

UNIVERSITY OF KERALA

(Abstract)

M A Degree Course in English Language and Literature in affiliated colleges – revised Syllabus with effect from 2017 admission onwards —approved -- Orders issued.

ACADEMIC A.II SECTION

No.Ac.A.II/4/20/ 2017

Dated, Thiruvananthapuram 22.07.2017

- Read :
1. Item IV B I(1) of the minutes of the Faculty of Arts held on 22.03.2017
 2. Letter from the Chairman,BoS English (PG) and also the Dean of Faculty of Arts to the Vice-Chancellor dated 16.06.2017

ORDER

The Vice Chancellor subject to reporting to the Academic Council has approved the revised syllabus of MA Degree Course in English Language and Literature as recommended by the Board of Studies in English (PG) and as endorsed by the , Faculty of Arts. The revised syllabus shall be implemented with effect from 2017 admissions onwards.

A copy of the revised syllabus is appended.

Orders are issued accordingly.

Sd/-

SOBHANAKUMARI. K
DEPUTY REGISTRAR (Acad.II)
For REGISTRAR

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2. Chairman, Board of Studies in English(PG)
3. Principals of all Colleges offering MA Degree Course in English Language and Literature
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UNIVERSITY OF KERALA



Revised Syllabus for
M. A. Degree Programme
in
English Language and Literature

Prepared by
The P. G. Board of Studies in English 2014-17

w. e. f. 2017 admission onwards

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INTRODUCTION

The P. G. Degree Programme in English Language and Literature would equip students to enter the teaching profession, especially in the Higher Education sector, or to take up other employment. The programme also envisages the inculcation of human values in the learner.

The General Objectives of the M. A. Degree Programme in English Language and Literature are:

- to enable students to engage critically and creatively with a wide range of selected texts
- to develop in them an appreciation of the nuances of literary language through an understanding of the way the English language functions
- to help them understand the relationship between art and life in order to comprehend the social/ emotional/ psychological/cultural value of literary texts
- to provide students with the skills and knowledge necessary to work towards a research degree in any area of their choice and in any place of their preference
- to familiarize them with the current trends in literary research
- to give them insight into basic pedagogical principles and praxis relating to the teaching of both the English Language and Literature in English
- to give them the confidence to use their communication skills in English in a wide range of professional and practical contexts.

The Learning Outcomes at the end of the M. A. Degree Programme in English Language and Literature will be:

- to demonstrate the ability to engage critically with a wide range of selected texts by offering interpretations and evaluations from multiple perspectives
- to demonstrate an understanding of the formal structure of the various genres
- to show an awareness of the literariness of literary language
- to demonstrate the ability to analyse and explain the complexities and subtleties of human experience
- to be able to relate the socio-politico-historical context to the evolution of the forms, styles, and themes of texts
- to demonstrate the research and language skills necessary to do independent, innovative research
- to show they have understood contemporary pedagogic principles and practices in teaching both language and literature
- to demonstrate an ability to communicate effectively in a variety of language situations

COURSE STRUCTURE

Semester 1	Core / Elective	Course Code	Name of Paper	Instructional hours/ week	Marks		
					ESA	CA	Total
Paper 1	Core	EL211	Chaucer to the Elizabethan Age	6	75	25	100
Paper 2	Core	EL212	Shakespeare Studies	6	75	25	100
Paper 3	Core	EL213	The Augustan Age	6	75	25	100
Paper 4	Core	EL214	Romantics and Victorians	7	75	25	100
Semester 2							
Paper 5	Core	EL221	From Modernism to the Present	6	75	25	100
Paper 6	Core	EL222	Indian Writing in English	6	75	25	100
Paper 7	Core	EL223	American Literature	6	75	25	100
Paper 8	Core	EL224	Critical Studies I	7	75	25	100
Semester 3							
Paper 9	Core	EL231	Linguistics and Structure of the English Language	6	75	25	100
Paper 10	Core	EL232	Critical Studies II	7	75	25	100
Paper 11	Elective 1	EL233._		6	75	25	100
Paper 12	Elective 2	EL234._		6	75	25	100
Semester 4							
Paper 13	Core	EL241	English Language Teaching	6	75	25	100
Paper 14	Core	EL242	Cultural Studies	7	75	25	100
Paper 15	Elective 3	EL243._		6	75	25	100
Paper 16	Elective 4	EL244._		6	75	25	100
Paper 17	Compr Ppr	EL245	Comprehensive Paper		100		
Paper 18	Project	EL246	Project		80		100
			Project based Viva Voce		20		
			Grand Total				1800

ELECTIVES: SELECTION OPTIONS***Any ONE from each group****SEMESTERS III & IV****Semester III****Paper XI: EL233 (6 hours / week)****Electives**

1. European Drama	EL233.1
2. Canadian and Australian Literature	EL233.2
3. Film Studies	EL233.3
4. Kerala Studies	EL233.4
5. Women's Writing	EL233.5

Paper XII: EL234 (6 hours / week)**Electives**

6. European Fiction	EL234.1
7. African and Caribbean Literature	EL234.2
8. Fiction and Film	EL234.3
9. Folklore Studies	EL234.4
10. Writing Lives, Performing Gender	EL234.5

Semester IV**Paper XV: EL243 (6 hours / week)****Electives**

11. Comparative Literature	EL243.1
12. South Asian Literature	EL243.2
13. Screenwriting	EL243.3
14. Theatre Studies	EL243.4
15. Travel Writing	EL243.5

Paper XVI: EL244 (6 hours / week)**Electives**

16. Translation Studies	EL244.1
17. Regional Literatures in English Translation	EL244.2
18. Media Studies	EL244.3
19. Dalit Writing	EL244.4
20. Theorising Sexualities	EL244.5

*The Selection options have been categorized to enable colleges to select specialities across the two semesters. For example, a college can specialize in World Literatures by choosing Canadian and Australian Literature and African and Caribbean Literature in Semester III, and South Asian Literature and Regional Literatures in English Translation in Semester IV.

QUESTION PAPER PATTERN

For Core Courses

(Except Shakespeare Studies, Linguistics and Structure of the English Language, English Language Teaching, Critical Studies 1 and 2, and Cultural Studies):

The question paper shall be divided into 4 parts.

Part I

Very Short Answers (50 words)

- Choice: 5 out of 8
- 2 marks for each question ($5 \times 2 = 10$ marks)
- Questions to be based on Modules II and III:
 - FOUR questions from Modules II (two each from Poetry and Drama) and FOUR questions from Module III (two each from Prose and Fiction), **both detailed and non-detailed texts.**

Part II

Annotations/ Critical Comments (150 words) to be based on texts prescribed for detailed study only

- Choice: 2 out of 4
- 5 marks for each question ($2 \times 5 = 10$ marks)
- Questions to be based only on texts prescribed **for detailed study** from Modules II and III
 - This part shall have two sections
 - Section A – TWO questions from Poetry
 - Section B – TWO questions – ONE question from Drama and ONE from Prose

Part III

Short Notes (150 words)

- Choice: 2 out of 4
- 5 marks for each question ($2 \times 5 = 10$ marks)
- ONE question from Module I; ONE question from detailed/ non-detailed section of Module II; ONE from detailed/ non-detailed section of Module III; and ONE question from Module IV.

Part IV

Essay (500 words)

- Choice: 3 out of 9
- 15 marks for each question (3 x 15 = 45 marks)
- This part shall have three sections. Each section shall have three questions. To answer one from each section.
 - Section A to be based on poetry and drama (i.e., Module II)
 - Section B to be based on prose and fiction (i.e., Module III)
 - Section C to be based on Social-political and Literary background and Critical Responses (i.e., Modules I and IV)

Difficulty levels of the questions:

- There are to be three levels of difficulty: EASY, AVERAGE and DIFFICULT.
- Part I: Very short answers (2 marks each; 5 questions to be answered out of 8): Difficulty level: EASY, for all 8 questions (10 marks)
- Part II: Critical comments (5 marks each; 2 questions to be answered out of 4): Difficulty level: AVERAGE, for all 4 questions (10 marks)
- Part III: Short notes (5 marks each; 2 questions to be answered out of 4): Difficulty level: AVERAGE, for all 4 questions (10 marks)
- Part IV: Essay questions (three sets of questions with each set having three questions): Difficulty level: Any one set of three questions – EASY (15 marks); any one set of three questions – AVERAGE (15 marks); any one set of three questions – DIFFICULT (15 marks)
 - Total marks: 75
 - EASY questions: 25 marks (33%)
 - AVERAGE questions: 35 marks (47%)
 - DIFFICULT questions: 15 marks (20%)

Shakespeare Studies Paper

- Part I (2 mark questions; to answer 5 out of 8): TWO questions from Module I; FOUR from Module II; and TWO from Module III.
- Part II (5 marks: Critical Comments; 2 out of 4). THREE questions from the detailed texts (with at least ONE from each play) of Module II; and ONE question from Module II Poetry).
- Part III (5 marks: Short notes; 2 out of 4). ONE from each of the four modules.

- Part IV: Essay (3 out of 9): Section A (3 questions): THREE questions from the drama texts for detailed and non-detailed study in Module II; Section B (3 questions): TWO questions from the adaptations of Shakespeare's plays, and ONE from Poetry; Section C (3 questions): From Modules I and IV with at least one from each module.
- Difficulty level: As in the core papers

Critical Studies I & II and Cultural Studies papers

- Parts I (2 mark questions; 5 out of 8): Questions to be asked from all five modules with at least one from each module. *Maximum only 2 questions to be asked from Supplementary Reading.*
- Part II (5 marks: Short notes; 4 out of 8). From all five modules with at least one from each module. *Maximum 2 out of 8 questions to be asked from Supplementary Reading.*
- Part III: Essay (3 out of 9 questions; 1 from each section): Section A (3 questions): THREE questions from the texts for Required Reading; Section B (3 questions): THREE questions from the Course Descriptions or the texts for Supplementary Reading; Section C: THREE questions based on critical analysis of a known or unknown short text (to be provided) from three different critical perspectives.
- Difficulty level:
 - Part I: 8 EASY questions (to answer 5) (10 marks)
 - Part II: 8 AVERAGE questions (to answer 4) (20 marks)
 - Part III:
 - Section A: 3 EASY questions (to answer 1) (15 marks).
 - Section B: 3 AVERAGE questions (to answer 1) (15 marks)
 - Section C: 1 DIFFICULT question (15 marks)

Linguistics and Structure of the English Language

- Part I (2 mark questions; to answer 5 out of 8): TWO questions each from ALL FOUR modules.
- Part II (5 marks: Short notes; 4 out of 8). TWO questions each from ALL FOUR modules.
- Part III (15 marks)
 - Section A: Essay question: To answer 2 out of 4 questions. ONE question to be asked from each of the FOUR modules
 - Section B: Practical Application:
 - ONE transcription passage (5 marks)

- To resolve TWO ambiguities out of FOUR (through IC analysis or TG grammar) (2 ½ marks each)
- To derive PS and T Rules for ONE singulary transformation out of THREE choices (passivisation/ interrogation/ negation) (5 marks)
- Difficulty level:
 - Part I: 8 EASY questions (to answer 5) (10 marks)
 - Part II: 8 AVERAGE questions (to answer 4) (20 marks)
 - Part III:
 - Section A: EASY (direct) questions (to answer 2) (30 marks)
 - Section B: DIFFICULT questions (15 marks)

English Language Teaching

- Part I (2 mark questions; to answer 5 out of 8): At least ONE question from each of the FIVE modules.
- Part II (5 marks: Short notes; 4 out of 8). At least ONE question from each of the FIVE modules.
- Part III (15 marks)
 - Section A: Essay question: To answer 2 out of 4 questions. The four questions to be from the FIVE modules (with not more than ONE question from any one module).
 - Section B: Lesson Plan: To answer one out of two questions. To be based on i) a given poem or ii) a given passage to teach a grammar point.
- Difficulty level:
 - Part I: 8 EASY questions (to answer 5) (10 marks)
 - Part II: 8 AVERAGE questions (to answer 4) (20 marks)
 - Part III:
 - Section A: EASY (direct) questions (to answer 2) (30 marks)
 - Section B: DIFFICULT questions (15 marks)

For Electives

Part I

- The same pattern as for core papers - very short answers of 50 words - 8 questions - 5 to be answered.
- If the paper contains Module 1: Background and/or Module 4: Critical Responses; FOUR questions each shall be asked only from Modules 2 and 3. Otherwise TWO questions each may be asked from all four modules.

Part II

- No annotations/critical comments to be asked in the elective papers. Instead, Part II of the question paper should contain 8 questions for short notes of which 4 have to be answered. The 8 questions are to be divided into TWO sections, A and B.
- Section A should contain 2 questions from Module 1 and 2 from Module II;
- Section B should contain 2 questions from Module III and 2 from Module IV.
- 2 questions from each section to be answered.

Part III

- Essay questions - The same pattern as for core papers

Difficulty level:

Part I: EASY; Part II: AVERAGE; Part III: One section EASY; one section AVERAGE; one section DIFFICULT

NOTE ON INTERNAL TEST QUESTION PAPER PATTERN

- The same pattern in the 2013 syllabus may be followed.

NOTE ON PROJECT GUIDELINES

- The Project Guidelines for the 2013 syllabus shall continue. However, MLA 8th edition is to be followed for citations.

NOTE ON ADDITIONAL READING

The Board strongly recommends the following series even if they might not appear in the Reading Lists of courses (Colleges may take special interest in acquiring these books):

Lists of courses (Colleges may take special interest in acquiring these books):

1. *The Cambridge Companion Series* published by Cambridge UP
2. *The New Accents Series* published by Routledge
3. *The New Critical Idiom Series* published by Routledge
4. *The Key Concepts Series* published by Routledge
5. *The Beginning Series* published by Manchester UP
6. *The Literary Criticism Online Series* from Gale
7. *Bloom's Modern Critical Views Series* published by Chelsea House
8. *The Norton Anthology Series* published by W. W. Norton & Company
9. *The Pelican/ New Pelican Guide to English Literature Series* published by Penguin

SEMESTER I**Paper I - EL 211: Chaucer to the Elizabethan Age (6 hours /week)****Objectives**

The objectives of this paper are to:

- provide students with an idea of the major historical events and the socio-cultural contexts that shaped the literature of the fifteenth and sixteenth centuries
- develop in students a historical awareness of the evolution of poetry, drama, prose, fiction and literary criticism in English in these two centuries
- examine critically the contributions of poets, dramatists, prose writers and critics that marked the singularity of the age
- explore the structural/ formal and stylistic features of various representative texts of this period

Learning Outcomes

At the end of the course, students will be able to:

- display an awareness of the major historical events and the socio-cultural context which shaped the medieval and early Renaissance period and literature
- explain the impact of the Renaissance on the thought and literature of the period
- explain how socio-historical factors have influenced individual texts and how individual texts are representative of their age
- identify and explain the formal and literary features of each genre and text, and how they contribute to the complexity of values and emotions represented in the texts
- analyze and explain the similarities and differences between various types of the drama of the age
- demonstrate how different critical perspectives have resulted in various readings of selected texts

Course Description**Module I – Socio-political and Literary Background**

The Norman Conquest and its consequences – the church and feudalism – the Crusades – strife between the Pope and kings – Black Death – Peasants' Revolt – Wars of the Roses – decline of feudalism and the rise of benevolent despotism – The English Renaissance – Reformation – Growth of education – Caxton and the printing press – rise of England as a maritime power.

Poetry: Arthurian legends – metrical romances and ballads – Geoffrey Chaucer - English and Scottish Chaucerians – William Langland, John Gower, Thomas Wyatt, Earl of Surrey and the sonnets – Edmund Spenser – Metaphysical Poetry – John Donne, George Herbert, Henry Vaughan, Andrew Marvell, Richard Crashaw

Drama: Mystery, Miracle, Morality and Interludes – Thomas Sackville, Thomas Norton, Nicholas Udall – The Revenge Tragedy, Seneca – University Wits – Thomas Kyd, Christopher Marlowe – Comedy of Humours: Ben Jonson – Jacobean Drama – John Webster, Francis Beaumont and John Fletcher, Philip Massinger, Thomas Dekker.

Prose and Fiction: Medieval and Renaissance prose – Sir Thomas More – Bible Translations – John Wycliffe, William Tyndale, Miles Coverdale and *the Authorized Version* – The Pamphleteers – Stephen Gosson, Philip Sydney – Robert Greene – Francis Bacon – Roger Ascham – John Lyly – Sir Walter Raleigh – Richard Hooker – Richard Hakluyt – Isaak Walton – Thomas Browne – Thomas Hobbes

Recommended Reading (Relevant sections in the following texts)

Carter, Ronald and John McRae. *The Routledge History of Literature in English*. London: Routledge, 1997. e-book.

Daiches, David. *A Critical History of English Literature in Two Volumes*. Vol. I. London: Secker & Warburg, 1961. e-book.

Poplawski, Paul. *English Literature in Context*. London: Cambridge UP, 2008. Print.

Sanders, Andrew. *The Short Oxford History of English Literature*. London: Clarendon P, 1994. e-book.

Module II – Poetry and Drama

Prescribed Texts

Detailed Study

Poetry

Geoffrey Chaucer	“The Prologue.” <i>The Canterbury Tales</i> . Trans. Nevill Coghill.
Edmund Spenser	“Prothalamion”
John Donne	“The Canonization”, “The Blossom”

Drama

Christopher Marlowe *Doctor Faustus*

Non-Detailed Study

Poetry

William Langland *Piers the Plowman*

Sir Thomas Wyatt	"Farewell, Love"
Henry Howard	"Alas, so all things now do hold their peace!"
Edmund Spenser	"Epithalamion"
George Herbert	"Easter Wings"
Henry Vaughan	"The Retreat," "The World"
Andrew Marvell	"To His Coy Mistress"
Richard Crashaw	"Epithalamium"
Ballads	"Sir Patrick Spens"

Drama

Thomas Kyd	<i>The Spanish Tragedy</i>
Ben Jonson	<i>Every Man in His Humour</i>

Module III – Prose and Fiction**Prescribed Texts****Detailed Study**

Francis Bacon	"Of Friendship," "Of Truth," "Of Parents and Children," "Of Marriage and Single Life"

Non-Detailed Study

Philip Sydney	<i>An Apologie for Poetry</i>
Sir Thomas More	<i>Utopia</i>

Module IV – Critical Responses

This is a set of critical responses to texts in modules 2 and 3. They are to be used as critical tools for the analysis of primary texts. No annotations are to be asked from the following texts.

Recommended Reading

Brooks, Cleanth. "The Language of Paradox." Chapter 1. *The Well Wrought Urn*. New York: Harcourt, 1947. 3-21. Print.

Deats, Sara Munson. "'Mark this Show': Magic and Theatre in Marlowe's *Doctor Faustus*." *Placing the Plays of Christopher Marlow: Fresh Cultural Contexts*. Ed. Sara Munson Deats and Robert A. Logan. Hampshire: Ashgate, 2008. 13-24. e-book.

Greenblatt, Stephen. "Introduction." *Renaissance Self-fashioning: From More to Shakespeare*. Chicago: U of Chicago P, 2005. 1-10. Print.

Wetherbee, Winthrop. "The General Prologue." *Chaucer: The Canterbury Tales (Lanterns of World Literature)*. 2nd ed. Cambridge: Cambridge UP, 2004. 18-34. Print.

Reading List

Alden, Raymond M. *Elizabethan Humours and the Comedy of Ben Jonson*. archive.org. Web. <<https://archive.org/stream/elizabethanhumo01clubgoog#page/n9/mode/2up>>.

Boitani, Piero and Jill Mann, ed. *The Cambridge Companion to Chaucer*. UK: Cambridge UP, 2003. Print.

Caudle, Mildred Witt. "Sir Thomas More's *Utopia*: Origins and Purposes." *Social Science* 45.3 (1970): 163-69. JSTOR. Web. <<http://www.jstor.org/stable/41959507>>.

Coursen, Jr, Herbert R. "The Unity of *The Spanish Tragedy*." *Studies in Philology* 65.5 (1968): 768-82. JSTOR. Web. <<http://www.jstor.org/stable/4173620>>.

Eliot, T.S. "The Metaphysical Poets." *T.S. Eliot: Selected Essays 1917-1932*. New York: Harcourt, Brace and Company, 1932. 241-50. Print.

Ellis-Fermor, Una. *Jacobean Drama: An Interpretation*. London: Methuen, 1936. Print.

Engeman, Thomas S. "Hythloday's *Utopia* and More's England: An Interpretation of Thomas More's *Utopia*." *The Journal of Politics* 44.1 (1982): 131-49. JSTOR. Web. <<http://www.jstor.org/stable/2130287>>.

Ford, Boris, ed. *The Age of Chaucer. The Pelican Guide to English Literature*. Vol.1. Harmondsworth: Penguin, 1972. Print.

Grierson, Herbert J.C., ed. *Metaphysical Lyrics and Poems of the 17th Century*. Revised by Alastair Fowler. London: Oxford UP, 1995. Print.

Healey, Thomas. "Dr. Faustus." *The Cambridge Companion to Christopher Marlowe*. Ed. Peter Cheney. Cambridge: Cambridge UP, 2004. 174-92. Print.

Hopkins, Lisa. *Christopher Marlowe: Renaissance Dramatist*. Edinburgh: Edinburgh UP, 2008. Print.

Kamholtz, Jonathan Z. "Thomas Wyatt's Poetry: The Politics of Love." *Criticism* 20.4 (1978): 349-65. JSTOR. Web. <<http://www.jstor.org/stable/23102683>>.

Kay, Carol McGinnis. "Deception through Words: A Reading of *The Spanish Tragedy*." *Studies in Philology* 74.1 (1977): 20-38. JSTOR. Web. <<http://www.jstor.org/stable/4173925>>.

Kostic, Milena. "Introduction: The Renaissance Heritage and 'Dr. Faustus.'" *The Faustian Motif in the Tragedies by Christopher Marlowe*. New Castle: Cambridge Scholars, 2013. 1-37. Print.

Sampson, George. *The Concise Cambridge History of English Literature*. 3rd ed. Cambridge: Cambridge UP, 1970. Print.

The Cambridge History of English and American Literature. Bartelby.com. Web. <<http://www.bartleby.com/cambridge/>>

SEMESTER I

Paper II- EL 212: Shakespeare Studies (6 hours/week)

Objectives

The objectives of this paper are:

- to give an overview of the socio-political and historical events which were instrumental in patterning Elizabethan consciousness
- to help students appreciate Shakespeare as a pioneering figure in defining the course of English drama
- to look into Shakespeare's contributions to enriching the English language
- to identify the discourses met within the plays and to familiarize the learners with significant critical responses

Learning Outcomes

At the end of this course, students will be able to:

- evaluate the significance of the socio-political and historical events which shaped the perspective of the Elizabethan Age
- relate the texts selected for study to the genres/ subgenres they belong to and identify and explain their formal/ stylistic/ literary features
- identify discourses addressed in the plays and critically evaluate them
- analyze the similarities and differences between the various types of drama
- attempt critical reviews of Shakespearean plays based on contemporary theoretical perspectives and their reworking/ adaptations.

Course Description

Module I – Socio-political and Literary Background

Social and political environment of Elizabethan England and its reflection in Shakespearean plays – biographical details of the author – production of plays – sources, actors, theatre, collaborators, audience, structure of the Shakespearean plot – editions and emendations – folios and quartos, Hemminge and Condell, later editions – literary elements – Senecan influence, character types, women, use of the supernatural, blank verse, imagery, quibbles, soliloquy and aside, irony (verbal, situational and prophetic), disguise – thematological classification of plays – tragedies, comedies, romances, problem plays, histories and Roman plays – Shakespeare's enrichment of the English Language – words, phrases and quotable quotes – discourses encountered – humanism, imperialism, feudalism,

patriarchal dominance, homosexuality – Shakespearean criticism – John Keats, Charles Lamb, A.C. Bradley, T.S. Eliot, Wilson Knight, William Empson, Leslie Stephen, Frank Kermode, Terry Eagleton, Jonathan Dollimore.

Poetry: Structure of the Shakespearean sonnet – dedication of the sonnets – identity of the 'Dark Mistress' and the 'Rival Poet' – stock themes of the sonnets.

Recommended Reading

Ford, Boris, ed. *The Age of Shakespeare. The New Pelican Guide to English Literature*. Vol. 2. London: Penguin, 1991. Print. (Relevant sections from this book.)

Kennedy, William J. "Shakespeare and the Development of English Poetry." *The Cambridge Companion to Shakespeare's Poetry*. Ed. Patrick Cheney. Cambridge: Cambridge UP, 2007. 14-32. Print.

Stern, Tiffany. "The Theatre of Shakespeare's London." *The New Cambridge Companion to Shakespeare*. Ed. Margreta de Grazia. Cambridge: Cambridge UP, 2010. 45-60. Print.

Taylor, Gary. "Shakespeare Plays on Renaissance Stages." *The Cambridge Companion to Shakespeare on Stage*. Ed. Stanley Wells and Sarah Tandon. Cambridge: Cambridge UP, 2002. 1-20. Print.

Module II – Drama

Detailed Study

Plays by Shakespeare

Hamlet

Twelfth Night

Poetry

Sonnet Nos.

18 "Shall I compare thee to a summer's day"

30 "When to the sessions of sweet silent thought"

127 "In the old age black was not counted fair"

130 "My mistress' eyes are nothing like the sun"

Non-detailed study

The Tempest

Henry IV Part I

Module III - Modern Adaptations and Re-workings of Shakespeare

Non-detailed study

Tom Stoppard	<i>Rosencrantz and Guildenstern are Dead</i>
Howard Jacobson	<i>Shylock is My Name</i>
Akira Kurosawa	<i>Ran</i>

Module IV - Critical Responses

This is a set of critical reading related to modules 2 and 3. They are to be used as critical tools for the analysis of primary texts. No annotations are to be asked from the following texts.

Recommended Reading

Brown, Paul. "‘This Thing of Darkness I Acknowledge Mine:’ *The Tempest* and the Discourse of Colonialism." *Political Shakespeare: Essays in Cultural Materialism*. Ed. Jonathan Dollimore and Alan Sinfield. 2nd ed. Manchester: Manchester UP, 1994. 48-71. Print.

Johnson, Samuel. *Preface to Shakespeare* (Paragraphs 1-60). 1765. East Sussex: ReadHowYouWant, 2008. Print. ebooks.adelaide.edu.au/j/johnson/samuel/preface/preface.html

Reading List

Barber, Cesar Lombardi. *Shakespeare's Festive Comedy: A Study of Dramatic Form and its Relation to Social Custom*. Princeton: Princeton UP, 1972. Print.

Bloom, Harold. "Shakespeare's Universalism." *Shakespeare: The Invention of the Human*. 1998. New York: The Berkley Publishing Group, 1999. 1-20. Print.

Bradley, A. C. Introduction. *Shakespearean Tragedy*. Foreword by John Bayley. London: Penguin, 1991 (1904). 19-22. Print.

—. "Lecture I- The Substance of Shakespearean Tragedy." *Shakespearean Tragedy*. Foreword by John Bayley. London: Penguin, 1991 (1904). 23-51. Print.

—. "Lecture II – Construction in Shakespeare's Tragedies." *Shakespearean Tragedy*. Foreword by John Bayley. London: Penguin, 1991 (1904). 52-83. Print.

Bryson, Bill. *Shakespeare: The World as Stage*. London: Harper Collins. 2007. Print

Dollimore, Jonathan. "Introduction: Shakespeare, Cultural Materialism and the New Historicism." *Political Shakespeare: New Essays in Cultural Materialism*. Ed. Jonathan Dollimore and Alan Sinfield. Ithaca: Cornell UP, 1985. 2-17. Print.

Eliot, T. S. "Hamlet and His Problems." *Selected Essays, 1917-1932*. 1919. San Diego: Harcourt, Brace and Company, 1932. 121-26. Print.

- Greer, Germaine. *Shakespeare's Wife*. New York: Harper Perennial, 2009. Print.
- Hazlitt, William. *Characters of Shakespeare's Plays*. 1817. South Australia: U of Adelaide, 30 Dec. 2014. Web. <<https://ebooks.adelaide.edu.au/h/hazlitt/william/characters-of-shakespeares-plays/chapter9.html>>.
- Howlett, Kathy M. *Framing Shakespeare on Film: How the Frame Reveals Meaning*. Ohio: Ohio UP, 2000. Print.
- Jones, Ernest. "The Psycho-Analytical Solution." *Hamlet and Oedipus*. New York: Norton, 1976. 45-70. Print.
- Kermode, Frank. Introduction. *Shakespeare's Language*. New York: Ferrar, Straus and Giroux, 1998. 3-24. Print.
- Spurgeon, Caroline F. E. *Shakespeare's Imagery and What it Tells Us*. 1935. Cambridge: Cambridge UP, 2004. Print.
- Wells, Stanley and Lena Cowen Orlin, eds. *Shakespeare: An Oxford Guide*. Indian ed. New Delhi: Oxford UP, 2007. Print.
- Wilson, John Dover. *What Happens in Hamlet*. 1935. Cambridge: Cambridge UP, 2003. Print.

SEMESTER I

Paper III – EL 213: The Augustan Age (6 hours/ week)

Objectives

The objectives of this paper are to:

- familiarize the students with the major socio-political and literary trends in English literature from the Reformation to the post-Restoration era
- evaluate critically the contributions of Augustan writers
- introduce the students to the various features of Augustan poetry and prose
- examine the relative similarities and differences between the different types of Restoration drama

Learning Outcomes

At the end of the course, students will be able to

- gain a comprehensive understanding of Puritanism, its aftermath and subsequent fall and the restoration of the monarchy in England

- display an awareness of specific features of Neo-Classicism in English literature
- acquire a critical understanding of the emergence and popularity of prose and novel in England, during the period
- assess critically the conflicting trends in the literature of the age

Course Description

Module I – Socio-political and Literary Background

The Stuart Age – the Civil War – the Puritan Movement – the Interregnum – the Restoration – the Enlightenment – the Glorious Revolution – Clubs and Coffee Houses – Neo-Classicism – the French Revolution – the Age of Sensibility

Poetry: Caroline Lyricists: Robert Herrick – Thomas Carew – John Suckling – Richard Lovelace – Abraham Cowley – Waller and Denham; John Milton – grand style – satire – mock-epic – John Dryden – Alexander Pope – heroic couplet – Matthew Prior – John Gay; Poets of the Transition: William Blake – Thomas Gray – William Collins – William Cowper – Robert Burns

Drama: The drama of Milton; Restoration Comedy of Manners: William Wycherley – William Congreve – George Etherege – George Farquhar; Jeremy Collier and his critique of the Comedy of Manners; Dryden and Heroic Drama – Sentimental Comedy: Colley Cibber – Richard Steele – Anti-Sentimental Comedy: Richard Sheridan – Oliver Goldsmith

Prose: Milton's prose – John Bunyan – Jeremy Taylor – Richard Baxter; Diarists: Samuel Pepys and John Evelyn; Sir William Temple – John Locke; the Periodical Essay: Addison and Steele – Daniel Defoe – Jonathan Swift – Dr Johnson and his circle; Edmund Burke – Edward Gibbon – David Hume – Literary Criticism – Contributions of Dryden, Pope and Johnson

Fiction: Rise of the Novel: John Bunyan – Daniel Defoe – Samuel Richardson – Henry Fielding – Tobias Smollett – Laurence Sterne – the novel of sentiment and sensibility – Epistolary and Picaresque novels – Women writers: Aphra Behn – Eliza Heywood – Fanny Burney

Recommended Reading (Relevant sections from the following texts)

Choudhury, Bibhash. *English Social and Cultural History: An Introductory Guide and Glossary*. New Delhi: PHI, 2005. Print.

Daiches, David. *A Critical History of English Literature*. Vol. 1 and Vol. 2. London: Secker & Warburg, 1961. Print.

Ford, Boris. *The Pelican Guide to English Literature: From Dryden to Johnson*. Vol. 4. London: Pelican, 1957. Print.

Sampson, George. *The Concise Cambridge History of English Literature*. 1941.
Cambridge: Cambridge UP, 1999. Print.

Module II – Poetry and Drama

Prescribed Texts

Poetry

Detailed Study

John Milton	<i>Paradise Lost, Book I</i>
John Dryden	"Mac Flecknoe"

Drama

R. B. Sheridan	<i>The Rivals</i>

Non-detailed Study

Poetry

Alexander Pope	"Rape of the Lock"
Aphra Behn	"On the Death of the Late Earl of Rochester"
Robert Burns	"A Red, Red Rose," "Auld Lang Syne"
Sir John Suckling	"Love Turned to Hate"
Thomas Carew	"The Unfading Beauty"
Thomas Gray	"Ode on the Death of a Favourite Cat"
William Blake	"The Lamb," "The Tyger," "A Cradle Song"
William Cowper	"The Nightingale and the Glow-Worm"

Drama

William Congreve	<i>The Way of the World</i>
Colly Cibber	<i>Love's Last Shift</i>

Module III – Prose and Fiction

Prescribed Texts

Prose

Detailed Study

Richard Steele	"The Spectator Club"
Jonathan Swift	"The Vindication of Isaac Bickerstaff"
Dr Johnson	"On Procrastination"

Non-detailed Study

Prose

John Locke	<i>An Essay Concerning Human Understanding</i> – Chapter 1 "Introduction." < http://brembs.net/metabiology/essay.html#HD_NM_7 >

Jonathan Swift

*The Battle of the Books***Fiction**

Aphra Behn

Oroonoko

Daniel Defoe

Robinson Crusoe

Samuel Richardson

Pamela

Henry Fielding

*Joseph Andrews***Module IV – Critical Responses**

This is a set of critical responses to texts in modules 2 and 3. These are to be used as critical tools for the analysis of primary texts. No annotations are to be asked from the following texts.

Recommended Reading

Addison, Joseph. "Notes upon the Twelve Books of Paradise Lost." *Spectator* No. 303. Ann Arbor, Michigan: University of Michigan Library, 2007. *Eighteenth Century Collections Online*. Web. <<http://quod.lib.umich.edu/e/ecco/004856155.0001.000/1:8?rgn=div1;view=fulltext>>.

Collier, Jeremy. *A Short View on the Immorality and Profaneness of the English Stage Together with the Sense of Antiquity upon this Argument*. Paragraphs 1-15. London: S. Keble, 1698. *Gutenberg.org*.

Web. <<http://www.gutenberg.org/files/44645/44645-h/44645-h.htm#page15>>.

Kant, Immanuel. "An Answer to the Question: What is Enlightenment?" *Aub.edu.Ib*.

Web. <https://www.aub.edu.lb/fas/cvsp/Documents/reading_selections/CVSP%20203/Fall%2013-14/What%20is%20Enlightenment%20-%20Immanuel%20kant.pdf>.

Watt, Ian. "Realism and the Novel Form." *The Rise of the Novel*. 1957. 2nd American ed. California: U of California P, 2001. 9-30. Print.

Reading List

Cowan, Brian William. "Mr Spectator and the Coffeehouse Public Sphere." *Eighteenth-Century Studies* 37.3 (2004): 345-66. Web. <<https://muse.jhu.edu/article/53861>>.

Drabble, Margaret, et al., eds. *The Concise Oxford Companion to English Literature*. 1990. 3rd ed. Oxford: Oxford UP, 2007. Print.

Fisk, Deborah Payne, ed. *The Cambridge Companion to English Restoration Theatre*. 2000. Cambridge: Cambridge UP, 2003. Print.

Foucault, Michel. "What is Enlightenment?" *The Foucault Reader: An Introduction to Foucault's Thought*. 1984. Ed. Paul Rabinow. London: Penguin, 1991. 32-50. Print.

Frost, William. "Dryden and Satire." *Studies in English Literature 1500-1900* 11.3 (1971): 401-16. JSTOR.

Web. <http://www.jstor.org/stable/449903?seq=1#pagescan_tab_contents>.

Hawthorn, Jeremy. *Studying the Novel*. 1985. 7th ed. London: Bloomsbury Academic, 2017. Print.

Holmsland, Oddvar. "Aphra Behn's "Oroonoko": Cultural Dialectics and the Novel." *ELH* 68.1 (2001): 57-79. JSTOR.

Web. <http://www.jstor.org/stable/30031959?seq=1#page_scan_tab_contents>.

Lewis, C. S. *A Preface to Paradise Lost*. 1942. London: Oxford UP, 1961. Print

Lynch, Kathleen M. *The Social Mode of Restoration Comedy*. 1926. New York: Biblio and Tannen, 1965. Print.

Peck, H. W. "The Theme of *Paradise Lost*." *PMLA* 29.2 (1914): 256-69. JSTOR. Web. <<http://www.jstor.org/stable/pdf/457078.pdf>>.

Poplawski, Paul, ed. *English Literature in Context*. 2008. South Asian Ed. Cambridge: Cambridge UP, 2010. Print.

Rimmon-Kenan, Shlomith. *Narrative Fiction: Contemporary Poetics*. 1983. London, Routledge, 2002. Print.

Saintsbury, George. *The English Novel*. 1913. London: J.M. Dent and Sons, 1927. *Archive.org*. Web. <<https://archive.org/stream/cu31924013275254#page/n5/mode/2up>>.

Schmidt, James, ed. *What is Enlightenment: Eighteenth Century Answers and Twentieth Century Questions*. Berkeley: U of California P, 1996. Print.

Todd, Janet, ed. *Aphra Behn Studies*. Cambridge: Cambridge UP, 1996. Print.

Wall, Cynthia, ed. *A Concise Companion to the Restoration and Eighteenth Century*. Malden: Blackwell, 2005. Print.

Watt, Ian. *Rise of the Novel*. 1957. 2nd American ed. California: U of California P, 2001.

SEMESTER I

Paper IV - EL 214: Romantics and Victorians (7 hours/week)

Objectives

The objectives of this paper are to:

- understand the socio-cultural, political and intellectual contexts that nourished Romantic and Victorian Literature
- evaluate critically the different phases of Romanticism, the change in mood and temper in the Victorian era and the conflict between science and religion at the turn of the century
- enable the students to evaluate critically the English mindset in the context of rapid social transformations in the nineteenth century
- identify and explain the features of the different kinds of literary texts in terms of the literary movements

Learning Outcomes

At the end of the course, students will be able to:

- relate the texts selected for study to the genres they belong to and identify and explain the structural, formal, stylistic and literary features.
- display an awareness of the contributions of the poets, novelists and prose writers
- explain and analyze the similarities and differences between the different types of novels of the Romantic and Victorian ages
- understand the social and literary changes that influenced drama in the century
- evaluate the implications of the critical responses of the period

Course Description

Module I - Socio-political and Literary Background

The French Revolution and its impact – the Industrial Revolution – urbanisation and unemployment – the Luddite Riots – Peterloo Massacre – the Reform Act of 1832 – Corn Laws – the Hungry Forties – the Oxford Movement.

Change in mood and temper in the Victorian age – spread of science and technology – the conflict between science and religion – Parliamentary reform and political stability – Utilitarianism – Charles Darwin – Karl Marx and Sigmund Freud – Methodism – the rise of education – Public school system – changes in social life – politics of colonization – the Victorian Dilemma – the Victorian Compromise – Victorian Morality.

Poetry: The Romantic Revival and Revolt – William Wordsworth and Samuel Taylor Coleridge - the *Lyrical Ballads* – Wordsworth's theory of poetry – different phases of Romanticism – the younger Romantics – John Keats, Percy Bysshe Shelley, Lord Byron – Women poets of the Romantic age – Anna Laetitia Barbauld, Elizabeth Benger – Fleshly school of poetry – Aestheticism - Decadent poetry – Contemplative poetry, love poetry, elegy, dramatic monologue – Alfred Lord Tennyson, Matthew Arnold, A.H. Clough, Robert Browning, Elizabeth Barrett Browning – Pre-Raphaelites – D.G. Rossetti, Christina Rossetti, Algernon Swinburne, William Morris – Precursors to Modernist poetry – Thomas Hardy – Gerard Manley Hopkins, Rudyard Kipling – Symbolism – Arthur Symonds

Drama: Verse drama in the Romantic age – closet drama – Samuel Taylor Coleridge – William Wordsworth – George Gordon Byron – Percy Bysshe Shelley – John Keats – Lord Tennyson – the decline of drama in the Romantic and Victorian ages – causes – dramatists of transition – T.W. Robertson and Stage Naturalism – spectacular theatre and melodrama – Pinero and Jones and the problem play – Oscar Wilde and Comedy of Manners

Prose and Fiction: The rise of the modern review and magazines – Essay writing and criticism – Thomas De Quincey and J.G. Lockhart – Charles Lamb – the personal essay – William Hazlitt – Leigh Hunt – Coleridge's prose writings – Mary Wollstonecraft – the development of the English Novel in the first half of the nineteenth century – Walter Scott – the Historical Novel – Jane Austen – Horace Walpole, Mary Shelley – the Gothic Novel

Prose in the age of Tennyson – Thomas Carlyle – Arnold's essays – other prose writers – Walter Pater, Leslie Stephen, Thomas Huxley and John Henry Newman – Age of Fiction – Charles Dickens and the Humanitarian Movement – William Thackeray – George Eliot – the – the Bronte sisters, George Meredith, R.L. Stevenson – Hardy and the Wessex novels

Recommended Reading (relevant sections of the following texts)

Choudhury, Bibhash. *English Social and Cultural History: An Introductory Guide and Glossary*. New Delhi: PHI, 2005. Print.

Daiches, David. *A Critical History of English Literature*. Vol. 2. London: Secker & Warburg, 1961. Print.

Ford, Boris. *The Pelican Guide to English Literature*. Vol. 5 and Vol. 6. London: Penguin Books, 1980. Print.

Sampson, George. *The Concise Cambridge History of English Literature*. 1941. Cambridge: Cambridge UP, 2004. Print.

Module II - Poetry and Drama**Prescribed Texts****Detailed Study****Poetry**

William Wordsworth	"Ode on the Intimations of Immortality"
Samuel Coleridge	"Dejection: An Ode"
P. B. Shelley	"Ode to the West Wind"
John Keats	"Ode on a Grecian Urn"
Lord Tennyson	"The Lotus-Eaters"
Robert Browning	"Fra Lippo Lippi"
Matthew Arnold	"Dover Beach"
G. M. Hopkins	"Pied Beauty"

Drama

Oscar Wilde	<i>The Importance of Being Earnest</i>

Non-detailed Study**Poetry**

Lord Byron	"The Prisoner of Chillon"
Robert Southey	"My Days among the Dead are Past"
Emily Bronte	"No Coward Soul is Mine"
D. G. Rossetti	"The Blessed Damozel"
Elizabeth Barrett Browning	<i>Sonnets from the Portuguese</i> -14 and 22
William Morris	"The Haystack in the Floods"

Drama

P. B. Shelley	<i>The Cenci</i>

Module III- Prose and Fiction**Prescribed Texts****Detailed Study****Prose**

Charles Lamb	"Oxford in the Vacation," "Mackery End, in Hertfordshire," "A Dissertation upon Roast Pig"
Matthew Arnold	"Sweetness and Light," <i>Culture and Anarchy</i> , Chapter I: 1-19.

Non-detailed Study**Prose**

William Wordsworth	<i>Preface to the Lyrical Ballads</i>
Lytton Strachey	"Dr. Arnold" <i>Eminent Victorians</i> : 207-242

Fiction

Jane Austen	<i>Mansfield Park</i>
Charles Dickens	<i>David Copperfield</i>
George Eliot	<i>The Mill on the Floss</i>
Thomas Hardy	<i>The Mayor of Casterbridge</i>

Module IV - Critical Responses

This is a set of critical responses to texts in modules 2 and 3. These are to be used as critical tools for the analysis of primary texts. No annotations are to be asked from the following texts.

Recommended Reading

Abrams, M. H. "Introduction: Orientation of Critical Theories." *The Mirror and the Lamp: Romantic Theory and the Critical Traditions*. 1953. Oxford: Oxford UP, 1971. 3-29. Print.

Bloom, Harold. "Prometheus Rising: The Backgrounds of Romantic Poetry." *The Visionary Company: A Reading of English Romantic Poetry*. 1961. Rev. and enl. ed. Ithaca: Cornell UP, 1971. xiii-xxv. Print.

Walker, Hugh. "The New Age." *The Literature of the Victorian Era*. 1910. Cambridge: Cambridge UP, 2011. 1-22. Print.

Reading List

Alexander, Michael. *A History of English Literature*. Chennai: Palgrave Macmillan, 2007. Print.

Bloom, Harold. *The Visionary Company: A Reading of English Romantic Poetry*. 1961. Rev. and enl. ed. Ithaca: Cornell UP, 1971. Print.

Bowra, Cecil Maurice. *The Romantic Imagination*. 1949. London: Oxford UP, 1964. Print.

Brantlinger, Patrick. *Victorian Literature and Postcolonial Studies*. Edinburgh: Edinburgh UP, 2009. Print.

Bush, Douglas. *Mythology and Romantic Traditions*. 1937. New York: Pageant, 1957. Print.

Cordery, Gareth. "Foucault, Dickens, and David Copperfield." *Victorian Literature and Culture* 26.1 (1998): 71-85. JSTOR. Web. <<http://www.jstor.org/stable/25058404>>.

Evans, Ifor. *A Short History of English Literature*. New York: Penguin, 1990. Print.

Foster, Richard. "Wilde as Parodist: A Second Look at the Importance of Being Earnest." *College English* 18.1 (1956): 18-23. JSTOR. Web. <<http://www.jstor.org/stable/372764>>.

- Frye, Northrop. *A Study of English Romanticism*. New York: Random House, 1968. Print.
- Grierson, Sir Herbert John and James Cruickshanks Smith. *A Critical History of English Poetry*. 1946. London: Bloomsbury Academic, 2013. Print.
- Hoernier, Fred. "Nostalgia's Freight in Wordsworth's 'Intimations Ode'" *ELH* 62.3 (1995): 631-61. *JSTOR*. Web. <<http://www.jstor.org/stable/30030094>>.
- Knight, George Wilson. *The Starlit Dome: Studies in the Poetry of Vision*. 1941. London: Routledge, 2002. Print.
- Lawrence, Karen, Betsy Seifter and Lois Ratner. *McGraw-Hill Guide to English Literature Vol.II: William Blake to D. H. Lawrence*. New York: McGraw-Hill, 1985. Print.
- Peck, John and Martin Coyle. *A Brief History of English Literature*. 2002. 2nd ed. UK: Palgrave Macmillan, 2013. Print.
- Radford, Andrew and Mark Sandy, ed. *Romantic Echoes in the Victorian Era*. 2008. London: Routledge, 2016. Print.
- Trilling, Lionel. *The Liberal Imagination: Essays on Literature and Society*. 1950. New York: New York Review, 2008. Print.
- Watt, Ian, ed. *The Victorian Novel: Modern Essays in Criticism*. London: Oxford UP, 1971. Print.

SEMESTER II

Paper V - EL 221: From Modernism to the Present (6 hours/ week)

Objectives

The Objectives of this course are to:

- ❖ familiarize students with the socio-cultural impulses that shaped the twentieth century English society
- ❖ introduce and examine the various movements that dominated the literature, culture, and arts of the century and which produced significant shifts in the patterns of thought and living
- ❖ introduce the students to the poets, novelists, dramatists, essayists, prose writers and critics of the age
- ❖ examine the similarities and differences between the literature of the first and the second half of the centuries

Learning Outcomes:

At the end of this course, students will be able to:

- ❖ demonstrate an understanding of how the age affected the literature and the various genres
- ❖ demonstrate a knowledge of the major movements that influenced British and European literature
- ❖ analyze critically and explain the features of Modernism
- ❖ evaluate critically the texts in terms of their stylistic and formal features

Course Description

Module I – Socio-political and Literary Background

Georgian and Edwardian periods – The Irish Question – World Wars I & II and the inter-war years – Depression Years – Decline of political power – The End of the Empire – Labour Government – Mass Culture – Welfare State – Cold War – Thatcher's England – Millennial England – Literature and media in the twentieth century – Role of the BBC

Poetry: Edwardian Poets – John Masefield – Walter de la Mare – A.E. Housman – Georgians – Robert Bridges – Symbolist Movement – Irish Literary Revival – W.B. Yeats – Poets of World War I – Wilfred Owen, Siegfried Sassoon, Rupert Brooke – Imagism – Modernist Poetry – T.S. Eliot – the Poets of the thirties – W. H. Auden, Louis MacNeice, Stephen Spender et al. – Surrealism – Dylan Thomas – New Apocalypse – Movement Poetry – Philip Larkin, Thom Gunn, Elizabeth Jennings – Confessional Poetry – Sylvia Plath – New poets of the 50's – Ted Hughes – John Betjeman – Mavericks – Seamus Heaney, Andrew Motion, Geoffrey Hill, R.S. Thomas – 1980s – Martians and Gorgons – Craig Raine – Contemporary – Charles Tomlinson, Donald Davie, Benjamin Zephaniah – Scottish Poets – Jackie Kay, Carol Ann Duffy

Drama: The New Drama – influence of Ibsen – Problem Play – Bernard Shaw – John Galsworthy – James Barrie – The Well-Made Play – Poetic Drama – T.S. Eliot, Christopher Fry – Irish Dramatic Movement – Abbey Theatre – W.B. Yeats, J. M. Synge, Sean O'Casey – Post-war Drama – The Kitchen-sink Drama – Arnold Wesker – The Angry Young Men – John Osborne – The Theatre of the Absurd – Samuel Beckett – The Theatre of Cruelty – Comedy of Menace – Harold Pinter, Tom Stoppard: Edward Bond, Robert Bolt – Women Dramatists: Caryl Churchill; Charlotte Keatley – In-Yer-Face Theatre

Prose: Criticism – T.S. Eliot, Virginia Woolf, I.A. Richards, William Empson, F.R. Leavis, Raymond Williams, Terry Eagleton – The Essay – Hilaire Belloc, G.K. Chesterton, Max Beerbohm, Bertrand Russell, A.G. Gardiner, Aldous Huxley, George Orwell, E.V. Lucas – Biography – Lytton Strachey – Periodicals – the little magazine.

Novel: Edwardian Novelists – John Galsworthy – Rudyard Kipling – H.G. Wells – Psychological Novel – D.H. Lawrence – Stream-of-consciousness – James Joyce, Virginia Woolf – Joseph Conrad – E.M. Forster – George Orwell – Somerset Maugham – Detective Novel – Post-war fiction – Graham Greene, William Golding, Samuel Beckett, Campus Novel – Evelyn Waugh, C.P. Snow – Other novelists – Kingsley Amis, John Wain, Angus Wilson, Lawrence Durrell, Anthony Burgess, Christopher Isherwood, Malcolm Bradbury, Doris Lessing, Anita Brookner, Iris Murdoch, A.S. Byatt, Margaret Drabble, Muriel Spark, Angela Carter, John Fowles, Ian McEwan, Peter Ackroyd, Alan Hollinghurst, Hilary Mantel, J.K. Rowling.

Recommended Reading (Relevant sections from the following books)

Carter, Ronald, and John McRae. *The Routledge History of Literature in English*. 2nd ed. New York: Routledge, 2001. Print.

Daiches, David. *A Critical History of English Literature*. Vol. 4. 1960. 2nd ed. New Delhi: Allied, 2005.

Poplawski, Paul. *English Literature in Context*. 2nd ed. Cambridge: Cambridge UP, 2017. Print.

Sanders, Andrew. *The Short Oxford History of English Literature*. 3rd ed. Oxford: Oxford UP, 2004. Print.

Module II – Poetry and Drama

Prescribed Texts

Detailed study

Poetry

W. B. Yeats	“The Second Coming,” “Sailing to Byzantium”
T. S. Eliot	“The Waste Land”
W. H. Auden	“In Memory of W. B. Yeats”
Dylan Thomas	“Poem in October”
Sylvia Plath	“Daddy”
Carol Anne Duffy	“Anne Hathaway”

Drama

Samuel Beckett	<i>Waiting for Godot</i>

Non-detailed study

Poetry

Wilfred Owen	“Dulce et Decorum Est”
Philip Larkin	“Church Going”

Ted Hughes	"Thought Fox"
Seamus Heaney	"Punishment"
Alice Oswald	"The Wedding"
Benjamin Zephaniah	"The British"

Drama

David Hare	<i>Stuff Happens</i>
Caryl Churchill	<i>Cloud Nine</i>

Module III – Prose and Fiction:**Prescribed Texts****Detailed Study****Prose**

T. S. Eliot	"Tradition and the Individual Talent"
Virginia Woolf	"Modern Fiction"

Non-detailed Study**Prose**

George Orwell	"Prevention of Literature"
Raymond Williams	"Seeing a Man Running"

Fiction**Novel**

James Joyce	<i>The Portrait of an Artist as a Young Man</i>
Angela Carter	<i>The Nights at the Circus</i>
Julian Barnes	<i>Sense of an Ending</i>
P. G. Wodehouse	<i>The Code of the Woosters</i>

Short Story

Somerset Maugham	"Rain"
Margaret Drabble	"The Reunion"

Module IV- Critical Responses

This is a set of critical reading related to modules 2 and 3. They are to be used as critical tools for the analysis of primary texts. No annotations are to be asked from the following texts.

Recommended Reading

Eagleton, Terry. "The Rise of English." *Literary Theory: An Introduction*. 1983. Anniversary ed. Minneapolis: U of Minnesota P, 2008. 15-46. Print.

Esslin, Martin. "Introduction: The Absurdity of the Absurd." *The Theatre of the Absurd*. 1961. New ed. London: Bloomsbury, 2013. 19-28. Print.

Fraser, G.S. "Chapter I." *The Modern Writer and His World: Continuity and Innovation in Twentieth Century Literature*. London: Derek Verschoyle, 1953. Print.

Reading List

Alegre, Sara Martín. *Post-War English Literature: 1945-1990*. Universitat Oberta Catalunya. [Gent.uab.cat](http://gent.uab.cat).

Web. <<http://gent.uab.cat/saramartinalegre/sites/gent.uab.cat.saramartinalegre/files/Post-War%201945-1990.pdf>>.

Bradbury, Malcolm. *The Social Context of Modern English Literature*. New York: Schocken, 1971. Print.

Childs, Peter. *The Twentieth Century in Poetry: A Critical Survey*. London: Routledge, 1999. Print.

Fish, James F. *A Concise Companion to Contemporary British Fiction*. London: Blackwell, 2006. Print.

Ford, Boris, ed. *The New Pelican Guide to English Literature*. Vol. 7 (*From James to Eliot*) and Vol. 8 (*From Orwell to Naipaul*). London: Penguin, 1997. Print.

Head, Dominic. *The Cambridge Introduction to Modern British Fiction*. Cambridge: Cambridge UP, 2002. Print.

Innes, Christopher. *Modern British Drama: The Twentieth Century*. Cambridge: Cambridge UP, 2002. Print.

Lane, David. *Contemporary British Drama: Edinburgh Critical Guides to Literature*. Edinburgh: Edinburgh UP, 2010. Print.

Leavis, F.R. *New Bearings in English Poetry*. Harmondsworth: Penguin, 1963. Print.

Levenson, Michael, ed. *The Cambridge Companion to Modernism*. 1999. Cambridge: Cambridge UP, 2003. Print.

Malcolm, Cheryl Alexander and David Malcolm. *A Companion to the British and Irish Short Story*. Oxford: Wiley-Blackwell, 2008. Print.

Morrison, Jago. "Angela Carter: Genealogies." *Contemporary Fiction*. London: Routledge, 2003. 155-78. Print.

Perkins, David. *A History of Modern Poetry: From the 1890s to the High Modernist Mode*. Cambridge: Harvard UP, 1976. Print.

—. *A History of Modern Poetry: Modernism and After*. Cambridge: Harvard UP, 1987. Print.

- Schoene, Berthold. *The Cosmopolitan Novel*. Edinburgh: Edinburgh UP, 2009. Print.
- Sheppard, Robert. *The Poetry of Saying: British Poetry and its Discontents, 1950-2000*. Liverpool: Liverpool UP, 2005. Print.
- Tew, Philip. *The Contemporary British Novel*. 2004. 2nd ed. London: Continuum, 2011. Print.
- The Cambridge History of English and American Literature*. Bartelby.com. Web. <<http://www.bartleby.com/cambridge/>>
- Thomas, C. T. Introduction. *Twentieth Century Verse: An Anglo-American Anthology*. 1979. New Delhi: Macmillan, 1990. Print.
- Thwaite, Anthony. *Poetry Today: A Critical Guide to British Poetry, 1960-1995*. 1966. London: Routledge, 2013. Print.
- Waugh, Patricia, ed. *Revolutions of the Word: Intellectual Contexts for the Study of Modern Literature*. London: Arnold, 1997. Print.
- Williams, Raymond. *Drama from Ibsen to Brecht*. 1965. Rev. ed. London: Penguin, 1973. Print.

SEMESTER II

Paper VI – EL 222: Indian Writing in English (6 hours/week)

Objectives

The objectives of this paper are to:

- enable students to understand the historical and socio-cultural contexts for the emergence of English as a medium for communication and literary expression in India
- provide students a perspective on the diverse aspects of Indian Writing in English
- enable students to trace the evolution of Indian Writing in English
- enable students to get an overview of Indian English poetry, prose, drama, novel and short story
- help students to develop a general understanding of Indian aesthetics
- enable an understanding of the recent trends in Indian Writing in English

Learning Outcomes

At the end of the course, the students will be able to:

- display an in-depth awareness of the major historical events and the socio-cultural contexts which moulded the various genres in Indian Writing in English
- analyze how the sociological, historical, cultural and political context impacted the texts selected for study
- evaluate critically the contributions of major Indian English poets, dramatists, prose writers, novelists and short story writers
- develop a literary sensibility and display an emotional response to the literary texts and cultivate a sense of appreciation for them
- apply the ideas encapsulated in Indian Aesthetics to literary texts

Course Description

Module I - Socio-political and Literary Background

Colonialism and Macaulay's Minutes – historical context for the rise of Indian Writing in English – Indian Renaissance – socio-cultural movements – social reformers – rise of Indian nationalism – Nehruvian socialism – secularism – crisis in Indian democracy – Emergency – Postcolonialism – Indian feminist thought – dalit consciousness – subaltern voices – advent of globalization – diaspora – popular literature

Poetry: Influence of Romanticism – emergence of epics – lyrics – sonnets – impact of nationalism on Indian English poetry – Michael Madhusudan Dutt, Aurobindo Ghose, Rabindranath Tagore, Toru Dutt, Sarojini Naidu – Modernism and after – Nissim Ezekiel, A.K. Ramanujan, Jayanta Mahapatra, R. Parthasarathy, Gieve Patel, Keki. N. Daruwalla, Shiv. K. Kumar, Eunice De Souza, Adil Jussawala, Kamala Das, Arun Kolatkar, Vikram Seth, Meena Alexander, Tabish Khair, Vijay Sheshadri, Mamang Dai, Jeet Thayil

Drama: Indian Classical Drama – Bharatamuni, Patanjali, Bhasa, Kalidasa, Bhavabhuti – Loknatya in seventeenth century – modern drama – social drama, historical drama, artistic drama, amateur theatre – Indian Peoples' theatre, street theatre – Bharatendu Harishchandra, Krishna Mohan Banerjee, Michael Madhusudan Dutt, Aurobindo Ghose, Rabindranath Tagore, Harindranath Chattopadhyay, T. P. Kailasam, B.V. Karanth, J.M. Lobo Prabhu – Asif Currimbhoy, Girish Karnad, Vijay Tendulkar, Badal Sircar - Safdar Hashmi, Pritish Nandi, Alyque Padamsee, Mahesh Dattani, Shanta Gokhale, Manjula Padmanabhan, Mahashweta Devi

Prose: Impact of modernity in nineteenth century – Impact of Nationalism in twentieth century - Vivekananda, Mahatma Gandhi, Jawaharlal Nehru, S. Radhakrishnan, Nirad. C. Chaudhury – Contemporary Indian prose - Cho Ramaswamy, C.S. Lakshmi, Kancha Ilaiah, P. Sainath, Arundhati Roy, Ramachandra Guha

Fiction: Pre-Independence fiction and Partition fiction – Khushwant Singh, R.K. Narayan, Raja Rao, Mulk Raj Anand, G.V. Desai, Nayantara Sehgal – Fiction of the Diaspora – Jhumpa Lahiri, Kiran Desai, Chitra Divakaruni, Rohinton Mistry, Salman Rushdie, V.S. Naipaul – Women writers – Kamala Markandaya, Ruth Praver Jhabwala, Shashi Deshpande, Anita Desai, Anita Nair, Arundhati Roy – Contemporary writers – Amitav Ghosh, Shashi Tharoor, Vikram Seth, Manu Joseph, Chetan Bhagat, Amish Tripathi, Amit Chaudhuri, Anees Salim

Recommended Reading

Iyengar, K. R. S. *Indian Writing in English*. 1962. New Delhi: Sterling, 1985. Print.

Mehrotra, Arvind Krishna. *A Concise History of Indian Literature in English*. New Delhi: Permanent Black, 2008. Print.

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

Seturaman, V. S., ed. *Indian Aesthetics*. Madras: Macmillan, 1992. Print.

Module II – Poetry and Drama

Prescribed Texts

Detailed Study

Poetry

Sarojini Naidu	“Coromandel Fishers”
Kamala Das	“The Freaks”
Jayanta Mahapatra	“Grandfather”
Nissim Ezekiel	“Background Casually”
Mamang Dai	“This Summer – The Cicada’s Song”
Jeet Thayil	“Life Sentence”
Eunice De Souza	“The Road”

Drama

Mahesh Dattani	<i>Dance Like a Man</i>

Non Detailed Study

Poetry

Toru Dutt	“Our Casuarina Tree”
Rabindranath Tagore	<i>Gitanjali</i> (Songs 1, 6, 50 & 103)
Parthasarathy	“As a Man Approaches Thirty He May”
Arun Kolatkar	“An Old Woman”
Gieve Patel	“On Killing a Tree”
Mamta Kalia	“After Eight Years of Marriage”

Drama

Vijay Tendulkar

Silence! The Court is in Session

Girish Karnad

*The Fire and the Rain***Module III- Prose and Fiction****Prescribed Texts****Detailed Study****Prose**

A. K. Ramanujan: "Is There an Indian Way of Thinking: An Informal Essay."

Non-detailed Study**Fiction**

R. K. Narayan

The Guide

Salman Rushdie

Shame

Amitav Ghosh

Sea of Poppies

Bharati Mukherjee

Jasmine

Anita Nair

*The Mistress***Short Story**

Ruskin Bond

"The Kite Maker"

Arjun Dangle

"Promotion"

Jhumpa Lahiri

*"A Temporary Matter"***Module IV – Critical Responses**

This is a set of critical reading related to modules 2 and 3. They are to be used as critical tools for the analysis of primary texts. No annotations are to be asked from the following texts.

Recommended Reading

Chaudhuri, Amit. "Poles of Recovery." *Clearing a Space: Reflections on India, Literature and Culture*. New Delhi: Penguin, 2012. 39-56. Print.

Mukherjee, Meenakshi. "From Pūrāna to Nutana." *The Twice Born Fiction: Themes and Techniques of the Indian Novel in English*. New Delhi: Heinemann, 1971. Print.

Paniker, Ayyappa K. "Indian Poetry in English and the Indian Aesthetic Tradition." *The Indian Journal of English Studies* 23 (1983): 137-51. Print.

Reading List

Amitabh. "The Cull." *Poisoned Bread: Translations from Modern Marathi Dalit Literature*. Ed. Arjun Dangle. New Delhi: Orient BlackSwan, 2009. 191-96. Print.

- Chaudhuri, Amit. *Clearing a Space: Reflections on India, Literature and Culture*. 2008. New Delhi: Penguin, 2012. Print.
- Chaudhuri, Asha Kuthari. *Contemporary Indian Writers in English: Mahesh Dattani, An Introduction*. New Delhi: Foundation, 2005. Print.
- Dharwadker, Vinay, ed. *The Collected Essays of A. K. Ramanujan*. 1999. Oxford: Oxford UP, 2004. Print.
- Ghosh, Amitav. "Opium Financed British Rule in India." Interview by Soutik Biswas. *BBC.com*. 23 June 2008.
- Web. 30 June 2010. <http://news.bbc.co.uk/2/hi/south_asia/7460682.stm>
- . *Sea of Poppies*. London: Penguin, 2008. Print.
- Iyengar, K. R. Sreenivasa. *Indian Writing in English*. 1962. New Delhi: Sterling, 1985. Print.
- King, Bruce. *Modern Indian English Poetry*. 1987. Rev. ed. New Delhi: Oxford UP, 2001. Print.
- Lakshmi, Vijay. "Janaki." *In Search of Sita: Revisiting Mythology*. Ed. Namita Gokhale and Malashri Lal. New Delhi: Penguin, 2009. 209-17. Print.
- Lin, Lidan. "The Rhetoric of Posthumanism in Four Twentieth Century International Novels." Diss. U of North Texas, 1998.
- Web. <<https://digital.library.unt.edu/ark:/67531/metadc278990/>>.
- Mehrotra, Arvind Krishna, ed. *A Concise History of Indian Literature in English*. New Delhi: Permanent Black, 2008. Print.
- Mukherjee, Meenakshi. *The Twice Born Fiction: Themes and Techniques of the Indian Novel*. New Delhi: Arnold Heinemann, 1971. Print.
- Naik, M. K. *A History of Indian English Literature*. New Delhi: Sahitya Akademi, 1982. Print.
- . *Twentieth Century Indian English Fiction*. 2001. New Delhi: Pencraft, 2004. Print.
- . *Indian English Poetry: From the Beginnings up to 2000*. New Delhi: Pencraft, 2006. Print.
- Parthasarathy, R., ed. *Ten Twentieth Century Indian Poets*. 1976. New Delhi: Oxford UP, 1997. Print.
- Sethuraman, V. S., ed. *Indian Aesthetics: An Introduction*. Chennai: Macmillan, 1992. Print.
- Tandon, Neeru, ed. *Perspectives and Challenges in Indian-English Drama*. New Delhi: Atlantic, 2006. Print.
- Thampi, G. B. Mohan. "Rasa as Aesthetic Experience." *The Journal of Aesthetics and Art Experience* 24.1 (Autumn 1965): 75-80. JSTOR.
- Web. <<https://www.jstor.org/stable/428249>>.

