	2
	Corecourse–VII	Statistical Computing and Numerical Analysis Using C Programming	4
	Corecourse–VIIPractical	Statistical Computing and Numerical Analysis Using C Programming	2
	SkillEnhancementCourse– A	TBD (two choices)	2
	GenericElective–3	TBD	4
	GenericElective–3Practical	TBD	2

4	Corecourse–VIII	Survey Sampling & Indian Official Statistics	4
	Corecourse–VIIIPractical	Survey Sampling & Indian Official Statistics Lab	2
	Corecourse–IX	Statistical Inference-I and Sampling Distributions	4
	Corecourse–IXPractical	Statistical Inference-I and Sampling Distributions Lab	2
	Corecourse–X	Index Numbers and Time Series Analysis	4
	Corecourse–XPractical	Index Numbers and Time Series AnalysisLab	2
	SkillEnhancementCourse- B	TBD (two choices)	2
	GenericElective–4	TBD	4
	GenericElective–4Practical	TBD	2
5	Corecourse–XI	Statistical Inference-II	4
	Corecourse–XIPractical	Statistical Inference-II Lab	2
	Corecourse–XII	Linear Models and Regression	4
	Corecourse–XIIPractical	Linear Models and Regression Lab	2
	DisciplineSpecificElective– A(1)	TBD (two choices)	4
	DisciplineSpecificElective– A(1) Practical	TBD (two choices)	2
	DisciplineSpecificElective– B(1)	TBD (two choices)	4
	DisciplineSpecificElective– B(1) Practical	TBD (two choices)	2
6	Corecourse–XIII	Design of Experiments	4
	Corecourse–XIIIPractical	Design of Experiments Lab	2
	Corecourse–XIV	Multivariate Analysis and Nonparametric Methods	4
	Corecourse–XIVPractical	Multivariate Analysis and Nonparametric Methods Lab	2
	DisciplineSpecificElective–A(2)	TBD (one choice)	4
	DisciplineSpecificElective– A(2) Practical	TBD (one choice)	2
	DisciplineSpecificElective– B(2)	TBD (one choice)	4
	DisciplineSpecificElective– B(2) Practical	TBD (one choice)	2

*Use of suitable software such as MS-EXCEL/ MINITAB/SPSS etc. depending on the availability of faculty and resources for all the core practical courses.

1.3 Choices for Discipline Specific Electives

DisciplineSpecificElectives (Choose any 4, two from each group) Semesters 5 and 6			
Statistical Quality Control (Gr-A1) -Sem 5	Econometrics (Gr-A1) -Sem 5	Survival Analysis (Gr-A2) Sem-6	Operations Research (Gr-B1)-Sem 5
Stochastic Process & Queueing Theory (Gr-B1)-Sem 5	Project Work (Gr-B2) Sem-6		

1.4 Choices for Skill Enhancement Courses

Skill Enhancement Courses (Choose any 2, one from each group) Semesters 3 & 4		
Statistical Data Analysis Using R (Gr-A)	Research Methodology (Gr-A)	
Monte Carlo Methods (Gr-B)	Data Base Management System (Gr B)	

1.5 General Electives : Four Generic Elective papers to be selected from General Core Courses of two other subjects in semesters 1-4

2. Core Subjects Syllabus

Subject Code: Sublect(STS)-Hons/Gen(A/G)-Course(CC/DSE/SEC/GE/AECC)-Semester(1-6)-Paper No-Paper Comp

2.1 Core T1 –Descriptive Statistics 6 Credits

CC-1 Sem-1 Descriptive Statistics (STS-A-CC-1-1-TH)	
	4 Credits
Unit 1	**15L**
Statistics: Definition and scope. Concepts of statistical population and sample. Data: quantitative and qualitative, cross-sectional and time-series, discrete and continuous. Scales of measurement: nominal, ordinal, interval and ratio. Presentation of data: tabular and graphical. Frequency distributions, cumulative frequency distributions and their graphical representations. Stem and leaf displays.	
Unit 2	**15L**
Measures of Central Tendency: Mean, Median, Mode. Measures of Dispersion: Range, Mean deviation, Standard deviation, Coefficient of variation, Gini's Coefficient, Lorenz Curve. Moments, skewness and kurtosis. Quantiles and measures based on them. Box Plot. Outliers.	
Unit 3	**18L**
Bivariate data: Definition, scatter diagram, simple correlation, linear regression, principle of least squares, fitting of polynomial and exponential curves, correlation ratio, correlation index, intraclass correlation. Rank correlation – Spearman's and Kendall's measures.	
Unit 4	**12L**
Analysis of Categorical Data: Contingency table, independence and association of attributes, measures of association - odds ratio, Pearson's and Yule's measure, Goodman-Kruskalgamma.	
Reference Books	
Goon, A.M., Gupta, M.K. and Dasgupta, B. (2002): Fundamentals of Statistics, Vol. I& II, 8th Edn. The World Press, Kolkata. Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia. Mood, A.M., Graybill, F.A. andBoes, D.C. (2007): Introduction to the Theory of Statistics, 3rd Edn. (Reprint), Tata McGraw-Hill Pub. Co. Ltd. Tukey, J.W.(1977) : Exploratory Data Analysis, Addison-Wesley Publishing Co. Agresti, A. (2010): Analysis of Ordinal Categorical Data, 2nd Edition, Wiley. Freedman, D., Pisani, R. and Purves, R. (2014): Statistics, 4th Edition, W. W. Norton & Company.	

2.2 Core P1 – Descriptive Statistics Lab

CC-1 Sem-1 Descriptive Statistics (STS-A-CC-1-1-P)	
	2 Credits
List of Practical	
Diagrammatic representation of data. Problems based on construction of frequency distributions, cumulative frequency distributions and their graphical representations, stem and leaf plot. Problems based on measures of central tendency. Problems based on measures of dispersion. Problems based on combined mean and variance and coefficient of variation. Problems based on moments, skewness and kurtosis. Problems related to quantiles and measures based on them, construction of box plot. Problems based on analysis of bivariate data. Problems based on measures of rank correlation. Problems based on analysis of categorical data.	

2.3 Core T2 –Probability -I 6 Credits

CC-2 Sem-1 Probability and Probability Distributions -I (STS-A-CC-1-2-TH)	
	4Credits
Unit 1	**20L**
Probability: Introduction, random experiments, sample space, events and algebra of events. Definitions of Probability – classical, statistical, and axiomatic,	
Unit 2	**15L**
Conditional Probability, laws of addition and multiplication, independent events, theorem of total probability, Bayes' theorem and its applications.	
Unit 3	**10L**
Random Variables : Definition of discrete and continuous random variables, cumulative distribution function (c.d.f.) and its properties (with proof), probability mass function (p.m.f.) and probability density function (p.d.f.)	

Unit 4	**15L**
Expectation and Moments, Dispersion, Skewness, Kurtosis, Quantiles. Probability inequalities (Markov's and Chebychev's).	
Reference Books	
Chung, K.L. (1983): Elementary Probability Theory with Stochastic Process, Springer / Narosa. Feller, W. (1968): An Introduction to Probability Theory & its Applications, John Wiley. Goon, A.M., Gupta, M.K. &Dasgupta, B. (1994): An Outline of Statistical Theory (Vol-1), World Press. Parzen, E. (1972): Modern Probability Theory and its Applications, John Wiley . Uspensky, J.V. (1937): Introduction to Mathematical Probability,McGraw Hill. Cacoullos, T. (1973): Exercises in Probability. Narosa. Rahman, N.A. (1983): Practical Exercises in Probability and Statistics, Griffen. Ross, S. (2002): A First Course in Probability, Prentice Hall.	

2.4 Core P2 – Probability and Probability Distributions-I Lab

CC-2 Sem-1 Probability and Probability Distributions -I (STS-A-CC-1-2-P)	
	2 Credits
List of Practical	
Application problems based on Classical Definition of Probability. Application problems based on Bayes Theorem. Finding moments, quantiles from a given probability distribution. Applications of probability inequalities. Application based problems on probability distributions.	

2.5 Core T3 – Mathematical Analysis 6 Credits

CC-3 Sem-2 Mathematical Analysis (STS-A-CC-2-3-TH) & (STS-A-CC-2-3-TU)	
	5+1 Credits
Unit 1	**25L**
Representation of real numbers as points on a line. Algebraic, Order and Completeness properties of **R** (Concepts only). Bounded and unbounded sets, neighbourhood of a point, Supremum and infimum. Functions, Countable, Uncountable sets andUncountability of **R**. Sequences and their convergence, monotonic	

sequences, bounded sequences, squeeze theorem Limits of some special sequences such asr^n, $(1+\frac{1}{n})^n$, $n^{\frac{1}{n}}$.

Infinite series, positive termed series and their convergence, Comparison test, ratio test and root test. Absolute convergence of series, Leibnitz's test for the convergence of alternating series, Conditional convergence.

Unit 2 **20L**

Review of limit, continuity and differentiability. Indeterminate form, L' Hospital's rule. Rolle's and Lagrange's Mean Value theorems. Taylor's theorem with lagrange's form of remainder(without proof). Taylor's series expansions of sinx, cosx, e^x, $(1+x)^n$, log (1+x).

Maxima and Minima of Functions. Successive Differentiation.

Unit 3 **12L**

Integral Calculus: definite integral (definition). Statements of properties, Fundamental Theorem of Integral Calculus.

Improper Integral, Beta and Gamma functions: properties and relationship between them.

Unit 4 **18L**

Functions of two variables and Partial Derivatives. Maxima and Minima of such Functions. Constrained Maximization and minimization, use of Lagrange Multiplier. Double Integral (intuitive-graphical approach),change of order of integration, transformation of variables and Jacobians (statement of relevant theoremsand their uses).

Reference Books

Malik S.C. and Savita Arora (1994): Mathematical Analysis, Second Edition, Wiley Eastern Limited, New Age International Limited, New Delhi.

Somasundram, D. And Chaudhary, B (1987.: A First Course in Mathematical Analysis, Narosa Publishing House, New Delhi.

Gupta S.L. and Nisha Rani(1995): Principles of Real Analysis, Vikas Publ. House Pvt. Ltd., New Delhi.

Apostol, T.M(1987): Mathematical Analysis, Second Edition, Narosa Publishing House, New Delhi.

Shanti Narayan(1987): A course of Mathematical Analysis, 12th revised Edition, S. Chand & Co. (Pvt.) Ltd., New Delhi.

Singa,l M.K. and Singal A.R (2003): A First Course in Real Analysis, 24th Edition, R. Chand& Co., New Delhi.

Bartle, R. G. and Sherbert, D. R. (2002): Introduction to Real Analysis (3rd Edition), John Wiley and Sons (Asia) Pte. Ltd., Singapore.

Ghorpade, Sudhir R. and Limaye, Balmohan V. (2006): A Course in Calculus and Real Analysis, Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint.

Chakraborty, Arnab (2014): Real Analysis, volumes 1,2,3, second edition. Sarat Book House.

2.6 Core T4 – Probability and Probability Distributions -II 6 Credits

CC-4 Sem-2 Probability and Probability Distributions-II (STS-A-CC-2-4-TH)	
	4 Credits
Unit 1	**15L**
Generating functions, p.g.f and m.g.f Standard discrete probability distributions: Binomial, Poisson, geometric, negative binomial, hypergeometric, uniform. Limiting/approximation cases, Truncated distributions.	
Unit 2	**15L**
Standard continuous probability distributions: uniform, normal, exponential, Cauchy, beta, gamma, lognormal, logistic, double exponential and Pareto along with their properties, Truncated distributions. Limiting /approximation cases.	
Unit 3	**15L**
Two dimensional random variables: joint, marginal and conditional distributions, properties of c.d.f, independence of variables, Theorems on sum and product of expectations of random variables, Conditional Expectation, Correlation and Regression.	
Unit 4	**15L**
Trinomial distribution and its properties. Bivariate Normal Distribution (BVN): p.d.f. of BVN, properties of BVN, marginal and conditional p.d.f. of BVN.	
Reference Books	
Hogg, R.V., Tanis, E.A. and Rao J.M. (2009): Probability and Statistical Inference, Seventh Ed, Pearson Education, New Delhi. Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia. Myer, P.L. (1970): Introductory Probability and Statistical Applications, Oxford & IBH Publishing, New Delhi. Rohatgi, V. K. and Saleh, A.K. Md. E. (2009): An Introduction to Probability and Statistics. 2nd Edn. (Reprint) John Wiley and Sons. Ross, S. (2002): A First Course in Probability, Prentice Hall. Feller, W. (1968): An Introduction to Probability Theory & its Applications, Vol-I, John Wiley.	

2.7 Core P4 – Probability and Probability Distributions –II Lab

CC-4 Sem-2 Probability and Probability Distributions-II (STS-A-CC-2-4-P)	
	2 Credits
List of Practical	
Fitting of binomial distributions for n and p = q = ½. Fitting of binomial distributions for given n and p. Fitting of binomial distributions after computing mean and variance. Fitting of Poisson distributions for given value of mean Fitting of Poisson distributions after computing mean. Fitting of negative binomial distribution. Fitting of suitable discrete distributions Application problems based on binomial distribution. Application problems based on Poisson distribution. Application problems based on negative binomial distribution. Problems based on area property of normal distribution. To find the ordinate for a given area for normal distribution. Application based problems using normal distribution. Fitting of normal distribution when parameters are given. Fitting of normal distribution when parameters are not given. Problems similar to those in 11 to 15 in cases of other continuous distributions. Application based Problems on trinomial distributions Application based Problems on bivariate normal distributions	

2.8 Core T5–Linear Algebra 6 credits

CC-5 Sem-3 Linear Algebra (STS-A-CC-3-5-TH)	
	4 Credits
Unit 1	**15L**
Definition of vectors, operation of vectors (angle, distance etc.). Vector spaces, Subspaces, sum of subspaces, Span of a set, Linear dependence and independence, dimension and basis, dimension theorem. Extension of basis. Orthogonal vectors, Gram-Schmidt Orthogonalization. Algebra of matrices. Linear transformation. Elementary matrices and their uses, theorems related to triangular, symmetric and skew symmetric matrices, idempotent matrices, orthogonal matrices. Trace of a matrix.	
Unit 2	**20L**

Determinants of Matrices: Definition, properties and applications of determinants for 3rd and higher orders, evaluation of determinants of order 3 and more using transformations. Symmetric and Skew symmetric determinants, product of determinants. Use of determinants in solution to the system of linear equations. Adjoint and inverse of a matrix and related properties. Singular and non-singular matrices and their properties. The system of equations A**x** = **b**, conditions for consistency, uniqueness, infinite solutions, solution sets of linear equations, linear independence, Applications of linear equations.
Unit 3 **10L**
Rank of a matrix, row-rank, column-rank, standard theorems on ranks, rank of the sum and the product of two matrices. Partitioning of matrices and simple properties
Unit 4 **15L**
Characteristic roots and Characteristic vectors, Properties of characteristic roots, Quadratic forms: Classification & canonical reduction.
Reference Books
Lay David C (2000).: Linear Algebra and its Applications, Addison Wesley. Schaum's Outlines (2006): Linear Algebra, Tata McGraw-Hill Edition, 3rd Edition. Krishnamurthy, V., Mainra V.P. and Arora J.L.: An Introduction to Linear Algebra (II, III, IV, V). Biswas, S. (1997): A Textbook of Matrix Algebra, New Age International. Gupta,S.C(2008).: An Introduction to Matrices (Reprint). Sultan Chand & Sons. Artin, M (1994): Algebra. Prentice Hall of India. Datta, K.B (2002): Matrix and Linear Algebra. Prentice Hall of India Pvt. Ltd. Hadley, G (2002) : Linear Algebra. NarosaPublishing House (Reprint). Searle, S.R (1982).: Matrix Algebra Useful for Statistics. John Wiley &Sons. Chakraborty, Arnab (2014): Linear Algebra, first edition. Sarat Book House. Goon A.M. (1988): Vectors and Matrices, World Press

2.9 Core P5 Linear Algebra Lab

CC-5 Sem-3 Linear Algebra Lab (STS-A-CC-3-5-P)	
	2 Credits
List of Practical	
Problems related vectors and vector spaces. Problems related to matrices. Problems related to determinant of matrices.	

Problems on solution to a linear system of equations.

Problems on characteristic roots and characteristic vectors.

Problems related to quadratic forms.

2.10 CoreT6 –Demography and Vital Statistics 6 Credits

CC-6 Sem-3 Demography and Vital Statistics (STS-A-CC-3-6-TH)	
	4 Credits
Unit1	**15L**
Population Theories: Coverage and content errors in demographic data, use of balancing equations and Chandrasekaran-Deming formula to check completeness of registration data. Adjustment of age data, use of Myer and UN indices, Population composition, dependency ratio.	
Unit 2	**15L**
Introduction: Sources of data on vital statistics, errors in census and registration data. Measurement of population, Rates and ratios of vital events. *Measurements of Mortality*: Crude Death Rate (CDR), Specific Death Rate (SDR), Standardized Death Rate, Cause of Death Rate, Case Fatality Rate, Infant Mortality Rate (IMR), Maternal Mortality Rate (MMR), Neonatal and Perinatal Mortality Rates.	
Unit 3	**15L**
Life (Mortality) Tables: Assumption, descriptions of Complete and Abridged Life Tables, Cohort vs. Current Life Tables, Stationary and Stable population, Construction of Complete Life Table from population and death statistics, Central Mortality Rates and Force of Mortality, Uses of Life Tables. *Measurements of Morbidity*: Morbidity Incidence and Morbidity Prevalence Rates. *Measurements of Fertility*: Crude Birth Rate (CBR), General Fertility Rate (GFR), Specific Fertility Rate (SFR) and Total Fertility Rate (TFR).	
Unit 4	**15L**
Measurement of Population Growth: Crude rates of natural increase, Pearl's Vital Index, Gross Reproduction Rate (GRR) and Net Reproduction Rate (NRR). *Population Estimation, Projection and Forecasting*: Use of A.P. and G.P. methods for population estimates, Use of	

component method for population projection, Fitting of Logistic curve for population forecasting using Rhode's method.

Reference Books

Mukhopadhyay, P. (1999): Applied Statistics, Books and Allied (P) Ltd.

Goon, A.M., Gupta, M.K. and Dasgupta, B. (2008): Fundamentals of Statistics, Vol. II, 9th Edition, World Press.

Biswas, S. (1988): Stochastic Processes in Demography & Application, Wiley Eastern Ltd.

Keyfitz, N and Caswell. H (2005): Applied Mathematical Demography (3rd edition), Springer.

Chattopadhyay, A.K. and Saha, A.K. (2012): Demography: Techniques and Analysis, Viva Books.

Ramakuar, R. and Gopal, Y.S. (1986):Technical Demography. Wiley Eastern Ltd.

Spiegelman M. (1980): Introduction to Demography, Harvard University Press.

Mishra B.D. (1980): An Introduction to the Study of Population, South Asian Pub.

2.11 Core P6 –Demography and Vital Statistics Lab

CC-6 Sem-3 Demography and Vital Statistics Lab (STS-A-CC-3-6-P)	
	2 Credits

List of Practical

To calculate CDR and Age Specific death rate for a given set of data

To find Standardized death rate by:-

Direct method

Indirect method

To construct a complete life table.

To fill in the missing entries in a life table.

To calculate CBR, GFR, SFR, TFR for a given set of data.

To calculate Crude rate of Natural Increase and Pearle's Vital Index for a given set of data.

To calculate GRR and NRR for a given set of data and compare them.

Population Estimation.

2.12 Core T7–Statistical Computing and Numerical Analysis Using C Programming 6 Credits

CC-7 Sem-3 Statistical Computing and Numerical Analysis Using C Programming (STS-A-CC-3-7-TH)	
	4 Credits
Unit 1	**10L**
Approximation of numbers and functions. Absolute and Relative errors. Interpolation: Polynomial approximation, Weierstrass Theorem (Statement). Difference Table, Newton's Forward and Backward interpolation formulae and Lagrange's general interpolation formula, Error terms. Numerical Differentiation and its applications. Numerical Integration: Trapezoidal and Simpson's 1/3 rules.	
Unit 2	**5L**
Numerical solution of equations: method of fixed point iteration and Newton-Raphson method in one unknown, Conditions of convergence, rates of convergence. Extension of the iteration method to two unknowns (without convergence). Stirling's approximation to factorial n.	
Unit 3	**22L**
Components, basic structure programming, character set, C/C++ tokens, Keywords and Identifiers and execution of a C/C++ program. Data types: Basic data types, Enumerated data types, derived data types. Constants and variables: declaration and assignment of variables, Symbolic Constants, overflow and underflow of data. Operators and Expressions: Arithmetic, relational, logical, assignment, increment/decrement, operators, precedence of operators in arithmetic, relational and logical expression. Implicit and explicit type conversions in expressions, library functions. Managing input and output operations: reading and printing formatted and unformatted data.	
Unit 4	**23L**
Decision making and branching - if...else, nesting of if...else, else if ladder, switch. Looping in C/C++: for, nested for, while, do...while, and jumps in and out of loops. Arrays: Declaration and initialization of one-dim and two-dim arrays. Character arrays and strings: Declaring and initializing string variables, reading and writing strings from Terminal (using scanf and printf only). User-defined functions: A multi-function program using user-defined functions, definition of functions, return values and their types, function prototypes and calls. Category of Functions: no arguments and no return values, arguments but no return values, arguments with return values, no arguments but returns a value, functions that return multiple values.	
Reference Books	
Kernighan, B.W. and Ritchie, D.(1988): CProgramming Language,2nd Edition, Prentice Hall. Balagurusamy, E. (2011): Programming in ANSI C, 6th Edition Tata McGraw Hill. Gottfried, B.S. (1998): Schaum's Outlines: Programming with C, 2nd Edition, TataMcGraw Hill. Jain, M. K., Iyengar, S. R. K. and Jain, R. K. (2003): Numerical methods for scientific and engineering computation, New age International Publisher, India. Mukherjee, Kr. Kalyan (1990): Numerical Analysis. New Central Book Agency. Sastry, S.S. (2000): Introductory Methods of Numerical Analysis, 3rd edition, Prentice Hall of India Pvt. Ltd., New Del. Scarborough, J.B. (1966): Numerical Mathematical Analysis. Oxford and IBH Publishing.	

2.13 Core P7 – Statistical Computing and Numerical Analysis Using C Programming Programming Lab

CC-7 Sem-3 Statistical Computing and Numerical Analysis Using C Programming (STS-A-CC-3-7-P)	
	2 Credits
List of Practical (Using UNIX based platforms)	
Plot of a graph y = f(x). Roots of a quadratic equation (with imaginary roots also). Sorting of an array and hence finding median. Mean, Median and Mode of a Grouped Frequency Data. Variance and coefficient of variation of a Grouped Frequency Data. Preparing a frequency table. Random number generation from uniform, exponential,calculate sample mean and variance and compare with population parameters. Matrix addition, subtraction, multiplication, Transpose,Trace , Rank and Determinant. Fitting of Binomial, Poisson distribution. Compute ranks and then calculate rank correlation(without tied ranks). Fitting of lines of regression. Numerical methods: Interpolation by Lagrange formula, Solving one-variable equations using Newton-Raphson and Iteration methods. Trapezoidal and Simpson 1/3 rdrule for numerical integration with convergence. Solving a linear system of equation. Storing the C output in a file	

2.14 Core T_8 –Survey Sampling and Indian Official Statistics 6 Credits

CC-8 Sem-4 Survey Sampling and Indian Official Statistics (STS-A-CC-4-8-TH)	
	4 Credits
Unit 1	**15L**
Concept of population and sample, complete enumeration versus sampling, sampling and non-sampling errors. Types of sampling: non-probability and probability sampling, basic principle of sample survey, simple random sampling with and without replacement, definition and procedure of selecting a sample, estimates of: population mean, total and proportion, variances of these estimates, estimates of their variances and sample size determination.	
Unit 2	**15L**
Stratified random sampling: Technique, estimates of population mean and total, variances of these estimates, proportional and optimum allocations and their comparison with SRS. Practical difficulties in allocation, estimation of gain in precision, post stratification and its performance. Systematic Sampling: Technique, estimates of population mean and total, variances of these estimates (N=nxk). Comparison of systematic sampling with SRS and stratified sampling in the presence of linear trend and corrections.	
Unit 3	**20L**
Introduction to Ratio and regression methods of estimation, first approximation to the population mean and total (for SRS of large size), MSE of these estimates and estimates of these variances, MSE in terms of correlation coefficient for regression method of estimation and their comparison with SRS. Cluster sampling (equal clusters only) estimation of population mean and its variance, comparison (with and without randomly formed clusters). Concept of sub sampling. Two-stage Sampling, Estimation of Population mean and variance of the estimate.	
Unit 4	**10L**
An outline of present official statistical system in India, Methods of collection of official statistics, their reliability and limitations. Role of Ministry of Statistics & Program Implementation (MoSPI), Central Statistical Office (CSO), National Sample Survey Office (NSSO), Registered General Office and National Statistical Commission. Government of India's Principal publications containing data on the topics such as Agriculture, price, population, industry, finance and employment. Consumer price Index, Wholesale price index number and index of industrial production. National Income: Basic idea and a brief description of income, expenditure and production approaches.	
Reference Books	
Cochran, W.G. (1984): SamplingTechniques (3rd Ed.), Wiley Eastern. Sukhatme, P.V., Sukhatme, B.V. Sukhatme, S. Asok, C. (1984). Sampling Theories of Survey With Application, IOWA State University Press and Indian Society of Agricultural Statistics Murthy, M.N. (1977): Sampling Theory & Statistical Methods, Statistical Pub. Society, Calcutta. Des Raj and Chandhok P. (1998): Sample Survey Theory, Narosa Publishing House.	

Goon A.M., Gupta M.K. and Dasgupta B. (2008): Fundamentals of Statistics, Vol-II, World Press.
Guide to current Indian Official Statistics, Central Statistical Office, GOI, and New Delhi.
http://mospi.nic.in/

2.15 Core P_8 – Survey Sampling and Indian Official Statistics Lab

CC-8 Sem-4 Survey Sampling and Indian Official Statistics (STS-A-CC-4-8-P)	
	2 Credits
List of Practical	
To select a SRS with and without replacement. For a population of size 5, estimate population mean, population mean square and population variance. Enumerate all possible samples of size 2 by WR and WOR and establish all properties relative to SRS. For SRSWOR, estimate mean, standard error, the sample size. Stratified Sampling: allocation of sample to strata by proportional and Neyman's methods. Compare the efficiencies of above two methods relative to SRS. Estimation of gain in precision in stratified sampling. Comparison of systematic sampling with stratified sampling and SRS in the presence of a linear trend. Ratio and Regression estimation: Calculate the population mean or total of the population. Calculate mean squares. Compare the efficiencies of ratio and regression estimators relative to SRS. Cluster sampling: estimation of mean or total, variance of the estimate. Two-stage Sampling. Tabular and graphical exercises based on available official statistics. Construction of Consumer and wholesale price index numbers.	

2.16 Core T9 –Statistical Inference-I and Sampling Distributions 6 Credits

CC-9 Sem- 4 Statistical Inference-I and Sampling Distributions (STS-A-CC-4-9-TH)	
	4Credits
Unit 1	**14L**
Basic concepts of Statistical Inference: Population & parameter, random sample & statistic, point and interval Estimation, confidence level, testing of hypothesis. Distributions of functions of random variables. Sampling distribution of a statistic and its standard error.	
Unit 2	**22L**
Exact sampling distributions: χ^2 distribution, definition and derivation of its p.d.f. with n degrees of freedom (d.f.), nature of p.d.f. curve for different degrees of freedom, mean, variance, m.g.f., additive property of χ^2 distribution. Derivation of the sampling distribution of sample mean and variance for a normal population. Student's and Fisher's t-distributions, Derivation of its p.d.f., nature of probability curve with different degrees of freedom, mean, variance and limiting form of t distribution. Snedecor's F-distribution: Derivation of p.d.f., nature of p.d.f. curve with different degrees of freedom, mean, variance. Distribution of 1/F (n1, n2). Relationship between t, F and χ2 distributions. Distributions of sample means, sample variances and sample correlation coefficient (null case) of a random sample from a bivariate normal population, distribution of the simple regression coefficient (for both stochastic and non-stochastic independent variable cases).	
Unit 3	**8L**
Order Statistics: Introduction, distribution of the rth order statistic, smallest and largest order statistics. Joint distribution of order statistics, distribution of sample median and sample range.	
Unit 4	**16L**
Elements of hypothesis testing: Null and alternative hypotheses, simple & composite hypotheses, critical region, type I and type II errors, level of significance, size, power, p-value. Exact tests and confidence intervals: classical and p-value approaches. Tests of significance related to Binomial proportion(s), Poisson mean(s), Univariate Normal mean (s), standard deviation(s) and Bivariate normal parameters. Combination of probabilities in tests of significance.	
Reference Books	
Goon, A.M., Gupta, M.K. and Dasgupta, B. (2003): An Outline of Statistical Theory, Vol. I, 4th Edn. World Press, Kolkata. Rohatgi V. K. and Saleh, A.K. Md. E. (2009): An Introduction to Probability and Statistics. 2ndEdn. (Reprint) John Wiley and Sons. Hogg, R.V. And Tanis, E.A. (2009): A Brief Course in Mathematical Statistics. Pearson Education. Johnson, R.A. and Bhattacharya, G.K. (2001): Statistics-Principles and Methods, 4th Edn. John Wiley and Sons. Mood, A.M., Graybill, F.A. and Boes, D.C. (2007): Introduction to the Theory of Statistics, 3rd Edn. (Reprint).Tata McGraw-Hill Pub. Co. Ltd.	

Hogg R.V. & Craig A.T. (1978): Introduction to Mathematical Statistics, Prentice Hall.