Thieme, John. "All in the Same Boat: *Sea of Poppies* by Amitav Ghosh." *Literary Review* May 2008. *Literaryreview.co.uk*. Web. <<https://literaryreview.co.uk/all-in-the-same-boat>>.

SEMESTER II

Paper VII – EL223: American Literature (6 hours/ week)

Objectives

The objectives of the course are to:

- understand the socio-political factors that shaped the American literary scene
- analytically explore works of prose, poetry, drama and fiction in relation to their historical and cultural contexts
- examine the Afro-American experience as articulated in African American literature
- develop an awareness of the evolving American experience and character

Learning Outcomes

At the end of this course, the students will be able to:

- demonstrate an awareness of the socio-political and cultural history of America
- identify key ideas and characteristic perspectives or attitudes as expressed in American literature
- demonstrate knowledge of the contributions of major literary periods, works and persons in American literature and recognize their continuing significance
- evaluate the thoughts, beliefs, customs, struggles, and visions of African American writers
- compare/contrast literary works through an analysis of genre, theme, character, and other literary devices

Course Description

Module I - Socio-political and Literary Background

Historical background – Colonization – European heritage – Puritanism – American Revolution – American Dream – Expansion of the Western Frontier and closing of the Western Frontier – ‘Americanness’ of American literature – Nineteenth century – American Romanticism – Transcendentalism – the period of the world wars – segregation – American Civil War - Harlem Renaissance Transnationalism and Twentieth Century American Literature

Poetry: Poetry of the colonial period – Edward Taylor – postcolonial poetry – William Bryant – H. W. Longfellow – poetry of the Nineteenth century – Ralph Waldo Emerson,

Edgar Allan Poe, Henry David Thoreau, Walt Whitman, Emily Dickinson – Carl Sandberg – 20th century Robert Frost – Ezra Pound – T. S. Eliot – Gertrude Stein – Wallace Stevens – Williams Carlos Williams – E. E. Cummings – Langston Hughes – Robert Lowell – Confessional Movement – Sylvia Plath – Anne Sexton – Beat Poets – Allen Ginsberg – Jack Kerouac

Drama: The beginnings – Lewis Hallam, Jr., Thomas Godfrey – Post independence – Royall Tyler – William Dunlap – Nineteenth century – “The Walnut” – William Henry Brown – Minstrel Show – Post war Theatre – Theatrical Syndicate – Realism in Drama – David Belasco – Twentieth century – Modern American Theatre – Province town Players – Eugene O’Neill, Arthur Miller, Tennessee Williams, Sam Shepard, August Wilson and Lorraine Hansberry

Prose: Writings of pre-colonial times – Exploration narratives – Sir Walter Raleigh – Historical writings – Captain John Smith – William Bradford – Religious Writings – John Winthrop – Political prose – Jefferson Franklin Long – Slave Narratives – Frederick Douglass – American Romanticism – Transcendentalism – Ralph Waldo Emerson, Henry David Thoreau – Twentieth century – Margaret Fuller – Amiri Baraka – Kate Millet – Elaine Showalter – Lionel Trilling

Fiction: First American fiction – 1900s – Washington Irving – Historical novel – Fenimore Cooper – Puritanism – Nathaniel Hawthorne – Herman Melville, Edgar Allan Poe – Realism and Naturalism – Mark Twain, Stephen Crane – Modernism – Henry James – The Lost Generation – Ernest Hemingway, F. Scott Fitzgerald – Harlem Renaissance – W. E. B. Du Bois – Ralph Ellison – Richard Wright – William Faulkner – Experimental Novels – Thomas Pynchon, Vladimir Nabokov, J. D. Salinger, Saul Bellow, John Updike, Thomas Berger, Philip Roth, Joseph Heller – Women’s writing – Toni Morrison, Alice Walker

Recommended Reading

Gray, Richard J. *A Brief History of American Literature*. 2010. Oxford: Wiley-Blackwell, 2011. Print.

Harris, Charles B. *Contemporary American Novelists of the Absurd*. New Heaven: College & UP, 1971. Print.

Horton, Rod William and Herbert W. Edwards. *Backgrounds of American Literary Thought*. 1949. New Jersey: Prentice Hall. 1974. Print.

Ruland, Richard and Malcolm Bradbury. *From Puritanism to Postmodernism: A History of American Literature*. 1991. New York: Penguin, 1992. Print.

Module II - Poetry and Drama**Prescribed Texts****Detailed Study****Poetry**

Walt Whitman	"Out of the Cradle Endlessly Rocking"
Longfellow	"A Psalm of Life"
Emily Dickinson	"There is Something Quieter than Sleep," "I am Afraid to Own a Body"
Robert Frost	"Birches"
Maya Angelou	"Phenomenal Woman"
Wallace Stevens	"Sunday Morning"
Jorie Graham	"Prayer"

Drama

Eugene O'Neill	<i>Long Day's Journey into Night</i>

Non-detailed Study**Poetry**

E. E. Cummings	"Buffalo Bill"
Allen Ginsberg	"Sunflower Sutra"
William Carlos Williams:	"The Red Wheel Barrow"
Gertrude Stein	"Daughter"
John Ashbery	"Self Portrait in a Convex Mirror"

Drama

Tennessee Williams	<i>The Glass Menagerie</i>
Sam Shepard	<i>The Buried Child</i>

Module 3 - Prose and Fiction**Prescribed Texts****Detailed Study****Prose**

Ralph Waldo Emerson	<i>Self-Reliance</i>

Non-detailed Study**Prose**

Adrienne Rich	"The Domestication of Motherhood" from <i>Of Woman Born: Motherhood as Experience and Institution</i> : (110-127)

Fiction**Novel**

Hawthorne	<i>The Scarlet Letter</i>
Joseph Heller	<i>Catch-22</i>
Toni Morrison	<i>The Bluest Eye</i>
Philip Roth	<i>The Ghost Writer</i>

Short Stories:

Edgar Allan Poe	"The Cask of Amontillado"
Stephen Crane	"Blue Hotel"
Ernest Hemingway	"The Short Happy Life of Francis Macomber"
George Saunders	"Victory Lap"

Module IV - Critical Responses

This is a set of critical responses to texts in modules 2 and 3. These are to be used as critical tools for the analysis of primary texts. No annotations are to be asked from the following texts.

Recommended Reading

Baraka, Amiri (LeRoi Jones). "Black is a Country." *Home: Social Essays*. 1966. New York: Akashic, 2009. 101-06. Print.

James, Henry. *The Art of Fiction*. *Publicwsu.edu*. Web. <<https://public.wsu.edu/~campbelld/amlit/artfiction.html>>.

More, Paul Elmer. "The Origins of Hawthorne and Poe." *Shelburne Essays: First Series*. New York: G.P. Putnam's Sons, 1909. 51-71. *Archive.org*. Web. <<https://archive.org/stream/shelburneessaysf00more#page/n7/mode/2up>>

Reading List

Bell, Bernard W. *The Afro-American Novel and its Tradition*. 1987. Amherst: U of Massachusetts P, 1989. Print.

Bercovitch, Sacvan, ed. *The Cambridge History of American literature*. 1994. Cambridge: Cambridge UP, 1997. 8 vols. Print.

Bordman, Gerald Martin and Thomas S. Hirschack. *The Oxford Companion to American Theatre*. 3rd ed. New York: Oxford UP, 2004. Print.

Elliott, Emory, ed. *The Columbia History of the American Novel*. New York: Columbia UP, 1991. Print.

Gardner, Thomas, ed. *Jorie Graham: Essays on the Poetry*. Wisconsin: The U of Wisconsin P, 2005. Print.

- Kolin, Philip C, ed. *American Playwrights since 1945: A Guide to Scholarship, Criticism, and Performance*. New York: Greenwood, 1989. Print.
- Leary, Lewis Gaston. *Articles on American Literature 1900-1950*. Durham, NC: Duke UP, 1954. Print.
- . *Articles on American Literature 1950-1967*. Durham, NC: Duke University Press, 1970. Print.
- Malkoff, Karl. *Crowell's Handbook of Contemporary American Poetry*. 1825. New York: Crowell, 1973. Print.
- Matthiessen, F. O. *American Renaissance: Art and Expression in the Age of Emerson and Whitman*. 1941. Oxford: Oxford UP, 1968. Print.
- Mish, Charles Carroll. *English Prose Fiction*. Charlottesville, Virginia: Bibliographical Society of the University of Virginia, 1952. Print.
- Perkins, David. *A History of Modern Poetry*. Cambridge, Massachusetts: Harvard UP, 1976-1987. 2 Vols. Print.
- Rich, Adrienne. "The Domestication of Motherhood." *Of Woman Born: Motherhood as Experience and Institution*. New York: Norton, 1976. Print.
- Ruland, Richard and Malcolm Bradbury. *From Puritanism to Postmodernism: A History of American Literature*. 1991. New York: Penguin, 1992. Print.
- Saunders, John. *The Tenth of December*. New York: Random House, 2013. Print.
- Spiller, Robert E, et al., eds. *Literary History of the United States*. 1948. London: Macmillan, 1974. Print.
- White, Barbara Anne. *American Women Writers: An Annotated Bibliography of Criticism*. New York: Garland, 1977.

SEMESTER II

Paper VIII – Critical Studies I¹ [7 hours/week]

Objectives²

The objectives of this paper are to:

- represent the important theoretical schools that have radically changed the perception of literature as a cultural phenomenon.

¹ It is proposed to offer the works of the major thinkers of the last and the present century in Europe and in our own country in a set of three papers (Critical Studies I in Semester II, Critical Studies II in Semester III, and Cultural Studies in Semester IV). The texts prescribed for detailed study are those texts that led to an epistemic shift in our thinking with reference to subject, language and knowledge.

² The objectives of these three papers are the same.

- familiarize the students with the basic premises of the foundational schools of modern thought, particularly on the construction of the subject, language, and socio-cultural formations.
- discuss the intellectual milieu in Europe that led to the emergence of theories of structuralism, post structuralism, psychoanalysis, Marxism and feminism
- familiarize the students with the primary conceptual apparatus of these systems of thought
- enable the students to analyze literary phenomena using the theoretical tools provided by the above schools.

Learning Outcomes

At the end of the course it is expected that the students

- would sharpen their analytical and critical faculties drawing inspiration from the readings provided.
- gain an idea of the evolution of critical thinking in Europe and India in the 20th and 21st centuries.
- understand the function of language in the construction and analysis of literary and cultural phenomena.
- gain an insight into the interconnected nature of these major schools of thought leading to a shift from the paradigmatic to the syntagmatic.

Course Description

Module 1: Structuralism and Semiotics

Saussure's concept of the synchronic study of language has radically changed the basic assumptions in the analysis and interpretation of language and literature. As a form of human science, structuralism can be perceived as a method of systematizing human experience in the study of linguistics, anthropology, sociology, psychology and literary studies. Structuralism views language as a system of signs that structures our perception of the world around us. For the structuralists, the visible world consists of surface phenomena whereas the world that is not visible consists of structures that underlie and organize the surface phenomena. The structuralist insights are useful especially in analysing literary conventions and popular culture.

Language as a system of signs – Ferdinand de Saussure – Noam Chomsky – Claude Levi-Strauss – Raman Jakobson – Vladimir Propp – Julien Greimas – Roland Barthes – Mikhail Bakhtin – Structuralist linguistics – Russian Formalism – Prague, Moscow and

Copenhagen schools of Linguistics – Structuralism in Anthropology – binary opposites – diachronic and synchronic reading – Semiotics – sign-code-confabulation – connotation / denotation – encoding / decoding – lexical modality – representation – semiosis – semiosphere – Semiotics of culture – metalanguage

Required Reading

Saussure, Ferdinand de. "The Object of Study." 1915. Trans. Roy Harris. *Literary Theory: An Anthology*. 1998. Ed. Julie Rivkin & Michael Ryan. 2nd ed. Massachusetts: Blackwell, 2004. 59-63. Print.

Supplementary Reading

Barthes, Roland. "Myth Today." *Mythologies*. 1957. Trans. Annette Lavers. New York: The Noonday P, 1991. 109-45. Print

Module II: Post structuralism

Post structuralism emerged as a reaction against the structuralist's orderly vision of language and human experience. Post structuralist theory has become instrumental in decentring the Western philosophical canon by viewing language as the conceptual framework that encases our experience. Derrida's theory of deconstruction asserts that language is dynamic, ambiguous, and unstable, disseminating possible meanings. For post structuralism, language is the ground of being and the world is an infinite text, that is, an infinite chain of signifiers always in play.

Frederich Nietzsche – Martin Heidegger – Jacques Derrida – Jean Baudrillard – Jean-Francois Lyotard – Gilles Deleuze – Felix Guattari – Julia Kristeva – Hermeneutics – speech – phenomena – 'metaphysics of presence' – logos – logocentrism – bricolage – alterity – difference/différance – arche-writing – play – closure – theory of hierarchy – aporia – phenomenology

Required Reading

Nietzsche, Friedrich. "On Truth and Lie in an Extra-Moral Sense." *Oregonstate.edu*. Web. <http://oregonstate.edu/instruct/phl201/modules/Philosophers/Nietzsche/Truth_and_Lie_in_an_Extra-Moral_Sense.htm>

Supplementary Reading

Derrida, Jacques. "The Written Being/The Being Written." *Of Grammatology*. Trans. Gayatri Chakravorty Spivak. 1974. 40th Anniversary ed. Baltimore: Johns Hopkins UP, 2016. 19-24. Print.

Module III: Marxism

Marxism focuses on the specific historical and material causes that affect all human events and productions. According to the Marxist theory, the key to understanding a society at any point in history is to focus primarily on the modes of production because all the ideologies and norms of society are constructed with the interests of one who controls the modes of production. Marxism views literature, like all cultural manifestations, as a product of the socio-economic and ideological conditions of the time and place in which it was written. For Marxism, attentions to the material conditions of life and a critical engagement with our attitude to those conditions are paramount.

Karl Marx – Antonio Gramsci – Walter Benjamin – Georg Lukacs – Louis Althusser – Slavoj Zizek – Terry Eagleton – *The Communist Manifesto* – class – base and superstructure – commodity fetishism – dialectical materialism – hegemony – ideology – interpellation – commodification – theory of production – bourgeois nationalism – bourgeois socialism – capitalist state – dictatorship of the proletariat – means of labor – means of production – mode of production – super-imperialism – surplus product – two-stage theory – wage slavery – conspicuous consumption – false consciousness – reflectionism – sign value – historical situation

Required Reading

Marx, Karl. "The Fetishism of Commodities and the Secret Thereof." *Classical Sociology Theory*. Ed. Ian McIntosh. New York: New York UP, 1997. 68-71. Print.

—. "The German Ideology." *Classical Sociology Theory*. Ed. Ian McIntosh. New York: New York UP, 1997. 26-38. Print.

Supplementary Reading

Benjamin, Walter, "The Work of Art in the Age of Mechanical Reproduction." *Illuminations*. 1968. Ed. Hannah Arendt. Trans. Harry Zohn. New York: Schocken, 2007. 217-53. Print.

Module IV: Psychoanalysis

One of the most significant insights of Freud which still governs classical psychoanalysis is the notion that human beings are motivated or driven by unconscious fears, desires, needs and conflicts. The existence of unconscious is central to all psychoanalytic theories and is conceived as a dynamic entity that engages humans at the deepest level of their being. Unconscious is ambiguous, seen as both the cause and effect of repression and can be accessed through dreams as well as the dynamics of language. For

the psychoanalysts sexual behaviour is a product of our culture and the origin of our sexual being lies in the nature of the affirmation or disruption of our sense of self that occurs in childhood.

Sigmund Freud – C.G. Jung – Jacques Lacan – Rene Girard – id, ego and superego – repression – condensation – displacement – fetishism – fixation – regression – archetypes – oral phase – phallic phase – the gaze – symbolic order – imaginary order – mirror stage – the real – name of the father – imago – reality principle – instinctual pleasure – jouissance – hysteria – neurosis – Oedipus complex – penis envy – Freudian slips

Required Reading

Freud, Sigmund. "The Conscious and the Unconscious," "The Ego and the Id," "The Ego and the Super-Ego." *Beyond the Pleasure Principle and Other Writings*. Trans. John Reddick. London: Penguin, 2003. 105-29. Print.

Supplementary Reading

Lacan, Jacques. "The Insistence of the Letter in the Unconscious." *Modern Criticism and Theory: A Reader*. 1988. 3rd ed. Ed. David Lodge and Nigel Wood. London: Routledge, 2013. 186-209. Print.

Module V: Feminism

As a political and literary movement, Feminism poses new ways of asking and answering questions, challenging the conventional forms of discourse that exist within the mainstream of philosophy, culture and politics. The primary goal of Feminism is to liberate women from patriarchal oppression and attain the social, economic and political equality of the sexes. Feminist literary theory analyses how language, social power structures and institutions reflect patriarchal interests and the ways in which the thoughts marking the above have influenced women's perception of themselves. The writings of feminists try to reveal the basic asymmetry between the terms "masculine" and "feminine" and argue against biological determination and socialization used by patriarchal forces in the construction of gender and sexuality.

Mary Wollstonecraft – Simone de Beauvoir – Betty Friedan – Helene Cixous – Shulamith Firestone – Germaine Greer – Judith Butler – Julia Kristeva – Luce Irigaray – Sandra Gilbert – Susan Gubar – Adrienne Rich – women's suffrage – aphasia – transcendence – psychosomatic frigidity – liberal feminism – radical feminism – marxist feminism – new feminism – post feminism – Indian feminism – écriture féminine – gynocriticism – male gaze – objectification – phallogocentrism – phallogocentrism

Required Reading

Rubin, Gayle. "The Traffic in Women: Notes on the 'Political Economy' of Sex". *Wordpress.com*. Web. <<https://genderstudiesgroupdu.files.wordpress.com/2014/08/the-traffic-in-women.pdf>>

Supplementary Reading

Chakravarty, Uma. "Conceptualizing Brahminical Patriarchy in Early India: Gender, Class and State." *Class, Caste, Gender - Readings in Indian Government and Politics-5*. Ed. Manoranjan Mohanty. New Delhi: Sage, 2004. 271-95. Print.

Reading List

Atkins, G. Douglas. *Reading Deconstruction/Deconstructive Reading*. Lexington: U of Kentucky P, 1983. Print.

Barthes, Roland. *Elements of Semiology*. Trans. Richard Howard. Evanston: Northwestern UP, 1972. Print.

—. *Mythologies*. Trans. Annette Lavers. New York: Hill and Wang, 1972. Print.

—. *S/Z*. 1970. Trans. Richard Miller. New York: Hill and Wang, 1975. Print.

Baudrillard, Jean. *America*. Trans. Chris Turner. London: Verso, 1988. Print.

Beauvoir, Simone de. *The Second Sex*. 1949. Ed. and Trans. H. M. Parshley. New York: Bantam, 1961. Print.

Belsey, Catherine and Jane Moore, eds. *The Feminist Reader: Essays in Gender and the Politics of Literary Criticism*. 1989. 2nd ed. Massachusetts: Blackwell, 1997. Print.

Bloom, Harold, et al. *Deconstruction and Criticism*. New York: Seabury, 1979. Print.

Brooks, Ann. *Postfeminisms: Feminism, Cultural Theory, and Cultural Forms*. London: Routledge, 1997. Print.

Cavallaro, Dani. "The Abject." *The Gothic Vision: Three Centuries of Horror, Terror and Fear*. London: Continuum, 2002. 199-206. Print.

Cixous, Hélène. "The Laugh of the Medusa." *The New French Feminisms*. rpt. Ed. Elaine Marks and Isabelle de Courtivron. New York: Schocken, 1981. 245-64. Print.

Creed, Barbara. *The Monstrous Feminine: Film, Feminism and Psychoanalysis*. London: Routledge, 1993. Print.

Culler, Jonathan. *Structuralist Poetics: Structuralism, Linguistics, and the Study of Literature*. 1975. London: Routledge, 2002. Print.

- Derrida, Jacques. *Of Grammatology and Writing and Difference*. 1967. Trans. Gayatri Chakravorty Spivak. Baltimore: Johns Hopkins UP, 1976. Print.
- Eagleton, Mary, ed. *Feminist Literary Theory: A Reader*. 2nd ed. 1986 Oxford: Blackwell, 1996. Print.
- Eagleton, Terry. *Criticism and Ideology: A Study in Marxist Literary Theory*. 1975. New ed. London: Verso, 2006. Print.
- . *Heathcliff and the Great Hunger: Studies in Irish Culture*. London: Verso, 1995. Print.
- , ed. *Raymond Williams: Critical Perspectives*. Oxford: Polity, 1989. Print.
- Elliott, Anthony. *Psychoanalytic Theory: An Introduction*. Oxford: Blackwell, 1994. Print.
- Ellmann, Maud, ed. *Psychoanalytic Literary Criticism*. London: Longman, 1994. Print.
- Faflak, Joe. *Romantic Psychoanalysis: The Burden of the Mystery*. Albany: New York P, 2008. Print.
- Felman, Shoshana, ed. *Literature and Psychoanalysis: The Question of Reading Otherwise*. 1977. Baltimore: Johns Hopkins UP, 1982. Print.
- Foucault, Michel. *The Foucault Reader*. Ed. Paul Rabinow. New York: Pantheon, 1984. Print.
- Friedan, Betty. *The Feminine Mystique*. 1963. New York: Norton, 2001. Print.
- Gay, Peter, ed. *The Freud Reader*. 1989. London: Norton, 1995. Print.
- Genette, Gérard. *Narrative Discourse: An Essay in Method*. Trans. Jane Lewin. Ithaca: Cornell UP, 1980. Print.
- Gilbert, Sandra M., and Susan Gubar. *The Madwoman in the Attic: The Woman Writer and the Nineteenth-Century Literary Imagination*. New Haven: Yale UP, 1979. Print.
- Hawkes, Terence. *Structuralism and Semiotics*. Berkeley: U of California P, 1977. Print.
- Humm, Maggie. *The Dictionary of Feminist Theory*. 2nd ed. Hemel Hempstead: Harvester Wheatsheaf, 1995. Print.
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- Jameson, Fredric. *Marxism and Form: Twentieth-Century Dialectical Theories of Literature*. 1971. New Jersey: Princeton UP, 1974. Print.
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- Kristeva, Julia. *Desire in Language: A Semiotic Approach to Literature and Art*. Rev.ed. New York: Columbia UP, 1982. Print.
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- Leitch, Vincent B. *Deconstructive Criticism: An Advanced Introduction*. New York: Columbia UP, 1982. Print.
- Lentricchia, Frank. "Uncovering History and the Reader: Structuralism." *After the New Criticism*. Chicago: U of Chicago P, 1980. 103-55. Print.
- Lévi-Strauss, Claude. *Structural Anthropology*. 1963. Trans. C. Jacobson and B. G. Schoepf. London: Allen Lane, 1968. Print.
- Lukács, Georg. *The Historical Novel*. 1937. Trans. Hannah and Stanley Mitchell. London: Merlin, 1962. Print.
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- , ed. *The Kristeva Reader*. 1986. UK: Blackwell, 2002. Print.
- Moreno, Marta Cerenzo. *Critical Approaches to Shakespeare: Shakespeare for All Time*. Madrid: UNED, 2014. Print.
- Propp, Vladimir. *The Morphology of the Folktale*. 1968. Trans. Laurence Scott. Austin: U of Texas P, 2009. Print.
- Scholes, Robert. *Structuralism in Literature: An Introduction*. New Haven: Yale UP, 1974. Print.
- Showalter, Elaine. "Feminist Criticism in the Wilderness." *Critical Inquiry* 8.2 (Winter 1981): 179-205. JSTOR. Web. <https://www.jstor.org/stable/1343159?seq=1#page_scan_tab_contents>
- . *A Literature of Their Own: British Women Novelists from Brontë to Lessing*. Princeton: Princeton UP, 1977. Print.
- Snodgrass, Mary Ellen. *Encyclopedia of Feminist Literature*. New York: Facts on File, 2006. Print.
- Todorov, Tzvetan. *The Fantastic: A Structural Approach to a Literary Genre*. 1970. Trans. Richard Howard. Ithaca: Cornell UP, 1975. Print.
- Williams, Raymond. *Culture and Society 1780–1950*. 1958. New York, Columbia UP, 1983. Print.
- . *Marxism and Literature*. Oxford: Oxford UP, 1977. Print.

Woolf, Virginia. *A Room of One's Own*. London: Hogarth P, 1929. Print.

—. *Three Guineas*. London: Hogarth P, 1938. Print.

—. *Women and Writing*. 1979. Ed. and Intro. Michèle Barrett. San Diego: A Harvest Book, 1979. Print.

SEMESTER III

Paper IX – EL 231: Linguistics and Structure of the English Language

(6 hours/week)

Objectives

The objectives of this course are:

- to enable students to get a fundamental understanding of the basic nature, branches, and history of linguistics
- to attempt a comparison of RP, GIE and Malayalam sounds based on contrastive linguistics
- to examine the features of language units at the phonological, morphological and syntactical levels
- to familiarize the students with history and developments of Modern Grammar

Learning Outcomes

At the end of this course, students will:

- have developed an awareness of the basic nature, branches, and history of linguistics
- have become familiar with contrastive linguistics
- be able to analyse language units based on their phonological, morphological and syntactical features
- have developed an awareness of the principles and limitations of TCA and PSG
- be able to explain the transformation of sentences based on TG grammar

Course Description

Module I - Language and Linguistics

Animals and human language, properties of human language – regional variation in language – dialect, dialectology, bilingualism, pidgin, creole – social variation in language – speech style, register, slang – Speech and writing – Linguistics as a scientific study of

language – Scope of linguistics – Branches – Sociolinguistics, Psycholinguistics – Saussurean concepts – langue and parole, competence and performance, language as a system of signs, syntagmatic and paradigmatic, synchronic and diachronic – American Structuralism and Bloomfield – The Prague School – Noam Chomsky and his theories.

Module II - Phonology, Morphology, Semantics and Pragmatics

Phonology: suprasegmental features – word stress, stress shift – primary and secondary, compound word stress, speech rhythm, intonation – phonemes and allophones – comparison of RP, General Indian English and Malayalam sounds – Transcription – Morphology: morph, classification of morphemes – analysis of affixes – allomorph – morpho-phonemics – Semantics: meaning, conceptual meaning, associative meaning – Lexical semantics: antonymy, synonymy, hyponymy, homonymy and polysemy – Pragmatics: content and meaning, invisible meaning, discourse analysis, Speech Act Theory

Module III - Modern Grammar

Grammar – Traditional Grammar – fallacies – Structural Descriptive Grammar – prescriptive vs descriptive – grammar and usage – grammaticality and acceptability – word classes – form class and function class words – phrases and their functions – clauses – co-ordination and subordination – noun, adverb and relative clauses – basic sentence patterns – cleft sentences – kinds of sentences – affirmative, interrogative, exclamatory, imperative – simple, compound, complex – Elements of a sentence – subject, verb, object, complement, adverbial

Module IV - Syntactic Theories

IC Analysis – ambiguity and limitations – PS Grammar – PS rules-limitations – TG Grammar – transformational and generative – deep and surface structure – optional and obligatory rules – Aspect model of Chomsky – Transformations: a) Singularly – Interrogation, Negation, Passivisation, Tag Questions, b) Double based – relativisation, complementation, adverbialisation, co-ordination – Tagmemics, Chomsky's Trace Theory (1980) model – Case, government and binding

Recommended Reading

Akmajian, Adrian, et al. *Linguistics: An Introduction to Language and Communication*. 6th ed. Cambridge: MIT, 2001. Print.

Balasubramaniam, T. *A Textbook on Phonetics for Indian Students*. New Delhi: Macmillan, 1981. Print.

Bansal, R. K. and J. B. Harrison. *Spoken English: A Manual of Speech and Phonetics*. 1972. Hyderabad: Orient BlackSwan, 2006. Print.

- Chomsky, Noam. *Aspects of the Theory of Syntax*. Cambridge, Massachusetts: MIT Press, 1965. Print.
- Crystal, David. *Introducing Linguistics*. London: Penguin English, 1992. Print.
- Fries, Charles Carpenter. *The Structure of English*. London: Longman, 1977. Print.
- Fromkin, Victor, et al., ed. *Linguistics: An Introduction to Linguistic Theory*. 2000. rpt. Malden, Massachusetts: Blackwell, 2001. Print.
- Leach, Geoffrey N. *Semantics*. London: Penguin, 1976. Print.
- Lyons. *An Introduction to Theoretical Linguistics*. 1968. Cambridge: Cambridge UP, 1995. Print.
- Quirk, Randolph, and Sidney Greenbaum. *A University Grammar of English*. 6th ed. New Delhi: Pearson, 2003. Print.
- Roach, Peter. *English Phonetics & Phonology: A Practical Course*. 1983. 4th ed. Cambridge: Cambridge UP, 2009. Print.
- Robins, R.H. *General Linguistics: An Introductory Survey*. Harlowe: Longman, 1971. Print.
- Saussure, Ferdinand de. *Course in General Linguistics*. New York: McGraw-Hill. 1966. Print.
- Sethi, J. and P. V. Dhamija. *A Course in Phonetics and Spoken English*. 2nd ed. New Delhi: PHI, 1999. Print.
- Syal, Pushpinder and D.V. Jindal. *An Introduction to Linguistics- Language, Grammar and Semantics*. 2nd ed. New Delhi: Prentice Hall of India, 2007. Print.
- Verma, S. K. and N. Krishnaswamy: *Modern Linguistics*. New Delhi: Oxford UP, 1989. Print.
- Widdowson, H. G. *Linguistics. Oxford Introductions to Language Study*. Series Ed. H. G. Widdowson. 1996. Oxford: Oxford UP, 2003. Print.
- Yule, George. *The Study of Language*. 2nd ed. Cambridge: Cambridge UP, 1996. Print.
- . *Pragmatics. Oxford Introductions to Language Study*. Series Ed. H. G. Widdowson. 1996. Oxford: Oxford UP, 2008. Print.

SEMESTER III

Paper X – Critical Studies II [7 hours/week]

Course Description

Module I: Postmodernism

Postmodernism has derived its key ideas from post structuralist assumptions like multiple meanings and deconstructed centres. As a theory of history, society, culture, art, and literature, postmodernism questions the superiority of order and the unity of experience. Postmodernism rejects elitism, sophisticated formal experimentation and tragic sense of alienation predominant in the modernist writers. Theories of postmodernism critique grand narratives and promote the existence of little narratives in literary expressions. It celebrates fragmentation which obliterates the illusion of the text as 'real' and provides multiple interpretations and even parody.

Søren Kierkegaard – Friedrich Nietzsche – Jürgen Habermas – Martin Heidegger – Jacques Derrida – Michel Foucault – Jean-François Lyotard – Richard Rorty – Jean Baudrillard – Edmund Husserl – Martin Heidegger – Pierre Bourdieu – alterity – bricolage – constructivism – cyberpunk – hyperreality – pastiche – simulacra – virtual reality – black humor – intertextuality – metafiction – fabulation – historiographic metafiction – temporal distortion – magic realism – technoculture – paranoia – maximalism – minimalism – fragmentation

Required Reading

Habermas, Jürgen. "Modernity—An Incomplete Project." *Postmodernism: A Reader*. Ed. Thomas Docherty. New York: Cambridge UP, 1993. 98-109. Print.

Supplementary Reading

Bauman, Zygmunt. "On Being Light and Liquid." *Liquid Modernity*. Cambridge: Polity, 2000. 1-15. Print.

Module II: Cultural Materialism

Theories of Cultural Materialism along with New Historicism have shown new ways of reading and analysing literature, culture and history. As a critical method Cultural Materialism combines an attention to the historical context, theoretical method, political commitment and textual analysis. As an offshoot of Marxist criticism it bridges the gap between Marxism and Postmodernism. In Cultural Materialism, the word 'culture' includes all forms of culture, from the high to the low, and 'materialism' signifies the opposite of idealism. Cultural Materialists argue that the meanings of literary texts are not fixed by a

universal criterion: rather they are always in play and often subject to politically radical appropriations.

Raymond Williams – Marvin Harris – Eric Ross – John Cole – Allen W. Johnson – David H. Price – Stephen Sanderson – Stuart Hall – Angela McRobbie – Debbie Epstein – Chris Griffin – Frankfurt school – reductionism – dominant ideology – dissident readings – historical materialism – mode of reproduction – domestic economy – political economy – infrastructural determinism – epistemological principles of cultural materialism – ethnograph – containment

Required Reading

Williams, Raymond. "Hegemony", "Tradition, Institution, Formations", "Dominant, Residual, Emergent". *Marxism and Literature*. 1977. rpt. New York: Oxford UP, 2009. 108-27. Print.

Supplementary Reading

Raghavendra, M. K. "Structure and Form in Indian Popular Film Narrative." *Fingerprinting Popular Culture: The Mythic and the Iconic in Indian Cinema*. Ed. Vinay Lal and Ashis Nandy, New Delhi: Oxford UP, 2006. 24-50.

Module III: New Historicism

New Historicism focuses on the historicity of literary texts and the textuality of history by analysing them in the context of power and ideology at a given time. New Historicist theory derives its basic assumptions from Foucauldian discourses on hegemonic institutional practices and individual subjectivities. This has led to an understanding that the production, categorization and analysis of texts are determined by forces of history, which in turn shape the cultural work itself. The New Historicist believes in the impossibility of objective analysis of history. The reading of a literary or cultural text is never definitive; it opens up ever new possibilities of interpretation.

Michel Foucault – Stephen Greenblatt – Fredric Jameson – Stephen Orgel – Clifford Geertz – Partha Chatterjee – Gyan Prakash – non discursive practices – apparatus – archaeology vs genealogy – historiography – arts of existence – discontinuity – episteme – non reductionism – circulation – panopticon – regimes of truth – textuality – anecdote

Required Reading

Foucault, Michael. "The Unities of Discourse." *The Archaeology of Knowledge and the Discourse on Language*. London & New York: Pantheon, 1972. 21-31. Print.

Supplementary Reading

Chakrabarty, Dipesh. "Post Coloniality and the Artifice of History." *Representations* 37 (1992):1-26. JSTOR. Web. <https://www.jstor.org/stable/2928652?seq=1#page_scan_tab_contents>.

Module IV: Postcolonialism

Edward Said's *Orientalism* explores the culturally constructed distinction between the Orient and the Occident that paved the way for postcolonial theory. Postcolonialism attempts to understand the political, social, cultural and psychological operations of the colonialist and anticolonialist ideologies. Postcolonial theory goes on to analyse the ways in which a text reinforces or resists colonialism's oppressive ideology. Postcolonial theorists try to explore the double consciousness of the colonial subjects, divided between the culture of the colonizer and that of the indigenous community. They insist that the understanding of textual reflections of racism and ethnocentrism demands an attention to the cultural history and belief systems of the social group(s) being portrayed and discussed.

Aimé Césaire – Frantz Fanon – Kwame Nkrumah – Edward Saïd – Gayatri Chakravorty Spivak – Homi K. Bhabha – Dipesh Chakrabarty – Derek Gregory – Amar Acheraïou – Benedict Anderson – Partha Chatterjee – Michel de Certeau – Hubert Harrison – C. L. R. James – Salman Rushdie – Leopold Sedar Senghor – Robert Young – Ngugi wa Thiong'o – Bill Ashcroft – Gareth Griffiths – Helen Tiffin – Ashis Nandy - colony and colonialism – settler – empire – orient and occident – centre/margin – marginality – decolonisation – nativism – anticolonialism – neo colonialism – eurocentricism – third world – ambivalence – diaspora – ethnicity – hybridity – mapping – mimicry – nation/nation-state – orientalism – negritude – other – subaltern – contact zone – essentialism – aboriginal – apartheid – black studies – counter discourse – dislocation – post colonial reading – world system theory

Required Reading

Said, Edward W. "Introduction to Orientalism." *Orientalism*. 1978. New Delhi: Penguin, 2001. 1-28. Print.

Supplementary Reading

Nandy, Ashis. "The Psychology of Colonialism: Sex, Age and Ideology in British India." Sections, I, II & III. *The Intimate Enemy: Loss and Recovery of Self Under Colonialism*. 1983. New Delhi: Oxford UP, 2010.1-7. Print. *Psychiatry* 45(1982): 197-219. *tandfonline.com*. 08 Oct. 2016. Web. <<http://www.tandfonline.com/doi/abs/10.1080/00332747.1982.11024151>>

Module V: Nationalism & Post Nationalism

Nation as an imagined collective entity is often assumed as a sacred object. The nation can be conceived as an imagined political community created by the state which propagates certain common ideologies, beliefs and myths. The state creates its own tradition and myths to generate a 'long historical continuity' and a 'common cultural past' for the nation. Though most often, the cultural boundaries of nations overlap leading to conflicts and violence, the state's aim is to construct a national unity and the state does this by positioning one group as the constitutive other of the normative group. Thus, a nation cannot exist without the 'other'. It is the contradiction between the desire for homogeneity and diversity that is within the nation that makes the issue of nation and nationalism more problematic.

Talal Asad – Antoinette Burton – Partha Chatterjee – Bernard Cohn – Ernest Gellner – Stuart Hall – Eric Hobsbawm – Chandra Talpade Mohanty – Rajeswari Sunder Rajan – Dipesh Chakrabarty – Nationalism – post nationalism – sovereignty – citizenship – patriotism – myths – common cultural past – territory – immigrant identity – human rights – dalit studies – subaltern studies – minority ethnic community – re-emergence of extreme communal violence – gender ethnography

Required Reading

Anderson, Benedict. Introduction. *Imagined Communities: Reflections on the Origin and Spread of Nationalism*. 1983. Rev. ed. London: Verso, 2003. 1-8. Print.

Supplementary Reading

Chatterjee Partha. "Nationalism as a Problem in the History of Political Ideas." 1986. *Nationalist Thought and the Colonial World: A Derivative Discourse*. London: Zed, 1993. 1- 35. Print.

Reading List

Ashcroft, Bill, et al., eds. *The Post-Colonial Studies Reader*. London and New York: Routledge, 1995. Print.

Baudrillard, Jean. *Simulacra and Simulation*. 1981. Trans. Sheila Faria Glaser. Ann Arbor: U of Michigan P, 1994. Print.

—. *Jean Baudrillard: Selected Writings*. Ed. Mark Poster. 2nd ed. Stanford: Stanford UP, 2001. Print.

Bauman, Zygmunt. *Postmodern Ethics*. Oxford: Blackwell, 1993. Print.

Bhabha, Homi K. *The Location of Culture*. 1994. London: Routledge, 2004. Print.

- , ed. *Nation and Narration*. London: Routledge, 1990. Print.
- Brannigan, John. *New Historicism and Cultural Materialism*. New York: St. Martin's P, 1998. Print.
- Brazier, Jóna Evans and Anita Mannur, eds. *Theorizing Diaspora: A Reader*. Oxford: Blackwell, 2003. Print.
- Brooker, Peter, ed. *Modernism/Postmodernism*. 1992. London: Routledge, 2014. Print.
- Brydon, Diana, ed. *Postcolonialism: Critical Concepts in Literary and Cultural Studies*. 5 vols. London: Routledge, 2000. Print.
- Butler, Judith. *Gender Trouble: Feminism and the Subversion of Identity*. 1990. New York: Routledge, 2010. Print.
- Caesar, Michael. *Umberto Eco: Philosophy, Semiotics and the Work of Fiction*. Cambridge: Polity, 1997. Print.
- Connor, Steven. *Postmodernist Culture: An Introduction to Theories of the Contemporary*. 1989. 2nd ed. Oxford: Blackwell, 1996. Print.
- , ed. *The Cambridge Companion to Postmodernism*. Cambridge: Cambridge UP, 2004. Print.
- Darwish, Mahmud. *Victims of a Map*. Trans. Abdullah al-Udhari. London: Al Saqi Books, 1984. Print.
- Docherty, Thomas, ed. *Postmodernism: A Reader*. New York: Columbia UP, 1993. Print.
- Du Bois, W. E. Burghardt. *Colour and Democracy: Colonies and Peace*. New York: Harcourt Brace, 1945. Print.
- Eagleton, Terry. "Capitalism, Modernism and Postmodernism." *Against the Grain: Selected Essays, 1975–85*. London: Verso, 1986. 131–48. Print.
- Eco, Umberto. *Travels in Hyperreality*. 1986. Trans. William Weaver. London: Picador, 1987. Print.
- Fanon, Frantz. *Black Skin, White Masks*. 1952. Trans. C. L. Markmann with Foreword by Homi K. Bhabha. London: Pluto, 1986. Print.
- . *The Wretched of the Earth*. 1961. Trans. Constance Farrington with Preface by Jean-Paul Sartre. London: Penguin, 2001. Print.
- Foucault, Michel. "Two Lectures." *Power/Knowledge: Selected Interviews and Other Writings 1972–1977*. Ed. Colin Gordon. New York: Pantheon, 1980. [uwf.edu. Web. <http://uwf.edu/dearle/foucault.pdf>](http://uwf.edu/dearle/foucault.pdf).
- Gallagher, Catherine and Stephen Greenblatt. *Practicing New Historicism*. Chicago: U of Chicago P, 2000. Print.

- Gramsci, Antonio. "History of the Subaltern Classes: Some Methodological Criteria." *Selections from the Prison Notebooks of Antonio Gramsci*. Ed. and Trans. Quintin Hoare and Geoffrey Nowell Smith. London: Lawrence & Wishart, 1971. 52-55. Print.
- Greenblatt, Stephen. *Hamlet in Purgatory*. Princeton: Princeton UP, 2001. Print.
- Guha, Ranajit. *A Rule of Property for Bengal: An Essay on the Idea of Permanent Settlement*. Paris: Mouton, 1963. Print.
- Hall, Stuart. "Cultural Identity and Diaspora." *Identity: Community, Culture, Difference*. Ed. Jonathan Rutherford. London: Lawrence & Wishart, 1990. 222-37. Print.
- Harlow, Barbara. *Resistance Literature*. New York: Methuen, 1987. Print.
- Harris, Marvin. *Cultural Materialism: The Struggle for a Science of Culture*. New York: Random House, 1979. Print.
- hooks, bell. *Yearning: Race, Gender and Cultural Politics*. Boston: South End P, 1990. Print.
- Hutcheon, Linda. *A Poetics of Postmodernism: History, Theory, Fiction*. London: Routledge, 1988. Print.
- Huyssen, Andreas. *After the Great Divide: Modernism, Mass Culture, Postmodernism*. Basingstoke: Macmillan, 1988. Print.
- Lucy, Niall, ed. *Postmodern Literary Theory: An Anthology*. Oxford: Blackwell, 2000. Print.
- Lyotard, Jean-François. *The Postmodern Condition: A Report on Knowledge*. 1979. Trans. Geoff Bennington and Brian Massumi. Manchester: Manchester UP, 1984. Print.
- Mohanty, Chandra Talpade. "Under Western Eyes: Feminist Scholarship and Colonial Discourses." *Third World Women and the Politics of Feminism*. Ed. Chandra Talpade Mohanty et al. Bloomington: Indiana UP, 1991. 51-80. Print.
- Montrose, Louis. "New Historicisms." *Redrawing the Boundaries: The Transformation of English and American Literary Studies*. Ed. Stephen Greenblatt and Giles Gunn. New York: Modern Language Association, 1992. 392-418. Print.
- Panikkar, K. M. *Asia and Western Dominance: A Survey of the Vasco da Gama Epoch of Asian History 1498-1943*. New ed. London: Allen & Unwin, 1965. Print.
- Said, Edward W. *Culture and Imperialism*. London: Chatto & Windus, 1993. Print.
- Sim, Stuart, ed. *The Routledge Companion to Postmodernism*. 1998. 3rd ed. London and New York: Routledge, 2011. Print.
- Smith, Neil. *Uneven Development: Nature, Capital and the Production of Space*. Oxford: Basil Blackwell, 1984. Print.

- Spivak, Gayatri Chakravorty. "Three Women's Texts and a Critique of Imperialism." *Critical Inquiry* 12.1 (Autumn 1985): 243-61. *Chicago Journals*. Web. <https://www2.warwick.ac.uk/fac/arts/english/currentstudents/pg/masters/modules/femlit/gayatri_spivak_three_womens_texts_and_a_critique_of_imperialism.pdf>
- . *In Other Worlds: Essays in Cultural Politics*. London: Routledge, 1987. Print.
- Taylor, Victor E. and Charles E. Winquist, eds. *Encyclopedia of Postmodernism*. London: Routledge, 2001. Print.
- Veesser, H. Aram, ed. *The New Historicism*. New York: Routledge, 1989. Print.
- Walker, Alice. *In Search of Our Mothers' Gardens: Womanist Prose*. New York: Harcourt Brace Jovanovich, 1983. Print.
- Wagh, Patricia, ed. *Postmodernism: A Reader*. London: Arnold, 1992. Print.
- Williams, Raymond. "Base and Superstructure in Marxist Cultural Theory." *New Left Review* 1/82. (Nov-Dec 1973). 3-16. *New Left Review*. Web. <<https://newleftreview.org/authors/raymond-williams>>.
- Wolmark, Jenny. *Aliens and Others: Science Fiction, Feminism and Postmodernism*. Iowa City: U of Iowa P, 1994. Print.
- Young, Robert. *White Mythologies: Writing, History and the West*. 1990. 2nd ed. London: Routledge, 2004. Print.

SEMESTER IV

Paper XIII – EL 241: English Language Teaching (6 hours/ week)

Objectives

The objectives of this course are:

- to examine the historical and current theories of L1 and L2 acquisition
- to create critical awareness of approaches and methodologies and the underlying principles in the ESL context
- to understand learner problems and learner factors in developing proficiency in language skills
- to evaluate critically syllabi, teaching materials, and evaluation procedures

Learning Outcomes

At the end of this course, students should:

- have acquired knowledge of the historical and current theories in ELT

- be able to assess critically the implications of the various approaches, methods, techniques
- have developed the ability to critically evaluate syllabi, teaching materials, and evaluation procedures

Course Description

Module I - Theoretical Perspectives on Language Acquisition and Language Teaching

History of English Language Teaching in India – Some important landmarks – a) Critique of Macaulay's Minutes b) Landmarks of English Education in India after Independence c) Key concepts in ELT – Acquisition/ Learning – Teaching/ Learning – Bilingualism/ Multilingualism – Teacher-oriented/Learner-oriented – significance of ESL and EFL – explanation and comparison of L1 and L2 acquisition – Interlanguage – ESP

Module II - Major Approaches, Methods and Syllabi

Traditional methods - Use of Grammar Translation method, Direct method, Audio-Lingual method, Suggestopedia, Silent Way - Community Language Learning – comparison of different methodological perspectives and approaches - CLT - linguistic competence and communicative competence - Krashen's Monitor Model (Natural method) - Task Based Teaching - Critical Pedagogy

Module III - Learning Theories

Behaviourism, Cognitivism, Chomsky's Contributions - Universal Grammar/Language Acquisition Device (LAD) – Constructivism - Implications of learning theories in ELT - Learner factors - Teaching Aids - ICT in Language teaching, including multimedia, computer based and online materials - authentic materials - appropriate and practical uses of traditional materials and e-resources

Module IV - Teaching Strategies to Develop Competence in Language Skills

Listening, speaking, reading, writing - Identifying problems experienced by learners with regard to developing specific language skills - Teaching of language through literature - Teaching of poetry, prose, drama, fiction - Classroom practice teaching

Module V - Curriculum and Evaluation

Purposes of assessment - criteria of good test - concepts of validity, reliability, objectivity and practicality - critical evaluation of types of assessment - continuous assessment and external assessment – types of tests: Diagnostic, Proficiency, Achievement, Aptitude tests - Tools of evaluation - Question paper design, different types of questions and their uses – summative and formative tests – norm-referenced and criterion-referenced tests.

Recommended Reading

- Brown, H. Douglas. *Principles of Language Learning and Teaching*. 4th ed. New York: Longman, 2000. Print.
- Brumfit, Christopher and Keith Johnson, eds. *The Communicative Approach to Language Teaching*. 1979. Oxford UP, 1987. Print.
- Gleason, J. B. and N. Ratner, eds. *Psycholinguistics*. 2nd ed. New York: Harcourt, 1997. Print.
- Krishnamurthy, N. and T. Sriraman. *English Teaching in India*. Chennai: T. R. Publications, 1994. Print.
- Larsen-Freeman, D. and M. Long. *An Introduction to Second Language Acquisition Research*. Ed. C. N. Candlin. New York: Longman, 1991. Print.
- . *Techniques and Principles in Language Teaching*. 1986. 2nd ed. New York: Oxford UP, 2000. Print.
- Mitchell, R. and F. Myles. *Second Language Learning Theories*. London: Arnold, 1998. Print.
- Nunari, D. *Second Language Teaching and Learning*. Boston: Heinle & Heinle, 1999. Print.
- Prabhu, N. S. *Second Language Pedagogy*. London: Oxford UP, 1987. Print.
- Richards, J. C. and Theodore. S. Rogers. *Approaches and Methods in Language Teaching*. 1986. 2nd ed. New York: Cambridge UP, 2001. Print.
- Stern, H. H. *Fundamental Concepts of Language Teaching*. London: Oxford UP, 1983. Print.
- Tickoo, M. L. *Teaching and Learning English: A Source Book*. New Delhi: Orient Longman, 2003. Print.

SEMESTER IV

Paper XIV – Cultural Studies [7 hours/week]

Course Description

Module I: Cultural Studies: Theory

Cultural Studies is a new area of research and teaching that brings in new perspectives to our notions regarding 'texts' and 'meanings' and therefore to the study of literatures, cultures and societies. This course will try to develop theoretical tools and critical

perspectives to interrogate the advertisement, film, television, newspaper and internet texts that saturate our lives.

Theodor W. Adorno – Mikhail Bakhtin – Arjun Appadurai – Homi K. Bhabha – Pierre Bourdieu – Judith Butler – Rey Chow – Michel de Certeau – Gilles Deleuze – Paul Gilroy – Antonio Gramsci – Felix Guattari – Jürgen Habermas – Stuart Hall – Richard Hoggart – Max Horkheimer – Toby Miller – Antonio Negri – Jacques Rancière – Slavoj Žižek – John Berger – agency and structure – citizenship – counter-culture – cultural relativism – cultural reproduction – culture industry – ethnic/ethnicity – ethnocentrism – nationalism – popular culture – visual culture

Required Reading

Adorno, Theodor W. and Horkheimer, Marx. 1944. "The Culture Industry: Enlightenment as Mass Deception." *Dialectics of Enlightenment: Philosophical Fragments*. Ed. Gunzelin Schmid Noerr. Trans. Edmund Jephcott. Stanford: Stanford UP, 2002. 94-136. Print.

Supplementary Reading

Prasad, M. Madhava. "The Absolutist Gaze: Political Structure and Cultural Form." *Ideology of the Hindi Film: A Historical Construction*. 1998. New Delhi: Oxford UP, 2006. 53-87. Print.

Module II: Cultural Studies: Methodology

The primary focus of cultural studies is a revisionary reading of the concept of culture, viewing culture as a discourse that openly critiques the concept of high culture and low culture. In doing so culture studies teases out the interconnections of power and culture particularly in modes of representation. Of particular interests to theorists of culture are figurations of the popular and the interplay between the dominant and the subordinated.

Martin Lister – Giorgio Agamben – Zygmunt Bauman – James Clifford – John Fiske – Michael Hardt – Henry Jenkins – Janice Radway – Edward Soja – Paul du Guy – audience research – agency – collaboration – content analysis – cultural consumption – cultural democratisation – ethnography – experience – focus groups – observation – qualitative and quantitative analysis – race/racialisation – reflexivity – relativism – self-help culture – stereotyping

Required Reading

Hall, Stuart. "Encoding/Decoding." *Culture, Media, Language: Working Papers in Cultural Studies 1972-79*. Eds. Stuart Hall, et. al. London: Unwin Hyman, 1980. 117-127. Print. *Georgetown.edu*. Web. <<http://www9.georgetown.edu/faculty/irvinem/theory/SH-Encoding.pdf>>.

Supplementary Reading

Gay, Paul du. "What is Culture?" *Doing Cultural Studies: The Story of the Sony Walkman*. 1997. London: Sage, 2003. 5-7. Print.

Module III: Media

Media theory examines the reciprocal relationship between media and its audience. Media theory proposes a systematic way of thinking the means of communication. It looks at how media is used to reinforce ideologies in a globalized world, the development of print media and digital media with the development of consumerism and commercialism. Media theory emphasizes the fact that media cannot exist outside the ideological constraints and become constitutive of the very ideology it re-presents.

Marshall McLuhan – Andrew L. Shapiro – Andrew Barry – James Boyle - representation – narrative – code – theories of production – gatekeeping – agenda setting – polysemy – audience – branding – censorship – construct – marketing – mass media – media education – media literacy – production values – media systems – public sphere – augmented reality – old media – new media – cyberculture – cybertext – metamedia – virtual communities – technological determinism – soft determinism – interactivity – collective intelligence – digital rhetoric – non-linear media – residual media – social media – free speech

Required Reading

Castells, Manuel. "The Network Society." *The Network Society from Knowledge to Policy*. Ed. Manuel Castells and Gustavo Cardoso. Massachusetts: John Hopkins Centre for Transatlantic Relations, 2005. 3-22. Print. *Umass.edu*. Web. <https://www.umass.edu/digitalcenter/research/pdfs/JF_NetworkSociety.pdf>.

Supplementary Reading

Pinney, Christopher. "The Politics of Popular Images from Cow Protection to M. K Gandhi 1890- 1950." *The Indian Public Sphere: Readings in Media History*. Ed. Arvind Rajagopal. New York: Oxford UP, 2009. 65-87. Print.

Module IV: Visual Culture

The study of visual culture as a serious line of enquiry started with the establishment of cultural studies in the academy in the 1970s. The rise of the internet which enabled the proliferation of visual images without any borders and the rise of a screen culture where seeing is believing gave impetus to the discipline. Colours and shapes took on a new life before our eyes and along with it the possibilities of symbolic signification. A study of visual culture brings within its fold a wide array of cultural artefacts or even simple everyday

objects that gain a cultural status when viewed it from the perspective of visual culture studies.

John Berger – Laura Mulvey – Gyorgy Kepes – William Ivins Jr. – W. J. T. Mitchell – Giuliana Bruno – Stuart Hall – Lisa Cartwright – Pal Miklos – Nicholas Mirzoeff – Martin Jay – Johannes Fabian – visualism – mediascape – media influence – visual anthropology – visual ethics – visual rhetoric – visual mediation – visual representation – visual competence – theory of art – institutional theory – social network theory – mediology – complexity theory – high art – implied viewer

Required Reading

Berger, John. Section 1. *Ways of Seeing*. London: BBC and Penguin, 1972. 7-33. *Waysofseeing.com*. Web. <<http://waysofseeingwaysofseeing.com/ways-of-seeing-john-berger-5.7.pdf>>.

Supplementary Reading

Sarkar, Tanika. "Nationalist Iconography: The Image of Women in Nineteenth-Century Bengali Literature." *Economic and Political Weekly* 22.47 (Nov. 21, 1987): 2011-15. Print. *JSTOR*. Web. <https://www.jstor.org/stable/4377759?seq=1#page_scan_tab_contents>.

Module V: Queer Theory

Queer theory designates a radical rethinking of the relationship between sexuality, subjectivity and representation. Queer theory challenges essentialist notions of homosexuality and heterosexuality that exist in mainstream of discourse. Foucault's conception of sexuality as a discursive pattern rather than an essential human attribute becomes influential in the theoretical world of Queer politics. In Judith Butler's opinion, Queer theory emphasizes the constructedness, ambivalence and potential plurality of all gendered and sexual identities. It has become instrumental in deconstructing the hetero/homo dichotomy in discussions of sexuality. By repoliticizing lesbian and gay theory, queer theory works against the hegemony of patriarchal heterosexuality.

Body policing - code switching - Judith Butler - Lee Edelman - Jack Halberstam - David Halperin - José Esteban Muñoz - Eve Kosofsky Sedgwick - Adrienne Rich - Diana Fuss - Annamarie Jagose - Monique Wittig - Michael Warner - Teresa de Lauretis - David Halperin - masculinity/femininity - homosexuality - bisexuality - heterosexuality – gendering - genderqueer - androgyny - homophobia - gay/lesbian - transsexual - transgender - crossgender - hijras - sex workers - people with AIDS - lavender linguistics - heteronormativity - disability – disidentification

Required Reading

Butler, Judith, "Subject of Sex/Gender/Desire." *Gender Trouble: Feminism and the Subversion of Identity*. 1999. New York: Routledge, 2002. 3-44. *Wordpress.com*. Web. <https://selforganizedseminar.files.wordpress.com/2011/07/butler-gender_trouble.pdf>.

Supplementary Reading

John, Mary E. and Tejaswini Niranjana. "Mirror Politics: 'Fire,' Hindutva and Indian Culture." *Economic and Political Weekly* 34.10/11 (Mar. 1999): 581-84. Print. *JSTOR*. Web. <<https://www.jstor.org/action/doBasicSearch?Query=Mirror+Politics%3A+Fire%2C+Hindutva+and+Indian+Culture&acc=rr>>.

Reading List

Abelove, Henry et al., eds. *The Lesbian and Gay Studies Reader*. London: Routledge, 1993. Print.

Adorno, Theodor W. *The Culture Industry: Selected Essays on Mass Culture*. Ed. and Intro. J. M. Bernstein. London: Routledge, 1991. Print.

Ames, M. *Museums, the Public, and Anthropology: A Study of the Anthropology of Anthropology*. Vancouver: U of British Columbia P, 1986. Print.

Antinous, George. *The Arab Awakening: The Story of the Arab National Movement*. 1938. London: Routledge, 2010. Print.

Appadurai, Arjun, ed. *The Social Life of Things: Commodities in Cultural Perspective*. 1986. Cambridge: Cambridge UP, 2003. Print.

Arlen, Michael J. *The Camera Age: Essays on Television*. New York: Penguin, 1981. Print.

Attali, Jacques. *Noise: The Political Economy of Music*. Trans. Brian Massumi. Minneapolis: U of Minnesota P, 1985. Print.

Bakhtin, Mikhail. *The Dialogic Imagination: Four Essays*. 1981. Ed. Michael Holquist. Trans. Caryl Emerson and Michael Holquist. Austin: U of Texas P, 1982. Print.

Barber, Cesar Lombardi. *Shakespeare's Festive Comedies: A Study of Dramatic Form and its Relation to Social Custom*. Princeton: Princeton UP, 1959. Print.

Belsey, Catherine. *Critical Practice*. 1980. New York: Routledge, 2002. Print.

—. "Re-reading the Great Tradition." *Rereading English*. Ed. Peter Widdowson. 1992. London: Psychology P. 2003. 121-35. Print.

Berman, Russell. A. *Modern Culture and Critical Theory: Art, Politics and the Legacy of the Frankfurt School*. Madison: U of Wisconsin P, 1989. Print.

- Bhabha, Homi K. *The Location of Culture*. 1994. New York: Routledge, 2004. Print.
- Boddy, W. "The Shining Centre of the Home": Ontologies of Television in the 'Golden Age'." *Television in Transition*. Ed. P. Drummond and R. Paterson. London: British Film Institute, 1985. Print.
- Boyd-Barrett, O. "Mass Communication in Cross-cultural Contexts: The Case of the Third World." *Mass Communication and Society*. 1977. Eds. J. Curran, M. Gurevitch and J. Woollacott. Milton Keynes: Open UP, 1982. Print.
- . "Cultural Dependency and the Mass Media." *Culture, Society and the Media*. Ed. M. Gurevitch, T. Bennett, J. Curran and J. Woollacott. 1980. London: Routledge, 1982. 172-93. Print.
- Brake, Mike. *The Sociology of Youth Culture and Youth Subcultures*. London: Routledge & Kegan Paul. 1980. Print.
- Bristow, Joseph. *Effeminate England: Homoerotic Writing after 1885*. Milton Keynes: Open UP, 1995. Print.
- . *Sexuality*. London: Routledge, 1997. Print.
- and Angela R. Wilson, eds. *Activating Theory: Lesbian, Gay and Bisexual Politics*. London: Lawrence & Wishart. 1996. Print.
- Butler, Judith. *Gender Trouble: Feminism and the Subversion of Identity*. London: Routledge, 1992. Print.
- Calhoun, Craig, ed. *Habermas and the Public Sphere*. Cambridge, Massachusetts: The MIT P, 1992. Print.
- Campbell, Colin. *The Romantic Ethic and the Spirit of Modern Consumerism*. Oxford: Basil Blackwell. 1987. Print.
- Chambers, Iain. *Urban Rhythms: Pop Music and Popular Culture*. London: Macmillan, 1985. Print.
- Chatterjee, Partha. *The Nation and its Fragments: Colonial and Postcolonial Histories*. Princeton: Princeton UP, 1993. Print.
- Collins, Jim. *Uncommon Cultures: Popular Culture and Post-modernism*. New York: Routledge, 1989. Print.
- Connor, Steven. *Postmodern Culture: An Introduction to Theories of the Contemporary*. Oxford: Blackwell, 1989. Print.
- Cruikshank, Margaret, ed. *Lesbian Studies: Present and Future*. New York: The Feminist P, 1982. Print.

- Curran, James and Michael Gurevitch, eds. *Mass Media and Society*. London: Edward Arnold. 1991. Print.
- Davies, Ioan. *Cultural Studies and Beyond: Fragments of Empire*. London: Routledge. 1995. Print.
- DeJean, Joan. *Fictions of Sappho 1565–1937*. Chicago: U of Chicago P, 1989. Print.
- de Lauretis, Teresa. "Sexual Indifference and Lesbian Representation." *Theatre Journal* 40.2 (May 1998): 155-177. *Wordpress.com*.
- Web. <<https://programaddssrr.files.wordpress.com/2013/05/sexual-indifference-and-lesbian-representation.pdf>>
- Doan, Laura, ed. *The Lesbian Postmodern*. New York: Columbia UP, 1994. Print.
- Dollimore, Jonathan. *Radical Tragedy: Religion, Ideology, and Power in the Drama of Shakespeare and his Contemporaries*. Chicago: U of Chicago P, 1984. Print.
- . *Sexual Dissidence: Augustine to Wilde, Freud to Foucault*. Oxford: Clarendon P, 1991. Print.
- During, Simon, ed. *The Cultural Studies Reader*. New York: Routledge, 1999. Print.
- Edelman, Lee. *Homographesis: Essays in Gay Literary and Cultural Theory*. London: Routledge, 1994. Print.
- Ellis, John. *Visible Fictions: Cinema, Television, Video*. London: Routledge, 1982. Print.
- Friedman, Jonathan. *Cultural Identity and Global Process*. London: Sage. 1994. Print.
- Foucault, Michel. *The History of Sexuality: Volume 1. An Introduction*. 1976. Trans. Robert Hurley. Harmondsworth: Penguin, 1990. Print.
- Fuss, Diana, ed. *Inside/Outside: Lesbian Theories, Gay Theories*. London: Routledge, 1991. Print.
- Garber, Marjorie B., et al., eds. *Media Spectacles*. New York: Routledge, 1993. Print.
- Gay, Paul du. *Consumption and Identity at Work*. London: Sage, 1996. Print.
- Gibian, Peter, ed. *Mass Culture and Everyday Life*. London: Routledge. 1997. Print.
- Goldberg, David Theo, ed. *Multiculturalism: A Critical Reader*. Oxford: Blackwell. 1994. Print.
- Gray, Chris Hables, ed. *The Cyborg Handbook*. New York: Routledge. 1997. Print.
- Greenberg, David F. *The Construction of Homosexuality*. Chicago: U of Chicago P, 1988. Print.
- Hall, Donald E. *Queer Theories*. Basingstoke: Palgrave Macmillan, 2002. Print.

- Hall, Stuart. "Culture, the Media and the Ideological Effect." *Mass Communication and Society*. Ed. John Curran. London: Edward Arnold, 1977. 315-48. Print.
- Halperin, David M. *One Hundred Years of Homosexuality*. London: Routledge, 1989. Print.
- Kellner, Douglas. *Media Culture: Cultural Studies, Identity and Politics between the Modern and the Post-modern*. New York: Routledge, 1995. Print.
- Lloyd, David and Paul Thomas, eds. *Culture and the State*. New York: Routledge, 1998. Print.
- Munt, Sally, ed. *New Lesbian Criticism: Literary and Cultural Readings*. Hemel Hempstead: Harvester Wheatsheaf, 1992. Print.
- Parker, Andrew, et al., eds. *Nationalisms and Sexualities*. London: Routledge, 1992. Print.
- Rai, Amit. "An American Raj in Filmistan: Images of Elvis in Indian films." *Screen* 35.1 (1994): 51-77. Print.
- Rich, Adrienne. "Compulsory Heterosexuality and Lesbian Existence." *Signs* 5.4. (Summer 1980): 631-60. JSTOR. Web. <https://www.jstor.org/stable/3173834?seq=1#page_scan_tab_contents>.
- Rose, Nikolas. *Governing the Soul: The Shaping of the Private Self*. London: Routledge, 1990. Print.
- Sedgwick, Eve Kosofsky. *Epistemology of the Closet*. Berkeley and Los Angeles: U of California P, 1990. Print.
- Sinfield, Alan. *The Wilde Century: Effeminacy, Oscar Wilde and the Queer Moment*. London: Cassell, 1994. Print.
- Storey, John, ed. *Cultural Theory and Popular Culture: A Reader*. 1994. 3rd ed. London: Pearson, 2006. Print.
- Sussman, G. and John A. Lent, eds. *Transnational Communications: Wiring the Third World*. Newbury Park: Sage. 1991. Print.
- Viswanathan, Gauri. "Raymond Williams and British Colonialism." *Yale Journal of Criticism* 4.2 (1991): 47-66. Print.
- Wittig, Monique. "The Straight Mind." 1980. rpt. *The Straight Mind and Other Essays*. Hemel Hempstead: Harvester Wheatsheaf, 1992. Print.
- Young, Robert J. C. *Colonial Desire: Hybridity in Theory, Culture, and Race*. London: Routledge, 1995. Print.

ELECTIVES: SELECTION OPTIONS**Any ONE from each group****SEMESTERS III & IV****Semester III****Paper XI: EL233 (6 hours / week)****Electives**

20. European Drama	EL233.1
21. Canadian and Australian Literature	EL233.2
22. Film Studies	EL233.3
23. Kerala Studies	EL233.4
24. Women's Writing	EL233.5

Paper XII: EL234 (6 hours / week)**Electives**

25. European Fiction	EL234.1
26. African and Caribbean Literature	EL234.2
27. Fiction and Film	EL234.3
28. Folklore Studies	EL234.4
29. Writing Lives, Performing Gender	EL234.5

Semester IV**Paper XV: EL243 (6 hours / week)****Electives**

30. Comparative Literature	EL243.1
31. South Asian Literature	EL243.2
32. Screenwriting	EL243.3
33. Theatre Studies	EL243.4
34. Travel Writing	EL243.5

Paper XVI: EL244 (6 hours / week)**Electives**

35. Translation Studies	EL244.1
36. Regional Literatures in English Translation	EL244.2
37. Media Studies	EL244.3
38. Dalit Writing	EL244.4
39. Theorising Sexualities	EL244.5

SEMESTER III**PAPER XI: Choice 1****E L 233.1 – Elective Course: European Drama [6 hours/week]****OBJECTIVES**

The objectives of this course are to:

- introduce the students to the civilizational factors that led to the emergence of drama as a genre in ancient Europe.
- enable the students to correlate between the theory and practice of drama in terms of elements like plot, character, diction, spectacle, thought etc
- give the students a historical awareness about how the European theatrical movements reflected the social, intellectual and political realities of their times
- create in the students an aesthetic appreciation of the formal and thematic innovations made by key figures in the field of dramaturgy.

Learning outcomes:

At the end of this course students should be able to:

- trace the conditions that facilitated the origin and evolution of drama as a literary genre in Europe
- display a comprehensive awareness of the aesthetic and socio-moral principles that governed the art of dramaturgy in Europe down the ages
- claim acquaintance with the defining aspects of the major theatrical movements that came into being in the post-World War era in Europe, and connect them to their respective sociological backgrounds
- critically analyse a play with reference to the component elements of drama, as well as to identify the themes reflected in the plot
- attempt dramatic compositions.

Course Description**Module I – Socio-cultural Background of Drama in Europe**

Origin and evolution of the Greek theatre – Dithyramb – Chorus – Foundation of the Greek plays in popular legends and myths – Thematic emphasis on the relation between God and man, and on the relation between the ruler and the ruled – Contributions of Aeschylus, Sophocles and Euripides – Old Comedy and New Comedy – Aristophanes and Menander –

Senecan tragedies and their influence – French Theatre – Racine – Moliere – Major Theatrical movements in the twentieth century: From Romanticism to Realism – Arthur Wing Pinero's plays – Theatre of Anger – Theatre of the Absurd – Epic Theatre – Theatre of Cruelty – Poor Theatre – Moscow Art Theatre – Feminist Theatre Groups – Postmodernism in drama

Required Reading

Aristotle: *Poetics*

Ch.1. "The Preliminaries to the Definition of Tragedy" (51-57)

Ch.2. "The Nature of Tragedy" (57-65)

Ch.3. "Excellence in Tragedy" (66-80), from Russell, D. A. and Michael Winterbottom, eds. *Classical Literary Criticism*. 1989. Oxford: Oxford UP, 2007. Print.

Module II – Classical Drama

Sophocles: *Oedipus Rex (Three Theban Plays*. Trans. Jamey Hecht. Wordsworth Classics)

Aristophanes: *Frogs*

Moliere: *The Miser* (Free Download from-
<https://archive.org/themiser06923gut/7miser10.txt>)

Racine: *Phaedra*

Module III – Continental Drama

Henrik Ibsen *A Doll's House*

Anton Chekhov *The Cherry Orchard*

Bertolt Brecht *Mother Courage and Her Children*

Luigi Pirandello *Six Characters in Search of an Author*

Jean Anouilh *Antigone* (Trans. Lewis Galantieri)

(<[http://share.nanjing-school.com/dpenglisha/files/2012/12/](http://share.nanjing-school.com/dpenglisha/files/2012/12/Antigone-1xmwabm.pdf)

Antigone-1xmwabm.pdf>)

Dario Fo *Accidental Death of an Anarchist* (A new version by Allan Cumming and Tim Supple. Ed. and Intro. Christopher Cairns. London: Methuen Drama, 1991.)

Module IV – Critical Responses

Friedrich Nietzsche *The Birth of Tragedy*. Sections 1-5. (Trans. Shaun Whiteside. Ed. Michael Tanner. 1993. London: Penguin, 2003. 14-32. Print.)

Martin Esslin: Introduction. *The Theatre of the Absurd*. 1961. Rev. and Enl. ed. Britain: Pelican, 1968.

Recommended reading

Banham E. Martin. *The Cambridge Guide to the Theatre*. 1988. 2nd ed. Cambridge: Cambridge UP, 1995. Print.

Barr, Allan P. Ed. *Modern Women Playwrights of Europe*. New York: Oxford UP, 2001. Print.

Bloom, Harold, ed. *Greek Drama*. 2004. Philadelphia: Chelsea House, 2009. Print.

Donaldson, Ian. *Transformations in Modern European Drama*. London: Macmillan, 1983. Print.

Gascoigne, Bamber. *Twentieth-Century Drama*. 1962. London: Hutchinson, 1974. Print.

Howatson M. C. *The Oxford Companion to Classical Literature*. 1993. New Delhi: Oxford UP 2011. Print.

Lyman, Jane, ed. *Perspectives on Plays*. London: Routledge & Kegan Paul, 1976. Print.

McGuire, Susan Bassnett. *Luigi Pirandello*. London: Macmillan, 1983. Print.

Nicoll, Allardyce and Arthur Wilmurt. *World Drama: From Aeschylus to Anouilh*. 1949: London: Harrap, 1976. Print.

Orr, John. *Tragic Drama and Modern Society: A Sociology of Dramatic Form from 1880 to the Present*. 1981. 2nd ed. London: Macmillan, 1989. Print.

Trussler, Simon. *20th Century Drama*. London: Macmillan, 1983. Print.

Williams, Raymond. *Drama from Ibsen to Brecht: A Critical Account and Revaluation*. 1965. London: Penguin, 1983. Print.

SEMESTER III**PAPER XI: Choice 2****EL 233.2 - Elective Course: Canadian and Australian Literatures (6 hours/week)****Objectives**

The objectives of this course are to:

- introduce the students to Canadian and Australian Literature
- familiarize the students with major literary figures in Canada and Australia
- help students understand the socio-cultural contexts that nourish the emergence of these literatures
- make them understand the ethnic and cultural diversity of Canada and Australia
- interrogate the idea of multiculturalism and national culture
- contextualise the emergence of 'Englishes'

Learning Outcome

At the end of the course students will be able to:

- demonstrate an awareness of the spread and reach of literatures from Canada and Australia
- explain the politics and ideology in canon formation
- display an awareness of how socio-cultural contexts shape literary experiences
- conceptualize concepts like ethnicity, diversity, national culture, and multiculturalism
- engage critically with decolonization

Course Description**Module I - Socio-political and Literary Background**

The founding of the colonies of Canada and Australia – compulsions – the ties with Europe – native cultures during contact with Europeans – the effects of European contact – colonization – effects – revolts – Canadian and Australian allegiance to the British crown – political fallout – confederation – social and cultural issues like alcoholism – genocide – immigration – settlement – diaspora – transnationalism – multiculturalism – melting pot – migration studies – first natives – aboriginals – life in the reserves in Canada – French and English sides of Canada

Required Reading

Howells, Coral Ann and Eva Marie Kroeller. Introduction. *Cambridge History of Canadian Literature*. Ed. Coral Ann Howells and Eva Marie Kroeller. London: Cambridge UP, 2009. 1-24. Print.

Webby, Elizabeth. "The Beginnings of Literature in Colonial Australia." *The Cambridge History of Australian Literature*. Ed. Peter Pierce. Melbourne: Cambridge UP, 2009. 34-51. Print.

Module II -- Poetry

Required Reading

First Nations Blackfoot	"Song of the Great Spirit"
Margaret Atwood	"Notes Towards a Poem that Can Never be Written"
Claire Harris	"Framed"
A. D. Hope	"Moschus Moschiferous: A Song for St. Cecilia's Day"
Himani Bannerji	"Wife"
Kenneth Slessor	"Country Towns"
Judith Hope	"Woman to Man"
David Malouf	"The Year of the Foxes"

Module III - Drama and Fiction

Required Reading

Drama

George Ryga	<i>The Ecstasy of Rita Joe</i>
Sharon Pollock	<i>Komagata Maru Incident</i>
Ray Lawler	<i>Summer of the Seventeenth Doll</i>
Jack Davis	<i>No Sugar</i>

Fiction

Sinclair Ross	<i>As for Me and My House</i>
Gabrielle Roy	<i>Enchantment and Sorrow</i>
Patrick White	<i>Voss</i>
Sally Morgan	<i>My Place</i>

Module IV - Critical Responses

Required Reading

Buckridge, Patrick. "Allusive Rhetoric of Nationality: Development of Australian Literature from 1890s to 1980s." *Reading Down Under: Australian Literary Studies Reader*. Ed. Amit Sarwal and Reema Sarwal. New Delhi: SSS, 2009. 1-6. Print.

Kortenaar, Neil Ten. "Multiculturalism and Globalization." *Cambridge History of Canadian Literature*. Ed. Carol Ann Howells and Eve Marie Kroeller. London: Cambridge UP, 2003. 556-79. Print.

Reading List

- Brown, Russell M. and Donna Bennett, ed. *An Anthology of Canadian Literature in English*. 2 vols. Toronto: Oxford UP, 1982. Print.
- Clarke, George Eliot. *Directions Home: Approaches to African-Canadian Literature*. U of Toronto P, 2012. Print.
- Edelson, Phyllis F., ed. *An Anthology of Writing from the Land Down Under*. New York: Ballantine, 1993. Print.
- Howells, Coral Ann and Eva Marie Kroeller, eds. *Cambridge History of Canadian Literature*. London: Cambridge UP, 2009. Print.
- Kinsella, John. *The Penguin Anthology of Australian Poetry*. Melbourne: Penguin, 2008. Print.
- Klinck, Carl F. et al., ed. *A Literary History of Canada*. Toronto: U of Toronto P, 1976. Print.
- Kramer, Leonie and Adrain Mitchell. *The Oxford Anthology of Australian Literature*. 1981. Melbourne: Oxford UP, 1985. Print.
- New, W. H. *A History of Canadian Literature*. 1989. 2nd ed. Montreal: McGill UP, 2003. Print.
- Pierce, Peter. *The Cambridge History of Australian Literature*. Melbourne: Cambridge UP, 2009. Print.
- Sarwal, Amit and Reema Sarwal, eds. *Reading Down Under: Australian Literary Studies Reader*. New Delhi: SSS, 2009. Print.
- Webby, Elizabeth. *The Cambridge Companion to Australian Literature*. Cambridge: Cambridge UP, 2000. Print.

SEMESTER III

PAPER XI: Choice 3

EL 233.3 – Elective Course: Film Studies (6 hours/week)

Objectives

The objectives of this paper are to:

- introduce students to the language of cinema
- teach them how to 'read' and analyse a film
- familiarise students with various aspects of film studies including film analysis, film history and film theory

- evaluate the contributions of the director, actors, writers, and other technical crew
- understand the function of narrative in film and the social, cultural, and political implications of the film text
- look at the dynamics of adaptation

Learning outcomes

At the end of this Course, the students will be able to:

- appreciate films from the angles of both a critic and a spectator
- interpret various cinematic as well as socio cultural aspects of films
- analyse movies as major ideological tools
- explicate and do research on the filmography of the master directors
- critically analyse the dynamics of adaptation of texts selected for study

Course Description

Module I - History and Technology of Cinema

What is Cinema? – film language, grammar, composition and narrative logic in Cinema – a general overview of the history of cinema especially American, French, Soviet Union/ Russian, Italian, German, Indian, and Japanese – a brief introduction to Malayalam cinema – approaches – feminism and film – psychoanalysis – ideology and cinema – representation and cinema

Required Reading

Baudry, Jean Louis. "Ideological Effects of Basic Cinematographic Apparatus." *Film Quarterly* 28.2 (1974-75): 39-47. Print.

Bazin, André. "The Evolution of the Language of Cinema." *What is Cinema*. Vol. 1. Trans. Hugh Gray. Berkeley: U of California P, 1967. 23-40. Print.

Mulvey, Laura. "Afterthoughts on Visual Pleasure and Narrative Cinema." *Visual and Other Pleasures*. London: Palgrave, 1989. 29-38. Print.

Module II - Film Movements

Soviet Cinema - montage - Kuleshov, Eisenstein, Pudovkin, Vertov - *Mother*, *Man With a Movie Camera* - Parajanov and *Shadows of Forgotten Ancestors* - Tarkovsky - *Andrei Rublev*, *The Sacrifice* - Italian neo-realism - Rossellini - *Rome-Open City* - De Sica - *Bicycle Thieves* - Antonioni - *L'Arventura* and *Blow Up* - Poetic Realism - Jean Renoir - French new wave - the long take - auteur theory - *Cahiers du Cinema* - François Truffaut, Jean-Luc Godard, Éric Rohmer, Claude Chabrol, and Jacques Rivette - the left bank group - Chris

Marker, Alain Resnais, and Agnès Varda - Indian new wave - Satyajit Ray, Ritwik Ghatak, Mrinal Sen, G Aravindan, Adoor Gopalakrishnan - Iranian cinema - post revolutionary cinema - the new wave - Abbas Kiarostami, Jafar Panahi, Mohsen Makhmalbaf, Majid Majidi

Films for Study

Sergei Eisenstein	<i>Battleship Potemkin</i>
Majid Majidi	<i>Baran</i>
Adoor Gopalakrishnan	<i>Elippathayam</i>
Octavio Getino & Fernando Solanas	<i>The Hour of the Furnaces</i>

Module III - Film Genres

Westerns - classical, acid, spaghetti — Sci-fi - utopian, dystopian, space westerns — musicals — comedy - sight gag, screwball, slapstick, sentimental, romantic, and black/dark comedy — film noir — horror films - slasher films, ghost stories, mad scientist films — animations — epics — documentaries — adaptations

Films for Study

Robert Weiss	<i>The Sound of Music</i>
Andrew Stanton	<i>WALL-E</i>
John Ford	<i>Stagecoach</i>
Anand Patwardhan	<i>War and Peace</i>

Module IV - Critical Response

These are critical texts that respond to general issues or particular film texts; they are to be included for discussion along with the prescribed films.

Required Reading

Budd, Michael. "A Home in the Wilderness: Visual Imagery in John Ford's Westerns." *Cinema Journal* 16.1(1976): 62-75. Print.

Burton, Julianne. "The Camera as 'Gun': Two Decades of Culture and Resistance in Latin America." *Latin American Perspectives* 5.1(1978): 49-76. Print.

Dassanowsky, Robert von. "An Unclaimed Country: The Austrian Image in American Film and the Sociopolitics of *The Sound of Music*." *Bright Lights Film Journal* 41 (31 July 2003). *Brightlightsfilm.com*. Web.

Eisenstein, Sergei. "Word and Image." *Film Scense*. 1947. Trans. Jay Leyda. New York: Meridian, 1955. 3-65. Print.

Tofighian, Omid. "Contemporary Liminal Encounters: Moving Beyond Traditional Plots in Majidi's *Bârân*." *Conflict and Development in Iranian Film*. Ed. A. A. Seyed-Gohrab and K. Talattof. Leiden: Leiden UP, 2013. 103-16. Print.

Films Recommended for Further Viewing

Robert Wiene	<i>The Cabinet of Dr. Caligari</i>
Jean Renoir	<i>The Rules of the Game</i>
Carl Theodore Dreyer	<i>The Passion of Joan of Arc</i>
Charlie Chaplin	<i>Modern Times</i>
Alfred Hitchcock	<i>Rear Window</i>
Gene Kelly & Stanley Donen	<i>Singin' in the Rain</i>
Jean-Luc Godard	<i>Breathless</i>
Alain Resnais	<i>Hiroshima Mon Amour</i>
Ingmar Bergman	<i>Wild Strawberries</i>
Yasujiro Ozu	<i>Tokyo Story</i>
Robert J. Flaherty	<i>Nanook of the North</i>
Guru Dutt	<i>Pyaasa</i>
Satyajit Ray	<i>Charulata</i>
Ritwik Ghatak	<i>Meghe Dhaka Tara</i>
K. G. George	<i>Yavanika</i>

Reading list

Barnouw, Erik and S. Krishnaswamy. *Indian Film*. Delhi: Oxford UP, 1980. Print.

Braudy, Leo and Marshall Cohen, eds. *Film Theory and Criticism*. New York and Oxford: Oxford UP, 2009. Print.

Butler, Andrew M. *Film Studies: Pocket Essential Series*. Harpenden: Pocket Essentials, 2005. Print.

Dix, Andrew. *Beginning Film Studies*. Series Ed. Peter Barry. Manchester: Manchester UP, 2008. Print.

Geiger, Jeffrey and R. L. Rutsky, eds. *Film Analysis: A Norton Reader*. New York: Norton, 2005. Print.

Hill, John and Gibson Pamela Church. *The Oxford Guide to Film Studies*. Oxford: Oxford UP, 1998. Print.

Kuhn, Annette, and Guy Westwell. *A Dictionary of Film Studies*. Oxford Quick Reference Series. 1998. Oxford: Oxford UP, 2012. Print.

- Monaco, James. *How to Read a Film: Movies, Media and Beyond*. 2000. 4th ed. Oxford: Oxford UP, 2009. Print.
- Mulvey, Laura. *Visual and Other Pleasures*. London: Palgrave Mcmillan, 1989.
- Nelmes, Jill. *Introduction to Film Studies*. 1996. 5th ed. London: Routledge, 2011. Print.
- Nowell-Smith, Geoffrey. *The Oxford History of World Cinema*. 1996. Oxford: Oxford UP, 1997. *Archive.org*. Web. <https://archive.org/stream/The_Oxford_History_Of_World_Cinema_Compact/The_OxfordHistory_Of_World_Cinema_Compact_djvu.txt>.
- Rajadhyaksha, Ashish and Paul Willemen, eds. *Encyclopedia of Indian Cinema*. London and New Delhi: BFI and Oxford, 1994.
- Stempleski, Susan and Barry Tomalin. *Film (Resource Books for Teachers)*. Oxford: Oxford UP, 2010. Print.
- Villarejo, Amy. *Film Studies: The Basics*. London: Routledge, 2007. Print.

SEMESTER III

PAPER XI: Choice 4

EL 233.4 – Elective Course: Kerala Studies [6 hours/week]

Objectives:

The objectives of this paper are to:

- bring an awareness of the local histories and the politics of socio-cultural formations
- make the students realize the essential plurality that underline any given society and the varied resistances Keralam put forth
- shift the focus of academic exercises to a broader arena of lived experiences and to read it as a critique of the formations of histories and knowledge systems

Learning Outcomes:

At the end of this course, students will be able to:

- understand the specificities of the land called Keralam
- have a deep understanding of a sense of one's own history
- display an awareness of the inherent link between history, polity, society, economy, art and the formations of culture and knowledge

Course Description

Module I – History and Polity

A) Background

Megalithic remains and Sangam period - political history – Pathittupattu - early dynasties – religious and ethnic groups – kingdoms – Perumals of Kerala – Vazhappally inscriptions, Tharisappally copper plates - Jewish copper plates – medieval period – naadu and swaroopams – administration – matrilineal system – colonization and the decline of Swaroopams – European interventions – Portuguese, French, Dutch, English - National Movement – development of leftist ideology – formation of Kerala state – land reforms – the Naxal Movement – emergency – governments – participatory democracy – democratic de-centralization

B) Required Reading

Veluthat, Kesavan. “The Keralolpathi as History.” *The Early Medieval in South India*. New Delhi: Oxford UP, 2009. 129-46. Print.

Ganesh, K. N. “From Naadu to Swaroopam: Political Authority in Southern Kerala from the Tenth to the Thirteenth Centuries.” *Irreverent History, Essays for M.G.S Narayanan*. Ed. Kesavan Veluthat and Donald. R. Davis Jr. New Delhi: Primus, 2015. 33-52. Print.

Module II - Economy and Social Movements

A) Background

Concept of thina – spread of agriculture and trade – social and cultural life – formation of agrarian society in Kerala – history-political form – socio-economic structure – Brahmin settlements – janmi system – Arab and Chinese traders – advent of western monopolistic mercantile group – hegemony – relations of production during various periods – economy, state and society – Kerala model development – migrant labourers in Kerala

Resistance movements, revolts and agitations: Pazhassi revolt – Veluthampi Dalawa and Paliath Achan – Kurichiya revolt – Channar revolt – Kachi pudava samaram – Mukkuthi samaram – Pandara pattam proclamation – Malayali Memorial – Ezhava Memorial – Kallumaala agitation – Malabar lahala – Wagon tragedy – Peasant movements in Travancore and Malabar – Kayyur samaram – Vaikom satyagraham – Guruvayoor satyagraham – Temple entry proclamation – Yachana yathra – Nivarthana prakshobham – Pattini jatha – Kuttamkulam samaram – Purnapra-Vayalar lahala – Paliyam sathyagraham – Working class movements – Vimochana samaram – Environmental struggles – Chengara samaram – Muthanga samaram – Break the curfew – Queer pride – Pembilai Orumai

Social reform movements – Kerala renaissance – Reformers: Nangeli – Vaikunda Swamikal – Thycaud Ayya Guru – Makti Thangal – Chattampi Swamikal – Sree Narayana Guru – Ayyankali – Mithavadi Krishnan – Vaikom Abdul Khadar Moulavi – Mannath Padmanabhan – Poykayil Yohannan – Vagbhatananda – Pandit Karuppan – Sahodaran Ayyappan – V. T. Bhattathirippad – Parvathy Nenmanimangalam – Koothattukulam Mary – Kesari Balakrishna Pillai – K. Devayani – Dakshayani Velayudhan – Kallen Pokkoodan – Mayillamma – Daya Bai – Nilamboor Aisha – Ajitha – C. K. Janu – Saleena Prakanam – Vijayaraja Mallika

Organizations: Sree Narayana Dharma Paripalana Yogam (SNDP), Nair Service Society (NSS), Sadhu Jana Paripalana Yogam (SJPY), Yogakshema Sabha, Sahodara Sangam, Prathyaksha Raksha Daiva Sabha (PRDS), Adivasi Gothra Maha Sabha (AGMS) – Kerala Yukthivaadi Sangam (KYS) – Trade Unions, Asankhaditha Thozhilali Prasthanam – Anweshi – Self Employed Women's Association (SEWA) – Kudumbasree – Sahayathrika – Queerala

B) Required Reading

Bose, Satheese Chandra. "(Re) Construction of 'The Social' for Making a Modern Kerala: Reflections on Narayana Guru's Social Philosophy." *Kerala Modernity: Ideas, Spaces and Practices in Transition*. Ed. Satheese Chandra Bose and Shiju Sam Varughese. New Delhi: Orient BlackSwan, 2015. 59-73. Print.

Gurukkal, Rajan. "The Formation of Caste Society in Kerala: Historical Antecedents." *Social Formation of Early South India*. New Delhi: Oxford UP, 2010. 306-19. Print.

Module III – Art and Culture

A) Background

Thamizhakam – Muziris – Aryanization and its impact – Sankaracharya and Advaita philosophy – Srimulavasa – Kantalur Salai – Bhakthi Movement – Synod of Diamper – Missionary Activities

Language: Pattu – Manipravalam – Early Prose Writings – Cherusseri, Niranam poets, Ezhuthachan, Kunchan Nambiar – Keralolpathi – Ballads – Folk songs

Temple Arts – Koodiyattam, Ashtapadiyattam, Krishnanattam, Mohiniyattam, Thullal, Chendamelam, Panchavadyam, Thayampaka

Folk Arts – Theyyam, Patayani, Mudi yettu, Vilpaattu, Margamkali, Dufmuttu, Mudi yattam – Music – Sopana Sangeetham – Architecture – Painting – Murals

Theatre (KPAC): Kerala Kalamandalam – Cinema – Kerala Chalachithra Academy

Legal practices – Smartha vicharam – Caste practices – Pulapedi, Mannapedi, Parayapedi – Breast tax

B) Required Reading

Caldwell, Sarah. "Landscapes of Feminine Power." *Oh Terrifying Mother: Sexuality, Violence and Worship of the Goddess Kali*. New Delhi: Oxford UP, 1999. 104-54. Print.

Rajeevan, B. "Cultural Formation of Kerala." *Essays on the Cultural Formation of Kerala*. Ed. P. J. Cherian. Trivandrum: Kerala State Gazetteers Department, 1999. 1-34. Print.

Module IV- 20th Century Progressive Movements & Literature

A) Background

Kerala Jeevatsahitya Sangham (1937), Deshabhimani Study Circle (1970s), Purogamana Kala Sahitya Sangham (Pukasa – Progressive Arts & Literary Organisation) (1981) Kerala Shashtra Sahitya Parishad, 1962 (KSSP, Kerala Science Literature Movement) – Muslim Education Society (MES 1964)

Library Movements and Literacy Mission – Puthuvayil Narayana Panicker – Thiruvithaamkoor Granthasala Sangham (Travancore Library Association, 1945), Kerala Granthasala Sangham, 1956 (KGS), Kerala State Library Council (1977), Kerala Association for Non-formal Education and Development (KANFED), Kerala State Literacy Mission

Modern literary genres: poetry – drama – fiction – historical writings – manuals – life writing Media and Modernity: Newspaper – Akashvani – Doordarshan – New Media

B) Required Reading

Elayidom, Sunil P. "Cross-Currents Within: A Cultural Critique of Kerala Renaissance." *Janasamskriti.org*. Web. <<http://janasamskriti.org/emssem.html>>.

Reading List

Antharjanam, Lalithambika. *Agnisakshi*. 1976. Trans. Vasanthi Sankaranarayanan. New Delhi: Oxford UP, 2015. Print.

Bahauddin, K. M. *Kerala Muslim History: A Revisit*. Calicut: Other Books, 2012. Print.

Bhattathirippad, V. T. *My Tears, My Dreams*. Trans. Sindu V. Nair. New Delhi: Oxford UP, 2013. Print.

Bose, Satheese Chandra and Siju Sam Varughese, eds. *Kerala Modernity: Ideas, Spaces and Practices in Transition*. New Delhi: Orient BlackSwan, 2015. Print.

Brown, Lesley W. "The Christians of St. Thomas in the Sixteenth Century." *The Indian Christians of St. Thomas: An Account of the ancient Syrian Church of Malabar*. Cambridge: Cambridge UP, 1956. Print.

Devika, J. *Kulasthreeyum Chandapennum Undaayathengane*. Thiruvananthapuram: CDS, 2010. Print.

- Ganesh, K. N. *Keralathinte Innalekal*. Trivandrum: The State Institute of Languages, 1990. Print.
- . *Exercises in Modern Kerala History*. 2008. Kottayam: Sahithya Pravarthaka Co-operative Society, 2012. Print.
- Guru, Nataraja. *The Word of the Guru: Life and Times of Guru Narayana*. New Delhi: D. K. Print World, 2008. Print.
- Gurukkal, Rajan. *Social Formation of Early South India*, New Delhi: Oxford UP, 2010. Print.
- Jeffrey, Robin. *The Decline of Nair Dominance Society and Politics in Travancore 1847-1908*. New Delhi: Manohar, 1976. Print.
- Kumari, A. Krishna. *Samarapadhangalile Pen Peruma*. Thrissur: Samatha: A Collective of Gender Justice, 2012. Print.
- Kuroor, Manoj. *Nilam Poothu Malarnna Naal*. Kottayam: DC Books, 2015. Print.
- Kurup, K. K. N. *Aspects of Kerala History and Culture*. Vadakara: College Book House, 1977.
- Menon, O. Chandu. *Indulekha*. 1889. Trans. Anitha Devasia. New Delhi: Oxford UP, 2005. Print.
- Mohan, Sanal. "Searching for Old Histories: Social Movements and the Project of Writing History in Twentieth Century Kerala." *History in the Vernacular*. Ed. Raziuddin Aquil and Partha Chatterjee. New Delhi: Permanent Black, 2008: 357-90. Print.
- Nair, Vasudevan M. T. *Naalukettu*. 1958. *Naalukettu: The House Around the Courtyard*. Trans. Gita Krishnankutty. New Delhi: Oxford UP, 2008. Print.
- Narayanan, M. G. S. *Perumals of Kerala*. Thrissur: Cosmo Books, 1996. Print.
- Nisar, M. and Meena Kandasamy. "Ayyankali and his Movement." *Ayyankali Dalit Leader of Organic Protest*. Calicut: Other Books, 2007. Print.
- Padmanabhan, K. P. *History of Kerala*. 4 Vols. New Delhi: Asian Educational Services, 1924. Print.
- Panikkar, K. N. *Essays on the History and Society of Kerala*. Trivandrum: Kerala Council for Historical Research, 2015. Print.
- Ramanujan, A. K. *Poems of Love and War*. New York: Columbia UP, 1985. Print.
- Usha Kumari, T. A., ed. *Thozhil Kendrathilekku*. Thrissur: Samatha: A Collective of Gender Justice, 2014. Print.

Varier, M. R. Raghava and Rajan Gurukkal, eds. *Cultural History of Kerala*. 2 vols. Thiruvananthapuram: Department of Cultural Publications, Government of Kerala 1999. Print.

Veluthat, Kesavan. *Brahman Settlement in Kerala: Historical Studies*. Thrissur: Cosmo, 2013. Print

Vielle, Christophe. "How did Parasurama Come to Rise Kerala?" *Irreverent History, Essays for M. G S Narayanan*. Ed. Kesavan Veluthat and Donald R. Davis Jr. New Delhi: Primus, 2014. Print.

SEMESTER III

PAPER XI: Choice 5

EL 233.5 – Elective Course: Women's Writing [6 hours/week]

Objectives:

The objectives of this paper are to:

- introduce students to the different genres and literary themes presented by women writers, especially Indian women writers
- help students to understand the historical and social context in which literary expression by Indian women developed
- help students to appreciate the richness and variety of literary production by women

Learning Outcomes

At the end of this course, students will be able to:

- describe and evaluate the roles of such categories as race, gender and sexuality, disability, class, ethnicity, and religion
- demonstrate an advanced critical understanding of the cultural history of women's writing
- demonstrate the ability to use and respond to historicist, feminist and other critical approaches to women writers

Course Description

Module I- Introduction to Women's Writing.

Introduction – definition of women's writing – emergence as a genre – major women writers – aesthetics of women's writing – politics of women's writing – black feminism – Indian feminism – multiracial feminism – post colonial feminism – eco feminism – misogynist writings – Mary Wollstonecraft and her circle – first wave of feminism – second wave – third wave – pro-feminism – new feminism – *écriture féminine*

Required Reading

Eagleton, Mary. Introduction. *Feminist Literary Theory: A Reader*. 1986. London: Blackwell, 2011. 1-8. Print.

Irigaray, Luce. Introduction. *This Sex Which is Not One*. Trans. Catherine Porter and Carolyne Burke. 1977. New York: Cornell UP, 1985. 23-33. Print.

Module II: Poetry

Required Reading

Kamala Das	"Too Late for Making Up"
Shanta Acharya	"Delayed Reaction"
Vijila	"A Place for Me"
Imtiaz Dharker	"Minority"
Judith Wright	"Naked Girl and Mirror"
Sylvia Plath	"Balloons"
Alice Walker	"Before I leave the Stage"
Pratibha Nandakumar	"Poem"
Sugathakumari	"Devadasi"
Carol Ann Duffy	"Eurydice"
Vijayalekshmi	"Thachante Makal"
Temsula Ao	"Heritage"

Module III - Prose and Fiction

Prose

Required Reading

Adichie, Chimamanda Ngozi. *We Should All Be Feminists*. TED talk given in the United Kingdom. London: Fourth Estate, 2014. Print.

Jain, Jasbir. "From Experience to Aesthetics: The Dialectics of Language and Representation." *Growing Up As A Woman Writer*. Ed. Jasbir Jain. 2006. New Delhi: Sahitya Akademi, 2007. Print.

Niranjana, Tejaswini. "Translation, Colonialism, and the Rise of English." *Economic and Political Weekly* 25.15(1990): 773-79. Print.

Parker, Dorothy. "Good Souls." *Dudley.harvard.edu*.

Web. <https://dudley.harvard.edu/files/dudley/files/dorothy_parker_-_good_souls_a_telephone_call.pdf>.

Fiction

Required Reading

Lalithambika Antaranam
 Mahaswetha Devi
 P. Vatsala
 Shashi Deshpande
 Doris Lessing
 Katherine Mansfield
 M Saraswati Bai
 Kumudini
 Penelope Fitzgerald
 Mrinal Pande
 Sarah Orne Jewett

"Goddess of Revenge"
 "The Divorce"
 "The Nectar of Panguru Flower"
 "Independence Day"
 "No Witchcraft for Sale"
 "A Doll's House"
 "Brainless Women"
 "Letters from the Palace"
 "The Axe"
 "A Woman's Farewell Song"
 "A White Heron"

Module IV- Drama and Short Fiction

Drama

Required Reading

Caryl Churchill
 Vinodini

Top Girls
Thirst

Short Fiction

Required Reading

Mahasweta Devi

"Draupadi"

Reading List:

- Eagleton, Mary, ed. *Feminist Literary Theory: A Reader*. 1986. Oxford: Blackwell, 1999. Print.
- Irigaray, Luce. *This Sex which is Not One*. Trans. Catherine Porter and Carolynne Burke. New York: Cornell UP, 1985. Print.
- Kristeva, Julia. *Desire in Language: A Semiotic Approach to Literature and Art*. 1969. Ed. Leon S. Roudiez. Trans. Thomas Gora and Alice A. Jardine. New York: Columbia UP, 1980. Print.
- Mitchell, Juliet. *Psychoanalysis and Feminism: Freud, Reich, Laing and Women*. 1975. New York: Penguin, 2000. Print.
- Moi, Toril. *Sexual/Textual Politics: Feminist Literary Theory*. 1985. New York: Routledge, 2002. Print.

- Showalter, Elaine. *A Literature of Their Own: British Women Novelists from Bronte to Lessing*. Princeton, NJ: Princeton UP, 1977. Print.
- Swindells, Julia, ed. *The Uses of Autobiography*. Abingdon: Taylor and Francis, 1995. Print.
- Tharu, Susie and K. Lalita, eds. *Women Writing in India: 600 BC to the Present*. 2 vols. 1991. Delhi: Oxford UP, 1993. Print.
- Weeden, Chris, et al. *Rewriting English: Cultural Politics of Gender and Class*. London: Psychology P, 2003. Print.

SEMESTER III

PAPER XII: Choice 1

EL 234.1 - Elective Course: European Fiction (6 hours/week)

Objectives

The objectives of this paper are to:

- introduce the students to European fiction
- broaden and deepen the understanding of European fiction and its various trends
- introduce the students to some of the classical and modern fictions

Learning Outcomes

At the end of the course students will be able to:

- identify the main themes of the texts and examine them from a different perspective
- display their understanding of the historical, cultural, political, religious, stylistic, structural outlooks that shaped European fiction
- demonstrate the ability to read, enjoy, think about, and respond to European fiction in critical and meaningful ways

Module I – Socio-political and Literary Background

Renaissance – Cervantes, Niccolo Machiavelli, Giovanni Boccaccio, Petrarch – Age of Enlightenment – Voltaire, Jean-Jacques Rousseau, Denis Diderot – Romanticism – Victor Hugo, Goethe, Faust, Hegel – Realism – Gustave Flaubert, Claude Bernard, Emile Zola, Fyodor Dostoyevsky, Leo Tolstoy – Modernism – Immanuel Kant, Clement Greenberg, Baudelaire, Manet, Flaubert, Nietzsche, Wassily Kandinsky – Stream of Consciousness – Dadaism – Cubism – German Expressionism – Futurism – Surrealism – Pop – Minimalism – Postmodernism – Metafiction, Black Humour, Subversion.

Recommended Reading

Bell, Michael, ed. *The Cambridge Companion to European Novelists*. London: Cambridge UP, 2012. Print. (Relevant sections)

Childs, Peter. *Modernism*. Critical Idiom Series. 2000. 2nd ed. London: Routledge, 2007. Print.

Cohen, Walter. *A History of European Literature*. London: Oxford UP, 1999. Print. (Relevant sections)

Woods, Tim. *Beginning Postmodernism*. Manchester: Manchester UP, 1999. Print.

Module 2: Realism and Naturalism

Novel

Cervantes	<i>Don Quixote</i>
Gustave Flaubert	<i>Madame Bovary</i>
Fyodor Dostoyevsky	<i>Crime and Punishment</i>

Short Story

Honore de Balzac	"A Passion in the Desert"
Guy de Maupassant	"A Dead Woman's Secret"

Module 3: Modernism and Postmodernism

Novel

Gunter Grass	<i>Tin Drum</i>
Italo Calvino	<i>If on a Winter's Night a Traveller</i>
Elfriede Jelinek	<i>The Piano Teacher</i>

Short story

Orhan Pamuk	"Distant Relations"
Jose Saramago	"The Chair"

Module 4: Critical Responses

Gay, Peter. "A Climate for Modernism." *Modernism: The Lure of Heresy*. London: W. W. Norton & Company, 2010. Print.

Hutcheon, Linda. "Discourse, Power, Ideology: Humanism and Postmodernism." *A Poetics of Postmodernism: History, Theory and Fiction*. London: Routledge, 1988. 178-200. Print.

Lehan, Richard Daniel. "Realism and Naturalism as the Expression of an Era." *Realism and Naturalism: Love in an Age of Transition*. London: The U of Wisconsin P, 2005. Print.

Reading List

- Cascardi, Anthony J. *The Cambridge Companion to Cervantes*. London: Cambridge UP, 2002. Print.
- Ferber, Michael. *A Companion to European Romanticism*. Victoria: Blackwell, 2005. Print
- Konzett, Matthias Piccolruaz and Margarete Lamb-Faffelberger, eds. *Elfriede Jelinek: Writing Woman, Nation, and Identity: A Critical Anthology*. New Jersey: Associated UP, 2007. Print
- Polhemus, Robert M. and Roger B. Henkle, eds. *Critical Reconstructions: The Relationship of Fiction and Life*. Stanford: Stanford UP, 1994. Print.
- Samarago, Jose. *The Lives of Things*. London: Verso, 1978. Print
- Taberner, Stuart. *The Cambridge Companion to Gunter Grass*. Cambridge: Cambridge UP, 2009. Print.
- Unwin, Timothy, ed. *The Cambridge Companion to Flaubert*. London: Cambridge UP, 2004. Print.

SEMESTER III

PAPER XII: Choice 2

EL 234.2 African and Caribbean Literatures (6 hours/week)

Objectives:

The objectives of this paper are to:

- introduce the students to different literary genres from African and Caribbean literature
- familiarize them with the historical and cultural context of literary works
- help students understand the impact of colonialism, race, class, ethnicity and gender
- enable them to gain a broad knowledge of the major texts and major concerns of African and Caribbean literatures

Learning outcomes:

At the end of this course, students will be able to:

- appreciate the diversity of literary voices from Africa and the Caribbean and to enable them to read texts in relation to the historical and cultural contexts

- understand the debates and concepts emerging from the field of African-Caribbean Studies
- develop the ability to think critically about African-Caribbean Diaspora

Course Description

Module I – Socio-political and Literary Background

Impact of colonialism/colonial encounters – race and ethnicity – oral literature – negritude movement – themes of colonialism, liberation – nationalism – tradition – displacement and rootlessness in African and Caribbean literature – creolization – post-colonial literature in Africa – decolonization – African mythology and worldview – humour and satire in African & Caribbean literature – African diaspora – post-apartheid literature – recent trends in African and Caribbean literatures – Anglo-Caribbean & West Indian literature – indentureship and migration

Recommended Reading

Achebe, Chinua. "An Image of Africa: Racism in Conrad's *Heart of Darkness*." *The Massachusetts Review* 57.1(2016): 14-27. Web. <https://polonistyka.amu.edu.pl/_data/assets/pdf_file/0007/259954/Chinua-Achebe,-An-Image-of-Africa.-Racism-in-Conrads-Heart-of-Darkness.pdf>.

Spivak, Gayatri Chakravorty. "Can the Subaltern Speak?" *Colonial Discourse and Post-Colonial Theory: A Reader*. Ed. Patrick Williams and Laura Chrisman. New York: Columbia UP, 2004. 66-111. Print.

Module II - Poetry and Drama

Required Reading

Poetry

Louise Bennett	"Colonization in Reverse"
Leopold Sedar Senghor	"Black Woman"
David Diop	"Africa," "The Vultures"
Chinua Achebe	"Refugee Mother and Child"
Derek Walcott	"A Far Cry from Africa"
Edward Kamau Brathwaite	"South"
Wole Soyinka	"Hamlet"
John Pepper Clark	"Night Rain"
Kofi Awoonor	"Songs of Sorrow"

Drama

Wole Soyinka

*Death and the King's Horseman***Module III - Prose and Fiction****Required Reading****Prose**

Nelson Mandela

"Birth of a Freedom Fighter"

George Lamming

"The Occasion for Speaking"

Fiction

Chinua Achebe

Things Fall Apart

J. M. Coetzee

Disgrace

Chimamanda Ngozi Adichie

Half of a Yellow Sun

V. S. Naipaul

*The Enigma of Arrival***Module IV – Critical Responses****Required Reading**

Frantz Fanon

"The Fact of Blackness"

Frantz Fanon

"The Negro and Language"

Ngugi wa Thiong'o.

"Decolonising the Mind"

Reading List

Cesaire, Aime. *Discourse on Colonialism*. Trans. Joan Pinkham. New York: Monthly Review P, 2000. Print.

Fanon, Franz. "The Negro and Language." *Black Skin White Masks*. 1952. Trans. Richard Philcox. London: Pluto, 1986. 8-27. Print. .

—. *Black Skin, White Masks*. 1952. Trans. Richard Philcox. New York: Grove, 2008. Print.

—. *Wretched of the Earth*. New York: Grove P, 1968. Print.

Irele, Abiola, Simon Gikandi, ed. *The Cambridge History of African and Caribbean Literature*. 2 vols. Cambridge UP, 2004. Print.

Kelley, Robin D. G. "A Poetics of Anticolonialism." *Monthly Review: An Independent Socialist Review* 51.06 (Nov. 1999). *Monthlyreview.org*. Web. <<https://monthlyreview.org/1999/11/01/a-poetics-of-anticolonialism/>>

Lamming, George. "The Occasion for Speaking." *The Post-Colonial Studies Reader*. Ed. Bill Ashcroft, et al. London: Routledge, 1995. 12-17. Print.

Mandela, Nelson. "Birth of a Freedom Fighter." Part 3 Section 11. *Long Walk to Freedom: The Autobiography of Nelson Mandela*. 1994. London: Abacus, 2003. 109-16. Print.

Ojaide, Tanure. *Contemporary African Literature: New Approaches*. African World Series. Series Ed. Toyin Falola. Durham: Carolina Academic P., 2012. *Cap-press.com*. Web. <<http://www.cap-press.com/pdf/2296.pdf>>.

Olaniyan, Tejumola and Ato Quayson. *African Literature: An Anthology of Criticism and Theory*. 2007. London: Blackwell, 2010. Print.

Ricard, Alain. *The Languages and Literatures of Africa: The Sands of Babel*. Trans. Naomi Morgan. Oxford: James Currey, 2004. Print.

Soyinka, Wole. *Myth, Literature, and the African World*. 1976. Cambridge: Cambridge UP, 2005. Print.

Thiong'o, Ngũgĩ wa. "Decolonising the Mind." *Archive.org*. Web. <https://archive.org/stream/DecolonisingTheMind/Decolonising_the_Mind_djvu.txt>.

Williams, Patrick and Laura Chrisman, ed. *Colonial Discourse and Post-Colonial Theory: A Reader*. 1993. London: Routledge, 2015. Print.

SEMESTER III

PAPER XII: Choice 3

EL 234.3 - Elective Course: Fiction and Film (6 hours /week)

Objectives

The objectives of this paper are to:

- examine the relationship between fiction and cinema by focusing on film adaptations of literary genres such as the novel, short story, novella and graphic novels
- broaden and deepen the understanding of film adaptations and its various trends
- consider classic and contemporary theories of film adaptation

Learning Outcomes

At the end of the course students will be able to:

- demonstrate an understanding of the evolving relation between literature and cinema through adaptations and its history
- apply adaptation theories to read films
- read and critically analyze film adaptations with reference to the medium

Course Description

Module I – Fiction to Film - Theory

‘Sisters Arts’ – Cinema history – Notion of fidelity – Medium specificity and codes – Mise-en-scene – Characters – Literary language and Film language – Techniques and Narrative strategies – Modes of adaptation – Borrowing – Intersecting – Transforming of sources – Dynamics of exchange – A Dialogue – Intertextuality – Authorship and Auteurism – Ideological and Political implications – Assessing adaptations – Transpositions – Commentary – Analogy – Aesthetics of adaptation – Fiction, Films, Television Series, Fairy tales, Animations, Graphic novels

Required Reading

Andrew, Dudley. “Adaptation.” *Concepts in Film Theory*. London: Oxford UP, 1984. 96-106. Print.

Wald, Jerry. “Foreword: Fiction versus Film.” *Fiction, Film and Faulkner: The Art of Adaptation*. Ed. Gene D. Philips. Knoxville: The U of Tennessee P, 1988. Print.

Module II - Novels to Films

Author	Novel	Director	Film
Emily Bronte	<i>Wuthering Heights</i>	Peter Kosminsky	<i>Emily Bronte's Wuthering Heights</i>
Bram Stoker	<i>Dracula</i>	Francis Ford Coppola	<i>Dracula</i>
Ken Kesey	<i>One Flew Over the Cuckoo's Nest</i>	Miloš Forman	<i>One Flew Over the Cuckoo's Nest</i>
Malayattoor Ramakrishnan	<i>Yakshi</i>	K. S. Sethumadhavan	<i>Yakshi</i>

Module III- Short fiction to Films

Author	Novel	Director	Film
Paul Zacharia	“Bhaskara Pattelarum Ente Jeevithavum”	Adoor Gopalakrishnan	<i>Vidheyan</i>
Rabindranath Tagore	“The Broken Nest”	Satyajit Ray	<i>Charulatha</i>

Module IV – Graphic Novels and Fairy Tales to Films

Author	Novel	Director	Film
Alan Moore	<i>From Hell</i>	Allen Hughes, Albert Hughes	<i>From Hell</i>
Brothers Grimm	<i>The Frog Prince</i>	Ron Clements John Musker	<i>The Princess and the Frog</i>

Recommended Reading

Cohan, Keith. *Film and Fiction: The Dynamics of Exchange*. London: Yale UP, 1979.

Hutcheon, Linda, and Siobhan O'Flynn. *A Theory of Adaptation*. New York: Routledge, 2013.

McFarlane, Brian. *Novel to Film: An Introduction to the Theory of Adaptation*. Oxford: Oxford UP, 1996.

Roberge, Gaston. *The Subject of Cinema*. 1985. Calcutta: Seagull, 1990.

Stam, Robert and Alessandra Raengo, eds. *Literature and Film: A Guide to Theory and Practice of Film Adaptation*. London: Blackwell, 2005.

SEMESTER III**PAPER XII: Choice 4****EL 234.4 - Elective Course: Folklore Studies (6 hours/week)****Objectives**

The objectives of this paper are to:

- look at folklore and its different forms with specific reference to the cultures in which they are determined
- arrive at methods of analysing folklore with a view to understanding their function within their cultures
- give an idea of early cultural formations including oral culture in founding and sustaining modern societies
- develop an understanding of early cultures and their expressions.

Learning outcomes

At the end of this course, the students will be able to:

- display an awareness of the nature and form of folklore and its significance in the cultural formations of a people

- gather and identify different types of folklore and discuss them in the context of the cultures that inform them and are informed by them in turn
- critically analyse and understand folklore using different methodologies available
- think about folklore as a living tradition with contemporary relevance
- conduct fieldwork to collect and analyse folklore and study them in connection with the past and present culture

Course Description

Module I — Fundamentals of Folklore Studies

Definitions of folklore – folklore studies – a historical overview – folk groups and folk culture – the question of what constitutes a folk group – folklore and tradition – folklore as history of the oppressed classes

Required Reading

Bendix, Regina F., and Galit Hasan-Rokem. Introduction & Part 1. *Companion to Folklore. Blackwell Companions to Anthropology*. Oxford: Blackwell, 2012. Print.

Sim, Martha C. and Martine Stephens. Chapters 1-6. *Living Folklore: An Introduction to the Study of People and Their Tradition*. 2005. 2nd ed. Logan, UT: Utah State UP, 2011. Print.

Module II — Forms of Folklore

Folktales — folk narratives - folk songs, peasants and their imagination - folk performances — theatre, rituals - folklore in everyday life — food, clothing, superstitions

Required Reading

Dundes, Alan. "Projection in Folklore: A Plea for Psychoanalytic Semiotics." *MLN* 91.6 (1976): 1500-1533. Print.

Propp, Vladimir. "The Nature of Folklore." *Theory and History of Folklore*. Trans. Ariadna Y. Martin and Richard P. Martin. Minneapolis: U of Minnesota P, 1997. 1-63. Print.

Module III — Methodologies for Analysis

Comparative theory – Finnish historical-geographic method – national folklore theories – Russian – Hungarian – American – anthropological theory – Franz Boas – psychoanalytic theory – Freud – *Dreams and Myth* – structural theory – Propp – Levi-Strauss – the contextual theory – Milman Parry and Albert B. Lord – field work and methodology of folklore research

Required Reading

Burns, Thomas A. "Folkloristics: A Conception of Theory." *Western Folklore* 36.2 (1977): 109-34. Print.

Dorson, Richard M. "Current Folklore Theories." *Current Anthropology* 4.1 (1963): 93-112. Print.

Sims, Martha C. and Martine Stephens. Chapter 7. *Living Folklore: An Introduction to the Study of People and Their Tradition*. 2005. 2nd ed. Logan, UT: Utah State UP, 2011. Print.

Module IV —Folklore of Kerala

Description of different forms of Kerala folk-art performances – theyyam, mudiyettu, padayani, thira, thottam, chavittunatakam, pavakkoothu, kakkarassinatakam, vellarinatakam – songs and oral performances – vadaḱkan and thekkanpattu, brahmanipattu, koythupattu, kuthiyottapattu, vallappattu – *Aithihyamala*

Required Reading

A. K. Ramanujan

"A Drum" (Hindi)

"Raja Vikram and Princess of China"

"Sukhu and Dukhu" (Bengali)

"A Heron in the Mouth"

"Teja and Teji" (Assamese)

"The Priest Who Could See as Far as Mecca"

"The Lord of Death" (Punjabi)

"In Another Country"

"A Tall Tale in Urdu" (Urdu)

"How the Weaver Went to Heaven"

"A Story in Search of an Audience" (Telugu)

"Tenali Rama's Dream"

"A Flowering Tree" (Kannada)

"In the Kingdom of Fools"

"The Clay Mother-in-Law" (Tamil)

"Crossing a River, Losing a Self"

Kottarathil Sankunni

"The Market Place of Kozhikode"

"The Martial Arts Master of Kallanthattil"

"The Panikkar of the House of Avanangattu and the Evil Spirits"

Namboodiri, Vishnu M. V. *Folklore: Identity of Culture*. Thiruvananthapuram: Department of Information and Public Relations, Government of Kerala, 2012. Print.

Reading List

Bendix, Regina F., and Galit Hasan-Rokem, eds. *Blackwell Companion to Anthropology: Companion to Folklore*. Hoboken: Wiley-Blackwell, 2012. Print.

Dorson, Richard M., ed. *Folklore and Folk Life : An Introduction*. Chicago: The U of Chicago P, 1972. Print.

Dundes, A., ed. *The Study of Folklore*. London: Prentice Hall, 1965. Print.

Handoo, Jawaharlal. *Folklore : An Introduction*. Hyderabad: CIEFL, 1989. Print.

———. *Theoretical Essays in Folklore*. New Delhi: Zooni, 2000. Print.

Leach, Maria, ed. *The Standard Dictionary of Folklore, Mythology and Legend*. 1949. New York: Funk & Wagnalls, 1972. Print.

Ramanujan, A. K. *Selections from Folktales from India*. 1994. Gurgaon: Penguin, 2009. Print.

Sankunni, Kottarathil. *Selections from Aithiyamala*. Trans. Leela James. Gurgaon: Hachette, 2015. Print.

Sims, Martha C. and Martine Stephens. *Living Folklore: An Introduction to the Study of People and Their Tradition*. 2005. 2nd ed. Logan, UT: Utah State UP, 2011. Print.

SEMESTER III

PAPER XII: Choice 5

EL 234.5 – Elective Course: Writing Lives, Performing Gender [6 hours/week]

Objectives:

The objectives of this paper are to:

- focus on dancing bodies in performance which may open up enquiries into the behaviours of gendered, raced and sexed bodies within the cultural space.
- open up multiple ways of thinking about bodies in performance, beyond the normalized ways of embodying selves.
- guide the students towards a concrete understanding of how the performers have dealt with gendered roles

Learning outcomes:

At the end of this course, students will be able to:

- display informed ways of understanding lives and bodies in performance.
- describe and explain the agonies of lives that were devoted to experimenting with the self, body and the other
- evaluate critically the relationship between performance and gender

Course Description**Module I - Isadora Duncan**

The extract from the life of Isadora Duncan shall acquaint the students with the persistent struggle of an iconoclastic performer, considered the creator of modern dance in the west, to extend the grammar of female dancing body beyond the codified rigidities of classical ballet. Duncan wanted to restore dance to a high art form instead of entertainment and for this she continually sought to redefine the connection between emotions and movement. Her autobiography tries to capture the agonies of a life that was devoted to experimenting with the self, body and the other.

Required Reading

Duncan, Isadora. *My Life*. 1927. New York: Liveright, 1995. Print.

Module II - Chandralekha

Chandralekha is in many ways an epochal eastern counterpart of Isadora Duncan and hence elaborates the enquiries of the students begun in the first extract to a more familiar cultural scenario. Chandralekha's incessant experiments to widen the idiom of Bharatanatyam to encompass the powerfully fluid movements of limbs in Kalaripayattu and Yoga, to tap multiple ways of erotic expression, her quests to bring out the feminine within the male, and her own postulations of the seamless body shall incite further critical thinking in these directions.

Required Reading

Barucha, Rustom. *Chandralekha: Woman, Dance, Resistance*. New Delhi: Indus, 1995.

Module III – Vaslav Nijinsky

A dancer-choreographer who shocked the classical ballet audience used to stipulated kinesthetics of the moving male body, Vaslav Nijinsky's modes of expression were futuristic in many ways. From dancing *en pointe* which was not expected of men, to extreme sparseness employed in the rendering, his two dimensional movement vocabulary set against lush music

and open expression of physicality on the stage, Nijinsky's life both on and off the stage was riveting. This extract brings in myriad questions into norms of masculinity that popular art and literature promote.

Required Reading

Nijinsky, Vaslav. *The Diary of Vaslav Nijinsky*. Ed. Joan Acocella. New York: Farrar, Straus and Giroux, 1995. Print

Module IV - Sarah Caldwell's Study of *Mudiyettu*

The extract from Sarah Caldwell's study of *Mudiyettu* in many ways consolidates the explorations incited by the other selections in this paper. The remarkable power of this book's analysis of sexualities in performances in a ritual space in Kerala comes from the position of an involved participant that Caldwell takes, as against any supposed objective scholarship on the same. The mix of insight in the form of entries in her journal and letters that generously peppers her academic analysis enables her to pour forth the frustrations within her person as she encounters conventions of female behaviour and gender performance in Kerala. The vividly examined psychological dynamics working behind ritual structures, the conflicts between genders it reflects and the way the same are negotiated through ritual, all narrated with empathy shall encourage students further in their own experiential assessments.

Required Reading

Caldwell, Sarah. *Oh Terrifying Mother: Sexuality, Violence and Worship of the Goddess Kali*. New Delhi: Oxford UP, 1999. 104-54. Print.

Reading List

Bahrani, Zainab. "Metaphorics of the Body: Nudity, the Goddess and the Gaze." *Women of Babylon: Gender and Representation in Mesopotamia*. London: Routledge, 2001. 40-69. Print.

Bharucha, Rustom. *Chandralekha: Woman, Dance, Resistance*. New Delhi: Harper Collins, 1999. Print.

Brewer, Carolyn. "'Good' and 'Bad' Women: The Virgin and the Whore." *Shamanism, Catholicism and Gender Relations in Colonial Philippines, 1521-1685*. London: Ashgate, 2004. 39-64. Print.

Burt, Ramsay. "Dissolving in Pleasure: The Threat of the Queer Male Dancing Body." *Dancing Desires: Choreographing Sexualities on and off the Stage*. Ed. Jane Desmond. Wisconsin: U of Wisconsin P, 2001. 562-81. Print.

Caldwell, Sarah. *Oh Terrifying Mother: Sexuality, Violence and Worship of the Goddess Kali*. New Delhi: Oxford UP, 1999. Print.

Chatterjee, Ananya. "Chandralekha: Negotiating the Female Body and Movement in Cultural/Political Signification." *Moving History, Dancing Cultures: A Dance History Reader*. Ed. Dils Ann and Ann Cooper Albright. New York: Wesleyan UP, 2001. 389-97. Print.

Coorlawala, Uttara. "Ananya and Chandralekha – A Response to Chandralekha: Negotiating the Female Body and Movement in Cultural/Political Signification." *Moving History, Dancing Cultures: A Dance History Reader*. Ed. Dils Ann and Ann Cooper Albright. New York: Wesleyan UP, 2001. 398-403. Print.

Duncan, Isadora. *My Life*. New York: Liveright, 1995. Print.

Foster, Susan Leigh. "The Ballerina's Phallic Pointe." *Corporealities: Dancing Knowledge, Culture and Power*. New York: Routledge, 1996. 1-26. Print.

Franko, Mark. "The Invention of Modern Dance." *Dancing Modernism: Performing Politics*. New York: IUP, 1995. 1-24. Print.

Hanna, Lynne Judith. "The Sense and Symbol of Sexuality and Gender in Dance Images." *Dance, Sex and Gender: Signs of Identity, Dominance, Defiance and Desire*. Chicago: U of Chicago P, 1998. 150-76. Print.

Hodson, Millicent. "Searching for Nijinsky's Sacre." *Moving History, Dancing Cultures: A Dance History Reader*. Ed. Ann Dils and Ann Cooper Albright. New York: Wesleyan UP, 2001. 17-29. Print.

Joyce, Rosemary. "Goddesses, Matriarchs and Manly-Hearted Women: Troubling Categorical Approaches to Gender." *Ancient Bodies, Ancient Lives: Sex, Gender and Archaeology*. New York: Thames and Hudson, 2008. 46-66. Print.

Kopelson, Kevin. "Nijinsky's Golden Slave." *Dancing Desires: Choreographing Sexualities on and off the Stage*. Ed. Jane Desmond. Wisconsin: U of Wisconsin P, 2001. Print.

Nijinsky, Vaslav. *The Diary of Vaslav Nijinsky*. Ed. Romola Nijinsky. London: U of California P, 1971. Print.

Perry, Elizabeth M., and Rosemary Joyce. "Providing a Past for Bodies that Matter: Judith Butler's Impact on the Archaeology of Gender." *International Journal of Sexuality and Gender Studies*. 6.1/2 (2001): 63-76. *Springer Link*. Web. <<https://link.springer.com/article/10.1023/A:1010142023744>>.

Phelan, Peggy. "Dance and the History of Hysteria." *Corporealities: Dancing Knowledge, Culture and Power*. New York: Routledge, 1996. 90-105. Print.

SEMESTER IV**PAPER XV: Choice 1****EL 243.1 – Elective Course: Comparative Literature [6 hours/week]****Objectives:**

The objectives of this paper are to:

- give a historical overview of the development of the theory of comparative literature
- familiarize students with the theory of comparative literature
- enable students to assess cross-cultural currents in literature and other arts
- train students in the methodologies of comparative analysis

Learning Outcomes

At the end of the course, the students will be able to:

- display an awareness of the major transformations in the concept of comparative literature
- assess the cultural similarities and dissimilarities represented in the literature of different languages
- demonstrate the ability to analyze texts across languages and cultures
- assess the flow of forms and concepts across language and national boundaries
- appreciate the universal character of literature and arts

Course Description**Module I— Socio-political and Literary Background**

The origin and growth of the comparative approach – comparative Indian literature – Malayalam literature – inter-semiotic comparison – the question of adaptations – the translations of the epics – Ezhuthacchan – the lyric impulse and *Krishnagatha* – hymns – Poonthanam – Kunjan Nambiar – romanticism – Kumaran Asan – Vallathol Narayana Menon – modernism – Ayyappa Paniker – M. Govindan – postmodernism – P.P. Ramachandran – S. Joseph – Mohanakrishnan Kalady

Required Reading

Hogan, Patrick Colm. "Beauty, Politics, and Cultural Otherness: The Bias of Literary Difference." *Literary India: Comparative Studies and Aesthetics, Colonialism and Culture*. Ed. Patrick Colm Hogan and Lalita Pandit. Albany: State University of New York, 1995. 3-44. Print.

Palumbo-Liu, David. "Method and Congruity: The Odious Business of Comparative Literature." *A Companion to Comparative Literature*. Ed. Ali Behdad and Dominic Thomas. London: Wiley-Blackwell. 2011. Print.

Module II — Poetry and Drama

Required Reading

Poetry

Kumaran Asan	"The Fallen Flower"
Ayyappa Paniker	"Kurukshetra"

Drama

N. Krishna Pillai	<i>Investment</i>
C. J. Thomas	<i>Crime 27 of 1128</i>

Module III — Prose and Fiction

Required Reading

O. Chandu Menon	<i>Indulekha</i>
M. T. Vasudevan Nair	<i>The Second Turn</i>
K. P. Ramanunni	<i>What the Sufi Said</i>
Ponkunnam Varkey	<i>The Key of the Store</i>

Module IV — Literature and Other Arts

Required Reading

A. Vincent	<i>Bhargavi Nilayam</i>
G. Aravindan	<i>Kanchana Sita</i>

Reading List

Aravindan, G., dir. *Kanchana Sita*. Perf. Prem Nazir, Keshav Panicker. Release: 21 Dec. 1978. Film. (Intertext: *Kanchana Sita* by C. N. Sreekantan Nair)

Asan, Kumaran. "The Fallen Flower." *Selected Poems*. Trivandrum: U of Kerala, 1975. (Intertext: English Romantics)

Bassnett, Susan. *Comparative Literature: A Critical Introduction*. Oxford: Blackwell, 1993.

Behdad, Ali and Dominic Thomas, eds. *A Companion to Comparative Literature*. London: Wiley-Blackwell. 2011. Print.

Clüver, Claus and Burton Watson. "On Intersemiotic Transposition." *Poetics Today* 10.1 (1989): 55-90. JSTOR. Web. <<http://www.jstor.org/stable/1772555>>.

- Derrida, Jacques and Eric Prenowitz. "Who or What Is Compared? The Concept of Comparative Literature and the Theoretical Problems of Translation." *Discourse* 30.1/2 (2008): 22-53. *JSTOR*. Web. <<http://www.jstor.org/stable/41389791>>.
- During, Simon. "Comparative Literature." *ELH* 71.2 (2004): 313-22. *JSTOR*. Web. <<http://www.jstor.org/stable/30030050>>.
- Hogan, Patrick Colm and Lalita Pandit, eds. *Literary India: Comparative Studies and Aesthetics, Colonialism and Culture*. Albany: State University of New York, 1995. Print
- Jantz, Harold S. "The Fathers of Comparative Literature." *Books Abroad* 10.4 (1936): 401-03. *JSTOR*. Web. <<http://www.jstor.org/stable/40077574>>.
- Lefevere, André. "Introduction: Comparative Literature and Translation." *Comparative Literature* 47.1 (1995): 1-10. *JSTOR*. Web. <<http://www.jstor.org/stable/1771359>>.
- Menon, O. Chandu. *Indulekha*. 1889. Trans. Anitha Devasia. New York: Oxford UP, 2005.
- Mohan, Chandra, ed. *Aspects of Comparative Literature: Current Approaches*. New Delhi: India Publishers, 1989.
- Nair, Vasudevan. M. T. *The Second Turn*. Trans. of *Randaamoozham*. 1984. Trans. P. K. Ravindranath. Madras: Macmillan, 1996.
- Paniker, K. Ayyappa. "Kurukshetra." Kottayam: D.C. Books, 1999. (Intertext: Modernism, T. S. Eliot, *The Waste Land*).
- Pillai, Krishna N. *Investment*. Trans. of *Mudakkumuthal*. Trans. Dr. S. Velayudhan. Thrissur: Kerala Sahitya Academy, 1981. (Intertext: Henrik Ibsen)
- Prawer, Siegbert Salomon. *Comparative Literary Studies: An Introduction*. London: Duckworth, 1973.
- Ramanunni, K. P. *What the Sufi Said*. 1993. Trans. N. Gopalakrishnan. New Delhi: Rupa, 2002.
- Routh, H. V. "The Future of Comparative Literature." *The Modern Language Review* 100 (2005): 5-18. *JSTOR*. Web. <<http://www.jstor.org/stable/3738148>>.
- Thomas, C. J. *Crime 27 of 1128*. Trans. C. J. Thomas, Allent Wendt and K. Ayyappa Paniker. *Journal of South Asian Literature* 15.2 (1980): 165-212. *JSTOR*. Web. <http://www.jstor.org/stable/40861190?seq=1#page_scan_tab_contents> (Intertext: Luigi Pirandello)
- Vincent, A., dir. *Bhargavi Nilayam*. Perf. Prem Nazir, Madhu, Vijayamala. Release: 22 November 1964. Film. (Intertext: "Neela Velicham" by Vaikom Muhammad Basheer)
- Wellek, René. "Comparative Literature Today." *Comparative Literature* 17.4 (1965): 325-37. *JSTOR*. Web. <<http://www.jstor.org/stable/1770091>>.
- Yu, Pauline. "Comparative Literature in Question." *Daedalus* 135.2 (2006): 38-53. *JSTOR*. Web. <<http://www.jstor.org/stable/20028031>>.