Casella , G. and Berger R.L (2002).: Statistical Inference, 2nd Edn.Thomson Learning.

2.17 Core P9 –Statistical Inference-I and Sampling Distributions Lab

CC-9 Sem-4 Statistical Inference-I and Sampling Distributions lab (STS-A-CC-4-9-P)	
	2 Credits
List of Practical	
Test of significance for single proportion and difference of two proportions. Test of significance for single Poisson mean and difference of two Poisson means. Test of significance and confidence intervals for single mean and difference of two means. Test of significance and confidence intervals for single variance and ratio of two variances. Test of parameters under bivariate normal distribution.	

2.18 Core T10- Index Numbers and Time Series Analysis 6 credits

CC-10 Sem-4 Index Numbers and Time Series Analysis (STS-A-CC-4-10-TH)	
	4 Credits
Unit 1	**12L**
Index Numbers: Weighted means, price and quantity index numbers, choice of weights, Laspeyres' and Paasche's index numbers. Tests of index numbers and Fisher's ideal index number. Consumer price Index, Wholesale price index number and index of industrial production.	
Unit 2	**12L**
Stochastic Process: Introduction and Stationary Process. Introduction to time series data, application of time series from various fields. Modelling time series as deterministic function plus IID errors: Components of a time series (trend, cyclical and seasonal patterns, random error) Decomposition of time series. Estimation of trend: free hand curve method, method of moving averages, fitting various mathematical curves and growth curves. Effect of elimination of trend on other components of the time series.	
Unit 3	**12L**

Estimation of seasonal component by Method of simple averages,

Notions of multiplicative models: ratio to Trend.

Introduction to stochastic modelling: Concept of stationarity. Illustration of how a stationary time series may show temporal patterns. Stationarity in mean.

Unit 4 **24L**

Box-Jenkins modelling: Moving-average (MA) process and Autoregressive (AR) process of orders one and two.ACF and its graphical use in guessing the order of MA processes. Estimation of the parameters of AR (1) and AR (2) using least square and Yule-Walker equations.

Forecasting: Exponential smoothing methods.

Reference Books

Chatfield C. (1980): The Analysis of Time Series –An Introduction, Chapman & Hall.

Kendall M.G. (1976): Time Series, Charles Griffin.

Brockwell and Davis (2010):Introduction to Time Series and Forecasting (Springer Texts in Statistics) ,2nd Edition.

Goon, A.M., Gupta, M.K. and Dasgupta, B. (2002): Fundamentals of Statistics, Vol. II, 8th Edn. The World Press, Kolkata

Mudgett B.D. (1951): Index Numbers, John Wiley

Allen R.G.D. (1975): Index Numbers in Theory and Practice, Macmillan

Nagar A.L. & Das R. K. (1976): Basic Statistics

2.19 Core P10 – Index Numbers and Time Series Analysis Lab

CC-10 Sem-4 Index Numbers and Time Series Analysis (STS-A-CC-4-10-P)	
	2 Credits

List of Practical

Plotting a real life time series, and detecting various features (trend, periodic behaviours etc). Suggested data sets:

a) Sun spot data

b) Dollar-Rupee exchange rates

c) Stock market data

Fitting and plotting of mathematical curves:

modified exponential curve

Gompertz curve

Fitting of trend by Moving Average Method.

Plotting detrended series.

Measurement of Seasonal indices Ratio-to-Moving Average method.

Plotting ACF of a given time series. Using Yule-Walker equation and Least squares to fit AR (1) and AR (2) models to real life data Forecasting by exponential smoothing. Calculation of price and quantity index numbers. Construction of Consumer and wholesale price index numbers.

2.20 Core T11 – Statistical Inference II **6 Credits**

CC-11 Sem-5 Statistical Inference-II (STS-A-CC-5-11-TH)	
	4 Credits
Unit 1	**8L**
Limit laws: Sequence of random variables, convergence in probability, convergence in mean square and convergence in distribution and their interrelations, Weak law of large numbers and their applications, De-Moivre Laplace Limit theorem, Statement of Central Limit Theorem (C.L.T.) for i.i.d. variates, applications of C.L.T.	
Unit 2	**20L**
Point Estimation: Concepts of estimation, notions of mean square error, unbiasedness, best linear unbiasedness and minimum variance unbiasedness. Necessary and sufficient condition for uniformly minimum variance unbiased estimators (UMVUE). Properties of UMVUE. Consistent estimators and asymptotic efficiency. Sufficiency, factorization theorem (discrete case only). Fisher' information (for single parameter only). Cramer-Rao inequality and minimum variance bound (MVB) estimators, Rao-Blackwell theorem and its applications. Methods of Estimation: Method of moments, method of maximum likelihood estimation and statements of their properties.	
Unit 3	**20L**
Theory of hypothesis testing: Test function, randomized and non-randomized tests, most powerful (MP) test, uniformly most powerful (UMP) test, Neyman - Pearson Lemma (statement and proof of sufficiency part only) and its applications to construct MP and UMP tests, uniformly most powerful unbiased (UMPU) tests (definition only). Likelihood ratio tests, properties of likelihood ratio tests (without proof). Interval Estimation: Confidence intervals, Concepts of Uniformly Most Accurate (UMA) confidence sets, relationship with tests of hypotheses.	
Unit 4	**12L**
Large Sample Theory: Delta method, Derivation of large sample standard error of sample moments, standard	

deviation, coefficient of variation, b1 and b2 measures, and correlation coefficient and their uses in large sample tests under normality assumption, Large sample distribution of sample quantile.

Transformations of Statistics to stabilize variance: derivation and uses of Sin^{-1}, square root, logarithmic and z-transformations.

Large sample tests for binomial proportions, Poisson means (single and two independent samples cases) and correlation coefficients.

Large Sample distribution of Pearsonian $\chi 2$ –statistic and its uses.

Reference Books

Goon A.M., Gupta M.K.: Das Gupta.B. (2005), Outline of Statistics, Vol. I & II, World Press, Calcutta.

Rohatgi V. K. and Saleh, A.K. Md. E. (2009): An Introduction to Probability and Statistics. 2ndEdn. (Reprint) John Wiley and Sons.

Miller, I. and Miller, M. (2002) : John E. Freund's Mathematical Statistics (6th addition, low price edition), Prentice Hall of India.

Dudewicz, E. J., and Mishra, S. N. (1988): Modern Mathematical Statistics. John Wiley & Sons.

Mood A.M, Graybill F.A. and Boes D.C, Introduction to the Theory of Statistics, McGraw Hill.

Bhat B.R, Srivenkatramana T and Rao Madhava K.S. (1997) Statistics: A Beginner's Text, Vol. I, New Age International (P) Ltd.

Snedecor G.W and Cochran W.G. (1967) Statistical Methods. Lowa State University Press.

Casella , G. and Berger R.L. (2002).: Statistical Inference, 2nd Edn. Thomson Learning.

2.21 Core P11 – Statistical Inference II Lab

CC-11 Sem-5 Statistical Inference II (STS-A-CC-5-11-P)	
	2 Credits
List of Practical	
Maximum Likelihood Estimation. Estimation by the method of moments, minimum Chi-square. Type I and Type II errors. Most powerful critical region. Uniformly most powerful critical region. Unbiased critical region. Power curves. Confidence intervals and UMA confidence sets. Likelihood ratio tests for simple null hypothesis against simple alternative hypothesis. Likelihood ratio tests for simple null hypothesis against composite alternative hypothesis. Asymptotic properties of LR tests. Large sample tests.	

2.22 Core T12–Linear Models and Regression 6 credits

CC-12 Sem-5 Linear Models and Regression (STS-A-CC-5-12-TH)	
	4 Credits
Unit 1	**10L**
Gauss-Markov set-up: Theory of linear estimation, Estimability of linear parametric functions, Method of least squares, Gauss-Markov theorem, Estimation of error variance. Fundamental Theorems on least squares (statements only), Orthogonal splitting of total variation, selection of valid error.	
Unit 2	**16L**
Regression analysis: Multiple Regression. Estimation and hypothesis testing in case of simple and multiple regression models. Tests for parallelism and identity, linearity of simple regression. *Regression Diagnostics*: Model checking: Prediction from a fitted model.	
Unit 3	**28L**
Analysis of variance: Definitions of fixed, random and mixed effect models, analysis of variance and covariance in one-way classified data for fixed effect models, analysis of variance and covariance (with one concomitant variable) in two-way classified data with equal number of observations per cell, for fixed effect models. Analysis of variance in one-way classified data for random effect models.	
Unit 4	**6L**
Binary and Count data regression: Logistic and Poisson Regression.	
Reference Books	
Weisberg, S. (2005). Applied Linear Regression (Third edition). Wiley. Wu, C. F. J. And Hamada, M. (2009). Experiments, Analysis, and Parameter Design Optimization (Second edition), John Wiley. Renchner, A. C. And Schaalje, G. B. (2008). Linear Models in Statistics (Second edition), John Wiley and Sons. Scheffe, H. (1959): The Analysis of Variance, John Wiley. Goon, A.M., Gupta, M.K., Das Gupta, B. (2005). Outline of Statistics, Vol.II, World Press, Calcutta.	

Agresti, A. (2010): Analysis of Ordinal Categorical Data, 2nd Edition, Wiley

Chatterjee S., Hadi A.S., Price B.: Regression Analysis by Example, 3rd Edn, John Wiley & Sons.

2.23 Core P12–Linear Models and Regression Lab

CC-12 Sem-5 Linear Models & Regression (STS-A-CC-5-12-P)	
	2 Credits
List of Practical	
Simple Linear Regression. Multiple Regression. Tests for Linear Hypothesis. Analysis of Variance of a one way classified data. Analysis of Variance of a two way classified data with one observation per cell. Analysis of Variance of a two way classified data with more than one observation per cell. Analysis of Covariance of a one way classified data with one concomitant variable. Analysis of Covariance of a two way classified data with one concomitant variable. Analysis of Variance of a one way classified data for random effect model.	

2.24 Core T13- Design of Experiments 6 Credits

CC-13 Sem-6 Design of Experiments (STS-A-CC-6-13-TH)	
	4 Credits
Unit1	**6L**
Experimental designs: Role, historical perspective, terminology: Treatments, Experimental units & Blocks, Experimental error, Basic principles of Design of Experiments (Fisher). Uniformity trials, fertility contour maps, choice of size and shape of plots and blocks in Agricultural experiments. Uses in Industrial Experiments.	
Unit 2	**25L**
Basic designs: Completely Randomized Design (CRD), Randomized Block Design (RBD), Latin Square Design (LSD) – layout, model and statistical analysis, relative efficiency.Analysis with one missing observation in RBD and LSD.	
Unit 3	**20L**
Factorial experiments: advantages, notations and concepts. 2^nexperiments: design and analysis. Total and Partial confounding for 2^n ($n \leq 5$). Factorial experiments in a single replicate.	
Unit 4	**9L**
Split Plot Designin RBD and Strip arrangements, Groups of experiments with RBD and LSD.	
Reference Books	
Cochran, W.G. and Cox, G.M. (1959): Experimental Design. Asia Publishing House. Das, M.N. and Giri, N.C. (1986): Design and Analysis of Experiments. Wiley Eastern Ltd. Goon, A.M., Gupta, M.K. and Dasgupta, B. (2005): Fundamentals of Statistics. Vol. II, 8thEdn. World Press, Kolkata. Kempthorne, O. (1965): The Design and Analysis of Experiments. John Wiley. Montgomery, D. C. (2008): Design and Analysis of Experiments, John Wiley. Wu, C. F. J. And Hamada, M. (2009). Experiments, Analysis, and Parameter Design Optimization (Second edition), John Wiley. Dean, A.M. and Voss, D. (1999): Design and Analysis of Experiments. Springer Texts in Statistics.	

2.25 Core P13 – Design of Experiments Lab

CC-13 Sem-6 Design of Experiments (STS-A-CC-6-13-P)	
	2 Credits
List of Practical	
Analysis of a CRD. Analysis of an RBD. Analysis of an LSD. Analysis of an RBD with one missing observation. Analysis of an LSD with one missing observation. Analysis of $\mathbf{2^2}$ and$\mathbf{2^3}$ factorial in CRD and RBD. Analysis of a completely confounded two- level factorial design in 2 blocks. Analysis of a completely confounded two- level factorial design in 4 blocks. Analysis of a partially confounded two- level factorial design. Analysis of a single replicate of a $\mathbf{2^n}$ design. Analysis of Split Plot and Strip Plot designs. Analysis of Groups of experiments in RBD and LSD	

2.26 Core T14–MultivariateAnalysisandNonparametricMethods 6 Credits

CC-14 Sem-6 Multivariate Analysis and Nonparametric Methods (STS-A-CC-6-14-TH)	
	4 Credits
Unit 1	**20L**
Multivariate Data: multiple regression, multiple and partial correlation coefficients. Random Vector: Probability mass/density functions, Distribution function, mean vector & Dispersion matrix, Marginal & Conditional distributions. Multiple and partial correlation coefficient.	
Unit 2	**15L**
Multivariate Normal distribution and its properties. Multinomial Disrtribution and its properties. Tests forMultiple and partial correlation coefficients.	

Unit 3	**10L**
Applications of Multivariate Analysis: Principal Components Analysis and Factor Analysis (Application Oriented discussion, derivations not required)	
Unit 4	**15L**
Nonparametric Tests: Introduction and Concept, Test for randomness based on total number of runs, Empirical distribution function, One Sample Tests: Kolmogrov- Smirnov, Sign, Signed rank.Wilcoxon-Mann-Whitney test.Kruskal-Wallis test.	

Reference Books

Anderson, T.W. (2003): An Introduction to Multivariate Statistical Analysis, 3rdEdn., John Wiley

Muirhead, R.J. (1982): Aspects of Multivariate Statistical Theory, John Wiley.

Kshirsagar, A.M. (1972): Multivariate Analysis, 1stEdn. Marcel Dekker.

Johnson, R.A. And Wichern, D.W. (2007): Applied Multivariate Analysis, 6thEdn., Pearson & Prentice Hall

Mukhopadhyay, P.: Mathematical Statistics.

Goon, A.M., Gupta, M.K. and Dasgupta, B. (2002): Fundamentals of Statistics, Vol. I, 8th Edn. The World Press, Kolkata.

Gibbons, J. D. and Chakraborty, S (2003): Nonparametric Statistical Inference. 4th Edition. Marcel Dekker, CRC.

Rohatgi, V. K. and Saleh, A.K. Md. E. (2009): An Introduction to Probability and Statistics. 2nd Edn. (Reprint) John Wiley and Sons.

2.27 Core P14 – MultivariateAnalysis&NonparametricMethods Lab

CC-14 Sem-6 Multivariate Analysis and Nonparametric Methods (STS-A-CC-6-14-P)	
	2 Credits
List of Practical	
Test for Multiple Correlation. Test for Partial Correlation. Multivariate Normal Distribution. Principal Components Analysis. Factor Analysis. Test for randomness based on total number of runs. Kolmogorov -Smirnov test for one sample. Sign test . Signed rank test. Wilcoxon-Mann-Whitney test. Kruskal-Wallis test.	

3. Department Specific Electives Subjects Syllabus

3.1 DSE T1–Statistical Quality Control

DSE-A1 Sem-5 Statistical Quality Control (STS-A-DSE-A-5-1-TH)	
	4 Credits
Unit 1	**10L**
Quality: Definition, dimensions of quality, Difference between product control and process control, Statistical Process Control - Seven tools of SPC, chance and assignable Causes of quality variation.	
Unit 2	20L
Statistical Control Charts - Construction and Statistical basis of 3-σ Control charts, Rational Sub-grouping, Control charts for variables: X-bar & R-chart, X-bar & s-chart. Control charts for attributes: np chart, p-chart, c-chart and u-chart. Comparison between control charts for variables and control charts for attributes. Analysis of patterns on control chart, Estimation of process capability.	
Unit 3	20L
Definitions related to product control, Acceptance sampling plan, Principle of acceptance sampling plans, Single sampling plan - their OC, AQL, LTPD, AOQ, AOQL, ASN, ATI functions with graphical interpretation, Double sampling plan - their OC, AQL, LTPD, AOQ, AOQL, ASN, ATI functions with graphical interpretation, use and interpretation of Dodge and Roming sampling inspection plan tables.	
Unit 4	10L
Introduction to Six-Sigma: Overview of Six Sigma, Lean Manufacturing and Total Quality Management (TQM), Introduction to ISO quality standards: ISO 9001, ISO 14001, BIS.	
Reference Books	
Montogomery, D. C. (2009): Introduction to Statistical Quality Control, 6th Edition, Wiley India Pvt. Ltd. Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. II, 8th Edn. The World Press, Kolkata. Mukhopadhyay, P (2011): Applied Statistics, 2nd edition revised reprint, Books and Allied (P) Ltd. Montogomery, D. C. and Runger, G.C. (2008): Applied Statistics and Probability for Engineers, 3rd Edition reprint, Wiley India Pvt. Ltd. Ehrlich,B.Harris(2002):Transactional Six Sigma and Lean Servicing, 2nd Edition St. Lucie Press. Hoyle, David (1995): ISO Quality Systems Handbook, Heinemann Publication. 2nd Edition, Butterworth	

3.2 DSE P1 – Statistical Quality Control Lab

DSE-A1 Sem-5 Statistical Quality Control (STS-A-DSE-A-5-1-P)	
	2 Credits
List of Practical	
Construction and interpretation of statistical control charts X-bar & R-chart X-bar & s-chart np-chart p-chart c-chart u-chart Single sample inspection plan: Construction and interpretation of OC, AQL, LTPD, ASN, ATI, AOQ, AOQL curves Calculation of process capability	

3.3 DSE T2 - Econometrics

DSE-A1 Sem-5 Econometrics (STS-A-DSE-A-5-1-TH)	
	4 Credits
Unit 1	**15L**
Introduction: Objective behind building econometric models, nature of econometrics, model building, role of econometrics, structural and reduced forms. Estimation under linear restrictions. Dummy variables, Qualitative data.	
Unit 2	**15L**
Multicollinearity: Introduction and concepts, detection of multicollinearity, consequences and solutions of multicollinearity,.	
Unit 3	**15L**
Autocorrelation: Concept, consequences of auto correlated disturbances, detection and solution of autocorrelation. Generalized least squares estimation.	
Unit 4	**15L**
Heteroscedastic disturbances: Concepts and efficiency of Aitken estimator with OLS estimator under heteroscedasticity. Consequences of heteroscedasticity. Tests and solutions of heteroscedasticity. Errors in variables: Correlation between error and regressors. Instrumental variable method (Single-equation model with one explanatory variable)	
Reference Books	
Gujarati, D. and Sangeetha, S. (2007): Basic Econometrics, 4th Edition McGraw Hill Companies Johnston, J. (1972): Econometric Methods, 2nd Edition, McGraw Hill International. Koutsoyiannis, A. (2004): Theory of Econometrics, 2nd Edition, , Palgrave Macmillan Limited Maddala, G.S. and Lahiri, K. (2009): Introduction to Econometrics, 4th Edition, John Wiley & Sons.	

3.4 DSE P2 –Econometrics Lab

DSE-A1 Sem-5 Econometrics (STS-A-DSE-A-5-1-P)	
	2 Credits
List of Practical	
Problems related to consequences of Multicollinearity. Diagnostics of Multicollinearity. Problems related to consequences of Autocorrelation (AR(I)). Diagnostics of Autocorrelation. Problems related to consequences Heteroscedasticity. Diagnostics of Heteroscedasticity. Estimation of problems of General linear model under Heteroscedastic distance terms. Problems on Autoregressive models. Problems on Instrumental variable.	

3.5 DSE T_3–Survival Analysis

DSE-A2 Sem-6 Survival Analysis (STS-A-DSE-A-6-2-TH)	
	4 Credits
Unit 1	**15L**
Survival Analysis: Functions of survival times, survival distributions and their applications- exponential, gamma, Weibull, Rayleigh, lognormal distributions, and distribution having bath-tub shaped hazard function. Mean Residual Time.	
Unit 2	**15L**
Censoring Schemes: Type I, Type II and progressive or random censoring with biological examples. Estimation of mean survival time and variance of the estimator for Type I and Type II censored data with numerical examples.	
Unit 3	15L
Non-parametric methods: Actuarial and Kaplan-Meier methods for estimating survival function and variance of the Estimator.	
Unit 4	15L
Competing Risk Theory: Indices for measurement of probability of death under competing risks and their inter-relations. Estimation of probabilities of death using maximum likelihood principle and modified minimum Chi-square methods.	
Reference Books	
Lee, E.T. and Wang, J.W. (2003): Statistical Methods for Survival data Analysis, 3rd Edition, John Wiley and Sons. Kleinbaum, D.G. (1996): Survival Analysis, Springer. Chiang, C.L. (1968): Introduction to Stochastic Processes in Bio Statistics, John Wiley and Sons. Indrayan, A. (2008): Medical Biostatistics, 2nd Edition Chapman and Hall/CRC.	

3.6 DSE P_3 –Survival Analysis Lab

DSE-A2 Sem-6 Survival Analysis (STS-A-DSE-A-6-2-P)	
	2 Credits
List of Practical	
To estimate survival function. To determine death density function and hazard function. To identify type of censoring and to estimate survival time for type I censored data. To identify type of censoring and to estimate survival time for type II censored data. To identify type of censoring and to estimate survival time for progressively type I censored data. Estimation of mean survival time and variance of the estimator for type I censored data. Estimation of mean survival time and variance of the estimator for type II censored data. Estimation of mean survival time and variance of the estimator for progressively type I censored data. To estimate the survival function and variance of the estimator using Non-parametric methods with Actuarial methods. To estimate the survival function and variance of the estimator using Non-parametric methods with Kaplan-Meier method.	

3.7 DSE T4-Operations Research

DSE-B1 Sem-5 Operations Research (STS-A-DSE-B-5-1-TH)	
	4 Credits
Unit 1	**12L**
Introduction and Historical Background, Phases of Operations Research, model building, various types of O.R. problems. Linear Programming Problem, Requirements of LPP, Mathematical Formulation of LPP, Graphical Methods to Solve Linear Programming Problems. Convex sets, Extreme point.	
Unit 2	**12L**
Simplex method for solving L.P.P. Charne's M-technique for solving L.P.P. involving artificial variables. Special cases of L.P.P. Concept of Duality in L.P.P: Dual simplex method.	
Unit 3	**18L**
Introduction, Formulation of Transportation Problem (TP). Initial solution by North West corner rule, Least cost method and Vogel's approximation method (VAM), MODI's method to find the optimal solution, special cases of transportation problem. Assignment problem: Hungarian method to find optimal assignment, special cases of assignment problem.	
Unit 4	**18L**
Game theory: Introduction, Competitive Situations, Characteristics of Competitive Games. Rectangular game, Two-Person Zero-Sum game, minimax-maximin principle, solution to rectangular game using graphical method, dominance and modified dominance property to reduce the game matrix and solution to rectangular game with mixed strategy.	
Reference Books	
Taha, H. A. (2007): Operations Research: An Introduction, 8 Hall of India. KantiSwarup, Gupta, P.K. and Manmohan (2007): Operations Research, 13th Edition, Sultan Chand and Sons. Hadley, G: (2002) : Linear Programming, Narosa Publications Hillier, F.A and Lieberman, G.J. (2010): Introduction to Operations Research- Concepts and cases, 9th Edition, Tata McGraw Hill	

3.8 DSE P4 – Operations Research Lab

DSE-B1 Sem-5 Operations Research (STS-A-DSE-B-5-1-P)	
	2 Credits
List of Practical (Using TORA/WINQSB/LINGO/LINDO)	
Mathematical formulation of L.P.P and solving the problem using graphical method, Simplex technique and Charne's Big M method involving artificial variables. 2. Identifying Special cases by Graphical and Simplex method and interpretation a. Degenerate solution b. Unbounded solution c. Alternate solution d. Infeasible solution 3. Allocation problem using Transportation model. 4. Allocation problem using Assignment model. 5. Problems based on game matrix. 6. Graphical solution to mx2 / 2xn rectangular game. 7. Mixed strategy.	

3.9 DSE T4- Stochastic Processes and Queuing Theory

DSE-B1 Sem-5 Stochastic Processes and Queuing Theory (STS-A-DSE-B-5-1-TH)	
	4 Credits
Unit 1	**10 L**
Stochastic Process: Introduction, Stationary Process.	
Unit 2	**20 L**
Markov Chains: Definition of Markov Chain, transition probability matrix, order of Markov chain, Higher transition probabilities. Classification of states and chains, stability of Markov system	
Unit 3	**15 L**
Poisson Process: postulates of Poisson process, properties of Poisson process, inter-arrivaltime, pure birth process, Yule Furry process, birth and death process, pure death process.	
Unit 4	**15 L**
Queuing System: General concept, steady state distribution, queuing model, M/M/1 withfinite and infinite system capacity, waiting time distribution (without proof).	

Reference Books

Medhi, J. (2009): Stochastic Processes, New Age International Publishers.
Basu, A.K. (2005): Introduction to Stochastic Processes, Narosa Publishing.
Bhat,B.R.(2000): Stochastic Models: Analysis and Applications, New AgeInternational Publishers.
Taha, H. (1995): Operations Research: An Introduction, Prentice- Hall India.
Feller, William (1968): Introduction to probability Theory and Its Applications, Vol I,3rd Edition, Wiley International.

3.10 DSE P4 – Stochastic Processes and Queuing Theory Lab

DSE-B1 Sem-5 Stochastic Processes and Queuing Theory (STS-A-DSE-B-5-1-P)	
	2 Credits

List of Practical

1. Calculation of transition probability matrix.
2. Identification of characteristics of reducible and irreducible chains.
3. Identification of types of classes.
4. Identification of ergodic transition probability matrix
5. Stationarity of Markov chain.
6. Computation of probabilities in case of generalizations of independent Bernoulli trials.
7. Calculation of probabilities for given birth and death rates and vice versa.
8. Calculation of probabilities for Birth and Death Process.
9. Calculation of probabilities for Yule Furry Process.
10. Computation of inter-arrival time for a Poisson process.
11. Calculation of Probability and parameters for (M/M/1) model and change in behavior of queue as N tends to infinity.
12. Calculation of generating function and expected duration for different amounts of stake.

3.11 DSE T5–Project Work

DSE-B2 Sem-6 Project Work (STS-A-DSE-B-6-2-P)	
	6 Credits

Analysing Social Change in Historical Perspective

Objective: The aim of the course is to initiate students to write and present a statistical report, under the supervision of a faculty, on some area of human interest. The project work will provide hands on training to the students to deal with data emanating from some real life situation and propel them to dwell on some theory or relate it to some theoretical concepts.

4. Skill Enhancement Course

4.1 SEC T1 – Statistical Data Analysis using R

SEC-A Sem-3 Statistical Data Analysis Using R (STS-A-SEC-A-3-1-TH)	
	2Credits
Unit 1	**5L**
Introduction to R: Installation, commandline environment, overview of capabilities, brief mention of open source philosophy. R as a calculator: The four basic arithmetic operations. Use of parentheses nesting up to arbitrary level. The power operation. Evaluation of simple expressions. Quotient and remainder operations for integers. Standard functions, e.g., sin, cos, exp, log.	
Unit 2	**5L**
The different types of numbers in R: Division by zero leading to Infor -Inf. NaN. NA. No need to go into details. Variables. Creating a vector using c(), seq() and colon operator. How functions map overvectors. Functions to summarise a vector: sum, mean, sd, medianetc. Extracting a subset from the vector (by index, by property). R as a graphing calculator: Introduction to plotting. Plot(), lines(), abline(). No detailsabout the graphics parameters except colour and line width.Barplot, Pie chart and Histogram. Box plot. Scatter plot and simple linear regression using lm(y~x).	
Unit 3	**5L**
Matrix operations in R: Creation. Basic operations. Extracting submatrices. Loading data from a file: read.table() and read.csv(). Mention of head=TRUE and head=FALSE. Dataframes. Mention that these are like matrices, except that different columns may be of different types.	
Unit 4	**5L**
Problems on discrete and continuous probability distributions.	
Reference Books	

Gardener, M (2012) Beginning R: The Statistical Programming Language, Wiley Publications.

Braun W J, Murdoch D J (2007): A First Course in Statistical Programming with R. Cambridge University Press. New York

A simple introduction to R by Arnab Chakraborty (freely available at http://www.isical.ac.in/~arnabc/)

R for beginners by Emmanuel Paradis (freely available at **https://cran.r-project.org/doc/contrib/Paradis-rdebuts_en.pdf**)

4.2 SEC T2 – Research Methodology

SEC-A Sem-3 Research Methodology (STS-A-SEC-A-3-1-TH)	
	2 Credits
Unit 1	**5L**
What is Research? Role of Research in important areas. Characteristics of Scientific Method. Process of research: Stating Hypothesis or Research question, Concepts & Constructs, Units of analysis & characteristics of interest, Independent and Dependent variables, Extraneous or Confounding variables. Measurements and scales of Measurements. Types of research: Qualitative & Quantitative Research, Longitudinal Research, Survey & Experimental Research.	
Unit 2	**5L**
Survey Methodology and Data Collection, sampling frames and coverage error, non-response.	
Unit 3	**5L**
Review of various techniques for data analysis covered in core statistics papers, techniques of interpretation, precaution in interpretation.	
Unit 4	**5L**
Develop a questionnaire, collect survey data pertaining to a research problem (such as gender discriminations in private v/s government sector, unemployment rates, removal of subsidy, impact on service class v/s unorganized sectors), questions and answers in surveys, Internal & External validity, , interpret the results and draw inferences. Formats and presentations of Reports – an overview.	
Reference Books	
Kothari, C.R. (2009): Research Methodology: Methods and Techniques, 2nd Revised Edition reprint, New Age International Publishers. Kumar, R (2011): Research Methodology: A Step - by - Step Guide for Beginners, SAGE publications.	

4.3 SEC T3 – Monte Carlo Method

SEC-B Sem-4 Monte Carlo Method (STS-A-SEC-B-4-2-TH)	
	2 Credits
Unit 1	**5L**
Using the computer for random number generation. (treated as a black box) A brief look at some popular approaches (nomathematical justification needed). Simulating a coin toss, a die roll and a card shuffle.	
Unit 2	**5L**
CDF inversion method. Simulation from standard distributions. Finding probabilities and moments using simulation.	
Unit 3	**5L**
Monte Carlo integration. Basic idea of importance sampling. MCMC not included.	
Unit 4	**5L**
Generating from Binomial and Poisson distributions, and comparing the histograms to the PMFs. Generating from Uniform(0,1) distribution, and applying inverse CDF transforms. Simulating Gaussian distribution using Box-Muller method. Approximating the expectation of a given function of a random variable using simulation. Graphical demonstration of the Law of Large Numbers. Approximating the value of pi by simulating dart throwing.	
Reference Books	
Shonkwiler, Ronald W. and Mendivil, Franklin (2009):Explorations in Monte Carlo Methods (Undergraduate Texts in Mathematics) Carsey,Thomas M. and Harden, Jeffrey J. (2014):Monte Carlo Simulation and Resampling Methods for Social Science.	

4.4 SEC T4 –Data Base Management Systems

SEC-B Sem-4 Data Base Management Systems (STS-A-SEC-B-4-2-TH)	
	2 Credits
Unit 1	**5 L**
Introduction: Overview of Database Management System, Introduction to Database Languages, advantages of DBMS over file processing systems.	
Unit 2	**5 L**
Relational Database Management System: The Relational Model, Introduction to SQL: Basic Data Types, Working with relations of RDBMS: Creating relations e.g. Bank, College Database (create table statement).	
Unit 3	**5 L**
Modifying relations (alter table statement), Integrity constraints over the relation like Primary Key , Foreign key, NOT NULL to the tables, advantages and disadvantages of relational Database System.	
Unit 4	**5 L**
Database Structure: Introduction, Levels of abstraction in DBMS, View of data, Role of Database users and administrators, Database Structure: DDL, DML, Data Manager (Database Control System).Types of Data Models Hierarchical databases, Network databases, Relational databases, Object oriented databases.	
Reference Books	
► Gruber, M(1990): Understanding SQL, BPB publication. ► Silberschatz, A, Korth, H and Sudarshan, S(2011) “Database System and Concepts”, 6th Edition McGraw-Hill. ► Desai, B. (1991): Introduction to Database Management system, Galgotia Publications.	

University of Calcutta

B.Sc.STATISTICS(General)

2018

Credit Distribution across Courses

		Credits	
Course Type	Total Papers	Theory + Practical	Theory*
Core Courses	12	12*4 =48 12*2 =24	12*5 =60 12*1=12
Discipline Specific Electives	6	6*4=24 6*2=12	6*5=30 6*1=6
Ability Enhancement Language Courses	2	2*2=4	2*2=4
Skill Enhancement Courses	4	4*2=8	4*2=8
Totals	24	120	120

*Tutorials of 1 Credit will be conducted in case there is no practical component

Core Course: 4 courses each from **three** subjects, total 12 (1 course from each subject under each semester)

Discipline Specific Electives: 2 courses each from **three** subjects, total 6 (1 course from each subject under each semester)

Skill Enhancement Course: 2 courses each from **two** subjects, total 4

Choices for Discipline Specific Electives

Discipline Specific Elective			
Operations Research (Gr-A) Sem-5	Survival Analysis (Gr-B) Sem-6		
Econometrics (Gr-A) Sem-5	Project work (Gr-B) Sem-6		

Choices for Skill Enhancement Courses

Skill Enhancement Course Semesters 3-6	
Statistical Data Analysis Using R (Gr-A1) Sem-3	Research Methodology (Gr-A2) Sem-5
Data Base Management System (Gr B1) Sem4	Monte Carlo Methods (Gr-B2) Sem-6

Subject Code: Sublect(STS)-Hons/Gen(A/G)-Course(CC/DSE/SEC/GE/AECC)-Semester(1-6)-Paper No-Paper Comp

B. Sc 3 years general course Syllabus (Statistics)

Core Course (and Generic Elective for Honours Course)

Descriptive Statistics

CC-1 Sem-1 Descriptive Statistics (STS-G-CC-1-1-TH) & (STS-A-GE-1-1-TH)	
	4 Credits
Unit 1	**20 L**
Introduction: Definition and scope of Statistics, concepts of statistical population and sample. Data: quantitative and qualitative, attributes, variables, scales of measurement - nominal, ordinal, interval and ratio. Frequency distribution, Presentation: tabular and graphic, including histogram and ogives.	
Unit 2	**15 L**
Measures of Central Tendency: mathematical and positional. Measures of Dispersion: range, quartile deviation, mean deviation, standard deviation, coefficient of variation, moments, skewness and kurtosis.	
Unit 3	**25 L**
Bivariate data: Definition, scatter diagram, simple, partial and multiple correlation (3 variables only), rank correlation (Spearman). Simple linear regression, principle of least squares and fitting of polynomials and exponential curves.	
Reference Books	
Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I& II, 8th Edn. The World Press, Kolkata. Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia. Mood, A.M. Graybill, F.A. AndBoes, D.C. (2007): Introduction to theTheory of Statistics, 3rd Edn. (Reprint), Tata McGraw-Hill Pub. Co. Ltd. Goon A.M., Gupta M.K. and Dasgupta B. : Basic Statistics. The World Press, Kolkata. Chakraborty, Arnab (2016) : Probability and Statistics. Sarat Book House.	

Descriptive Statistics

CC-1 Sem-1 Descriptive Statistics Lab (STS-G-CC-1-1-P) & (STS-A-GE-1-1-P)	
	2 Credits
List of Practical	
Graphical representation of data Problems based on measures of central tendency Problems based on measures of dispersion Problems based on combined mean and variance and coefficient of variation Problems based on moments, skewness and kurtosis Fitting of polynomials, exponential curves Karl Pearson correlation coefficient Partial and multiple correlations (3 variables only) Spearman rank correlation with and without ties. Correlation coefficient for a bivariate frequency distribution Lines of regression, angle between lines and estimated values of variables.	

CC-2 Sem-2 Elementary Probability Theory (STS-G-CC-2-2-TH) & (STS-A-GE-2-2-TH)	
	4 Credits
Unit 1	**20 L**
Probability: Introduction, random experiments, sample space, events and algebra of events. Definitions of Probability – classical, statistical, and axiomatic. Conditional Probability, laws of addition and multiplication, independent events, theorem of total probability, Bayes' theorem and its applications.	
Unit 2	**15 L**
Random Variables: Discrete and continuous random variables, p.m.f., p.d.f., c.d.f. Illustrations of random variables and its properties. Expectation, variance, moments.	
Unit 3	**25 L**
Standard probability distributions: Binomial, Poisson, geometric, negative binomial, Uniform, normal, exponential. Weak law of large numbers and Lindeberg-Levy Central Limit Theorem (C.L.T).	
Reference Books	
Hogg, R.V., Tanis, E.A. and Rao J.M. (2009): Probability and Statistical Inference, Seventh Ed, Pearson Education, New Delhi. Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia. Myer, P.L. (1970): Introductory Probability and Statistical Applications, Oxford & IBH Publishing, New Delhi Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I& II, 8th Edn. The World Press, Kolkata. Chakraborty, Arnab (2016) : Probability and Statistics. Sarat Book House. Ross, S. (2002): A First Course in Probability, Prentice Hall.	

CC-2 Sem-2 Elementary Probability Theory Lab (STS-G-CC-2-2-P) & (STS-A-GE-2-2-P)	
	2 Credits
List of Practical	
Fitting of binomial distributions for n and p = q = ½ Fitting of binomial distributions for n and p given Fitting of binomial distributions computing mean and variance Fitting of Poisson distributions for given value of lambda Fitting of Poisson distributions after computing mean Application problems based on binomial distribution Application problems based on Poisson distribution Problems based on area property of normal distribution To find the ordinate for a given area for normal distribution Application based problems using normal distribution Fitting of normal distribution when parameters are given Fitting of normal distribution when parameters are not given	

Introduction to Statistical Inference

CC-3 Sem-3 Introduction to Statistical Inference (STS-G-CC-3-3-TH) & (STS-A-GE-3-3-TH)	
	4 Credits
Unit 1	**15 L**
Population and Sample, Parameter and Statistic, Population distribution and Sampling distribution. Statistical Inference: Point Estimation, Interval Estimation and Testing of Statistical Hypothesis. Four useful distributions for statistical Inference; Normal, χ^2 , t and F (Statement of the pdf's & shape of the curves)	
Unit 2	**25 L**
Estimation of population mean, confidence intervals for the parameters of a normal distribution (one sample and two sample problems). The basic idea of significance test. Null and alternative hypothesis. Type I& Type II errors, level of significance, concept of p-value. Tests of proportions. Tests of hypotheses for the parameters of a normal distribution (one sample and two sample problems). Sign test (Single Sample)	
Unit 3	**20 L**
Analysis of variance, one-way and two-way classification (one & multiple observation(s) per cell). Brief exposure of three basic principles of design of experiments, Statistical concepts of "treatment", "plot" and "block". Analysis of completely randomized design, randomized complete block design.	
Reference Books	
Daniel, Wayne W., Bio-statistics (2005): A Foundation for Analysis in the Health Sciences. John Wiley . Goon, A.M., Gupta M.K. & Das Gupta (2005):Fundamentals of statistics, Vol.-I & II. Dass, M. N. &Giri, N. C.: Design and analysis of experiments. John Wiley. Dunn, O.J (1977): Basic Statistics: A primer for the Biomedical Sciences. John Wiley.	

CC-3 Sem-3 Introduction to Statistical Inference Lab (STS-G-CC-3-3-P) & (STS-A-GE-3-3-P)	
	2 Credits
List of Practical	
Estimators of population mean. Confidence interval for the parameters of a normal distribution (one sample and two sample problems). Tests of hypotheses for the parameters of a normal distribution (one sample and two sample problems). Test for proportions. Sign test for median. Analysis of Variance of a one way classified data Analysis of Variance of a two way classified data. Analysis of a CRD. Analysis of an RBD.	

CC-4 Sem-4 Applications of Statistics (STS-G-CC-4-4-TH) & (STS-A-GE-4-4-TH)

	4 Credits

Unit 1 **20L**

Concept of population and sample, complete enumeration versus sampling, sampling and non-sampling errors. Types of sampling: non-probability and probability sampling, basic principle of sample survey, simple random sampling with and without replacement, definition and procedure of selecting a sample, estimates of: population mean, total and proportion, variances of these estimates, estimates of their variances. Stratified random sampling: Technique, estimates of population mean and total, variances of these estimates, estimates of their variances, proportional and optimum allocations.

Unit 2 **20L**

Index numbers: Definition, Criteria for a good index number, different types of index numbers. Construction of index numbers of prices and quantities, consumer price index number & wholesale price index number. Uses and limitations of index numbers. Tests for index numbers

Economic Time Series: Components of time series, Decomposition of time series- Additive and multiplicative model with their merits and demerits, Illustrations of time series. Measurement of trend by method of free-hand curve, method of least squares. Moving average method.

Unit 3 **20L**

Demographic Methods: Introduction, measurement of population, rates and ratios of vital events. Measurement of mortality: CDR, SDR (w.r.t. Age and sex), IMR, Standardized death rates.

Life (mortality) tables: definition of its main functions and uses. Measurement of fertility and reproduction: CBR, GFR, and TFR. Measurement of population growth: GRR, NRR.

Reference Books

Mukhopadhyay, P. (1999): Applied Statistics, New Central Book Agency, Calcutta.
Goon, A.M., Gupta, M.K. and Dasgupta, B. (2008): Fundamentals of Statistics, Vol. II,9th Edition World Press, Kolkata.
Gupta, S. C. and Kapoor, V.K. (2008): Fundamentals Of Applied Statistics, 4th Edition (Reprint), Sultan Chand & Sons

CC-4 Sem-4 Applications of Statistics Lab (STS-G-CC-4-4-P) & (STS-A-GE-4-4-P)	
	2 Credits
List of Practical	
To select a SRS with and without replacement. For a population of size 5, estimate population mean, population mean square and population variance. Enumerate all possible samples of size 2 by WR and WOR and establish all properties relative to SRS. For SRSWOR, estimate mean, standard error, the sample size. Stratified Sampling: allocation of sample to strata by proportional and Neyman's methods. Construction of price and quantity index numbers by Laspeyre's formula, Paasche's formula, Marshall-Edgeworth's formula, Fisher's Formula. Comparison and interpretation. Construction of Consumer and wholesale price index numbers, fixed base index number and consumer price index number with interpretation. Measurement of trend: Fitting of linear, quadratic trend, exponential curve and plotting of trend values and comparing with given data graphically. Computation of measures of mortality. Completion of life table. Computation of measures of fertility and population growth.	

Discipline Specific Electives

Operations Research

DSE-A Sem-5 Operations Research (STS-G-DSE-A-5-1-TH)	
	4 Credits
Unit 1	**20L**
Introduction and Historical Background, Phases of Operations Research, model building, various types of O.R. problems. Linear Programming Problem, Requirements of LPP, Mathematical Formulation of LPP, Graphical Methods to Solve Linear Programming Problems.	
Unit 2	**15L**
Simplex method for solving L.P.P. Charne's M-technique for solving L.P.P. involving artificial variables. Special cases of L.P.P. Concept of Duality in L.P.P: Dual simplex method.	
Unit 3	**25L**
Introduction, Formulation of Transportation Problem (TP). Initial solution by North West corner rule, Least cost method and Vogel's approximation method (VAM), MODI's method to find the optimal solution, special cases of transportation problem. Assignment problem: Hungarian method to find optimal assignment, special cases of assignment problem.	
Reference Books	
Taha, H. A. (2007): Operations Research: An Introduction, 8 Hall of India. KantiSwarup, Gupta, P.K. and Manmohan (2007): Operations Research, 13th Edition, Sultan Chand and Sons. Hadley, G: (2002) : Linear Programming, Narosa Publications Hillier, F.A and Lieberman, G.J. (2010): Introduction to Operations Research- Concepts and cases, 9th Edition, Tata McGraw Hill	

DES-A Sem-5 Operations Research Lab (STS-G-DSE-A-5-1-P)	
	2 Credits
List of Practical (Using TORA/WINQSB/LINDO/LINGO)	

Mathematical formulation of L.P.P and solving the problem using graphical method, Simplex technique and Charne's Big M method involving artificial variables.

2. Identifying Special cases by Graphical and Simplex method and interpretation

    a. Degenerate solution

    b. Unbounded solution

    c. Alternate solution

    d. Infeasible solution

3. Allocation problem using Transportation model.

4. Allocation problem using Assignment model.

DSE-B Sem-6 Survival Analysis (STS-G-DSE-B-6-2-TH)	
	4 Credits
Unit 1	**20L**
Survival Analysis: Functions of survival times, survival distributions and their applications- exponential, gamma, Weibull, Rayleigh, lognormal distributions, and distribution having bath-tub shaped hazard function. Mean Residual Time.	
Unit 2	**20L**
Censoring Schemes: Type I, Type II and progressive or random censoring with biological examples. Estimation of mean survival time and variance of the estimator for Type I and Type II censored data with numerical examples.	
Unit 3	**20L**
Non-parametric methods: Actuarial and Kaplan-Meier methods for estimating survival function and variance of the Estimator.	
Reference Books	
Lee, E.T. and Wang, J.W. (2003): Statistical Methods for Survival data Analysis, 3rd Edition, John Wiley and Sons. Kleinbaum, D.G. (1996): Survival Analysis, Springer. Chiang, C.L. (1968): Introduction to Stochastic Processes in Bio Statistics, John Wiley and Sons. Indrayan, A. (2008): Medical Biostatistics, 2nd Edition Chapman and Hall/CRC.	

Survival Analysis Lab

DSE-B Sem-6 Survival Analysis Lab (STS-G-DSE-B-6-2-P)	
	2 Credits
List of Practical	
To estimate survival function. To determine death density function and hazard function. To identify type of censoring and to estimate survival time for type I censored data. To identify type of censoring and to estimate survival time for type II censored data. To identify type of censoring and to estimate survival time for progressively type I censored data. Estimation of mean survival time and variance of the estimator for type I censored data. Estimation of mean survival time and variance of the estimator for type II censored data. Estimation of mean survival time and variance of the estimator for progressively type I censored data. To estimate the survival function and variance of the estimator using Non-parametric methods with Actuarial methods. To estimate the survival function and variance of the estimator using Non-parametric methods with Kaplan-Meier method.	

Econometrics

DSE-A Sem 5 Econometrics (STS-G-DSE-A-5-1-TH)	
	4 Credits
Unit 1	**15L**
Introduction: Objective behind building econometric models, nature of econometrics, model building, role of econometrics, structural and reduced forms. Estimation under linear restrictions. Dummy variables, Qualitative data.	
Unit 2	**15L**
Multicollinearity: Introduction and concepts, detection of multicollinearity, consequences and solutions of multicollinearity,.	
Unit 3	**15L**
Autocorrelation: Concept, consequences of auto correlated disturbances, detection and solution of autocorrelation. Generalized least squares estimation.	

Unit 4	**15L**
Heteroscedastic disturbances: Concepts and efficiency of Aitken estimator with OLS estimator under heteroscedasticity. Consequences of heteroscedasticity. Tests and solutions of heteroscedasticity. Errors in variables: Correlation between error and regressors. Instrumental variable method (Single-equation model with one explanatory variable)	
Reference Books	
Gujarati, D. and Sangeetha, S. (2007): Basic Econometrics, 4th Edition McGraw Hill Companies Johnston, J. (1972): Econometric Methods, 2nd Edition, McGraw Hill International. Koutsoyiannis, A. (2004): Theory of Econometrics, 2nd Edition, , Palgrave Macmillan Limited Maddala, G.S. and Lahiri, K. (2009): Introduction to Econometrics, 4th Edition, John Wiley & Sons.	

Econometrics Lab

DSE-A Sem-5 Econometrics Lab (STS-G-DSE-A-5-1-P)	
	2 Credits
List of Practical	
Problems related to consequences of Multicollinearity. Diagnostics of Multicollinearity. Problems related to consequences of Autocorrelation (AR(I)). Diagnostics of Autocorrelation. Problems related to consequences Heteroscedasticity. Diagnostics of Heteroscedasticity. Estimation of problems of General linear model under Heteroscedastic distance terms. Problems on Autoregressive models. Problems on Instrumental variable.	

Project Work

DSE-B Sem-6 Project Work (STS-G-DSE-B-6-2-P)	
	6 Credits
Analysing Social Change in Historical Perspective	
Objective: The aim of the course is to initiate students to write and present a statistical report, under the supervision of a faculty, on some area of human interest. The project work will provide hands on training to the students to deal with data emanating from some real life situation and propel them to dwell on some theory or relate it to some theoretical concepts.	

Skill Enhancement Courses

Statistical Data Analysis using R-I

SEC-A1 sem-3 Statistical Data Analysis Using R (STS-G-SEC-A-3-1-TH)	
	2 Credit
Unit 1	**10 L**
Introduction to R: Installation, commandline environment, overview of capabilities, brief mention of open source philosophy. R as a calculator: The four basic arithmetic operations. Use of parentheses nesting up to arbitrary level. The power operation. Evaluation of simple expressions. Quotient and remainder operations for integers. Standard functions, e.g., sin, cos, exp, log.	
Unit 2	**10 L**
The different types of numbers in R: Division by zero leading to Infor -Inf. NaN. NA. No need to go into details. Variables. Creating a vector using c(), seq() and colon operator. How functions map overvectors. Functions to summarise a vector: sum, mean, sd, medianetc. Extracting a subset from the vector (by index, by property). R as a graphing calculator: Introduction to plotting. Plot(), lines(), abline(). No detailsabout the graphics parameters except colour and line width.Barplot, Pie chart and Histogram. Box plot. Scatter plot and simple linear regression using lm(y~x).	
Unit 3	**10 L**
Matrix operations in R: Creation. Basic operations. Extracting submatrices. Loading data from a file: read.table() and read.csv(). Mention of head=TRUE and head=FALSE. Dataframes. Mention that these are like matrices, except that different columns may be of different types.	
Reference Books	

Gardener, M (2012) Beginning R: The Statistical Programming Language, Wiley Publications.

Braun W J, Murdoch D J (2007): A First Course in Statistical Programming with R. Cambridge University Press. New York

A simple introduction to R by Arnab Chakraborty (freely available at http://www.isical.ac.in/~arnabc/)

R for beginners by Emmanuel Paradis (freely available at https://cran.r-project.org/doc/contrib/Paradis-rdebuts_en.pdf)

Data Base Management Systems

SEC-B1 Sem-4 Data Base Management Systems (STS-G-SEC-B-4-2-TH)	
	2 Credits
Unit 1	**5 L**
Introduction: Overview of Database Management System, Introduction to Database Languages, advantages of DBMS over file processing systems.	
Unit 2	**5 L**
Relational Database Management System: The Relational Model, Introduction to SQL: Basic Data Types, Working with relations of RDBMS: Creating relations e.g. Bank, College Database (create table statement).	
Unit 3	**5 L**
Modifying relations (alter table statement), Integrity constraints over the relation like Primary Key , Foreign key, NOT NULL to the tables, advantages and disadvantages of relational Database System.	
Unit 4	**5 L**
Database Structure: Introduction, Levels of abstraction in DBMS, View of data, Role of Database users and administrators, Database Structure: DDL, DML, Data Manager (Database Control System).Types of Data Models Hierarchical databases, Network databases, Relational databases, Object oriented databases.	
Reference Books	

- Gruber, M(1990): Understanding SQL, BPB publication.
- Silberschatz, A, Korth, H and Sudarshan, S(2011) “Database System and Concepts”, 6th Edition McGraw-Hill.
- Desai, B. (1991): Introduction to Database Management system, Galgotia Publications.

SEC-A2 Sem-5 Research Methodology (STS-G-SEC-A-5-3-TH)	
	2 Credit
Unit 1	**16 L**
What is Research? Role of Research in important areas. Characteristics of Scientific Method. Process of research: Stating Hypothesis or Research question, Concepts & Constructs, Units of analysis & characteristics of interest, Independent and Dependent variables, Extraneous or Confounding variables. Measurements and scales of Measurements. Types of research: Qualitative & Quantitative Research, Longitudinal Research, Survey & Experimental Research.	
Unit 2	**14 L**
Survey Methodology and Data Collection, sampling frames and coverage error, non-response.	
Reference Books	
Kothari, C.R. (2009): Research Methodology: Methods and Techniques, 2nd Revised Edition reprint, New Age International Publishers. Kumar, R (2011): Research Methodology: A Step - by - Step Guide for Beginners, SAGE publications.	

SEC-B2 Sem-6 Monte Carlo Method (STS-G-SEC-B-6-4-TH)	
	2 Credit
Unit 1	**8L**
Using the computer for random number generation. (treated as a black box) A brief look at some popular approaches (nomathematical justification needed). Simulating a coin toss, a die roll and a card shuffle.	
Unit 2	**8 L**
CDF inversion method. Simulation from standard distributions. Finding probabilities and moments using simulation.	
Unit 3	**6L**
Monte Carlo integration. Basic idea of importance sampling.	
Unit 4	**8 L**
Generating from Binomial, and comparing the histograms to the PMFs. Generating from Uniform(0,1) distribution, and applying inverse CDF transforms. Simulating Gaussian distribution using Box-Muller method.	
Reference Books	
Shonkwiler, Ronald W. and Mendivil, Franklin (2009):Explorations in Monte Carlo Methods (Undergraduate Texts in Mathematics) Carsey,Thomas M. and Harden, Jeffrey J. (2014):Monte Carlo Simulation and Resampling Methods for Social Science.	

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

UNIVERSITY OF CALCUTTA

CBCS SYLLABUS OF ZOOLOGY

2018

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THREE-YEAR HONOURS

DEGREE COURSE OF STUDIES

Outline Structure of CBCS Curriculum for Zoology (Hons), C.U.

PART I; SEM I				
Subject Code	**Name of Paper**	**Theory**	**Practical**	**Internal assessment**
CC 1	Non Chordata – I (Protists to Pseudocoelomates)	50	30	20
CC 2	Molecular Biology	50	30	20
PART I; SEM II				
CC 3	Non Chordata – II (All Coelomate Phyla)	50	30	20
CC 4	Cell Biology	50	30	20
PART II; SEM III				
CC 5	Chordata	50	30	20
CC 6	Animal Physiology: Controlling & Co-ordinating System	50	30	20
CC 7	Fundamentals of Biochemistry	50	30	20
SEC-A (1/2)	Apiculture / Sericulture	80	NA	20
PART II; SEM IV				
CC 8	Comparative Anatomy of Vertebrate	50	30	20
CC 9	Animal Physiology: Life sustaining system	50	30	20
CC 10	Immunology	50	30	20
SEC- B(1/2)	Aquarium Fisheries/ Medical Diagnosis	80	NA	20
PART III; SEM V				
CC 11	Ecology	50	30	20
CC 12	Principle of Genetics	50	30	20
DSE A(1/2)	Parasitology/Biology of Insect	50	30	20
DSE B (1/2)	Endocrinology/Reproductive Biology	50	30	20
PART III; SEM VI				
CC 13	Developmental Biology	50	30	20
CC 14	Evolutionary Biology	50	30	20
DSE A (1/2)	Animal Biotechnology/Animal Cell Biotechnology	50	30	20
DSE B (1/2)	Animal Behaviour & Chronology/Fish & Fisheries	50	30	20

Abbreviations:

CC: Core Course; DSE A/B: Discipline Specific Elective A/B; SEC A/B: Skill Enhancement Course.

SUBJECT/PAPER CODE FORMAT

1. **Subject Code: ZOO**
2. **Honours Code: A**
3. **Course Code: a) Core Course: CC**

   b) Discipline Specific Elective: DSE-A/DSE-B

   c) Skill Enhancement Course: SEC-A/SEC-B
4. **Semester Code: 1/2/3/4/5/6**
5. **Paper No. Code: 1/2/3…../14**
6. **Paper Component Code: a) Theory: TH, b) Practical: P**

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CBCS ZOOLOGY (HONOURS), Papers & Their Codes

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ZOOA-CC1-1-P	Non- Chordates I Lab	6
ZOOA-CC1-2-TH	Molecular Biology	6
ZOOA-CC1-2-P	Molecular Biology Lab	7
ZOOA-CC2-3-TH	Non-Chordate II (Coelomate Phyla) Theory	7
ZOOA-CC2-3-P	Non-Chordate II Lab	8
ZOOA-CC2-4-TH	Cell Biology Theory	8
ZOOA-CC2-4-P	Cell Biology Lab	9
ZOOA-CC3-5-TH	Chordata Theory	9
ZOOA-CC3-5-P	Chordata Lab	10
ZOOA-CC3-6-TH	Animal Physiology: Controlling & Co-ordinating system Theory	11
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ZOOA-CC3-7-TH	Fundamental of Biochemistry Theory	12
ZOOA-CC3-7-P	Fundamental of Biochemistry Lab	13
ZOOA-CC4-8-TH	Comparative Anatomy of Vertebrate Theory	13
ZOOA-CC4-8-P	Comparative Anatomy of Vertebrate Lab	14
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PART I: SEMESTER 1

CORE COURSE 1. Non-Chordates I

ZOOA-CC1-1-TH

Full Marks 50	**4 Credits**	**50 Hours**
Non-Chordates I: Protists to Pseudocoelomates		
Unit 1: Basics of Animal Classification		4
Definitions: Classification, Systematics and Taxonomy; Taxonomic Hierarchy, Taxonomic types Codes of Zoological Nomenclature; Principle of priority; Synonymy and Homonymy; Concept of classification – three kingdom concept of Carl Woese, 1977 and five kingdom concept of Whittaker, 1969		
Unit 2: Protista and Metazoa		15
Protozoa General characteristics and Classification up to phylum (according to Levine *et. al.*, 1980) Locomotion in *Euglena*, *Paramoecium* and *Amoeba*; Conjugation in *Paramoecium*. Life cycle and pathogenicity of *Plasmodium vivax* and *Entamoeba histolytica* **Metazoa** Evolution of symmetry and segmentation of Metazoa		
Unit 3: Porifera		6
General characteristics and Classification up to classes (Ruppert and Barnes, 1994, 6th Ed.); Canal system and spicules in sponges		
Unit 4: Cnidaria		10
General characteristics and Classification up to classes (Ruppert and Barnes, 1994, 6th Ed.), Metagenesis in *Obelia*; Polymorphism in Cnidaria; Corals and coral reef diversity, Role of symbiotic algae in reef formation. Conservation of coral and coral reefs.		
Unit 5: Ctenophora		2
General characteristics		
Unit 6: Platyhelminthes		6
General characteristics and Classification up to classes (Ruppert and Barnes, 1994, 6th Ed.) Life cycle and pathogenicity and control measures of *Fasciola hepatica* and *Taenia solium*		
Unit 7: Nematoda		7
General characteristics and Classification up to classes (Ruppert and Barnes, 1994, 6th Ed.) Life cycle, and pathogenicity and control measures of *Ascaris lumbricoides* and *Wuchereria bancrofti* Parasitic adaptations in helminthes		

Non-Chordates I Lab; ZOOA-CC-1-1-P

Non-Chordates I: Protists to Pseudocoelomates

Full Marks 30	**60 Hours**	2 credits
List of Practical		
Study of whole mount of *Euglena*, *Amoeba* and *Paramoecium* Identification with reason & Systematic position of *Amoeba*, *Euglena*, *Entamoeba*, *Paramecium*, *Plasmodium*, *Balantidium*, *Vorticella* (from the prepared slides) Identification with reason & Systematic position of *Sycon*, *Poterion* (Neptune's Cup), *Obelia*, *Physalia*, *Aurelia*, *Gorgonia*, *Metridium*, *Pennatula*, *Madrepora*, *Fasciola hepatica*, *Taenia solium* and *Ascaris lumbricoides.* Staining/mounting of any protozoa/helminth from gut of *Periplaneta* sp.		