SEMESTER IV**PAPER XV: Choice 2****EL 243.2 – Elective Course: South Asian Literatures (6 hours/ week)****Objectives**

The objectives of this paper are to:

- introduce South Asian Literatures as a discipline
- introduce the history, culture and literature of South Asia
- explore the writings of the national literatures of India, Pakistan, Bangladesh, Sri Lanka and other South Asian countries

Learning Outcomes

At the end of the course, the students will be able to:

- demonstrate an analytical awareness of the history of European imperialism and the experiences of immigration and diaspora as reflected in South Asian literatures
- identify and differentiate between the distinguishing factors such as culture, class, religion, and other differences amongst South Asians
- explain critically themes of identity, memory, alienation, assimilation, solidarity and resistance

Course Description**Module I – Socio-political and Literary Background**

Socio-political background and growth of national literatures in South Asian countries – classical literatures – impact of national cultures – regional writings – colonial rule – decolonization – nationalistic fervour in literature – freedom struggle – partition literature – features and themes – trauma in partition literature – diasporic literatures – conflict literature

Required Reading

Bhabha, Homi. K. "The Other Question: Stereotype, Discrimination and the Discourse of Colonialism." *The Location of Culture*. London: Routledge, 1994. 94-120. Print.

Chatterjee, Partha. Chapters 1 and 2. *The Nation and its Fragments: Colonial and Postcolonial Histories*. New Jersey: Princeton UP, 1993. 3-34. Print.

Course Description**Module II – Poetry and Drama****Required Reading****Poetry**

Alamgir Hashmi	“Sun and Moon”
Kaiser Haq	“Ode on a Lungi”
Anne Ranasinghe	“July 1983”
Yasmine Gooneratne	“The Big Match”
Suman Pokhrel	“You are as You are”
Maki Khureishi	“Curfew Summer”

Drama

Ayed Akhtar	<i>Disgraced</i>

Module III – Prose and Fiction**Required Reading****Prose**

D.C.R.A. Goonetilleke	“Sri Lankan Poetry in English: Getting Beyond the Colonial Heritage”
Mohsin Hamid	“Why Migration is a Fundamental Human Right”
Aung San Suu Kyi	“Freedom from Fear”

Fiction

Romesh Gunashekhara	<i>Reef</i>
Taslima Nasreen	<i>The Homecoming</i>
Bapsi Sidhwa	<i>Cracking India</i>
Hanif Kureishi	<i>The Buddha of Suburbia</i>
Kunzang Choden	<i>The Circle of Karma</i>

Module IV – Critical Responses**Required Reading**

Lal, Malashri and Sukrita Paul Kumar, eds. “Part I: Partition: Questioning Borders.” *Interpreting Homes in South Asian Literature*. New Delhi: Pearson, 2007. 3-44. Print.

Pollock, Sheldon. Introduction. *Literary Cultures in History: Reconstructions from South Asia*. Ed. Sheldon Pollock. Berkeley: U of California P, 2003. 1-38. Print.

Reading List

- Appadurai, Arjun. *Modernity at Large: Cultural Dimensions of Globalization*. London: U of Minnesota P, 1996. Print.
- Bhabha, Homi. K. *The Location of Culture*. London: Routledge, 1994. Print.
- Chatterjee, Partha. *The Nation and its Fragments: Colonial and Postcolonial Histories*. New Jersey: Princeton UP, 1993. Print.
- Didur, Jill. *Unsettling Partition: Literature, Gender, Memory*. New Delhi: Pearson, 2007. Print.
- Goonetilleke, D.C.R.A. "Sri Lankan Poetry in English: Getting Beyond the Colonial Heritage." *ARIEL: A Review of International English Literature* 21.3 (1990): 39-53. *Journalhosting.ucalgary.ca*. Web. <<https://journalhosting.ucalgary.ca/index.php/ariel/article/view/33250/27297>>.
- Hall, Stuart and Paul du Gay, ed. *Questions of Cultural Identity*. London: Sage, 1996. Print.
- Hamid, Mohsin. "Why Migration is a Fundamental Human Right?" *Discontent and Its Civilizations*. London: Hamish Hamilton, 2014. Print.
- Lal, Malashri and Sukrita Paul Kumar, eds. *Interpreting Homes in South Asian Literature*. New Delhi: Pearson, 2007. Print.
- Pollock, Sheldon. Introduction. *Literary Cultures in History: Reconstructions from South Asia*. Ed. Sheldon Pollock. Los Angeles: U of California P, 2003: 1-37. Print.
- Suu Kyi, Aung Sang. "Freedom from Fear Speech." 1990. *Web*. <<http://www.thirdworldtraveler.com/Burma/FreedomFromFearSpeech.html>>

SEMESTER IV

PAPER XV: Choice 3

EL 243.3 - Elective Course: Screenwriting (6 hours/week)

Objectives

The objectives of this paper are to:

- examine screenplays as literary texts
- understand how a narrative is transformed into a screenplay
- become familiar with ways of "reading" screenplays as texts
- broaden and deepen the understanding of film adaptations and its emerging trends

Learning Outcomes

At the end of the course students will be able to:

- demonstrate an understanding of the elements involved in the construction of screenplays
- understand the elements involved in the creation of adapted screenplays and original screenplays
- review film history and the various theoretical and technical notions associated with screenwriting

Course Description

Module I – Screenplay as Literature – Theory

Screenplays, Screenwriting and Screenwriter – Adapted screenplay and Original screenplay – Spec scriptwriting, Commissioned scriptwriting and Script doctoring – Structure of Screenplays – Three-act structure in Screenwriting – Syd Field and his theory of paradigm – Non-linear narrative and Plot points – Inciting incident in plot – Pinch points – The Sequence Approach – Storyboard – Beat Sheet – Logline – Treatment – Prelap – Tweak – Freeze frame- Voiceover – Flash forward – Flash back – Background – Slugline – Intercut – Montage – Issues of authorship – Copyright law - Auteurism – Auteur – Structuralism – Reconstructed auteurism – Continuity script – Silent film script – Master scene screenplays – Screenwriting manuals – George Polti's 36 dramatic situations

Required Reading

Monaco, James. "The Language of Film: Signs and Syntax." *How to Read a Film: Movies, Media, Multimedia*. London: Oxford UP, 2009. 170-251. Print.

Price, Steven. Introduction. *A History of Screenplay*. London: Palgrave Macmillan, 2013. 1-10 (up to 'An Industrial History of the Screenplay'). Print.

Module II - Adapted Screenplays

William Peter Blatty	<i>The Exorcist</i>
Mario Puzo & Francis Ford Coppola	<i>The Godfather</i>
Ted Tally	<i>The Silence of the Lambs</i>
Joel Coen and Ethan Coen	<i>No Country for Old Men</i>

Module III - Original Screenplays

Quentin Tarantino	<i>Pulp Fiction</i>
Shyam Benegal	<i>Netaji Subhash Chandra Bose: The Forgotten Hero</i>

Andrew Nicol	<i>The Truman Show</i>
Michel Hazanavicius	<i>The Artist</i>
Bob Peterson, Pete Docter & Tom Mccarthy	<i>Up</i>

Module IV Critical Responses

Jenkins, Greg. "Lolita". *Stanly Kubrick and the Art of Adaptation*. London: McFarland, 1952. 31-63. Print.

Tropp, Martin. "Recreating the Monster: Frankenstein and Film." *Mary Shelley's Monster: The Story of Frankenstein*. London: Houghton Mifflin. 1976. Print.

Recommended Reading

Field, Syd. *Screenplay: The Foundations of Screenwriting*. 1979. New York: Bantam Dell, 2005. Print.

Lupus, Barbara Tapa, ed. *Nineteenth-Century Women at the Movies: Adapting Classic Women's Fiction to Film*. Ohio: Bowling Green University Popular P, 1981. Print.

Maras, Stephen. *Screenwriting: History, Theory and Practice*. London: Wallflower, 2009. Print.

Wollen, Peter. "The Auteur Theory". *Artistes.ucsc.edu*.

Web.<<http://artsites.ucsc.edu/faculty/Gustafson/FILM%20162.W10/readings/wollen.auteur.pdf>>

SEMESTER IV

PAPER XV: Choice 4

EL 243.4 – Elective Course: Introduction to Theatre Studies (6 hours/week)

OBJECTIVES

The objectives of this paper are to:

- introduce students to the concepts and practices of theatre
- familiarise various aspects of theatre studies including the basics, history, genres, and aesthetic theories
- understand the social, cultural, and political functions of theatre
- enhance their aptitude and skills in the field of theatre and performance studies
- ensure their theoretical and practical expertise to be good practitioners of theatre arts

LEARNING OUTCOMES

At the end of the course the students will be able to:

- appreciate theatre as an art and a 'socio-cultural institution'
- internalise the functions and aesthetic values of each theatre and performance
- differentiate each genre, movement, and its historical significance
- participate creatively in theatrical activities as part of one's social commitment and as means of self-realisation
- probe into the potential of theatre, performance and related fields
- be able to involve in critical discourses of an interdisciplinary nature

COURSE DESCRIPTION

Module I

Theatre – nature and elements – theatre as a complete art – act – playwright – director – actor – character – audience – dialogue – monologue – soliloquy – aside – text for reading and staging – performance – space, time and action – subplot – subtext – unities – production – chorus – scenography – dramaturgy – improvisation – climax – denouement – catharsis – alienation – carnival – mise-en-scene – play within a play

Module II

Socio-historical context – Classical drama – Greek and Roman drama – Medieval liturgical plays – Renaissance Italy and England – Jacobean drama – Seventeenth century French and Spanish influence on Restoration drama – Melodrama – Realism and Naturalism – Symbolism – Existentialism – American drama – Indian theatre – Classical Theatre – Folk theatre – Regional theatres – Indian English Theatres – recent trends – Major dramatists – Girish Karnad, Vijay Tendulkar, Badal Sarkar, Mahesh Dattani, Manjula Padmanabhan, Poile Sengupta, Dina Mehta

Module III

Comedy – tragedy – commedia dell'arte – Farce – Well-made play – Problem play – Poetic drama – Radio play – Theatre of Cruelty – Theatre of the Absurd – Epic theatre – Meta theatre – Off-Broadway and Off-Off-Broadway – Postcolonial theatre – Theatre of the Roots – Poor and Environmental theatre – Community theatre – Street theatre – Holy theatre – Pantomime – Solo performance – Japanese: Noh and Kabuki theatre – Chinese: Beijing Opera – Indonesian: Wayang Kulit

Module IV

Natyasastra: Rasa theory – nava rasas – rituals and myths from the region of India – Poetics: Tragedy – Performance theory: ritual, culture, ideology and politics – folk theatre – Kathakali – Koodiyattam – Jatra – Tamasha – Swang – Nautangi – Bhand Pather – The Ustad and Jamoora format – Bhavai – Dashavatar – Khayal – Ramlila – Raslila – Therukoothu – Yakshagana – Chhau – Turra Kalgi – Veedhi Natakam – Burra Katha – Kuravanji – Ankiya Nat – Palas and Daskathias – Puppet drama – role of theatre in the Indian freedom struggle – Parsi theatre

Recommended Reading

- Aristotle. *Poetics*. Trans. S. H. Butcher. London: Macmillan, 1895. Print.
- Awasthi, Suresh. *Performance Tradition in India*. New Delhi: National Book Trust, 2001. Print.
- Bentley, Eric, ed. *The Theory of the Modern Stage: An Introduction to Modern Theatre and Drama*. Harmondsworth: Penguin, 1968. Print.
- Brockett, Oscar Gross and Robert J. Ball. *The Essential Theatre*. 1941. 8th ed. Belmont: Thomson-Wadsworth, 2004. Print.
- Crow, Brian, and Chris Banfield. *An Introduction to Post-Colonial Theatre*. Cambridge: Cambridge UP, 1996. Print.
- Esslin, Martin. *Theatre of the Absurd*. 1961. 3rd ed. New York: Vintage, 2009. e-book.
- Fischer-Lichte, Erica. *History of European Drama and Theatre*. Trans. Jo Riley. London: Routledge, 2002. e-book.
- Iyengar, K. R. Srinivasa. *Indian Writing in English*. 1962. Rev. ed. 18th rpt. New Delhi: Sterling, 2009. Print.
- Kennedy, Dennis, ed. *Oxford Companion to Theatre and Performance*. Oxford: Oxford UP, 2010. Print.
- Leech, Robert. *Theatre Studies: The Basics*. London: Routledge, 2008. Print.
- Millett, Fred B., and Gerald Eades Bentley. *The Art of Drama*. 1935. New York: Appleton Century Crofts, 1963. Print.
- Pickering, Kenneth. *Key Concepts in Drama and Performance*. London: Palgrave, 2010. Print.
- Schechner, Richard. *Performance Theory*. Rev. ed. London: Routledge, 2005. Print.
- . *Performance Studies: An Introduction*. Media Ed. Sara Brady. 3rd ed. London: Routledge, 2013. Print.
- Vatsyayan, Kapila. *Bharata: The Natyasastra*. 1996. Reprint. New Delhi: Sahitya Akademi, 2007. Print.

Reading List

Behera, Guru Charan. *Appropriating Folk Culture: A Study of the Post-Independence Indian Drama*. Delhi: Authorspress, 2008. Print.

Culpeper, Jonathan, et al., eds. *Exploring the Language of Drama: From Text to Context*. London: Routledge, 1998. Print.

Lal, Ananda. ed. *The Oxford Companion to Indian Theatre*. New Delhi: Oxford UP, 2004. Print.

Rai, Ramanand. *Theory of Drama: A Comparative Study of Aristotle and Bharata*. New Delhi: Classical, 1992. Print.

Richmond, Farley P., et al., eds. *Indian Theatre: Traditions of Performance*. 1990. Delhi: Motilal Banarsidass, 2007. Print.

Schechner, Richard. *Over Under and Around: Essays in Performance and Culture*. Calcutta: Seagull, 2004. Print.

[Note: This syllabus is expected to make students proficient in all the aspects of theatre. Students are advised to watch all types of plays in their original space/stage to complement this study.]

SEMESTER IV

PAPER XV: Choice 5

EL 243.5: Elective Course - Travel Writing (6 hours/week)

Objectives

The objectives of this paper are to help:

- understand that travel writing has a chequered history of evolution
- analyse travel texts through critical reading
- acquire familiarity with samples of travel writing from across the world
- place Indian travel writing in a global context
- examine the blend of fact and fiction in travel narratives

Learning Outcomes

At the end of this course student will be able to:

- display an awareness of the evolution of travel writing, its distinctive features, and to distinguish between its various forms

- identify the cross-links between travel writing and other genres such as memoirs, history, ethnography, anthropology and so on
- develop a conscious understanding of the various nuances of the author's subjectivity and perceptions that colour the narrative on place
- undertake a critical reading of travel texts to unearth probable subtexts
- display an awareness regarding the many cultural connotations and prejudices that are embedded in many travel narratives

Course Description

Module I - Departures

Tools: maps and atlas: Mappa Mundi – Mercator's Projection – world atlas; Guides: Karl Baedeker – Lonely Planet – Google maps – travelogues, travel stories, travel guides – GPS

Evolution: Ptolemy's *Geographia* – Pausanias' *Description of Greece* – Marco Polo – Ibn Batuta – Fa Hien – Huan Sang – Gerald of Wales – Petrarch's *Ascent of Mount Ventoux* – Elizabethan voyages of discovery and English explorers – Richard Hakluyt – Purchas' *Pilgrimage* – Captain James Cook – Charles Darwin's voyage on HMS Beagle – Colonial travelers: David Livingston – Richard Burton – Pandita Ramabai – Sleeman – Fisher – Frances Parker Bowles – Thoma Paremmakkal – S. K. Pottekkatt – Contemporary travelers: Jan Morris – Bill Bryson – Michael Palin

Types of Travels: explorations – colonialism – the grand tour – pilgrimages – piracy – war and immigration – exile – tourism

Required Reading

Thompson, Carl. Introduction and Chapters, 2 & 3. *Travel Writing*. London: Routledge, 2011. 1-61. Print.

Module II - The World and Beyond

Multiple purposes in journeys - a plethora of experiences beyond simple sight-seeing - record of personal realization and transformations - attempts to know new people and places - the prejudices of the author - travel as a means of self-realisation - Road movies.

Required Reading

Che Guevara

The Motorcycle Diaries

Cheryl Strayed

Wild

Paul Theroux

The Great Railway Bazaar: By Train through Asia

Pico Iyer

Falling off the Map

Robert Pirsig

*Zen and the Art of Motorcycle Maintenance***Module III – Home and Away**

Travel narratives – instrumental in defining or branding national cultures – the Briton's view of India as heavily colonial and condescending – branded the nation as “the land of snake charmers and sanyasis” – postcolonial travel narratives from India – complete make-over of the nation's profile – unique cultural variety and richness – attempts to redefine itself as one of the emerging economies – Indians abroad – attempts to narrate places without colonial burden.

Required Reading

Amitav Ghosh

Dancing in Cambodia

Pankaj Mishra

Butter Chicken in Ludhiana: Travels in Small Town India

William Dalrymple

City of Djinns: A Year in Delhi

Elizabeth Gilbert

Eat, Pray, Love

Samanth Subramanian

*Following Fish***Module V – Critical Responses****Required Reading**

Bartkowski, Frances. “Travel As/Is.” *Travelers, Immigrants, Inmates: Essays in Estrangement*. U of Minnesota P, 1995. xv-xviii. Print.

Campbell, Mary Baine. “Travel Writing and its Theory.” *The Cambridge Companion to Travel Writing*. Ed. Peter Hulme and Tim Youngs. Cambridge: Cambridge UP, 2002. 261-78. Print.

Hulme, Peter and Tim Youngs. “Introduction.” *Cambridge Companion to Travel Writing*. Ed. Peter Hulme and Tim Youngs. Cambridge: Cambridge UP, 2002. Print. 1-16.

Iyer, Pico. “Why we Travel.” *Salon.com*. 19 March 2000. Web. <<http://www.salon.com/2000/03/18/why/>> .

Reading List

Hulme, Peter and Tim Youngs, eds. *Cambridge Companion to Travel Writing*. Cambridge: Cambridge UP, 2002. Print.

Miller, Sam. *A Strange Kind of Paradise: India through Foreign Eyes*. London: Vintage, 2014. Print.

Thompson, Carl. *Travel Writing*. London: Routledge, 2011. Print.

SEMESTER IV**PAPER XVI: Choice 1****EL 244.1- Elective Course: Translation Studies (6 Hours/week)****Objectives**

The objectives of this paper are to:

- provide the students with a systematic understanding of the process of translation; and, of different translation types
- familiarize the students with the histories of translation in the East and the West
- provide the students a critical understanding of the concerns, concepts and issues in translation theory
- help the students evaluate translations
- enable the students to develop practical translation skills

Learning Outcomes

At the end of the course, the students will be able to:

- demonstrate an understanding of the nature of translation studies as an independent academic discipline
- reflect critically on the process of translation, and on various translation types
- demonstrate a systematic and critical understanding of the concerns, concepts and issues in translation theory, both modern and traditional
- make critical judgments on the quality of translation
- apply translation techniques and strategies from theoretical essays, and analyses of existing translations

Course Description**Module I – History of Translation**

History of translation in India: translations from Sanskrit – translations in regional languages – translations from and through English translations during the colonial period – History of translation in the West: translations from the classical languages of Latin and Greek – the Bible translation

Required Reading

Dash, Debendra K. and Dipti R. Pattanaik. "Translation and Social Praxis in Ancient and Medieval India." *Translation – Reflections, Refractions, Transformations*. Ed. Paul St Pierre and Prafulla C. Kar. Philadelphia: Benjamins Translation Library, 2007. 153-73. Print.

Lefevere, Andre. "Translation: Its Genealogy in the West." *Translation, History and Culture*. Ed. Susan Bassnett and Andre Lefevere. London: Pinter, 1990. 14-28. Print.

Ramakrishna, Shantha. "Translation and the Quest for Identity: Democratization of Knowledge in 19th Century India." *Translation and Culture: Indian Perspectives*. Ed. G. J. V. Prasad. New Delhi: Pencraft, 2010. 19-35. Print.

Module II – Translation: Theoretical Issues

Translatability – the concept of equivalence – translation of culture – translation theories – Indian perspectives – translation theories – Western tradition

Required Reading

Devy, G. N. "Translation Theory: An Indian Perspective." *In Another Tongue: Essays on Indian English Literature*. Ed. G. N. Devy. Chennai: Macmillan, 1995. 162-67. Print.

Gopinathan, G. "Translation, Transcreation and Culture: The Evolving Theories of Translation in Hindi and other Modern Indian Languages." London: Centre for Asian and African Literatures, SOAS, UCL, 2005. 1-23.

Nida, Eugene A. "Principles of Translation as Exemplified by Bible Translating." In *Language Structure and Translation: Essays by Eugene A. Nida*. Ed. Anwar S. Dil. Stanford, California: Stanford UP, 1975. 24-46. Print.

Simon, Sherry. "Enter the Translatress" & "Aphra Behn: 'The Translatress in Her Own Person Speaks.'" *Gender in Translation: Cultural Identity and the Politics of Transmission*. London: Routledge, 1996. 45-58. Print.

Module III – Translation Types

Retellings – adaptations - translation of knowledge texts – feminist translation - interpretation

Required Reading

Kapoor, Kapil. "Philosophy of Translation: Subordination or Subordinating : Translating Technical Texts from Sanskrit - Now and Then." *Translation and Multilingualism: Post-colonial Contexts*. Ed. Shantha Ramakrishna. New Delhi: Pencraft International, 1997. 146-66. Print.

Pochhacks, Franz. "Issues in Interpreting Studies." *The Routledge Companion to Translation Studies*. Ed. Jeremy Munday. New York: Routledge, 2009. 128-40. Print.

Sen, Nabaneeta Dev. "When Women Retell The Ramayana." *Manushi* 108 (September-October 1998): 18-27. Print. <<http://www.manushi.in/>>.

Thapar, Romila. "Adaptations: Another Popular Tradition and its Role in Another Court." *Sakuntala: Texts, Readings, Histories*. Ed. Romila Thapar. New Delhi: Kali for Women, 1999. 189-96. Print.

Module IV – Processes of Translation

Practice of translation – strategies and techniques – translation of poetry – translating prose – translation of drama

Required Reading

Aurobindo, Sri. "On Translating Kalidasa." *The Harmony of Virtue: Early Cultural Writings*. vol. 3. Pondicherry: Sri Aurobindo Ashram, 1972. 236-49. Print.

Paniker, K. Ayyappa. "On Translating T. S. Eliot's Poetry into Malayalam." *International Journal of Translation* 3.1 & 2 (Jan - Dec 1991): 73-81. Print.

Suhrud, Tridip. "Reading Gandhi in Two Tongues." *Reading Gandhi in Two Tongues and Other Essays*. Shimla: Indian Institute of Advanced Study, 2012. 1-19. Print.

Reading List

Bassnett, Susan. *Translation Studies*. 1980. 4th edn. London: Routledge, 2014. Print. *New Accents Series*.

—. *Translation*. 2013. London: Routledge, 2014. Print. *New Critical Idiom Series*.

Boratti, Vijayakumar M. "Rethinking Orientalism: Administrators, Missionaries and the Lingayaths." *Translation in Asia: Theories, Practices, Histories*. Ed. Ronith Ricci and Jan Van Der Putten. Manchester: St. Jerome, 2011. 88-103. Print.

Das, Sunil. "Drama in Translation: Dramatic Collage." *Making of Indian Literature: A Consolidated Report of Workshops on Literary Translation, 1986-1988*. Ed. K. Ayyappa Paniker. New Delhi: Sahitya Akademi, 1991. 229-33. Print.

Dryden, John. "On Translation." *Theories of Translation: An Anthology of Essays from Dryden to Derrida*. Ed. Rainer Schulte and John Biguenet. Chicago: U of Chicago P, 1992. 17-31. Print.

Grossman, Edith. "Translating Poetry." *Why Translation Matters*. Ed. Edith Grossman. New Haven: Yale UP, 2010. 89-120. Print.

Nair, Sreedevi K. "One Story, Many Texts: Conceptualising Seed Text in Epics Retold." *Reflections and Variations on The Mahabharata*. Ed. T. R. S. Sharma. New Delhi: Sahitya Akademi. 2009. 301-15. Print.

Pound, Ezra. "Guido's Relations." *Theories of Translation: An Anthology of Essays from Dryden to Derrida*. Ed. Rainer Schulte and John Biguenet. Chicago: U of Chicago P, 1992. 83-92. Print.

Reynolds, Mathew. *Translation: A Very Short Introduction*. London: Oxford UP, 2016. Print. *Very Short Introduction Series*.

Trivedi, Harish. "Translating Culture vs Cultural Translation." *Translation – Reflections, Refractions, Transformations*. Ed. Paul St-Pierre and Prafulla C. Kar. Philadelphia: Benjamins Translation Library, 2007. 251-60. Print.

V. P. C., Ubaid. "Translating the Quran : An Analysis of Discourse on Hijab in Selected English Translations." *Translation Today* 9.1 (2015): 157-77. Print.

SEMESTER IV

PAPER XVI: Choice 2

EL 244.2 – Elective Course: Regional Literatures in English Translation [6 hours/week]

Objectives:

The objectives of this paper are to:

- introduce the students to the consciousness of the great linguistic and literary diversity of India
- enable the students to cultivate a political sensitivity not to dismiss these with pejorative labels such as "minor," or "primitive"
- give students a historical awareness of regional literary movements

Learning Outcomes:

At the end of this course, students will be able to:

- demonstrate knowledge of at least a few languages and literatures with a smaller number of native speakers and readers
- demonstrate basic knowledge about the 8th schedule of the Indian Constitution
- show an understanding of the major landmarks and trends in at least a few of India's major literatures from the 19th century to the present day
- analyse critically some of the thematic concerns running through most of the above literatures such as the critical exploration of the idea of nationalism, protest against inequities based on caste, creed, gender and social status, concern for the environment and reworking/ retelling of long established myths and dominant narratives

Course Description

Module I: Socio-political and Literary Background

Major language families in India, their history in brief and their important members – Indo-European – Dravidian – Tibeto-Burman - Khmer-Nancowry – an idea of the oral traditions – myths – fables – ballads - epics – religious myths and legends – bhakti and Sufi devotional traditions – post independence concerns – emergence of marginalized voices – revolutionary voices – ancient Indian poetry, prose – medieval Indian poetry, prose – pre-Independence poetry, prose – post-independence poetry, prose – thematic trends in poetry, prose and drama.

Recommended Reading

Natarajan, Nalini. "Introduction: Regional Literature of India: Paradigms and Contexts." *Handbook of Twentieth Century Literature of India*. Ed. Nalini Natarajan. London: Greenwood, 1996. 1 - 20. Print.

Module II – Poetry

Required Reading

Amrita Pritam	"Street Dog" (Punjabi)
Thanjam Ibopishak Singh	"I Want to be Killed by an Indian Bullet" (Manipuri, Trans. Robin Ngangom)
Namdeo Dhasal	"Tree of Violence" (Marathi, Trans. Dilip Chitre)
Khadar Mohiuddin	"A Certain Fiction Bit Me" (Telugu, Trans. Velcheru Narayan Rao)
S. Joseph	"Identity Card" (Malayalam, Trans. K. Satchidanandan)
Devara Dasimayya:	"Suppose You Cut a Tall Bamboo" (Kannada, Trans. A. K. Ramanujan)
Gulam Mohammed Sheikh	"Jaisalmer 1" (Gujarati, Trans. author and Saleem Peeradina)
Sitanshu Yashaschandra	"Magan's Insolence" (Gujarati, Trans. Saleem Peeradina)
Navakanta Barua	"Measurements" (Assamese, Trans. D. N. Bezbaruah)
Kalidasa	<i>The Cloud Messenger (Meghadutam)</i> [First 10 Stanzas]

Module III - Prose and fiction

Required Reading

A. K. Ramanujan	"Introduction" to <i>Folktales from India</i>
Bana	<i>Karukku</i>

Rabindranath Tagore	<i>The Home and the World</i> (Bengali novel)
Indira Goswami	<i>The Man from Chinnamasta</i> (Assamese novel)
Saadat Hasan Manto	"Toba Tek Singh" (Urdu)
Ambai	"The Calf that Frolicked in the Hall"
Fakir Mohan Senapati	"Rebati" (Odia short story)
M. M. Vinodini	"The Parable of the Lost Daughter"

Module IV – Drama

Required Reading

Girish Karnad	<i>Yayati</i> (Kannada, Trans. the author)
Vijay Tendulkar	<i>Sakharam Binder</i> (Marathi)

Reading List

Ambai (C. S. Lakshmi). "The Calf that Frolicked in the Hall." Trans. Lakshmi Holmström. *Fish in a Dwindling Lake*. New Delhi: Penguin, 2012. 17-42.

Bama. *Karukku*. 2011. Trans. Lakshmi Holmström. New Delhi: Oxford UP, 2015. Print.

Chaudhari, Amit, ed. *The Picador Book of Modern Indian Literature*. London: Picador, 2001: i-xxxiv. Print.

George, K. M., ed. *Comparative Indian Literatures*. 2 vols. Thrissur: Kerala Sahitya Akademi, 1984. Print.

Gokak, V. K., ed. *Literatures in Modern Indian Languages*. New Delhi: Publications Division, 1957. Print.

—. *Masterpieces of Indian Literature*. 3 vols. New Delhi: National Book Trust, 1997.

Indian Literature. New Delhi: Kendra Sahitya Akademi (relevant issues). 2008.

Kalidasa. *The Cloud Messenger*. *Sacred-texts.com*.

Web. <<http://www.sacred-texts.com/hin/sha/sha17.htm>>.

Manto, Saadat Hasan. "Toba Tek Singh." 1953. Trans. Tahira Naqvi. *Kingdom's End: Selected Stories*. New Delhi: Penguin, 2007. 9-17. Print.

Ramakrishnan, E. V., et al., eds. *Interdisciplinary Alter-Native in Comparative Literature*. New Delhi: Sage, 2013.

Venuti, Lawrence, ed. *The Translation Studies Reader*. London: Routledge, 2004. Print.

Vinodini, M. M. "The Parable of the Lost Daughter." Trans. Uma Bhugubanda. *The Exercise of Freedom*. Ed. K Satyanarayana and Susie Tharu. New Delhi: Navayana, 2013.

SEMESTER IV**PAPER XVI: Choice 3****EL 244.3 – Elective Course: Media Studies****[6 hours/week]****Objectives:**

The objectives of this paper are to:

- introduce the students to the world of mass media and the different fields of journalism.
- develop in students an understanding of the mass communication process
- help students develop life skills which enable them to analyse various forms of modern communication
- develop a critical understanding of the role of media in society
- provide basic skills in reporting and editing in the fields of print, electronic and online communication

Learning Outcomes

At the end of the course, students will be able to:

- demonstrate their understanding of basic components of the world of journalism and mass media
- demonstrate their skills at reporting and editing in print and electronic media
- do a critical appraisal of the role of media in society.

Course Description**Module I – Mass Communication**

What is communication? – definitions – elements and process of communication – types of communication – intrapersonal, interpersonal, group and mass communication – types of mass media: print, radio, film, TV, internet – a comparison of the scope and limitations of print and broadcast media, online media and their potential

Module II – Print Media – Reporting and Editing

What is news? – news values – the basics of reporting – news gathering techniques – news structure – types of news – hard news & soft news – editorial - news sources - news conference – meet the press – news agencies - the art of interviewing – feature writing – editing for clarity and accuracy – objectivity – fairness – style book – headline writing – banner, skyline, kicker, deck, strap line, feature heads

Module III – Writing for Electronic Media

Writing for radio – radio formats – internet radio – script - radio talk – interview – structure of news bulletins – characteristics of the television medium – writing for television – camera movements – shot composition – visual language – soap opera – reality shows – game shows – shooting script – story board – live broadcasts

Module IV – New Media

The Internet as mass medium – journalism and new media – internet editions of newspapers and TV channels – open source journalism – participatory journalism – its potential and limitations – hypertextuality – interactivity – convergence – blogs – news portals – social networking sites

Recommended Reading

Baskette, Floyd K., et al. *Art of Editing*. 5th edn. New York: McMillan. 1992. Print.

Chantler, Paul. *Basics: Radio Journalism*. London: Focal P, 2013.

Delancy and Landow. *Hypermedia and Literary Studies*. Cambridge: Massachussets, MIT, 1995. Print.

Dewdney, Andrew, and Peter Ride. *The New Media Handbook*. London: Routledge, 2009. Print.

Donald, Ralph, and Thomas Spann. *Fundamentals of Television Production*. Iowa: Iowa UP, 2000. Print.

Fiske, John. *Introduction to Mass Communication Studies*. London: Routledge. 1996. Print.

Kawamoto, Kevin. "Digital Journalism: Emerging Media and the Changing Horizons of Journalism." Introduction. *Digital Journalism: Emerging Media and the Changing Horizons of Journalism*. Ed. Kevin Kawamoto. Lanham, Maryland: Rowman and Littlefield, 2003. Print.

McLeish, Robert. *Radio Production*. London: Focal, 2001. Print.

McLuhan, Marshall. *Understanding Media: The Extensions of Man*. London: Sphere Books, 1973. Print.

Pavarala, Vinod and Kanchan K. Malik. *Other Voices: The Struggle for Community Radio in India*. New Delhi: Sage, 2007. Print.

Ray, Tapas. *Online Journalism: A Basic Text*. London, Cambridge UP, 2006. Print.

Saxena, Ambrish. *Fundamentals of Editing and Reporting*. New Delhi: Kanishka. 2007. Print.

- Saxena, Sunil. *Headline Writing*. New Delhi: Sage, 2006. Print.
- Stepp, Carl Sessions. *Writing as Craft and Magic*. New Delhi: Oxford UP, 2007. Print.
- Ward, Mike. *Journalism Online*. Oxford: Focal, 2002. Print.
- Wetton, Steve. *Writing TV Scripts: Successful Writing in 10 Weeks*. London: Aber, 2010. Print.
- Wulfemeyer, K. Tim. *Radio-TV News Writing*. 1995. 2nd ed. Iowa: Iowa State P, 2003. Print.

SEMESTER IV

PAPER XVI: Choice 4

EL 244.4 – Elective Course: Dalit Writing [6 hours/week]

Objectives:

The objectives of this paper are to:

- centre Dalit literature as a significant locus of imaginative and polemical writing
- provide curricular recognition to the experience, art and knowledge of a marginalized community
- expose students to the Dalit renewal of the discussion on democracy, humanism and literature.
- familiarize them with the building up of a counter-canon in the Indian literary context.

Learning Outcomes

At the end of the course, students will be able to:

- come into contact with key modern Dalit writers and thinkers and their varied concepts
- enhance their understanding of the issues at stake in the contemporary Dalit movement
- evolve an in-depth grasp of the field at the levels of experience as well as concept
- extend their awareness of the social and aesthetic questions being raised in the writing.

Course Description

Module I – Key Concepts

Definitions of Dalit – varna and caste hierarchy – opposition to Brahminical hegemony and ideology – bhakti movement – B. R. Ambedkar's contributions to Dalit movement –

Early leaders of Dalit movements – Dalit Panther movement – Adi Dharm movement – Dalit Buddhist movement – role of Brahmo Samaj and Arya Samaj – Dalit movement in Kerala and contributions of Sri Ayyankali – language of the Dalit – Dalit women writers – contemporary Dalit movements and issues - annihilation of caste

Recommended Reading

Limbale, Sharankumar. "Towards a Dalit Aesthetics." *Towards an Aesthetic of Dalit Literature: History, Controversies and Considerations*. Trans. Alok Mukherjee. New Delhi: Orient Longman, 2004. 103-21. Print.

Satyanarayana K., and Susie Tharu. Introduction. *From Those Stubs, Steel Nibs are Sprouting: New Dalit Writing from South India: Dossier II: Kannada and Telugu*. Ed. K. Satyanarayana and Susie Tharu. Noida: Harper Collins, 2013. Print.

Module II – Poetry & Drama

Required Reading

Satish Chandar	"Panchama Vedam"
N. D. Rajkumar	"Our Gods do not Hide"
S. Joseph	"Fish Monger"
Poikayil Appachan	"Song"
M. R. Renukumar	"The Poison Fruit"
Prathiba Jeyachandran	"Dream Teller"
N. K. Hanumanthiah	"Untouchable, Yes I am!"
Madduri Nagesh Babu	"A This-Worldly Prayer"/ "What People are You?"
Namdeo Dhasal	"Cruelty"
G Sasi Madhuraveli	"With Love"
Meena Kandasamy	"Mulligatawny Dreams"

Drama

A. Santhakumar	<i>Dream Hunt</i>
K. Gunashekaran	<i>Touch</i>

Module III – Prose & Fiction

Required Reading

Prose

B. R. Ambedkar	"Annihilation of Caste"
Gopal Guru	"Dalit Women Talk Differently"
T. M. Yesudasan	"Towards a Prologue to Dalit Studies"

Fiction

Gogu Shyamala	<i>Father May Be an Elephant and Mother only a Small Basket, But.....</i>
P. Sivakami	<i>The Grip of Change</i>
Paul Chirakkarode	"Nostalgia"
C. Ayyappan	"Madness"
Bandhumadhav	"Poisoned Bread"

Module IV - Autobiography**Required Reading**

Sharan Kumar Limbale	<i>The Outcaste</i>
Om Prakash Valmiki	<i>Joothan</i>
Balbir Madhopuri	<i>Changia Rukh</i>

Reading List

Ambedkar, B. R. "Annihilation of Caste". *The Essential Writings of B. R. Ambedkar*. Ed. Valerian Rodrigues. New Delhi: Oxford UP, 2002. 263-305. Print.

Appachan, Poikayil. "Song." M. Dasan, et al., eds. *The Oxford India Anthology of Malayalam Dalit Literature*. New Delhi: Oxford UP, 2012. 5-6. Print.

Ayyappan, C. "Madness." Trans. Abhirami Sriram. *The Oxford India Anthology of Malayalam Dalit Literature*. Ed. M. Dasan, et al. New Delhi: Oxford UP, 2012. Print.

Bandhumadhav. "Poisoned Bread." *Poisoned Bread: Translations from Modern Marathi Dalit Literature*. Ed. Arjun Dangle. Hyderabad: Orient BlackSwan, 2009. Print.

Basu, Tapan et al., eds. *Listen to the Flames: Texts and Readings from the Margins*. New Delhi: Oxford UP, 2016. Print.

Chandar, Satish. "Panchama Vedam." *From Those Stubs Steel Nibs are Sprouting: New Dalit Writing from South India: Kannada and Telugu*. Ed. K. Satyanarayana and Susie Tharu. Noida: Harper Collins, 2013. 565-69. Print.

Chirakkarode, Paul. "Nostalgia." *Counter Cultural Discourse and Dalit Literature in India*. Ed. M. Dasan and Rajesh Karankal. New Delhi: ABD Publishers, 2014. Print.

D'souza, Eunice de, ed. *Both Sides of the Sky: Post-Independence English Poetry*. New Delhi: National Book Trust, 2008. Print.

Dangle, Arjun, ed. *Poisoned Bread: Translations from Modern Marathi Dalit Literature*. Hyderabad: Orient BlackSwan, 2009. Print.

Dasan, M. and Rajesh Karankal, eds. *Counter Cultural Discourse and Dalit Literature in India*. New Delhi: ABD Publishers, 2014. Print.

- Dhasal, Namdeo. "Cruelty." *A Current of Blood*. Trans. Dilip Chitre. New Delhi: Navayana, 2011. Print.
- Gunasekaran, K. "Touch." *The Oxford Anthology of Tamil Dalit Writing*. Ed. Ravikumar and Azhagarasan. Oxford UP, 2012. 163-68. Print.
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- Hanumanthiah, N. K. "Untouchable, Yes I am!" *From Those Stubs Steel Nibs are Sprouting: New Dalit Writing from South India: Kannada and Telugu*. Ed. K. Satyanarayana and Susie Tharu. Noida: Harper Collins, 2013. 372-74. Print.
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- Jeyachandran, Prathiba. "Dream Teller". Ed. Ravikumar and Azhagarasan. *The Oxford Anthology of Tamil Dalit Writing*. New Delhi: Oxford UP, 2012. 5-6. Print.
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- Kunhambu, Potheri. *Saraswathi Vijayam*. 1892. Trans. Dilip Menon. New Delhi: The Book Review Literary Trust, 2002. Print.
- Limbale, Sharankumar. *The Outcaste: Akarmashi*. 1991. Trans. Santosh Bhoomkar. New Delhi: Oxford UP, 2003. Print.
- Limbale, Sharankumar. "Towards a Dalit Aesthetics." *Towards an Aesthetic of Dalit Literature: History, Controversies and Considerations*. Trans. Alok Mukherjee. New Delhi: Orient Longman, 2004. 103-21. Print.
- Madhopuri, Balbir. *Changia Rukh*. Trans. Tripti Jain. New Delhi: Oxford UP, 2010. Print.
- Madhuraveli, G. Sasi. "With Love." *The Oxford India Anthology of Dalit Literature*. Ed. M. Dasan, et al. New Delhi: Oxford UP, 2012. 22. Print.
- Nagesh Babu, Madduri. "A This-Worldly Prayer": What People are You?" *From Those Stubs Steel Nibs are Sprouting: New Dalit Writing from South India: Dossier II: Kannada and Telugu*. Ed. K. Satyanarayana and Susie Tharu. Noida: Harper Collins, 2013. Print.
- Omvedt, Gail. *Dalit Visions: The Anti-Caste Movement and the Construction of an Indian Identity*. 1995. Rev. ed. New Delhi: Orient BlackSwan, 2006. Print.
- . *Dalits and the Democratic Revolution: Dr Ambedkar and the Dalit Movement in Colonial India*. New Delhi: Sage, 2014. Print.

Rajkumar, N. D. *Give us this Day a Feast of Flesh*. Trans. Anushiya Ramaswamy. New Delhi: Navayana, 2011. Print.

Rawat, Ramnarayan S. and K. Satyanarayana, eds. *Dalit Studies*. Durham: Duke UP, 2016. Print.

Rege, Sharmila. *Writing Caste/ Writing Gender: Reading Dalit Women's Testimonies*. New Delhi: Zubaan, 2006. Print.

Renukumar, M. R. "The Poison Fruit." *The Oxford Anthology of Malayalam Dalit Writing*. Ed. M. Dasan, et al. New Delhi: Oxford UP, 2012. Print.

Rodrigues, Valerian, ed. *The Essential Writings of B. R. Ambedkar*. New Delhi: Oxford UP, 2002. Print.

Santhakumar, A. "Dream Hunt." *The Oxford Anthology of Malayalam Dalit Writing*. Ed. M. Dasan, et al. New Delhi: Oxford UP, 2012. 168-79. Print.

Satyanarayana, K., and Susie Tharu, eds. *No Alphabet in Sight: New Dalit Writing from South India*. New Delhi: Penguin, 2011. Print.

—, eds. *From Those Stubs, Steel Nibs are Sprouting: New Dalit Writing from South India: Dossier II: Kannada and Telugu*. Noida: Harper Collins, 2013. Print.

Shyamala, Gogu. *Father May Be an Elephant and Mother only a Small Basket, But.....* New Delhi: Navayana, 2012. Print.

Sivakami, P. *The Grip of Change*. Trans. Author. Hyderabad: Orient BlackSwan, 2006. Print.

Valmiki, Om Prakash. *Joothan*. Trans. Arun Prabha Mukherjee. Berkeley: Columbia UP, 2003. Print.

Yesudasan, T. M. "Towards a Prologue to Dalit Studies." *No Alphabet in Sight*. Ed. K. Satyanarayana and Susie Tharu. New Delhi: Penguin, 2011. 611-30. Print.

SEMESTER IV

PAPER XVI: Choice 5

EL 244.5: Elective Course – Theorising Sexualities (6 hours/ week)

Objectives

The objectives of this paper are to:

- demonstrate an awareness of biological, social and grammatical gender as being three different categories
- give a basic awareness of struggles and attainments of people with alternative sexualities in civil rights in various parts of the world

- help the students view with scepticism the simplistic conflation of biological sex with socially and culturally conditioned gender

Learning outcomes

At the end of this course the students will be able to:

- appreciate, if not accept the viewing of gender as a continuum
- critically analyse different gender self-identification preferences such as transgender and inter-genders rather than seeing the polar genders male and female as the only 'natural' ones
- show sensitivity to the legal and social persecution faced by persons belonging to the LGBTI or simply, Queer, community in societies across the world and view their rights as human rights
- exercise an enhanced openness and honesty when encountering/ generating discourse on matters of sexuality and gender roles

Course Description

Module I – Introducing Sexuality

The norm of heterosexuality in religious texts and traditions – the Bible, the Quran and Manusmriti – hypermasculine models in classical mythology – Sanskrit, Greek and Roman – the coexistence of characters, models and narratives that can be said to constitute counterpoints to the dominant mythical norm – the androgyny in Christ – the Sufi tradition of viewing God as the lover and the believer as the beloved – the Shiva-Mohini and Ayyappa myths in Hinduism – the tales of Shikhandin and Rishyasringa in the Mahabharata – the colonial encounter and the masculinisation of religion in India

Sexological types: Sexual classifications, sexual development, sexual orientation, gender identity, sexual relationships, sexual activities, paraphilias, atypical sexual interests

Psychoanalytic drives: Freud and Lacan.

Required Reading:

Bristow, Joseph. Introduction. *Sexuality: The New Critical Idiom Series*. 1997. 2nd ed. London: Routledge, 2011. 1-11. Print.

Butler, Judith. Introduction. *Bodies That Matter: On the Discursive Limits of "Sex."* London: Routledge, 1993. xi-xx. Print.

de Beauvoir, Simone. Part II: Chapter 4, "The Lesbian." *The Second Sex*. 1949. Paris: Knopf Doubleday, 2012. Print.

Jagose, Annamarie. "Theorising Same-Sex Desire." *Queer Theory: An Introduction*. New York: New York UP, 1996. 7-21. Print.

Module II - Poetry

The song of songs – the Sufi and Bhakti traditions – the concept of Radha Bhaav

Required Reading

Shakespeare	Sonnet 73
	"That time of the year ... in me behold"
Emily Dickinson	"Her Breast is Fit for Pearls"
Adrienne Rich	"Diving into the Wreck"
Walt Whitman	"The Wound Dresser"
Siegfried Sassoon	"The Last Meeting"

Module III – Prose

Required Reading

Manoj Nair	"Rite of Passage"
Chimamanda N. Adichie	"On Monday of Last Week"
Mukul Kesavan	"Nowhere to Call Home"
Shyam Selvadurai	<i>Cinnamon Gardens</i> (novel)
Ismat Chughtai	"The Quilt" (Urdu short story)

Module IV – Drama and Films

Required Reading

Drama

Edward Albee	<i>The Zoo Story</i>

Films

Moses Tulasi	<i>Walking the Walk</i> (English – Telugu – Urdu documentary film)

Reading List

de Lauretis, Teresa. *Technologies of Gender: Essays on Theory, Film and Fiction*. Bloomington: Indiana UP, 1987. Print.

Dollimore, Jonathan. *Sexual Dissidence: Augustine to Wilde, Freud to Foucault*. Oxford: Clarendon, 1991. Print.

Foucault, Michel. *A History of Sexuality*. 3 vols. Trans. Robert Hurley. New York: Vintage, 1978. Print.

- Kapoor, Shekhar, dir. *Bandit Queen*. Perf. Seema Biswas, Nirmal Pandey, Rakesh Vivek. 1994. DVD. Film.
- Mehta, Deepa, dir. *Fire*. Perf. Shabana Azmi, Nandita Das, Karishma Jhalani. 1996. DVD. Film.
- Mehta, Hansal, dir. *Aligarh*. Script. Apurva Asrani. Perf. Manoj Bajpayee and Rajkummar Rao. 2016. DVD.
- Nair, Manoj. "Rite of Passage." *Yaraana: Gay Writing from India*. Ed. Hoshang Merchant. New Delhi: Penguín, 1999. 171-79. Print.
- Rao, Raj R. and Dibyajyoti Sarma, eds. *Whistling in the Dark: Twenty-One Queer Interviews*. New Delh: Sage, 2009. Print.
- Revathy, A. *The Truth About Me: A Hijra Life Story*. Trans. V. Geetha. New Delhi: Penguin, 2013. Print.
- Sedgwick, Eve Kosofsky. *Between Men: English Literature and Male Homosocial Desire*. New York: Columbia UP, 1985. Print.
- Vanita, Ruth and Saleem Kidwai, eds. *Same-Sex Love in India: A Literary History*. New Delhi. Penguin, 2000. Print.

UNIVERSITY OF KERALA

(Abstract)

Corrections in the revised syllabus of the II,III and IV semesters of M.A English language and Literature in affiliated colleges w.e.f 2017 admission onwards- Approved- orders issued.

ACADEMIC A.II.SECTION

No.Ac.A.II/13/2018

Thiruvananthapuram, Dated 03.05.2018

- Read:
1. U.O No.Ac A II/4/20/2017 dated 22.07.2017
 2. Item no.98 of the minutes of the Academic Council held on 07.10.2017
 3. Item no. II. I. (1) of the minutes of the Academic Council held on 06.04.2018

ORDER

The Academic Council at its meeting held on 07.10.2017, approved the Syllabus of M.A Degree course in English language and literature vide read (2) as above and further resolved that the syllabus be referred to the Dean, Faculty of arts for examination and specific recommendations. The Dean, Faculty of Arts recommended corrections in the syllabus of Semester II,III, and IV of M.A degree course in English Language and Literature w.e.f 2017 admissions. The Academic Council held on 06.04.2018 approved the corrections in the syllabus vide read (3) as above. The corrections are applicable to the students of 2017 admissions also. The copy of the list of corrections in the syllabus is appended.

Orders are issued accordingly.

Sd/-

SHOBHANA KUMARI.K
DEPUTY REGISTRAR (Acad.II)
For REGISTRAR

To.

1. The Dean, Faculty of Arts
2. The Chairman Board of Studies in English (PG)
3. All the members of Board of Studies in English (PG)
4. The Principals of Colleges offering M.A Degree courses in English
5. PA to CE/The Director Computer Centre/The Director IDE
6. AR EB/JR/DR/AR Exams.
7. MA Tabulation Section
8. PRO/RO/Enquiry
9. The Librarian, University Library, Thiruvananthapuram
10. The Librarian Campus Library, Kariavattom.
11. Stock file/File copy.

Forwarded By Order



Section Officer

SEMESTER II

Paper VIII – Critical Studies I [7 hours/week]

Objectives

The objectives of this paper are to:

- represent important theoretical schools that have radically changed the perception of literature as a cultural phenomena.
- familiarize students with the basic premises of the foundational schools of modern thought, particularly on the construction of the subject, language, and socio-cultural formations.
- discuss the intellectual milieu in Europe that led to the emergence of theories of structuralism, post structuralism, psychoanalysis, Marxism and feminism
- familiarize students with the primary conceptual apparatus of these systems of thought
- enable students to analyze literary phenomena using the theoretical tools provided by the above schools.

Learning Outcomes

At the end of the course it is expected that the students

- would have sharpened their analytical and critical faculties drawing inspiration from the readings provided.
- would have gained an idea of the evolution of critical thinking in Europe and India in the 20th and 21st century.
- Would have understood the function of language in the construction and analysis of literary and cultural phenomena.
- Would have gained an insight into the interconnected nature of these major schools of thought leading to a shift from the paradigmatic to the syntagmatic.

Course Description

Module 1: Structuralism and Semiotics

Saussure's concept of the synchronic study of language has radically changed the basic assumptions in the analysis and interpretation of language and literature. As a form of human science, structuralism can be perceived as a method of systematizing human experience in the study of linguistics, anthropology, sociology, psychology and literary studies. Structuralism views language as a system of signs that structures our perception of the world around us. It is an excellent tool especially in analysing literary conventions and popular culture.

Structural Linguistics- Ferdinand de Saussure (Langue/Parole, Signifier/Signified, Synchrony/Diachrony, Syntagmatic/Paradigmatic) - Claude Levi Strauss (Structural Anthropology, Mytheme, Bricolage) - Roland Barthes (Readerly/Writerly text) - Roman Jakobson (Defamiliarization, Foregrounding, Connotation, Denotation) Vladimir Propp (Seven Spheres of Action) - Mikhail Bakhtin (Polyphony)

Required Reading

Saussure, Ferdinand de. "The Object of Study." Course in General Linguistics. Trans. Roy Harris. Literary Theory: An Anthology. Ed. Julie Rivkin & Michael Ryan. USA: Blackwell, 1998. 59-63. Print.

Module II: Post structuralism

Post structuralism emerged as a reaction against the structuralist's orderly vision of language and human experience. Post structuralist theory has become instrumental in decentring the Western philosophical canon by viewing language as the conceptual framework that encases our experience. Post structuralism demands paradigm shifts in analyzing human experiences and creative expressions.

Historical context- 1968 uprising and related events- Influences- Derrida (Deconstruction)- Lyotard (metanarrative)- Julia Kristeva (intertextuality)- Deleuze and Guattari (rhizome)- Michael Foucault (Discourse)- Phenomena- metaphysics of presence- logos – logocentrism- bricolage – alterity - difference/différance – arche writing - play- closure – aporia- trace

Required Reading

Derrida, Jacques. "Structure sign and play in the Discourse of Human Sciences"
<http://www5.csudh.edu/ccauthen/576f13/DerridaSSP.pdf>

Module III: Marxism

Marxism focuses on the specific historical and material causes that affect all human events and productions. Marxism views literature, like all cultural manifestations, as a product of the socio-economic and ideological conditions of the time and place in which it was written. Though an offshoot of Marxist criticism, cultural materialism bridges the gap between Marxism and post modernism. Cultural materialism argues that the meanings of literary texts are not fixed by universal criteria, rather they are always at play and often subject to politically radical appropriation.

Karl Marx and Friedrich Engels (The Communist Manifesto) Lukacs (historical consciousness)- Frankfurt School- Antonio Gramsci (civil society/political society) – Louis Althusser (ISA/RSA, Interpellation)- class – base and superstructure - commodity fetishism - dialectical materialism – historical materialism- hegemony – ideology - theory of production - means of labor - means of production - mode of production – false consciousness – reflectionism

Required Reading

Eagleton, Terry. " Marxism and Literary Criticism"
<https://utah.instructure.com/courses/108427/files/9428871/download>

Module IV: Psychoanalysis

One of the most significant insights of Freud which still governs classical psychoanalysis is the notion that human beings are motivated or driven by unconscious fears, desires, needs and conflicts. The existence of unconscious is central to all psychoanalytic theories and is conceived as a dynamic entity that engages humans at the deepest level of their being. Unconscious is ambiguous, seen as both the cause and effect of repression and can be accessed through dreams as well as the dynamics of language.

Id, ego and superego - repression - condensation - displacement - archetypes - the gaze - symbolic order - imaginary order - mirror stage - the real- reality principle – instinctual pleasure – jouissance

Required Reading

Lacan, Jacques. "Insistence of Letter in the Unconscious". Modern Criticism and Theory A Reader 2nd Edition. Ed. David Lodge with Nigel Wood. UK: Longman, 1988.62-87- Print.

Module V: Gender Studies

As a political and literary movement, Feminism poses new ways of asking and answering questions, challenging the conventional forms of discourse that exist within the mainstream of philosophy, culture and politics. Feminist literary theory analyses how language, social power structures and institutions reflect patriarchal interests and the ways in which the thoughts marking the above have influenced women's perception of themselves. The writings of feminists try to reveal the basic asymmetry between the terms "masculine" and "feminine" and argue against biological determination and socialization used by patriarchal forces in the construction of gender and sexuality.

Historical Beginnings- Mary Wollstonecraft – Waves of Feminism- feminine, feminist, female- gynocriticism-
écriture feminine- male gaze- objectification- womanism- intersectionality- sexuality- gender identity-
performativity.

Required Reading

Cixous, Hélène, 'The Laugh of the Medusa' [1975; revd 1976 version trans. by Keith and Paula Cohen], reprinted in Elaine Marks and Isabelle de Courtivron (eds)

Reading List

- Atkins, C. Douglas. *Reading Deconstruction/Deconstructive Reading*. Lexington: U of Kentucky P, 1983.
- Barthes, Roland. *Elements of Semiology*. Trans. R. Howard. Evanston: Northwestern UP, 1972
- . *S/Z*. 1970. Trans. Richard Miller. New York: Hill and Wang, 1975.
- . "Myth Today". *Mythologies*. Trans. Annette Lavers. New York: The Noonday, 1991. 109 - 145. Web.
- Baudrillard, Jean. *America*. Trans. Chris Turner. London: Verso, 1988.
- Belsey, Catherine and Moore, Jane (eds), *The Feminist Reader: Essays in Gender and The Politics of Literary Criticism*. 2nd edn. Basingstoke: Palgrave Macmillan, 1997.
- Benjamin, Walter, "The Work of Art in the Age of Mechanical Reproduction" *Illuminations*. Ed. Hannah Arendt. Trans. Harry Zohn. London: Fontana, 1973. 219-53. Print.
- Bloom, Harold, Geoffrey Hartman, Paul de Man, Jacques Derrida, and J. Hillis Miller. *Deconstruction and Criticism*. New York: Seabury, 1979.
- Buller, Judith. "Performative Acts and Gender Constitution: An Essay in Phenomenology and Feminist Theory". *Theatre Journal*, Vol. 40, No. 4. (Dec., 1988), pp. 519-531.
- . *Gender Trouble: Feminism and the Subversion of Identity*. London: Routledge, and New York, 1992.
- Chakravarty, Uma. "Conceptualizing Brahminical Patriarchy in Early India: Gender, Class and State". *Class, Caste, Gender- Readings in Indian Government and Politics-5*. Ed. Manoranjan Mohanty, New Delhi: Sage, 2004. 271-295. Print.
- Culler, Jonathan. *Structuralist Poetics: Structuralism, Linguistics, and the Study of Literature*. New York: Cornell UP, 1973.
- de Beauvoir, Simone, *The Second Sex* [1949], trans. by H. M. Parshley (Bantam, New York, 1961; Penguin, Harmondsworth, 1974).
- Derrida, Jacques. *Of Grammatology and Writing and Difference*. Trans. Gayatri Chakravorty Spivak. Baltimore: Johns Hopkins UP, 1976.
- Eagleton, Mary (ed.), *Feminist Literary Theory: A Reader*. 2nd edn. Oxford: Blackwell, 1995.
- Eagleton, Terry. *Criticism and Ideology*. New York: Schocken, 1978.
- Elliott, Anthony. *Psychoanalytic Theory: An Introduction*. Oxford: Blackwell, 1994.
- Ellmann, Maud, ed. *Psychoanalytic Literary Criticism*. London: Longman, 1994.
- Felman, Shoshana (ed.), *Literature and Psychoanalysis* Baltimore: Johns Hopkins UP, 1977.
- Foucault, Michel. *The Foucault Reader*. Ed. Paul Rabinow. New York: Pantheon, 1984.
- Friedan, Betty, *The Feminine Mystique*. New York: Dell, 1963.
- Freud, Sigmund. "The Conscious and the Unconscious", "The Ego and the Id", "The Ego and the Super-Ego". *Beyond the Pleasure Principle and other Writings*. Harmondsworth: Penguin, 2003. 105-129. Print.
- Gilbert, Sandra M., and Susan Gubar. *The Madwoman in the Attic: The Woman Writer and the Nineteenth-Century Literary Imagination*. New Haven, CT: Yale UP, 1979.
- Hawkes, Terence. *Structuralism and Semiotics*. Berkeley: U of California P, 1977.
- Humm, Maggie, *The Dictionary of Feminist Theory*. Hemel Hempstead: Harvester Wheatsheaf, 1989.
- Millett, Kate, *Sexual Politics*. New York: Doubleday, 1970).
- Kristeva, Julia. *Revolution in Poetic Language and Desire in Language: A Semiotic Approach to Literature and Art*. New York: Columbia University Press, 1980.
- Jameson, Fredric. *Marxism and Form: Twentieth-Century Dialectical Theories of Literature*. Princeton: PUP, 1971.
- Lauretis, Teresa de. *Figures of Resistance: Essays in Feminist Theory*. Urbana and Chicago: U of Illinois P, 2007.
- Lévi-Strauss, Claude. *Structural Anthropology*. Trans. C. Jacobson and B. G. Schoepf.

- London: Allen Lane, 1968.
 Lukács, Georg, *The Historical Novel* [1937], trans. by Hannah and Stanley Mitchell. London: Merlin Press, 1962.
 Marx, Karl. "The Fetishism of Commodities and the Secret Thereof", *Classical Sociology Theory*, Ed. I. McIntosh. New York: New York UP. 68-71.
 Mohanty, Chandra Talpade, 'Under Western Eyes: Feminist Scholarship and Colonial Discourses', in Mohanty et al. (eds), *Third World Women and the Politics of Feminism*. Bloomington: Indiana University Press, 1991.
 Moi, Toril. *Sexual/textual Politics: Feminist Literary Theory*. London ; New York : Methuen, 1985.PN98.W64 M65 1985.
 Propp, Vladimir. *The Morphology of the Folktale*. 1928. Trans. Laurence Scott. Austin: U of Texas P, 1968.
 Scholes, Robert. *Structuralism in Literature: An Introduction*. New Haven: Yale UP, 1974.
 Sedgwick, Eve Kosofsky. *Epistemology of the Closet*. California: U of California P, 1990
 Showalter, Elaine. *A Literature of Their Own: British Women Novelist from Brontë to Lessin*. Princeton: PUP, 1977.
 Williams, Raymond. *Marxism and Literature*. Oxford: OUP, 1977.
 Williams, Raymond. *Culture and Society 1780-1950*. London: Chatto&Windus, 1958.
 Woolf, Virginia, *A Room of One's Own*. London: Hogarth Press, 1929.
 On Women and Writing [1979], selected and intro. By Michèle Barrett.
 London: The Women's Press, 2001.

SEMESTER III

Paper X – Critical Studies II [7 hours/week]

Course Description

Module I: Postmodernism

Postmodernism has derived its key ideas from post structuralist assumptions like multiple meanings and deconstructed centres. As a theory of history, society, culture, art, and literature, postmodernism questions the superiority of order and the unity of experience. Theories of postmodernism critique grand narratives and celebrate fragmentation which obliterates the illusion of the text as "real" and provides multiple interpretations and even parody.

Constructivism- discontinuity- parody- Pastiche – simulacra - virtual Reality - black humor – Intertextuality- Metafiction - Fabulation- Historiographic metafiction- Temporal distortion- Magic realism- schizophrenia

Required Reading

Habermas, Jurgen. "Modernity - An Incomplete Project". *Postmodernism: A Reader*. Ed. Thomas Docherty. New York: Harvester Wheatsheaf, 1993.98-109. Print.

Module II: New Historicism

New Historicism focuses on the historicity of literary texts and the textuality of history by analysing them in the context of power and ideology at a given time. New Historicist theory derives its basic assumptions from Foucauldian discourses on hegemonic institutional practices and individual subjectivities. The New Historicist believes in the impossibility of objective analysis of history. The reading of a literary or cultural text is never definitive; it opens up ever new possibilities of interpretation.

Historiography- Textuality of History- Historicity of Texts- Author Function- Stephen Greenblatt on Renaissance- Fredric Jameson on neo Marxist historicism- Clifford Geertz on symbolic anthropology, thick description- non discursive practices – apparatus – archaeology vs genealogy - arts of existence

Required Reading

Foucault, Michael. "The Unities of Discourse", *The Archaeology of Knowledge*. London & New York: Routledge, 2009. 23-33. Print.

Module III: Postcolonialism

Postcolonialism attempts to understand the political, social, cultural and psychological operations of the colonialist and anticolonialist ideologies. Postcolonial theory goes on to analyse the ways in which a text reinforces or resists colonialism's oppressive ideology. In the context of postcolonialism nationhood is perceived in complex ways. It is the contradiction between the desire for homogeneity and diversity that is within the nation that makes the issue of nation and nationalism more problematic.

colony and colonialism - empire - orient and occident - centre/ margin - marginality - decolonisation - nativism - anticolonialism - neo colonialism - eurocentricism - third world - ambivalence - diaspora - ethnicity - hybridity - mimicry - nation/nation-state - negritude - other - dislocation - imagined communities

Required Reading

Said, W. "Introduction to Orientalism", *Orientalism*. London: Penguin, 1-28. Print.

Module IV: Subaltern Studies

Subalternity in the context of postcolonialism opens up interesting areas of critical study. It focuses on identity politics as well as demands a critique of postcolonial grand narratives.

Subaltern- Subaltern Studies Group- post imperial societies- antiessentialism- race-class-caste-gender- ethnicity- third world-fourth world- narratives of subversion- voices of resistance- life writings

Required Reading

Spivak, Gayatri Chakravorty. "Can the Subaltern Speak?"
http://abahlali.org/files/Can_the_subaltern_speak.pdf

Module V: Age of the Anthropocene

Critical readings of the age of the Anthropocene help us comprehend the reality of times in all its complexity. Rapidly shifting social formations are re-interpreted and redefined in this context.

Post-truth- post feminism- literary representations of the Anthropocene (Amitav Ghosh)- eco criticism- posthumanism- techno culture- cyber punk.

Required Reading

Chakrabarty, Dipesh "The Climate of History: Four Theses"
<http://www.law.uvic.ca/demcon/2013%20readings/Chakrabarty%20-%20Climate%20of%20History.pdf>

Reading List

Anderson, Benedict. "Introduction to Imagined Communities" *Imagined Communities*, 2nd ed. London: Verso, 2006. 1-7.