CORE COURSE 2: Molecular Biology

ZOOA-CC1-2-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Nucleic Acids		3
Salient features of DNA, Chargaff's Rule, Hypo and Hyperchromic shift. Watson and Crick Model of DNA. RNA types & Function.		
Unit 2: DNA Replication		9
Mechanism of DNA Replication in Prokaryotes, Prove that replication is Semi-conservative, bidirectional and discontinuous, RNA priming, Replication of telomeres.		
Unit 3: Transcription		9
Mechanism of Transcription in prokaryotes and eukaryotes, Transcription factors, Difference between prokaryotic and eukaryotic transcription.		
Unit 4: Translation		9
Genetic code, Degeneracy of the genetic code and Wobble Hypothesis. Mechanism of protein synthesis in prokaryotes.		
Unit 5: Post Transcriptional Modifications and Processing of Eukaryotic RNA		8
Capping and Poly A tail formation in mRNA; Split genes: concept of introns and exons, splicing mechanism, alternative splicing and RNA editing		

Unit 6: Gene Regulation	7
Regulation of Transcription in prokaryotes: *lac* operon and *trp* operon; Regulation of Transcription in eukaryotes: Activators, enhancers, silencer, repressors, miRNA mediated gene silencing. Epigenetic Regulation: DNA Methylation, Histone Methylation & Acetylation.	
Unit 7: DNA Repair Mechanisms	2
Types of DNA repair mechanisms, RecBCD model in prokaryotes, nucleotide and base excision repair, SOS repair	
Unit 8: Molecular Techniques	3
PCR, Western and Southern blot, Northern Blot	

Molecular Biology Lab; ZOOA-CC-1-2-P

Full Marks 30	**60 Hours**	2 Credits
List of Practical		
1. Demonstration of polytene and lampbrush chromosome from photograph 2. Isolation and quantification of genomic DNA from goat liver. 3. Agarose gel electrophoresis for DNA. 4. Histological staining of DNA and RNA in prepared slides		

PART I: SEMESTER 2

CORE COURSE 3: Non-Chordates II – Coelomates

ZOOA-CC2-3-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Introduction		2
Evolution of coelom		
Unit 2: Annelida		10
General characteristics and Classification up to classes (Ruppert and Barnes, 1994) Excretion in Annelida through nephridia; Metamerism in Annelida.		
Unit 3: Arthropoda		16
General characteristics and Classification up to classes (Ruppert and Barnes, 1994); Insect Eye (Cockroach only). Respiration in Prawn and Cockroach; Metamorphosis in Lepidopteran Insects; Social life in Termite		
Unit 4: Onychophora		2
General characteristics and Evolutionary significance		

Unit 5: Mollusca	10
General characteristics and Classification up to classes (Ruppert and Barnes, 1994); Nervous system in *Pila sp*. Torsion in Gastropoda. Feeding and respiration in *Pila* sp.	
Unit 6: Echinodermata	8
General characteristics and Classification up to classes (Ruppert and Barnes, 1994); Water-vascular system in *Asterias*. Echinoderm larva and affinities with chordates	
Unit 7: Hemichordata	2
General characteristics of phylum Hemichordata. Relationship with non-chordates and chordates	

Non-Chordates II Lab, ZOOA-CC-2-3-P

Full Marks 30	**2 Credits**
List of Practical	

1. Study of following specimens:
   - **a.** Annelids - *Aphrodite, Nereis, Chaetopterus,* Earthworm, *Hirudinaria*
   - **b.** Arthropods - *Limulus, Palaemon, Balanus, Eupagurus, Scolopendra, Peripatus,* Silkworm – life history stages, Termite – members of a colony and Honey bee – members of the colony
   - **c.** Molluscs - *Dentalium, Patella, Chiton, Pila, Achatina, Pinctada, Sepia, Octopus, Nautilus*
   - **d.** Echinoderms - *Asterias, Ophiura, Clypeaster, Echinus, Cucumaria* and *Antedon*
2. Anatomy study: Nervours system, Reproductive system (Male & female), Mouth parts & Salivary apparatus in *Periplaneta* sp.

PART I: SEMESTER 2

CORE COURSE 4: Cell Biology

ZOOA-CC2-4-TH

Full Marks 50	**4 Credits**	**50 Hours**
Unit 1: Plasma Membrane		7
Ultra-structure and composition of Plasma membrane: Fluid mosaic model, Transport across membrane - Active and Passive transport, Facilitated transport, Cell junctions: Tight junctions, Gap junctions, Desmosomes		
Unit 2: Cytoplasmic organelles I		5
Structure and Functions: Endoplasmic Reticulum, Golgi Apparatus, Lysosomes; Protein sorting and mechanisms of vesicular transport		
Unit 3: Cytoplasmic organelles II		7
Mitochondria: Structure, Semi-autonomous nature, Endosymbiotic hypothesis Mitochondrial Respiratory Chain, Chemiosmotic hypothesis; Peroxisomes: Structure and Functions		

Centrosome (Kinetochore and centromeric DNA): Structure and Functions	
Unit 4: Cytoskeleton	5
Type, structure and functions of cytoskeleton; Accessory proteins of microfilament & microtubule	
Unit 5: Nucleus	8
Nuclear envelope, Nuclear pore complex, Nucleolus; Chromatin: Euchromatin and Heterochromatin and packaging (nucleosome),	
Unit 6: Cell Cycle	10
Cell cycle and its regulation, Cancer (Concept of oncogenes and tumor suppressor genes with special reference to p53, Retinoblastoma and Ras. Process of Proto-oncogene activation	
Unit 7: Cell Signalling	8
Cell signalling transduction pathways; Types of signalling molecules and receptors (Classification and Example only): RTK & JAK/STAT. Apoptosis	

Cell Biology Lab; ZOOA-CC-2-4-P

Full Marks 30	**60 Hours**	2 Credits
List of Practical		

1. Preparation of temporary stained squash of onion/arum root tip to study various stages of mitosis
2. Study of various stages of meiosis from grasshopper testis
3. Preparation of permanent slide to show the presence of Barr body in human female blood cells/cheek cells.
4. Preparation of permanent slide to demonstrate:
    a. DNA by Feulgen reaction
    b. Cell viability study by Trypan Blue staining

PART II: SEMESTER 3.

CORE COURSE 5 : Chordata

ZOOA-CC3-5-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Introduction to Chordates		2
General characteristics and outline classification of Phylum Chordata (Young, 1981)		
Unit 2: Protochordata		7
General characteristics and classification of sub-phylum Urochordata and Cephalochordata up to Classes (Young, 1981). Metamorphosis in *Ascidia*. Chordate Features, structure of pharynx and feeding in *Branchiostoma*		

Unit 3: Agnatha	2
General characteristics and classification of cyclostomes up to order (Young, 1981)	
Unit 4: Pisces	7
General characteristics and classification up to living sub classes (Young, 1981); Accessory respiratory organ, Migration in fishes; Parental care in fishes; Swim bladder in fishes.	
Unit 5: Amphibia	7
General characteristics and classification up to living Orders (Young, 1981); Metamorphosis, Paedomorphosis, Parental care in Amphibia	
Unit 6: Reptilia	8
General characteristics and classification up to living Orders (Young, 1981); Poison apparatus and Biting mechanism in Snake. Poisonous & Non-Poisonous snake.	
Unit 7: Aves	8
General characteristics and classification up to living Sub-Classes (Young, 1981); Exoskeleton and migration in Birds; Principles and aerodynamics of flight	
Unit 8: Mammals	9
General characters and classification up to living sub classes (Young, 1981); Exoskeleton derivatives of mammals; Adaptive radiation in mammals with reference to locomotory appendages; Echolocation in Micro chiropterans	

Chordata Lab; ZOOA-CC-3-5-P

Full Marks 30	**60 Hours**	2 Credits
List of Practical		

Identification with Reasons

a) **Protochordata**: *Balanoglossus*, *Branchiostoma*
b) **Agnatha**: *Petromyzon*
c) **Fishes**: *Scoliodon, Sphyrna, Pristis, Torpedo, Mystus, Heteropneustes, Labeo rohita, Exocoetus, Hippocampus, Anabas,* Flat fish
d) **Amphibia**: *Necturus, Bufo (Duttaphrynus) melanostictus, Rana (Hoplobatrachus) tigerinus, Hyla, Tylototriton,* Axolotl larva
e) **Reptilia**: Chelone, Trionyx, Hemidactylus, Varanus, *Calotes*, *Chamaeleon, Draco, Vipera, Naja, Hydrophis,*
f) **Mammalia**: Bat (Insectivorous and Frugivorous), *Funambulus* (Indian Palm squirrel)

Dissection of brain and pituitary – *ex situ*, digestive and Urino-genital system of *Tilapia*

Pecten from Fowl head

Power point presentation on study of habit, habitat or behaviour of any one animal by student – for internal assessment only

PART II: SEMESTER 3.

CORE COURSE 6: Animal Physiology: Controlling and Co-ordinating System

ZOOA-CC3-6-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Tissues		4
Structure, location, classification and functions of epithelial tissue, connective tissue, muscular tissue and nervous tissue		
Unit 2: Bone and Cartilage		4
Structure and types of bones and cartilages, Ossification		
Unit 3: Nervous System		10
Structure of neuron, resting membrane potential, Origin of action potential and its propagation across the myelinated and non-myelinated nerve fibres; Types of synapse, Synaptic transmission and Neuromuscular junction		
Unit 4: Muscular system		10
Histology of different types of muscle; Ultra-structure of skeletal muscle; Molecular and chemical basis of muscle contraction; Characteristics of muscle fibre		
Unit 5: Reproductive System		6
Histology of mammalian testis and ovary; physiology of mammalian reproduction – menstrual and oestrous cycle		
Unit 6: Endocrine System		16
Histology and function of thyroid, pancreas and adrenal. Function of pituitary Classification of hormones; Mechanism of Hormone action; Signal transduction pathways for Steroidal and Non- steroidal hormones; Hypothalamus (neuroendocrine gland) - principal nuclei involved in neuroendocrine control of anterior pituitary; Placental hormones		

Animal Physiology: Controlling & Coordinating Systems, Lab;

ZOOA-CC3-6-P

Full Marks 30	**60 Hours**	2 Credits
List of Practical		
1. Recording of cardiac and simple muscle twitch with electrical stimulation 2. Preparation of temporary mounts: Squamous epithelium, Striated muscle fibres and nerve cells 3. Study of permanent slides of Mammalian Skin, Spinal cord, Pancreas, Testis, Ovary, Adrenal, Lung, pyloric stomach, cardiac stomach, Thyroid, small intestine and large intestine of mammal (white rat) 4. Microtomy: Preparation of permanent slide of any five mammalian (Goat/white rat) tissues		

PART II: SEMESTER 3

CORE COURSE 7: Fundamentals of Biochemistry

ZOOA-CC3-7-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Carbohydrates		8
Structure and Biological importance: Monosaccharides, Disaccharides, Polysaccharides; Derivatives of Monosaccharides; Carbohydrate metabolism: Glycolysis, Citric acid cycle, Pentose phosphate pathway, Gluconeogenesis		
Unit 2: Lipids		7
Structure and Significance: Physiologically important saturated and unsaturated fatty acids, Tri-acylglycerols, Phospholipids, Sphingolipid, Glycolipids, Steroids, Eicosanoids and terpinoids. Lipid metabolism: β-oxidation of fatty acids - a. Palmitic acid {saturated (C 16:0)}, b. Linoleic acid {unsaturated (C 18:2)}; Fatty acid biosynthesis		
Unit 3: Proteins		10
Amino acids: Structure, Classification, General and Electro chemical properties of α-amino acids; Physiological importance of essential and non-essential amino acids, Proteins Bonds stabilizing protein structure; Levels of organization; Protein metabolism: Transamination, Deamination, Urea cycle, Fate of C-skeleton of Glucogenic and Ketogenic amino acids		
Unit 4: Nucleic Acids		10
Structure of Purines, Pyrimidines, Nucleosides and Nucleotides; Nucleic Acid Metabolism: Catabolism of adenosine, Guanosine, cytosine and thymine.		
Unit 5: Enzymes		13
Nomenclature and classification; Cofactors; Specificity of enzyme action; Isozymes; Mechanism of enzyme action; Enzyme kinetics; Derivation of Michaelis-Menten equation, Lineweaver-Burk plot; Factors affecting rate of enzyme-catalyzed reactions; Enzyme inhibition.		
Unit 5: Oxidative Phosphorylation		**2**
Redox systems; Mitochondrial respiratory chain, Inhibitors and un-couplers of Electron Transport System		

Fundamentals of Biochemistry Lab; ZOOA-CC-7-3-P

Fundamentals of Biochemistry		
Full Marks 30	**60 Hours**	**2 Credits**
List of Practical		
1. Qualitative tests for carbohydrates, proteins and lipids 2. Qualitative estimation of Urea & Uric acid 3. Paper chromatography of amino acids. 4. Quantitative estimation of water soluble proteins following Lowry Method		

PART II: SEMESTER 4

CORE COURSE 8.Comparative Anatomy of Vertebrates

ZOOA-CC4-8-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Integumentary System		10
Structure, function and derivatives of integument in amphibian, birds and mammals		
Unit 2: Digestive System		6
Comparative anatomy of stomach; dentition in mammals		
Unit 3: Respiratory System		6
Respiratory organs in fish, birds and mammals		
Unit 4: Circulatory System		7
General plan of circulation, Comparative account of heart and aortic arches		
Unit 5: Urinogenital System		5
Succession of kidney in different vertebrate groups; evolution of urino-genital ducts		
Unit 6: Nervous system and sense organs		**8**
Comparative account of brain in vertebrates; cranial nerves; olfactory and auditory receptors in vertebrates		
Unit 7: Skeletal system		**8**
Overview of axial and appendicular skeleton – limbs, girdles of pigeon; jaw suspension in mammals		

Comparative Anatomy of Vertebrates Lab; ZOOA-CC4-8-P

Full Marks 30	60 Hours	2 Credits
List of Practical		
1. Study of placoid, cycloid and ctenoid scales through permanent slides/photographs 2. Study of disarticulated skeleton of toad, Pigeon, Guineapig (limb bones, vertebrae, limb and girdle) 3. Comparative study of heart and brain, with the help of model/picture 4. Identification of skulls: Pigeon, one herbivore (Guineapig) and one carnivore (Dog) animal		

PART II: SEMESTER 4

CORE COURSE 9: Animal Physiology: Life Sustaining Systems

ZOOA-CC4-9-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Physiology of Digestion		10
Structural organisation and function of gastro-intestinal tract; Mechanical and chemical digestion of food, absorption of Carbohydrates, Lipids and Proteins in Human		
Unit 2: Physiology of Respiration		10
Mechanism of Respiration, Respiratory volumes and capacities, transport of Oxygen and Carbon dioxide in blood, Dissociation curves and the factors influencing it, respiratory pigments; Carbon monoxide poisoning		
Unit 3: Physiology of Circulation		8
Structure and functions of haemoglobin; Blood clotting system; Haematopoiesis; Basic steps and its regulation; Blood groups; ABO and Rh factor		
Unit 4: Physiology of Heart		**8**
Coronary Circulation, Structure and working of conducting myocardial fibres, Origin and conduction of cardiac impulses; Cardiac Cycle and cardiac output		
Unit 5: Thermoregulation & Osmoregulation		6
Thermal regulation in camel and polar bear, Osmoregulation in aquatic vertebrates		
Unit 6: Renal Physiology		8
Structure of Kidney and its functional unit, Mechanism of urine formation, Regulation of acid-base balance		

Animal Physiology: Life Sustaining Systems Lab; ZOOA-CC4-9-P

Full Marks 30	60 Hours	2 Credits
List of Practical		
1. Determination of ABO Blood group 2. Estimation of haemoglobin using Sahli's haemoglobin meter 3. Identification of blood cells from human blood 4. Preparation of haemin crystals and haemochromogen crystals 5. Identification of blood cells from cockroach haemolymph 6. Demonstration of blood pressure by digital meter		

PART II: SEMESTER 4

CORE COURSE 10: Immunology

ZOOA-CC4-10-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Overview of Immune System		3
Introduction – concept of health and disease; Cells and organs of the Immune system		
Unit 2: Innate and Adaptive Immunity		9
Anatomical barriers, Inflammation, Cell and molecules involved in innate immunity, Adaptive immunity (Cell mediated and humoral).		
Unit 3: Antigens		6
Antigenicity and immunogenicity, Immunogens, Adjuvants and haptens, Factors influencing immunogenicity, B and T-Cell epitopes		
Unit 4: Immunoglobulins		10
Structure and functions of different classes of immunoglobulins, Antigen-antibody interactions, Immunoassays (ELISA and RIA), Monoclonal antibody production		
Unit 5: Major Histocompatibility Complex		6
Structure and functions of MHC molecules. Structure of T cell Receptor and its signalling, T cell development & selection		
Unit 6: Cytokines		3
Types, properties and functions of cytokines.		

Unit 7: Complement System	5
Components and pathways of complement activation.	
Unit 8: Hypersensitivity	4
Gell and Coombs' classification and brief description of various types of hypersensitivities.	
Unit 9: Vaccines	4
Various types of vaccines. Active & passive immunization (Artificial and natural).	

Immunology Lab; ZOOA-CC4-10-P

Full Marks 30	**60 Hours**	2 Credits
List of Practical		
1. Demonstration of lymphoid organs (by picture). 2. Histological study of Bursa fabricius, spleen, thymus and lymph nodes through slides/ photographs 3. Demonstration of ELISA		

PART III: SEMESTER 5

CORE COURSE 11.Ecology

ZOOA-CC5-11-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Introduction to Ecology		4
Autecology and synecology, Levels of organization, Laws of limiting factors, Study of Physical factors, The Biosphere.		
Unit 2: Population		20
Unitary and Modular populations Unique and group attributes of population: Demographic factors, life tables, fecundity tables, survivorship curves, dispersal and dispersion. Geometric, exponential and logistic growth, equation and patterns, r and K strategies Population regulation - density-dependent and independent factors, Population Interactions, Gause's Principle with laboratory and field examples, Lotka-Volterra equation for competition.		
Unit 3: Community		11
Community characteristics: species diversity, abundance, dominance, richness, Vertical stratification, Ecotone and edge effect; Ecological succession with one example.		

Unit 4: Ecosystem	8
Types of ecosystem with an example in detail, Food chain: Detritus and grazing food chains, Linear and Y-shaped food chains, Food web, Energy flow, Ecological pyramids and Ecological efficiencies; Nitrogen cycle.	
Unit 5: Applied Ecology	7
Types & level of biodiversity Mega-diversity countries, Biodiversity Hot spot, Flagship species, Keystone species, Wildlife Conservation (*in situ* and *ex situ* conservation), concept of protected areas. Red data book, Indian wild life act & Schedule. Concept of corridor, advantages and problem of corridor. Threats to survival and conservation strategies for Tiger, Olive ridley, White Rumped Vulture.	

Ecology Lab, ZOOA-CC5-11-P

Full Marks 30	**60 Hours**	2 Credits
List of Practical		
1. Determination of population density in a natural/hypothetical community by quadrate method and calculation of Shannon-Weiner diversity index for the same community 2. Study of an aquatic ecosystem: Phytoplankton and zooplankton, Measurement of area, temperature, salinity, determination of pH, and Dissolved Oxygen content (Winkler's method), Chemical Oxygen Demand and free CO_2 **3.** Report on a visit to National Park/Biodiversity Park/Wild life sanctuary/ any place of ecological interest/ ecological uniqueness/ Zoological garden		

PART III: SEMESTER 5

CORE COURSE 12.Principle of Genetics

ZOOA-CC5-12-TH

Full Marks 50	4 Credits	Class
Unit 1: Mendelian Genetics and its Extension		12
Principles of inheritance, Incomplete dominance and co-dominance, Epistasis, Multiple alleles, Isoallele (White eye mutations), Pseudoallele (Lozenge Locus) & Cis-trans test for allelism, Lethal alleles, Pleiotropy, Penetrance & Expressivity		
Unit 2: Linkage, Crossing Over and Linkage Mapping		8
Linkage and Crossing, Complete & Incomplete Linkage, Measuring Recombination frequency and linkage map construction using three factor crosses, Interference and coincidence Sex linkage in *Drosophila* (White eye locus) & Human (Haemophilia).		

Unit 3: Mutations	12
Types of gene mutations (Classification), Types of chromosomal aberrations (Classification with one suitable example from *Drosophila* and Human of each), variation in chromosome number; Non-disjunction of X chromosome in *Drosophila*; Non-disjunction of Human Chromosome 21. Molecular basis of mutations in relation to UV light and chemical mutagens. Mutation detection in *Drosophila* by attached X method. Biochemical mutation detection in *Neurospora*.	
Unit 4: Sex Determination	8
Mechanisms of sex determination in *Drosophila* and in man; Dosage compensation in *Drosophila* & Human	
Unit 5: Extra-chromosomal Inheritance	2
Kappa particle in *Paramoecium*, Shell spiralling in snail	
Unit 6: Genetic Fine Structure	2
Complementation test in Bacteriophage (Benzer's experiment on rII locus)	
Unit 7: Transposable Genetic Elements	6
IS element in bacteria, Ac-Ds elements in maize and P elements in *Drosophila*, LINE, SINE, Alu elements in humans	

Principles of Genetics Lab, ZooA-CC5-12-P

Full marks 30	**60 Hours**	2 Credits
List of Practical		
1. Chi-square analyses for genetic ratio test 2. Identification of chromosomal aberration in *Drosophila* and man from photograph 3. Pedigree analysis of some inherited traits in animals		

PART III: SEMESTER 6

CORE COURSE 13: Developmental Biology

ZOOA-CC6-13-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Early Embryonic Development		20
Gametogenesis: Spermatogenesis, Oogenesis (sea urchin & mammal); Types of eggs, Egg membranes; Fertilization in sea urchin and mammal; Planes and patterns of cleavage; Types of Blastula [frog and chick]; Fate map in chick embryo, fate mapping using vital dye and radioactive technique; Gastrulation in frog and chick; Embryonic induction and organizers in *Xenopus* (Spemann & Mangold's experiment)		

Unit 2: Late Embryonic Development	10
Extra-embryonic membranes in Chick; Implantation of embryo in humans, Placenta (Structure, types and functions of placenta)	
Unit 3: Post Embryonic Development	8
Development of brain and Eye in Chick. Molecular Induction in Brain and Eye development.	
Unit 4: Implications of Developmental Biology	12
In vitro fertilization (IVF), Stem cell: Concept of potency, types, markers and applications of stem cell therapy in bone marrow transplantation and cartilage regeneration	

Developmental Biology Lab; ZOOA-ZooA-CC6-13-P

Full Marks 30	**60 Hours**	2 Credits
List of Practical		
1. Study of whole mounts of developmental stages of chick embryo through permanent slides: 24, 48, and 96 hours of incubation 2. Study of the developmental stages and life cycle of *Drosophila* 3. Study of different sections of placenta (photomicropgraph/ slides) 4. Identification of Invertebrate larva through slides/ photographs of Phylum Annelida, Arthropoda, Mollusca and Echinodermata		

PART III: SEMESTER 6

CORE COURSE 14.Evolutionary Biology

ZOOA-CC6-14-TH

Full Marks 50	4 Credits	50 Hours
Unit 1		**5**
Origin of Life (Chemical basis), RNA world hypothesis		
Unit 2		5
Historical review of Evolutionary concepts: Lamarkism, Darwinism and Neo Darwinism		
Unit 3		6
Geological time scale, Fossil: types and age determination by Carbon dating, Evolution of horse		
Unit 4		6
Natural Selection: Modes with Examples;		

Unit 5	10
Species concept, Isolating mechanisms, modes of speciation; Speciation by chromosome rearrangement in *Drosophila*. Adaptive radiation/macroevolution (exemplified by Galapagos finches).	
Unit 6	2
Origin and Evolution of Man, Unique Hominid characteristics contrasted with primate characteristic	
Unit 7	10
Population genetics: Hardy-Weinberg Law; factors disrupting H-W equilibrium (Genetic Drift, Migration and Mutation and Selection in changing allele frequencies (only derivations required). Simple problems related to estimation of allelic and gene frequencies.	
Unit 8	**3**
Extinction, back ground and mass extinctions, detailed example of K-T extinction	
Unit 9	**5**
Phylogenetic trees, construction and interpretation of Phylogenetic tree using parsimony, convergent and divergent evolution.	

Evolutionary Biology Lab, ZooA-CC6-14-P

Full Marks 30	**60 Hours**	2 Credits
List of Practical		
1. Study of fossils from models/ pictures: Dickinsonia, Paradoxides (Trilobita), Asteroceras (Ammonoid), Pentremites (Blastoid Echinoderm), Ichthyosaur, Archaeopteryx, Cynodont. 2. Study of homology and analogy from suitable specimens. 3. Phylogenetic trees, Construction & interpretation of Phylogenetic tree using parsimony, Construction of dendrogram following principles of phenetics & cladistics from a data table.		

Discipline Specific Elective

[Students will choice either of ZOOA-DSE(A)-5-1-TH or ZOOA-DSE(A)-5-2-TH]

PART III: SEMESTER 5

DSE1. Parasitology

ZOOA-DSE(A)-5-1-TH

Full Marks 50	**4 Credits**	**50 hours**
Unit 1: Introduction to Parasitology		2
Brief introduction of Parasitism, Parasite, Parasitoid and Vectors (mechanical and biological vector); Host parasite relationship		
Unit 2: Parasitic Protists		12
Study of Morphology, Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment of *Giardia intestinalis*, *Trypanosoma gambiense*, *Leishmania donovani*		
Unit 3: Parasitic Platyhelminthes		12
Study of Morphology, Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment of *Schistosoma haematobium*, *Taenia solium*		
Unit 4: Parasitic Nematodes		12
Study of Morphology, Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment of *Ascaris lumbricoides*, *Ancylostoma duodenale*, *Wuchereria bancrofti*, Nematode plant interaction.		
Unit 5: Parasitic Arthropods		10
Biology, importance and control of ticks: Soft tick (*Ornithodoros)*, Hard tick (*Ixodes*), mites (*Sarcoptes*), Lice (*Pediculus*), Flea (*Xenopsylla*) and Bug (*Cimex*). Parasitoid.		
Unit 6: Parasite Vertebrates		**2**
Cookicutter Shark, Hood Mocking bird, Vampire bats their parasitic behaviour and effect on host.		

Parasitology Lab, ZOOA-DSE(A)-5-1-P

Full Marks 30	**60 Hours**	2 Credits
List of Practical		

1. Study of life stages of *Giardia intestinalis*, *Trypanosoma gambiense*, *Leishmania donovani*, *Plasmodium vivax*, *Plasmodium falciparum* through permanent slides/micro photographs
2. Study of adult and life stages of *Schistosoma haematobium*, *Taenia solium* through permanent slides/micro photographs
3. Study of adult and life stages of *Ancylostoma duodenale* through permanent slides/micro photographs.

4. Study of monogenea from the gills of fresh/marine fish [Gills can be procured from fish market as by product of the industry]
5. Study of nematode/cestode parasites from the intestines of Poultry bird [Intestine can be procured from poultry/market as a by-product] & Goat.

Submission of a brief report on parasitic vertebrates

PART III: SEMESTER 5

DSE2. Biology of Insects

ZOOA-DSE(A)-5-2-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Insect Taxonomy		4
Basis of insect classification; Classification of insects up to orders (Ruppert and Barnes, 1994)		
Unit 2: General Morphology of Insects		6
External Features; Head – Eyes, Types of antennae, Mouth parts with respect to feeding habits Thorax: Wings and wing articulation, Types of Legs adapted to diverse habitat Abdominal appendages and genitalia		
Unit 3: Physiology of Insects		20
Structure and physiology of Insect body systems - Digestive, respiratory, endocrine and nervous system Photoreceptors: Types, Structure and Function Metamorphosis: Types and Neuroendocrine control of metamorphosis		
Unit 4: Insect Society		7
Social insects with special reference to termites Trophallaxis in social insects such as ants, termites and bees		
Unit 5: Insect Plant Interaction		4
Theory of co-evolution, role of allelochemicals in host plant mediation Host-plant selection by phytophagous insects, Major insect pests in paddy		
Unit 6: Insects as Vectors		**9**
Insects as mechanical and biological vectors, Brief discussion on houseflies and mosquitoes as important vectors		

Biology of Insect Lab, ZOOA-DSE(A)-5-2-P

Full Marks 30	**60 Hours**	2 Credits
List of Practical		
1. Study of life cycle of Mosquito 2. Study of different kinds of antennae, legs and mouth parts of insects 3. Mounting of insect wings any insects 4. Methodology of collection, preservation and identification of insects. *5.* Morphological studies of various castes of *Apis*, Ant-*Camponotus*, Termite-*Odontotermes* 6. Study of major insect pests of paddy and their damages 7. Study of Mulberry silk moth as beneficial insect		

Students will choice either of ZOOA-DSE(B)-5-1-TH or ZOOA-DSE(B)-5-2-TH

PART III: SEMESTER 5

DSE1. Endocrinology

ZOOA-DSE(B)-5-1-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Introduction to Endocrinology		**6**
General idea of Endocrine systems, Classification, Characteristic and Transport of Hormones, Neuro-secretions and Neuro-hormones: Examples and Functions		
Unit 2: Hypothalamo-Hypophyseal Axis		12
Structure and functions of hypothalamus and Hypothalamic nuclei, Regulation of neuroendocrine glands, Feedback mechanisms, Hypothalamo-Hypophyseal-Gonadal Axis. Structure of pituitary gland, Hormones and their functions, Hypothalamo-hypophyseal portal system		
Unit 3: Peripheral Endocrine Glands		12
Structure, Hormones and Functions of Thyroid gland, Parathyroid, Adrenal, Pancreas, Ovary and Testis. Disorders of endocrine glands (*Diabetes mellitus* type I & Type II; Graves' Disease).		
Unit 4: Regulation of Hormone Action		12
Mechanism of action of steroidal, non-steroidal hormones with receptors (cAMP, IP3-DAG), Calcium and Glucose homeostasis in mammals. Bioassays of hormones using RIA & ELISA, Estrous cycle in rat and menstrual cycle in human.		

Unit 5. Non Mammalian Vertebrate Hormone	**8**
Functions of Prolactin in Fishes, Amphibia & Birds Function of Melanotropin in Teleost fishes, Amphibians and Reptiles.	

Endocrinology Lab, ZOOA-DSE(B)-5-1-P

Full Marks 30	**60 Hours**	**2 Credits**

List of Practical

1. Dissect and display of Endocrine glands in laboratory bred rat.
2. Study of the permanent slides of all the endocrine glands
3. Tissue fixation, embedding in paraffin, microtomy and slide preparation of any endocrine gland.
4. H-E staining of Histological slides.

PART III: SEMESTER 5

DSE2. Reproductive Biology

ZOOA-DSE(B)-5-2-TH

Full Marks 50	**4 Credits**	**50 Hours**
Unit 1: Reproductive Endocrinology		**10**
Mechanism of action of steroid and glycoprotein hormones. Hypothalamo – Hypophyseal – gonadal axis, regulation of gonadotrophin secretion in human (male and female); Reproductive system: Development and differentiation of gonads, genital ducts and external genitalia		
Unit 2: Functional anatomy of male reproduction		14
Histoarchitechture of testis in human; Spermatogenesis and its hormonal regulation; Androgen synthesis and metabolism; Accessory glands functions		
Unit 3: Functional anatomy of female reproduction		18
Histoarchitechture of ovary in human; Oogenesis and its hormonal regulation; Steroidogenesis and secretion of ovarian hormones; Reproductive cycles (human) and their regulation, Fertilization; Hormonal control of implantation; Hormonal regulation of gestation, pregnancy diagnosis, feto-maternal relationship; Mechanism of parturition and its hormonal regulation; Lactation and its regulation		
Unit 4: Reproductive Health		8
Infertility in male and female: causes, diagnosis and management, Assisted Reproductive Technology: Sex selection, sperm banks, frozen embryos, *in vitro* fertilization IVF & IUI Modern contraceptive technologies		

Reproductive Biology Lab, ZOOA-DSE(B)-5-2-P

Full Marks 50	**60 Hours**	2 Credits
List of Practical		
1. Study of animal house: set up and maintenance of animal house, breeding techniques, care of normal and experimental animals (only demonstration through chart). 2. Tissue fixation, embedding in paraffin, microtomy and slide preparation of any endocrine gland. 3. H-E staining of histological slides. 4. Examination of histological sections from photomicrographs/ permanent slides of rat/human: testis, epididymis and accessory glands of male reproductive systems; ovary, fallopian tube, uterus (proliferative and secretory stages), cervix and vagina.		

Students will choice either of ZOOA-DSE(A)-6-1-TH or ZOOA-DSE(A)-6-2-TH

PART III: SEMESTER 6

DSE1. Animal Cell Biotechnology

ZOOA-DSE(A)-6-1-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Introduction		2
Concept and Scope of Biotechnology		
Unit 2: Techniques in Gene manipulation		15
Recombinant DNA technology, Restriction endonucleases. Cloning Vectors & their features: Plasmids, Phage vectors, Cosmids, Phagemids, BAC, YAC, and HAC. Shuttle and Expression Vectors. Construction of Genomic libraries and cDNA libraries Transformation techniques: Cloning in bacteria and detection technique of clone		
Unit 3: Animal cell Culture		15
Basic techniques in animal cell culture and organ culture, Primary Culture and Cell lines, Culture media – Natural and Synthetic, Stem cells, Cryopreservation of cultures. Agarose and Polyacrylamide Gel Electrophoresis, Southern, Northern and Western blotting, Polymerase chain reaction: Allele specific, RAPD & RT PCR.		
Unit 4: Fermentation		10
Different types of Fermentation: Submerged & Solid state; batch, Fed batch & Continuous; Stirred tank, Air Lift, Fixed Bed and Fluidized. Downstream Processing: Filtration, centrifugation, extraction, chromatography, spray drying and lyophilization.		

Unit 5: Application in Health	8
Hybridoma technology, Production of recombinant Proteins: Insulin and growth hormones.	

Animal Cell Biotechnology Lab, ZOOA-DSE(A)-6-1-P

Full Marks 50	**60 Hours**	2 Credits
List of Practical		

1. Packing and sterilization of glass and plastic wares for cell culture.
2. Preparation of culture media.
3. Preparation of genomic DNA from E. coli/animals/ human.
4. Plasmid DNA isolation (pUC 18/19) and DNA quantitation using agarose gel electrophoresis (by using lambda DNA as standard).
5. Techniques: Western Blot, Southern Hybridization, DNA Fingerprinting, PCR, DNA Microarrays (By Photograph).

PART III: SEMESTER 6

DSE2. Animal Biotechnology

ZOOA-DSE(A)-6-2-TH

Full Marks 50	4 Credits	Class
Unit 1: Introduction		5
Organization of *E.coli* and *Drosophila* genome.		
Unit 2: Molecular Techniques in Gene manipulation		23
Recombinant DNA technology, Restriction endonucleases. Cloning Vectors & their features: Plasmids, Phage vectors, Cosmids, Phagemids, BAC, YAC, and HAC. Shuttle and Expression Vectors. Construction of Genomic libraries and cDNA libraries Transformation techniques: Cloning in bacteria and detection technique of clone Agarose and Polyacrylamide Gel Electrophoresis, Southern, Northern and Western blotting, Polymerase chain reaction: Allele specific, RAPD & RT PCR, DNA Fingerprinting		
Unit 3: Genetically Modified Organisms		12
Production of cloned and transgenic animals: Nuclear Transplantation, Retroviral Method, DNA microinjection. Applications of transgenic animals: Production of pharmaceuticals, production of donor organs, knock-out mice.		
Unit 4: Culture Techniques and Applications		10
Animal cell culture, Expressing cloned genes in mammalian cells, Molecular diagnosis of		

genetic diseases (Cystic fibrosis, Sickle cell anaemia, Thalassemia). Dolly &Polly cloning Genetically modified economically important animal Gene Therapy	

Animal Biotechnology Lab, ZOOA-DSE(A)-6-2-P

Full Marks 30	**60 Hours**	2 Credits
List of Practical		

1. Genomic DNA isolation from *E. coli* and Plasmid DNA isolation (pUC 18/19) from *E. coli*
2. To study following techniques through photographs - Southern Blotting, Northern Blotting, Western Blotting, PCR, DNA fingerprinting
3. Project report on animal cloning & Application & ethical Issues.

Students will choice either of ZOOA-DSE(B)-6-1-TH or ZOOA-DSE(B)-6-2-TH

PART III: SEMESTER 6

DSE1. Animal Behaviour and Chronobiology

ZOOA-DSE(B)-6-1-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Patterns of Behaviour		10
Stereotyped Behaviours (Orientation, Reflex); Individual Behavioural patterns; Instinct vs. Learned Behaviour; FAP, Associative learning, classical and operant conditioning, Habituation, Imprinting.		
Unit 2: Social and Sexual Behaviour		20
Social organisation in termites; Communication (dance & pheromones in Bees) Social behaviour: Altruism (Hamilton's rule and concept of haplodiploidy), Cooperation and Selfishness Sexual Behaviour: Sexual dimorphism, Mate choice in peacock, Intra-sexual selection (male rivalry in red deer) Kinship theory: Relatedness & inclusive fitness; parental care in fishes (Nest Building & coast benefit), conflict within families: parent offspring conflict and sibling rivalry		
Unit 3: Chronobiology & Biological Rhythm		20
Types and characteristics of biological rhythms: Short- and Long- term rhythms; Circadian rhythms; Tidal rhythms and Lunar rhythms, Circannual rhythms; Photic and non-photic zeitgebers; Role of melatonin. Biological clock and its adaptive significance. Circannual rhythm in bird migration.		

Animal Behaviour and Chronobiology Lab, ZOOA-DSE(B)-6-1-P

Full Marks 50	**60 Hours**	2 Credits
List of Practical		

1. To study nests and nesting habits of the birds and social insects.
2. To study the behavioural responses of wood lice to dry and humid conditions(demonstration only).
3. To study geotaxis behaviour in earthworm.
4. To study the phototaxis behaviour in insect larvae.
5. Visit to Forest/ Wild life Sanctuary/Biodiversity Park/Zoological Park to study behavioural activities of animals and prepare a short report.
6. Study of circadian functions in humans (daily eating, sleep and temperature patterns).

PART III: SEMESTER 6

DSE2. Fish and Fisheries

ZOOA-DSE(B)-6-2-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Introduction and Classification		**4**
Feeding habit, habitat and manner of reproduction. Classification of fish (upto Subclasses) (Romar, 1959)		
Unit 2: Morphology and Physiology		14
Types of fins and their modifications; Locomotion in fish; Hydrodynamics; Types of Scales, Use of scales in Classification and determination of age of fish; Gills and gas exchange; Swim Bladder: Types and role in Respiration, buoyancy; Electric organ, Bioluminescence		
Unit 3: Fisheries		10
Inland Fisheries; Marine Fisheries; Fishing crafts and Gears; Depletion of fisheries resources; Application of remote sensing and GIS in fisheries; Fisheries law and regulations		
Unit 4: Aquaculture		16
Extensive, semi-intensive and intensive culture of fish; Pen and cage culture; Polyculture; Composite fish culture; Brood stock management; Induced breeding of fish; Management of finfish hatcheries; Preparation and maintenance of fish aquarium; Preparation of compound diets for fish; Role of water quality in aquaculture; Fish diseases: Bacterial, viral and parasitic; Preservation and processing of harvested fish, Fishery by-products		
Unit 5: Fish in research		6
Transgenic fish Zebra fish as a model organism in research		

Fish and Fisheries Lab, ZOOA-DSE(B)-6-2-P

Full Marks 30	**60 Hours**	2 Credits

List of Practical

1. Morphometric and meristic characters of fishes
2. Identification of *Petromyzon, Myxine, Pristis, Exocoetus, Hippocampus, Gambusia, Labeo, Heteropneustes, Anabas*
3. Study of different types of scales (through permanent slides/ photographs).
4. Study of crafts and gears used in Fisheries (Photoghaphs)
5. Water quality criteria for Aquaculture: Assessment of pH, alkalinity, Salinity.
6. Study of air breathing organs in *Channa, Heteropneustes, Anabas* and *Clarias*
7. Project Report on a visit to any fish farm/ pisciculture unit/Zebrafish rearing Lab.

Skill Enhancement courses (SEC)

[A student will choice either ZOOA-SEC(A)-3-1 or ZOOA-SEC(A)3-2]

PART II: SEMESTER 3

SEC-1 Apiculture

ZOOA-SEC(A)-3-1-TH

Full Marks 80	2 Credits	30 Hours
Unit 1: Biology of Bees		**2**
Apis and Non-*Apis* Bee species and their identification. General Morphology of *Apis* Honey Bees Social Organization of Bee Colony		
Unit 2: Rearing of Bees		14
Artificial Bee rearing (Apiary), Beehives – Newton and Langstroth box Bee Pasturage Selection of Bee Species for Apiculture Modern Bee Keeping Equipment Methods of Extraction of Honey (Indigenous and Modern)		
Unit 3: Diseases and Enemies		6
Bee Diseases and Enemies Control and Preventive measures		
Unit 4: Bee Economy		2
Products of Apiculture Industry and its Uses – Honey, Bees Wax, Propolis, Pollen etc.		
Unit 5: Entrepreneurship in Apiculture		6
Bee Keeping Industry – Recent Efforts, Modern Methods in employing artificial Beehives for cross pollination in horticultural gardens		

PART II: SEMESTER 3

SEC-2.Sericulture

ZOOA-SEC(A)-3-2-TH

Full Marks 80	2 Credits	30 Hours
Unit 1: Introduction		**6**
Sericulture: Definition, history and present status; Silk route Types of silkworms, Distribution and Races Exotic and indigenous races Mulberry and non-mulberry Sericulture		
Unit 2: Biology of Silkworm		4
Life cycle of *Bombyx mori* Structure of silk gland and secretion of silk		
Unit 3: Rearing of Silkworms		10
Selection of mulberry variety and establishment of mulberry garden Rearing house and rearing appliances. Disinfectants: Formalin, bleaching powder, RKO Silkworm rearing technology: Early age and Late age rearing Types of mountages Spinning, harvesting and storage of cocoons		
Unit 4: Pests and Diseases		7
Pests of silkworm: Uzi fly, dermestid beetles and vertebrates Pathogenesis of silkworm diseases: Protozoan, viral, fungal and bacterial Control and prevention of pests and diseases		
Unit 5: Entrepreneurship in Sericulture		3
Prospectus of Sericulture in India: Sericulture industry in different states, employment, potential in mulberry and non-mulberry sericulture Visit to various sericulture centres.		

[A student has to choice either ZOOA-SEC(B)-4-1 or ZOOA-SEC(B)4-2]

PART II: SEMESTER 4

SEC-1.Aquarium Fish Keeping

ZOOA-SEC(B)-4-1-TH

Full Marks 80	2 Credits	30 Hours
Unit 1: Introduction to Aquarium Fish Keeping		**2**
The potential scope of Aquarium Fish Industry as a Cottage Industry, Exotic and Endemic species of Aquarium Fishes		
Unit 2: Biology of Aquarium Fishes		10
Common characters and sexual dimorphism of Fresh water and Marine Aquarium fishes such as Guppy, Molly, Sword tail, Gold fish, Angel fish, Blue morph, Anemone fish and Butterfly fish		
Unit 3: Food and feeding of Aquarium fishes		8
Use of live fish feed organisms. Preparation and composition of formulated fish feeds, Aquarium fish as larval predator		
Unit 4: Fish Transportation		5
Live fish transport - Fish handling, packing and forwarding techniques.		
Unit 5: Maintenance of Aquarium		5
General Aquarium maintenance – budget for setting up an Aquarium Fish Farm as a Cottage Industry		

PART II: SEMESTER 4

SEC-2.Medical Diagnostic Technique

ZOOA-SEC(B)-4-2-TH

Full Marks 80	2 Credits	30 Hours
Unit 1: Diagnostics Methods Used for Analysis of Blood		**8**
Blood composition, Differential Leucocyte Count (DLC) using Leishman's stain, Platelet count using haemocytometer, Erythrocyte Sedimentary Rate (ESR), Packed Cell Volume (PCV)		
Unit 2: Diagnostic Methods Used for Urine Analysis		**4**
Urine Analysis: Physical characteristics; Abnormal constituents, Urine culture		
Unit 3: Non-infectious Diseases		**6**
Causes, types, symptoms, complications, diagnosis and prevention of Diabetes (Type I and Type		

II), Hypertension (Primary and secondary), Testing of blood glucose using Glucometer/Kit	
Unit 4: Infectious Diseases	**3**
Causes, types, symptoms, diagnosis and prevention of Tuberculosis and Hepatitis, Malarial parasite (Microscope based and ELISA based)	
Unit 5: Clinical Biochemistry	**1**
Lipid profiling, Liver function test. PSA test	
Unit 6: Clinical Microbiology	**1**
Antibiotic Sensitivity Test	
Unit 7: Tumours	**2**
Types (Benign/Malignant), Detection and metastasis; Medical imaging: X-Ray of Bone fracture, PET, MRI and CT Scan (using photographs).	
Unit 8: Visit to Pathological Laboratory and Submission of Project	**6**

UNIVERSITY OF CALCUTTA

CBCS SYLLABUS FOR ZOOLOGY

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THREE-YEAR GENERAL
DEGREE COURSE OF STUDIES

ZOOLOGY

2018

Outline Structure of CBCS Curriculum For Zoology (General), C.U.

PART I; SEM I				
Subject Code	**Name of Paper**	**Theory**	**Practical**	**Internal assessment**
CC1/GE1	**Animal Diversity**	**50**	**30**	**20**
PART I; SEM II				
CC2/GE2	**Comparative Anatomy & Developmental Biology**	**50**	**30**	**20**
PART II; SEM III				
CC 3/GE3	**Physiology and Biochemistry**	**50**	**30**	**20**
SEC-A (1)	**Apiculture**	**80**	**NA**	**20**
PART II; SEM IV				
CC 4/GE4	**Genetics and Evolutionary Biology**	**50**	**30**	**20**
SEC- B(1)	**Aquarium Fish Keeping**	**80**	**NA**	**20**
PART III; SEM V				
DSE A(1)	**Applied Zoology**	**50**	**30**	**20**
DSE B (1)	**Aquatic biology**	**50**	**30**	**20**
SEC-A (1)	**Sericulture**	**80**	**NA**	**20**
PART III; SEM VI				
DSE A (1)	**Biology of Insect**	**50**	**30**	**20**
DSE B (2)	**Ecology & Wild life Biology**	**50**	**30**	**20**
SEC-B (1)	**Medical diagnosis**	**80**	**NA**	**20**

Abbreviations:

CC: Core Course; DSE A/B: Discipline Specific Elective A/B; SEC A/B: Skill Enhancement Course.

SUBJECT/PAPER CODE FORMAT

4. **Subject Code: ZOO**
5. **Honours Code: G**
6. **Course Code: a) Core Course:CC**
   b) Discipline Specific Elective: DSE-A/DSE-B
   c) Skill Enhancement Course: SEC-A/SEC-B

4. **Semester Code: 1/2/3/4/5/6**
5. **Paper No. Code: 1/2/3…../14**
6. **Paper Component Code: a) Theory:TH, b) Practical: P**

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CBCS ZOOLOGY (GENERAL), Papers & Their Codes

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ZOOG-CC2-2-TH	**Comparative Anatomy & Developmental Biology Theory**	37
ZOOG-CC2-2-P	**Comparative Anatomy & Developmental Biology Lab**	38
ZOOG-CC3-3-TH	**Physiology and Biochemistry Theory**	38
ZOOG-CC3-3-P	**Physiology and Biochemistry Lab**	39
ZOOG-CC4-4-TH	**Genetics and Evolutionary Biology Theory**	39
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ZOOG-DSE(A)-5-1-TH	**Applied Zoology Theory**	40
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ZOOA-DSE(B)-6-2-TH	**Ecology & Wild life BiologyTheory**	44
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Skill Enhancement Course		
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PART I: SEMESTER 1.

CORE COURSE 1.Animal Diversity

ZOOG-CC1-1-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Kingdom Protista		2
General characters and classification up to classes (Levine et. al., 1980); Locomotory Organelles and locomotion in *Amoeba* and *Paramecium*		
Unit 2: Phylum Porifera		2
General characters and classification up to classes (Ruppert and Barnes, 1994, 6th Ed.); Canal System in *Sycon*		
Unit 3: Phylum Cnidaria		2
General characters and classification up to classes (Ruppert and Barnes, 1994, 6th Ed.); Metagenesis in *Obelia*		
Unit 4: Phylum Platyhelminthes		2
General characters and classification up to classes (Ruppert and Barnes, 1994, 6th Ed.); Life history of *Taenia solium*		
Unit 5: Phylum Nemathelminthes		2
General characters and classification up to classes (Ruppert and Barnes, 1994, 6th Ed.); Life history of *Ascaris lumbricoides* and its adaptation		
Unit 6: Phylum Annelida		4
General characters and classification up to classes (Rupert and Barnes, 1994, 6th Ed.); Metamerism in Annelida		
Unit 7: Phylum Arthropoda		4
General characters and classification up to classes (Ruppert and Barnes, 1994, 6th Ed.); Eye in Cockroach, Metamorphosis in Lepidoptera		
Unit 8: Phylum Mollusca		2
General characters and classification up to classes (Ruppert and Barnes, 1994, 6th Ed.); Respiration in *Pila*		
Unit 9: Phylum Echinodermata		4
General characters and classification up to classes (Ruppert and Barnes, 1994, 6th Ed.); Water-vascular system in Asteroidea		
Unit 10: Protochordates		2
General Characters ; Pharynx and feeding mechanism in *Amphioxus*		
Unit 11: Agnatha		2
General features of Agnatha and classification of cyclostomes up to classes (Young, 1981)		

Unit 12: Pisces	4
General features and Classification up to orders (Young, 1981); Osmoregulation in Fishes	
Unit 13: Amphibia	4
General features and Classification up to orders (Young, 1981); Parental care	
Unit 14: Reptiles	4
General features and Classification up to orders (Young, 1981); Poisonous and non-poisonous snakes, Biting mechanism	
Unit 15: Aves	4
General features and Classification up to orders (Young, 1981); Flight adaptations in birds	
Unit 17: Mammals	4
Classification up to orders (Young, 1981); Hair, Horn & Antler, Nail & claw	

Animal Diversity, ZOOG-CC1-1-P

Full Marks: 30	60 Hours	2 Credits

List of Practicals

1. Identification with reasons of the following specimens:

   Amoeba, Euglena, Paramecium, Sycon, Obelia, Aurelia, Metridium, Taenia solium, Ascaris lumbricoides (Male and female), *Aphrodite, Nereis, Hirudinaria, Palaemon, Cancer, Limulus, Apis, Chiton, Dentalium, Unio, Sepia, Octopus, Echinus, Cucumaria* and *Antedon, Balanoglossus, Branchiostoma, Petromyzon, Torpedo, Labeo rohita, Exocoetus, Salamandra, Hyla, Chelone, Hemidactylus, Chamaeleon, Draco, Vipera, Naja*, Bat, *Funambulus*
2. Key for Identification of poisonous and non-poisonous snakes
3. Study of anatomy of digestive system, salivary gland, mouth parts of *Periplaneta*, Study of reproductive system of female cockroach

   An "animal album" containing photographs, cut outs, with appropriate write up about the above mentioned taxa. Different taxa/ topics may be given to different sets of students for this purpose

PART I: SEMESTER 2.

CORE COURSE 2.Comparative Anatomy & Developmental Biology

ZOOG-CC2-2-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Integumentary System		4
Derivatives of integument with respect to glands in Birds & Mammals		
Unit 2: Digestive System		4
Stomach and Dentition		
Unit 3: Respiratory System		6

Brief account of Gills, lungs, air sacs and swim bladder	
Unit 4: Circulatory System	6
Evolution of heart and aortic arches	
Unit 5: Urino-genital System	6
Succession of kidney, Evolution of urino-genital ducts	
Unit 6: Early Embryonic Development	14
Gametogenesis: Spermatogenesis and oogenesis with respect to mammals. Fertilization: Sea-Urchin; Early development of frog; structure of mature egg and its membranes, patterns of cleavage, fate map, up to formation of gastrula; types of morphogenetic movements; Fate of germ layers	
Unit 7: Late Embryonic Development	10
Placenta types and function; Metamorphic events in frog life cycle and its hormonal regulation	

Comparative Anatomy & Developmental Biology Lab, ZOOG-CC2-2-P

Full marks 30 60 hours	**2 Credits**
List of Practical:	
1. Osteology: Limb bones, girdle and vertebra of Pigeon & Guineapig, Mammalian skulls: One herbivorous; Guinea pig and one carnivorous; Dog. 2. Larval stages: Veliger, Nauplius, Trochophore, Mysis. 3. Study of the different types of placenta- histological sections through photomicrographs. 4. Developmental stages of chick embryo: 24 Hrs., 48 Hrs, 72 Hrs., 96 Hrs.	

PART II: SEMESTER 3.

CORE COURSE 3. PHYSIOLOGY AND BIOCHEMISTRY

ZOOG-CC3-3-TH

Full Marks 50	4 Credits	50 Hours
Unit 1: Nerve and muscle		**8**
Structure of a neuron, resting membrane potential, Origin of Action potential and its propagation in myelinated and non-myelinated nerve fibres, Ultra-structure of skeletal muscle, Molecular and chemical basis of muscle contraction		
Unit 2: Digestion		6
Physiology of digestion in the alimentary canal; Absorption of carbohydrates, proteins, lipids		
Unit 3: Respiration		6
Pulmonary ventilation, Transport of Oxygen and carbon		
Unit 4: Cardio-vascular system		6

Composition of blood, Structure of Heart, Origin and conduction of the cardiac impulse, cardiac cycle	
Unit 5: Excretion	6
Structure of nephron, Mechanism of Urine formation; Counter-current Mechanism	
Unit 6:Reproduction and Endocrine Glands	10
Physiology of male reproduction: Histology of testis, hormonal control of spermatogenesis; Physiology of female, reproduction: Histology of ovary, hormonal control of menstrual cycle. Structure and function of pituitary, thyroid, pancreas and adrenal.	
Unit 7: Carbohydrate Metabolism	4
Glycolysis, Kreb's cycle, Glycogenesis, Electron Transport Chain.	
Unit 8: Lipid metabolism	
Beta oxidation of Palmitic acid {saturated (C 16:0)} and Linoleic acid {unsaturated (C 18:2)}	
Unit 9: Protein Metabolism	4
Transamination, Deamination, Urea cycle	
Unit 10. Enzyme	2
Enzyme Classification, factors affecting enzyme action, Inhibition.	

PHYSIOLOGY AND BIOCHEMISTRY Lab; ZOOG-CC3-3-P

Full Marks 30	**60 Hours**	2 Credits
List of Practical		
1. Study of permanent histological sections of mammalian pituitary, thyroid, pancreas, adrenal gland. 2. Study of permanent histological sections of mammalian duodenum, liver, lung, kidney. 3. Qualitative test for carbohydrate samples.		

PART II: SEMESTER 4.

CORE-COURSE 4.Genetics & Evolutionary Biology

ZOOG-CC4-4-TH

Full Marks 50	4 Credits	50 Hours
Unit 1:Mendelian Genetics and its Extension		10
Principles of Inheritance, Chromosome theory of inheritance, Incomplete dominance and co-dominance, Multiple alleles, lethal alleles, sex linked inheritance in *Drosophila* (White eye locus) & Human (Thalassemia).		
Unit 2: Linkage, Crossing Over		8
Linkage and crossing over, Complete & Incomplete Linkage, Recombination frequency as a measure of linkage intensity. Holiday Model		
Unit 3: Mutation		

Chromosomal mutation, Deletion, duplication, inversion, translocation, aneuploidy, gene mutation, induced mutation, types & example	8
Unit 4: Sex determination	8
Genic Balance theory and dosage compensation in *Drosophila*.	
Unit 5: Origin of Life	2
Chemical Origin of life	
Unit 6: Evolutionary Theories	6
Lamarckism, Darwinism, Neo-Darwinism.	
Unit 7: Process of Evolutionary changes	4
Isolating mechanism, Natural Selection.	
Unit 8: Speciation	4
Sympatric, Allopatric, Parapatric	

Genetics and Evolutionary Biology Lab ZOOG-CC4-4-P

Full marks 30	**2 Credits**
List of Practical:	
Verification of Mendelian Ratio using Chi square test. Identification of Human Aneuploidy using photo graph of karyotype. Phylogeny of horse with diagram of limb and skull. Study and identification of Darwin Finches from photographs. Visit to natural history museum and submission of report.	