Ashcroft, Bill, Griffiths, Gareth and Tiffin, Helen (eds), *The Post-Colonial Studies Reader*. London and New York: Routledge, 1995.

Baudrillard, Jean, *Simulacra and Simulation* [1981], trans. by Sheila Faria Glaser. Ann Arbor: University of Michigan Press, 1994.

Baudrillard, Jean, *Jean Baudrillard: Selected Writings*, ed. by Mark Poster. 2nd enlarged edn, Cambridge: Polity Press, 2001.

Bauman, Zygmunt, *Postmodern Ethics*. Oxford: Blackwell, 1993.

Bauman, Zygmunt. "On being Light and Liquid". *Liquid Modernity*. Cambridge: Polity, 2000. 1-15.

- Bhabha, Homi K. (ed.), *Nation and Narration*. London: Routledge, 1990.
- , *The Location of Culture* [1994]. London: Routledge, 2004.
- Brazier, Jana Evans and Mannur, Anita (eds), *Theorizing Diaspora: A Reader*. Oxford: Blackwell, 2002.
- Brannigan, John. *New Historicism and Cultural Materialism*. New York: St. Martin's P, 1998.
- Brooker, Peter (ed.), *Modernism/Postmodernism*. London: Longman, 1992.
- Chakrabarty, Dipesh. "Post Coloniality and the Artifice of History". *Representations* 37 Special Issue: Fantasies and Postcolonial Histories (1992): 1-26. JSTOR Web. 16 Aug 2005.
- Chatterjee Partha. "Nationalism as a Problem in the History of Political Ideas". *Nationalist Thought and the Colonial World: A Derivative Discourse*. USA: University of Minnesota, 1993. 1- 35.
- Connor, Steven (ed.), *The Cambridge Companion to Postmodernism*. Cambridge: Cambridge University Press, 2004.
- Eagleton, Terry, 'Capitalism, Modernism and Postmodernism' [1985], *Against the Grain: Selected Essays, 1975-85*. London: Verso, 1986.
- Eco, Umberto, *Travels in Hyperreality* [1986], trans. by William Weaver. London: Picador, 1987.
- Fanon, Frantz, *Black Skin, White Masks* [1952], trans. by C. L. Markmann, with Foreword by Homi Bhabha. London: Pluto, 1986.
- , *The Wretched of the Earth* [1961], trans. by Constance Farrington, with Preface by Jean-Paul Sartre. London: Penguin, 2001.
- Foucault, Michael. "Power/Knowledge" (1st lecture). *Power/Knowledge: Selected Interviews and Other Writings 1972-1977*. Ed. Colin Gordon. New York: Pantheon, 2005. 78-92.
- Gallagher, Catherine and Stephen Greenblatt. *Practicing New Historicism*. Chicago: U of Chicago P, 2000.
- Gramsci, Antonio, 'History of the Subaltern Classes: Some Methodological Criteria', excerpts in Quintin Hoare and Geoffrey Nowell Smith (eds), *Selections from the Prison Notebooks of Antonio Gramsci*. London: Lawrence & Wishart, 1971.
- Greenblatt, Stephen. *Hamlet in Purgatory*. Princeton: PUP, 2001.
- Hall, Stuart, 'Cultural Identity and Diaspora', in Jonathan Rutherford (ed.), *Identity: Community, Culture, Difference*. London: Lawrence & Wishart, 1990.
- Harlow, Barbara. *Resistance Literature*. New York and London: Methuen, 1987.
- Harris, M. *Cultural Materialism: The Struggle for a Science of Culture*. New York: Random House, 1979.
- Hutcheon, Linda. *A Poetics of Postmodernism: History, Theory, Fiction*. London: Routledge, 1988.
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- Nandy, Ashis. "The Psychology of Colonialism: Sex, age and Ideology in British India." Sections, I, II & III. *The Intimate Enemy: Loss and Recovery of Self under Colonialism*. New Delhi: OUP, 2010.1-7.
- Panikkar, K. M. *Asia and Western Dominance: A Survey of the Vasco da Gama Epoch of Asian History 1498-1943*. New ed. London: Allen & Unwin, 1965.
- Said, Edward, *Culture and Imperialism*. London: Chatto & Windus, 1993. Sim, Stuart (ed.), *The Routledge Companion to Postmodernism*. London: Routledge, 2001.
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- Vesser, H. Aram, ed. *The New Historicism*. New York: Routledge, 1989.
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SEMESTER IV
Paper XIV – Cultural Studies [7 hours/week]

tives

- 1) To gain insight into the historical, social, cultural and political backdrop from which the discipline of Cultural Studies emerged.
- 2) To familiarise with the basic terminology and the foundational theoretical works, in order to acquire conceptual clarity.
- 3) To know the development of the discipline along two paradigms connected with Culturalism and Structuralism.
- 4) To analyse the development of British Cultural Studies, with a special focus on the contributions of CCCS, Birmingham, and the later developments of the domain in other parts of the world.
- 5) To assess the degree of multi-disciplinary nature of the field of study by evaluating the methods and tools used in recent Cultural Studies, including its encounter with areas of research based on class, gender, ethnicity, nationalism, visual arts, post colonialism, post modernism etc.
- 6) To have a proper understanding of the contemporary trends in the field and to equip students to analyse various cultural texts, discourses and practices with critical acumen.

Learning Outcomes.

At the end of the course, students should have;

- 1) A thorough understanding of the origin and evolution of Cultural Studies, major theorists and their contributions.
- 2) Sufficient knowledge about its methodology and praxis besides theory.
- 3) Competence to analyse and evaluate cultural texts and practices critically.

Course Description

Module I: Cultural Studies: Theory

Cultural Studies is a new area of research and teaching that brings in new perspectives to our notions regarding 'structure' and 'meanings' and therefore to the study of literatures, cultures and societies. This course will try to develop theoretical tools and critical perspective to interrogate the advertisement, film, television, newspaper and internet texts that saturate our lives.

Key Concepts: Frankfurt School, False consciousness, Culture Industry, Birmingham School, Culture as ordinary, Mass culture, Power, Hegemony

Required Reading: Adorno, T. & Horkheimer, M., 1944. "The Culture Industry: Enlightenment as Mass Deception". In T. Adorno and M. Horkheimer, *Dialectics of Enlightenment*. Translated by John Cumming. New York: Herder and Herder, 1972.

<http://www.scribd.com/doc/3998279/The-Culture-Industry-Enlightenment-as-Mass-Deception-Adorno-Horkheimer>

Module II: Cultural Studies: Methodology

The primary focus of cultural studies is a revisionary reading of the concept of culture, viewing culture as a course that openly critiques the concept of high culture and low culture. In doing so culture studies teases out the interactions of power and culture particularly in modes of representation. Of particular interests to theorists of culture are figurations of the popular and the interplay between the dominant and the subordinated.

Key Concepts: Agency, Cultural consumption, Stereotyping, Subjectivity, Representation, Interpellation

Required Reading: Hall, Stuart ([1973] 1980): 'Encoding/decoding'. In *Centre for Contemporary Cultural Studies* (ed.): *Culture, Media, Language: Working Papers in Cultural Studies, 1972-79* London: Hutchinson, pp. 128-38.

etc.

<http://www9.georgetown.edu/faculty/irvinem/theory/SH-Coding.pdf>

Module III: Popular Culture

Module IV: Visual Culture

study of visual culture as a serious line of enquiry started with the establishment of cultural studies in the 1970s. The rise of the internet which enabled the proliferation of visual images without any barriers and the rise of a screen culture where seeing is believing gave impetus to the discipline. Colours and images took on a new life before our eyes and along with it the possibilities of symbolic signification. A study of visual culture brings within its fold a wide array of cultural artefacts or even simple everyday objects that gain a new status when viewed from the perspective of visual culture studies.

Required Reading: Scopophilia, Spectacle, Culture capital, Visual ethics

Required Reading: Laura Mulvey. "Visual Pleasure and Narrative Cinema"

Module V: Cultural Studies Praxis

The semiotics of a cultural text has to be analysed in depth. This module will help develop a critical perspective on the various cultural products that influence man in this millennium.

Required Reading: Chandrima Chakraborty. *Bollywood Motifs: Cricket Fiction and Fictional Cricket*.

Hollywood Motifs

Reading List

- Arnold, Theodor W. *The Culture Industry: Selected Essays on Mass Culture*, ed. with intro. J. M. Bernstein. London: Routledge, 1993. Print.
- Baudrillard, J. (ed.) *The Social Life of Things: Commodities in Cultural Perspective*. Cambridge: Cambridge University Press, 1986. Print.
- Adorno, T. W. *J. Noise: The Political Economy of Music*. trans. Brian Massumi. Minneapolis: University of Minnesota Press, 1985. Print.
- Lyotard, J. F. *The Dialogic Imagination*. Austin: University of Texas Press, 1981. Print.
- Chhabra, H. K. *The Location of Culture*. New York: Routledge, 1994. Print.
- Curran, Peter. *A Glossary of Cultural Theory*. London: Arnold, 2003. Print.
- Day, P. *Consumption and Identity at Work*. London: Sage, 1996. Print.
- Gray, Simon. *The Cultural Studies Reader*. New York: Routledge, 1999. Print.
- Gray, J. *Visible Fictions: Cinema, Television, Video*. London: Routledge, 1982. Print.
- Holmes, Norman. *Critical Discourse Analysis*. Boston: Addison Wesley, 1995. Print.
- Miller, "What it is and what it isn't: Introducing Cultural Studies," *A Companion to Cultural Studies*, Ed. Toby Miller. Blackwell, 2001.
- Gray, J. (ed). *Cultural Theory and Popular Culture: A Reader*, 2nd ed. London: Prentice Hall, 1999. Print.
- Widdows, G. 'Raymond Williams and British colonialism', *Yale Journal of Criticism* 4/2 Williamson, J. 1978.
- Reading Advertisements: Ideology and Meaning in Advertising. London: Marion Boyars, 1991. Print.
- Gray, R. *Colonial Desire: Hybridity / Theory, Culture and Race*. London: Routledge, 1995. P

UNIVERSITY OF KERALA

SYLLABUS

**MA Degree Programme in
Malayalam Language and Literature
2019 Admissions Onwards**

ബോർഡ് ഓഫ് സ്റ്റഡീസ് അംഗങ്ങൾ

ഡോ. ജി. പത്മരാവു (ചെയർമാൻ)

ഡോ. സി.ആർ. രാജഗോപാലൻ

ഡോ. സി.ആർ. പ്രസാദ്

ഡോ. എ.എം. ശ്രീധരൻ

ഡോ. അഷറഫ് നിസ

ഡോ. ആർ.എസ്. രാജീവ്

എം.എ. മലയാളം സിലബസ് 2019
അഫിലിയേറ്റഡ് കോളേജുകളിലെ സെമസ്റ്റർ ഘടന
കോഴ്സുകൾ

സെമസ്റ്റർ - 1

ML 211	-	പ്രാചീനസാഹിത്യം
ML 212	-	മധ്യകാലസാഹിത്യം
ML 213	-	കേരളസംസ്കാരം
ML 214	-	മലയാളവ്യാകരണം

ഗവേഷണരീതിശാസ്ത്രം

സെമസ്റ്റർ - 2

ML 221	-	ആധുനികസാഹിത്യം - ഗദ്യം
ML 222	-	ആധുനികസാഹിത്യം - പദ്യം
ML 223	-	ഭാരതീയകാവ്യമീമാംസ
ML 224	-	സാഹിത്യമീമാംസ - പാശ്ചാത്യം

ഗവേഷണരീതിശാസ്ത്രം

സെമസ്റ്റർ - 3

ML 231	-	സമകാലികസാഹിത്യം - ഗദ്യം
ML 232	-	സാഹിത്യചരിത്രവിജ്ഞാനീയം
ML 233	-	Sanskrit Paper I Classical Sanskrit Literature, Poetry, Drama and definitions of Poetic types of Sanskrit
ML 234	-	മലയാളവിമർശനം

സെമസ്റ്റർ - 4

ML 241	-	സമകാലികസാഹിത്യം - പദ്യം
ML 242	-	Sanskrit Paper II (Prose - Elementary Grammar, Composition Translation)
ML 243	-	ആധുനികഭാഷാശാസ്ത്രം
ML 244	-	ഐച്ഛികം
		1. താരതമ്യസാഹിത്യം
		2. നാടോടിവിജ്ഞാനീയം
		3. വിവർത്തനം : തത്ത്വവും പ്രയോഗവും

(ഒരു കോളേജ് ഇതിൽ ഏതെങ്കിലും ഒരു വിഷയം സ്വീകരിക്കേണ്ടതാണ്)

ചോദ്യമാതൃക

നിർദ്ദേശം	ആകെ ചോദ്യം	എഴുതേണ്ടത്	മാർക്ക്	ആകെ മാർക്ക്
രണ്ടുപുറം	14	7	3	21
നാലുപുറം	10	5	6	30
അഞ്ചുപുറം	6	3	8	24
ആകെ	30	15		75

മലയാളഭാഷയ്ക്കും സാഹിത്യത്തിനും പ്രാധാന്യം നൽകി വിദ്യാർത്ഥികൾക്ക് ചരിത്രബോധത്തോടെയുള്ള അറിവുണ്ടാക്കുക എന്നതാണ് സിലബസിന്റെ മുഖ്യലക്ഷ്യം. മലയാളഭാഷ, സാഹിത്യം എന്നിവയെ സംബന്ധിച്ച കാലാനുക്രമമായ വിജ്ഞാനം ലഭ്യമാക്കുന്ന വിധത്തിലാണ് സിലബസ് തയ്യാറാക്കിയിരിക്കുന്നത്. ഏതെങ്കിലും ഒരു ഭാഗത്തിന് പ്രാധാന്യം നൽകുന്ന രീതി കഴിവതും ഒഴിവാക്കിയിട്ടുണ്ട്. കേരള സർവ്വകലാശാലയിൽ നിന്നും എം.എ. ബിരുദം നേടുന്നവർക്ക് ഭാഷാസാഹിത്യ മേഖലകളിൽ സാമാന്യവും വ്യക്തവുമായ അറിവുണ്ടാക്കുക എന്നതിലാണ് ശ്രദ്ധിക്കേണ്ടത്. സിലബസിൽ നൽകിയിരിക്കുന്ന പുസ്തകങ്ങളോ ലേഖനങ്ങളോ കേവലമായ ഉദാഹരണങ്ങൾ മാത്രമാണ്. അതിൽ മാത്രം ഊന്നി നിന്നുകൊണ്ടുള്ള അധ്യയനമോ ചോദ്യങ്ങളോ ഉണ്ടാകാതിരിക്കാൻ പ്രത്യേകം ശ്രദ്ധിക്കണം. സിലബസ് അഭിസംബോധന ചെയ്യുന്നത് ഓരോ മേഖലയെയാണ്. പ്രസ്തുതമേഖലയെ വിശദമായി വിദ്യാർത്ഥികൾക്ക് പരിചയപ്പെടുത്തുന്നതിൽ അധ്യാപകർ ശ്രദ്ധിക്കണം. പ്രസ്ഥാനങ്ങൾ, വ്യക്തികൾ എന്നിവയെക്കുറിച്ചു പഠിപ്പിക്കുമ്പോൾ അതിൽ മാത്രം ഊന്നി നിൽക്കാതിരിക്കാൻ പ്രത്യേകം ശ്രദ്ധിക്കണം. അതിന്റെ സവിശേഷതകൾ പഠിപ്പിക്കുന്നതിനൊപ്പം അക്കാലം രൂപപ്പെട്ട കാരണങ്ങൾ, അതിനോടൊപ്പം നിലവിലുള്ള ഇതരഘടകങ്ങൾ അവയുടെ സ്വഭാവം എന്നിവയെക്കുറിച്ചെല്ലാം വിദ്യാർത്ഥി അറിഞ്ഞിരിക്കണം. സെമിനാർ, പ്രബന്ധം എന്നിവയ്ക്ക് പാഠ്യപുസ്തകങ്ങളെ ഒഴിവാക്കി ഇത്തരം മേഖലകളിൽ നിന്നും വിഷയം നൽകാൻ പ്രത്യേകം ശ്രദ്ധ നൽകണം.

2013 മുതൽ ഗവേഷണരീതിശാസ്ത്രത്തെ സംബന്ധിച്ച പഠനം കൂടി സിലബസിൽ ഉൾപ്പെടുത്തിയിട്ടുണ്ട്. കുട്ടികൾക്ക് ഗവേഷണം നടത്തുന്നതിന്റെ പ്രാഥമികധാരണയും അതിന്റെ ആവശ്യകതയും ബോധ്യപ്പെടുത്തുന്നതിനാണ് ഈ പഠനം രൂപപ്പെടുത്തിയിരിക്കുന്നത്. ഒന്നും രണ്ടും സെമസ്റ്ററുകളിൽ 3 മണിക്കൂർ വീതം ഗവേഷണരീതിശാസ്ത്രത്തിന് മാറ്റിവെച്ചിരിക്കുന്നു. രണ്ടാം സെമസ്റ്ററിൽ ഒരു സെമിനാർ (10 മാർക്ക്) ആഭ്യന്തരപ്പരീക്ഷ (10 മാർക്ക്) ഹാജർ (5 മാർക്ക്) ഗവേഷണപ്രബന്ധം (Research Paper) (50 മാർക്ക്), വാചാപ്പരീക്ഷ (25 മാർക്ക്) എന്നിങ്ങനെയാണ് ഈ പേപ്പറിന്റെ മാർക്ക് വിതരണം. പ്രബന്ധം നാലാം സെമസ്റ്ററിന്റെ ആദ്യം തന്നെ സമർപ്പിക്കേണ്ടതും വിഷയം മൂന്നാം സെമസ്റ്ററിന്റെ ആദ്യം സർവ്വകലാശാലയിൽ രജിസ്റ്റർ ചെയ്യേണ്ടതുമാണ്.

പ്രബന്ധം 40 പുറത്തിൽ കവിയാൻ പാടില്ല. ഉപശീർഷകങ്ങൾ ആവാമെങ്കിലും പ്രബന്ധത്തിൽ അധ്യായവിഭജനം ഉണ്ടാകരുത്.

Malayalam (ML) Course & Marks Distribution

ML-211, പ്രാചീനസാഹിത്യം

മലയാള ഭാഷയുടെ വാമൊഴി വഴക്കത്തിന്റെ സംഭാവനകളായ പഴഞ്ചൊല്ലുകൾ, കടങ്കഥകൾ, നാടോടിഗാനങ്ങൾ എന്നിവയിലാരംഭിച്ച സാഹിത്യരൂപങ്ങൾ മുതൽ ചെറുശ്ശേരിയുടെ കൃഷ്ണഗാഥവരെയുള്ള പദ്യ-ഗദ്യ സാഹിത്യത്തിന്റെ ചരിത്രമാണ് പ്രാചീന സാഹിത്യം എന്ന പേപ്പറിന്റെ പഠനവിഷയം. ഇതുകൂടാതെ മലനാട്ടു വഴക്കത്തിന്റെ സംഭാവനകളായ സംഘകാല സാഹിത്യവും പരിചയപ്പെടേണ്ടതാണ്. ഇതിന്റെ ഉപോദ്ബലകമായ കൃതികളാണ് പാഠാനുബന്ധമായി കൊടുത്തിട്ടുള്ളത്. പാഠ്യപുസ്തകഭാഗങ്ങൾ സൂചകങ്ങൾ മാത്രമാണ്. കൃതികൾക്കുപരിയായി അവ ഉൾപ്പെടുന്ന സാഹിത്യപ്രസ്ഥാനങ്ങളെക്കുറിച്ച് ചുരുക്ക കൃത്യമായ ബോധം പഠിതാക്കൾക്കുണ്ടായിരിക്കേണ്ടതാണ്.

1. വാമൊഴി സാഹിത്യം - പഴഞ്ചൊല്ലുകൾ - കടങ്കഥകൾ - നാടോടിഗാനങ്ങൾ - നിർവചനങ്ങൾ, ഘടന, പ്രമേയം - വാമൊഴിപാട്ടുകളുടെ ഘടനാപരമായ വളർച്ചയുടെ ഘട്ടങ്ങൾ - അനുഷ്ഠാന ഗാനങ്ങൾ - വിനോദഗാനങ്ങൾ - കൃഷിപ്പാട്ടുകൾ - പ്രകടനകലാരൂപസാഹിത്യങ്ങൾ - തെക്കൻ വടക്കൻ പാട്ടുകൾ ഇവയെപ്പറ്റിയുള്ള സാമാന്യ പഠനം.

പാഠ്യഭാഗങ്ങൾ

1. പണ്യക്കാട്ടുഭഗവതിത്തോറ്റം (തെയ്യം 1998. എം. വി.വിഷ്ണുനമ്പൂതിരി, അനുബന്ധം പുറം. 160-165.)
2. പാലാട്ടുകോമന്റെ പാട്ടുകഥ.
2. പാട്ടുപ്രസ്ഥാനം - ആദ്യകാലമണിപ്രവാളം - നിർവചനം - സവിശേഷതകൾ, ഇതിഹാസ-പുരാണപാരമ്പര്യങ്ങൾ സംസ്കൃതത്തിൽനിന്ന് കേരളഭാഷയിലേക്ക് - രാമചരിതം - തിരുനിഴൽമാല - രാമകഥാപ്പാട്ട് - കൃതികളെയും കർത്താക്കൻമാരെയും, കാലത്തെയും സംബന്ധിച്ചും, അതതു കാലഘട്ടങ്ങളുടെ സാഹിത്യ - സാംസ്കാരിക പശ്ചാത്തലത്തെക്കുറിച്ചുമുള്ള വിശദമായ അറിവ് ലഭ്യമാക്കണം.

പാഠ്യഭാഗങ്ങൾ

- 1 രാമചരിതം - 120 മുതൽ 122 വരെ പടലം

2. രാമകഥപ്പാട്ട് - ബാലകാണ്ഡം - ഒന്നാം വൃത്തം
3. തിരുനിഴൽമാല - ഖണ്ഡം ഒന്നിൽ ആറൻമുളഗ്രാമവർണ്ണന ആദ്യത്തെ 13 ഈരടി “തെരുതെളപ്പുകൾ” എന്നു തുടങ്ങി “നാടുകുടിവനടുക്കുമേടം” എന്നുവരെ
3. പാട്ടുഭാഷയുടെ ക്രമാനുഗതമായ വികാസം - കണ്ണങ്കൽമാർ (നിരണം കവികൾ) ഭാഷാപരവും, സാഹിത്യവിഷയവുമായ നിരണം കവികളുടെ സംഭാവനകൾ.

പാഠ്യഭാഗങ്ങൾ

കണ്ണശ്ശരാമായണം - സുന്ദരകാണ്ഡം - ആദ്യത്തെ 25 പാട്ട്

ഭാരതമാല - കർണ്ണപർവ്വം - ആദ്യത്തെ 15 പാട്ട്

ഭാഷാഭഗവദ്ഗീത - ആദ്യത്തെ 15 പാട്ട്

4. പാട്ടു പ്രസ്ഥാനത്തിന്റെ മലയാള കാവ്യപാരമ്പര്യത്തിലേക്കുള്ള പരിണാമം ഗാഥ - ഗാനസാഹിത്യത്തിന്റെ പ്രാദേശികഭേദങ്ങൾ.

പാഠ്യഭാഗം

കൃഷ്ണഗാഥ - കുചേലസദ്ഗതി

5. മണിപ്രവാളത്തിന്റെ ഉൽപ്പത്തി ലക്ഷണം - പ്രാചീന മണിപ്രവാളത്തിന്റെ സവിശേഷതകൾ, മണിപ്രവാളകാലഘട്ടത്തിലെ കേരളസമൂഹം വൈശികരാത്രം-അച്ചീചരിതങ്ങൾ (ആദ്യകാലചമ്പുക്കൾ) -സന്ദേശകൃതികൾ സ്തോത്രകൃതികൾ - ലഘുകവനങ്ങൾ. കൃതികൾ നൽകുന്ന കേരള ചരിത്രസംസ്കാര സംബന്ധിയായ സൂചനകൾ.

പാഠ്യഭാഗങ്ങൾ

1. ഉണ്ണിച്ചിചരിതം (ഗദ്യം 18 വരെ)
2. വൈശികതന്ത്രം - ആദ്യത്തെ 15 ശ്ലോകം
3. അനന്തപുരവർണ്ണന - നടക്കാവിൻരെ വർണ്ണനവരെ
4. ചെറിയച്ചി
5. ഉണ്ണിച്ചിരുതേവി ചരിതം - ചോകിരം വർണ്ണന, അർദ്ധനാരീശ്വരവർണ്ണന
6. ഉണ്ണുന്നീലിസന്ദേശം - ഉത്തരഭാഗം - കടത്തേരി വർണ്ണന

6. പ്രാചീനഗദ്യം - ഭാഷാകൗടലീയം - ശാസനഗദ്യം - ഭാഷോർപ്പത്തി പഠനത്തിനുള്ള ആകര സാമഗ്രികൾ എന്ന നിലയിൽ - ശാസനഭാഷയുടെ സവിശേഷതകൾ - പഠനങ്ങൾ - കൗടലീയഭാഷ - അഭിപ്രായഭേദങ്ങൾ ഭൂതവാക്യം ഗദ്യം - നമ്പ്യാന്തമിഴ് - ആട്ടപ്രകാരം - ക്രമദീപിക എന്നിവയുടെ സാഹിത്യമൂല്യം.

പാഠ്യഭാഗങ്ങൾ

1. ബ്രഹ്മാണ്ഡപുരാണം - 21 അദ്ധ്യായം
2. അംബരീഷോപാഖ്യാനം

സഹായകഗ്രന്ഥങ്ങൾ

1. പി. ഗോവിന്ദപിള്ള, ഉള്ളൂർ, ആറ്റൂർ കൃഷ്ണപിഷാരടി, എൻ.കൃഷ്ണപിള്ള എന്നിവരെ സാഹിത്യചരിത്രരചനകൾ.
2. സാഹിത്യചരിത്രം പ്രസ്ഥാനങ്ങളിലൂടെ - എഡി: ഡോ.കെ.എം. ജോർജ്ജ്
3. ആധുനികസാഹിത്യചരിത്രം പ്രസ്ഥാനങ്ങളിലൂടെ -
4. നിരണം പാട്ടുകവികൾ - ഡോ. ദേശമംഗലം രാമകൃഷ്ണൻ
5. വടക്കൻ പാട്ടുകളുടെ പണിക്കല - എം.ആർ. രാഘവവാര്യർ
6. മലയാള കവിതാസാഹിത്യചരിത്രം - ഡോ.എം. ലീലാവതി
7. പദ്യരത്നം (ഉപോദ്ഘാതം) - ഡോ.പി.കെ. നാരായണപിള്ള
8. ഭാഷാചമ്പുക്കൾ - ഉള്ളൂർ എസ്. പരമേശ്വരയ്യർ
9. രണ്ടുപ്രാചീന ഗദ്യകൃതികൾ - സ്കറിയ സക്കറിയ
10. കണ്ണശ്ശരാമായണം മഹോദ്ഘാതം - ഡോ. പുതുശ്ശേരി രാമചന്ദ്രൻ
11. രാമചരിതവും പാട്ടുമാതൃകകളും - ഡോ. എം.എം. പുരുഷോത്തമൻനായർ
12. മണിപ്രവാളകവിത - ഡോ. പി.പി. വേലായുധൻപിള്ള
13. ഭാഷാകൗടലീയം അവതാരിക - ഡോ.കെ.എൻ. എഴുത്തച്ഛൻ
14. ഗാഥ - ഡോ. എൻ. മുകുന്ദൻ
15. രാമചരിതവും പ്രീചീന മലയാളവും - ഡോ.എൻ.ആർ. ഗോപിനാഥപിള്ള
16. ഭാഷാഭഗവദ്ഗീത (പരാവർത്തനം) ഡോ. ബി.വി. ശശികുമാർ, കണ്ണശ്ശസമഗ്രവികസന സമിതി, മലയിൻകീഴ്, 2013.

ML-212, മധ്യകാലസാഹിത്യം

കൃഷ്ണഗാഥയ്ക്കു ശേഷമുള്ള കാലഘട്ടം തൊട്ട് പത്തൊൻപതാം നൂറ്റാണ്ടിന്റെ ഉത്തരഘട്ടം വരെയുള്ള സാഹിത്യസംസ്കാരിക സവിശേഷതകളാണ് മധ്യകാലസാഹിത്യത്തിൽ ഉൾപ്പെടുത്തിയിട്ടുള്ളത്. പാട്ട് മണിപ്രവാളം എന്നിവയുടെ വ്യതിരിക്തമായ പ്രസക്തി നഷ്ടപ്പെടുകയും ഭാഷയുടെ മാനകീകരണത്തിലേക്കുള്ള പ്രചാരണവും ഈ ഘട്ടത്തിലാണ് സംഭവിക്കുന്നത്. മധ്യകാലമണിപ്രവാളം - ഭക്തിപ്രസ്ഥാനത്തിന്റെ ശാക്തീകരണം-കീർത്തനസാഹിത്യം - വഞ്ചിപ്പാട്ടുകൾ. ദൃശ്യശ്രവ്യകലയുടെ സൗന്ദര്യവൽക്കരണമായ ആട്ടക്കഥ-മാപ്പിളപ്പാട്ടും ഗദ്യത്തിന്റെ ആധുനീകരണത്തിലേക്കുള്ള പ്രയാണം- എന്നിവയെല്ലാം വിശദമായിത്തന്നെ പഠനവിഷയമാകണം.

1. മധ്യകാലമണിപ്രവാളകൃതികൾ - പുതിയ ആഖ്യാനപാരമ്പര്യം - പ്രബന്ധങ്ങളിൽനിന്ന് ചമ്പുക്കളിലേക്ക് - ഭാഷാമ്പുക്കൾ ഇതിഹാസപുരാണകഥനങ്ങൾ- മധ്യമ, മധ്യമ കല്പമണിപ്രവാളഭാഷ - ഭാഷാരാമായണം - ഭാഷാനൈഷധം - ഭാഷാനാരായണീയം - സാമൂഹികരാഷ്ട്രീയ പശ്ചാത്തലം - നാടുവാഴിത്തം.

പാഠഭാഗങ്ങൾ

1. ഭാഷാനൈഷധം ചമ്പു - പൂർവ്വഭാഗം -25 ശ്ലോകം-കുരുദണ്ഡകം (ഹര!ഹര! ശിവ! ശിവ! ചിത്രം! ചിത്രം!...)
2. ഭാഷാരാമായണം ചമ്പു - ഉദ്യാനപ്രവേശം (ആദ്യത്തെ 15 ശ്ലോകം)
2. പാട്ടുപ്രസ്ഥാനത്തിന്റെ നിരന്തരപരിണാമം, ഭക്തിപ്രസ്ഥാനം, ഭക്തി പ്രസ്ഥാനത്തിനു കാരണമായ സാമൂഹിക - രാഷ്ട്രീയ - സാമുദായിക കാരണങ്ങൾ. കിളിപ്പാട്ടു പ്രസ്ഥാനത്തിന്റെ സവിശേഷതകൾ - പ്രധാനകൃതികൾ കിളിപ്പാട്ടു പ്രസ്ഥാനത്തിന് എഴുത്തച്ഛന്റെ സംഭാവനകൾ - രാമായണം - മഹാഭാരതം. മഹാഭാരതം - എഴുത്തച്ഛന്റെ ഭാഷാസവിശേഷതകൾ, എഴുത്തച്ഛൻ സൃഷ്ടിച്ച കാവ്യ സൗന്ദര്യബോധം.

പാഠഭാഗങ്ങൾ

1. അദ്ധ്യാത്മരാമായണം കിളിപ്പാട്ട് - അയോദ്ധ്യാകാണ്ഡം
2. മഹാഭാരതം കിളിപ്പാട്ട് - സ്ത്രീപർവ്വം
3. കീർത്തനസാഹിത്യത്തിന്റെ സാമാന്യ സ്വഭാവം, ഭക്തിയും തത്ത്വചിന്തയും പഠന-ഗീത പ്രബന്ധം തുടങ്ങിയവയുടെ പരിചയം.

പാഠഭാഗം

1. ഹരിനാമകീർത്തനം - എഴുത്തച്ഛൻ (ആദ്യത്തെ 25 ശ്ലോകം)
2. ജ്ഞാനപ്പാന - പുന്താനം
3. ഗിരിജാ കല്യാണം - പാർവ്വതിയുടെ യൗവനവർണ്ണന (ഒന്നുരണ്ടാണ്ടുകളിങ്ങനെ ചെന്നപ്പോൾ"- എന്നുതുടങ്ങി "വിശ്വം തണുപ്പിച്ചു വിജയമാക്കിനാൻ" എന്നുവരെ)
4. ജനകീയ കാവ്യശാഖയുടെ തുടർച്ച - വഞ്ചിപ്പാട്ട് - മാപ്പിളപ്പാട്ട് - മതപരവും മതേതരവുമായ ഗാനസാഹിത്യം.

പാഠഭാഗം

1. കുചേലവൃത്തം വഞ്ചിപ്പാട്ട് - രാമപുരത്തുവാര്യർ
2. മാപ്പിളപ്പാട്ട് - ബദറൂൽ മുനീർ ഹുസുനൂൽ ജമാൽ (മികവുറ്റ ബദറൂൽ മുനീർ റെത്തന്നെ... തുടങ്ങുന്ന 32 വരികൾ)
3. പുത്തൻപാന (12-ാം പാദം)
4. കേരളഭൃഗുകലാസാഹിത്യം - കഥകളി - തുള്ളൽ - സാഹിത്യരൂപങ്ങൾ എന്ന നിലയിലുള്ള പ്രാധാന്യം വിശദമാക്കിയുള്ള പഠനം.

പാഠഭാഗങ്ങൾ

നളചരിതം ആട്ടക്കഥ - നാലാംദിവസം

ഘോഷയാത്ര - കുഞ്ചൻ നമ്പ്യാർ

6. ഭാഷാഗദ്യം - സാഹിത്യമൂല്യം - മിഷനറിമാരുടെ സംഭാവനകൾ - വർത്തമാനപുസ്തകം - ഉദയം പേരൂർ സൂനഹദോസിലെ കാനോനുകൾ - സാമാന്യ പരിചയം.

പാഠഭാഗം

വർത്തമാനപുസ്തകം - ആദ്യത്തെ രണ്ടുപദം

സഹായകഗ്രന്ഥങ്ങൾ

1. സാഹിത്യചരിത്രം പ്രസ്ഥാനങ്ങളിലൂടെ - എഡി. കെ.എം. ജോർജ്ജ്.
2. കേരളസാഹിത്യചരിത്രം - ഉള്ളൂർ.
3. കൈരളിയുടെ കഥ - പ്രൊഫ. എൻ. കൃഷ്ണപിള്ള

4. കേരളഭാഷയുടെ വികാസപരിണാമങ്ങൾ - ഇളംകുളം കുഞ്ഞൻപിള്ള
5. കുഞ്ചൻനമ്പ്യാർ വാക്കും സമൂഹവും - കെ.എസ്. ഗണേഷ്
6. പാഠവും പഠനവും - ഡോ.എൻ. ആർ. ഗോപിനാഥപിള്ള
7. എഴുത്തച്ഛന്റെ കഥ - പി.കെ. ബാലകൃഷ്ണൻ
8. തെരഞ്ഞെടുത്ത പ്രബന്ധങ്ങൾ - ഡോ. കെ.എൻ. എഴുത്തച്ഛൻ
9. ഗിരിജാകല്യാണ - ഒരു പഠനം - വി. രാജീവ്
10. സാഹിത്യപഞ്ചാനനന്റെ കൃതികൾ - പി.കെ. നാരായണപിള്ള
11. എഴുത്തച്ഛനും വേദവ്യാസനും - പി.കെ. ബാലകൃഷ്ണൻ
12. കണ്ണശ്ശൻമാരും എഴുത്തച്ഛനും - കെ.ഇ. നാരായണപിള്ള
13. തുഞ്ചൻ പ്രബന്ധങ്ങൾ - കേരള സാഹിത്യഅക്കാദമി
14. മലയാളവിമർശനം (ഫോക്ലോർ പതിപ്പ്) - കാലിക്കറ്റ് സർവ്വകലാശാല (മലയാള വിഭാഗം)
15. സാഹിത്യചരിത്രസംഗ്രഹം - പി. ശങ്കരൻനമ്പ്യാർ

ML-213, കേരളസംസ്കാരം

പാഠ്യപദ്ധതി

1. സംസ്കാരം - സംസ്കാരപഠനത്തിന്റെ സാംഗത്യം- ലോകാന്തരവീക്ഷണങ്ങൾ- ചരിത്രരചന, ഭൂതകാലയാഥാർത്ഥ്യവും ഭാവിയുടെ നിർമ്മിതിയും- സംസ്കാരപഠനത്തിൽ ചരിത്രബോധത്തിന്റെ അനിവാര്യത- ഗ്രാഷി, നെഗ്രി എന്നിവരുടെ സാംസ്കാരപഠന ചിന്തകൾ - അർനോൾഡ് ടോയൻബിയുടെ ചരിത്രരചനാസമീപനങ്ങൾ- രാഹുൽ സങ്കുത്യായൻ, ഡി.ഡി കോസാംബി, റൊമിലാ മാപ്പർ- കേരള സംസ്കാര പഠനത്തിലെ പൂർവ്വമാതൃകകൾ- കെ.പി. പത്മനാഭമേനോൻ, സുന്ദരപിള്ള, ചട്ടമ്പിസ്വാമികൾ- സാഹിത്യകൃതികൾ ചരിത്രപാഠങ്ങൾ എന്ന നിലയിൽ
2. പഠനസാമഗ്രികൾ - പ്രാചീനാവശിഷ്ടങ്ങൾ - ശിലാരൂപങ്ങൾ- ചിത്രരേഖകൾ - ശിലായുഗ ശേഷിപ്പുകൾ- ശിലായുഗസംസ്കാരത്തിന്റെ അടരുകൾ - സ്ഥലനാമ

ങ്ങൾ - സാഹിത്യ പരാമർശനങ്ങൾ- മൊഴിവഴക്കങ്ങൾ- കല്പെഴുത്തുകൾ - ചെപ്പേടുകൾ - വിദേശ സഞ്ചാരികളുടെ കുറിപ്പുകൾ.

3. കേരളീയസംഘകാലം - തമിഴുമലയാളം - മലനാട്ടുസംഘസാഹിത്യം : ചിലപ്പതികാലം, മണിമേഖല- സംഘകാല ദൈവസങ്കല്പങ്ങൾ-ഗോത്രസമൂഹങ്ങളിലെ തൊഴിൽ സമത്വവും സമുദായിക സമത്വവും-തലയാളൻമാരുടെ മേൽക്കോയ്മ-കാടൻസംസ്കൃതിയും കലയും-സാമൂഹിക സമത്വത്തിന്റെ പൂർവ്വമാതൃക- കാട്ടുവാഴ്ചയിൽ നിന്ന് നാട്ടുവഴികളിലേയ്ക്കുള്ള സാംസ്കാരികപരിണാമം-സംഘകാല രാജാക്കന്മാർ - സാഹിത്യ രേഖകൾ - സംഘകാല കവികളും അവരുടെ സാംസ്കാരിക സങ്കല്പങ്ങളും.
4. പ്രാചീനകേരളത്തിലെ വിദ്യാഭ്യാസം-മൂല്യനിർമ്മിതിയും പ്രയോഗവും- അനുഭവത്തിന് നിന്നുള്ള പ്രായോഗിക ജ്ഞാനം-വേദാധികാരവും ബ്രാഹ്മണരും-ഗുരുക്കുലവിദ്യാഭ്യാസം - കളരികൾ-പാഠശാലകൾ-പഠനശാലകളെക്കുറിച്ചുള്ള പ്രാചീന സാഹിത്യ രേഖകൾ-പാരമ്പര്യ വിദ്യകൾ- സാഹിത്യജ്ഞാനവും ജനകീയവിദ്യാഭ്യാസവും-കണ്ണശ്ശക്കവികളുടെ സംഭാവന-എഴുത്തച്ഛൻ സാമൂഹിക ദർശനം-വിദ്യാഭ്യാസത്തിലെ അയിത്തം-വിദ്യാഭ്യാസത്തിൽ വൈദേശികശക്തികളുടെ സ്വാധീനം- മിഷനറിമാരുടെ വരവ്- അച്ചടി, മതവിദ്യാഭ്യാസം-പൊതുപാഠശാലകൾ- ഗുണ്ടർട്ട്, ഇട്ടി അച്യുതൻ, ഊരാച്ചേരി ഗുരുക്കന്മാർ-ലോകദർശനത്തിന്റെ അടിസ്ഥാനത്തിലുള്ള നവീന ജ്ഞാന സങ്കല്പം-വൈജ്ഞാനിക ലോകം എന്ന ആശയം-സാംസ്കൃതിക വിദ്യയുടെ സ്വാധീനം- കൊളോണിയൽ വിദ്യാഭ്യാസത്തിന്റെ ശക്തിയും ദൗർലഭ്യവും അധികാരയുക്തിയും-സർവ്വകലാശാല വിദ്യാഭ്യാസം-ബദൽ വിദ്യാഭ്യാസ രീതികൾ- ഹൈടെക് പഠനരീതികൾ ഉത്തരാധുനിക വിദ്യാഭ്യാസ സങ്കല്പം.
5. സമ്പദ് വിനിമയത്തിലെ സംസ്കാര ചിന്ത-നാടോടിയിൽ നിന്ന് നാഗരികനിലേയ്ക്ക്-പ്രാചീന ഉത്പാദനരീതികൾ-സംഘകാല സമ്പദ്വ്യവസ്ഥ- കടൽവാണിജ്യത്തിന്റെ സാംസ്കാരിക വിനിമയങ്ങൾ- പ്രകൃതിസമ്പത്തും അധ്വാനശേഷിയും-പഴയ അങ്ങാടികൾ-സാഹിത്യസൂചനകൾ- ബാർട്ടർ സമ്പ്രദായം-പഴയ നാണയങ്ങൾ-പണമിടപാടുകൾ-ലാഭനിർമ്മിതി എന്ന ആശയം-വൈദേശിക സാമ്പത്തിക ലക്ഷ്യങ്ങളുടെ സ്വാധീനം-മധ്യകാലത്തെ മൂലധനസങ്കല്പം- അതിന്റെ പ്രേരണാശക്തികൾ-സമ്പദ് വിതരണത്തിലെ പ്രശ്നങ്ങൾ-തൊഴിൽ സമൂഹങ്ങളിലെ സമ്പദ്വ്യവസ്ഥ - രാജാവിനെ കേന്ദ്രീകരിച്ചുള്ള മുതലാളി

ത്തം-ഭൂവുടമാ മുതലാളിത്തം-കച്ചവടമുതലാളിത്തം-സമ്പത്തിന്റെ ജനാധിപത്യ വത്ക്കരണം- വാണിജ്യസംസ്കാരത്തിൽ പോർട്ടുഗീസ്, ഫ്രഞ്ച്, ഇംഗ്ലീഷ്, ഡച്ച് ശക്തികളുടെ പങ്ക്-

6. കേരളസംസ്കാരത്തിലെ മതാത്മകമൂല്യങ്ങൾ- മതം എന്ന സംസ്കാരം- മതമില്ലാത്ത പ്രാചീനകേരളം-ദ്രാവിഡസംസ്കാരത്തിലെ സമത്വചിന്ത- ബുദ്ധ-ജൈന മതസംസ്കാരങ്ങൾ-അവയുടെ സവിശേഷതകൾ-ധർമ്മചിന്തകൾ-സാംസ്കാരിക ഭാവുകത്വത്തിൽ മതബോധത്തിന്റെ സ്വാധീനം- ജൂതമതം-ഭക്തിപ്രസ്ഥാനം- ശൈവ, വൈഷ്ണവ, ശാക്തേയപ്രസ്ഥാനങ്ങൾ-ഹിന്ദുമതം-ശങ്കരാചാര്യരുടെ നിലപാടുകൾ-രചനാലക്ഷ്യങ്ങൾ- സംസ്കൃതഭാഷയും കേരളവും-പ്രാദേശികഭാഷകളുടെ അതിജീവനവും തമസ്കരണവും-ഭാഷാദേശീയതയെക്കുറിച്ചുള്ള സങ്കല്പങ്ങൾ-സംസ്കൃതഭാഷയുടെ ദേശീയവത്ക്കരണം-ഭാഷയും സംസ്കാരകേന്ദ്രീകരണവും- ആചാരാനുഷ്ഠാനങ്ങളിലെ സാംസ്കാരിക മൂല്യങ്ങൾ-തീർത്ഥാടന സങ്കല്പം - കേരളത്തിലെ തീർത്ഥാടന കേന്ദ്രങ്ങൾ - ക്രിസ്തുമത - ഇസ്ലാംമതം - അവയുടെ സാംസ്കാരിക ദർശനങ്ങൾ - ആചാരവിശ്വാസങ്ങൾ - യുക്തിവാദം - പ്ലൂയോമയമതം - വിദ്വാൻകുട്ടിയുടെ സമത്വ സംഘം - മതസമന്വയം
7. മധ്യകാലഘട്ടത്തിലെ ഭരണവ്യവസ്ഥ - വേണാട് - കോലത്തുനാട് - വള്ളുവനാട് - കോഴിക്കോട് രാജവംശം - മുഷക വംശം - സാമൂതിരി - വള്ളുവക്കോനാതിരി - വേണാട്ടുരാജവംശം - വൈദികശക്തികളുടെ അക്രമണങ്ങളും നാട്ടുരാജ്യങ്ങൾ തമ്മിലുള്ള സംഘർഷവും - മലബാർ - കൊച്ചി-തിരുവിതാംകൂർ - ജയസിംഹനാട് - ഭരണമാറ്റങ്ങൾ - മാമാങ്കം - നാട്ടാചാരങ്ങൾ - യുദ്ധങ്ങൾ- പോർട്ടുഗീസ് ശക്തിയും സാമൂതിരിയും - സ്വരൂപങ്ങൾ- വൈദേശിക ശക്തികളുടെ തന്ത്രങ്ങൾ - തിരുവിതാംകൂറിന്റെ ഭരണാധിപത്യം - മാർത്താണ്ഡവർമ്മയുടെ ഭരണകാലം - പരിഷ്കാരങ്ങൾ - കുളച്ചൽ യുദ്ധം - ശ്രീപത്മനാഭസ്വാമി ക്ഷേത്രം - ഹൈദരാലിയും ടിപ്പുവും- ശ്രീരംഗപട്ടണം ഉടമ്പടി - മലബാറിൽ ബ്രിട്ടീഷ് ഭരണം - പഴശ്ശിരാജ, വേലുത്തമ്പി ദളവ, വൈക്കം പത്മനാഭപിള്ള - പാരമ്പര്യ സംസ്കാരത്തിൽ ആധുനിക സംസ്കാരത്തിലേയ്ക്ക്- കൊളോണിയൽ കേരളം, ഒരു വിലയിരുത്തൽ - ഉപഭോഗ സംസ്കാരം
8. ആധുനിക പൂർവകേരളം- കാർഷിക വിപ്ലവങ്ങൾ- ജന്മിത്തത്തിനെതിരെയുള്ള കലാപങ്ങൾ- ജാതീയമായ ഉച്ചനീചത്വങ്ങൾക്കെതിരെയുള്ള സമരങ്ങൾ- മാപ്പിളലഹള, പുലയലഹള- പാർശ്വവത്ക്കരിക്കപ്പെട്ടവരുടെ പ്രതിരോധങ്ങൾ- മിഷനറി

മാരുടെ സ്കൂൾ സ്ഥാപനം- പത്തൊമ്പതാം നൂറ്റാണ്ടിലെ കേരളീയ സംഘടനകൾ- ശൗണ്ഡികധർമ്മപരിപാലനയോഗം- ഈഴവ മഹാജനസഭ- മലയാളിസഭ- ശ്രീനാരായണ ധർമ്മപരിപാലനയോഗം- എൻ. എസ്. എസ് - കേരളീയ നായർ സമാജം- ബാസൽ മിഷൻ- ചർച്ച് മിഷൻ- ലണ്ടൻമിഷൻ സൊസൈറ്റി- ജ്ഞാന പ്രജാഗരം സഭ- ശൈവപ്രകാശസഭ.

9. നവോത്ഥാനദർശനങ്ങൾ- പത്തൊമ്പത്, ഇരുപത് നൂറ്റാണ്ടുകളിലെ നവോത്ഥാനത്തുടിപ്പുകൾ- പാതിരിമാരുടെ പരിശ്രമങ്ങൾ- അച്ചടിശാലകൾ- പള്ളിക്കൂടങ്ങൾ- ആനുകാലികങ്ങളുടെ പ്രസാധനം- കേണൽ മൺറോയുടെ നിലപാടുകൾ- സന്യാസിമാരുടെ വിചാരവിപ്ലവങ്ങൾ- തിരുവിതാംകൂറിലെ അയിത്തോച്ചാടനപ്രവർത്തനങ്ങൾ- വിളംബരങ്ങൾ- മാറുമറക്കൽ കലാപങ്ങൾ- ഊരാച്ചേരി ഗുരുക്കന്മാർ- ആത്മീയതയും നവോത്ഥാനസങ്കല്പങ്ങളും- വൈകുണ്ഠസ്വാമികൾ- വിദ്വാൻകുട്ടി- തപസ്വി ഓമലൻ- ചട്ടമ്പിസ്വാമികൾ- ശ്രീനാരായണഗുരു- മക്തിതങ്ങൾ- അയ്യൻകാളി- ബ്രഹ്മാനന്ദശിവയോഗി- പൊയ്കയിൽ കുമാര ഗുരു- വാഗ്ഭടാനന്ദഗുരു- വക്കം മൗലവി- ഡോ. പത്മപു, ടി. കെ. മാധവൻ, സ്വദേശാമാനി സഹോദരൻ അയ്യപ്പൻ, രാമകൃഷ്ണപിള്ള- ആഗമാനന്ദസ്വാമികൾ- ശുഭാനന്ദഗുരുദേവൻ- ആനന്ദതീർഥർ, കുമ്പളത്ത് ശങ്കുപ്പിള്ള എന്നിവർ നടത്തിയ കുളിവിപ്ലവങ്ങൾ- സാമൂഹികനീതിയ്ക്കുവേണ്ടിയുള്ള സമരങ്ങൾ- ചാന്നാർ ലഹള, പെരിനാട് ലഹള- എൻ.എസ്. എസ്- എസ് എൻ. ഡി. പി, പ്രസ്ഥാനങ്ങളുടെ നവോത്ഥാന സംഭാവനകൾ- തീർഥപാദപരമഹംസർ, അധ്യാത്മഭാരതി ചിന്നമ്മ- സാധുജനപരിപാലനയോഗം- സഹോദരമിഷൻ- യോഗക്ഷേമസഭ- നാടകങ്ങളിലൂടെ നവോത്ഥാനം- സ്ത്രീനാടകങ്ങൾ- വെള്ളരിനാടകങ്ങൾ- സംഗീതനാടകങ്ങൾ- ദേവകി നിലയങ്ങോട്, ആര്യാപള്ളം- വൈക്കം സത്യാഗ്രഹം- ഗുരവായൂർ സത്യാഗ്രഹം- മാപ്പിള ലഹള- ഇസ്ലാം മത നവോത്ഥാനപ്രസ്ഥാനങ്ങൾ- ഇടതുപക്ഷ പ്രസ്ഥാനങ്ങൾ- രാഷ്ട്രീയ കേരളം: ഒരു വിചിന്തനം.

10. നവകേരളം - ഭരണമാറ്റങ്ങൾ- നിവർത്തന പ്രക്ഷോഭം- രാഷ്ട്രീയ കേരളത്തെ സ്വാധീനിക്കുന്ന സാംസ്കാരിക സംവർഗങ്ങൾ- ജനകീയ പ്രക്ഷോഭങ്ങൾ- തിരുവിതാംകൂർ- കൊച്ചി സംയോജനം- ഐക്യകേരളം- കേരളപ്പിറവി- ഇ എം എസ് മന്ത്രി സഭ- വിമോചന സമരം- പഞ്ചവത്സര പദ്ധതികൾ- വികസന നയങ്ങൾ- കേരള മോഡൽ: പാരിസ്ഥിതിക പ്രത്യാഘാതങ്ങൾ- ജൈവികനയത്തിന്റെ അനിവാര്യത- സാംസ്കാരിക പുരോഗതി: ഒരു വിലയിരുത്തൽ.

11. (a) കേരള സംസ്കാരത്തിന്റെ ഉള്ളടക്കങ്ങൾ- കലാ- സാംസ്കാരിക മണ്ഡലങ്ങൾ- കലാസംഘടനകൾ- ഗ്രന്ഥശാലകൾ- ഗ്രന്ഥശാലാ പ്രസ്ഥാനം- ശാസ്ത്ര സാഹിത്യ പരിഷത്ത്- സാഹിത്യ പ്രവർത്തക സഹകരണസംഘം- ശാസ്ത്രസാങ്കേതിക പഠന ഗവേഷണശാലകൾ- ബദൽ പാഠശാലകൾ- പാരിസ്ഥിതിക സംഘടനകൾ- ആർട്സ് സ്പോർട്സ് ക്ലബ്ബുകൾ- അമേച്വർ നാടക സംഘങ്ങൾ- പ്രൊഫഷണൽ നാടകവേദികൾ- വിനോദ ക്ലബ്ബുകൾ- ടൂറിസം- കഥകളി സംഘങ്ങൾ- കേരള സാഹിത്യ അക്കാദമി- ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്- സർവ്വവിജ്ഞാന കോശം ഇൻസ്റ്റിറ്റ്യൂട്ട്- കേരള ആർക്കൈവ്സ്, കരടികളി സംഘം- നാടോടി ഗായകസംഘം - ഗാനമേള സംഘങ്ങൾ- ശാസ്ത്ര പഠന സംഘങ്ങൾ - കായിക കലാസ്ഥാപനങ്ങൾ - തൊഴിൽ രംഗത്തെ സാംസ്കാരിക സംഘടനകൾ- പൂർവ്വ വിദ്യാർത്ഥി സംഘടനകൾ

(b) കേരളീയ കലകൾ

ചിത്രകല, ശില്പകല, ചമയകല, വാസ്തുക്കല, സംഗീതകല-രാജാരവിവർമ്മ- ഷാഡോ ആർട്ട്- ക്ഷേത്രകലകൾ- പടയണി, ചുട്ടേറ്റ്, പറന്നേറ്റ്, മുടിയേറ്റ്, തെയ്യം, തിറ, തീയാട്ട്, തോൽപ്പാവക്കൂത്ത്, രുതികക്കോലമെടുപ്പ്- കേരളീയ സംഗീതം- ക്ലാസ്സിക്കൽ സംഗീതം- വിദ്യാൻകുട്ടിയുടെ കീർത്തനങ്ങൾ- കെ.സി. കേശവപ്പിള്ളയുടെ കീർത്തനങ്ങൾ- കെ.സി.കേശവപ്പിള്ളയുടെ സംഗീത പോഷണം- സ്വാതിതിരുനാളിന്റെ സംഭാവനകൾ- കേരളകലാമണ്ഡലം - ലളിത കലാ അക്കാദമി- ചലച്ചിത്ര അക്കാദമി- സ്കൂൾ ഓഫ് ഡ്രാമ- നാടകക്കളരി- പുത്തൻ പരീക്ഷണനാടകങ്ങൾ- അനുഷ്ഠാന നാടകങ്ങൾ.

(c) കേരളീയ കലാസംസ്കാരത്തിൽ സോഷ്യൽ മാധ്യമങ്ങളുടെ പങ്ക്- ടി.വി. ചാനൽ പരിപാടികളുടെ സാംസ്കാരിക പങ്കാളിത്തം- നവീന കലാപരിപാടികൾ- നർമ്മകല- അവതരണ കല- സ്റ്റേജ് ഷോസംസ്കാരം- സാംസ്കാരിക കലാ പരിപാടികളും പ്രൊഫഷണൽ സമീപനങ്ങളും- മാറുന്ന ലോകം, മാറുന്ന കേരളം: ഒരു വിശകലനം.

സഹായകഗ്രന്ഥങ്ങൾ

1. കേരളചരിത്രം - എ. ശ്രീധരമേനോൻ.
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മലയാള ഭാഷാവ്യാകരണ ചരിത്രത്തിൽ ഇതഃപര്യന്തമുള്ള പ്രവണതകൾ വിശദമായി മനസ്സിലാക്കുയാണ് ഈ പേപ്പറിന്റെ ലക്ഷ്യം. വ്യാകരണത്തിൽ ലഭ്യമായ സമീപനരീതികൾ അറിയുക. വ്യാകരണ സിദ്ധാന്തങ്ങളെയും, സങ്കല്പനങ്ങളെയും വിശദീകരിക്കാനായി വിലയിരുത്തുക തുടങ്ങിയവ പ്രധാനമാണ്. വ്യാകരണതത്ത്വങ്ങൾ ചരിത്രപരമായും വിവരണാത്മകമായും പഠനവിഷയമാക്കണം. ഭാഷാപഠനത്തിൽ വ്യാകരണപഠനത്തിന്റെ പ്രാധാന്യം മനസ്സിലാക്കി പുതിയ ഗവേഷണ മേഖലകളിലേക്ക് പഠനം വ്യാപിപ്പിക്കുക എന്നതും മുഖ്യ ഉദ്ദേശ്യമായിരിക്കണം.

വ്യാകരണപഠനത്തിന്റെ സാമാന്യജ്ഞാനം ബിരുദ പഠനത്തിൽത്തന്നെ നേടിയെടുത്തിട്ടുള്ള പഠിതാവ്. ഇക്കാര്യത്തിൽ മികച്ച ധാരണ നേടിയെടുക്കേണ്ടതായിട്ടുണ്ട്. ഏതെങ്കിലും ഒരു കൃതിയെ മാത്രം കേന്ദ്രീകരിച്ചുള്ള പഠനം ഭാഷാചരിത്ര, വ്യാകരണ മേഖലയിൽ പരിപൂർണ്ണത നൽകുകയില്ല എന്ന തിരിച്ചറിവ് ഉണ്ടാകണം. ഇതിന് വ്യാകരണ സംബന്ധമായ പഴയതും പുതിയതുമായ നിലപാടുകളും, ഭാഷയിൽ സംഭവിച്ചിട്ടുള്ള പരിണാമങ്ങളും അറിഞ്ഞിരിക്കേണ്ടതാണ്. മലയാള ഭാഷയുടെ വ്യാകരണ സംബന്ധമായി ഉണ്ടായിട്ടുള്ള പ്രധാന രചനകളെയും താരതമ്യം ചെയ്തു പഠിക്കുന്നത് കൂടുതൽ പ്രയോജനപ്രദമായിരിക്കും.

1. വ്യാകരണരചന - ലക്ഷ്യവും, പ്രശ്നങ്ങളും, ആകരസാമഗ്രികളും വിവിധ വ്യാകരണ സമീപനങ്ങളുടെ അടിസ്ഥാനത്തിൽ പരിശോധിക്കണം.
2. ആദ്യകാല മലയാളവ്യാകരണഗ്രന്ഥങ്ങൾ - ലീലാതിലകം മുതൽ ഇരുപതാം നൂറ്റാണ്ടിന്റെ ആദ്യശതകങ്ങൾവരെയുള്ള രചനകൾ - മിഷനറിമാരുടെ സംഭാവനകൾ - കേരളഭാഷാവ്യാകരണം - മലയാൾമയുടെ വ്യാകരണം - കേരളകൗമുദി -

കേരളപാണിനീയം ആദ്യപതിപ്പ് - വ്യാകരണമിത്രം-തുടങ്ങിയവയുടെ സാമാന്യ ജ്ഞാനം.

3. കേരളപാണിനീയം പണ്ടാംപതിപ്പ് - വ്യാകരണപരമായ സമീപനരീതിയിലെ വ്യതിയാനങ്ങൾ - കേരളപാണിനീയത്തിനുള്ളിലായ വിമർശനങ്ങൾ - നാളിതുവരെ യുണ്ടായ പ്രധാന വ്യാകരണ ഗ്രന്ഥങ്ങൾ - കണ്ടെത്തലുകൾ.
4. ഭാഷാൽപ്പത്തിവാദങ്ങൾ - സാംസ്കൃതജന്യവാദം - തമിഴ് ജന്യവാദം - സ്വാതന്ത്ര്യതാവാദം - മിശ്രഭാഷാവാദം - പൂർവ്വതമിഴ്ജന്യവാദം - ഭാഷാസംക്രമണവാദം - ക്ലാസ്സിക്കൽ പദവിയുടെ ലഭ്യത - എന്നിവ ഉപദാനങ്ങളെ പ്രമാണമാക്കി പരിശോധിക്കുക. ലീലാതിലകം മുതൽ ഇന്നുവരെയുള്ള ഗ്രന്ഥങ്ങൾ പരിശോധന വിഷയമാക്കേണ്ടതാണ്.
5. അക്ഷരമാല - വർഗ്ഗീകരണവും, വിവരണവും - മലയാളത്തിന്റെ വർണ്ണവ്യവസ്ഥ - ഉച്ചാരണരീതിയിൽ - ശ്രുതിഭേദകാരണങ്ങൾ - വർണ്ണവികാരം - സന്ധി - കേരളപാണിനീയം, ലീലാതിലകം, പാച്ചുമുസ്സതിന്റെ കേരളഭാഷാവ്യാകരണം, ഭാഷാശാസ്ത്രത്തിലെ ധ്വനിഭേദനിയമങ്ങൾ (Laws of Phenetical Charge) എന്നിവയുടെ ചർച്ചയും താരതമ്യവും വിമർശനവും നടത്തണം.
6. ശബ്ദവിഭാഗം - വാചകം - ദ്യോതകം - നാമം - കൃതി - ഭേദകവിഭജനം - ഭേദകവിഭജനത്തിലെ യുക്തികൾ - ഭേദകവിഭജനത്തിന്റെ വിമർശനങ്ങൾ - ദ്യോതകം - വിഭജനങ്ങൾ - നാമവിശേഷണങ്ങളും, ക്രിയാവിശേഷണങ്ങളും ഉണ്ടോ? - എന്നിവ കേരളപാണിനീയത്തിലെയും, അതുതര വ്യാകരണ ഗ്രന്ഥത്തിലെയും ചർച്ചകളുടെ അടിസ്ഥാനത്തിൽ പരിശോധിക്കുക.
7. നാമങ്ങളിൽ ചേർക്കേണ്ട ലിംഗ - വചന - വിഭക്തികളുടെ പ്രത്യയങ്ങളും അവയുടെ ആഗമാനചരിത്രവും - ലീലാതിലകം രണ്ടാം ശില്പത്തിലെ ലിംഗ, വചന, വിഭക്തി കാര്യങ്ങളുമായി താരതമ്യം ചെയ്യുക - വിഭക്തോഭാസം - കാരകം - സമാസങ്ങൾ - സമാസത്തിന്റെ വകഭേദങ്ങൾ - തദ്ധിതം എന്നിവ പരിശോധിച്ച് വിലയിരുത്തുക.
8. ക്രിയാവിഭാഗം - കാരിതം, അകാരിതം, കേവലം - പ്രയോജകം, സകർമ്മകം-അകർമ്മകം, മുറ്റുവിന - പറ്റുവിന, പേരെച്ചം - വിനയച്ചം എന്നിവ വിമർശന ബുദ്ധ്യ പരിശോധിക്കുക.

9. കാലം - പ്രകാരം - പ്രയോഗങ്ങൾ - അനുപ്രയോഗം - നിഷേധം പ്രയോഗസന്ദർഭങ്ങൾ - പ്രത്യയങ്ങളുടെ ഉൽപ്പത്തിചിത്രങ്ങൾ - കൃത്ത് എന്നിവ വിലയിരുത്തുക.
10. വാക്യം - വാക്യങ്ങളിലെ പദക്രമം, പൊരുത്തം, മലയാളത്തിലെ വാക്യപഠനം സമീപനങ്ങൾ - കർത്തരി - കർമ്മണി പ്രയോഗങ്ങൾ എന്നിവ ഭാഷാശാസ്ത്രത്തിലെ വാക്യവിജ്ഞാനീയവുമായി താരതമ്യം പരിശോധിക്കുക.
11. മലയാള വ്യാകരണ പഠനത്തിൽ ലീലാതിലകത്തിന് സവിശേഷപ്രാധാന്യമുള്ളതിനാൽ ലീലാതിലകത്തിലെ വ്യാകരണ സംബന്ധമായ കാര്യങ്ങൾ പ്രധാനമായി പരാമർശിക്കുന്ന രണ്ടും, മൂന്നും ശില്പങ്ങൾ പ്രധാനമായും പഠിക്കേണ്ടതാണ്. ഒന്നാം ശില്പത്തിൽനിന്നും ഭാഷാചരിത്രപരമായും വ്യാകരണ പ്രധാനമായും മുള്ള പരാമർശങ്ങളും സവിശേഷ പഠനത്തിന് വിഷയമാക്കേണ്ടതാണ്. ഉദാ: നമ്പ്യാന്തമിഴ് - കൂന്തൽാദം തുടങ്ങിയവയെപ്പറ്റിയുള്ള ചർച്ചകൾ.