Discipline specific courses

Elective Course (Any One from DSE-A)

Semester-5

DSE-A

Applied Zoology.ZOOG-DSE-A-5-1-TH

Full Marks 50	Credits 4	50 Hours
Unit I: Host & Parasite Relationship		2
Type of Host, Types of Parasites, Other types of Relations.		
Unit 2: Epidemiology of Diseases		5

Transmission, Prevention and Control of Tuberculosis and Typhoid.	
Unit 3: Parasitic Protozoa	7
Life History and pathogenicity of *Entamoeba histolytica*, *Plasmodium vivax* and *Trypanosoma gambiense.*	
Unit 4: Parasitic Helminthes	8
Life History and pathogenicity of *Alcylostoma duodenale, Wuchereria bancrofti*.	
Unit 5: Insect of Economic Importance	8
Biology, Control and Damage caused by *Heliocoverpa armigera, Pyrilla perpusilla, Sytophilus oryzae* and *Tribolium casteneum*.	
Unit 6: Insect of Medical Importance	2
Medical Importance and control of *Anopheles*	
Unit 8: Animal Husbandry	6
Preservation and artificial insemination in cattle; Induction of early puberty and synchronization of estrus in cattle	
Unit 9: Poultry Farming	6
Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs	
Unit 10: Fish Technology	6
Genetic improvements in aquaculture industry; Induced breeding and transportation of fish seed	

Applied Zoology. ZOOG-DSE-A-5-1-P

Full marks 30	**60 Hours**	2 Credits
List of Practical:		

1. Study of *Plasmodium vivax, Entamoeba histolytica, Trypanosoma gambiense, Ancylostoma duodenale* and *Wuchereria bancrofti* and their life stages through permanent slides/photomicrographs or specimens.
2. Study of arthropod vectors associated with human diseases: *Pediculus, Culex, Anopheles, Aedes*
3. Study of insect damage to different plant parts/stored grains through damaged products/photographs.
4. Identifying feature and economic importance of *Helicoperva; Heliothis armigera,Papilio demoleus, Pyrilla perpusilla*, *Callosobruchus chinensis, Sitophilus oryzae* and *Tribolium castaneum*
5. Visit to poultry farm or animal breeding centre. Submission of visit report
6. Maintenance of freshwater aquarium(demonstration only)

Discipline specific courses

Elective Course (Any One from DSE-A)

Semester-5

DSE-A

AQUATIC-BIOLOGY. ZOOG-DSE-A-5-2-TH

Full Marks 50	**Credits 4**	**Class 60**
Unit 1: Aquatic Bionics		15
Brief introduction of the aquatic biomes: Freshwater ecosystem; lakes, wetlands, streams and rivers, estuaries, intertidal zones, oceanic pelagic zone, marine benthic zone and coral reefs.		
Unit 2: Freshwater Biology lakes		15
Origin and classification, Lake as an Ecosystem, Lake morphometry, Physico-chemical Characteristics: Light, Temperature, Thermal stratification, Dissolved Solids, Carbonate, Bicarbonates, Phosphates and Nitrates, Turbidity; dissolved gases; Oxygen, Carbon dioxide. Nutrient Cycles in Lakes-Nitrogen, Sulphur and Phosphorous. **Streams:** Different stages of stream development, Physico-chemical environment, Adaptation of hill-stream fishes.		
Unit 3: Marine Biology		15
Salinity and density of Sea water, Continental shelf, Adaptations of deep sea organisms, Coral reefs, Sea weeds.		
Unit 4: Management of Aquatic Resources		15
Causes of pollution: Agricultural, Industrial, Sewage, Thermal and Oil spills, Eutrophication, Management and conservation ;legislations, Sewage treatment Water quality assessment - BOD and COD		

AQUATIC BIOLOGY. ZOOG-DSE-A-5-2-P

Full Marks 30	60 Hours	2 Credits

1. Determine the area of a lake using graphimetric and gravimetric method.
2. Identify the important macrophytes, phytoplanktons and zooplanktons present in a lake ecosystem.
3. Determine the amount of dissolved Oxygen, and free Carbon dioxide, in water collected from a nearby lake / water body.
4. Visit to any aquatic Ecosystem and preparation and submission of report.

Discipline specific courses

Elective Course (Any One from DSE-B)

Semester-6

DSE-B

Biology of Insect. ZOOG-DSE-B-6-1-TH

Full Marks 50	Credits 4	50 Hours
Unit I: Introduction to Insects		6
General Features of Insects, Morphological features, Head, Eyes, Types of antennae, Mouth parts with respect to feeding habits		
Unit II: Concept of Vectors		6
Brief introduction of Carrier and Vectors; mechanical and biological vector, Reservoirs, Host-vector relationship, Adaptations as vectors, Host Specificity		
Unit III: Insects as Vectors		8
Classification of insects up to orders, detailed features of orders with insects as vectors - Diptera, Siphonaptera, Siphunculata, Hemiptera		
Unit IV: Dipteran as Disease Vectors		14
Dipterans, as important insect vectors - Mosquitoes, Sand fly, Houseflies; Study of mosquito-borne diseases - Dengue, Viral encephalitis, Filariasis; Control of mosquitoes.		
Unit V: Siphonaptera as Disease Vectors		6
Fleas as important insect vectors; Host-specificity, Study of Flea-borne diseases - Plague, Typhus fever; Control of fleas		
Unit VI: Siphunculata as Disease Vectors		4
Human louse; Head, Body and Pubic louse as important insect vectors; Study of louse-borne diseases -Typhus fever, Relapsing fever, Trench fever; Control of human louse		
Unit VII: Hempitera as Disease Vectors		6
Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanical vectors,Control and prevention measures		

Biology of Insect. ZOOG-DSE-B-6-1-P

Full marks 25	**60 Hours**	2 Credits
List of Practical		
1. Study of different kinds of mouth parts of insects 2. Study of following insect vectors through permanent slides/photographs: *Aedes, Culex, Anopheles, Pediculus humanuscapitis, Pediculus humanuscorporis, Phlebotomus argentipes, Musca domestica,* 3. Submission of a project report on any one of the insect vectors and disease transmitted by the insect.		

Ecology& Wild life Biology;ZOOG-DSE-B-6-2-TH

Full Marks 50	Credits 4	Class 60
Unit 1: Introduction to Ecology		4
Ecosystem, Autecology and synecology, Levels of organization, Laws of limiting factors, Study of Physical factors, The Biosphere.		
Unit 2: Population		20
Attributes of population: Life tables, fecundity tables, survivorship curves, dispersal and dispersion. Geometric, exponential and logistic growth, equation and patterns, Population regulation: density-dependent and independent factors,		
Unit 3: Community		11
Community characteristics: species diversity, abundance, dominance, richness, Vertical stratification, Ecotone and edge effect.		
Unit 4: Ecosystem		10
Types of ecosystem with an example in detail, Food chain: Detritus and grazing food chains, Linear and Y-shaped food chains, Food web, Energy flow through the ecosystem, Ecological pyramids and Ecological efficiencies		
Unit 5: Wild Life		5
Wildlife Conservation (in-situ and ex-situ conservation)**:** Necessity for wildlife conservation; National parks & sanctuaries, Tiger conservation - Tiger reserves in India; Management challenges in Tiger reserve		

Ecology& Wild life Biology;ZOOG-DSE-B-6-2-P

Full marks 30	**60 Hours**	2 Credits
List of Practical		
1. Identification of flora, mammalian fauna, avian fauna 2. Demonstration of basic equipment needed in wildlife studies use, care and maintenance (Compass, Binoculars, Spotting scope, Range Finders, Global Positioning System, Various types of Cameras and lenses) 3. Familiarization and study of animal evidences in the field; Identification of animals through pug marks, hoof marks, scats, pellet groups, nest, antlers, etc. 4. Study of an aquatic ecosystem: Phytoplankton and zooplankton, Measurement of area, temperature, salinity, determination of pH, and Dissolved Oxygen content (Winkler's method), Chemical Oxygen Demand and free CO_2		

Skill Enhancement Elective Courses (SEC)

SEMESTER –3

SEC-A

APICULTURE; ZOOG-SEC-A-3-1-TH

Full Marks 80	Credits 2	30 Hours
Unit 1: Biology of Bees		2
Classification and Biology of Honey Bees Social Organization of Bee Colony		
Unit 2: Rearing of Bees		14
Artificial Bee rearing; Apiary, Beehives - Newton and Langstroth, Bee Pasturage; Selection of Bee Species for Apiculture; Bee Keeping Equipment; Methods of Extraction of Honey; Indigenous and Modern		
Unit 3: Diseases and Enemies		6
Bee Diseases and Enemies Control and Preventive measures		
Unit 4: Bee Economy		2
Products of Apiculture Industry and its Uses ;Honey, Bees Wax, Propolis, Pollen etc		
Unit 5: Entrepreneurship in Apiculture		6
Bee Keeping Industry - Recent Efforts, Modern Methods in employing artificial Beehives for cross		

Skill Enhancement Elective Courses (SEC)

SEMESTER – 4

AQUARIUM FISH KEEPING; ZOOG-SEC-B-4-2-TH

Full Marks 80	Credits 2	30 Hours
Unit l: Introduction to Aquarium Fish Keeping		2
The potential scope of Aquarium Fish Industry as a Cottage Industry, Exotic and Endemic species of Aquarium Fishes		
Unit 2: Biology of Aquarium Fishes		10
Common characters and sexual dimorphism of Fresh water and Marine Aquarium fishes such as Guppy, Molly, Sword tail, Gold fish, Angel fish, Blue morph, Anemone fish and Butterfly fish		
Unit 3: Food and feeding of Aquarium fishes		8
Use of live fish feed organisms. Preparation and composition of formulated fish feeds		
Unit 4: Fish Transportation		5
Live fish transport - Fish handling, packing and forwarding techniques.		
Unit 5: Maintenance of Aquarium		5
General Aquarium maintenance - budget for setting up an Aquarium Fish Farm as a Cottage		

Skill Enhancement Elective Courses (SEC)

SEMESTER –5

SEC-A

Sericulture; ZOOG-SEC-A-5-3-TH

Full Marks 80	Credits 2	30 Hours
Unit 1: Introduction		6
Sericulture: Definition, history and present status; Silk route; Types of silkworms, Distribution and Races Exotic and indigenous races Mulberry and non-mulberry Sericulture		
Unit 2: Biology of Silkworm		4
Life cycle of *Bombyx mori;* Structure of silk gland and secretion of silk		
Unit 3: Rearing of Silkworms		10
Selection of mulberry variety and establishment of mulberry garden Rearing house and rearing appliances Disinfectants: Formalin, bleaching powder, RKO Silkworm rearing technology: Early age and Late age rearing Types of mountages; Spinning and harvesting and storage of cocoons.		
Unit 4: Pests and Diseases		7
Pests of silkworm: Uzi fly, dermestid beetles and vertebrates Pathogenesis of silkworm diseases: Protozoan, viral, fungal and bacterial Control and prevention of pests and diseases		
Unit 5: Entrepreneurship in Sericulture		3
Prospectus of Sericulture in India: Sericulture industry in different states, employment, potential in mulberry and non-mulberry sericulture. Visit to various sericulture centres.		

Skill Enhancement Elective Courses (SEC)

SEMESTER –6

SEC-B

Medical diagnosis; ZOOG-SEC-B-6-4-TH

Full Marks 80	Credits 2	Class 30
Unit 1: Diagnostics Methods Used for Analysis of Blood		8
Blood composition, Preparation of blood smear and Differential Leucocyte Count (D.L.C) using Leishman's stain, Platelet count using haemocytometer, Erythrocyte Sedimentation Rate (E.S.R)		
Unit 2: Diagnostic Methods Used for Urine Analysis		4
Urine Analysis: Physical characteristics; Abnormal constituents, Urine culture		
Unit 3: Non-infectious Diseases		6
Causes, types, symptoms, complications, diagnosis and prevention of Diabetes (Type I and Type II), Hypertension (Primary and secondary), Testing of blood glucose using Glucometer/Kit		
Unit 4: Infectious Diseases		3
Causes, types, symptoms, diagnosis and prevention of Tuberculosis and Hepatitis, Malarial parasite		

(Microscope based and ELISA based)	
Unit 5: Clinical Biochemistry	1
Lipid profiling, Liver function test. PSA test	
Unit 6: Clinical Microbiology	1
Antibiotic Sensitivity Test	
Unit 8: Tumours	2
Types (Benign/Malignant), Detection and metastasis; Medical imaging: X-Ray of Bone fracture,	
Unit 9: Visit to Pathological Laboratory and Submission of Project	5

REFERENCE BOOKS

Non Chordata

Anderson DT (Ed.) 2001. Invertebrate Zoology. 2nd Ed. Oxford University Press.
Barnes R. S. K. - The Diversity of Living Organisms; Blackwell Science
Barrington EJW. 1981. Invertebrate Structure and function. 2nd Ed. ELBS & Nelson.
Bernays, E. A., & Chapman, R. F., Host Selection by Phytophagous insects, Chapman & Hall
Blackwelder RE. 1967. Taxonomy- A text and reference book. John Wiley & Sons.
Brusca RC , Brusca GJ. 2002. Invertebrates. 4th Ed. Sinauer Associates
Chaki K C; Kundu G & Sarkar S. - Introduction to General Zoology (Vol. 1), NCBA, Kolkata
Hyman LH. 1951. The Invertebrates (Vol-I). Mc.Graw Hill Book Company.
Jordan EL,Verma PS. 2006. Invertebrate Zoology. S. Chand & Com. New Delhi.
Kapoor VC. 2008. Theory and practice of animal taxonomy. 6th Ed. Oxford & IBH Pub
Kotpal RL. 1988 – 1992. Protozoa, Porifera, Coelentereta, Annelida, Arthropoda, Mollusca, Echinodermata,
Mayr E, Ashlock PD. 1991. Principles of Systematic Zoology. 2nd Ed., McGraw-Hill.
Mayr E. Principle of Systematic Zoology (TATA McGraw Hill)
Meglitsch PA, Schram FR. 1991. Invertebrate Zoology. Oxford University Press.
Moore J. - An introduction to the Invertebrates; Cambridge Univ. Pr.
Nigam H.C. - Biology of non-chordates; Vishal Pub.
Parker TJ, Haswell W. 1972. Text Book of Zoology, Volume I. Macmillan Press, London.
Pechenik JA. 1998. Biology of the Invertebrates, 4th Ed. McGraw Hill.
Rupert E E, Barnes R D. 2006. Invertebrate Zoology, VIII Ed. (Harcourt Asia)
Ruppert E E, Fox R, Barnes R D. 2003. Invertebrate Zoology: a Functional Evolutionary Approach. (Brooks Cole)
Ruppert EE, Fox R, Barnes RD. (1991). Invertebrate Zoology: a Functional Evolutionary Approach. Brooks Cole.
Simpson G. G. - Principles of Animal Taxonomy (Oxford IBH)
Sinha AK, Adhikari S, Ganguly BB. Biology of Animals. Vol. I. NCBA
Villee, C. A., W. F. Walker and R. D. Barnes - General Zoology; Saunders College Pub.
Wilmer P. - Invertebrate inter relationship; Cambridge Univ. Pr.
Wood R. - Reef evolution; Oxford Univ. Pr

Chordata, Comparative Anatomy

Arora MP. *Chordata I. Himalaya Pub Hous*
Chaki K C; Kundu G & Sarkar S. - Introduction to General Zoology (Vol. 2), NCBA, Kolkata
Hilderbrand M, Gaslow GE. Analysis of Vertebrate Structure, John Wiley and Sons
Jordan EL, Verma PS. 2003.Chordate Zoology. S.Chand & Company Ltd. New Delhi.
Kardong K V. 2005. Comparative Anatomy of Vertebrates, Function and Evolution; McGraw-Hill
Kardong KV. 2002.Vertebrates: Comparative anatomy, function evolution. Tata McGraw Hill.
Kent GC, Carr RK. 2001.Comparative anatomy of the Vertebrates. 9th Ed. Mc Graw Hill.

Marieb, E. ;1998. Human Anatomy and Physiology, IV Edition, Addison-Wesley.
Norman, J.R. A history of Fishes, Hill and Wang Publishers
Parker TJ, Haswell W. 1972. Text Book of Zoology, Volume II: Marshall and Willam Eds. Macmillan Pr.
Pough H, Christine MJ, Haiser B. 2002. Vertebrate life, VIII Edition, Pearson Internatl.
Romer AS, Parsons TS. 1986. The vertebrate body. 6th Ed. Saunders College Publishing
Sinha KS, Adhikari S, Ganguly BB. 2001. Biology of Animals. Vol. II. NCBA
Young JZ. 2004. The Life of Vertebrates. III Edition. Oxford University press

Molecular Biology

Alberts B et al. 2008. Molecular Biology of the Cell. V Edition, Garland publishing Inc.
Allison LA. 2007. Fundamental Molecular Biology. Blackwell Publishing. W.H. Freeman
Bergstorm CT, Dujatkin LA. 2012. Evolution. 1st Edn. W.W. Norton and Co.
Karp G. 2008. Cell and Molecular biology: Concepts and Application. 5th Edn, John Wiley.
Lackie JM. 2013. Dictionary of Molecular Biology. Academic Press.
Lodish, B, Matsudaira, K B, Plough, A and Martin ;2016. Molecular Cell Biology. W.H. Freeman
Meyers R.A. – Molecular Biology and Biotechnology; VCH Pub.
Pal A. 2011. Textbook of Cell and Molecular Biology 3rd Edn, Books and Allied, Kolkata.
Russel PJ. 2010. iGenetics: A Molecular Approach, Pearson Benjamin
Strachan T. & A. Read – Human Molecular Genetics; BIOS Scientific
Turner, McLennan, Bales & White ;2005. Instant Notes in Molecular Biology. Taylor Francis
Twyman – Advanced Molecular Biology; Springer
Watson D et al. 2008. Molecular Biology of the Gene, VI Edition, Cold Spring Harbor Lab. Press
Watson J. D. – Molecular Biology of the gene; Pearson

Cell Biology, Genetics, Histology

Banerjee P. K. – Problems on Genetics, Molecular Genetics and evolutionary genetics; NCBS
Becker W. M., L. J. Kleinsmith, J. Hardin – The World of Cell
Cohen N. – Cell Structure, Function and Metabolism; Hodder & Stoughton
Cooper G M – Cell Biology; Sinauer
Cooper G M, Hausman RE. 2009. The Cell: A Molecular Approach. V Ed. ASM Press and Sunderland
Cormack DH. 2003. PDQ Histology. B.C. Decker Ins., London.
Elrod S. and W. Stansfield – Genetics; Schaum
Eroschenko VP. 2008. Atlas of Histology with Functional correlations. Lippincott & Wilkins.
Gillespie J H. 1998. Population Genetics: a Concise Guide. John Hopkins Univ Press.
Hardin J, Bertoni G, Kleinsmith JL. 2012. Becker's World of the Cell, Pearson Benjamin Cummings.
Harvey L. 2004. Molecular Cell Biology. 5th Edn. W.H. Freeman
Hutchison C. & D.M. Glover – Cell cycle control; IRL Oxford Univ.
Junqueria LC, Carneiro J. 2005. Basic histology text and atlas
Klug W S, Cummings MR, Spencer CA. 2012. Concepts of Genetics. Xth Ed. Benjamin Cummings
Lewin B. 2008. Gene IX. Joned and Barlett.
Masters J R W – Animal Cell Culture – a practical approach; Oxford Univ. Pr.
Morgan S. J. & D. C. Darling – Animal cell culture; Oxford
Plopper G D, Sharp, Siroski, E (2015) Lewin's Cell 3rdEdition—Johns & Bartlett Publishers
Pollard MD, Earnshaw W C, Lippincott-Schwartz. 2007. Cell Biology. 2nd Edn Saunders. Press
Robert A. – Biology of Cancer Weinberg. 2nd edition
Ross M H, Pawlina W. 2010. Histology: A Text and Atlas. Lippincott Williams and Wilkins
Roychoudhuri S – A Text Book of Genetics & Molecular Biology; NCBA
Snustad D P, Simmons MJ. 2009. Principles of Genetics. V Edition. John Wiley and Sons Inc
Strickberger M. W – Genetics; Macmillam
Tamarin R. H. – Principles of Genetics; McGraw Hill
Weinberg R A. 2014. Biology of Cancer. 2nd edition. Garland Science, Taylor & Francis
Winter P. C., G. I. Hickey & H. L. Fletcher – Genetics; Viva

Animal Physiology, Nutrition

Bamji M S, Rao N P, and Reddy V. Text Book of Human Nutrition; 2009; Oxford & IBH Publishing

Fox S I. 2011. Human Physiology. 12th Edn. Mc Graw Hill

Ganong's Review of Medical Physiology; McGraw Hill

Gibney et al. Public Health Nutrition; 2004; Blackwell Publishing

Gunstream SE. 2010. Anatomy and Physiology with integrated study guide. Mc Graw Hill.

Guyton AC, Hall JE. 2006. Textbook of Medical Physiology. Hercourt Asia P Ltd.

Guyton, A.C. and Hall, J.E.; 2011. Textbook of Medical Physiology, XII Edition, Saunders Company

Hall JE. 2015. Guyton and Hall Textbook of Medical Physiology. Saunders publication.

Hill RW, Wyse GA, Anderson M. 2012. Animal Physiology. 3rd Edn. Sineuer Asso

Hoar W. S. – General and Comparative Physiology; PHI

Kesar, S. and Vashisht, N.; 2007. Experimental Physiology, Heritage Publishers.

Lakra P, Singh MD. Textbook of Nutrition and Health; First Ed; 2008; Academic Excellence.

Manay MS, Shadaksharaswamy. Food-Facts and Principles; 1998; New Age International. P Ltd.

McCue, D.–Comparative Physiology of Fasting, Starvation, and Food Limitation; Springer

Metzler DE. 2001. The chemical reactions of living cells – Academic Press.

Mudambi, SR and Rajagopal, MV. Fundamentals of Foods, Nutrition and Diet Therapy; 5th Ed; New Age International Publishers

Prosser C. L. and F. A. Brown – Comparative Animal Physiology; Saunders

Randall D , Burggren W. 2001. Eckert Animal Physiology by. 4th edition. W. H. Freeman.

Refinetti R. 2000. Circadian Physiology. CRC Press, Boca Raton.

Schmidt-Neilson K – Animal Physiology – Adaptation & Environment, Cambridge University Pr

Sembulingam K, Sembulingam P. 2012. Essentials of Medical Physiology. Jaypee Pub, New Delhi

Sherwood L. 2013. Human Physiology from cells to systems. 8th Edn., Brooks & Cole

Srilakshmi B. Nutrition Science; 2002; New Age International ;P Ltd.

Swaminathan M. Handbook of Foods and Nutrition; Fifth Ed; 1986; BAPPCO.

Tortora, G.J. and Derrickson, B.H.; 2009. Principles of Anatomy and Physiology, XII Ed, Wiley and Sons, Inc.

Vander A, Sherman J, Luciano D. 2014. Vander's Human Physiology: The Mechanism of Body Function. XIII Edn. McGraw Hills

Wardlaw GM, Hampl JS. Perspectives in Nutrition; Seventh Ed; 2007; McGraw Hill.

Widmaier, E.P., Raff, H. and Strang, K.T. ;2008. Vander's Human Physiology, XI Edition, McGraw Hill

Biochemistry

Berg J. & G. Tomaselli – A Clinical Companion to Accompany Biochemistry –; Freeman & Co

Berg JM, Tymoczko JL, Stryer L.2007.Biochemistry, VI Edition, W.H.Freeman and Co., New York.

Campbell MK, Farrell SO. 2012. Biochemistry. 7th Edn. Brooks and Cole.

Chatterjee MN, Shinde R. 2012. A Textbook of Medical Biochemistry. 8th Edn. Jaypee

Conn E. E. & P. K. Stumpf – Outlines of Biochemistry –(Wiley Eastern

Cox MM, Nelson DL. 2008. Lehninger's Principles of Biochemistry, W.H. Freeman & Co., NY

Das D. 2000. Biochemistry. NCBA, Kolkata

Deb A. C. – Fundamentals of Biochemistry; NCBA

Hames BD, Hooper NM. 2000. Instant Notes in Biochemistry, II Edition, BIOS Scientific

Harper's Illustrated Biochemistry; McGraw Hill

Jain JL, Jain N, Jain S. 1979. Fundamentals of Biochemistry. S. Chand Pub. N. Delhi

Lehninger Principle of Biochemistry – D. L. Nelson & M. M. Cox; Maxmillan

Maheswari N. 2008. Clinical Biochemistry. Jaypee Pub., New Delhi

Murray RK et al. 2009. Harper's Illustrated Biochemistry, 28th Edition, McGraw- Hill Co.

Nelson D. L. & M. M. Cox Lehninger Principle of Biochemistry – Maxmillan

Saltsman K., J. Berg & G. Tomaselli – A clinical companion to accompany biochemistry – Freeman

Sathyanarayana U, Chakrapani. 2002. Biochemistry –Books & Allied ;P Ltd, Kolkata

Voet D, Voet JG. 2004. Biochemistry –3rd edition, 2004, John Wiley & Sons, Inc.

Zubay GL. 1998. Biochemistry, 4th edition, Mc Graw-Hill.

Economic Zoology: Apiculture, Sericulture

Bisht D.S., Apiculture, ICAR Publication.
Chaudhuri S. 2017. Economic Zoology. Kolkata: New Central Book Agency ;PLtd.
Chun and Chen Da-Chung ;1988 Silkworm Rearing; Pub. By FAO, Rome.
Cramp D. 2012. The Complete Step by Step Book of Beekeeping. Anness Publishing.
Econ Handbook of Silkworm Rearing: Agriculture and Technical Manual-1, Fuzi Pub. Co. Ltd.,
Jolly, M. S: Appropriate Sericultural Techniques
Krishnaswamy, Improved Method of Rearing Young age silkworm; 1986 S., Bangalore
Mathews G. 2011. Integrated Vector Management: Controlling Vectors of Malaria and Other Insect Vector Borne Diseases. Wiley-Blackwell
Narasimhanna MN. 1988. Manual of Silkworm Egg Production;, CSB, Bangalore.
Prost PJ. 1962. Apiculture. Oxford and IBH, New Delhi.
Rangaswami G. 1976. Manual on Sericulture; Food and Agriculture Organisation, Rome
Sarkar S; Kundu G & Chaki K C - Introduction to Economic Zoology; NCBA, Kolkata
Sengupta, K, ;1989 A Guide for Bivoltine Sericulture
Singh S. Beekeeping in India, Indian council of Agricultural Research, New Delhi.
Ullal SR, Narasimhanna MN. Handbook of Practical Sericulture: CSB, Bangalore

Economic Zoology: Fish & Fisheries, Aquarium Fisheries

Bone Q and R Moore, Biology of Fishes, Talyor and Francis Group, CRC Press, U.K.
Chaudhuri. S, 2017: Economic Zoology, NCBS
Evans D. H. and J. D. Claiborne, The Physiology of Fishes, Taylor and Francis Group, CRC Press, UK
Khanna S.S. and H.R. Singh, A text book of Fish Biology and Fisheries, Narendra Publishing House
Nelson JS. 2006. Fishes of the World, 4th Edn. Wiley.
Srivastava, C.B.L. Fish Biology, Narendra Publishing House
von der Emde, R.J. Mogdans and B.G. Kapoor. The Senses of Fish: Adaptations for the Reception of Natural Stimuli, Springer, Netherlands

Immunology

Abbas K A, Lechtman H Andrew. 2003. Cellular and Molecular Immunology. Saunders Publication.
Abbas KA, Andrew, LH. 2011. Basic Immunology: Functions and Disorders of Immune System. Saunders Elsevier
Delves PJ, Martin SJ, Burton DR, Roitt I M. 2006. Roitt's Essential Immunology. Blackwell Pub.
Kindt TJ, Goldsby RA, Osborne BA, Kuby J 2006. Immunology, W.H. Freeman and Company.
Mohanty SK , Leela KS. 2014. Text book of Immunology. 2nd Edn. Jaypee Pub. N. Delhi
Parija SC. 2012. Text book of Microbiology and Immunology. Elsevier.
Playfair, JHL, Chain BM 2001. Immunology at a glance. 7 th Edn. Blackwell Pub.
Reed JC, Green DR. 2011. Apoptosis: Physiology and Pathology. Cambridge University.
Shetty N. 2005. Immunology: Introductory Textbook, New Age International Pub.
Virella G. 2007. Medical Immunology, Informa Healthcare.

Ecology, Wild life, conservation

Begon M, Harper J L, Townsend CR. 2006. Ecology: Individuals, Populations & communities. 4th Ed. Blackwell sc.
Bookhout TA. 1996. Research & Management Techniques for Wildlife & Habitats, WLS, Allen
Cain M L, Bowman W D and Hacker S D. 2013. Ecology. 3rd ed. Sinauer associates.
Caughley G, Sinclair ARE. 1994. Wildlife Ecology and Management. Blackwell Science.
Chapman RL, Reiss MJ. 2000. Ecology - Principles & Application. Cambridge University Press.
Colinvaux P. 1993. Ecology 2. John Wiley & Sons, Inc. New York.
Faurie C, Ferra C, Medori P, Devaux J. 2001. Ecology-Science and Practice. Oxford & IBH Pub. Company.
Ghosh, A., S. P. Agarwala & B. Sau Loss of biodiversity and its ethical implications – Sadesh

Hunter ML, Gibbs JB, Sterling EJ. 2008. Problem-Solving in Conservation Biology and Wildlife Management: Exercises for Class, Field, and Laboratory. Blackwell Publishing
Hunter, M. L., J. James & P. Gibbs – Fundamentals of Conservation Biology – John Willey & Sons
Kormondy EJ. 2002. Concepts of Ecology. 4th Indian Reprint, Pearson Education.
Krebs CJ. 2016. Ecology: The Experimental Analysis of Distribution and Abundance. Pearson India Edcn Ltd.
Mackenzie, A, A. S. Ball & S. R. Virdee – Ecology – (Viva)
Majupuria T. C. – Wildlife of India – Techpress, Bangkok
Molles Jr. MC. 2005. Ecology: Concepts and Applications. 3rd Ed. McGraw- Hill.
Mukherjee A. K. – Endangered animals of India – Z.S.I
New T. R. – Invertebrate Surveys for Conservation – Oxford Univ. Pr.
Odum EP, Barret GW. 2017. Fundamentals of Ecology. 15th Indian reprint. Cengage learning India Pltd.
Odum EP. 2008. Fundamentals of Ecology. Brooks/Cole
Ricklefs RE, Miller, GL. 2000. Ecology. 4th Ed. W. H. Freeman & Company.
Russel PJ, Wolfe LS, Hertz PE, Starr C, McMillan B. 2008. Ecology.
Saha G. K. & S. Majumdar – Threatened Mammals of India – Daya Publication House
Saha GK, Mazumdar S. 2017. Wildlife Biology : an Indian Perspective, PHI Learning,
Saharia VB. 1998. Wildlife in India. Natraj Publishers.
Smith TM, Smith R L. 2006. Elements of Ecology. 6th Ed. Pearson Education.
Sodhi NS, Ehlich PR. 2010. Conservation Biology for All. Oxford University Press.
Stiling P. 2009. Ecology- Theories and Applications. 4th Ed. Prentice Hall of India.
Sutherland WJ.2000. The Conservation Handbook: Research, Management & Policy. Blackwell Sc
Townsand, C.; J. L. Harper, M. Bagon – Essentials of Ecology
Van Dyke F. 2008. Conservation Biology: Foundations, Concepts, Application. 2nd Ed. Springer Science
Wild life (Protection) Act 1972 – Wild life Society of India (Nataraj Publication)
Wilson, E. O. – Biodiversity – National Academic Press
Woodroffe R., Thirgood S, Rabinowitz A. 2005. People and Wildlife, Conflict or Co-existence? Cambridge Univ. Pr

Environmental biology

Agarwal MP. Solar energy. S Chand and Co. Ltd.
Boyle G. 2004. Renewable Energy, Power for a sustainable future. Oxford University Press
Cutter, S.L., Environmental Risk and Hazards, Prentice-Hall of India Pvt. Ltd., New Delhi, 1999.
Freedman B. 1989. Environmental Ecology. Academic press, Inc.
Jayakumar P. 2009. Solar Energy: Resource Assessment Handbook.
Joseph F L & B D Louver - Health and Environmental Risk Analysis fundamentals with applications, Prentice Hall, New Jersey1997.
Kasperson, J.X. , Kasperson, R.E. and Kasperson, R.E., Global Environmental Risks, V.N. Univ Pr, New York, 2003.
Kofi Asante Duah "Risk Assessment in Environmental management", John Wiley and sons, Singapore, 1998.
Kolluru R, Bartell S, Pitblado R, Risk Assessment and Management Handbook, McGrawHill Inc., New York, 1996.
Park – Environmental Biology
Saha G. K. – Wetland: Crisis and options; (Astral)
Walker, C. H., S. P. Hopkin, R. M. Sibley & D. B. Peakall Principles of Ecotoxicology; Taylor & Francis
Rai GD. 2004. Non-conventional energy sources. Khanna Publishers, New Delhi
Miller T, Spoolma SE. 2013. Environmental Science. Delhi: Cengage learning India Private limited.

Parasitology

Ahmed N, Dawson M, Smith C, Wood Ed. 2007. Biology of Disease. Taylor and Francis Group.
Arora D R, Arora B. 2001. Medical Parasitology. II Edition. CBS Publications and Distributors
Bogitsch B J, Carter CE, Oeltmann TN. 2013. Human Parasitology. 4th Edn. Elsevier.
Bose M. 2017. Parasitoses and zoonoses. New Central Book Agency.
Chakraborty P. 2016.. Textbook of Medical parasitology, 3rd edition. New Central Book Agency.
Chatterjee K D. 2009. Parasitology: Protozoology and Helminthology. XIII Edition, CBS Publishers
Dailey MD. 1996. Meyer, Olsen & Schmidt's Essentials of Parasitology. W.C. Brown Publishers
Gunn A, Pitt SJ. 2012. Parasitology: an Integrated Approach. Wiley Blackwell.

John DT, Petri WA. 2006. Markell and Voge's Medical Parasitology. Elsevier.
Marr JJ, Nilsen TW, Komuniecki RW. 2003. Molecular Medical Parasiology. 2nd Edn. Academic Press.
Muller R, Wakelin D. 2002. Worms and Human Disease. CAB International Publication.
Noble ER, Noble GA. 1982. Parasitology: The biology of animal parasites. Lea & Febiger
Paniker CKJ, Ghosh S. [Ed]; 2013. Paniker's Text Book of Medical Parasitology. Jaypee
Parija SC. 2013. Textbook of medical parasitology, protozoology & helminthology II Edition, All India Publishers and Distributers, Medical Books Publishers, Chennai, Delhi.
Prakash, G.; 2012. Lab Manual on Blood Analysis and Medical Diagnostics, S. Chand and Co Ltd.

Vector & Biology of Insect

Chandra G. 2000. Mosquito. Sribhumi Publication Co. Kolkata
Chapman RF. 1998. The Insects: Structure and Function. IV Edition, Cambridge University Press
Klowden, M. J., Physiological system in Insects, Academic Press, USA
Gullan, P. J. and Cranston, P. S., The Insects, An outline of Entomology, Wiley Blackwell, UK
Hati A. K., Medical Entomology, Allied Book Agency, 2010
IMM's AD. 1977. A General Text Book of Entomology. Chapman & Hall, UK
Nation, J. L., Insect Physiology and Biochemistry, CRC Press, USA
Pedigo LP. 2002. Entomology and Pest Management. Prentice Hall Publication
Saunders DS. 2002. Insect Clocks. Elsevier Science.
Snodgrass, R. E., Principles of Insect Morphology, Cornell Univ. Press, USA
Wilson, E. O., The Insect Societies, Harward Univ. Press, UK
Borror, D. J., Triplehorn, C. A., and Johnson, N. F. Introduction to the study of insects, Saunders Pub

Endocrinology

Fox T, Brooks A, Baidya B. 2015. Endocrinology. JP Medical, London.
Gardner DG, Shoback D. 2011. Greenspan's Basic and Clinical Endocrinology. McGraw Hill Lange.
Goodendocr man HM. 2000. Basic Medical Endocrinology. Academic Press.
Jameson JL. 2010. Harrison's Endocrinology. McGraw Hill
Melmed S, Conn PM. 2005. Endocrinology: Basic and Clinical Principles. Humana Press.
Melmed S, Polonsky K, Larsen PR, Kronenberg H. 2016. William's Text Book of Endocrinology. Elsevier.
Molina PE. 2013. Endocrine Physiology. McGraw Hill Lange.
Neal JM. 2000. Basic Endocrinology; an Interactive Approach. Blackwell Science.
Norris DO. 2007. Vertebrate Endocrinology. 4th Edn. Elsevier Academic Press
Strauss JF, Barbieri RL. 2014. Yen & Jaffe's Reproductive Endocrinology. Elsevier Sounders

Reproductive, Developmental Biology

Carlson BM. 2014. Human Embryology and Developmental Biology. 5th Edn. Elsevier..
Das N. 2012. Fundamental Concept of Developmental Biology. New Central Book Agency
Dudek RW, Fix JD. 2013. BRS Embryology. 3rd Edn. Lippincoat Williams Wilkins
Gardner DK. 2006. In Vitro Fertilization: a Practical Approach. CRC Press.
Gilbert S.F. 2010. Developmental Biology, IX Edition, Sinauer Associates, Inc., Publishers,
Schoenwolf GC, Bleyl SB, Brauer PR, Francis-West PH. 2009. Ladesn's Human Embryology. Elsevier
Slack JMW. 2012. Essential Developmental Biology. Wiley-Blackwell.
Wolpert L. 2002. Principles of Development. 2nd Edn. Oxford Univ. Press.

Evolutionary Biology

Barton NH, Birggs DEG, Elsen JA, Goldstein DB, Patel NH. 2007. Evolution. CSHL Press
Chattopadhyay S. 2012. Life: Evolution, Adaptation, Ethology. 3rd Edn. Books and Allied, Kolkata.
Darlington PJ. The Geographical Distribution of Animals, R.E. Krieger Pub Co
Dobzhansky T, Ayala FJ, Stebbins JL, Valentine JW. 1977. Evolution. Surajeet Pub., N.Delhi
Freeman S, Herron JC. 2016. Evolutionary Analysis. Pearson Education Limited, Noida, India.
Futuyma DJ. 1997. Evolutionary Biology. Sinauer Associates.

Hall BK, Hallgrimsson B. 2008. Strickberger's Evolution. IV Edition. Jones and Bartlett Publishers Inc
Kardong K. 2004. An Introduction to Biological Evolution. McGraw Hill.
Page RDM, Holmes EC. 1998. Molecular Evolution: A Phylogenetic Approach. Blackwell Sc
Rauchfuss H. 2010. Chemical Evolution and the Origin of Life. Springer.
Ridley M. 1996. Evolution. 2nd Edn. Blackwell Science.
Smith JM. 1998. Evolutionary Genetics. 2nd Edn. Oxford Univ Press.
Volpe EP, Rossenbaum PA. 1999. Evolution. McGraw Hill.

Animal Biotechnology & Animal Cell Biotechnology

Atlas R. M. and R. Bartha – Microbial Ecology : Fundamentals and Applications
Thieman W.J. and M.A. Palladino – Introduction to Biotechnology; Pearson

Animal Behaviour & Chronology

Alcock J. 2013. Animal Behaviour, Sinauer Associate Inc., USA.
Drickamer LC , Vessey SH . 2001. Animal Behaviour. McGraw-Hill
Dujatkin LA. 2014. Principles of Animal Behaviour. 3rd Edn. W.W.Norton and Co.
Dunlap JC, Loros JJ, DeCoursey PJ. 2004. Chronobiology Biological Timekeeping. Sinauer Assoc.
Krebs J. R. & N. B. Davies – An introduction to Behavioural Ecology – Blackwell Scientific
Kumar V. 2002. Biological Rhythms. Narosa Publishing House, New Delhi.
Mandal F. 2010. A Text Book of Animal Behaviour. Pentice Hall India.
Mathur R. 2005. Animal Behaviour. Rastogi Pub.
Ruhela A, Sinha M. 2010. Recent Trends in Animal Behaviour. Oxford Book Co.
Sherman PW, Alcock J. 2013. Exploring Animal Behaviour, Sinauer Assoc Inc., Massachusetts, USA.

Practical

Chatterjee A K, Chakraborty C. – Practical Zoology. (Nirmala Library)
Ghosh K C, Manna B. – Practical Zoology (NCBA)
Gunasegaran JP. 2010. A Text book of Histology and a Practical Guide. Elsevier
Sinha J K, Chatterjee A K. and Chattopadhyay P. – Advanced Practical Zoology (New Central Book Agency)
Poddar T, Mukhopadhyay S, Das S K. An advanced Laboratory Manual of Zoology (Trinity Press)

UNIVERSITY OF CALCUTTA

DEPARTMENT OF ARABIC

ChoiceBasedCreditSystem(CBCS)

UNDERGRADUATE PROGRAMME

(CourseseffectivefromAcademicYear2018-19)

Syllabus for B.A. General in Arabic

SYLLABUSOFCOURSESTOBEOFFERED

Core Courses, Elective Courses & Ability Enhancement Course

❖ Preamble

TheUniversity GrantsCommission(UGC)hasinitiated severalmeasurestobringequity, efficiencyandexcellenceinthe HigherEducationSystemofcountry.Theimportant measurestakentoenhanceacademicstandardsand qualityinhighereducationinclude innovationand improvementsincurriculum,teaching-learning process,examinationand evaluation systems,besides governance andothermatters.

TheUGChasformulatedvariousregulationsandguidelinesfromtimetotimetoimprove thehighereducation systemand maintainminimumstandardsandqualityacrossthe HigherEducationalInstitutions(HEIs)inIndia.Theacademicreformsrecommendedby theUGC intherecentpasthaveled tooverall improvementinthehigher educationsystem. However, due to lot ofdiversityinthesystemofhighereducation, therearemultiple approachesfollowedbyuniversitiestowardsexamination,evaluationand gradingsystem. WhiletheHEIsmusthavetheflexibility and freedomindesigningtheexaminationand evaluationmethodsthatbest fitsthecurriculum,syllabiand teaching–learningmethods, thereisaneedtodeviseasensiblesystemforawarding thegradesbased onthe performanceofstudents.Presently theperformanceofthestudentsisreported usingthe conventional systemof markssecured intheexaminationsorgradesor both. The conversionfrommarkstolettergradesand thelettergradesused vary widely acrossthe HEIsinthecountry.Thiscreatesdifficultyfor theacademiaand theemployersto understand and infer the performance of the students graduating from different universities andcolleges basedon grades.

Thegrading systemisconsidered tobebetterthantheconventionalmarkssystemand henceithasbeenfollowedinthetopinstitutionsinIndiaand abroad.Soitisdesirableto introduceuniform grading system.Thiswillfacilitatestudentmobility acrossinstitutions withinand acrosscountriesand alsoenablepotentialemployerstoassesstheperformance of students. To bring in the desired uniformity, in grading system and method for computingthecumulativegradepointaverage(CGPA)basedon theperformanceof students in the examinations,the UGChas formulatedtheseguidelines.

❖ Choice Based Credit System(CBCS):

TheCBCSprovides an opportunityforthe students to choose coursesfromthe prescribed courses comprisingcore, elective/minor orskillbased courses.The courses can beevaluated followingthe gradingsystem, which is considered to be better than the conventional marks system. Therefore, itis necessaryto introduceuniform gradingsystem in the entirehigher education inIndia. This willbenefit the students to move across institutions within Indiato begin with and across countries. Theuniform gradingsystem will also enable potential

employers in assessingthe performanceof thecandidates.In order to bringuniformityin evaluation systemandcomputation ofthe Cumulative GradePoint Average(CGPA)basedon student's performancein examinations, theUGC has formulated the guidelines to befollowed.

❖ OutlineofChoiceBasedCredit System:

1.

CoreCourse: Acourse,whichshouldcompulsorilybestudiedbyacandidateasacorerequirement is termed as aCore course.

2.

ElectiveCourse: Generallyacoursewhichcanbechosenfromapoolofcoursesandwhichmay beveryspecificorspecializedoradvancedorsupportivetothediscipline/subjectofstudyorwhich providesanextendedscopeorwhichenablesanexposure tosomeother discipline/subject/domain or nurtures thecandidate's proficiency/skillis called an ElectiveCourse.

2.1

DisciplineSpecificElective(DSE)Course:Electivecoursesmaybeofferedbythemain discipline/subjectofstudyisreferredtoasDisciplineSpecificElective.TheUniversity/Institute mayalsoofferdisciplinerelatedElectivecoursesofinterdisciplinary nature(tobeofferedby main discipline/subject of study).

2.2

Dissertation/Project:Anelectivecoursedesignedtoacquirespecial/advancedknowledge, suchassupplementstudy/supportstudytoaprojectwork,andacandidatestudiessuchacourse onhisownwithanadvisorysupportbyateacher/facultymemberiscalleddissertation/project.

2.3 GenericElective(GE) Course: An electivecoursechosen generallyfrom an unrelated discipline/subject, with an intention to seek exposureis calledaGenericElective.

P.S.:Acorecourseofferedinadiscipline/subjectmaybetreatedasanelectivebyother discipline/subjectandviceversaandsuchelectivesmayalsobereferredtoasGenericElective.

3.

AbilityEnhancementCourses(AEC)/CompetencyImprovementCourses/SkillDevelopment Courses/FoundationCourse: TheAbility Enhancement(AE)Coursesmay beoftwokinds:AE Compulsory Course(AECC)andAEElectiveCourse(AEEC)."AECC"coursesarethecourses

baseduponthecontentthatleadstoKnowledgeenhancement.They(i)EnvironmentalScience,(ii) English/MIL Communication)aremandatoryforalldisciplines.AEECcoursesarevalue-based and/or skill-based andare aimed at providinghands-on-training, competencies, skills, etc.

3.1 AE Compulsory Course (AECC): Environmental Science, English Communication/MIL Communication.

3.2 AEElectiveCourse(AEEC):These coursesmaybechosen from apoolof coursesdesignedto providevalue-based and/or skill-based instruct

Project work/Dissertationisconsideredasaspecialcourseinvolving applicationofknowledgein solving/analyzing/exploringareallifesituation/difficultproblem.AProject/Dissertationwork would be of 6 credits. A Project/Dissertation work.

❖ Common Course Structure for B.A/B.Sc. (Honours and General)

Course Component	B.Sc		B.A.	
	Honours	General	Honours	General
Core Course (CC)	14	12*	14	8**
Language Core Course (LCC)	0	0	0	4(2English courses+ 2MIL courses)
Generic Elective (GE) (From two inter disciplinary subjects)	4**	0	4**	2
Discipline Specific Elective (DSE)	4	6*	4	4**
Ability Enhancement Compulsory Course (AECC)	2	2	2	2
Skill Enhancement Elective Course (SEC)	2	4*	2	4
Total Number of Courses	**26**	**24**	**26**	**24**

*****covering three subjects.

**covering two subjects.

❖ Credit Structure for B.A.(General) Courses:

Course Type		Number of courses (Having practical)		Number of courses (Having Tutorial)		Number of Credits (Having practical)		Number of Credits (Having Tutorial)	
		Theory	Practical	Theory	Tutorial	Theory	Practical	Theory	Tutorial
Core Course	(CC)	8 x 4	8 x 2	8 x 5	8 x 1	32	16	40	8
	Language(LCC)	4 x 4	4 x 2	4 x 5	4 x 1	16	8	20	4
Elective Courses:									
i)Generic Elective (GE)		2 x 4	2 x 2	2 x 5	2 x 1	8	4	10	2
ii) discipline Specific Elective (DSE)		4 x 4	4 x 2	4 x 5	4 x 1	16	8	20	4
Ability Enhancement Compulsory Course (AECC)		2 x 2	0	2 x 2	0	4	0	4	0
Skill Enhancement Elective (SEC)		4 x 2	0	4 x 2	0	8	0	8	0
Totals		**24**	**18**	**24**	**18**	**84**	**36**	**102**	**18**

Total Courses=42 (24Th+18P/TU) **Total Credits**=120(84Th+36P)/(120Th+18TU)

❖ Semester wise Courses for B.A. (General):

	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6
	1	**2**	**3**	**4**	**5**	**6**
Core Course (CC)	2Th+2P/TU **CC-1**	2Th+2P/TU **CC-2**	2Th+2P/TU **CC-3**	2Th+2P/TU **CC-4**		
Language(LCC)			**L1(1)** 1Th+1P/TU	**L2(1)** 1Th+1P/TU	**L1(2)** 1Th+1P/TU	**L2(2)** 1Th+1P/TU
Elective Courses:						
i)Generic Elective (GE)	1Th+1P/TU **GE-1**	1Th+1P/TU **GE-2**				
ii) discipline Specific Elective (DSE)					2Th+2P/TU **DSE-A** (1A+2A)	2Th+2P/TU **DSE-B** (1B+2B)
Ability Enhancement Compulsory Course (AECC)	1Th+0P/TU **AECC-1**	1Th+0P/TU **AECC-2**				
Skill Enhancement Elective (SEC)			1Th+0P/TU **SEC-A(1)**	1Th+0P/TU **SEC-B(1)**	1Th+0P/TU **SEC-A(2)**	1Th+0P/TU **SEC-B(2)**
Total No. of Courses and Marks	**4x100 =400**	**4x100 =400**	**4x100 =400**	**4x100 =400**	**4x100 =400**	**4x100 =400**
Total Credits	**20**	**20**	**20**	**20**	**20**	**20**

Th=Theory P=Practical TU=Tutorial

- For Core Courses- 4 Courses each from 2 disciplines + 2English courses + 2MILcourses
- CC of general Course will be treated as GE for the candidates taking honours in other disciplines (other than Arabic.)
- For Elective Courses -2DSE courses is from same to disciplines+ 2GE from other subjects
- 1 Theory (Th) =4 credits +1 Practical (P)= credits o 1 Theory (Th) =5 credits +1 Tutorial (TU) = 1 credits
- For Ability/ Skill Enhancement Courses- Each Course has 2 Credits
- **L1** = English courses ; **L2** = MIL courses

Details Semester wise Courses for B.A. General in Arabic:

❖ B. A. General in Arabic :

➢ Semester: I

Course Code	Course	Course Wise Class	Credit
ARBG-CC 1	History of Arabic Literature-(Pre-Islamic Period 500-622 A.D., Islamic and Umayyad Period (622-750 A. D.) Grammar and Translation.	Core (60Th+15TU)	6 (5Th+1TU)
GE -1	From Interdisciplinary subject (Other than Arabic)	GE (60Th+15TU)	6 (5Th+1TU)
AECC-1	Communicative English /MIL	AECC	2 (2L)
Total	**4 Courses**	**Total**	**20**

➢ Semester: II

Course Code	Course	Course Wise Class	Credit
ARBG-CC- 2	History of Arabic Literature-(Abbasid Period, 750- 1258A.D.) Prose,Poetry,Grammar and Translation	Core (60Th+15T TU)	6 (5Th+1TU)
GE -2	From Interdisciplinary subject (Other than Arabic)	GE (60Th+15TU)	6 (5Th+1TU)
AECC-2	Environmental Studies.	AECC	2 (2Th)
Total	**4 Courses**	**Total**	**20**

➢ Semester: III

Course Code	Course	Course Wise Class	Credit
ARBG-CC- 3	Prose : Islamic,medieval andModernPeriod	Core (60Th+15TU)	6 (5Th+1TU)
LCC - L1(1)	Language (L1-1) English Courses	Core (60Th+15T)	6 (5Th+1TU)
SEC-A (1) SEC –A(2) To be Opted any one (either in semester III or in semester V)	Grammar , Translation & Letter Writing SEC: Specific literary feature of Modern Arabic Literature	SEC (25Th)	2 (2Th)
Total	**4 Courses**	**Total**	**20**

➢ Semester: IV

Course Code	Course	Course Wise Class	Credit
ARBG-CC -4	Poetry : Islamic, medieval and Modern Period	Core (60Th+15TU)	6 (5Th+1TU)
LCC- L2(1)	Language (L2-1)	Core (60Th+15TU)	6 (5Th+1TU)
SEC- B(1) SEC –B(2) To be Opted any one (either in semester IV or in semester VI)	SEC: Grammar, Translation & Essay Writing SEC: Specific literary feature of Modern Arabic Literature in Exile	SEC (25Th)	2 (2Th)
Total	**4 Courses**	**Total**	**20**

- **Semester: V**

Course Code	Course	Course Wise Class	Credit
LCC-(L1-2)	Language (L1-2) English Courses	Core (60Th+15TU)	6 (5Th+1TU)
DSE-A(1) DSE-A(2) (To be Opted any one)	Rhetoric Prosody	Core (60Th+15TU)	6 (5Th+1TU)
SEC-A (1) SEC –A(2) To be Opted any one (either in semester III or in semester V)	Grammar , Translation & Letter Writing SEC: Specific literary feature of Modern Arabic Literature	SEC (25Th)	2 (2Th)
Total	**4 Courses**	**Total**	**20**

- **Semester: VI**

Course Code	Course	Course Wise Class	Credit
LCC(L2-2)	Language (L2-2)	Core (60L+15T)	6 (5Th+1TU)
DSE-B(1) DES-B(2) To be Opted any one	History of Modern Arab World History of Modern Arab World	Core (60Th+15TU)	6 (5Th+1TU)
SEC- B(1) SEC –B(2) To be Opted any one (either in semester IV or in semester VI)	SEC:Grammar, Translation & Essay Writing SEC: Specific literary feature of Modern Arabic Literature in Exile	SEC (25Th)	2 (2Th)
Total	**4 Courses**	**Total**	**20**

❖ B.A. General Course in Arabic

Semester- I

CC- 1: History of Arabic Literature

(Pre- Islamic Period 500-622 A. D.)

Introduction of Pre-Islamic Period, Al-Muallaqatwith special reference to:ImraulQais, Zuhair bin AbiSulma and Labid bin Rabia.

(Islamic and Umayyad Period (622 -750 A.D.)

Al-Quran (b) Al-Hadith (c) Poetry with special reference to-Al-Khansa , Hassan bin Thabit,

Al-Akhtal , Al-Farazdaq, Jarir.

- **Grammar and Translation:**

The following topics-

(1) الكلمة و أقسامها: اسم ، فعل ، حرف

(2) الأداة : النكرة و المعرفة

(3) الجنس: المذكروالمؤنث

(4) العدد : الواحد، التثنية ، الجمع وأقسامه

(5) الفعل : الماضي ، المضارع ، الأمر،النهي

(6) جمع التكسير

(7) أدوات الاستفهام

(8)الفعل الثلاثي المجرد و أبواب والمزيد فيه

(9) الضميروأقسامه

(10) المضاف و المضاف اليه

(11) المبتدأ والخبر

(12) الموصوف والصفة

N.B.- Translation (Arabic to English & vice versa) should be exercised on the prescribed Grammatical topics pointed out wherever in the whole syllabus. This type of exercises of the grammar-based-translation should be strictly followed.

GE-1:From Interdisciplinary subject (Other than Arabic)

AECC-1: Communicative English /MIL

Semester- II

CC- 2: History of Arabic Literature

(Abbasid Period, 750- 1258 A. D.)

- **Prose**
  Prose with special reference to: Ibn-ul-Muqaffa, Al-Jahiz, Ibnul Amid, Qadi Al-Fadil, Al-Hariri and Al Hamazani.

- **Poetry**

Poetry with Special Reference to:Al-Mutanabbi, Al Maari, Bashar bin Burd, Abu Nuas,AbulAtahiah and Abu Tammam,

- **Grammar and Translation:**
  The following topics:

(1) نواصب المضارع

(2) جوازم المضارع

(3) اسم الإشارة

(4) اسم الموصول

(5) اسم الفاعل واسم المفعول من الثلاثي المجرد

(6) الفعل اللازم والمتعدي

(7)الحال: رفع ، نصب ، جر

(8) حروف الجر

(9) حروف الاستفهام

(10) حروف الشرط

(11) المعرب والمبني

GE2:FromInterdisciplinarysubject(Otherthan Arabic)

AECC-2:Environmental Studies.

Semester- III

CC-3: Prose: (Islamic, medieval and Modern Period)

1) سورة الحجرات	القرآن الكريم
2) الجامع الصحيح (أحاديث منتخبة)	الإمام مسلم بن الحجاج
3) سلمان الفارسي	عبد الرحمن رأفت الباشا
4) خطبة النبى فى حجة الوداع	محمد صلى الله عليه و أله وسلم
5) أصحاب الفيل	سيرة ابن هشام
6) الدين الصناعي	أحمد أمين

LCC - L1(1) Language1: English Courses

SEC-A (1):Grammar, Translation and Letter Writing:

- **Grammar and Translation** :

The following topics:

قواعد النحو والترجمة على أساس المواد التالية:الجملة الاسمية , الجملة الفعلية,الجملة الشرطية, حروف المشبه بالفعل ، الأفعال الناقصة , الحال وذو الحال والتميز، أفعال المقاربة

- **Letter Writing:**

Letter Writing: Official, Educational, Personal etc

SEC- A (2): Specific literary feature of Modern Arabic Literature

تاريخ النهضة العربية ، أسباب النهضة ، مدرسة الديوان ومؤسسوها عباس محمود العقاد ،،إبراهيم المازني وعبد الرحمن شكري، مدرسة أبولو ومؤسسوها أحمد زكي أبو شادي ، إبراهيم ناجي ، أبو القاسم الشابي

Semester- IV

CC- 4: Poetry: (Islamicand MedievalPeriod)

1) حسان بن ثابت	**(أ) قال يرثي النبي صلى الله عليه و أله وسلم**
	(ب) قال في يوم بدر
2) الحماسة	**(أ) العباس بن مرداس السلمي،**
	(ب) سالم بن وابصة الأسدي
3) المتنبي	**نعد المشرفية والعوالي**
4) أبو العتاهية	**وله في الوعظ**
5) أبو العلاء المعري	**ألا في سبيل المجد**
6) حافظ ابراهيم	**حال لسان اللغة العربية**
7) أحمد شوقي	**(أ)أيا صوفيا**
	(ب) صدى الحرب

LCC- L2(1) =MIL Course

SEC-B(1): Grammar, Translation& Essay Writing:

- **Grammar and Translation**:

The following topics**:**

الفعل المزيد فيه : إسم الفاعل والمفعول من المزيد فيه، المفاعيل الخمسة

- **Essay Writing** :

كتابة المقال (Essay Writing):

المدن، المكتبات، زيارة حديقة الحيوانات ، شخصية تحبها كثيرا (الأدب العربي)

SEC-B (2): Specific literary feature of Modern Arabic Literature in Exile

تاريخ أدب المهجر، الرابطة القلمية ومؤسسوها جبران خليل جبران ، إيليا أبو ماضي وميخائيل نعيمة و العصبة الأندلسية ومؤسسوها ميشال معلوف ، رشيد سليم الخوري و الياس فرحات

Semester- V

LCC-(L1-2) Language: English Courses

DSE-A (1): Rhetoric, the Following Items:

1) **التشبيه وأقسامه ، المجاز، الاستعارة ، الكناية ، الجناس ، والتورية**

DSE-A (2): Prosody, the Following Items

2) **تعريف علم العروض ، سبب ، وتد ، فاصلة ، أركان ، البحر الكامل ، البحر الطويل والتقطيع**

SEC-A (1): Grammar, Translation and Letter Writing:

- **Grammar and Translation** :

The following topics:

قواعد النحو والترجمة على أساس المواد التالية:الجملة الاسمية , الجملة الفعلية,الجملة الشرطية, حروف المشبه بالفعل ، الأفعال الناقصة , الحال وذو الحال والتميز، أفعال المقاربة

- **Letter Writing:**

Letter Writing: Official, Educational, Personal etc

SEC- A (2): Specific literary feature of Modern Arabic Literature

تاريخ النهضة العربية ، أسباب النهضة ، مدرسة الديوان ومؤسسوها عباس محمود العقاد ، إبراهيم المازني وعبد الرحمن شكري، مدرسة أبولو ومؤسسوها أحمد زكي أبو شادي ، إبراهيم ناجي ، أبو القاسم الشابي

Semester- VI

LCC-L2 (2): MIL Course

DSE-B (1): History of Modern Arab World. The Following Countries:

Saudi Arabia, Iraq, Syria, Jordan, UAE.