ആധാരഗ്രന്ഥങ്ങൾ

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2. ലീലാതിലകം - ഒന്ന്, രണ്ട്, മൂന്ന് ശില്പങ്ങൾ
3. കേരളകൗമുദി - കോവുണ്ണി നെടുങ്ങാടി
4. കേരളഭാഷാവ്യാകരണം - വൈക്കത്ത് പാച്ചുമുത്തത്ത്
5. കൈരളീ ശബ്ദാനുശാസനം - കെ. സുകുമാരപിള്ള
6. കേരളപാണിനീയപഠനങ്ങൾ - ഡോ. പുതുശ്ശേരി രാമചന്ദ്രൻ
7. കേരളപാണിനീയഭാഷ്യം - പ്രൊഫ. സി. എൽ. ആന്റണി
8. മലയാള വ്യാകരണ സമീക്ഷ - ഡോ. കെ.എം. പ്രഭാകരവാര്യർ
9. ഭാഷാശാസ്ത്രചിന്തകൾ - പ്രൊഫ. സി.ജെ. റോയി
10. മലയാളശൈലി - കുട്ടികൃഷ്ണമാരാർ
11. ഭാഷാനിരീക്ഷണം - ഡോ. എൻ.ആർ. ഗോപിനാഥപിള്ള
12. ആധുനികസാഹിത്യചരിത്രം പ്രസ്ഥാനങ്ങളിലൂടെ-
എഡിറ്റർ ഡോ.കെ.എം. ജോർജ്ജ്
13. ഏ.ആർ. വിജ്ഞാനീയം - മലയാള സർവ്വകലാശാല, തിരുർ,

നിർദ്ദേശം

ആധാരഗ്രന്ഥങ്ങളായി നൽകിയിട്ടുള്ള രചനകൾ അദ്ധ്യാപകരും, പഠിതാക്കളും കൃത്യമായും മനസ്സിലാക്കിയിരിക്കേണ്ടതാണ്.

സഹായകഗ്രന്ഥങ്ങൾ

കേരളപാണിനീയവിജ്ഞാനീയം - Vol.I, II മലയാള സർവ്വകലാശാല, തിരുർ.

1. ശബ്ദസൗഭാഗം - ഫാ: ജോൺ കുറുപ്പള്ളി
2. വ്യാകരണമിത്രം - ശേഷഗിരിപ്രഭു
3. പ്രാചീന മലയാളം - പുതുശ്ശേരി രാമചന്ദ്രൻ
4. വ്യാകരണവിവേകം - ഡോ. എൻ.എൻ. മുസത്
5. ഭാഷാപഠനങ്ങൾ - പ്രൊഫ. സിജിൽ ആന്റണി
6. കേരളഭാഷാവ്യാകരണം - ഡോ.ഇ.വി.എൻ. നമ്പൂതിരി
7. ഭാഷാവലോകം - ഡോ. ടി.ബി. വേണുഗോപാലപണിക്കർ
8. കേരളഭാഷാവിജ്ഞാനീയം - ഡോ. ഗോദവർമ്മ
9. വ്യാകരണപഠനങ്ങൾ - പ്രൊഫ. കെ.വി. രാമചന്ദ്രപൈ
10. ദ്രാവിഡഭാഷകളുടെ താരതമ്യവ്യാകരണം - റവ: റോബർട്ട് കാൽസ്വൽ
11. വാക്യവും ക്രിയയും മലയാളത്തിൽ - വി.കെ. ഹരിഹരനുണ്ണിത്താൻ
12. മലയാള വ്യാകരണ സിദ്ധാന്തങ്ങൾ, കേരളപാണിനിക്കുശേഷം
-ഡോ.എൻ.കെ. മേരി
13. വ്യാകരണം - ഡോ. സി.ആർ. പ്രസാദ്
14. ഭാഷാശാസ്ത്രത്തിലെ ചോംസ്കിയൻ വിപ്ലവം - ഡോ.കെ.എൻ. ആനന്ദൻ.
15. സന്ധിനിയമങ്ങൾ മലയാള വ്യാകരണ രചനയിൽ - ഡോ.എൻ. രാജേന്ദ്രൻ
16. സമകാലിക മലയാള വ്യാകരണം-എഡി. ശരത്ചന്ദ്രൻ നായർ, സി.ജി. രാജേന്ദ്രൻ ബാബു.

ഗവേഷണരീതിശാസ്ത്രം

Unit – 1

ഗവേഷണം, ജോർജ് വാട്സൺ, ജോൺ ഡബ്ലിയു ബെസ്റ്റ് തുടങ്ങിയവരുടെ നിർവ്വചനങ്ങൾ, നിരൂപണം എന്നിവയിൽ നിന്നു ഗവേഷണം വ്യത്യസ്തമാകുന്നതെങ്ങനെ ? ഗവേഷണത്തിന്റെ മുഖ്യസ്വഭാവങ്ങൾ.

Unit – 2

ഗവേഷണ പൂർവ്വ വായന(Pre- research reading)ഗവേഷണ വിഷയം- പലതരം വിഷയങ്ങൾ - Empathical, Survey type മുതലായവ- ഗവേഷകനുണ്ടായിരിക്കേണ്ട ഗുണങ്ങൾ.

Unit – 3

ആകരണാത്മകശീലങ്ങൾ- ഗവേഷണത്തിനു സമാന്തരമായിത്തന്നെ സഹായക ഗ്രന്ഥ സൂചി നിർമ്മിക്കൽ- കാർഡ് സമ്പ്രദായം- പ്രബന്ധരൂപരേഖ- അതിന്റെ ഘടന, ഉണ്ടായിരിക്കേണ്ട മുഖ്യ ഘടകങ്ങൾ.

Unit – 4

പ്രബന്ധക്കുറിപ്പ് തയ്യാറാക്കൽ- കാർഡ്സമ്പ്രദായം, ഫയൽ സമ്പ്രദായം

Unit – 5

ഗവേഷണസമീപനരീതി- വിഷയാധിഷ്ഠിതം, വീക്ഷണാധിഷ്ഠിതം എന്നവിഭജനമനുസരിച്ച് 6 തരം സമീപനരീതികൾ

Unit – 6

പ്രബന്ധ രചന- ഉപോദ്ഘാതം, പ്രബന്ധശരീരം, ഉപദർശനങ്ങൾ- എഴുത്തിന്റെ വിവിധ ഘട്ടങ്ങൾ- ഗവേഷണ പ്രബന്ധത്തിലെ ഭാഷ

Unit – 7

പാഠവിമർശനവും രചനാശീല്പ പഠനവും

Unit – 8

പരാമർശം-സൂചക പരാമർശവും വിവരണാത്മക പരാമർശവും-പരാമർശങ്ങളിൽ ഉൾപ്പെടേണ്ടുന്ന 6 കാര്യങ്ങൾ- ഉദ്ധാരണം- ശ്രദ്ധിക്കേണ്ട 5 കാര്യങ്ങൾ.

Unit – 9

പ്രബന്ധ സംവിധാനം- പ്രാഥമിക കാര്യങ്ങൾ, പ്രബന്ധ ശരീരം, പരാമർശ സാമഗ്രി- 7 പ്രാഥമിക കാര്യങ്ങൾ- പ്രബന്ധശരീരത്തിന്റെ ഘടന, അവയവങ്ങൾ- ഉപദർശനങ്ങളുടെ സ്വഭാവം.

Unit – 10

ഗ്രന്ഥസൂചി തയ്യാറാക്കേണ്ടുന്ന വിധം- DTPയിൽ ശ്രദ്ധിക്കേണ്ട കാര്യങ്ങൾ.

റഫറൻസ്

1. ഗവേഷണം : പ്രബന്ധരചനയുടെ തത്ത്വങ്ങൾ- ചാത്തനാത്ത് അച്യുതനുണ്ണി
2. ഗവേഷണരീതിശാസ്ത്രം- ഡോ.നടുവട്ടം ഗോപാലകൃഷ്ണൻ
3. ഗവേഷണ പദ്ധതി - കേരള സർവ്വകലാശാല പ്രസിദ്ധീകരണം.

ML-221, ആധുനികസാഹിത്യം - ഗദ്യം

പഠനലക്ഷ്യം

ആവിഷ്കാരം, ആസ്വാദനം എന്നീ തലങ്ങളിൽ പദ്യസാഹിത്യം നിലനിർത്തിയിരുന്ന പ്രാമാണികതയിലേക്ക് കടന്നുകയറാനും, പിൽക്കാലത്ത് ആധിപത്യം പുലർത്താനുമുള്ള പ്രാദേശിക മലയാള ഗദ്യസാഹിത്യം നടത്തിയത്. 19-ാം നൂറ്റാണ്ടിന്റെ അന്ത്യദശകങ്ങളിലാണ്. ഭാഷാ ഘടനയ്ക്കുണ്ടായ വളർച്ചാവികാസങ്ങൾ പോലും തർജ്ജമയെയും അനുകരണങ്ങളെയും വിട്ട് സ്വതന്ത്രപദവിയിലേക്കുയർന്ന ഇവിടുത്തെ ഗദ്യസാഹിത്യത്തിന്റെ നാനാവിധമായ പരിണാമങ്ങളോട് കടപ്പെട്ടിരിക്കുന്നു.

നോവൽ, ചെറുകഥ, നാടകം, ആത്മകഥ, ജീവചരിത്രം എന്നീ സാഹിത്യരൂപങ്ങളുടെ രചനാപരവും ഭാവുകത്വപരവുമായ സവിശേഷതകളെക്കുറിച്ച് ചരിത്രാത്മകമായ അവഗാഹം ഉണ്ടാക്കുകയാണ് പഠനലക്ഷ്യം. രചനാ സങ്കേതമായും ആസ്വാദനത്തെ നിർണ്ണയിക്കുന്ന പ്രവണതയായും വിവിധ സാഹിത്യപരികല്പനകൾ മലയാളത്തിൽ വ്യാപിച്ചതിന്റെ സംവാദതലങ്ങൾ പരിചയിക്കുന്നതിന് പ്രാദിനിധ്യസ്വഭാവമുള്ള കൃതികളാണ് തെരഞ്ഞെടുത്തിരിക്കുന്നത്.

I. നോവൽ

ഇതിവൃത്തം, ആഖ്യാനം, പശ്ചാത്തലം, വീക്ഷണം, ദർശനം തുടങ്ങിയ സംവർഗ്ഗങ്ങളിലുണ്ടായ പരിവർത്തനങ്ങൾ അന്വേഷിക്കുന്നു.

1. ഇന്ദുലേഖ	- ഒ.ചന്ദ്രമേനോൻ
2. രാമരാജബഹദൂർ	- സി.വി. രാമൻപിള്ള
3. ബാല്യകാലസഖി	- വൈക്കം മുഹമ്മദ് ബഷീർ
4. ഏണിപ്പടികൾ	- തകഴി ശിവശങ്കരപ്പിള്ള
5. ഒരു വഴിയും കുറേ നിഴലുകളും	- രാജലക്ഷ്മി

II. ചെറുകഥ

പ്രമേയം ആഖ്യാനരീതി, വ്യക്തിസങ്കല്പങ്ങൾ, സ്ഥലകാലദർശനം ഇവയിലുണ്ടായ മാർഗ്ഗങ്ങൾ.

1. ഒരുപൊട്ടുഭാഗ്യം	- വേങ്ങയിൽ കുഞ്ഞിരാമൻ നായർ
2. കൂനിയുടെ ചികിത്സ	- കെ. സുകുമാരൻ
3. മുടൽമഞ്ഞ്	- ഉറൂബ്
4. ചോലമരങ്ങൾ	- സരസ്വതിയമ്മ കെ.
5. സ്വർഗ്ഗത്തിലൊരു ചെങ്കുത്താൻ	- കേശവദേവ്
6. ചക്രാന്തി അട	- ടി. കെ.സി. വടുതല
7. കാൽചക്രം	- കാരൂർ നീലകണ്ഠപിള്ള
8. മുടുപടത്തിൽ	- ലളിതാംബിക അന്തർജ്ജനം
9. ഹീനജന്മം	- മുട്ടത്തുവർക്കി

III. ആത്മകഥ, ജീവചരിത്രം, യാത്രാവിവരണം

1. സാഹിത്യപഞ്ചാനൻ	- പി.കെ. പരമേശ്വരൻ നായർ
2. കൊഴിഞ്ഞ ഇലകൾ	- ജോസഫ് മുണ്ടശ്ശേരി
3. അമേരിക്കയിലൂടെ	- എൻ.വി. കൃഷ്ണവാരിയർ

IV. നാടകം

1. ബി.എ. മായാവി	- ഇ.വി. കൃഷ്ണപിള്ള
2. ബലാബലം	- എൻ.കൃഷ്ണപിള്ള
3. ആ മനുഷ്യൻ നീ തന്നെ	- സി.ജെ. തോമസ്
4. ലങ്കാലക്ഷ്മി	- സി.എൻ. ശ്രീകണ്ഠൻ നായർ

സഹായകഗ്രന്ഥങ്ങൾ

1. ആധുനികമലയാളസാഹിത്യചരിത്രം പ്രസ്ഥാനങ്ങളിലൂടെ	
2. സമ്പൂർണ്ണ മലയാള സാഹിത്യചരിത്രം - എഡി. പത്മനാഭചന്ദ്രൻ നായർ	
3. മലയാളനോവൽ സാഹിത്യചരിത്രം	- ഡോ.കെ.എം. തരകൻ
4. നോവൽ സാഹിത്യപഠനങ്ങൾ	- ഡോ.ഡി. ബഞ്ചമിൻ
5. മലയാളനോവൽ 19-ാം നൂറ്റാണ്ടിൽ	- ഡോ. ജോർജ്ജ് ഇരുമ്പയം
6. മാറുന്ന മലയാളനോവൽ	- കെ.പി. അപ്പൻ
7. ചെറുകഥാ സാഹിത്യം	- എം.പി. പോൾ
8. കാമികന്റെ പണിപ്പുര	- എം.ടി. വാസുദേവൻനായർ
9. ചെറുകഥ ഇന്നലെ, ഇത്	- എം. അച്യുതൻ
10. മലയാള ചെറുകഥാസാഹിത്യചരിത്രം	- ഡോ.എം.എം. ബഷീർ
11. കലയും ഭാവുകത്വപരിണാമവും	- കെ.എസ്. രവീകുമാർ
12. മലയാളനാടക സാഹിത്യചരിത്രം	- ജി. ശങ്കരപ്പിള്ള
13. പ്രതിപാത്രം ഭാഷണഭേദം	- എൻ. കൃഷ്ണപിള്ള
14. നോവൽ സിദ്ധിയും സാധനയും	- പി.കെ. ബാലകൃഷ്ണൻ
15. വാമൊഴിയുടെ സൗന്ദര്യശാസ്ത്രം	- ഡോ.എൻ. അജിത്കുമാർ
16. നോവലും ആഖ്യാനകഥയും	- ഡോ. എം. വിജയൻപിള്ള
17. മായാത്തസന്ധ്യകൾ	- പി.കെ.ബാലകൃഷ്ണൻ
18. The Craft of Fiction	- Perly Lubbock

19. Style in Fiction	- Longman
20. Realism & reality The Novel & Society in India	- Meenakshi Mukherjee
21. The Novel in India	- Ed. T.W. Clark
22. The Art of the Novel	- Milan Kundera

ML-222, ആധുനിക സാഹിത്യം - പദ്യം

ആത്മചേതനയും ചരിത്രചേതനയും കവിതയിലുണ്ട്. കവിയിലൂടെ വായിക്കപ്പെടുന്ന സാംസ്കാരിക ചരിത്രം കൂടിയാണ് കവിത. ഓരോ കാലഘട്ടത്തെയും രൂപപ്പെടുത്തുന്ന പ്രേരണാശക്തികളെ വൈകാരികമായും വൈചാരികമായും വിചാരണ ചെയ്യുന്ന കലയാണ് കവിത. പാഠം എന്ന നിലയിൽ സാമൂഹിക പരിണാമങ്ങളെയും സാഹിത്യകല എന്ന നിലയിൽ ആസ്വാദന രസഭേദങ്ങളെയും കവിതപിൻതുടരുന്നു. സമൂഹത്തന്റെ ഭാവശക്തിയായി പ്രവർത്തിക്കുന്ന കാവ്യപാഠങ്ങളുടെ വിശകലനമാണ് ഇവിടെ പഠനലക്ഷ്യം.

മലയാളിയുടെ സാംസ്കാരികബോധത്തിൽ ആധുനിക ജീവിതം വരുത്തിയ മാറ്റങ്ങൾ കവിതയിലൂടെ തെളിഞ്ഞുകാണാം. ആ തിരിച്ചറിവുകളെയാണ് ഈ പഠനം ലക്ഷ്യം വയ്ക്കുന്നത്.

1. രൂപശീലത്തിൽ നിന്ന് ഭാവശക്തിയിലേക്ക്

വിനോദമൂല്യങ്ങളുടെ പാരമ്പര്യ പ്രകൃതി- സമസ്യാപൂരണം - ഇംഗ്ലീഷ് വിദ്യാഭ്യാസം, അച്ചടി, ആനുകാലികങ്ങളുടെ പ്രചാരം, വൈദേശിക മതബോധനം എന്നിവയുടെ സ്വാധീനം- വിനോദത്തിൽ നിന്ന് വിചിന്തനത്തിലേക്ക്- വടക്കൻ കവിതയിലെ ശൃംഗാരപ്രാധാന്യവും തെക്കൻപാട്ടിലെ യുദ്ധവീര്യവും- വെൺമണി കവിതയും കേരളവർമ്മയുടെ കാവ്യദർശനങ്ങളും - പച്ചമലയാളം -ഭക്തിക്കവിതകൾ- കവിതക്കത്ത്-ദേശീയതയുടെയും വ്യക്തിബോധത്തിന്റെയും കാന്തനാദങ്ങൾ- വൈയക്തികചിന്തകളുടെ നിഴലും വെളിച്ചവും.

I. സമസ്യാപൂരണങ്ങൾ, കവിതക്കത്ത്, ബാലകവിത, മൂക്തകങ്ങൾ

1. കനിവവളിലുദിക്കാല്ല...	- ഒറവങ്കര

2. തിണ്ണം ചെന്നിട്ടു തീയിൽ - കാത്തുള്ളിൽ അച്യുതമേനോൻ
3. കഥകളിക്കേണം മിഴിക്കോണിനാൽ - ശീവൊള്ളി നാരായണൻ നമ്പൂതിരി
4. ബാലശിക്ഷയ്ക്കലട്ടുന്നു.(കവിതക്കത്ത്)- കുഞ്ഞിക്കുട്ടൻ തമ്പുരാൻ
5. മാണിക്യമാമലയിൽ (കവിതക്കത്ത്) - ചട്ടമ്പിസ്വാമികൾ
6. ദൈവനേ കൈതൊഴാം (ബാലകവിത) - പന്തളം കേരളവർമ്മ
7. പാടത്തിൻ കര - രാമപുരത്ത് വാര്യർ
8. മുടില്ലാഞ്ഞൊരു മുണ്ടുകൊണ്ട് - പുന്തോട്ടം
2. ജാതിക്കുമ്പി (ആദ്യത്തെ 25 വരികൾ) - കെ. പി. കറുപ്പൻ
3. മയൂര സന്ദേശം
(ആദ്യത്തെ 28 വരികൾ) - കേരളവർമ്മ വലിയകോയിത്തമ്പുരാൻ
4. മലയവിലാസം - ഏ. ആർ.
(ഇരുണ്ട നീണ്ടെത്തിതു.... പണ്ടേ
പെരും പ്രാതലിനാക്കിയേനേ (ആദ്യത്തെ 28 വരികൾ)
5. അറിവ് (പച്ചമലയാള കവിത) - ശ്രീനാരായണഗുരു
(ആദ്യത്തെ 5 പദ്യങ്ങൾ)
6. രാമചന്ദ്രവിലാസം (അലറിയവനടക്കും....
വലിയമലകൾ പോലാവാർദ്ധിയിങ്കൽപ്പതിച്ചു) - അഴകത്ത് പത്മമാഭക്കുറുപ്പ്

II. കാല്പനികഭാവുകത്വം-തുടക്കം

സ്വാതന്ത്ര്യബോധം, വൈകാരിക വിപ്ലവം, സ്വകാര്യദുഃഖങ്ങൾ- ദേശീയതയുടെ തുടിപ്പുകൾ- പുതിയ ലോകത്തോടുള്ള ഉത്കടതാത്പര്യം- സ്വാതന്ത്ര്യദർശനത്തെക്കുറിച്ചുള്ള കാഴ്ചപ്പാടുകൾ- ലോകമാനവിതകയെ കേന്ദ്രീകരിക്കുന്ന വികാരങ്ങളും ഭാവനകളും സ്വകാര്യതയുടെ ഉൾവെളിച്ചങ്ങൾ- കാല്പനികതയുടെ ഇളവെയിൽ.

1. ഒരുവിലാപം

തിങ്ങിപ്പൊങ്ങും തമസ്സിൽ..... - വി. സി. ബാലകൃഷ്ണപ്പണിക്കർ
.....വെറും പാവയെപ്പോലിരിക്കുന്നു

2. നളിനി

- കുമാരനാശാൻ
സ്നേഹമാണഖിലസാരമുഴിയിൽ...
.... ദുർലഭമലോകസംഭവം (28 വരികൾ)

3. മഗ്ദലനമറിയം - വള്ളത്തോൾ

സ്വാധിഗൃഹത്തിനകത്തു കടന്നു....

.... എൻവരിപേലവവായ്മലരാൽ (30 വരികൾ)

4. കണ്ണുനീർത്തുള്ളി - നാലാപ്പാട്ട് നാരായണമേനോൻ

താനിങ്ങു ചിന്താശകലങ്ങൾ....

..... പണിത്തരത്തിനുപയുക്തമാക്കാൻ

5. ഗ്രാമശ്രീകൾ - കടത്തനാട്ട് മാധവിയമ്മ

നാണിച്ചുപോകുന്നു നീളൻ കുടച്ചുടി---

..... മന്ദഗമനകൾ ഗ്രാമശ്രീകൾ

III. കാല്പനികത - മധുഘട്ടം

ഉല്ലാസത്തിനും ഇച്ഛാഭംഗത്തിനുമിടയിലെ കാല്പനികത- സ്വപ്നസങ്കല്പങ്ങളോടുള്ള സന്ദേഹവും യാഥാർത്ഥ്യങ്ങളുടെ ആഘാതവും- പ്രപഞ്ചത്തെക്കുറിച്ചുള്ള ദാർശനികമായ തിരിച്ചറിവ്.

1. സൗന്ദര്യദേവത - പി. കുഞ്ഞിരാമൻ നായർ

അത്രമേൽ പ്രണനും....

(തുടർന്നുള്ള 58 വരികൾ)

2. വേലക്കാരി - ബാലാമണിയമ്മ

3. സ്വപ്നിക്കുന്ന അസ്ഥിമാടം - ചങ്ങമ്പുഴ

4. കുരിശിനോട് - സിസ്റ്റർ മേരി ബനീജ്ഞ

5. വിശ്വദർശനം - ജി. ശങ്കരക്കുറുപ്പ്

6. പണിമുടക്കം - ഇടശ്ശേരി

7. കൃഷ്ണമൃഗങ്ങൾ - വൈലോപ്പിള്ളി

നിലയും മഞ്ഞയും ചോപ്പുമാം..

സംഗതിയായി കടിച്ചു കീറാൻ

IV. കാല്പനികത - തീവ്രഘട്ടം

മാനവികതയുടെ തീവ്രസ്വരം - പ്രണയത്തിനും വിപ്ലവത്തിനുമിടയിൽ- ജീവിത വികാരത്തിന്റെ ഉൾക്കാടുകളെക്കുറിച്ച്- വികാരം എന്ന സമരായുധം, ഉൾക്കാടുകളെക്കുറിച്ച്- വികാരം എന്ന സമരായുധം, പാശ്ചാത്യ പുരോഗമനചിന്തകളുടെ സ്വാധീനം.

1. പട്ടിപ്പാട്ട് - എൻ.എൻ. കക്കാട്
2. വയലാർ ഗർജിക്കുന്നു - പി. ഭാസ്കരൻ
3. രാവണപുത്രി - വയലാർ
4. ചോറുണ് - ഒ. എൻ. വി
5. പുതിയ കൊല്ലവും പുതിയൊരാലും - പുതുശ്ശേരി രാമചന്ദ്രൻ
6. ആദ്യത്തെ തീവണ്ടി - തിരുനല്ലൂർ കരുണാകരൻ
7. ബീഹാർ - സുഗതകുമാരി

V. കാല്പനികത - വിച്ഛേദഘട്ടം

ഉൾവലിഞ്ഞ കാല്പനികത ആധുനികതയുടെ സംക്രമണം- വികാരദൂർബല്യങ്ങളോടുള്ള പ്രതികരണം- വിഷാദകാല്പനികതയോടുള്ള പ്രതിഷേധം- കാല്പനികതയുടെ തിരുത്തൽ- അതികാല്പനികത, അപകാല്പനികത

1(a). പാഷാണപാട്ട്

- (b). വാക്കേ, വാക്കേ കൂടെവിടേ ? - എം. ഗോവിന്ദൻ
2. നാട്ടിൽ പാർക്കാത്ത ഇന്ത്യാക്കാരൻ - ആറ്റൂർ രവിവർമ
 3. മോഹൻ ദാസ് ഗാന്ധിയും
നാമുറാം ഗോഡ്സെയും - എൻ.വി. കൃഷ്ണവാരിയർ

സഹായകഗ്രന്ഥങ്ങൾ

1. കൈരളിയുടെ കഥ - എൻ. കൃഷ്ണപിള്ള
2. മലയാലകവിതാസാഹിത്യ ചരിത്രം - എം. ലീലാവതി
3. കവിതയുടെ നൂറ്റാണ്ട്
(രണ്ട് ഭാഗങ്ങൾ) - ജനറൽ എഡിറ്റർ: എം.എൻ.വിജയൻ

4. കവിയും കവിതയും
(2 വാല്യങ്ങൾ) - പി. നാരായണക്കുറുപ്പ്
5. ആധുനിക സാഹിത്യ ചരിത്രം
പ്രസ്ഥാനങ്ങളിലൂടെ - എഡി. ഡോ. കെ. എം. ജോർജ്ജ്
6. കവിതയുടെ ജീവചരിത്രം - കൽപ്പറ്റ നാരായണൻ
7. വെൺമണി പ്രസ്ഥാനം - അകവൂർ നാരായണൻ
8. കുമാരനാശാന്റെ കാവ്യപ്രപഞ്ചം - മലയാളവിഭാഗം കേരളസർവകലാശാല
9. കാവ്യലോകസ്തമരണകൾ - വൈലോപ്പിള്ളി
10. സൂര്യതേജസ്സ്
(ആശാൻ കവിതാപഠനങ്ങൾ) - പ്രസാധകൻ ഇ.കെ.പുരുഷോത്തമൻ
11. വൈലോപ്പിള്ളി - എം. എൻ. വിജയൻ
12. മഹാത്മജിയും മലയാള കവിതയും - എസ്. കൃഷ്ണകുമാർ
13. നമ്മുടെ കവിത - കെ. എൽ. പ്രകാശ്
14. ആശാനെക്കുറിച്ച് എഴുതിയതെല്ലാം - നിത്യചൈതന്യയതി
15. കവിതയും രാഷ്ട്രീയഭാവനയും - പ്രസന്നരാജൻ
16. ആശാൻ : നവോത്ഥാനത്തിന്റെ കവി - തായാട്ട് ശങ്കരൻ
17. ജിയുടെ ഭാവഗീതങ്ങൾ:ഒരു പഠനം - ഡോ. ഡി. ബഞ്ചമിൻ
18. ഇടശ്ശേരിക്കവിത - മേലത്ത് ചന്ദ്രശേഖരൻ
19. മഹാകാവ്യപ്രസ്ഥാനം - ടി. പി. ബാലകൃഷ്ണൻനായർ
20. ആധുനികതയുടെ അപാവരണങ്ങൾ - കെ. എസ്. രവികുമാർ
അപാവരണങ്ങൾ
21. ജി.യുടെ ഭാവഗീതങ്ങൾ - ഡോ.എൻ. മുകുന്ദൻ
22. കുമാരനാശാന്റെ രചനാശില്പം - എം. എം. ബഷീർ
23. വി. സി. ബാലകൃഷ്ണപ്പണിക്കർ - ദേശമംഗലം രാമകൃഷ്ണൻ
24. ജി യുടെ കാവ്യജീവിതം - എം.ലീലാവതി
25. സിംബലിസം മലയാളകവിതയിൽ - ഡോ.കെ. എം. വേണുഗോപാൽ

26. വേരുകളിലെ ജീവതാളം - ഡോ. എ. എം. ഉണ്ണിക്കുഷ്ണൻ
27. ലിറിക്കൽ ബാലഡ്സിന്റെ ആമുഖം - വിവർത്തനം ഡോ. തോന്നയ്ക്കൽ വാസുദേവൻ
28. കാല്പനികത - ബി. ഹൃദയകുമാരി
29. കടലിൽ തങ്ങിയ കാന്തഭൂമി - ഡോ. ബി. വി. ശശികുമാർ
30. ബിംബകല്പന: കുമാരനാശാന്റെയും വള്ളത്തോളിന്റെയും കവിതകളിൽ - ഡോ. കെ. കെ. ചന്ദ്രിക
31. ഭാഷയും ഭാവനയും: പ്രതിരോധത്തിന്റെ അടയാളങ്ങൾ - ഡോ.സി.ആർ. പ്രസാദ്
32. ചങ്ങമ്പുഴ: നക്ഷത്രങ്ങളുടെ സ്നേഹഭാജനം - എം. കെ. സാനു

ML-223, ഭാരതീയകാവ്യമീമാംസ

(Indian Literary theory)

ഭാരതീയ കാവ്യമീമാംസയുടെ അടിസ്ഥാന ശിലകളായ കാവ്യതത്വങ്ങൾ പരിചയപ്പെടുത്തുക വഴി സാഹിത്യത്തിന്റെ ആസ്വാദനം, അപഗ്രഥനം, പഠനം, മൂല്യനിർണ്ണയം എന്നിവയ്ക്ക് വിദ്യാർത്ഥികളെ കൂടുതൽ പ്രഗത്ഭരാക്കുക പ്രാപ്തരാക്കുക എന്നതാണ് ഈ കോഴ്സിന്റെ ലക്ഷ്യം- കാവ്യസിദ്ധാന്തങ്ങളുടെ പഠനത്തിലൂടെ ഇവയ്ക്കുള്ള ആധുനികമായ പ്രസക്തിയും പരിശോധിക്കപ്പെടണം.

മൊഡ്യൂൾ 1

ഭാരതീയാലങ്കാരികൻമാരും മുഖ്യകൃതികളും - ഭരതൻ - നാട്യശാസ്ത്രം, ക്ഷേമേന്ദ്രൻ- ഔചിത്യവിചാരചർച്ച, ജഗന്നാഥ പണ്ഡിതൻ- രസഗംഗാധരം, ആനന്ദ വർധനൻ- ധന്യാലോകം, കുന്തകൻ- വക്രോക്തി കാവ്യജീവിതം, വാമനൻ- കാവ്യാലങ്കാരസൂത്രവൃത്തി, മഹിമഭട്ടൻ- വൃക്തിവിവേകം, അരവിന്ദഘോഷിന്റെയും ടാഗോറിന്റെയും സാഹിത്യദർശനങ്ങളുടെയും പരിചയപ്പെടൽ.

കവി, കാവ്യം, സഹൃദയൻ, കാവ്യപ്രയോജനം, കാവ്യഹേതുക്കൾ, കാവ്യലക്ഷണം, കാവ്യ വിഭജനം, ദശരൂപകങ്ങൾ, മഹാകാവ്യങ്ങൾ, ആഖ്യാനിക, ചമ്പു.

മൊഡ്യൂൾ 2

ദ്രാവിഡസൗന്ദര്യശാസ്ത്രം തിന്ന സങ്കല്പം-തൊൽക്കാപ്പിയം-പൊരുളധികാരം-പരമ്പരാഗത അഞ്ചുതിണകൾ-മുതൽപ്പൊരുൾ-ഉരിപ്പൊരുൾ-കരുപ്പൊരുൾ-അകപ്പൊരുൾ-പുറപ്പൊരുൾ-തിണമയക്കം-തിണയും വിമർശനവും ഉള്ളൂരെ-തിണസങ്കല്പവും പരിസ്ഥിതി സൗന്ദര്യശാസ്ത്രവും.

മൊഡ്യൂൾ 3

രസപദ്ധതി- രസസിദ്ധാന്തം നാട്യശാസ്ത്രത്തിൽ-ഭരതന്റെ രസസൂത്രം- പ്രധാനപ്പെട്ട രസസൂത്രവ്യാഖ്യാനങ്ങൾ- ഭട്ടലൊല്ലടൻ, ശ്രീശങ്കുക്കൻ, ഭട്ടനായകൻ, അഭിനവഗുപ്തൻ-സാധാരണീകരണം, സപ്തവിഹ്നങ്ങൾ-രസസിദ്ധാന്തവും പാശ്ചാത്യ സാഹിത്യ മീമാംസയും രസങ്ങളുടെ നിറം, ദേവത, സംഖ്യ, സ്ഥായിഭാവങ്ങൾ വ്യഭിചാരിഭാവങ്ങൾ- രസസിദ്ധാന്തവും ആധുനിക സാഹിത്യവും.

മൊഡ്യൂൾ 4

സ്ഫോടവും ധ്വനി പദ്ധതിയും-ധ്വനി പദ്ധതി-ശബ്ദവ്യാപാരങ്ങൾ, അഭിധാനി യാമകങ്ങൾ-ധ്വനിസ്വരൂപം-ധ്വനി നിർവചനം-ധ്വനിഭേദങ്ങൾ-ധ്വനിയും ഗുണീഭൂതവും രസധ്വനി-രസവദ അലങ്കാരം- ധ്വനിയുടെ വിശിഷ്ട പ്രയോജനങ്ങൾ- ധ്വനിനിരാസവാദങ്ങൾ

മൊഡ്യൂൾ 5

രീതി പദ്ധതിയും ഗുണപദ്ധതിയും- രീതി പദ്ധതിയുടെ പൂർവ്വചരിത്രം- ദണ്ഡികയുടെ കാഴ്ചപ്പാട്, വാമനന്റെ രീതി സങ്കല്പം-രീതിയും സ്തോലം- വക്രോക്തി സിദ്ധാന്തം-വക്രോക്തി കുന്തകനു മുൻപ്-കുന്തകന്റെ വക്രോക്തി സിദ്ധാന്തം- വിവിധതരം വക്രോക്തികൾ-വക്രോക്തിയും ആധുനിക വിമർശനവും- ഔചിത്യമെന്ന സംജ്ഞ-ക്ഷേമേന്ദ്രന്റെ ഔചിത്യസിദ്ധാന്തം

മൊഡ്യൂൾ 6

അലങ്കാരപദ്ധതി-അലങ്കാരത്തിന്റെ പരിമിതവും വിശാലവുമായ അർത്ഥം-ഉദ്ഭടൻ, രുദ്രടൻ, ദണ്ഡി, വാമനൻ ഭാമഹൻ എന്നിവരുടെ അലങ്കാര സങ്കല്പങ്ങൾ-അലങ്കാരങ്ങളുടെ വർഗ്ഗീകരണങ്ങൾ-അലങ്കാരവും ഗുണവും- അലങ്കാരവും ഇമേജറിയും ഭാഷാഭൂഷണത്തിലെ അലങ്കാരപ്രകരണം.

ഉപമ, ഉൽപ്രേക്ഷ, രൂപകം, ഉല്ലേഖം, ഉദാത്തം, സ്വഭാവോക്തി, അർത്ഥാന്തരന്യായം, യമകം അപ്രസ്തുത പ്രശംസ-അലങ്കാരങ്ങളുടെ ലക്ഷണം- ഉദാഹരണം താര

തമ്യം വൃത്തശാസ്ത്രം-താളം, താളശില്പം അഥവാ വൃത്തം കാവ്യഭാഷയുടെ അർത്ഥ പ്രജനനശേഷിക്ക് സഹായകമാകുന്നതെങ്ങനെ. വൃത്തമഞ്ജരിയെ അടിസ്ഥാനമാക്കി താഴെപ്പറയുന്ന വൃത്തങ്ങൾ പഠിക്കണം. കേക, കാകളി, കളകാഞ്ചി, മഞ്ജരി, ദ്രുതകാകളി, മണിദാഞ്ചി, നതോന്നത തുടങ്ങിയ ഭാഷാ വൃത്തങ്ങൾ.

ഇന്ദ്രവജ്ര, ഉപേന്ദ്രവജ്ര, ഉപജാതി, രഥോവത, വസന്തതിലകം, മാലിനി, പഞ്ചചാമരം, മന്ദാക്രാന്ത, കുസുമമഞ്ജരി, പുഷ്പിതാഗ്ര, ശാർദ്ദൂലവിക്രീഡിതം, സ്രഗ്ധര, വിയോഗിനി തുടങ്ങിയ സംസ്കൃത വൃത്തങ്ങൾ കവിതയിലെ വൃത്തവും താളവും.

സഹായക ഗ്രന്ഥങ്ങൾ

ഭാഷാ ഭൂഷണം	- ഏ.ആർ. രാജരാജവർമ്മ
സാഹിത്യഭൂഷണം	- കുട്ടിക്കൃഷ്ണമാരാർ
രസഭാരതി	- വേദബന്ധം
ഔചിത്യവിചാരം- ക്ഷേമേന്ദ്രൻ -വ്യാഖ്യാനം	- സി. വി. വാസുദേവഭട്ടതിരി
ധന്യാലോകം- പരിഭാഷ	- സി. വി. വാസുദേവഭട്ടതിരി
കാവ്യാദർശം- പരിഭാഷ	- പ്രൊഫ. ആർ.വാസുദേവൻ പോറ്റി
താരതമ്യ കാവ്യ ശാസ്ത്രം	- ഡോ. സി. രാജേന്ദ്രൻ
അപോഹ തിയറി- (Indian Theory of Meaning)	ഡോ. കുഞ്ചുണ്ണിരാജ
സ്ഫോടവാദം	- നാഗേശഭട്ടൻ
അലങ്കാരശാസ്ത്രം മലയാളത്തിൽ	- ഡോ. ചാത്തനാട്ട് അച്യുതനുണ്ണി
രീതി ദർശനം	- ഡോ. ചാത്തനാട്ട് അച്യുതനുണ്ണി
സാഹിത്യമീമാംസ	- ഡോ. ചാത്തനാട്ട് അച്യുതനുണ്ണി
കൈരളി ധനി	- ഡോ. പി.കെ. നാരായണപിള്ള
രസകൗമുദി	- ഡോ. പുജപ്പുരകൃഷ്ണൻ നായർ
ഭാരതീയ കാവ്യശാസ്ത്രം	- ഡോ.ടി. ഭാസ്കരൻ
കാവ്യമീമാംസ	- ഡോ. കെ സുകുമാരപിള്ള
വൃത്തവിചാരം	- കെ. കെ.വാധ്യാർ
വക്രോക്തി ജീവിതം (വ്യാഖ്യാനം)	- ഡോ. എൻ. വി. പി ഉണിത്തിരി

സാഹിത്യ നിരീക്ഷണങ്ങൾ	- ഡോ. മാവേലിക്കര അച്യുതൻ
മലയാള സാഹിത്യ വിമർശനം	- ഡോ. തോന്നയ്ക്കൽവാസുദേവൻ
വിശ്വസാഹിത്യദർശനം	- ഡോ. നെല്ലിക്കൽ മുരളീധരൻ
കാവ്യപീഠിക	- മുണ്ടശ്ശേരി
ദ്രാവിഡ വൃത്തങ്ങളും അവയുടെ ദശാപരിണാമവും	- അപ്പൻ തമ്പുരാൻ
ഭാരതീയ കാവ്യദർശനങ്ങൾ	- ഡോ. ചാത്തനാട്ട് അച്യുതനുണ്ണി
ഉപന്യാസങ്ങൾ - രസസിദ്ധാന്തം	- കെ.പി.നാരായണപ്പിഷാരടി
ധ്വനി ദർശനം	- പ്രൊഫ. പി.സി. വാസുദേവനിയ്യത്
വക്രോക്തി	- ഡോ. എം. എസ്. മേനോൻ
പൗരസ്ത്യ സാഹിത്യ ദർശനം	- ഡോ. എം. എസ്. മേനോൻ
ചെന്തമിഴ് മുത്തുകൾ	- ചേലങ്ങാട്ട്നാരായണകുട്ടി (Preface)
ഇളയപെരുമാൾ	- സുബ്രഹ്മണ്യൻ
	വിവ: തൊൽക്കാപ്പിയം

ML-224, സാഹിത്യ മീമാംസ - പാശ്ചാത്യം

സാഹിത്യത്തിന്റെ സൈദ്ധാന്തിക അടിത്തറ ഉറപ്പിക്കുകയാണ് ഈ കോഴ്സിന്റെ ലക്ഷ്യം. ആധുനിക സാഹിത്യ രൂപങ്ങളുടെയും പ്രസ്ഥാനങ്ങളുടെയും ആവിർഭാവവും വളർച്ചയും ചരിത്രപരമായി വിശകലന വിധേയമാക്കണം. സാംസ്കാരിക പഠനം, ഉത്തരാധുനികത തുടങ്ങിയ എല്ലാ വൈജ്ഞാനിക ധാരകളെയും സംയോജിപ്പിച്ചുകൊണ്ട് വിമർശനത്തിലൂടെ ഒരു തനത് ചിന്താപദ്ധതി രൂപീകരിക്കാൻ വിദ്യാർത്ഥികൾക്ക് കഴിയണം.

മൊഡ്യൂൾ ഒന്ന്

പ്ലേറ്റോയുടെ അനുകരണവാദവും കവിയെക്കുറിച്ചുള്ള ആക്ഷേപങ്ങളും- അരിസ്റ്റോട്ടിലിന്റെ ദുരന്തനാടകവും കഥാർത്ഥ്യവും- ബുച്ചറിന്റെ വ്യാഖ്യാനഭേദങ്ങൾ ഹോരസ്- ലോംഗിനസിന്റെ ഉദാത്തതാസിദ്ധാന്തം- നിയോക്ലാസ്സിസിസം- പോപ്പ്, ഡ്രൈസൻ, ഡോ. ജോൺസൺ തുടങ്ങിയവരുടെ സാഹിത്യവീക്ഷണങ്ങൾ.

മൊഡ്യൂൾ രണ്ട്

ക്ലാസിസവും കാല്പനികതയും- കാവ്യഭാവനയെയും ഭാഷയെയും കുറിച്ചുള്ള വേർഡ്സ്വർത്തിന്റെയും കോൾറിഡ്ജിന്റെയും നിരീക്ഷണങ്ങൾ- മാതൃ ആർണോൾഡിന്റെ സാഹിത്യസിദ്ധാന്തങ്ങൾ- ക്രോച്ചേ- അന്തർദർശനം- കല കലയ്ക്കുവേണ്ടി- വാൾട്ടർ പേറ്റർ- ഓസ്കാർ വൈൽഡ്- ടോൾസ്റ്റോയുടെ കലാചിന്തകൾ- ഐ.എ. റിസ്റ്റാർഡ്സ്- റ്റി. എസ്. എലിയച് എന്നിവരുടെ വിമർശനസിദ്ധാന്തങ്ങൾ-ക്ലാസ്സിക്കൽ മാർക്സിയൻ നിരൂപണപദ്ധതി- റിയലിസം- ക്രിട്ടിക്കൽ റിയലിസം- സോഷ്യലിസ്റ്റ് റിയലിസം- സോഷ്യലിസ്റ്റ് റിയലിസം- സർറിയലിസം- സിംബോളിസം- എക്സ്പ്രഷണിസം- അസ്തിത്വവാദം

മൊഡ്യൂൾ മൂന്ന്

മനഃ ശാസ്ത്രനിരൂപണം- ഫ്രോയിഡ് - ലക്കാൻ- അബോധവും കാമനയും- യുങ്- ആദിരൂപനിഷ്ഠവിമർശനം- നവമാർക്സിസ്റ്റ് വിമർശനസിദ്ധാന്തങ്ങൾ- ജോർജ്ജ് ലൂക്കാച്ച്, ഗ്രാംഷി, ബ്രഹ്റ്റ്, ബഞ്ചമിൻ, അൽത്തൂസർ, അസോണം,ബക്തിൻ എന്നിവരുടെ ഉപദർശനങ്ങൾ സാംസ്കാരിക വിമർശനം- കൾച്ചറൽ മെറ്റീരിയലിസം - ന്യൂഹിസ്റ്റോറിസിസം എന്നീ സിദ്ധാന്തങ്ങളുടെ അടിസ്ഥാന തത്വങ്ങൾ.

മൊഡ്യൂൾ നാല്

ഘടനാവാദവും ചിഹ്നശാസ്ത്രവും- സൊസ്യൂർ- ഉമ്പർട്ടോ എക്കോ- അപനിർമ്മാണം- ദരിദ്ര- ഉത്തരാധുനികത- ലോത്യാർ, ബ്രോദ്ലിയർ, ഫെഡറിക് ജെയിംസൺ- ഉത്തരാധുനിക സാഹിത്യ പ്രവണതകൾ- ഘടനാവാദമാർക്സിസം- ടെറിസ്റ്റഗിൾടൺ

മൊഡ്യൂൾ അഞ്ച്

സ്ത്രീവാദം- വ്യത്യസ്തധാരകൾ-വെർജീനിയ വുൾഫ്, സിമൊൺ ദ ബൂവു, കാറ്റ് മില്ലെറ്റ്, ഷൊ വാൾട്ടർ, ഹെലൻ സിക്സസ്

ഇക്കോക്രിട്ടിസിസം- എമേഴ്സൺ, ഫുള്ളർ, തോറോ, വില്യം റൂക്വാർട്ട്, അർണേനെസ്റ്റ്.

കോളനിയനന്തരവാദം- ഫാനൻ, ആൽബർട്ട് മെമ്മി, പൗരസ്ത്യവാദവും എഡ്വേർഡ് സെയ്ദും, സ്പിവാക്കും ഭാഭയും.

സഹായക ഗ്രന്ഥങ്ങൾ

1. പാശ്ചാത്യസാഹിത്യദർശനം- എം.അച്യുതൻ

2. പാശ്ചാത്യസാഹിത്യ തത്വശാസ്ത്രം- കെ.എം. തരകന്ധ
3. വിശ്വസാഹിത്യദർശനങ്ങൾ- നെല്ലിക്കൽ മുരളീധരൻ
4. ആദിപ്രരൂപങ്ങൾ സാഹിത്യത്തിൽ - ഡോ. എം.ലീലാവതി
5. ആധുനികോത്തര സാഹിത്യസമീപനങ്ങൾ - സി.ജെ. ജോർജ്ജ്
6. കാല്പനികത- ബി. ഹൃദയകുമാരി
7. കേസരിയുടെ സാഹിത്യ വിമർശനങ്ങൾ- കേസരി ബാലകൃഷ്ണപിള്ള
8. ഉത്തരാധുനികത: വർത്തമാനവും വംശാവലിയും - കെ. പി. അപ്പൻ
9. കഥയും പരിസ്ഥിതിയും - ജി. മധുസൂദനൻ
10. അക്ഷരവും ആധുനികതയും - ഇ.വി. രാമകൃഷ്ണൻ
11. അർത്ഥാന്തരന്യായം- വി. സി. ശ്രീജൻ
12. നവസിദ്ധാന്തങ്ങൾ - ഡി. സി. ബുക്സ് പരമ്പര
13. ആധുനികോത്തരതയുടെ കേരളീയ പരിസരം- ഡോ. പി. കെ. പോക്കർ
14. സംസ്കാരപഠനത്തിനൊരാമുഖം- പി.പി. രവീന്ദ്രൻ
15. എം.എൻ. വിജയന്റെ സമ്പൂർണ്ണ കൃതികൾ
16. ദേവസ്വപനം- എം. പി. ദേവൻ
17. ദരിദ്ര- പി.കെ. പോക്കർ
18. സ്ത്രീവാദം- ജെ. ദേവിക
19. സാഹിത്യസംജ്ഞകോശം- എം.ജി.കെ. മേനോൻ
20. നവമാർക്സിസ്റ്റ് സാമൂഹ്യ വിമർശനം- ടി.പി. മധു
21. പെണ്ണെഴുത്ത്- എൻ. ജയകൃഷ്ണൻ
22. Literary Theory:An Introduction- Terry Eagleton
23. 20th century Literary criticism – David Lodge (edited)
24. Modern criticism and theory a reader – David Lodge (Edited)
25. Modern literary theories – Ann Jefferson and David Robey (edited)

26. Issue in contemporary critical theory – Peter Barry
27. Beginning of Theory- Peter Barry
28. Aestheticism- critical Idiom Series
29. The mirror and the lamp- M.H. Abrams
30. Principles of Literary criticism-I.A.Richards
31. Literary criticism a short history – William Wimsat Jr and Creanth Brook
32. Contemporary criticism and anthology – edited by V.S. Sethuraman
33. Semeiotics and Philosophy of Language –Umberto eco
34. Structuralism- John Sturrok
35. Structuralism and semeiotics- Terrence Hawkes
36. Contemporary Literary and Cultural Theory – Pramid K.Nayar.

Paper IX

ML 231, സമകാലികസാഹിത്യം - ഗദ്യം

നോവൽ

നവോത്ഥാനാനന്തരനോവലുകളുടെ തുടർച്ച - ആഖ്യാനവും ഭാഷയും പരിവർത്തിക്കപ്പെടുന്നു - വ്യക്തി എസ്റ്റാബ്ലിഷ്മെന്റുകളുടെ ഇരയാണെന്ന പ്രമേയങ്ങൾ - അധികാരവ്യവസ്ഥയുടെ ജീർണ്ണത വെളിപ്പെടുത്തുന്ന കൃതികൾ - സ്വതന്ത്രാനന്തര ഇന്ത്യയിലെ യുവത്വത്തിനുണ്ടാകുന്ന മോഹഭംഗം, അസ്ഥിത്വസംഘർഷത്തിലേർപ്പെടുന്ന കഥാപാത്രങ്ങൾക്ക് രൂപം നൽകുന്നു - ആഗോളീകരണകാലരാഷ്ട്രീയം ഭാവുകത്വപരിണാമത്തിന് കാരണമാകുന്ന - എഴുപതുകൾ മുതലുള്ള നോവൽ സാഹിത്യപഠനത്തിന് പ്രതിനിധാനസ്വഭാവമുള്ള അഞ്ച് നോവലുകൾ പാഠ്യവസ്തുക്കളായി ചേർക്കുന്നു.

1. ഖസാക്കിന്റെ ഇതിഹാസം - ഓ.വി. വിജയൻ

2. ആരോഹരണം - വി.കെ.എൻ.
3. ആയുസ്സിന്റെ പുസ്തകം - സി.വി.ബാലകൃഷ്ണൻ
4. ഊർകാവൽ - സാരാ ജോസഫ്
5. അന്ധകാരനഴി - ഇ. സന്തോഷ്കുമാർ

അസൈൻമെന്റ്, സെമിനാർ എന്നിവയ്ക്ക് ഇതേ കാലഘട്ടത്തിലെ ഇതര ഷെഡ്യൂൾഡ് നോവലുകൾക്കുടി ഉപയോഗിക്കേണ്ടതാണ്.

കഥ

സാമൂഹ്യപ്രശ്നങ്ങളിൽനിന്നുള്ള വൈയക്തികപ്രശ്നങ്ങളിലേക്ക് പ്രമേയങ്ങൾക്കുണ്ടാകുന്ന ചുവട്മാറ്റം - മിത്തുകളുടെ പുനർനിർമ്മിതി - ആഗോളീകരണ കാല കഥകളായ സ്ത്രീ - ദളിത് - പാരിസ്ഥിതികപ്രശ്നങ്ങൾക്കുള്ള ഊന്നൽ - സമ കാലരചനകളുടെ രാഷ്ട്രീയസ്വഭാവം.

1. നിധി ചാല സുഖമാ - ടി. പദ്മനാഭൻ
2. മൂണ്ഡനം ചെയ്യപ്പെട്ട ജീവിതം - എം. മുകുന്ദൻ
3. കല്യാണി - മാധവിക്കുട്ടി
4. ഹർജി - ആനന്ദ്
5. പുതിയരോഗങ്ങളും ചികിത്സാവിധികളും - വൈശാഖൻ
6. അശ്ലീലംവരുത്തിവച്ച വിന (പോംവഴി സഹിതം) - സക്കറിയ
7. മഞ്ഞ് - യു.പി., ജയരാജ്
8. മലകുണ്ഡത്തിൽ നിന്നൊരു മനുഷ്യൻ - വി.പി. ശിവകുമാർ
9. കാവൽബ്ഭൂതം - സി. അയ്യപ്പൻ
10. ഘരെ ബായ്രെ - ഗീതാഹിരണ്യൻ
11. ബി.എം.പി. - എൻ. പ്രഭാകരൻ
12. കൃഷ്ണഗാഥ - കെ.ആർ. മീര
13. കൂൻ ഓഫ് ദ പ്രിൻസസിന്റെയും - സുമേഷ് ചന്ദ്രോത്ത്
മറ്റ് പുസ്തകങ്ങളുടെയും ആരാധകർ
14. ഒരു ഹരിജൻ സാഹിത്യകാരന്റെ സങ്കടഹർജി - പി.എ. ഉത്തമൻ
15. രാമച്ചി - ബിനോയ് തോമസ്

നാടകം

ആവിഷ്കരണത്തിലെയും പ്രമേയത്തിലെയും യഥാതഥത്വം ചോദ്യം ചെയ്യപ്പെടുന്നു - അധിനാടകവേദി - തനത്നാടകവേദി - സ്ത്രീ - പാരിസ്ഥിതിക പ്രശ്നങ്ങൾ പ്രമേയമാകുന്നു.

1. കടക്ക അഥവാ വിശക്കുന്നവന്റെ വേദാന്തം - പി.എം. രാജ്
2. അവനവൻകടമ്പ - കാവാലം നാരായണപ്പണിക്കർ
3. ലേബർറൂം - കെ.വി. ശ്രീജ

യാത്രാവിവരണം/ ആത്മകഥ/ജീവചരിത്രം

1. വഴികൾ, വ്യക്തികൾ, ഓർമ്മകൾ - രവീന്ദ്രൻ
(രവീന്ദ്രന്റെ യാത്രകൾ എന്ന പുസ്തകത്തിലെ ഭാഗം)
2. ഡോ. വേലുക്കുട്ടി അരയൻ - രാജേഷ് ചിറപ്പാട് & രാജേഷ് കെ. എരുമാലി.

ML-232, സാഹിത്യ ചരിത്രവിജ്ഞാനീയം

പഠനലക്ഷ്യം

സാഹിത്യചരിത്രരചനയുടെ തത്വചിന്താപരവും ചരിത്രാത്മകവുമായ പ്രാധാന്യം മനസ്സിലാക്കുക. സാഹിത്യചരിത്ര രചനയുടെ കാലഘട്ടസംബന്ധമായ പരിണാമങ്ങളെ അടുത്തറിയുന്നതിലൂടെ ഭാവുകത്വചരിത്രബോധത്തെ വിമർശാത്മകമായി സമീപിക്കുക. സമഗ്രത എന്ന ആശയത്തെ സാഹിത്യചരിത്രരചനയിൽ സാക്ഷാത്കരിക്കാനാവുമോ എന്ന് അന്വേഷിക്കുക.

മൊഡ്യൂൾ - 1

സാഹിത്യചരിത്രരചയിതാവിന്റെ കാഴ്ചപ്പാട്- സാഹിത്യ ചരിത്രപഠനത്തെപ്പറ്റി വിലയ്ക്കം ഹെന്റി ഹഡ്സൺ- സാഹിത്യചരിത്രവിജ്ഞാനവും ചരിത്രവും.

മൊഡ്യൂൾ - 2

സാഹിത്യചരിത്രരചനയിലെ നാലു പ്രക്രിയകൾ- സാമാന്യ വൽക്കരണം വർഗ്ഗീകരണം, സജ്ജീകരണം, തിരഞ്ഞെടുക്കൽ- സാഹിത്യചരിത്രം നിർമ്മിക്കുന്നതിലെ സങ്കേതങ്ങളും മാർഗ്ഗരേഖകളും- സൗന്ദര്യശാസ്ത്രപരവും ചരിത്രപരവുമായ ഘട്ടവിഭജനം.

മൊഡ്യൂൾ - 3

സാഹിത്യചരിത്രസങ്കല്പത്തിന്റെ പടിഞ്ഞാറൻ വഴി- ഹെന്റി മോർലി- ഒലിവർ എൽടൺ-റെനെവെല്ലെക്സ്- സാഹിത്യപഠനവും ദേശരാഷ്ട്ര(Nation state) ചരിത്രവും.

മൊഡ്യൂൾ - 4

സാഹിത്യചരിത്രരചനയ്ക്ക് ഇതര വിജ്ഞാനശാഖകളുമായുള്ള ബന്ധം- വ്യാഖ്യാനശാസ്ത്രം (hermeneutics), ചരിത്രം, സാമൂഹിക ശാസ്ത്രം, നരവംശശാസ്ത്രം- ഇരുളിൽ ആണ്ടുകിടക്കുന്ന നല്ല രചനകൾ കണ്ടെത്തി അർഹമായ പ്രതിഷ്ഠ നൽകുക- അനർഹമായ പ്രതിഷ്ഠലഭിച്ചവയെ പുതുതായി വിലയിരുത്തുക.

മൊഡ്യൂൾ - 5

മാതൃകാ സാഹിത്യചരിത്രം സാധ്യമാണോ? പരിമിതികൾ - ചരിത്രരചയിതാവിന്റെ ആത്മനിഷ്ഠത- സാഹിത്യനിരൂപണം, സാഹിത്യ വിമർശനം, പുസ്തകപരിചയം എന്നിവയിലെ സാഹിത്യചരിത്രാംശങ്ങൾ- സാഹിത്യകൃതിയും അതിന്റെ സാഹിത്യേതരസന്ദർഭ(non- literary context) വുമായുള്ള ബന്ധം.

മൊഡ്യൂൾ - 6

സാഹിത്യചരിത്രരചനയും സൂക്ഷ്മമാഖ്യാന(micro narrative) സങ്കല്പങ്ങളും - ജാതി, വർണ്ണം, ലിംഗഭേദങ്ങൾ ആദിയായ വിചാരങ്ങൾ- ദലിത്, സ്ത്രീ, പരിസ്ഥിതി വീക്ഷണങ്ങളെ പുതിയ സാഹിത്യചരിത്രങ്ങൾ ഉൾക്കൊള്ളുന്ന വിധം - പൗരസ്ത്യവാദവും കോളനിയനന്തരചിന്തയും.

മൊഡ്യൂൾ - 7

കേരളസാഹിത്യചരിത്രരചന- മലയാള സാഹിത്യചരിത്രരചനാചരിത്രം- ആദ്യ കാല സാഹിത്യചരിത്രങ്ങൾ- വർത്തമാനകാലം- ആദ്യകാലത്തെ കരുതിക്കൂട്ടിയുള്ള തമസ്കരണങ്ങൾ- കവിഭാരതം, കവിരാമായണം.

മൊഡ്യൂൾ - 8

സാഹിത്യചരിത്രങ്ങളുടെ മൂല്യനിർണ്ണയം- മാതൃകകൾ- ഗവേഷമപരമായ അന്വേഷണം- ഇളംകുളത്തിന്റെയും ഡോ കെ. എം. ജോർജിന്റെയും സംഭാവനകൾ (സാമാന്യധാരണ - കേരളസാഹിത്യചരിത്രം, കൈരളിയുടെ കഥ (താരതമ്യം)

സഹായകഗ്രന്ഥങ്ങൾ, ലേഖനങ്ങൾ

1. ഗവേഷണത്തിന്റെ പ്രശ്നങ്ങൾ- കേരള സർവകലാശാല
2. കേരളസാഹിത്യ ചരിത്ര ചർച്ച - കേരള സർവകലാശാല
3. സാഹിത്യ ചരിത്രവിജ്ഞാനീയം എഡി. ഡോ. തോമസ് സ്കറിയ-അസെൻഡ് പബ്ലിഷേഴ്സ്
4. മലയാളഭാഷാചരിത്രം- പി. ഗോവിന്ദപ്പിള്ള - എൻ. ബി എസ്
5. Refiguring literary/ cultural
Historiography - Susie Tharu & Satish Poduval
EPW, June 20-26, 1998.
6. Words worth's Pope: A study
in Literary Historiography - Robert J Grif, Cambridge Press, 1995.

ML-234, മലയാള വിമർശനം

PAPER XII – ML - 234

കൃതിയുടെ കേവലമായ രസ - അലങ്കാരങ്ങളെ കണ്ടെത്തുന്നതിനപ്പുറം, കൃതി മുന്നോട്ടുവയ്ക്കുന്ന മൂല്യബോധത്തെ തിരിച്ചറിയുകയും അതിനോട് യുക്തിബദ്ധമായി സംവദിക്കുകയും ചെയ്യുമ്പോഴാണ് വിമർശനം രൂപപ്പെടുന്നത്. യുക്തിബോധത്തിന്റെയും സംവാദസന്നദ്ധമാകുന്ന ജനാധിപത്യബോധത്തിന്റെയും പ്രതലത്തിൽ നിന്നാണ് മലയാള വിമർശനസാഹിത്യവും രൂപംകൊള്ളുന്നത്.

മലയാളവിമർശനസാഹിത്യ ചരിത്രത്തെ സമഗ്രമായി മനസ്സിലാക്കുക, ഭാവുകത്വ പരിണാമകാരണങ്ങളെ സവിശേഷമായി കണ്ടെത്തുക, വിമർശനസാഹിത്യത്തിന്റെ സമീപനങ്ങളെയും സമ്പ്രദായങ്ങളെയും തിരിച്ചറിയുക തുടങ്ങിയവയാണ് ഈ പാഠ്യപദ്ധതിയുടെ ലക്ഷ്യം. വിമർശന ചരിത്രത്തെ നാല് ഘട്ടങ്ങളായി തിരിച്ചാണ് പാഠ്യപദ്ധതി തയ്യാറാക്കിയിരിക്കുന്നത്. ഓരോ ഘട്ടത്തിലും വിമർശന സിദ്ധാന്തങ്ങളും പ്രായോഗിക നിരൂപണങ്ങളും വെച്ചുതന്നെയാണ് നൽകിയിട്ടുള്ളത്. സിദ്ധാന്തത്തിലും പ്രയോഗത്തിലും ഉള്ള ക്രമാനുഗതമായ വളർച്ചയുടെ വിശകലനവും പഠനലക്ഷ്യത്തിൽപ്പെടുന്നുണ്ട്.

പാഠ്യവസ്തു വിമർശനചരിത്രത്തിലെ സൂചകങ്ങൾ മാത്രമാണ്. അവയെ മുൻനിർത്തി ആ കാലത്തിന്റെ ഭാവുകപഞ്ചായത്തെ സമീപിക്കുക എന്നതാകണം പഠനരീതി. അസൈൻമെന്റ്, സെമിനാർ എന്നിവയ്ക്ക് പാഠ്യവസ്തുവിന് പുറത്തുള്ള എഴുത്തുകാരുടെ കൃതികളും അവരുടെ രചനാരീതികളും വിഷയമാക്കാവുന്നതാണ്. പൊതു പരീക്ഷയ്ക്കുള്ള ലഘുചോദ്യങ്ങൾ പാഠ്യഭാഗത്തെ കേന്ദ്രീകരിച്ചാകുന്നതാണ് അഭികാമ്യം.

ഘട്ടം ഒന്ന്

മലയാളവിമർശനത്തിന്റെ പ്രാരംഭകാലം- പത്രമാസികാ നിരൂപണങ്ങൾ- രസ, അലങ്കാരഅന്വേഷണങ്ങൾക്കപ്പുറം വിമർശനത്തിൽ ജീവിതയുക്തിയുണ്ടാകണമെന്ന തിരിച്ചറിവ്- സംസ്കൃത ആലങ്കാരിക പദ്ധതികളോടുള്ള ചായ്വ് - കേരളവർമ്മ, സി. പി. അച്യുതമേനോൻ, ഏ. ആർ. രാജരാജവർമ്മ, വിദ്വാൻ സി. എസ്. നായർ, സി. അന്തപ്പായി, സ്വദേശാഭിമാനി രാമകൃഷ്ണപിള്ള തുടങ്ങിയവരുടെ വിമർശനരീതികൾ- നിരൂപണകാവ്യങ്ങളുടെ സവിശേഷതകൾ- പ്രാസവാദം - ആശാന്റെ ചിത്രയോഗനിരൂപണവും വള്ളത്തോളിന്റെ ലീലാ നിരൂപണവും.

സിദ്ധാന്തം

1. ഗ്രന്ഥനിരൂപണം- സി.പി. അച്യുതമേനോൻ
2. കവിതയും പദ്യവും- സി. അന്തപ്പായി

ഘട്ടം രണ്ട്

മലയാള വിമർശനത്തിലെ നവോത്ഥാനകാലം- വിമർശനം അക്കാഡമിക സ്വഭാവം കൈവരിക്കുന്നു- വിമർശനത്തിന് തത്ത്വചിന്തയുടെ രൂപം വരുന്നു- കൃതിയിൽ അർത്ഥമോ പ്രാസമോ മുഖ്യം എന്ന പ്രാസസംവാദം ഭാവ- രൂപസംവാദമായി തുടർച്ച നേടുന്നു- കല കലയ്ക്ക് വേണ്ടി/ ജീവിതത്തിന് വേണ്ടി എന്ന സംവാദം- പുരോഗമനസാഹിത്യ പ്രസ്ഥാന ആശയങ്ങളുടെ സ്വാധീനം- കേസരി, മാരാർ, മുണ്ടശ്ശേരി, പോൾ, ഭാസ്കരൻ നായർ തുടങ്ങിയവരുടെ നിലപാടുകള്- ചെറുകഥ, നോവൽ എന്നിവയ്ക്ക് ലക്ഷണഗ്രന്ഥങ്ങൾ

സിദ്ധാന്തം

1. നാടകാന്തം, കവിത്വം- ജോസഫ് മുണ്ടശ്ശേരി
2. യുക്തിബോധവും സൗന്ദര്യബോധവും - കുട്ടിക്കൃഷ്ണമാരാർ

പ്രയോഗം

1. ചണ്ഡാലഭിക്ഷുകി- കേസരി ബാലകൃഷ്ണപിള്ള
2. ചെമ്മീൻ നിരൂപണം - വേലുക്കുട്ടി അരയൻ

ഘട്ടം മൂന്ന്

വിമർശനത്തിൽ പാശ്ചാത്യചിന്തയുടെ സ്വാധീനം- ആധുനികതയ്ക്ക് ഇന്ത്യൻപരിസരമുണ്ടെന്ന നിരീക്ഷണങ്ങൾ- മനുഷ്യാസ്ത്രനിരൂപണം, ശൈലീനിഷ്ഠനിരൂപണം, ജീവചരിത്രാത്മക വിമർശനം തുടങ്ങിയ വിമർശനരീതികൾ- അതിന്റെ വിമർശനങ്ങൾ- എഴുത്തുകാരന്റെ സ്വാതന്ത്ര്യത്തെ സംബന്ധിച്ച സങ്കല്പനങ്ങൾ- പ്രതിബദ്ധതയെ സംബന്ധിച്ച ആശയങ്ങൾ- പ്രബലമായ സംവാദങ്ങൾ.

എം. എൻ. വിജയൻ, കെ.പി. അപ്പൻ, എസ്. ഗുപ്തൻനായർ, ഡോ. എം. ലീലാവതി, എം. പി. ശങ്കുണ്ണിനായർ, ആഷാമോനോൻ, വി. രാജകൃഷ്ണൻ, എസ്. സുധീഷ്, കെ. എം. ഡാനിയൽ, നരേന്ദ്രപ്രസാദ് തുടങ്ങിയവരുടെ വിമർശനസമീപനങ്ങൾ.

സിദ്ധാന്തം

1. തിരസ്കാരം- കെ. പി. അപ്പൻ
2. ആധുനികതയുടെ ചുവന്ന വാൽ I - ആർ. നരേന്ദ്രപ്രസാദ്

പ്രയോഗം

1. സഹൃദയന്റെ മകൻ - എം.എൻ. വിജയൻ
2. കാല്പനികതയുടെ യഥാർത്ഥ അപചയം- പ്രസന്നരാജൻ
(കേരള കവിതയിലെ കലിയും ചിരിയും)

ഘട്ടം നാല്

കോളനിയനന്തര കാല വിമർശനം - ഉച്ചകല (high Art)

നിമ്നകല (low art) എന്ന വിഭജനം ഇല്ലാതാകുന്നു - അബോധത്തിന്റെ അപകോളനീകരണത്തിലൂടെ സ്ത്രീയുടെയും ദളിതന്റെയും ഭൂമിയുടെയും മേൽക്കുള്ള അഭ്യൂഹകോയ്മകളെ എഴുത്ത് പ്രശ്നവൽക്കരിക്കുന്നു- പഴയകൃതികൾ പുതിയ കാഴ്ചപ്പാടിൽ പുനർവായനയ്ക്ക് വിധേയമാകുന്നു- സാഹിത്യ വിമർശനം അന്തർവൈജ്ഞാനികമാകുന്നു- ആഗോളീകരണകാലമുതലാളിത്തം ദൃശ്യ- ശ്രവ്യമാധ്യമങ്ങളിലൂടെ മനുഷ്യജീവിതത്തെ വിധേയപ്പെടുത്തുന്നതിനെ എൺപതുകളിൽത്തന്നെ മലയാളവി

മർശകർ(സച്ചിദാനന്ദൻ, മാധ്യമങ്ങളുടെ രാഷ്ട്രീയം 1987) തിരിച്ചറിയുന്നുണ്ട്. വി. സി. ശ്രീജൻ, കെ.കെ. കോച്ച്. സി. ആർ പ്രസാദ്, പി. ഗീത, ശാരദക്കുട്ടി, ഇ. പി. രാജഗോപാലൻ, കെ.ഇ. എൻ., പി.കെ. രാജശേഖരൻ, എന്നിവരുടെ വിമർശന സമീപനങ്ങൾ-സിദ്ധാന്തങ്ങളെ നേരിട്ടു പരാമർശിക്കാതെ തന്നെ ഉത്തരാധുനിക ഭാവുകത്വപരിസരത്തിനുള്ളിൽ നിന്ന് കൃതികളെ വായിക്കുന്ന രീതി.

സിദ്ധാന്തം

1. മലയാള കഥയിലെ ആധുനികോത്തരത - വി. സി. ശ്രീജൻ
2. അപനിർമ്മാണവും സാഹിത്യവിമർശനവും - പി. പി. രവീന്ദ്രൻ (ആധുനികാനന്തരം വിചാരം, വായന)

പ്രയോഗം

1. പെണ്ണെഴുതുമ്പോൾ : വ്യക്തി, സമൂഹം - ഇടപെടലുകൾ- പി. ഗീത
2. നീചമാമുടൽ - കൽപ്പറ്റ നാരായണൻ

ML-241, സമകാലികസാഹിത്യം - പദ്യം

പഠനലക്ഷ്യം

മലയാള കവിതാ ചരിത്രത്തിൽ സംഭവിച്ച വിപ്ലവാത്മകവും പരീക്ഷണാത്മകവുമായ ഭാവുകത്വ വ്യയാനങ്ങളെ പരിചയിക്കുകയാണ് ലക്ഷ്യം. കവിതയുടെ ഘടനാപരവും രൂപപരവുമായ നിരന്തരപരിണാമങ്ങൾ, കവിത പ്രതിനിധാനം ചെയ്യുന്ന ആശയപരവും പ്രത്യയശാസ്ത്രപരവുമായ തലങ്ങൾ എന്നിവയിൽ അവഗാഹം നേടാനുതകും വിധമാകണം പാഠ്യപദ്ധതി പ്രാവർത്തികമാക്കേണ്ടത്.

ആധുനികത - പ്രാരംഭം

ലോകമെമ്പാടും ഉണ്ടായ സൗന്ദര്യശാസ്ത്രസങ്കല്പങ്ങളെ തകിടം മറിച്ച ആധുനികതയുടെ അനുരണനങ്ങൾ മലയാളകവിതയിൽ പ്രത്യക്ഷപ്പെട്ടു തുടങ്ങിയത് നവോത്ഥാനത്തിന്റെയും കാല്പനികതയുടെയും രചനാസങ്കേതങ്ങളെ മറികടന്നുകൊണ്ടാണ്. ഈ രണ്ടുധാരകളും സാമ്പ്രദായികമായ ക്ലാസ്സിക് - നിയോക്ലാസ്സിക് പാരമ്പര്യങ്ങളോട് പുലർത്തിയ വിമുഖതയെ ഏറ്റെടുത്തുകൊണ്ട് അതിൽ നിന്നു വേറിട്ടതും ശക്തവും പരിവർത്തനോന്മുഖവുമായ പ്രവണതകൾ രൂപപ്പെടുത്തുകയാണ് ആധുനികത ചെയ്തത് അക്കിത്തം, അയ്യപ്പപ്പണിക്കർ, വിശ്വനാഥനായണൻ നമ്പൂതിരി,

എം.ഗോവിന്ദൻ, എൻ.എൻ. കക്കാട് എന്നിവരുടെ കവിതകളിൽ പ്രകടമായ ഭാവവൈരുദ്ധ്യങ്ങൾ, മൂല്യങ്ങളുടെ അപനിർമ്മാണം, സമൂഹാധിഷ്ഠിത ആത്മനിഷ്ഠതയുടെ തീവ്രനിലപാടുകൾ എന്നിവ പരിചയിക്കൽ.

പാഠഭാഗം - 1

ഇരുപതാം നൂറ്റാണ്ടിന്റെ ഇതിഹാസം

(നരകം എന്ന ഖണ്ഡം)	- അക്കിത്തം
പകലുകൾ രാത്രികൾ	- അയ്യപ്പപ്പണിക്കർ
ജ്ഞാനസ്നാനം	- എം. ഗോവിന്ദൻ
വജ്രകുണ്ഡലം	- എൻ.എൻ. കക്കാട്
രാവും പകലും	- വിഷ്ണുനാരായണൻ നമ്പൂതിരി

ആധുനികത - തീവ്രപക്ഷം

തിരസ്കാരത്തിന്റെയും വിശ്വാസരാഹിത്യത്തിന്റെയും ഭാഷ്യങ്ങൾക്കൊപ്പം കവിത കൂടുതൽ അന്വേഷണാത്മകമാക്കുകയാണ് രണ്ടാം ഘട്ടത്തിൽ കവിത സ്വയം വിശ്വാസമോ രാഷ്ട്രീയമോ പ്രത്യയശാസ്ത്രമോ ആകുന്ന പ്രവണതകൾ പരിചയപ്പെടൽ.

പിതൃഗമനം	- ആറ്റൂർ രവിവർമ്മ
അക്കമൊഴിയുന്നു	- സച്ചിദാനന്ദൻ
ഭൂമിയുടെ നട്ടെല്ല്	- സി. വിനയചന്ദ്രൻ
ചിത്തരോഗാശുപത്രിയിലെ ദിവസങ്ങൾ	- അയ്യപ്പൻ
പരീക്ഷ	- ബാലചന്ദ്രൻ ചുള്ളിക്കാട്
ചിതൽവരും കാലം	- ദേശമംഗലം രാമകൃഷ്ണൻ
ഹിമസമാധി	- വിജയലക്ഷ്മി

സൂക്ഷ്മരാഷ്ട്രീയം

ഉത്തരാധുനികതയുടെ ആശയസങ്കല്പങ്ങൾക്കിണങ്ങുന്ന രചനാസമീപനങ്ങൾ അടുത്തറിയുകയാണ് ഈ ഭാഗം. പാഠത്തിലും കർത്തൃത്വത്തിലും കടന്നുവന്ന ബഹുസ്വരതകളും സൂക്ഷ്മരാഷ്ട്രീയവും ഈ കവിതകളിലൂടെ ചർച്ചചെയ്യേണ്ടതുണ്ട്.

കോളേജിന്റെ ചുവരിൽ	-	എസ്. ജോസഫ്
അഴകില്ലാത്തവയെല്ലാം	-	അനിതാ തമ്പി
കാത്തിരുന്നു കാണാം	-	പി. രാമൻ
ഷീലയുടെ ശബ്ദം	-	വി.എം. ഗിരിജ
പക്ഷികൾ പാടുന്നു	-	സാവിത്രി രാജീവൻ
കാറ്റേ കടലേ	-	പി.പി. രാമചന്ദ്രൻ

സഹായക ഗ്രന്ഥങ്ങൾ

1. ഭാവുകത്വം 21-ാം നൂറ്റാണ്ടിൽ - എഡി.ജി. മധുസൂദനൻ
2. മലയാളകവിത സാഹിത്യചരിത്രം - ഡോ.എം. ലീലാവതി
3. 100 വർഷം 100 കവിത - ഡോ.പി.കെ. രാജശേഖരൻ
4. മലയാളകവിത ആധുനികാനന്തരം - ഡോ.സി.ആർ. പ്രസാദ്
5. ആധുനികത മലയാളകവിതയിൽ - എൻ. അജയകുമാർ
6. ആധുനിക മലയാളകവിതയിലെ സ്ത്രീപക്ഷ സമീപനങ്ങൾ - ഡോ.പി.ഗീത
7. കവിത വായനയും പ്രതികരണവും - എൻ. രാജൻ
8. മലയാളകവിതാപഠനങ്ങൾ - സച്ചിദാനന്ദൻ
9. അയ്യപ്പപ്പണിക്കരുടെ ലേഖനങ്ങൾ - അയ്യപ്പപ്പണിക്കർ
10. കവിതയുടെ സി.എൻ.എ. - വിഷ്ണുനാരായണൻ നമ്പൂതിരി
11. ഉത്തരാധുനികത : വർത്തമാനവും വംശാവലിയും - കെ.പി. അപ്പൻ
12. ആധുനികോത്തരം : വിശകലനവും വിമർശനവും - വി.സി. ശ്രീജൻ
13. പരിസരകവിത - ഡോ.എൻ. തോമസുകുട്ടി
14. തരിശുനിലത്തിലെ കാവ്യസഞ്ചാരികൾ - ഡോ.ടി.കെ. സന്തോഷ്കുമാർ
15. Indian Poetry Yoday - Gen Ed. Keshav Malik
16. Literary Theory & Criticism Ed - Patricia Waugh
17. Marxism, Pluralism & Beyond - Gregor Mc Lennan

18. Beginning Post colonialisms - John Mc Leod
19. Orientalism - Edward Said
20. INterdisciplinarity - Joe Moran

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ഭാഷാസാഹിത്യ പഠനത്തിന് കരുത്തും ആർജ്ജവവും നൽകിയ പഠന ശാഖയാണ് ഭാഷാ ശാസ്ത്രം. ഭാഷയുടെ ഈ ശാസ്ത്രീയ പഠനം ഭാഷാസാഹിത്യ മേഖലകൾ കടന്ന് അന്തർവൈജ്ഞാനികതയുടെ അനന്തസാധ്യതകൾ തുറന്നുതന്നു. ഭാഷാശാസ്ത്രത്തിലെ അടിസ്ഥാന വിവരങ്ങളും സിദ്ധാന്തങ്ങളും അപഗ്രഥനരീതികളും സൂഷ്മമായി പഠിക്കുവാൻ അവസരമൊരുക്കുന്നതോടൊപ്പം പുതിയ ചിന്തകളെയും സമീപനങ്ങളെയും കുറിച്ച് പഠിതാവിന് സാമാന്യബോധം സൃഷ്ടിക്കുവാൻ ഉദ്ദേശിച്ചാണ് ഈ കോഴ്സ് ക്രമപ്പെടുത്തിയിരിക്കുന്നത്. അതോടൊപ്പം ഭാഷാശാസ്ത്ര സിദ്ധാന്തങ്ങളെ ദ്രാവിഡ ഭാഷാശാസ്ത്രസിദ്ധാന്തങ്ങളെ ദ്രാവിഡ ഭാഷാശാസ്ത്രത്തിന്റെ പരിസരത്തിൽ വിശകലനം ചെയ്യാനും മലയാളഭാഷയോട് ചേർത്ത് അപഗ്രഥിക്കുവാനും ലക്ഷ്യമിടുന്നു. ഭാഷാഘടനകൾ മനസ്സിലാക്കുക, ഭാഷയുടെ സാമൂഹികവും മാനസികവും അന്തർവൈജ്ഞാനികവുമായ തലങ്ങളിലേക്ക് കൂടുതൽ ഉൾക്കാഴ്ച നൽകുക എന്നലക്ഷ്യവും ഈ പഠനത്തിനുണ്ട്. ഇന്ത്യൻഭാഷകളെ സവിശേഷം മനസ്സിലാക്കാനും ഈ സിലബസ് വിദ്യാർത്ഥികളെ പ്രാപ്തരാക്കും.

1. ഭാഷ- നിർവചനം - മനുഷ്യഭാഷയുടെ സവിശേഷതകൾ- ഭാഷയും ഭാഷണവും. ഭാഷകൾ- ജീവൽഭാഷ, മൃതഭാഷ, ക്ലാസ്സിക്കൽഭാഷ, മാതൃഭാഷ, ഭരണഭാഷ, വ്യാകരണവും ഭാഷാശാസ്ത്രവും- പൗരസ്ത്യവും (ഭാരതീയവും) പാശ്ചാത്യവുമായ ഭാഷാപഠനത്തിന്റെ ചരിത്രം- സ്ഫോടനസിദ്ധാന്തം- ആധുനികഭാഷാശാസ്ത്രത്തിന്റെ ചരിത്രം
2. ഭാഷയുടെ വർഗ്ഗീകരണം- ആനുവംശികവും (Genealogical) കക്ഷ്യപരവും (Topological) ആയ വർഗ്ഗീകരണം ഭാഷ, ഉപഭാഷ. സഗോത്രഭാഷകൾ, കുടുംബവൃക്ഷസിദ്ധാന്തം, തരംഗസിദ്ധാന്തം, ദ്രാവിഡഭാഷകൾ- ഭാരതീയ ഭാഷകളിൽ അവയ്ക്കുള്ള സ്ഥാനം- സാമാന്യവിവരണം. ഭാഷാകുടുംബസങ്കല്പം- ദ്രാവിഡ ഭാഷകളുടെ എണ്ണം- ശാഖാവിഭജനം- വിഭജനതത്ത്വങ്ങൾ- മലയാളത്തിന്റെ

സ്ഥാനം- ദ്രാവിഡഭാഷകളുടെ സാമാന്യസ്വഭാവം- വിവർത്തന പ്രക്രിയ- വിവർത്തനപ്രത്യയങ്ങൾ- ഖരമൃദുവിപര്യയം (convertibility of sounds and sonants)മലയാളത്തിന്റെ സ്വഭാവം

3. ഭാഷാപ്രഗമനരീതികൾ- ഏകകാലികം (synchronic) ബഹുകാലികം (diachronic), താരതമ്യാത്മകം (comparative), വ്യതിരേകാത്മകം (contrastive)
4. ഉച്ചാരണശാസ്ത്രം(Phonetics), പ്രസക്തി- അവാന്തര വിഭാഗങ്ങൾ- ശ്രവണാസ്വരം (Auditory), അവയവാസ്വരം (Articulatory), സ്വനഭൗതികം (Acoustics)- സ്വന നിർവചനം- സ്വനോത്പാദനം - ഭാഷണാവയവങ്ങൾ- സ്വരം, വ്യഞ്ജനം, മധ്യം - മാനകസ്വരങ്ങൾ (cardinal Vowels)- അന്താരാഷ്ട്ര സ്വനപ്പട്ടിക - സ്വരവ്യഞ്ജനങ്ങളുടെ വർഗ്ഗീകരണം- ഉച്ചാരണരീതിയും (Articulation) ഉച്ചാരണപ്രകാരവും (Articulation) അനുസരിച്ചുള്ള വർഗ്ഗീകരണം.
5. സ്വനിമ വിജ്ഞാനം (Phonetics)- സ്വനം (Phone), സ്വനിമം (Phoneme) ഇവതമ്മിലുള്ള വ്യത്യാസം - സ്വനിമനിർവചനം - സ്വനിമനിർണ്ണയനം- വ്യത്യയം (control), പൂരണം (complication), ഉപസ്വനം (Allophone) സ്വതന്ത്രോച്ചാരണം(Free variation)- വർണ്ണവിന്യാസനം (Distribution of Phonemes) വർണ്ണസംയുക്തങ്ങൾ (Phoneme clusters) പരിച്ഛിന്നസ്വനിമം (segmental phonemes), ലീന ധ്വനികൾ(supra segmentals) - വർണ്ണ വികാരം(Phonetic change), ധ്വനിഭേദ നിയമങ്ങൾ (Phonetic law) പ്രധാന വർണ്ണ വികാരങ്ങൾ, മലയാളത്തിലെ സ്വനിമങ്ങൾ- അക്ഷരം- അക്ഷരത്തെക്കുറിച്ചുള്ള വിവിധ സിദ്ധാന്തങ്ങൾ- ലിപി ചരിത്രം- മലയാള ലിപി
6. രൂപിമ വിജ്ഞാനം (morphology), രൂപിമം (morpheme) - നിർവ്വചനം - രൂപിമഭേദങ്ങൾ സ്വതന്ത്രം (free), ബദ്ധം (Bound) ഉപരൂപം (Allomorph)- മലയാളത്തിൽസ്വനിമാധിഷ്ഠിതം (Phonologically conditioned), രൂപാധിഷ്ഠിതം(morphologically conditioned), രൂപിമ വിഭാഗങ്ങൾ - ധാതു (root), പ്രകൃതി (stem), പദം (word), പ്രത്യയവിഭാഗങ്ങൾ പുരപ്രത്യയം(prefix), പരപ്രത്യയം (suffix) അന്തഃപ്രത്യയം (infix), പദാംഗം (syllable) രൂപസിദ്ധിയും നിഷ്കാദനവും.
7. വാക്യവിജ്ഞാനം (syntax), പ്രാധാന്യം ഘടനാത്മക സമീപനം (structural approach) പ്രജനക വ്യാകരണം (transformational generative grammar)അഗാധ ഘടന (deep structure), ഉപരിഘടന(surface structure) ദ്രാവിഡഭാഷക

ളുടെ വാക്യഘടന- മലയാളത്തിന്റെ വാക്യരീതി, അർത്ഥവിജ്ഞാനീയം (semantics)- അർത്ഥം അർത്ഥഭേദകാരണങ്ങൾ- അർത്ഥഭേദ നിയമങ്ങൾ.

8. ഭാഷാഭേദ വിജ്ഞാനം (dialectology), വ്യക്തിഭാഷ(idellect), ഭാഷാഭേദം (dialect), ഭാഷ (language), മാനകം(standard), മാനകേതരം(non standard), ഭാഷാഭേദഭൂപടം (dialect map)നിർമ്മാണരീതി- സംഭാഷാംശസീമാരേഖ (isogloss) കേന്ദ്രമേഖല(focal area) അവശിഷ്ടമേഖല(relic area) സംക്രമണ മേഖല(transition area) വ്യാപ്തി (spread), സാമൂഹിക ഭാഷാശാസ്ത്രം(socio linguistics) പ്രസക്തിയും ലക്ഷ്യവും ഭാഷാക്ഷേത്രം(linguistics area)എന്ന സങ്കല്പം
9. ആദാനം (borrowing), പ്രസക്തി- ആദാനഭേദങ്ങൾ- ആഗതാർത്ഥം, പരിവൃത്തി (loan shift) - മിശ്രരൂപങ്ങൾ/ ആദാന മിശ്രം(loan blend)- ആദാന തർജ്ജമ (loan translation)- മലയാളത്തിലെ പരകീയ പദങ്ങൾ
10. പുനഃസൃഷ്ടി (Reconstruction), ആന്തരിക പുനഃസൃഷ്ടി (Internal reconstruction) ബാഹ്യപുനഃസൃഷ്ടി(external reconstruction) പ്രാഗ്ഭാഷ (Protolanguage)
11. നവീനഭാഷാശാസ്ത്ര ദർശനങ്ങൾ വംശീയ ഭാഷാശാസ്ത്രം (ethnolinguistics), മനോഭാഷാശാസ്ത്രം (Psycholinguistics), ഹരിതഭാഷാശാസ്ത്രം (ecolinguistics), ധൈര്യഭാഷാശാസ്ത്രം (cognitive linguistics), ന്യൂറോ ഭാഷാശാസ്ത്രം(Neuro linguistics) ഭാഷാശാസ്ത്രവും സാഹിത്യപഠനവും.

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2. ആധുനിക ഭാഷാശാസ്ത്രം	- ഡോ. കെ. എം. പ്രഭാകരവാര്യർ
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31. Indo Aryan Loan words in Malayalam – Dr. Godavarma
32. Language of Middle Malayalam – Dr. Puthusseri Ramachandran
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38. ഹരിതഭാഷാശാസ്ത്രം - ഡോ.ടി. ശ്രീവൽസൻ
39. അധികാരവും ഭാഷയും - ഡോ.പി. എം. ഗീരീഷ്
40. ദ്രാവിഡഭാഷാശാസ്ത്രപഠനങ്ങൾ - ഡോ. കെ. എം. പ്രഭാകരവാര്യർ

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സാഹിത്യ പഠനത്തിന്റെ മേഖലകളെ വികസിപ്പിച്ച ഒരു പഠനപദ്ധതിയാണ് താരതമ്യസാഹിത്യം. മാനവികമായ ഏതകയെ ഉദ്ബോധിപ്പിക്കുന്നതിൽ താരതമ്യസാഹിത്യം ഉത്സുകമാണ്. ആത്യന്തികമായി ഇത് സംസ്കാരപഠനമാണ്. ഇതിന്റെ സൈദ്ധാന്തിക പരികല്പനകളെയും പ്രയോഗരീതികളെയും പരിചയപ്പെടുത്തുകയാണ് പഠനലക്ഷ്യം.

ലോകമെമ്പാടുമുള്ള മനുഷ്യന്റെ സമാനതകളും ദേശീയത്വനിമിതകളും നിർധാരണം ചെയ്യാൻ താരതമ്യസാഹിത്യം ശ്രമിക്കുന്നു. കാലം, ദേശം, ഭാഷ എന്നിവയ്ക്കെല്ലാം അതീതമായി മനുഷ്യവർഗ്ഗം പ്രകടിപ്പിക്കുന്ന മൗലികമായ സമാനതകൾ ഏറെ ശ്രദ്ധേയമാണ്. ഇതിൽ കേന്ദ്രീകരിക്കുമ്പോൾത്തന്നെ സൗന്ദര്യശാസ്ത്ര സംബന്ധമായ മാർഗ്ഗങ്ങളിലൂടെയും താരതമ്യസാഹിത്യം നീങ്ങുന്നുണ്ട്. ഇക്കാര്യങ്ങളെക്കുറിച്ചെല്ലാമുള്ള സമഗ്രമായധാരണ സ്വരൂപിക്കാൻ ഈ പഠനം സഹായകമാണ്. താരതമ്യ സാഹിത്യത്തിന്റെ അടിസ്ഥാനസങ്കല്പങ്ങൾക്കു നേരെ ഉയർന്ന വിമർശനങ്ങളെ പരിശോധിക്കുക, താരതമ്യസാഹിത്യത്തിന്റെ സമകാല പ്രസക്തി വിലയിരുത്തുക എന്നിവയും ഈ പഠനത്തിന്റെ ഭാഗമാണ്.

Unit I: താരതമ്യസാഹിത്യത്തിന്റെ ആവിർഭാവപശ്ചാത്തലത്തിൽ ഇതിന്റെ ഉൾപ്പെരളുകൾ മനസ്സിലാക്കുക- നവോത്ഥാനം- വിശ്വമാനവൻ- ഹ്യൂമനിസം-താരതമ്യസാഹിത്യം നിർവചനങ്ങൾ- താരതമ്യസാഹിത്യവും താരതമ്യ വിമർശനവും.

Unit II: താരതമ്യ സാഹിത്യത്തിലെ ഭിന്നമാർഗ്ഗങ്ങൾ- ഫ്രഞ്ച്, അമേരിക്കൻ, ജർമ്മൻ സ്കൂളുകൾ- ഇൻഡ്യൻ സ്കൂളിന്റെ സാധ്യതകൾ- താരതമ്യ സാഹിത്യത്തിന് ഏറ്റവും വളക്കൂറുള്ളമണ്ണ് ഭാരതമാണ് എന്ന വിശ്വാസം.

Unit III: ദേശീയ സാഹിത്യം - സാമാന്യസാഹിത്യം- വിശ്വസാഹിത്യം. പ്രധാനപഠനങ്ങൾ: പ്രമേയ പഠനം, പ്രസ്ഥാനപഠനം, രൂപ പഠനം, അന്തർവിദ്യാപഠനം, സാജാത്യ വൈജാത്യപഠനങ്ങൾ- സ്വാധീനത: പ്രത്യക്ഷസ്വാധീനത, പരോക്ഷ സ്വാധീനത, നിഷേധ സ്വാധീനത.

Unit IV: താരതമ്യസാഹിത്യത്തിനെതിരെ ഉയർന്ന വിമർശനങ്ങൾ- ലെയ്ൻ കൂപ്പർ, റെന്നെ വെല്ലക്സ്, ഗായത്രി ചക്രവർത്തി സ്പിവാക് തുടങ്ങിയവരുടെ വിമർശനങ്ങൾ- വിമർശനങ്ങൾ എത്രത്തോളം യുക്തിഭദ്രം? - താരതമ്യസാഹിത്യത്തിന്റെ സമകാലിക പ്രസക്തി.

Unit V: പ്രായോഗിക പഠനം

1. ബംഗാളി മലയാള നോവലുകളുടെ പ്രാരംഭഘട്ടം : സാഹിത്യ ചരിത്രപരമായ താരതമ്യം.
2. സംസ്കാര- (യു. ആർ. അനന്തമൂർത്തി) - ഗുരുസാഗരം- ഒ. വി. വിജയൻ
3. ദേശീയബോധം തമിഴ് മലയാള കവിതകളിൽ: സുബ്രഹ്മണ്യഭാരതി, വള്ളത്തോൾ എന്നിവരെ അടിസ്ഥാനമാക്കിയുള്ളപഠനം.

കുറിപ്പ്: താരതമ്യസാഹിത്യപഠനങ്ങൾ എഡി: എ.എം. ശ്രീധരൻ, (സമയം പബ്ലിക്കേഷൻസ്, കണ്ണൂർ, 2014) എന്ന ഗ്രന്ഥത്തിൽനിന്ന് താരതമ്യ സാഹിത്യത്തിലെ പുരിയ ചലനങ്ങളെക്കുറിച്ച് ധാരണകൾ സ്വരൂപിക്കാവുന്നതാണ്.

ML-244- 2 നാടോടി വിജ്ഞാനീയം (Folklore)

പാഠ്യലക്ഷ്യങ്ങൾ

സംസ്കാരത്തിൽ ഉന്നമിക്കാൻ മാനവ ജീവിതത്തെപ്പറ്റി പഠിക്കുന്ന ജ്ഞാനശാഖയാണ് ഫോക്ലോർ. ഗോത്രവർഗക്കാർ. കർഷകത്തൊഴിലാളികൾ, കൈവേലക്കാർ, പാർശ്വവൽക്കരിക്കപ്പെട്ട ജനതകൾ, മറ്റു സാമാന്യജനങ്ങൾ എന്നിവരുടെ സാംസ്കാരികവിഷ്കാരങ്ങളും ലോകവീക്ഷണങ്ങളും തിരിച്ചറിയുക എന്നതാണ് ഈ വിഷയം കൊണ്ടുദ്ദേശിക്കുന്നത്. ഓരോ രാജ്യത്തിലേയും സമ്പന്ന പൈതൃതമായ വാമൊഴിപാരമ്പര്യത്തിൽ നിന്നാണ് വരമൊഴി- സാഹിത്യചരിത്രം ജന്മമെടുത്തിട്ടുള്ളത്. ആചാരങ്ങൾ, അനുഷ്ഠാനങ്ങൾ, വാമൊഴിക്കലകൾ, അരങ്ങുകലകൾ, കൈവേലകൾ, നാട്ടറിവുകൾ തുടങ്ങി മനുഷ്യനേയും സംസ്കാരത്തേയും കുട്ടിയിണക്കുന്ന അന്തർവിജ്ഞാന മേഖലയാണ് നാടോടിവിജ്ഞാനീയം. ആധുനിക മനുഷ്യൻ നേരിടുന്ന ബഹുവിഷമസന്ധിയിൽ അതിജീവനത്തിനുള്ള മാർഗവും അന്യം നിന്നുപോയ്ക്കൊണ്ടിരിക്കുന്ന മാനവികമൂല്യങ്ങളും കൂട്ടായ്മയുടെ സങ്കല്പങ്ങളും നാട്ടുഭാഷയടക്കമുള്ള സാംസ്കാരത്തിന്റെ തനതു സ്രോതസ്സുകളും നാടൻ കലാപഠനത്തിലൂടെ കണ്ടെത്താനാകുന്നു.

പാഠ്യപദ്ധതി

1. നാടൻകല എന്ന വിജ്ഞാനശാഖയുടെ ഉത്ഭവചരിത്രവും വളർച്ചയും പരിണാമവും വ്യക്തമാക്കുന്നു. ഫോക് ലോർ എന്ന പദത്തിന്റെ ഉത്ഭവം, ആദ്യകാലസങ്കല്പങ്ങൾ, ശേഖരണകാലം, സിദ്ധാന്തരൂപീകരണകാലം, ഫോക് ലോർ വർഗീ

കരണം- നാടൻകലയുടെ സാമൂഹ്യധർമ്മങ്ങൾ- പ്രശ്നപരിസരം- സമകാലികപ്രസക്തി എന്നിവ സൂചിപ്പിക്കുന്നു. ഫോക്ലോറും നരവംശശാസ്ത്രവും ഫോക്ലോറും സാമൂഹ്യശാസ്ത്രവും ഫോക്ലോറും ഭാഷാശാസ്ത്രവും, ഫോക്ലോറും മനുഷ്യാശാസ്ത്രവും ഫോക്ലോറും നാട്ടുചരിത്രവും എന്നിങ്ങനെ വിവിധ വിഷയങ്ങളുമായുള്ള ബന്ധത്തെക്കുറിച്ചുള്ള പഠനം നാടോടിവിജ്ഞാനീയത്തെ വികസിപ്പിച്ചതെങ്ങനെയെന്ന് വ്യക്തമാക്കണം. ആധുനിക- നാഗരിക സംസ്കാരത്തിലും പുതിയ രൂപത്തിൽ ഫോക്ലോർ നിലനിൽക്കുന്നു. ആധുനികോത്തര പഠനങ്ങൾ നാടോടിജീവികയുടെ നാനാർത്ഥങ്ങൾ വികസിപ്പിക്കുന്നു.

2. വാമൊഴി പാരമ്പര്യത്തെ (oral tradition) പരിചയപ്പെടുത്തുന്ന പഠനങ്ങൾ പാഠ്യപദ്ധതിയിൽ ഉൾക്കൊള്ളുന്നു. കടങ്കഥകൾ, പഴഞ്ചൊല്ലുകൾ, നാടോടിക്രമകൾ, ഐതിഹ്യങ്ങൾ, പുരാവൃത്തങ്ങൾ, അനുഷ്ഠാന- അനുഷ്ഠാനേതരഗാനങ്ങൾ, നാടൻ പാട്ടുകൾ, നാട്ടുഭാഷ എന്നിവ വാമൊഴിക്കലയുടെയും നാട്ടുകലാചരിത്രത്തിന്റേയും ഭാഗമാണ്.
3. ഒരു ജനസംസ്കാരത്തിന്റെ ജീവിതവീക്ഷണങ്ങളും ജ്ഞാനരീതിയും മനസ്സിലാക്കാനുള്ള ഉപാധാനമാണ് ആചാരങ്ങളും അനുഷ്ഠാനങ്ങളും (social customs and rituals). ജനനം മുതൽ മരണം വരെയുള്ള ആചാരാനുഷ്ഠാനങ്ങളും സാമൂഹ്യാചാരങ്ങളും ഘടനാത്മക ഫോക്ലോർ പഠനത്തിന്റെ ഭാഗമായി വിലയിരുത്തണം നാട്ടാചാരങ്ങൾക്കു പുറമേ പ്രത്യേക ഭക്ഷണരീതികളും ഓരോ ദേശസംസ്കൃതിക്കുമുണ്ടായിരുന്നു.
4. നാടോടിക്കലകളിൽ പ്രധാനമാണ് അരങ്ങും ശരീരഭാഷയും ഉപയോഗിച്ചുള്ള പ്രകടനപരമായ രംഗകലകൾ (performing folklore). രംഗകലാതത്വങ്ങളുടെ വെളിച്ചത്തിൽ കേരളത്തിലെ രംഗകലകളുടെ പഠനം നിർവ്വഹിക്കണം. നാടൻകളികൾ, അനുഷ്ഠാന-അനുഷ്ഠാനേതരരംഗകലകൾ മറ്റു സാമൂഹ്യാവിഷ്ക്കരണങ്ങൾ എന്നിവ ഇതിൽ ഉൾക്കൊള്ളുന്നു.
5. നാടോടി ജീവിക (folklife)യിലെ പ്രധാന ഇനമാണ് ഭൗതികസംസ്കാര (material culture) ത്തിൽ നടന്നുവരുന്ന കൈവേലാവഴക്കങ്ങൾ (craft tradition). പ്രകൃതിവിഭവങ്ങളെ വൈപുണ്യനിർമ്മിതികളാക്കി മാറ്റുന്ന കരകൗശലചരിത്രം ഫോക്ലോർ പൈതൃകത്തിന്റെ ഭാഗമാണ്. സമൂഹത്തിന്റെ ഭൗതികനിർമ്മിതികൾ ആവിഷ്ക്കരിക്കുന്നതാണ് കർമ്മാള വ്യവസ്ഥ. കാർഷികോപകര

ണങ്ങൾ, വീട്ടുപകരണങ്ങൾ, ചമയങ്ങൾ, ദാരുശില്പങ്ങൾ എന്നിങ്ങനെയുള്ള ഗ്രാമീണ കരകൗശലപാരമ്പര്യം പരിചയപ്പെടുത്തണം.

6. നാട്ടുവിജ്ഞാനങ്ങളും പാരമ്പര്യജ്ഞാന സമ്പത്തും (Indigenous) നിറഞ്ഞതാണ് ഫോക്ലോർ മേഖല. പരിസ്ഥിതി, ആരോഗ്യം തുടങ്ങിയവയെ സംബന്ധിച്ച അറിവടയാളങ്ങൾ ഫോക്ലോറിൽ മുദ്രിതമാണ്. നാട്ടുജനതയുടെ ലോകവീക്ഷണങ്ങളും ദർശനങ്ങളും ഇതിൽ നിന്ന് തിരിച്ചറിയാം. പേറ്റന്റ് വ്യവസ്ഥ, ഭക്ഷ്യസുരക്ഷ, ജനിതക ഗവേഷണം തുടങ്ങി ആധുനിക കാലഘട്ടത്തിലുള്ള ഫോക്ലോറിന്റെ പ്രസക്തി ഇവിടെ മനസ്സിലാക്കുന്നു. ഇതോടൊപ്പം ഫോക്ലോർ ഫീൽഡു വർക്കിന്റെ തത്വങ്ങളും പ്രയോഗങ്ങളും തിരിച്ചറിയേണ്ടതുണ്ട്. ഏതെങ്കിലും പത്ത് ഫോക്ലോർ ഇനങ്ങളുടെ വസ്തുതാശേഖരണം നടത്താവുന്നതാണ്.

ML-244-3, വിവർത്തനം

ലോകം ആഗോള ഗ്രാമമായി മാറിക്കൊണ്ടിരിക്കുന്ന ഈ കാലഘട്ടത്തിൽ സവിശേഷമായ പ്രസക്തിയാണ് വിവർത്തനപഠനത്തിനുള്ളത്. വ്യത്യസ്ത ഭാഷണ സമൂഹങ്ങളുടെ ഇടയിൽ ധാരണയുടെ പാലം പണിയാൻ വിവർത്തനത്തിന് കഴിയുന്നു. വിവർത്തന പഠനത്തിന്റെ രംഗത്തെ പ്രധാന സിദ്ധാന്തങ്ങളെയും രീതിഭേദങ്ങളെയും പരിചയപ്പെടുത്താൻ ഈ പഠനം വഴി സാധിക്കുന്നതാണ്. വിവർത്തനങ്ങളെ മൂല്യനിർണ്ണയം ചെയ്യാനും വിവർത്തിത കൃതികളെ മൂലപാഠങ്ങളുമായി തട്ടിച്ചുനോക്കാനും വിദ്യാർത്ഥിക്ക് കഴിയേണ്ടതാണ്. സ്വതന്ത്രമായ വിവർത്തനപ്രക്രിയയിൽ ഏർപ്പെടാൻ പഠിതാക്കൾക്ക് പ്രചോദനം ലഭിക്കത്തക്കവിധത്തിലാണ് ഈ കോഴ്സ് സംവിധാനം ചെയ്തിരിക്കുന്നത്.

I. സിദ്ധാന്തവും ചരിത്രവും

1. വിവർത്തനം: ശ്രേഷ്ഠമായ ദൈവനിന്ദ- വിവർത്തനം: നിർവചനം - സ്രോതഭാഷ, ലക്ഷ്യഭാഷ- വിവർത്തനത്തിന്റെ ആവശ്യകത, പ്രയോജനം- പരിഭാഷ: എതിർനില്പാടുകൾ, പരിഭാഷയുടെ പരിമിതികൾ
2. അർനോൾഡ് ന്യൂമാൻ നിലപാടുകൾ
3. വിവർത്തനവിഭാഗങ്ങൾ: ശബ്ദാർത്ഥവിവർത്തനം, പദാനുപദവിവർത്തനം, ആശയവിവർത്തനം, സ്വതന്ത്രവിവർത്തനം, ആശയരൂപാന്തരണം-വിവർത്തന പ്രക്രിയ

4. വിവർത്തനോപകരണങ്ങൾ, വിവർത്തകനുവേണ്ട ഗുണങ്ങൾ
5. വിവർത്തനം - സർഗ്ഗാത്മകസാഹിത്യങ്ങളിലും ഇതരമേഖലകളിലും -മാധ്യമങ്ങളും വിവർത്തനവും
6. വിവർത്തന പ്രകാരങ്ങൾ : ഭാഷാന്തഃസ്ഥം, ഭാഷാന്തരസ്ഥം, സമഗ്രം, നിയന്ത്രിതം, പൂർണ്ണം, ഭാഗികം, കാര്യമാത്ര (പ്രയോഗിക) വിവർത്തനം (pragmatic translation) അധികൃത തർജ്ജമ, പരാവർത്തനം
7. വിവർത്തനമൂല്യനിർണ്ണയനം: നിക്ഷേപല സിദ്ധാന്തം, പിൻവിവർത്തനം
8. വിവർത്തകന്റെ ആദ്യശൃത - വിവർത്തനത്തിന്റെ രാഷ്ട്രീയം - ആഗോളീകരണവും വിവർത്തനവും : മിഷേൽ ക്രോണിൻ, ലോറൻസ് വെനുറ്റി എന്നിവരുടെ നിലപാടുകൾ

സാങ്കേതിക പദങ്ങൾ, സാഹിത്യ സംജ്ഞകൾ, ശൈലികൾ, വാക്യങ്ങൾ, ഖണ്ഡികകൾ, കാവ്യഭാഗങ്ങൾ- ഇംഗ്ലീഷിൽനിന്ന് മലയാളത്തിലേയ്ക്കും തിരിച്ചും

പഠിക്കേണ്ട പരിഭാഷകൾ

1. പാവങ്ങൾ:ഇംഗ്ലീഷിലെയും നാലാപ്പാടന്റെ വിവർത്തനത്തിലെയും ഒന്നാമധ്യായം.
2. വീണപൂവ് - കുമാരനാശാൻ. The fallen flower (ആദ്യത്തെ 10 ശ്ലോകം മാത്രം) (ജി. കുമാരപിള്ള)
3. ഖസ്സാക്കിന്റെ ഇതിഹാസം ഇംഗ്ലീഷ് വിവർത്തനം-ഒ.വി.വിജയൻ ഒന്നാമധ്യായം.
4. ചരമവാർഷികം - കെ.പി. രാമനുണ്ണി. Death Anniversary, Yaseen Ashraf (ഒന്നാമധ്യായം മാത്രം) (Oxford Universty Press).

സഹായകഗ്രന്ഥങ്ങൾ

1. വിവർത്തനം - കേരള ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്
2. വിവർത്തനത്തിന്റെ ഭാഷാശാസ്ത്ര ഭൂമിക- കേരള ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്
3. ഭാഷയും ഭാഷാന്തരവും - കെ. എ. കോശി
4. A Linguistic Theory of Translation - J.C. Catford
5. Towards A Science of Translation - E.A. Nido
6. Translation and Globalisation - Michael Cronin
7. Translation: An advanced Resource Book - Basil Hatim
8. The Translator's Invisibility: A History of Translation - Lawrence Venuti

**Learning Outcomes-based Curriculum Framework (LOCF)
for Post-graduate Programme**

Name of the Programme:

MA HINDI LANGUAGE AND LITERATURE

(Syllabus effective from 2021 Admission onwards)

For affiliated Colleges

UNIVERSITY OF KERALA

M.A. PROGRAMME IN HINDI LANGUAGE AND LITERATURE**PROGRAMME OBJECTIVES**

- **Acquire deep knowledge in Hindi literature.**
- **Enable the students capable in translation.**
- **Enable the students fluent in our National Language.**
- **Promote the language in the field of technology, business, bank etc apart from the academic field.**
- **Impart knowledge about various job opportunities in Hindi field and also to develop their potential in International level.**
- **The students are being enriched to avail ample opportunities in the field of Hindi Officers, Translators in Central Govt. Offices etc and also as Teachers, in schools, Assistant Professors in colleges and universities.**

STRUCTURE OF THE PROGRAMME

Se m	Course Code	Course Title	credits	Hours/ Week	Hrs /Sem	Esa Hrs	Maximum marks		
							CA	ESA	TOTAL
I	HL-CC 211	HINDI POETRY : ANCIENT AND MEDIEVAL PERIOD	4	6	108	3	25	75	100
	HL – CC 212	HINDI FICTION AND OTHER PROSE FORMS	4	6	108	3	25	75	100
	HL- CC 213	HISTORY OF HINDI LITERATURE : ANCIENT AND MEDIEVAL PERIOD	4	6	108	3	25	75	100
	HL-CC 214	GRAMMAR AND STRUCTURE OF HINDI LANGUAGE	6	7	126	3	25	75	100
II	HL – CC 221	INDIAN AND WESTERN LITERARY THOUGHTS, PROSODY AND POETICS	6	7	126	3	25	75	100
	HL- CC 222	HISTORY OF HINDI LANGUAGE AND LINGUISTICS	4	6	108	3	25	75	100
	HL – CC 223	HISTORY OF HINDI LITERATURE : MODERN PERIOD	4	6	108	3	25	75	100
	HL- CC 224	DRAMA AND ONE ACT PLAYS	4	6	108	3	25	75	100
III	HL – CC 231	MODERN POETRY UPTO PRAGATIVAD	6	7	126	3	25	75	100
	HL- CC 232	FUNCTIONAL HINDI	4	6	108	3	25	75	100
	HL – CC 233	INDIAN LITERATURE	4	6	108	3	25	75	100
	HL – DSE 234	FILM STUDIES (SPECIAL REFERENCE TO HINDI FILMS) OR	4	6	108	3	25	75	100

	SG- GC 234 A HL – GC 235	SANSKRIT BEGINNERS' HINDI							
IV	HL – CC 241	MODERN POETRY SINCE PRAYOGVAD	6	7	126	3	25	75	100
	HL – CC 242	HINDI LITERATURE : MODERN DISCOURSES	4	6	108	3	25	75	100
	HL- CC 243	TRANSLATION : THEORY AND PRACTICE	4	6	108	3	25	75	100
	HL –DSE 244 SG-GC 244A HL – GC 245	COMPARITIVE LITERATURE : HINDI AND MALAYALAM OR SANSKRIT SPOKEN HINDI	4	6	108	3	25	75	100
	HL- CC 246	DISSERTATION	6				80	20	100
		VIV VOCE	2						100
		TOTAL	80	100					1800

(Internal Assessment: Attendance: 5, Seminar: 5, Assignment: 5, Test: 10 – Total – 25)

- HL – Hindi Literature
- CC- Core Course
- GC – Generic Elective Course
- DSE – Discipline Specific Elective

PROGRAMME SPECIFIC OUTCOME

PSO	PSO Statement
PSO 1	• Understanding the relation between the society and literature and analyse the role played by Hindi literature.

	• Understand the concepts of literary trends, special dialects of Early and Medieval literature and its socio-cultural back ground • Understanding the strategy of converting worship into the movement of struggle for cultural freedom • Acquire knowledge about the various aspects of prose forms, stylistic features of eminent modern essayists with their contribution to overall development of Hindi prose. • Comprehend different concepts, origin and perspectives of Hindi Fiction. • Identify different trends in the development of Hindi Literature • Understand the History of Hindi Language through language classifications as well as stages of script development and acquire a thorough coverage of the origin, source and development of the language. • Understand the concepts of Basic Hindi Traditional grammar style, linguistic aspects and the acoustic qualities of the language for language promotion • Develop the basic structure of language by enhancing verbal and communication mode of Hindi through practice that enables them to be placed successfully in the jobs that requisites the language
PSO 2	• Familiarize with the Eastern and western literary thoughts of Literature • Understand the concepts of literary trends of Modern Hindi Literature • Familiarize with the linguistics of Hindi language and understands its basic theories • Enumerates Dwani Vigyan, Roop Vigyan, Vakya Vigyan and Arth Vigyan • Developing skills for writing official letters in Functional Hindi • Provide comprehensive knowledge about official language Hindi
PSO 3	• Understand the concepts of Hindi Modern Poetry, its political-socio-cultural aspects, trends of modern poetry. • Achieve a wider realm of knowledge on the concepts of Hindi drama and theatre conventions in the romantic and modern period through the comprehension of its thematic craft analysis, style and its vivid features and explore a variety of dramatic texts practically. • Familiarize with the structural concepts of modern Dramas and One act plays written in the romantic and modern period by many authors • Familiarize with the concept of one Indian literature and Indian writers through their representative works. • Understand a brief history of world cinema and Indian Cinema

PSO 4	• Enable to evaluate critically classic films in Hindi • Familiarize with the development of modern poetry- the different trends & styles of modern poetry. • Help to develop their faculty of appreciation. • sensitize about latest trends and discourses in Hindi literature like Dalit Discourse, Adivasi discourse, Gender discourse etc • Understands and evaluates different discourses in modern Hindi literature. • Track the problems of translation pertaining to the linguistic incompatibility of verbal meaning modulation, loan word application, and grammatical aspects and application of theoretical practice of inter-intra types of languages build up a strong self commendation practice in the bilingual translation. Through this learners will be capable to get into job in various central Government offices. • Understands the craft of comparative literature. • . Comprehend different perspectives of comparative literature.

SEMESTER: I

Course: HINDI POETRY: ANCIENT AND MEDIEVAL PERIOD

(HINDI KAVYA: PRACHEEN EVUM MADHYAKAALEEN PERIOD)

Course Code: HL-CC 211

Credits: 4

Hours /week: 6hrs

Aim: To familiarize the students with the concepts of Ancient and Medieval Hindi Poetry and its special dialects.

COURSE OBJECTIVES: This course covers Ancient form of Hindi Poetry up to 13th century and the poetry from 14th century up to 19th century. This course aims to create awareness among students on ancient form of Poetry and the language

style used in the poetry, thus they can understand the basic structure of Hindi language and its development over a period of time.

COURSE OUTCOME (COS)

CO 1: Gain knowledge of the features of ancient eminent Hindi writers of the period. Access the source of Aadikal and Origin of Hindi Literature--Ancient form of Hindi Poetry up to 13th Century thus imbibing the form and communicability of the themes in the poetry. Understand various features subsumed in ancient poetry that depicts the age and that marks the path of its transition towards Bhakti era.

CO 2: Analyze various elements of poetry in Ancient and Medieval period so as to gain the ability to interpret and appreciate the literary forms of this era in the socio cultural context .Imbibe the style of 'Raso' poetry through 'Raso' literature that expresses the brave deeds of the provincial kings and their romantic expressions that later marked its influence in the Ritikaleen poetry. Access the poetry of Vidyapati- Laukik Sahitya depicting the life of the common folk and will be able to perceive a detailed description.

CO 3 : Understanding the relation between Society and Literature and the role played by the poets of ancient and medieval period in Hindi literature and society. Understand the relevance of Bhaktikal and Origin of Bhakti Movement that have influenced medieval Hindi poetry. Acquaint with various features of Hindi poetry during the Bhakti era of Hindi literature and also will be able to diffuse with various Bhakti movements that enriched the literature both qualitatively and quantitatively. Derive a rigid knowledge about the various branches of 'Sant' poetry through the eminent Hindi writers of their period

CO 4: Imbibe social, cultural consciousness, critical insight and understand and appreciate poetry as a literary art form. Pervade their strong idea on the poetic contents of Tulsidas, Malik Muhammed Jayasi, Kabirdas, Soordas and Tulsidas.

CO 5 : Acquire deep understanding of the major traditions and values of reetikaleen poetry. Comprehend the features of Ritikal and understand the social, political, cultural contexts that explicits the development of ritikaleen poetry and also will be able to know more about the sources and trends of Ritikal and about the Ritikaleen poets.

CO 6 : Gain the insight into the major issues related to the socio-cultural contexts of India in this era. Achieve ideas about the inclusion of the folk aspects, various stylistic aspects, and other features in the poetry of Ritikaleen poets like Kesavdas, Ghananand, Bihari, and their contribution to Ritikaleen poetry.

COURSE CONTENT

Module 1: Aadikal , Ancient form of Hindi Poetry, Sidha Literature, Natha Literature, Jaina Literature, Raso Literature.

Module 2: Poems: Prithvi Raj Raso : REVA THAT – ONE ‘SAMAY’

Vidyapati Padavali – 2 PAD

Module 3: Origin of Bhakti Movement-Social-Cultural Aspects- various religious cults and philosophies which have influenced medieval Hindi poetry. Santkavya- Alwar Sant- Nirgun Bhakti - Gyanasrayi and Premashrayi, Sagun Bhakti- Ram Bhakti Kavya and Krishna Bhakti Kavya.

Module 4 : Poems :

KABEER : 5 PAD

JAYASI : NAGAMATI VIYOG KHAND

SOORDAS : VINAY -2 PAD ,
 BALKRISHNA – 2 PAD , BHRAMARGEET – 2 PAD
 THULSIDAS : KEVAT PRASANG 1-5

Module 5: Reetikal literary works socio-cultural context, Main Trends of Reetikal:
 Reetimukth, Reetisidh, Ritibadh Poetry.

Module 6: Poems

BIHARI : 5 DOHA (50-54)
 KESAVDAS : ANGAD –RAVAN SAMVAD
 GHANANAND : 2 PAD
 BHOOSHAN : 2 PAD

REFERENCES (TEXT FOR READING)

Prescribed Text: An edited Textbook on Pracheen evum Madhyakaleen kavya

Reference books General :

- Hindi Sahitya ka Adikal – Hazariprasad Dwivedi
- Hindi Sahitya ka VaigyanikItihas – Ganapatichandra Gupta
- Hindi sahitya ka Doosara Itihas – Dr. Bachan Singh - Vani Prakshan,
 Delhi
- Hindi ke Pracheen Pratinidhi Kavi – Dwarika Prasad Saxena

QUESTION PATTERN

HL- CC 211 HINDI POETRY – ANCIENT AND MEDIEVAL PERIOD

(HINDI KAVYA : PRACHEEN EVUM MADHYAKAALEEN PERIOD)

Time : 3 hrs

Maximum Marks : 75

- I. Answer the following ten objective questions . Each question carries 1 mark
(10 x1 =10 Marks)
- II. Answer two essays out of four. Each question carries 10 marks
(2 x 10 = 20 Marks)
- III. Answer five short notes questions out of seven . Each question carries 4 marks
(5 x 4 = 20 Marks)
- IV. Answer five annotations out of six. Each question carries 5 marks
(5 x 5 = 25Marks)

SEMESTER : I

Course : HINDI FICTION AND OTHER PROSE FORMS

(HINDI KATHA SAHITYA AUR ANY GADYA VIDHAYEIN)

Course Code: HL- CC 212

Credits : 4

Hours / week : 6

AIM: To familiarize the students with the concepts of Modern Hindi Novel and Short Stories. This course also aims to create awareness among students on different forms of writing of Prose and Essays and also to familiarize the students with the concepts of Development of Hindi Prose form from 1900.

COURSE OBJECTIVES: This course covers Origin and Development of Hindi Fictions in General and Hindi Novels and Short Stories in particular. Characterization, plot and new trends have to be analyzed. This course also covers Prose and Essay forms of Hindi. Essays, Sketches, Memoirs, Travelogue,

Biography, Autobiography and Diary are important Prose forms. Emergence of prose forms is closely associated with modernization and explosion of information and interest can be generated among learners and many lessons covers with national integrity, non-violence, humanism, different types of satire like political sociological, economical, religious etc

Course Outcome (Cos)

CO1 : Gain deep knowledge in various features of Hindi Fiction and able to get a transparent picture of the origin and development of Hindi fiction along with its vivid dimensions

CO2 : Understand the new trends arising in the study of Hindi Novels and short stories and know more about socio-cultural, psychological analysis through these literary works. Can access more about the stylistic aspects of the prominent writers such as Premchand, Agney etc. in the field of Hindi fiction. Understand about the feministic literature focusing mainly on the works of Chitra Mudgal.

CO3 : Comprehend the contributions of the eminent Short story writers and trend setters in Fiction and will be able to outline the origin and development of short stories in the pre- post and the period of Premchand .Imbibe a strong sense of influence of progressive movements with an insight of modernism and depiction of different dimensions of life in Nayikahani and Samkaleenkahani.

CO4 :Gain the knowledge about various forms of prose and improve the language skills. Familiarize with Origin and Development of Prose, Types of prose-Simple Essay, General Essay, Personal Essay, Reflective Essay, Psychological Essay etc.-memoirs-sketch-auto biography-biography- travelogue, Diary etc. Imbibe the knowledge of various types of prose forms and styles of presentations. Comprehend the Prose and Essay forms of Hindi.

CO 5 :Analyze various elements of prose of eminent essayists so that to gain the ability to interpret and appreciate the different form of prose in the socio-cultural context and imbibe the peculiarities of its historical development. Acquire a detailed study of the important essayists of Hindi Literature- Ramchandrashukla, Hazari Prasad Dwivedi,

Premchand, Mahadevi Varma, Vidyanivas Mishr, Dr.N.E.VishwanathIyeretc. Recognize and evaluate the literary features of the eminent essayists .

COURSE CONTENT

Module 1: Novel-Origin and Development - Premchand and Agney – The contribution of Premchand in the field of Novels and short stories, Agney and his contribution in the post sixty novels – his style of writing

Module 2 : The contribution of female novelists in Hindi literature - works of prominent women writers

Module 3 : Novels :

- GODAN by PREMCHAND (detailed study)
- SHEKHAR EK JEEVANI (BHAG 1) by AGYEY (non-detailed)
- GILIGADU by CHITRA MUDGAL (non detailed)

Module 4 : Stories

- Eedgaah–Premchand
- Akashdeep – Jayshankar Prasad
- Apna Apna Bhagy - Jainendr
- Gangreen - Agyey
- RaajaNirbansiya - Kamaleswar
- Sikka Badal Gaya – Krishna Sobdi
- EkkisvimSadi Ka Ped – Mridula Garg
- Sambandhon Ke Cheethde - Jaynandan

Module 5: Origin and Development of Prose-Types of prose-Simple Essay, General Essay, Personal Essay, Reflective Essay, memoirs-sketch-auto biography-biography-travelogue etc.

Module 6 :Other prose forms :

- Krodh – Ramchandra Shukla

- Nakhoon Kyon Badte Hain - Hazari Prasad Dwivedi
- Raziya – Ramvriksh Benipuri
- Prem Samadhi Ki Chandini Rat – Viswanath Iyer
- Bholaram Ka Jeev – Harishankar Parsayee
- Thele par Himalay – Dharmveer Bharati
- Meghadoot – Mahaveerprasad Dwivedee
- Bharateey Sanskriti – Gulabray

REFERENCES (TEXT BOOKS)

1 Godan– Premchand

2 Shekhar Ek: Jeevani(Part -1) –Agyey

3. Giligadu -ChitraMudgal

4. Short Story(An Edited textbook of story collection.)

Only the following Eight stories to be studied

- Eedgaah– Premchand
- Akashdeep – Jayshankar Prasad
- Apna Apna Bhagy– Jainendr
- Gangreen - Agyey
- Raaja Nirbansiya - Kamaleswar
- Sikka Badal Gaya – Krishna Sobdi
- Ekkisvim Sadi Ka Ped – Mridula Garg
- Sambandhon Ke Cheethde - Jaynandan

5. An Edited Text book of collection of other prose forms

- Krodh – Ramchandra Sukla
- Nakhoon Kyon Badte Hain - Hazari Prasad Dwivedi
- Raziya – Ramvriksh Benipuri
- Prem Samadhi Ki Chandini Rat – Viswanath Iyer
- Bholaram Ka Jeev – Harishankar Parsayee
- Thele par Himalay – Dharmveer Bharati

- Meghadoot – Mahaveerprasad Dwivedee
- Bharateey Sanskriti – Gulab ray

REFERENCES (GENERAL)

- Aaj ka Hindi Upanyas– Indranath Madan
- Adhunik Hindi Kahani– Ed.G.P.Vimal
- Bharteey Upanyas ki Avadharna aur swaroop– Dr. AlokGupt
, Rajkamal Prakashan, New Delhi
- Kahani Nayi Kahani– Dr.Namvar Singh
- Hindi Upanyas ki Pravartiyaam– Dr.Shashibhushan Sinhal
- Gadya ki vividh vidhayen- Majida Asad
- Hindi Gadya Sahitya- Ramchandra Tiwari
- Hindi Nibandh ka Vikas– Dr.Omkarnath Sharma
- Kalam Ke Mazdur: Premchand– Madan Gopal

Question pattern

HL – CC 212 Hindi Fiction and Other Prose Forms.

(HINDI KATHA SAHITYA AUR ANY GADYA VIDHAYEIN)

Time :3 hrs

Maximum Marks :75

- I. Answer the following ten objective questions. Each question carries 1 mark. (10 x 1 =10 Marks)
- II. Answer Two essays from Novel out of Three. Each question carries 10 marks. (2 x 10 = 20 Marks)
- III. Answer one essay from Short Story out of Three .Each question carries 10 marks. (1 x 10 = 10 Marks)
- IV. Answer one out of three essays from Prose. Each question carries ten Marks. (1 x10 = 10 Marks)
- V. Answer any five short questions out of eight. Each question carries 5 marks.

(5X5=25 Marks)

SEMESTER : I

Course :HISTORY OF HINDI LITERATURE : ANCIENT AND MEDIEVAL PERIOD (HINDI SAAHITY KAA ITIHAAS: PRACHEEN EVAM MADHYAKAAL)

Course Code : HL – CC 213

Credits : 4

Hours :6

Aim: To give a detailed account of trends in literature in the early and riti period. Familiarize the students with the thoughts, philosophy of great poets like Kabeer, Soordas, Tulsi, Jayasi ,Kesavdas,Bihari,Ghananand ,Bhushan etc.

COURSE OBJECTIVES :This course covers the History of Hindi Literature up to 19th Century.

Course Outcome (Cos) :

CO 1 : Understanding the basis of classification of History of Hindi Literature

CO 2 :Understanding the importance and the basis of the names given to each period of Hindi Literature.

CO 3 : Understand the trends, milestones and literary works of Early and Medieval history in the context of socio-cultural and political conditions of that period.

CO 4 : Critically evaluate the contribution of poets of that period.

CO 5 : Understand the influence of Early and Bhakti period writers on society and Hindi literature as a whole.

CO 6 : Achieve ideas about the inclusion of the folk aspects, various stylistic aspects, and other features of Ancient and Medieval poets

COURSE CONENT

Module 1 : Hindi Sahitya ka kaal vibhajan- uski Samagri

Module 2 : History of Hindi Literature - Aadikal - literary background, Sidh-Nath-Raso sahitya, main trends of Aadikal.

Module 3 : Major poets : Chand Bardai, Vidyapati and other prominent poets

Module 4: History of Hindi Literature -Bhaktikal ,Gyanashrayi-Premashrayi-Trend setters Kabir Das, Jayasi, -- Main trends of Bhaktikal.

Module 5 :Ram Bhakti-Krishna Bhakti. Trend setters :Tulsi Das and Soor Das , ashtachhaap ,Rahim ,Meera bai and other major poets

Module 6: History of Hindi Literature -Ritikal, Major poets Keshav Das, Bihari, Bhooshan, Ghananand -- Ritibadh, Ritimukth and Ritisidh.

REFERENCE BOOKS

- Hindi Sahitya Ka Itihas - Dr.Nagendra
- Hindi sahitya Ka VaigyanikItihas - Dr.Ganapati Chandra Gupt.
- Hindi Sahitya Ka Itihas - Acharya Ramchandra Sukla
- Hindi Sahitya Ka Itihas - Lakshmi Sagar Varshney

Question pattern

HL-CC 213 HISTORY OF HINDI LITERATURE : ANCIENT AND MEDIEVAL PERIOD(HINDI SAAHITY KAA ITIHAAS: PRACHEEN EVAM MADHYAKAAL)

Time :3 hrs

Maximum Marks :75

- I. Answer the following ten objective questions

Each question carries 1 mark (10 x1 =10 Marks)

- II. Answer two essays out of four

Each question carries 10 marks (10x2 = 20 Marks)

III. Answer one essay out of four

Each question carries 10 marks (10 x1 =10 Marks)

IV. Answer seven short questions out of Ten

Each question carries 5 marks (7 x5 =35 Marks)

SEMESTER : I

Course : GRAMMAR AND STRUCTURE OF HINDI LANGUAGE

(VYAKARAN AUR HINDI BHASHAAYEE SANRACHANA)

Course Code : HL-CC 214

Credits :6

Hours :7

AIM: To familiarize the students with the Structure of Hindi language. To familiarize the students with the concepts of Basic Hindi Traditional grammar style and the structural form.

COURSE OBJECTIVES : This course covers Word formation – Compounding and affixation, Parts of Speech, Nominal categories: case relations, number ,gender person, Verbal categories, mood modality, tense and aspect, The sentence : its elements and their order under Grammatical structure.

COURSE OUTCOME (COS)

CO 1 : Understands Varna and its subdivisions .Recollects types of varna and its subdivisions and understands correct spelling of words.

CO 2 : Recollects types of Sandhi, Samas, Upsarg, Pratyay

CO 3 : Defines all parts of speech and recollects all subdivisions and types of parts of speech .

CO 4 : Students use targeted grammatical structure meaningfully and appropriately in oral and written production. They will transfer their knowledge in effective, concise and grammatically correct writings

CO 5 : Demonstrate complete understanding of the major features of Hindi syntactic structure including word phrasal and clausal structures. Compare and contrast Hindi grammatical structure with other languages.

CO 6 : Apply in depth knowledge of the concepts, principles and skills in the study of Hindi language and literature in different contexts related to the fields of education, journalism, creative writings, translation etc.

COURSE CONTENT

Module I: Introduction- Language and Grammar, Importance of Grammar in Language, Parts of Grammar- Varna Vichar, -Dhwaniyan-Swar aur Vyanjan Samyukt Vyanjan-lekhan aur vartani- Akshar- Vartaniki Samasya.

Module 2 : Sabda Rachana- Sandhi – Sandhi kebhed–samās – upsarg –pratyay- Sanskrit Hindi aur videshi pratyay – structure and usage

Module 3 : Vikari sabd- Sagya- Sarvanam- Visheshan- -Sagya mein Roopantar- Ling, Vachan and karak Sarvanam mein roopantar- Visheshan mein roopantar- Visheshan ke tulana

Module 4 : Kriya –Kriya ke bhed - Kriya mein roopantar – Kaal -vachya

Module 5: Avikari Sabd-Kriya visheshan, Sambandh Bodhak, Samuchchya Bodhak, Vismayadi Bodhak- Unkipadavyakhyā.