DSE-B (2): History of Modern Arab World. The Following Countries:

Qatar, Kuwait, Oman, Egypt and Palestine

SEC-B (1): Grammar, Translation& Essay Writing:

- **Grammar and Translation**:

The following topics**:**

الفعل المزيد فيه : إسم الفاعل والمفعول من المزيد فيه، المفاعيل الخمسة

- **Essay Writing** :

كتابة المقال (Essay Writing):

المدن، المكتبات، زيارة حديقة الحيوانات ، شخصية تحبها كثيرا (الأدب العربي)

SEC-B (2): Specific literary feature of Modern Arabic Literature in Exile

تاريخ أدب المهجر، الرابطة القلمية ومؤسسوها جبران خليل جبران ، إيليا أبو ماضي وميخائيل نعيمة و العصبة الأندلسية ومؤسسوها ميشال معلوف ، رشيد سليم الخوري و الياس فرحات

❖ Books Recommended for B.A. General

A. Arabic Prose & Poetry

Arabic Selection- for B. A. General (under I+I+I system, New Regulation - 2011)

Published by University of Calcutta

B. History of Arabic Literature:

1.	تاريخ آداب اللغة العربية	جرجي زيدان
2.	تاريخ الأدب العربي	أحمد حسن الزيات
3.	تاريخ الأدب العربي	شوقي ضيف
4.	تاريخ الأدب العربي	عمر فروخ
5.	A Literary History of Arabs	R.A. Nicholson

C. Arabic Grammar & Translation:

1.	النحو الواضح (المراحل الابتدائية والثانوية)	علي الجارم و مصطفي أمين
2.	شرح قطر الندي وبل الصدي	أبو محمد عبد الله جمال الدين بن هشام الأنصاري
3.	ما يلزم من العربية	رفيع العماد فينان
4.	اللغة العربية للمبتدئين	سيد علي مدراس
5.	تعليم اللغة العربية :طريقة عملية	ولي أختر الندوي
6.	معلم الانشاء (1,2,3)	عبد الماجد الندوي و محمد رابع الحسني الندوي
7.	Teach Yourself Arabic	S. A. Rahman
8.	A Grammar of Arabic Language	Obaidullah Al-UbaidiShuharwardi
9.	Muslim jahan	Suharabuddin Ahmad
10.	The Arabs	Peter Mansfield

D. Indian Writers, Arab World, Rhetoric andProsody

1. نزهة الخواطر	السيد عبد الحي الحسني
2. سبحة المرجان في آثارهندستان	السيد غلام علي آزاد البلغرامي
3. البلاغة الواضحة	علي الجارم ومصطفى أمين
4. Muslim Jahan	Suhrabuddin Ahmad
5. The Arabs	Peter Mansfield
6. History of Arabs	P. K. Hitti

E. Skill Enhancement Courses (SEC)

1. محمد محبوب الرحمان- دروس الأشياء (من الدرس الأول إلى الدرس السابع)
2. ف. س. عبد الرحيم- دروس اللغة العربية (Easy Arabic Course)
3. قواعد اللغة العربية لغير الناطقين بالضاد- (لجنة العلماء)
4. أحمد حسن الزيات : تاريخ الأدب العربي
5. جرجي زيدان : تاريخ آداب اللغة العربية
6. د. طه حسين : من حديث الشعروالنثر
7. د. شوقي ضيف : تاريخ الأدب العربي
8. واضح رشيد الندوى: تاريخ الأدب العربي فى العصر الجاهلى
9. د. عبد الحليم الندوي : عربي أدب كي تاريخ
10. د. مقتدى حسن الأزهري : مختصرتاريخ أدب عربي
11. د. سيد احتشام أحمد ندوي : عربي أدب كا ارتقا

(i) R.A Nicholson- A Literary of the Arabs
(ii) H. A. R. Gibb- History of Arabs
(iii) J. A. Hayood- The History of Modern Arabc Literature
(iv) Dr. K.A. Fariq– History of Arabic Literature (2 Volumes)

UNIVERSITY OF CALCUTTA

DEPARTMENT OF PERSIAN

Choice Based Credit System (CBCS)

UNDERGRADUATE PROGRAMME

(Courses effective from Academic Year2018-19)

Syllabus for B.A. General in PERSIAN

SYLLABOUS OF COURSES TO BE OFFERED

Core Courses, Elective Courses & Ability Enhancement Courses

❖ Preamble

The University Grants Commission (UGC) has initiated several measures to bring equity, efficiency and excellence in the Higher Education System of country. The important measures taken to enhance academic standards and quality in higher education include innovation and improvements in curriculum, teaching-learning process, examination and evaluation systems, besides governance and other matters.

The UGC has formulated various regulations and guidelines from time to time to improve the higher education system and maintain minimum standards and quality across the Higher Educational Institutions (HEIs) in India. The academic reforms recommended by the UGC in the recent past have led to overall improvement in the higher education system. However, due to lot of diversity in the system of higher education, there are multiple approaches followed by universities towards examination, evaluation and grading system. While the HEIs must have the flexibility and freedom in designing the examination and evaluation methods that best fits the curriculum, syllabi and teaching–learning methods, there is a need to devise a sensible system for awarding the grades based on the performance of students. Presently the performance of the students is reported using the conventional system of marks secured in the examinations or grades or both. The conversion from marks to letter grades and the letter grades used vary widely across the HEIs in the country. This creates difficulty for the academia and the employers to understand and infer the performance of the students graduating from different universities and colleges based on grades.

The grading system is considered to be better than the conventional marks system and hence it has been followed in the top institutions in India and abroad. So it is desirable to introduce uniform grading system. This will facilitate student mobility across institutions within and across countries and also enable potential employers to assess the performance of students. To bring in the desired uniformity, in grading system and method for computing the cumulative grade point average (CGPA) based on the performance of students in the examinations, the UGC has formulated these guidelines.

❖ Choice Based Credit System (CBCS):

The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill based courses. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. Therefore, it is necessary to introduce uniform grading system in the entire higher education in India. This will benefit the students to move across institutions within India to begin with and across countries. The uniform grading system will also enable potential employers in assessing the performance of the candidates. In order to bring uniformity in evaluation system and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations, the UGC has formulated the guidelines to be followed.

❖ Outline of Choice Based Credit System:

1. **Core Course:** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.

2. **Elective Course:** Generally a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course.

   2.1 Discipline Specific Elective (DSE) Course: Elective courses may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective. The University/Institute may also offer discipline related Elective courses of interdisciplinary nature (to be offered by main discipline/subject of study).

   2.2 Dissertation/Project: An elective course designed to acquire special/advanced knowledge, such as supplement study/support study to a project work, and a candidate studies such a course on his own with an advisory support by a teacher/faculty member is called dissertation/project.

   2.3 Generic Elective (GE) Course: An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is called a Generic Elective.

   P.S.: A core course offered in a discipline/subject may be treated as an elective by other discipline/subject and vice versa and such electives may also be referred to as Generic Elective.

3. **Ability Enhancement Courses (AEC)/Competency Improvement Courses/Skill Development Courses/Foundation Course:** The Ability Enhancement (AE) Courses may be of two kinds: AE Compulsory Course (AECC) and AE Elective Course (AEEC). "AECC" courses are the courses based upon the content that leads to Knowledge enhancement. They (i) Environmental Science, (ii) English/MIL Communication) are mandatory for all disciplines. AEEC courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc.

   3.1 AE Compulsory Course (AECC): Environmental Science, English Communication/MIL Communication.

   3.2 AE Elective Course (AEEC): These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based instruct

Project work/Dissertation is considered as a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A Project/Dissertation work would be of 6 credits. A Project/Dissertation work.

❖ Common Course Structure for B.A/B.Sc. (Honours and General)

Course Component	B.Sc		B.A.	
	Honours	General	Honours	General
Core Course (CC)	14	12*	14	8**
Language Core Course (LCC)	0	0	0	4(2English courses+ 2MIL courses)
Generic Elective (GE) (From two inter disciplinary subjects)	4**	0	4**	2
Discipline Specific Elective (DSE)	4	6*	4	4**
Ability Enhancemant Compulsory Course (AECC)	2	2	2	2
Skill Enhancement Elective Course (SEC)	2	4*	2	4
Total Number of Courses	**26**	**24**	**26**	**24**

*****covering three subjects.
**covering two subjects.

❖ Credit Structure for B.A.(General) Courses:

Course Type		**Number of courses (Having practical)**		**Number of courses (Having Tutorial)**		**Number of Credits (Having practical)**		**Number of Credits (Having Tutorial)**	
		Theory	Practical	Theory	Tutorial	Theory	Practical	Theory	Tutorial
Core Course	(CC)	8 x 4	8 x 2	8 x 5	8 x 1	32	16	40	8
	Language(LCC)	4 x 4	4 x 2	4 x 5	4 x 1	16	8	20	4
Elective Courses:									
i)Generic Elective (GE)		2 x 4	2 x 2	2 x 5	2 x 1	8	4	10	2
ii) discipline Specific Elective (DSE)		4 x 4	4 x 2	4 x 5	4 x 1	16	8	20	4
Ability Enhancement Compulsory Course (AECC)		2 x 2	0	2 x 2	0	4	0	4	0
Skill Enhancement Elective (SEC)		4 x 2	0	4 x 2	0	8	0	8	0
Totals		**24**	**18**	**24**	**18**	**84**	**36**	**102**	**18**

Total Courses=42 (24Th+18P/TU) **Total Credits**=120(84Th+36P)/(120Th+18TU)

❖ Semester wise Courses for B.A. (General):

	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6
	1	2	3	4	5	6
Core Course (CC)	2Th+2P/TU CC-1	2Th+2P/TU CC-2	2Th+2P/TU CC-3	2Th+2P/TU CC-4		
Language(LCC)			L1(1) 1Th+1P/TU	L2(1) 1Th+1P/TU	L1 (2) 1Th+1P/TU	L2(2) 1Th+1P/TU
Elective Courses:						
i)Generic Elective (GE)	1Th+1P/TU GE-1	1Th+1P/TU GE-2				
ii) discipline Specific Elective (DSE)					2Th+2P/TU DSE-A (1A+2A)	2Th+2P/TU DSE-B (1B+2B)
Ability Enhancement Compulsory Course (AECC)	1Th+0P/TU AECC-1	1Th+0P/TU AECC-2				
Skill Enhancement Elective (SEC)			1Th+0P/TU SEC-A(1)	1Th+0P/TU SEC-B(1)	1Th+0P/TU SEC-A(2)	1Th+0P/TU SEC-B(2)
Total No. of Courses and Marks	4x100 =400	4x100 =400	4x100 =400	4x100 =400	4x100 =400	4x100 =400
Total Credits	20	20	20	20	20	20

Th=Theory P=Practical TU=Tutorial

- For Core Courses- 4 Courses each from 2 disciplines + 2English courses + 2MILcourses
- CC of general Course will be treated as GE for the candidates taking honours in other disciplines (other than Persian.)
- For Elective Courses -2DSE courses is from same to disciplines+ 2GE from other subjects
- 1 Theory (Th) =4 credits +1 Practical (P)= credits o 1 Theory (Th) =5 credits +1 Tutorial (TU) = 1 credits
- For Ability/ Skill Enhancement Courses- Each Course has 2 Credits
- **L1** = English courses ; **L2** = MIL courses

Details Semester wise Courses for B.A. General in Persian:

❖ B. A. General in Persian :

➢ Semester: I

Course Code	Course	Course Wise Class	Credit
PRNG-CC 1	History of Persian Literature: Pre Islamic Period (from 525BCE to 651 A.D) and Post Islamic Period (from 652 to1020A.D) Grammer and Translation	Core (60Th+15TU)	6 (5Th+1TU)
GE-1	From Interdisciplinary subject (Other than Persian)	GE (60Th+15T)	6 (5Th+1TU)
AECC-1	Communicative English /MIL	AECC	2 (2L)
Total	4 Courses	Total	20

➢ Semester: II

Course Code	Course	Course Wise Class	Credit
PRNG-CC- 2	History of Persian Literature:- Saljuque , Mongol. Ilkhanid &Timurid Grammar, translation and composition.	Core (60Th+15T TU)	6 (5Th+1TU)
GE -2	From Interdisciplinary subject (Other than Persian)	GE (60Th+15TU)	6 (5Th+1TU)
AECC-2	Environmental Studies	AECC	2 (2Th)
Total	4 Courses	Total	20

➢ Semester: III

Course Code	Course	Course Wise Class	Credit
PRNG-CC- 3	Prose: Classical , Medieval and Modern Period	Core (60Th+15TU)	6 (5Th+1TU)
LCC –L1(1)	Language (L1-1) English Courses	Core (60Th+15TU)	6 (5Th+1TU)
SEC-A-(1) SEC-A(2) To be Opted any one (either in semester III or in Semester V)	Applied Grammar, Translation and short Paragraphs writing in Persian SEC: Specific literary Feature of Modern Persian Literature	SEC (25Th)	2 (2Th)
Total	4 Courses	Total	20

➢ Semester: IV

Course Code	Course	Course Wise Class	Credit
PRNG-CC -4	Poetry: Classical Medieval and Modern Period	Core (60Th+15TU)	6 (5Th+1TU)
LCC-L2-1	Language Course (L2-1)	Core (60Th+15TU)	6 (5Th+1TU)
SEC- B(1) SEC –B(2) To be Opted any one (either in semester IV or in semester VI)	SEC: Grammar, translation and short Paragraphs writing in Persian SEC: Specific literary feature of Modern Persian Literature in Exile	SEC (25 Th)	2 (2Th)
Total	4 Courses	Total	20

➢ Semester: V

Course Code	Course	Course Wise Class	Credit
LCC-(L1-2)	Language (L1-2) English Courses	Core (60Th+15TU)	6 (5Th+1TU)
DSE-A(1) DSE-A(2) (To be Opted any one)	Rhetoric and Prosody Parsing and Analysis	Core (60Th+15TU)	6 (5Th+1TU)
SEC-A (1) SEC –A(2) To be Opted any one (either in semester III or in semester V1)	Grammar , Translation & Letter Writing SEC: Specific literary feature of Modern Persian Literature	SEC (25Th)	2 (2Th)
Total	4 Courses	Total	20

➢ Semester: VI

Course Code	Course	Course Wise Class	Credit
LCC(L2-2)	Language (L2-2)	Core (60L+15T)	6 (5Th+1TU)
DSE-B(1) DES-B(2) To be Opted any one	History of Persian Language and Literature in India During Mughal Period History of Persian Literature in Bengal	Core (60Th+15TU)	6 (5Th+1TU)
SEC- B(1) SEC –B(2) To be Opted any one (either in semester IV or in semester VI)	SEC: Grammar, Translation & Essay Writing Persian Linguistics:-	SEC (25Th)	2 (2Th)
Total	4 Courses	Total	20

B.A. General Course in Persian

SEMESTER – I

❖ **CC-1: History of Persian Literature:-**

- Pre Islamic Period (From 525BCE to 651 A.D)
  Avesta, Old Persian (rock inscription) and Pahlavi or Middle Persian.
  And
- Post Islamic Period (From 652 to 1020A.D) with special reference to Rudaki, Rabia, Daqiqi, and Firdausi.
- Grammer and Translation:-
- Grammer:-
  The following topics:-
  Persian Alphabets, vowel, Compound word, Infinitive & verb, Noun, Pronoun, Adjective, Possessive case, opposite, opposite numbers and make Sentences.
- **Translation:-**
  (Persian to English & vice versa) should be exercised on the prescribed Grammatical topics pointed out wherever in the whole syllabus. This type of exercises of the grammar-based-translation should be strictly followed.

❖ **GE-1:**From Interdisciplinary subject (Other than Persian)

❖ **AECC-1: Communication/MIL**

SEMESTER – II

❖ **CC- 2: History of Modern Persian Literature.**
(Saljuuque , Mongol. Ilkhanid &Timurid**)**

- **Prose:**
  1. **Marzaban Nama (داستانِ هنبوی و ضحاک)**
  2. **Gulista(1,2, 3,4 and 5)**
  3. **Baharistan (1, 2, 3, and 5).**
  4. **Kimya-e-Saadat (only one Hikayat)**
- **Poetry:**
  1. Mulana Rumi (حکایتِ مردِ بقال و طوطی)
  2. Nizami Ganjavi (حِمدِ باری تعالیٰ)
  3. Hafiz (غزل-1،2)

- **Grammar and Translation:**
  The following topics:
  Aorist, identify the tenses, correct the Sentence, words meaning, Zamana: Mazi, Haal, Mustaqbil Fel-e-Maaruf and Majhul, Kinds of Sentence.

❖ **GE-2:** From Inter disciplinary subject (Other than Persian)

❖ **AECC-2: Environmental Studies.**

SEMESTER – III

❖ **CC-3: Prose: (Classical Medieval and Modern Period)**

- The following topics:
  Safare Awwale Sindbad
  Majra-e-Kabutaran
  Dastan-e-Parwaz
  Yahya

❖ **LCC - L1 (1): Language: English Courses**

❖ **SEC-A (1):** Applied Grammar, Translation and short Paragraphs writing in Persian

- The following topics:
  - Grammer: Mouzaf-o-Mouzaf Alaih, Mousouf-o-Sifat, Mutaradif, Mutazad, Mufrad – Jama, Sifat-e-Nisbati,Kind of Sifat. Hurouf-o-Izafa, Alamatha-e- Zamir-e-Faeyli or Shenasha.
  - **Short Paragraph**: اسب ، شیر ، کالج ، دانشگاہ ، شہرِ کلکتہ ، تالارِ ویکتوریہ ، تاج محل، جامع مسجد دہلی .
  - Translation from prescribed book and unseen short stories and Vice versa

❖ **SEC- A (2) : Specific literary Feature of Modern Persian Literature:-**

Origin growth and development of drama, novel and fiction writings with special reference to Zabih Bahrouz, Syed Jamal Zadah, Sadique Hidayat, Jalal Aal Ahmad, Mohammad Hijazi.

SEMESTER – IV

❖ CC- 4: Poetry: (Classical, Medieval and Modern)

1. Kirme Ketabi, (Iqbal),
2. Chashma-o-Sang
3. Rubayyat-e-Umar Khayyam (1-3)
4. Rubah-o- Zagh,
5. Ashk-e-Yatim
6. Shahnama-i-Firdausi (Pages. 163-166) (Ghuftar-Andar Zadan)
7. Ghazalyat-e-Saadi (No.1 & 5)

❖ LCC- L2(1) =MIL Course

❖ SEC-B(1): Grammar, Translation& Short Paragraphs in Persian

- The following topics:

Aorist, Identify the tenses from sentence. Correct the Sentence. Zamana: Mazi, Haal, Mustaqbil, Fel-e-Maaruf and Majhul.

- **Short Paragraphs writing in Persian:**

Indian Museum, Victoria Memorial, National Library, Asiatic Society, Tajmahal, Red Fort, Iran Society, Urdu Academy, Calcutta University, Madarsah Alia Kolkata and Delhi. Saadi, Hafiz,Jami, Rumi.

❖ SEC-B (2) : Specific literary feature of Modern Persian Literature in Exile

A critical study of Iranian Literature born in Exile with special reference to Sargozast-e- Haji Baba-ye- Ispahani. Siyahatnameh –ye-Ebrahim Beg, Yaki Bud Yaki Nabud, Buf-e-Kur.

SEMESTER - V

❖ LCC-(L1-2) Language : English Courses

❖ DSE-A (1): Rhetoric & Prosody.

- The following topics:-

علمِ بیان :-حقیقت ۔ مجاز ۔ استعارہ ۔ تشبیہ ۔ استعارہ ۔ تجنیس ۔ مراعا ت النظیر ۔ تلمیح ۔ مبالغہ

علم عروض: شعر۔ وزن۔ قافیہ۔ حرف ۔ ھجا۔ تعین وزن ۔ اوزان شعرِ فارسی ۔

تقطیع: بحرِ ھزج ۔ بحرِ متقارب ۔

❖ DSE-A(2): Parsing and Analysis.

- The following Items:

ترکیبِ صرفی : ا حمد رفت ۔ شیر شاہ شیر را کشتہ بود ۔ کلا غی تشنہ در بیابان پرواز می کرد ۔ آقای سعدی بہ دبیرستان رفتند ۔ شیخ سنائی شعر گفتہ باشد۔ اکبر شاہ بادشاہِ ھند بود ۔ آ نھا بہ شکار گاہ رفتند

ترکیب نحوی: نیلوفر بیمار است ۔ خا نم آفرین دانشجو ھست ۔ احمد پسرِ یوسف است ۔ نیلوفر دختر زیبا است ۔ دخترِ امروز مادرِ فردا است ۔ خر دھقان گم شد ۔ کسی محمود را بخواب چنین دید ۔ دو طبیبِ حاذق رفتہ اند ۔

SEC-A (1) : Grammar , Translation & Letter Writing:-

- Grammer and Translation:
  The following topics:
  Tense, Present and Past root of verbs. Imperative, Verbal Noun, Passive voice of Past Indefinite , Past Imperfect , Present Perfect, Past Perfect, Dubious Past.

- Letter Writing:
  The following topics:
  Mother to son, Son to Mother, Father to Son, Friend to Friend and Business letter.

❖ SEC-A(2): Specific literary feature of Modern Persian:-

The following topics:-

Itroduction of Modern Prose and Poetry Writers with special reference to Bahar, Parween , Iraj Mirza, Lahuti, Hijaji, Sadique Hidayat.

SEMESTER – V1

❖ LCC-L2 (2): MIL Course.

❖ DSE-B-(1) : History of Persian Language and Literature in India During Mughal Period:

- Prose:
  1. Muntakhab-ut-tawarikh (**شیخ سلیم چشتی**) Abdul Qadir Badayuni.
  2. Panj Aahung (**نامہ ای کہ از کلکتہ بہ نام میرزا علی خان بہادر رقم شد**) by Mirza Ghalib.

- (b) Poetry:
  1. Ghazliyat-e-Naziri (Ghazal -1 and 2)
  2. Rubaya-t-Sarmad (1, 2, and 10)

❖ DSE-B (2) : History of Persian Literature in Bengal:-

- (a) Prose:
  1. Khulasa-e-Tawarikh-e-Bangale (**پلا سی جنگ**) by Abdur Rauf Waheed)
  2. Rabindra Nath Tagore by Ata Krim Barke

❖ PRNH-CC-14: Persian Literature in Bengal :-

- (b) Poetry:
  1. Sufi Fatah Ali Waisi (1 and 2 **غزل**)
  2. Raza Ali Wahshat (1 and 2 **غزل**)

❖ SEC:B (1): Grammar, Translation & Essay Writing.

Sign of Azafat. Kind of Izafat. Number. Sentences . Translation from passage and vice versa.

- Short Essay Writings:
  Firdausi, Khayyam,Saadi. Hafiz. Jami. Rumi. Imam Ghazali. Khusraw. Ghalib and Iqbal.

❖ SEC-B(2) : Persian Linguistics:- Philology, dialect, language, Ancient Language of Iran and Impact of Persian on Indian Languages (Urdu, Hindi and Bengali)

➢ Prescribed and Refrence Books:

- Muntakhabat-e-Farsi (B.A. Persian Selection Vol. I&II), Published by Calcutta University
- Aamad Namah, Darul Ashaat, Colutola, Kolkata-73
- Dr. Tanwir Ahmed, A Short History of Persian Literature, Naaz Publication Kolkata
- Prof. Mujibur Rahman, Persian-Urdu Rhetoric and Prosody, M. Bashir Husan & Sons, Calcutta.
- Dr.M. Rahman Persian Translation and Re-translation; Usmania Book Dept. Kolkata-73
- E. G. Browne; A Literary History of Persia; Goodwords Publication, New Delhi
- Dr. Iftekhar Ahmad, Gulbang-e-Farsi; Farhangistan Kolkata
- Dr. Yadullah Samari, Azfa 1-3 Tehran, Iran
- let's Learn Persian, N.C.P.U. L., Ministry of HRD, New Delhi
- Sharaf-e-Alam, Prof.; Patna University, Bihar: *Iran: Ahad- e-Qadeem Ki Siyasi, Saqafati*
- Afghanistan main Jadid Dari (Farsi) Shairi; Dr. Ghulam Muhammad lal Zad & Dr. Shoaib Azmi; NCPUL, New Delhi
- Dr. Iftekhar Ahmed; Naqshha e-Rung Rung, Kitabee Dunya, New Delhi
- Dr. M. Mansoor Alam; Critical Editions of Persian Historical Text in 20th Century of Bengal; AMU, 2008
- Dr. M. Mansoor Alam; Life & Achievements of Dr. Md. Ishaque; Iran Society, Kolkata, 2
- Dr. Gholam Sarwar Persian Linguistics, Arshia Publications, Delhi, 2011
- Shafaq, Razazadeh: Tarikh-e-Adabiyat -e- Iran, Translated in Urdu by Sayyed ubarizudd
- Tarikh-e-Hindustan Vol. 1-3; Shaikh Muhammad Ekraml;
- Chopra, Ravindra Mohan: The Rise, Growth and Decline of Indo-Persian Literature, Iran Society, Calcutta, 2012
- Hisdustan Main Ahad-e-Mughalia ka farsi adab; Dr. Muhammad Iqbal; JMI, New Delhi
- Shibli Nomani, Sher-ul-Ajam, Vol. 1-4, Darul Musannafin, Azamgarh, UP
- Waris Kirmani; Dreams Forgotten, An Anthology of Indo-Persian Poet; Kitab Khana-i-Shiraz, Allahwali Kothi, Dodhpur, Aligarh, 1986
- Dr. Mansoor Alam; Essays on Persian Literature; Iran Society, 2000
- Muhammad Husain Azad, Darbar-e-Akbari, NCPUL, Delhi
- Muhammad Abdul Ghani, A History of Persian Language and Literature at the Mughal Court (Part I & II), Allahabad (U.P.), 1929-30
- Muhammad Abdul Ghani, Pre Mughal Persian in Hindustan,
- Sabahuddin, Abdur Rahman: *Bazm-e-Taimuriah*, Shibli Academy, Azamgarh, (U.P.)
- Sabahuddin, Abdur Rahman: Bazm-e-Mamlukia, Shibli Academy Azamgarh (U.P .)

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

University of Calcutta

Under Graduate Curriculum under Choice Based Credit System (CBCS)

Syllabus forAbility Enhancement Compulsory Course-2 (AECC-2) in
Environmental Studies

Semester-2

Total Marks-100*(Credit -2)*
(50 Theory-MCQ type + 30 Project + 10 Internal Assessment + 10 Attendance)

[Marks obtained in this course will be taken to calculate SGPA & CGPA]

Theory

Unit 1	**Introduction to environmental studies**	2 lectures
	•Multidisciplinary nature of environmental studies; •Scope and importance; Concept of sustainability and sustainable development.	
Unit 2	**Ecology and Ecosystems**	6 lectures
	•Concept of ecology and ecosystem, Structure and function of ecosystem; Energy flow in an ecosystem; food chains, food webs; Basic concept of population and community ecology; ecological succession. •Characteristic features of the following: a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, wetlands, rivers, oceans, estuaries)	
Unit 3	**Natural Resources**	8 lectures
	• Concept of Renewable and Non-renewable resources • Land resources and landuse change; Land degradation, soil erosion and desertification. •Deforestation: Causes, consequences and remedial measures •Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). •Energy resources: Environmental impacts of energy generation, use of alternative and nonconventional energy sources, growing energy needs.	
Unit 4	**Biodiversity and Conservation**	8 lectures
	•Levels of biological diversity: genetic, species and ecosystem diversity; • Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots •India as a mega-biodiversity nation; Endangered and endemic species of India •Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; •Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. •Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.	
Unit 5	**Environmental Pollution**	8 lectures
	• Environmental pollution: concepts and types, • Air, water, soil, noise and marine pollution- causes, effects and controls • Concept of hazards waste and human health risks • Solid waste management: Control measures of Municipal, biomedical and e-waste.	

Unit 6	**Environmental Policies and Practices**	7 lectures
	•Climate change, global warming, ozone layer depletion, acid rain and their impacts on human communities and agriculture •Environment Laws: Wildlife Protection Act; Forest Conservation Act. Water (Prevention and control of Pollution) Act; Air (Prevention & Control of Pollution) Act; Environment Protection Act; Biodiversity Act. •International agreements: Montreal Protocol, Kyoto protocol and climate negotiations; Convention on Biological Diversity (CBD). •Protected area network, tribal populations and rights, and human wildlife conflicts in Indian context.	
Unit 7	**Human Communities and the Environment**	6 lectures
	•Human population growth: Impacts on environment, human health and welfare. •Case studieson Resettlement and rehabilitation. • Environmental Disaster: Natural Disasters-floods, earthquake, cyclones, tsunami and landslides; Manmade Disaster- Bhopal and Chernobyl. •Environmental movements: Bishnois.Chipko, Silent valley,Big dam movements. •Environmental ethics: Role of gender and cultures in environmental conservation. •Environmental education and public awareness	
Project/ Field work		Equal to 5 lectures
	•Visit to an area to document environmental assets: Natural resources/flora/fauna, etc. •Visit to a local polluted site-Urban/Rural/Industrial/Agricultural. •Study of common plants, insects, fish, birds, mammals and basic principles of identification. •Study of ecosystems-pond, river,wetland, forest,estuary and agro ecosystem.	
	Total	50 Lectures

Suggested Reading:

Asthana, D. K. (2006).*Text Book of Environmental Studies.* S. Chand Publishing.

Basu, M., Xavier, S. (2016). Fundamentals of Environmental Studies, Cambridge University Press, India

Basu, R. N., (Ed.) (2000). *Environment*. University of Calcutta, Kolkata

Bharucha, E. (2013). *Textbook of Environmental Studies for Undergraduate Courses*. Universities Press.

De, A.K., (2006).*Environmental Chemistry*, 6th Edition, New Age International, New Delhi.

Mahapatra, R., Jeevan, S.S., Das, S. (Eds) (2017). *Environment Reader for Universities*, Centre for Science and Environment, New Delhi.

Masters, G. M., &Ela, W. P. (1991).*Introduction to environmental engineering and science*. Englewood Cliffs, NJ: Prentice Hall.

Odum, E. P., Odum, H. T., & Andrews, J. (1971).*Fundamentals of ecology*. Philadelphia: Saunders.

Sharma, P. D., & Sharma, P. D. (2005).*Ecology and environment*.Rastogi Publications.