Module 6: Vaakya- vaakya ke bhed –prayog -structure and usage

REFERENCE BOOKS

1. Hindi Bhasha :Sanrachna aur Prayog- Dr.Bholanath Tiwari & Dr.Ravindranath Srivastav
2. Hindi Vyakaran– Kamta Prasad Guru
3. Vyavaharik Hindi VyakaranTatha Rachana – Hardev Bahari
4. Vyavaharik Hindi Vyakaran– Bholanath Tiwari

QUESTION PATTERN**HL – CC 214 GRAMMAR AND STRUCTURE OF HINDI LANGUAGE
(VYAKARAN AUR HINDI BHASHAAYEE SANRACHANA)**

Time : 3 hrs

Maximum Marks : 75

I. Answer the following ten objective questions

Each question carries 1 mark

(10 x 1 = 10 Marks)

I. Answer any one essay out of two

Each question carries 10 marks

(1 x 10 = 10 Marks)

II. Answer any four short answer questions out of six

Each question carries 5 marks

(4 x 5= 20 Marks)

III. Answer any one essay out of two

Each question carries 10 marks

(1 x 10 = 10 Marks)

IV. Answer any Three short answer questions out of five

Each question carries 5 marks

(3 x 5= 15 Marks)

V .Answer any five out of Eight (from Grammar practice)

(5 x 2 = 10 marks)

SEMESTER 2**Course: INDIAN AND WESTERN LITERARY THOUGHTS, PROSODY AND
POETICS****(BHARATEEYA EVUM PASHCHATYA KAAVYASHASTRA AUR KAVYA
PRADEEP)****COURSE CODE : HL – CC 221****CREDITS : 6**

Hours/week : 7

Aim : To familiarize the students with eastern and western literary thoughts . To familiarize the students with shabd shakti, selected Alankars, selected chands and nine rasas.

COURSE OBJECTIVES: This course covers Ancient Indian Literary thoughts, the theories of Aesthetic pleasures and different schools of literary theory, Prosody and poetics, definition of Poetry, function of poetry, classification of poetry, various forms and Western literary thought.

Course Outcome (Cos)

CO 1 :Familiarise the Indian literary thoughts and understand the various theories of aesthetic pleasures- theory of Rasa, Alankara, Guna, Riti, ,Vakrokti, Ouchitya and Dhvani and gain deep knowledge on definition, function, classification and various forms of poetry and prose. Achieve an overall idea of various theories of Aesthetic pleasures pertaining to the Indian literary thoughts. Understand in detail the multidimensional aspects of poetry and technical vividness of prose forms like shabdh shakti, riti etc.

CO 2 : Understand the history of western literary thoughts, theory and forms and poetic thoughts of western tradition and theoretical thoughts of western critics .

CO 3 : Gain better understanding of Plato and Aristotle and their concepts of art, reality and emotion concepts of drama plot, character and their inter relation and structure of plot in relation to tragedy, concept of tragic character. Able to sharpen their analysis of poetic thoughts through the detailed interpretation of poetic theories by western critics.

CO 4 : Acquiring knowledge on Catharsis and its interpretations, Concepts of Longinus on the sublime, classicism, neo classicism and romanticism. Differentiate the interpretations of various theories of art forms mainly in poetry and drama by western critics and able to explore the vivid contents inherent in their theories.

CO 5 : Familiarizing with the Poetic dictions of Coleridge, Wordsworth, Mathew Arnold, Richards and Eliot. Comprehend various scholarly critical approaches pertaining to the study of literature and able to set their point of view critically.

CO 6 : Able to achieve an outlook of Indian perspectives and and develop a schematic analysis on various western critical approaches like Marxism, Modernism, Psychological Analysis, Existentialism, Symbolism, Realism, Sur-realism, Formalism.

COURSE CONTENT

Module 1: Ancient Indian Literary Thought- The theories of Aesthetic pleasures and different schools of literary theory –The Rasa theory of Bharatha and its interpretations. The Alankara Schools of Bhamaha, Udbhata and Rudrata. The Guna school of Dandi – the Riti school of Vamana – the Vakrokti school of Kuntaka – Ouchitya school of Kshemendra – the Dhvani school of Aanandavardhan. Definition of Poetry, function of poetry, classification of poetry, various forms of poetry, Prabandh and Muktak Kavya, Mahakavya and various literary forms. Their techniques different forms of rasa, riti, guna and shabd Shakti.

Module 2: Prosody and poetics- Popular chands- Doha, Choupai, Rola, Soratta, Barvai, Indravajra, Upendravajra, Mandakranta. Popular Alankaras- Anupras, Yamak, Shlesh, Vakrokti, Upama, Roopak, Utpreksha, Vyatirek.

Module 3: History of western literary thoughts- theory and forms –poetic thoughts of western tradition-theoretical thoughts of western critics.

Module 4: Plato and Aristotle: art and reality, art and imitation, art and emotion, the plays of Art in society. Aristotle on drama plot, character and their inter-relation–structure of plot in relation to tragedy–the tragic character–the three unities–Catharsis and its interpretations– catharsis and rasa. Longinus on the sublime–classicism, neo-classicism

and romanticism– Coleridge on imagination–Coleridge and Wordsworth on poetic diction–Mathew Arnold– Richards – Eliot.

Module 5: Critic approaches: Marxism, Modernism, Psychological Analysis, Existentialism, Symbolism, Realism, Sur-realism, Formalism.

Module 6 : Hindi Sameeksha Paddhati – Interpretation of New-Criticism, Stylistics, Structuralism, Post-Structuralism, Post-Modernism, Discourses by modern critics Ramchandra Shukl, Nanddulare Vajpai, Shivdan Singh Chouhan, Ramvilas Sharma, Nagendr, Naamvar Singh, Mangal Pandey, Krishnadutt Palival, Indranath Madan

REFERENCE TEXT FOR READING

1. Pashchatya evam bharatheey kavyashastr – Tharaknath Bali
2. Kavya Pradeep – Rambahori Misra
3. Paschaty kavyashastr – Devendr Sharma
4. Kavya chintan ki paschimi parampara – Nirmala Jain
5. Paschaty kavya shastr: nayi pravruttiyan – Rajnath
6. Coleridge :aalochnasidhanth – Krishnadutt Sharma
7. Sanrachnavaad, uttarsanrachnavaad evam prachy kavyashastr – Gopichand narang
8. Nayi sameeksha :naye sandarbh – Dr. Nagendr
9. Hindi alochna – Viswanath tripati
10. Hindi aalochna ke naye vaicharik sarokaar :Krishnadutt Palival
11. Hindi aalochna ka vikas – Nandkishore naval
12. Aalochna aur aalochna :Bachan Singh
13. Aalochna ke pragatisheel aayaam – Shivkumar Mishr

QUESTION PATTERN**HL-CC 221 INDIAN AND WESTERN LITERARY THOUGHTS, PROSODY AND POETICS****(BHARATEEYA EVUM PASHCHATYA KAAVYASHASTRA AUR KAVYA PRADEEP)**

Time :3 hrs

Maximum Marks :75

I. Answer the following ten objective questions

Each question carries 1 mark

(10x1 =10 Marks)

II. Answer one essay out of two

Each question carries 8 marks

(1 x 8 = 8 Marks)

III. Answer any three out of six short answer questions

Each question carries three marks

(3 x 3 = 9 Marks)

IV. Answer two definitions out of four

Each question carries two marks (Alankaras)

(2 x 2= 4 Marks)

V. Answer two definitions out of four

Each question carries two marks (Chands)

(2 x 2= 4 Marks)

VI. Answer one essay out of two

Each question carries ten marks

(1 x 10 = 10 Marks)

VII. Answer any six out of nine short answer questions

Each question carries 5 marks

(6 x 5 = 30 Marks)

SEMESTER 2**COURSE : HISTORY OF HINDI LANGUAGE AND LINGUISTICS**

(HINDI BHASHA KAA ITIHAAS AUR BHASHAVIGYAAN)

COURSE CODE : HL - CC 222

Credits : 4

Hours /week : 6

Aim :To familiarize the students with the concepts of Hindi language and the linguistics of Hindi language.

Course Objectives :This course covers History of Hindi Language ,the Indo, European family of Language ,the term Hindi : its etymology and semantic evaluation, ancient Hindi, Classification of languages morphological and genealogical – the parameters of morphological classification. This course covers the Linguistics of Hindi Language ,Phoneticsarticulatory,acoustic and auditory ,Phonology , morphophonemics graphology ,Morphology, formation compounding and affixation.Syntax – structure,endo – centric and exocentric construction –immediate constituent analysis.

Course Outcomes (Cos)

CO 1 : Gain deep knowledge about Hindi and its origin, features, scripts, families and classification of languages as morphological and genealogical. Achieve a detailed study of the language classification and of the language families in India.

CO2: Comprehend the detailed study of Indo Aryan ,Indo European family of languages and Modern Indo-Aryan language and its broad classification and understand the Hindi outside India .Imbibe the various dialects of Hindi language and its grammatical aspects.

State the importance of Hindi as official language and adoption to suit modern technological demands. The learner will be able to trace out the source of Khadiboli and its flourishing as official language and understand about the transition of early Indian Script towards Devanagiri script. Will be able to know more about the nature and technological adaptation of the language.

CO 3 : Understand the Meaning and definition of philology ,its nature and development .

Able to Remember and understand Phonetics articulatory, Acoustic and auditory – organs of speech the mechanism of sound production classification of speech – sounds: vowel and consonant – cardinal vowels – supra – segmental features, stress, pitch : tone and juncture – syllable writing systems; pictogram; ideogram syllable script – the phonetic script broad and narrow transcription. Acquire a thorough knowledge about the distribution and acoustic qualities of the speech sounds through their physiological manner and understand about syllabic structure and phonetic transcription.

CO 4 : Able to understand and analyse Phonology–types of phonemes, segmental and non-segmental- morphophonemic graphology. Accomplish the linguistic study of speech that includes the phonological and morphophonemic analysis of language.

CO 5 : Understands Morphology-Morpheme and Allomorph- Types of Morphemes- free and bound ; Root stem and Affix ; derivational & grammatical; prefix,suffix and infix ; segmental & non segmental ;paradigmatic relations and morpheme classes,parts of speech:word formation compounding and affixation.

CO 6 : Understands Syntax –structure,syntagmatic relation,co-ordination & sub-ordination ; Embedding & Rank –shift –structure of phrases –Non phrase and its elements –verb ,phrase and its elements –clause structure –subject and predicate;theme and schemes given & new formation focus the sentence –endo centric and extro centric construction –immediate constituent analysis .Understands Semantics-Meaning – reference-synonymy-antonymy-hyponymy-polysemy-hyponymy-componential analysis-semantic changes-direction and reasons

Course Content :

Module 1:Classification of languages- morphological and genealogical -- The main language families -- Indo-European, Centum-Satam, Indo-Iranian --The three periods of its history Pali-Prakrit-Apabhramsa-- Modern Indo-Aryan language and their classification- Grierson and Chatterjee.

Module 2: The term Hindi :its etymology and semantic evaluation ,importance of Hindi, Urdu, Hindustani, the Dialects of Hindi and their classification, Hindi outside India.

Module 3: Modern standard Hindi :Khariboli–its vocabulary emergences, Hindi as Official Language of India, development of Devnagari script -its origin ,nature, adoption to suit modern technological demands

Module 3 :Language –Meaning and Definition ,Philology-Introduction -Development- Nature-Types and Branches of Philology Phonetics: articulatory, Acoustic and auditory – organs of speech the mechanism of sound production classification of speech – sounds: vowel and consonant – cardinal vowels – supra – segmental features, stress, pitch: tone and juncture – syllable writing systems; pictogram; ideogram syllable script – the phonetic script broad and narrow transcription.

Module 4 : Phonology – Phoneme and allophone – types of phonemes segmental and non- segmental – morphophonemic graphology.

Module 5 : Morphology-Morpheme & Allomorph- Types of Morphemes- free and bound ; Root stem and Affix :derivational & grammatical; prefix,suffix& infix ; segmental & non segmental ;paradigmatic relations & morpheme classes;parts of speech : word formation – compounding and affixation

Module 6 : Syntax –structure,syntagmatic relation,co-ordination & sub-ordination ; Embedding & Rank –shift –structure of phrases –Non phrase and its elements –verb phrase and its elements –clause structure –subject and predicate;theme and schemes given & new formation focus the sentence –endo centric and extro centric construction – immediate constituent analysis .Semantics-Meaning –reference-synonymy-antonymy-hyponymy-polysemy-hyponymy-componential analysis-semantic changes-direction and reasons

Prescribed Texts

- 1) Hindi Bhasha Ka Udgamaur Vikas - Dr.Udayanarayan Tiwari
- 2) Bhasha Vigyan – Dr.Bholanath Tiwari

REFERENCES (TEXT BOOK)

- 1)** Bhashiki ke prarambhik siddhaanth – H.Parameswaran
- 2)** Hindi Bhasha Ka Itihas- Dr.Dheerendra Varma
- 3) Hindi Bhasha Ka Itihas- Dr.Bholanath Tiwari
- 4)** Bhasha vigyan -Shyamsundardas ,Harish prakashan mandir
- 5) AadhunikBhashavigyan - Dr.Bholanath Tiwari
- 6) Samasaamayik Bhasha vigyan – Dr.Kavita Rastogi
- 7)** Bhasha vigyankee Bhoomika – Devendrnaath Sharma
- 8) Samkshipta Bhasha vigyan – Dr.S C Trivedi ,Surya Prakasan
- 9) Bhasha vigyan – Rajmal Bora
- 10) AadhunikBhashavigyan –Dr.Chaturbhuj Sahay

QUESTION PATTERN**HL – CC 222 HISTORY OF HINDI LANGUAGE AND LINGUISTICS****(HINDI BHASHA KAA ITIHAAS AUR BHASHAVIGYAAN)**

Time : 3 hrs

Maximum Marks : 75

I. Answer the following ten objective questions

Each question carries 1 mark

(10 x 1 = 10 Marks)

II. Answer any Two essay out of four . (from Linguistics)

Each question carries 10 marks

(2 x 10 = 20 Marks)

III. Answer any Four short answer questions out of seven (from Linguistics)

Each question carries 5 marks

(4 x 5= 20 Marks)

IV. Answer any one essay out of two. (from History of Hindi Language)

Each question carries 10 marks

(1 x 10 = 10 Marks)

- V. Answer any Three short answer questions out of five .(from History of Hindi Language) Each question carries 5 marks (3 x 5= 15 Marks)

SEMESTER 2

COURSE NAME: HISTORY OF HINDI LITERATURE : MODERN PERIOD

(HINDI SAAHITYA KAA ITIHAAS: AADHUNIKKAAL)

COURSE CODE : HL – CC 223

CREDITS 4

Hours/week 6

Aim : To Familiarize the students with the concepts of Modern Hindi Literature from post independent era.

COURSE OBJECTIVES : This course covers History of Hindi Language, the Indo-European family of Language, History of Hindi Literature especially post independent literature, post sixty literary experiments, movements, New poetry, anti-poetry, new stories, anti-stories, classics, neoclassicism existentialism, structuralism, post structuralism, deconstruction etc.

Course Outcome (Cos)

CO 1 : Understand the Modern period – Development of Hindi Literature. Acquire a deep comprehension of the period entering the post modern era and development of Hindi Literature since 1960 that enhances their zone of knowledge on modern Hindi literature and generate an evaluating ability regarding the various post sixty literary experiments and movements.

CO 2 : Imbibe the development of various prose forms and prominent writers – their contribution to the modern writing. Acquire knowledge on the developments pertaining to

various streams of prose forms and the contributions extended by the writers in the field of Hindi prose.

CO 3 : Understand the Salient features of Hindi fiction–emergence of modern female writers–vivid thematic distribution based on contemporary social aspects. Accomplish with the emergence of modern female writers along with the vivid thematic distribution in Hindi fiction based on contemporary social aspects. Understand the feministic approach of literature and their stylistic aspects towards the Hindi fiction. Familiarize with the modern concepts that builds the themes relevant to the contemporary situations.

CO 4 : Comprehend the emergence of new poetry and its various streams – new poetry-anti poetry- contemporary poetry and poets. Perceive the various dimensions and streams of modern poetry and familiarize with the contributions of modern poets in each stream.

CO 5 : Acquire a deep idea on the contribution of Hindi Drama – theatrical aspects of new drama – prominent dramatists of the age – various features and types of drama – problems faced by this literary stream in the post modern age. Understand the range of theatre conventions, its stylistic variations and the crisis developed in the modern drama along with the contributions given to Hindi drama by prominent dramatists and also will be able to acquire skill to demonstrate various dramatic features inherent in the plays too.

CO 6 : Develop a critical approach towards various streams of criticism in literature- psychological criticism, Existentialism- Formalism, New criticism, stylistics, Structuralism, Post- structuralism (Theory of Deconstruction). Understand the various streams of criticism in literature that enhances the learner to view literature in different perspective through the theories interpreted by eminent critics.

Module 1: Modern period – Development of Hindi Literature since 1960- entering the post modern era

Module 2: Prose: Development of various prose forms and prominent writers – their contribution to the modern writing.

Module 3: Salient features of modern Hindi fiction–emergence of modern female writers–vivid thematic distribution and stylistic aspects relevant to contemporary social aspects

Module 4: Emergence of new poetry and its various streams – new poetry-anti poetry-contemporary poetry and contributions towards modern poetry by the poets.

Module 5: Contribution of Hindi Drama – theatrical aspects of new drama – prominent modern dramatists of the age – various features and types of modern drama – problems faced by this literary stream in the post modern age .

Module 6: Various streams of criticism in literature- psychological criticism, Existentialism- Formalism, New criticism, stylistics, Structuralism, Post- structuralism (Theory of Deconstruction)

REFERENCE (TEXT FOR READING)

1. Hindi Sahitya Ka Itihas – Dr.Nagendra&Dr.Hardayal
2. Hindi Sahitya Ka Doosra Itihas – Dr.Bachan Singh
3. Hindi sahithy ka itihaas – Ramchandr Shukla
4. Adhunik Hindi sahithy ka itihaas – Bachan Singh
5. Adhunik Hindi sahithy ki pravruttiyan :Naamvar Singh
6. Hindi sahithy aur sanvedna ka vikas :Ramswaroop Chaturvedi

QUESTION PATTERN

HL – CC 223 HISTORY OF HINDI LITERATURE : MODERN PERIOD

(HINDI SAAHITYA KAA ITIHAAS: AADHUNIKKAAL)

Time :3 hrs

Maximum Marks :75

I. Answer the following ten objective questions

Each question carries 1 mark

(10X1 =10 Marks)

II. Answer three essays out of five

Each question carries 10 marks

(3 x 10 = 30 Marks)

III. Answer any seven out of Ten short answer questions

Each question carries 5 marks

(7 x 5 = 35 Marks)

SEMESTER 2

Course: DRAMA AND ONE ACT PLAYS

(NAATAK AUR EKAANKI)

Course Code: HL – CC 224

Credits: 4

Hours/week: 6

AIM: To Familiarize the students with the concepts of Modern Dramas and One act plays.

COURSE OBJECTIVES: This course covers Dramas written in the romantic period and also dramas written in the modern period, and also One Act Plays written by many authors.

Course Outcome (Cos)

CO 1 : Understand Hindi Drama and imbibe the emergence of drama in Hindi literature through different schools and types of Drama and know the History and Influence of theatre in Hindi literature through various structural aspects and stylistics features of drama such as mythical plays, symbolic plays ballads etc.

CO 2 : Acquire a deep idea on One act plays and understand the features and forms of one act plays through its origin and development and also achieve a good idea on the contributions of eminent playwrights.

CO 3 : Understand the Emergence of modern Hindi Drama and the role of dramatist Bharatendu Harischandra. Gain more knowledge about the emergence of modern Hindi Drama paved by the versatile writer and dramatist Bharatendu Harischandra. Attain a strong idea about the Father of modern Hindi literature Bharatendu Harischandra, who the pioneer of Hindi drama evoked consciousness in people rather than aiming mere entertainment. Initial achievements of modern Hindi drama and its influence to the later developments of drama in literature is sourced through this part.

CO 4 : Understand the Contribution of Mohan Rakesh in Hindi Drama through the Analysis and evaluation of the works and contributions of the eminent dramatist and playwright Mohan Rakesh who triumphantly depicted deep human emotions in his dramas thus enabling the directors to expose the feelings and emotions inherent in his dramatic script and acquire an overall idea in the emergence and development of modern Hindi drama.

CO 5 : Gain deep idea on the Historical and social plays of Jayasankar Prasad- impact of various aspects of his drama in the Hindi dramatic field. Develop an assessment strategy on Hindi drama in view of Jayasankar Prasad's historical and social plays that played a significant role in moulding a new stage craft, plot construction of Hindi drama and theatre and understand the impact of various aspects of his drama in the Hindi dramatic field and implication of these new trends in modern drama.

CO 6 : Acquaint with the prominent dramatist Sankar Shesh-his contribution in the post sixty Hindi Drama. Analyse the plays of prominent dramatist Dr.SankerShesh through his contributions in the post-sixty Hindi Drama and familiarize with different aspects of theatre arts in the eighties through evaluating the vivid manifestation of urban, folk and rural aspects in his plays.

COURSE CONTENT

Module 1: Origin of drama in Hindi literature-Different schools and types of Drama-History and Influence of theatre in Hindi literature-various structural aspects of drama such as mythical plays, symbolic plays ballads etc.

Module 2: One act plays –Origin of One Act Plays- Form and Development-Prominent Playwriters- UpendranathAshk, Lakshmi Narayan Lal, BheeshmSahni and other prominent Play writers.

Module 3: Emergence of modern Hindi Drama and the role of dramatist BharatenduHarischandra.

Module 4: Contribution of Mohan Rakesh in Hindi Drama.

Module 5: Historical and social plays of Jayasankar Prasad- impact of various aspects of his drama in the Hindi dramatic field.

Module 6: The prominent dramatist Sankar Shesh , Habeeb Tanveer etc and their contribution in the post-sixty Hindi Drama.

REFERENCES TEXT FOR READING

For detailed Study

1. AadheAdhoore – Mohan Rakesh
2. ‘AathEkanki’- Ed.Devendra Raj Ankur,Mahesh Anand ,Vani Prakashan,New Delhi-one act plays (Only four Ekankis has to be studied)
3. Dhruvaswamini – Jayshankar Prasad
4. EkAurDronacharya – Shankar Shesh

TEXT BOOKS FOR GENERAL STUDY

1. Andher Nagari- Bharatendu Harischandra
2. Charandaschorhai – Habeeb Tanveer

REFERENCES (GENERAL)

- Adhunik Bharatheeya Natya Vimarsh - Jaidev Taneja, Radhakrishna Prakashan, N.Delhi.
- Bharatendu ka Natya Sahitya – Virendra Kumar Shukla
- Ekankiaur Ekankikar – Ramachandra Mahendra

Hindi Ekanki : Swaroop aur Vikas

QUESTION PATTERN**HL – CC 224 DRAMA AND ONE- ACT PLAYS**

(NAATAK AUR EKAANKI)

Time: 3 hrs

Maximum Marks: 75

I .Answer the following 10 objective questions

Each question carries 1 marks

(10 x 1 = 10 Marks)

II. Answer any four annotations out of six questions

Each question carries 5 marks

(4 x 5 = 20 Marks)

III. Answer any two essays out of four

Each question carries 10 marks

(2 x 10 = 20 Marks)

IV. Answer any one essay out of two

Each question carries 10 marks

(1 x 10 = 10 Marks)

V. Answer three short questions out of six

Each question carries 4 marks

(3 x 5 = 15 Marks)

SEMESTER 3**COURSE NAME : MODERN POETRY UP TO PRAGATIVAD****(AADHUNIK KAVITHA : PRAGATI VAAD TAK)****COURSE CODE : HL – CC 231****CREDITS :6****Hours/week :7**

AIM: To Familiarize the students with the concepts of Hindi Modern Poetry especially from 20th Century. And provide students with best specimens of modern poetry representing different styles.

COURSE OBJECTIVES : This course covers the Poetry writing from the modern period ,ie: from 20th century till 1943. Representative poems have been prescribed for study. Romantic poems and pillars of the Romanticism in Hindi, and progressive literature is on the emphasis. Learners will be able to understand how the trend has been set for the literature and how the writing trends have been formed.

CO 1 : Gain deep knowledge about the concept of Nationalism. Understand the origin of Khadiboli as poetic Language and access the detailed development of khadiboli as poetic language. Acquire a new perspective about woman and knowledge about the accepted prominent writers of Dwivediyug like Maithilisarangupt, HariAudhetc who made a dynamic movement in bringing the modern Hindi poetry to the threshold of free verse.

CO 2 : Understand the entire trends of romantic poetry and the role of four pillars of the era. Understand the significant work of major poet Jayashankar Prasad. Acquire knowledge on the emergence of Romanticism in Hindi poetry and about the four strong romantic pillars of the era – Prasad, Pant, Nirala, Mahadevi Verma. Able to see into the romantic era of Hindi poetry and deeply understand the contributions of four major romantic poets that later led to the transition of modern poetry. Imbibe the works contributed by the poets of the romantic era and progressive era

CO 3 : Gain knowledge about various features of Nirala's poetic works. Understand the idea of free-verse. Develop a view in regard to the Progressive aspects and its impact in

Hindi modern poetry by Nirala. Understand the features of Hindi poetry during its transition towards the progressive era through the works of the prominent writer Nirala.

CO 4 : Understand the significant role of nature in romantic poetry with special reference to poet Pant. Familiarize with the stylistic aspects and features that demarcates his poetry from the traditional ones.

CO 5 : Achieve great outlook about the concept of mysticism in romantic poetry, through the works of Mahadevi Verma. Understand various philosophical aspects of Mahadevi Verma's poems.

CO 6 : Able to know about the idea of Marxism through pragativadi Hindi Kavita and poets. Understand the major trends of Pragativadi kavita. Features of pragativaad. Gain knowledge about the concept of Haalavad and its representative poet Bachan. Permeate deeply into the eccentricity of Harivamshrai Bachan's work and acquire a detailed criticism of Haalavaad thus gaining stylistic concepts of Bachan in the streams of haalavadi poetry.

COURSE CONTENT

Module 1: Poetry – Dwivedi Yug and Its Prominent Poets –Major trends, Concept of Nationalism. Cultural and Political aspects of Dwivedi yugeen poetry. Development of khadiboli Hindi as Poetic Language, Prominent Poets, Maithilisarangupt, Hariaudh etc.

Module 2: Romanticism in Hindi poetry – the romantic pillars of the era – Prasad, Pant, Nirala, Mahadevi and their major works. . Romanticism in Modern Hindi poetry, Main trends of romanticism, National-cultural and Political aspects of Modern Hindi romantic poetry.

Module 3: Progressive aspects and its impact in Hindi modern poetry- Nirala and his poetry Major features of poems of Nirala. Cultural aspects, Concept of free-verse, mysticism, Revolutionary aspects.

Module 4: Poems of Pant--Major features. Nature in Pant's poems. Philosophical aspects in Pant's poem

Module 5: Major features of Mahadevi Verma's poetry, Mysticism, Impact of various Philosophical thoughts in Mahadevi Verma's poetry.

Module 6: Concept of Marxism and Pragativad, Pragativad -Major features, prominent poets, Nagarjun, Kedaranath Agrawal, Balakrishna Sharma Naveen.Detailed criticism of Halavadi and Dr.Harivanshrai Bachan.

REFERENCES (TEXT FOR READING)

For Detailed Study

1. Kamayani – Jayshankar Prasad – Only Chinta and Shradhha
2. Rag-Virag – Nirala – Only the Poem Juheekale

Raamkeeshaktipooja

- 3.Saket – Maithili Sharangupta – Only NavamSarg.

- 4.Sandhini – Mahadevi Verma – Only poems

Ve murjhaaye phool nahin
Main nee rbharee dukh kee badlee

- 5.Sumitranandan Pant – Pratham Rashmi (A Text book to be Edited)

Pragativadikavi (Text to be edited)

1. Jaago phir ek baar :Bhag 1 - Nirala
2. Badal ko Ghirte dekha hai- Nagarjun
3. Yugpanthee se - Suman
4. Bat bolegi -

ShamsherBahadur Singh

5. Viplavgaan-

Balakrishnasharma Naveen'

6. Madhushaala –
 HarivanshRay Bachchan (20
 lines to be edited)

For Non detailed :

Kurukshetr :Dinkar

Sarojasmriti - Nirala

REFERENCES (GENERAL)

1. Adhunik Sahitya – NandadulareVajpayi
2. Adhunik Sahitya kiPravartian – Dr.Namvar Singh
3. Chhayavaad – Namvar Singh
4. Hindi Kavita meinYugaantar – Satyendra
5. Hindi Sahitya :Beesvi Shatabdi – NandadulareVajpayi

QUESTION PATTERN

HL- CC 231 MODERN POETRY UP TO PRAGATIVAD

(AADHUNIK KAVITHA :PRAGATHI VAAD TAK)

Time :3 hrs

Maximum Marks :

75

- I. Answer the following ten objective questions
 Each question carries 1 mark (10 x 1 =10 Marks)
- II. Answer five annotations out of seven
 Each question carries 4 marks (5 x 4 = 20Marks)
- I. Answer two essays out of four
 Each question carries 10 marks (2 x 10 = 20 Marks)
- II. Answer any five out of seven short answer questions

Each question carries 5 marks

(5 x 5 = 25 Marks)

SEMESTER 3

COURSE : FUNCTIONAL HINDI
(PRAYOJANMOOLAK HINDI)

COURSE CODE : HL - CC 232

CREDITS : 4

Hours/week : 6

AIM: To familiarize the students with the concepts of Hindi as Official Language and its functions in administration. To impart the knowledge about various job opportunities in Hindi field. This will enable the students to have higher education and job.

COURSE OBJECTIVES: This course covers the use and spread of the Mughal period Style of Khadiboli, Hindi as an official language. Indian constitutional provisions, OL policy and implementation. Need for large scale translation from English to Hindi consequent on the bilingual transitional stage. Problems of translation of office matters from English to Hindi, Technical terminology in Hindi, Difference between common language and Functional language, Specialties of Functional Hindi, Hindi in law, administration, literature, Science and techniques. Computerization in Hindi (Progress and prospects, bilingual and multilingual computers).

COURSE OUTCOME (COS)

CO1: Comprehend the Different forms of Hindi like Creative Language- Language of Media and Communication and Understand the spread of the Mughal period Style of Khadiboli to its present form through its use in the contemporary period and able to identify its concepts and functional applicability in administration.

CO2: Locating the Inevitability of Hindi as an official language in India through imbibing the Indian constitutional provisions. Identify the Problems of translation of office matters from English to Hindi. Understand in deep the conceptual facts of the OL policies, resolutions, Acts and the necessity of problem free translation.

CO3: Achieve a theoretical training in Secretarial Practice regarding the Official procedures in administration like Registration, noting, drafting etc and develop the efficiency in the official procedures and execution of technical terms in English-Hindi and vice-versa through practice is aimed.

CO4: Understand the Technical terminology in Hindi and understand the sources and principles of coining the technical terms and adhere to different opinions of Central Hindi Directorate and scientific and technical terminology Commission for accuracy in coining the technical terms and comprehend the source, importance and necessity of technical terminology used in the different sectors such as commerce, banking, administration, law, Journalism, techniques etc for the language development.

CO5: Understand the importance of Functional Hindi-.Realizing the relevance of Functional Hindi in the management of official language implementation both in the fields of Academic and Administration. Differentiate between common language and Functional language. Understand and get imbued with the specialties and different forms of Functional Hindi applied in sectors like trade, commerce, banking and insurance, media of communication, law, administration, literature, Science and techniques.

CO6: Develop knowledge in Hindi Computing through the Language Technology. Acquaint with various Hindi software packages and about the online learning and technological aspects of language development.

COURSE CONTENT

Module 1: Different forms of Hindi - Creative Language, Language of Media and Communication, National Language and Link language, localized form of Hindi, Hindi in the International Scenario.

Module 2: Hindi as an official language- Different official languages in India. Inevitability of official language in a nation. Hindi as an official language. Indian constitutional provisions – Articles 343 to 351.OL parliamentary 1955, Official Language committee 1955.OL Act 1963 and

revised 1967, resolution 1968, Rule OL 1976 and revised 1987, OL policy and implementation. Need for large scale translation from English to Hindi consequent on the bilingual transitional stage.-Problems of translation of office matters from English to Hindi.

Module 3: Secretarial Practice- Registration, noting, drafting (elementary drafting and advanced drafting), despatch. Different types of official letters, ordinary official letters, office memorandum, memorandum, demi official letter, circular, reminder, notification, office order, press communiqué and press note. U.O note, Notice (Advertisement, tender notice, court notice), Resolution, Endorsement, Telegram Report (types, method of preparing report, qualities etc.) Technical term- English-Hindi.

Module 4: Technical terminology in Hindi- Difference between common words and technical terms – Need for technical terminology. Sources and principles of coining the technical terms and different opinions. Role of Central Hindi Directorate and scientific and technical terminology commission in coining the technical terms. Technical terminology in Hindi used in the different Functional forms of Hindi such as commerce, administration, law, Journalism, techniques etc.

Module 5: Difference between common language and Functional language. Different forms of functional Hindi - Hindi in trade, commerce, banking and insurance, Hindi in the media of communication such as newspapers and periodicals, television and radio, Hindi in law-administration and science.

Module 6: Computerization in Hindi (Progress and prospects, bilingual and multilingual computers).

PRESCRIBED TEXT

1. Prayojanmoolak Hindi Sidhant aur Prayog- Dangal Jhalte, Vani Prakashan, New Delhi.

REFERENCES TEXT FOR READING

1. Adhunik Patrakarita – Dr. Arjun Tiwari, Vishwavidyalaya Prakashan, Varanasi
2. Computer Samanya Gyan Evam Guide – Ram Bansal Vigyacharya, chapters 1 & 6 to be studied, Vani Prakashan, New Delhi.
3. Prayojanmoolak Hindi – Dargal Jhalte, Prabhat Prakashan
4. Prayojanmoolak Hindi – Dr. R.N. Sreevastav, Kendriya Hindi Sansthan (Agra)
5. Rajabhasha Hindi ke Aayam – Dr. Malik Mohammed, Rajpal Sons, New Delhi.

REFERENCES (GENERAL)

- Anuvadtraimasik' Patrikake Aank, Anuvad Parishad, New Delhi
- Bhasha aur Proudhyogiki- Vinodkumar Prasad, Vani Prakashan, New Delhi
- Bhasha' Patrikake Aank
- Hindi Vigyan : Parakh Aur Pehchan- Dr. R. Jayachandran, Abhay Prakashan, Kanpur
- Hindi vividhyavaharonki Bhasha - Dr. Suvas Kumar, Vani Prakashan, New Delhi
- Karyalay Sahayika – Haribabu Kamsal, Kendriya Sachivalay Hindi Parishad, New Delhi
- Paribhashik Shabdavaliki Vikas Yatra – Dr. Gargi Gupta, Hindi Anuvad Parishad
- Prayojanmoolak Hindi aur Patrakarita - Dinesh Prasad Singh, Praroopan Tippan aur Proofshodhan – Bholanath Tiwari.
- Prayojanmoolak Hindi- Vinod Godre
- Rajabhasha Bharati' traimasik Patrikake Aank (Rajabhasha Vibhag Grihamantralay Rajabhasha Hindi aur Kamkaji Hindi – Prakash Chandra Bhari.
- Rajabhasha Sahayika – Avadhesh Mohan Gupta.
- Sarkari Karyalayom mein Hindi ka Prayog – R.N. Sreevastav, Lok Bharati
- Sampadan Kala – K.V. Narayan, Madhya Pradesh Hindi Academy

QUESTION PATTERN**HL -CC 232 FUNCTIONAL HINDI****(PRAYOJANMOOLAK HINDI)**

Time: 3 hrs

Maximum Marks: 75

1. Answer the following ten objective questions. Each question carries 1 mark
(10x 1 = 10) marks

- II. Answer any seven questions out of 10. Each question carries 3 marks.
(7x3 = 21) marks
- III. Answer one question out of two. Each question carries 7 marks.
(1x7 = 7) marks
- IV. Answer one question out of two. Each question carries 7 marks.
(1x7 = 7) marks
- V. Answer one question out of two. Each question carries 10 marks.
(1x10 = 10) marks
- VI. Answer one question out of two. Each question carries 10 marks.
(1x10 = 10) marks
- VII. A. Translate 3 words into Hindi out of 5 English words given (3x1 = 3) marks
B. Translate 3 words into English out of 5 Hindi words given (3x1 = 3) marks
C. Translate 4 words into Hindi out of 6 English words given (4x1 = 4) marks

SEMESTER 3

COURSE : INDIAN LITERATURE
(BHARATEEYA SAHITYA)

COURSE CODE : HL – CC 233

CREDITS : 4

Hours/week : 6

AIM: To Familiarize the students with the concepts and nature of Indian Literature.

COURSE OBJECTIVES: This course covers different perspectives of Indian Literature and the concept of comparative literature. Analysis of Indian literature apart from the linguistic diversities. To achieve a complete outlook of Indian culture and morals through the study of Indian literature.

Course Outcomes (Cos)

CO 1 :Acquire deep knowledge on Indian Literature and understand the Indian values and morals reflected on Indian literature. Achieve a thorough study on various environment and features of Indian literature through the understanding of the influence of Sanskrit and socio, cultural, political, regional impact on Indian literature apart from the linguistic barriers.

CO 2 : Understand about Concept and scope of Comparative Studies. Relevance of comparative studies in modern literature. Comprehend the concepts, trends and themes of comparative literature and its significance in modern literature thereby arriving to its

significance and scope in modern literature. Deep comparative study of Hindi literature and other Indian literature helps to broaden the literary perspective towards literature

CO 3 : Acquire a broad idea on the reputation of native languages in Indian literature and identify the problems in the study of Indian literature. Imbibe the dignity of each Indian language towards its finest attributes to literary works thus enhance more knowledge about Indian culture through these literary creations.

CO 4 : Understand the benefits of Translation in multi-lingual society .Learn about the wide scope and state the importance and utility of translation in a multi- lingual society. Comprehend the inevitability of translation that developed a new perspective and outlook to literature.

CO 5 : Evaluate Comparative Indian Literature through the Analysis of Indian Drama highlighting the contribution of Vijay Tendulkar and Sharan kumarLimbale's Novels – Indian poems and its prominent features. Acquire deep knowledge into the vivid perspectives of comparative Indian literature by analyzing the highlighting features of Indian drama, fiction and poetry and thoroughly comprehend the contributions of the eminent Indian writers.

CO 6 : Achieve an outlook of the concepts of Indian writers and ideologies of Mahatma Gandhi .Comprehend the works of Indian writers and also able to imbibe the Gandian thoughts inherent in their writings.

COURSE CONTENT

Module 1: Indian Literature- the nature and scope of Indian Literature. The influence of Sanskrit on Indian Literature. The problems related to the diversity of language – regional culture and socio- political environment. The pan-Indian features reflected on Indian literature – sociocultural-political impacts on Indian literature. The sociological aspects of Indianness. Social stratification reflected on Indian literature. Indian values and morals reflected on Indian literature.

Module 2: Comparative Studies – Concept and scope- Comparative Studies of Hindi and Indian literature in various prose forms – trends and theme. Relevance of comparative studies in modern literature

Module 3: Sahitya Mein DeshiBhashaom Ki Prathishta, Bharatiya Sahitya ke Adhyayan Ki Samasyayein, Bharathiya Sahitya Mein Bharath Ka Bimb.

Module 4: Bahu BhasheeyaSamaj Mein Anuvad, Impact of regional languages.

Module 5: TulnatmakBharathiya Sahitya- Analysis of Indian Drama highlighting the contribution of Girish karnad –salient features of Indian fiction with comparison to V.S.Khandelkar’s Novels – Indian poems and its prominent features.

Module 6 : Mahatma Gandhi keVicharaaurBharatiyaLekhak. Influence of Gandhian thoughts in Indian writings.

REFERENCES (TEXT FOR READING)

1. Anthology of Selected Indian Poems as follows:

1. **Kashmiri** - Chandrakantha -Nishkasitom Ki Basti Mein
2. **Punjabi**– AmritaPreetham - merapata
3. **Marathi** – Naam dev dhasal - manav vaad
4. **Gujarati** – YosephMekwan - Sarpdamsh
5. **Bengali** – ThaslimaNasreen -PreritNaree
6. **Oriya** – Jagnath Prasad Das - Kalahandi
7. **Assamese** –NeelamaniFukkan -Yahim Se Pani
8. **Kannada** - Gopalkrishna Adiga - Kuch Karo Bhai
9. **Telugu** - Varvar Rao - Vasant Kabhi AlagHokarNahinAata Hai
10. **Tamil** - SubrahmanyaBharatee –VandeMataram
11. **Malayalam** O.N.V.Kurupp – Thode se Pyarkeakshar

2. Yayathi (Novel) -V.S.Khandekar

3. Hayavadana (Naatak) – GireeshKarnad

General Study

1. Gora -Rabinranath Tagore

2. Sanskar -U.RAnanthamoorthi

3.Five Stories– BharathiyKahaniyam. Ed.Dr. K.Vanaja. Published by Rajpal and Sons

- BheeshanYudh Ke Bad – Mahasweta Devi (Bangali)
- Dhah Gaya – LanchenbaMeetai (Manipuri)
- Bees Rupaye – DayaPawar (Marati)
- Nagar – Sujatha (Tamil)
- Sampraday – Jagannath Prasad Das (Oriya)

REFERENCES (GENERAL)

- Aaj ka Bharatiya Sahitya – Eds.PrabhakarMachve&S.H.Vatsyayan
- Anuseelan – Journal CUSAT, KathasahithyameinBharateeyata, Kavita meinBharateeyata,Natak Mein Bharateeyata, Alochana Mein Bharateeyata
- BharatiyaBhashayemaur Hindi Anuvad :SamasyaSamadhan – Ed.Dr.Kailas Chandra Bhatia, Vani Prakashan
- Bharatiya Sahitya ki Bhoomika – Ramvilas Sharma, RajkamalPrakashan.Bharathiya Sahitya - Dr. Ram Chabila Tripathi, Vani Prakashan, Delhi
- Bharaathiya Sahitya Darshan- Dr. Krishnalal Hans, Grantham Kanpur
- Bharatiya Sahitya – Dr.NagendraBharathiya Sahitya vividhParidrishya- Dr. Vijaya Raghava Reddy.Sahityasahakar, N.Delhi
- Bharathiyatha Soundarya Sastra kiBhoomika – Dr. Nagendra, National PublishingHouse, New Delhi

QUESTION PATTERN

HL - CC 233 INDIAN LITERATURE
(BHARATEEYA SAHITYA)

Time :3 hrs

Maximum Marks :75

- I. Answer the following ten objective questions
 Each question carries 1 mark (10X1 =10 Marks)
- II. Answer four essays out of six
 Each question carries 10 marks (4 x 10 = 40 Marks)
- III. Answer any five out of seven short answer questions
 Each question carries 5 marks (5 x 5 = 25 Marks)

SEMESTER 3

COURSE: FILM STUDIES (SPECIAL REFERENCE TO HINDI FILMS)

(FILMEE ADHYAYAN (HINDI FILMON KE VISHESH SANDARBH MEIN)

COURSE CODE: HL- DSE 234

CREDITS: 4

Hours /week : 6

Aim : To provide basic knowledge on history, genre, personalities of films. and help them to analyze and appreciate films. Andalso provideexperiment knowledge on Adaptation.

Course Objectives: This course covers the History of world and Indian cinema , Critically evaluates personage and their contributions to the film industry , concept of different types of adaptations, Compare Movies historically and structurally.

Course Outcomes :

CO 1 : Get knowledge about the beginnings and growth of Hindi cinema.. Evaluates filmmakers and their contributions. Search and find important movies. Organizing exhibitions. Film trends and themes of different eras are critically evaluated in the light of historical, political and cultural events.

CO 2 : The relationship between Hindi films and Hindi literature can be explained. Refers to the writers who contributed to the film. Understand the concept of different types of adaptations. The original can be compared to an adaptation. The screenplay is evaluated as a literary form. Makes reviews.

CO 3: Gain ability to compare movies historically and structurally. Examines films both cinematically and aesthetically. Investigates and finds study models. Utilizes technology (e.g. mobile phone) to exploit the media potential of film. Gains the confidence to find the right structure and organize script writing and directing efforts.

CO 4 :. Gain ability to Compare Movies historically and structurally. Gain the ability to appreciate and evaluate films critically.

CO 5 : Gain the ability to appreciate and evaluate films critically. Broaden their awareness of different categories of films.

CO 6 : Be familiar with the important film personalities in the film industry and their contributions.

COURSE CONTENT

Module I

What is Cinema? - Brief history of World Cinema – Brief history of Indian Cinema - Hindi Film - Beginnings – Silent Era – The talkie - Studio system – New Waves in Indian Cinema – Parallel Cinema – Liberalization and Indian Cinema – Rise of Multiplex Cinema – Evolution of Censorship

Module 2

Film Industry - Film Festivals - Milestones - Individuals - Movements – Theaters - - Directors
Scriptwriting - Screenplay - Government and Non-Government Initiatives – Awards.

Module 3

Film Adaptations - Hindi Literature and Cinema - Adaptation in Hindi - Intermedia Translation

Film Adaptations

1. Fiction to Film
3 Idiots
Chemmen
Sara Aakash – Basu Chatterjee
2. Short fiction to Film
Shatranj ke Khiladi – Satyajit Ray
Sadgati
3. Short fiction to Tele- serials
Tahreer – Gulzar
4. Cross – Fiction adaptations
Haidar (Hamlet) – Vishal Bharadwaj
Devadas,
5. Retelling of Folklore / Mythology / Fairy tales
Raavan – Mani Ratnam
Rajneeti – Prakash Jha.
Oru Vadakkan Veeragadha

Module 4

Comparative Study of Original text and Adaptation - Relation to Adaptive Films and Originals -
Compare Films - In Theoretical and Practical Levels.

1. Sara Aakash by Rajendra Yadav and its adaptation by Basu Chatterjee.
2. Shatranj Ke Khiladi by Premchand and its adaptation by Satyajit Ray.

Module 5

Content - Form - Categories - Feature Film - Short Film - Documentary - Animation – Detective
- Horror - Musical - Comedy - Political Cinema – Women centered Film - Family Cinema

Film screening

Feature Film – Suraj ka Saatvan Ghoda – Syam Benegal
Women Oriented – Dhappad – Anubhav Sinha
Animation Film - Manpasand – The Perfect Match – Dhvani Desai.
Short Film – Afterglow – Kaushal Oza
Documentary – Kagaz ki Kashti – Brahmanand S Singh

Module 6

Study Tour - Studio Visit (Tour Report to be submitted along with the Dissertation)

Reference

Movies

1. Godaan
2. Tare zameen par
3. Queen
4. Dhappad
5. Paa
6. Padmavath
7. Aligadh
8. Lipsick under my Burkha
9. c u soon
10. Malgudi days –
11. Vellapokkathil – Jayraj
12. Omkara (Othello)– Vishal Bharadwaj
13. Maqbool (Macbeth)– Vishal Bharadwaj
14. Guide (R. K. Narayan)
15. Aisha (Emma)

Original Books

1. Lekhak ka Cinema – Kunvar Narayan, RajkamalPrakashan, Illahabad
2. Cinema aur Sahitya – Vani Prakashan, New Delhi
3. Khuli Kitab – AnujaGarga, Vani Prakashan, New Delhi
4. Bharatheeya Cinema ka Safarnama – Jaysingh, PrakashanVibhag
5. Hindi Cinema Sadi ka Safar – Anil Bhargav
6. Cinema Samakaleen Cinema – Ajay Brahmatmaj, Vani Prakashan
7. Film Kshetre – Rangkshetre – Amritlal Nagar, Vani Prakashan
8. Katha- Patkatha – Mannu Bhandari, Vani Prakashan
9. Cinema Ki Soch – Ajay Brahmatmaj
10. Bazar KeBazeegar – PrahladAgraval, RajkamalPrakashan
11. Film Nirदेशan – Kuldeep Singh, RadhakrishnPrakashan
12. Hindi Filmon ka SankshiptItihas – Dilchasp, SaamayikPrakashan
13. Achanak – Gulzar, RadhakrishnPrakashan
14. Bharatheeya Sine-Siddhanth – Anupam Ojha, Radhakrishna Prakashan
15. Hindi Cinema ke Sau Varsh – Dilchasp, BharatheeyaPusthak Parishad
16. Dhunonki Yatra-Hindi Filmon keSangeetkar 1931–2005 by Pankaj Rag

QUESTION PATTERN

HL-DSE 234: FILM STUDIES (SPECIAL REFERENCE TO HINDI FILMS)

(FILMEE ADHYAYAN (HINDI FILMON KE VISHESH SANDARBH MEIN)

Time: 3 hrs

Maximum Marks: 75

I .Answer the following 10 objective questions

Each question carries 1 marks

(10 x 1 = 10 Marks)

II. Answer any seven short questions out of Ten

Each question carries 5 marks

(7 x 5 = 35 Marks)

III. Answer any Three essays out of five

Each question carries 10 marks

(3 x 10 = 30 Marks)

SEMESTER 3

COURSE : SANSKRIT

COURSE CODE : SG – GC 234 A

CREDITS : 4

Hours/Week : 6

SEMESTER 3

COURSE: BEGINNERS' HINDI

COURSE CODE: HL- GC 235

CREDITS: 4

Hours /week : 6

Aim : This course aims to familiarize the students with the Pronunciation, Script and Spelling , Spoken Skills, Comprehension of Hindi Language.

Course Objectives : This course covers Structure of Hindi, Communicative Contexts of Hindi, Development of Vocabulary , Syntax and Discourse, Indian Language Computing, Technological Contexts of Hindi Computing ,Translation of Simple Sentences from English to Hindi, Origin and Development of Hindi language , Introduction to Hindi Poetry, Introduction to Hindi Prose, Hindi in the International Scene.

Course Outcome

CO 1 : Acquire capability in spoken and written Hindi- Pronunciation, Script and Spelling, Spoken Skills, Comprehension. Understand the basics of Hindi Script and spelling and will be able to develop the right pronunciation and speaking skills of the language. Develop the writing and speaking skill through acquiring a thorough knowledge of the language that aims in attaining the language proficiency.

CO 2 : Comprehend applied Hindi grammar- Structure of Hindi- Communicative Contexts of Hindi- Parts of Speech. Acquire the basics of grammatical structure of Hindi comprising of parts of speech and other communicative contexts offered through applied Hindi grammar that promotes their communicative skill thus emphasizing the accountability of the language.

CO 3 : Develop the Vocabulary, Syntax and Discourse and Hindi Computing- Indian Language Computing- Technological Contexts of Hindi- Computing. Understand and acquire progress in the language through the enrichment of the vocabulary, Syntax and Discourse development and comprehend the dimensions of Hindi Computing and its reliability with technological aspects.

CO 4 : To familiarize the translation of Simple Sentences from English to Hindi and vice versa.

CO 5 : Understand Hindi Literature- Origin and Development of Hindi Language. Introduction to Hindi Poetry, Introduction to Hindi Prose. Acquire the basics of Hindi literature mainly in poetry and prose and get accustomed to it by recognizing its relevance in the development of Hindi language.

CO 6 : Understand Hindi in the International Scene- Technology and Hindi- Hindi in the field of advertisement – Usage of Hindi in various scenarios. Explore the benefits of Hindi language in the field of technology, advertisement and usage of Hindi in various

scenarios thereby attaining a clear idea of relevance of Hindi in vivid fields taking into account its International acceptance too.

Course Content

Module 1 : Spoken and Written Hindi – Pronunciation, Script and Spelling, Spoken Skills, Comprehension.

Module 2 : Applied Hindi Grammar – Structure of Hindi, Communicative Contexts of Hindi , Parts of Speech.

Module 3 : Development of Vocabulary, Syntax and Discourse and Hindi Computing – Indian Language Computing , Technological Contexts of Hindi Computing.

Module 4 : Translation of Simple Sentences from English to Hindi and vice versa.

Module 5 : Hindi Literature – Origin and Development of Hindi Language, Introduction to Hindi Poetry, Introduction to Hindi Prose.

Module 6 : Hindi in the International Scene, Technology and Hindi, Hindi in the field of Advertisement , Usage of Hindi in various scenarios.

References

- 1) Vyavaharik Hindi Vyakaran Anuvad Tatha Rachna – Dr.H. Parameswaran
- 2) Bhasha Aur Proudhyogiki – Vinod Kumar Prasad, Vani Prakashan, New Delhi
- 3) Bhasha Aur Vyavahar – Brajmohan, Vani Prakashan, New Delhi.

QUESTION PATTERN

HL- GC 235 BEGINNERS' HINDI

Time: 3 hrs

Maximum Marks: 75

I .Answer the following 10 objective questions

Each question carries 1 marks

(10 x 1 = 10 Marks)

II. Answer any seven short questions out of Ten

Each question carries 5 marks

(7 x 5 = 35 Marks)

III. Answer any Three essays out of five

Each question carries 10 marks

(3 x 10 = 30 Marks)

SEMESTER 4

COURSE : MODERN POETRY SINCE PRAYOGVAD**(AADHUNIK KAVITA: PRAYOG SE SAMAKAALEEN TAK)****COURSE CODE : HL- CC 241****CREDITS :6****Hours/week :7****AIM:** To Familiarize the students with the concepts of Modern Poetry Post independence.**COURSE OBJECTIVES :**This course covers Development of modern poetry in Hindi literature and it covers some representative modern poetry and also two non detailed study of : poetry post-independence to till.

CO 1 : Understand the concept of Prayogavad and the significant role of Agey in its development. To be familiar with the major works of other poets of Prayogavad

CO 2 : Understand the features of Nayi Kavita as a literary movement. To know about the Fantasy and its elements in Hindi poetry with special reference to Muktibodh. Gain deep knowledge about the major poets and poems of NayiKavita

CO 3 : Gain knowledge about Sattothari Kavita, Akavita, Naxal vaadikavita and its major poems and poets.

CO4 : Achieve complete outlook of Samakalin Kavita and its Major trends .

CO 5 : Understand various discourses discussed in Samakalin Kavita like Feminism, Dalit, Trans-gender. Eco-criticism, etc.

CO 6 :Gain knowledge about Agyey and his contribution to Hindi poetry.

COURSE CONTENT

Module 1 :Origin of Prayogavad and Agyey , Major features of Prayogavad. Symbolic nature of poetry. Prominent poets of Prayogavad- Girijakumar Mathur, Bharat Bhooshan Agrawal.

Module 2: Nayikavita, Concept of nayi Kavita, Muktibodh and Fantasy. Prominent poets- SarveshwardayalSaksena, Dharma veer Bharati, Bhavaniprasadmishr, Kunvar Narayan.

Module 3: Sattotari Kavita, Concept of akavita, PratibaddhKavita, naxalbadi Kavita. Prominent writers- Dhoomil, Kedarnathsingh, Jagadish Chaturvedi, Rajkamal Chaudhari, RajeshJoshi .

Module 4: Major concepts of Samakaleen Kavita, trends, Prominent poets- Leeladharjagudi, Anamika, Arunkamal ,KunvarNarayan,Katyayani ,Madan Kashyap ,Kumar Ambuj,.

Module5: Samakalin Kavita and various Discourses - Feminism, Dalit, Transgender,Ecocriticism, Deconstruction,Structuralism and Post Structuralism, Impact of Globalization and neo colonialism.

Module6: Contribution of Agyey with special reference to ‘Asadhyaveena’

REFERENCES TEXT FOR READING (edited by Dept. of Hindi)

For Detailed Study

1. Agyeya- Kalgibajareki, Asadhyaveena, Kitnina vonmeinkitani bar
2. Muktibodh- Brahmarakshas
3. Dharmavir Bharati- Kavita keemaut
4. Rajkamal Chaudhari- is akalbelamein
5. BhavaniprasadMishr- Geetfarosh

6. SarveswarDayalSaksena- Mainekabkaha
7. Raghuveer Sahay- Swadheenvyakti
8. Dhumil-Mochiram,
9. KedarnathSingh- Akal meinSaras
10. LeeladharJagudi-VigyapanSundari
11. Arunkamal- Mukti
12. Kumar Ambuj -Bahuroopiya
13. Anamika-Bejagah
14. Madan Kashyap – Bhookhkaa koras
15. Rajesh joshi-Nepathyameinhasi
16. Katyayani- Kiranonke beech Bhoomigat
17. MangaleshDabaral- Pahaad par lalten
18. Pawan Karan – Gullak

REFERENCES(GENERAL)

- AgyeyaAurAdhunik Rachana ki Samasyayein – Ramwsaroop Chaturvedi
- AgyeyaMuktibodh: EkVishleshan – Ramesh Sharma
- Kavita kenayePratiman – Dr.Namvar Singh
- Nagarjun,Muktibodh :EkVishleshan – RameshSharma
- Naya Hindi Kavya – Dr.ShivkumarMishra
- NayiKavita Ka Aatmasangharsh –Muktibodh
- Nayi Kavita keSathAdhyay – Dr.KantiKumar
- NayaPratimanPuraneNikash – LakshmikantVarma
- Naya SrijanNaya Bodh – Dr.KrishnanathPalival

QUESTION PATTERN

HL – CC 241 MODERN POETRY SINCE PRAYOGVAD

(AADHUNIK KAVITA: PRAYOG SE SAMAKAALEEN TAK)

Time :3 hrs.

Maximum Marks :75

- I. Answer the following ten objective questions
Each question carries 1 mark (10 x1 =10 Marks)
- II. Answer three essays out of six
Each question carries 10 marks (3 x 10 = 30 Marks)
- III. Answer three short questions out of six
Each question carries 5 marks (3 x 5 =15 Marks)
- IV. Answer any four out of six annotation passage
Each question carries 5 marks (4 x 5 =20 Marks)

SEMESTER :4

COURSE : HINDI LITERATURE : MODERN DISCOURSES

(HINDI SAAHITY MEIN NAYE VIMARSH)

COURSE CODE : HL – CC 242

CREDITS :4

Hours/week :6

AIM: To Familiarize the students with the concepts of Contemporary discourses and boom in literature in terms of Women ,Dalit ,Aadivaasi,Gender ,Media,Cyber and other discourses

COURSE OBJECTIVES: This course covers the development of discourses and its interpretation in literature, last decades of twentieth century literary experiments, movements etc

Course Outcome (Cos)

CO 1 : Acquire awareness of the various kinds of literary representations from various sections of the society. understand the major social concerns and issues prevalent in our society

CO 2 : Comprehend the literary works that would portray the real life narratives. Critically examine the narratives and thus shape a critique of our contemporary society

CO 3 : Develop an approach of critical pedagogy to have a self- reflexive reading of the texts.

CO 4 : Understand the varied ways of dominance inherent in the society and how they are manifested in art and literature. Acquire the efficiency to become a constant reminder about the need to resist all kinds of power.

CO 5 : Gain the ability to analysis and interpret the literary forms of Hindi literature.

CO 6 : Gain the insight into the major issues related to the sociocultural context of India in this era.

COURSE CONTENT

Module 1:

Dalit writing- History and Devolpment- Auto Biographies- Poetry, Prose, Fiction, Drama, Criticism

Module 2 :

Aadivaasi, - Adivasi Writing History and Devolpment- Depiction of Aadivaasi life in Literature

Module 3:

Women Discourse –Politics of Women Writing , women and resistance movements , Patriarchy, Major writers through history, their themes and concerns, contemporary writers, women and environment.

Module 4:

Gender Discourse, Performativity, Queer theory – Sexuaities, Transgender Pshyco analysis, Vridhhvimarsh, krishakvimarsh and other discourses

Module 5: Environment Discourses, Eco Literature, Eco Criticism, Eco

Aesthetics, Eco Feminism : Media and Cyber Discourse in Hindi literature- Cyber theory, Media Technique, Cyber bullying

Module 6: Hindi Stories and poems related to these discourses**REFERENCE (TEXT FOR READING)**

Edited Textbook for stories and poems and the following lessons to be studied

Poems:

- 1.Naye yugmeinShatru –MangaleshDabarval
- 2.Ithna door mathbyahna baba- Nirmala Puthul
3. Pyasakunvaa–Gyanendrapathi
4. HamareeArtheeshaaheenahin ho saktee – Anuj Lugun
5. mere prati - kranti –Asang Ghosh
6. Dastakein -Agnishekhar

Stories

- 1.Salam :Om PrakashVatmееkee
2. File - Madhu Kankariya
- 3.Pitaa – Gyan Ranjan
- 4.Ibne Mariyam – Nasira Sharma
5. emdot.kom – Harnot

Novel

Post Box No.202 Nala sopara – Chitra Mudgal

REFERENCE for Module 1 to 5

1. Aadivasisahithy: vivid aayam – Ed. Dr. Ramesh Sambhajikure
2. Dalit sahityavisheshank –Hans patrika
3. Hindi Mein AaadivaasiSahity- Ispak Ali
4. Samakaaleen Hindi saahitya :vividhvimarsh Edited by
Prof.ShreeraamSharma,Vaneeprakashan ,New Delhi
5. Hindi saahitya meinasmitaamoolakvimarsh ,www.streekaal.com
6. Samakaaleenasmitaamoolakvimarsh , online course by www.swayam.gov.in

QUESTION PATTERN**HL – CC 242 HINDI LITERATURE : MODERN DISCOURSES**

(HINDI SAAHITY MEIN NAYE VIMARSH)

Time :3 hrs

Maximum Marks :75

I. Answer the following ten objective questions

Each question carries 1 mark

(10x1 = 10 Marks)

III. Answer two essays out of four

Each question carries 10 marks

(2 x 10 = 20 Marks)

III,Answer one essay out of four

Each question carries 10 marks

(1 x 10 = 10 Marks)

IV,Answer any seven out of Ten short answer questions

Each question carries 5 marks

(7 x 5 = 35Marks)

SEMESTER 4

COURSE : TRANSLATION : THEORY AND PRACTICE

(ANUVAD : SIDHHAANT EVUM PRAYOG)

COURSE CODE : HL-CC 243**CREDITS :4****Hours/week :6****AIM:** To Familiarize the students with the concepts of Translation and its different forms.

COURSE OBJECTIVES: This course covers translation and interpretation types of , inter semiotic, inter-language and intra language –. Translation of creative works and non creative works–Problems for translation between Hindi, English and Malayalam., Phonological problems in transliteration. Theoretical practice includes translation from Hindi to Malayalam and English , from Malayalam to Hindi and from English to Hindi. The candidate is required to comment and evaluate his own translation. Passages for translation will be of about 100 words related to creative and non-creative writings”.

Course Outcome (Cos)

CO 1 : Acquire a deep study and knowledge on the theory of Translation including the term ‘translation’ and its equivalents in Hindi and Malayalam. Understand The need for translation its importance in the present world that in turn helps in the development of the qualities required for a translator and an interpreter and helps in tracking the necessity of translation in modern contexts.

CO 2 : Understand the notion of equivalent in translation as Analysis – transfer and structuring etc. that helps to intrude into the practicality of translation through the comprehension and

analysis of the vivid perspectives of translation such as the time gap procured for a translation, translation types and its multidimensional features.

CO 3 : Develop keen observation of Linguistics in translation thus imbibing the linguistic elements in translation and transliteration and the linguistic models of translation pertaining to the text–lexical formation

CO 4 : Differentiate the Translation of creative works and noncreative works. This can enable to challenge the incompatibility in translation of stylistic elements and terminological translation respectively in the creative and non-creative translation and thereby rectify the problems to overcome the difficulties arising in such translation of creative works and non-creative works.

CO 5 : Trace the Problems for translation - Hindi, English and Malayalam. Identify the Phonological problems in transliteration and the problem of conveying it in translation. Develops the implication of loan words in translation.

CO 6 : Generate the Practice of commentation and translation i.e., Translating from Hindi to Malayalam and English, from Malayalam to Hindi and from English to Hindi. The candidate is required to comment and evaluate his own translation. Passages for translation will be of about 100 words related to creative and non-creative writings. This enhances an analytical and evaluative criterion in the self translation of creative and non creative writings and build up a strong commentation practice in the bilingual translation.

COURSE CONTENT

Module 1: Theory of Translation- The term ‘translation’ and its equivalents in Hindi and Malayalam. Definition of translation–qualities of a good translation–translation and interpretation qualities of a translator and of an interpreter–translation and original writing. The need for translation–importance of translation in the present world.

Module 2: The notion of equivalent in translation-Analysis – transfer and structuring – revision and evaluation – translation an art or a science – intrusion of the translate – the problem of style and diction, the time gap between the original and a translation. Types of Translation – inter semiotic, inter-language and intra language–types of inter-language

translation, the parameter, employed, totality, completeness, literalness, freedom, directness, function, medium, machine translation.

Module 3: Linguistics in translation – linguistic models of translation – Nida, Catford and Bathgate – a translator’s awareness of language and linguistics – bilingualism- Text, the unit of translation – means of text formation, text and sentences, inter-sentence Cohesion – order of elements of sentences, significance of marked order – lexical items Formation of words – technical items – loan words : different types – the question of synonymy, pronouns and terms of address – idioms, phrases and pro-verbs – transliteration.

Module 4: Translation of creative works and non-creative works – metre, rhythm and rhymes in poetry – features of spoken language and translation of dramatic and fictional works – the problem of cultural incompatibility in the case of images, metaphors and symbols – translation or transcreation. Translation of non-creative works – problems of terminology, guidelines laid down by the Commission for technical terminology – the problem of style and diction – types of texts and their addressees.

Module 5: Problems for translation - Hindi, English and Malayalam. Phonological problems in transliteration-second person pronouns and social Stratification -terms of address: the Malayali’s tendencies to avoid the first person pronouns within the family circle. The existential and possessive construction–order of clause structure elements in such cases and its significance, Causative and Negation. Voice and difference in meaning it involves – modulation of verbal meaning in Hindi and in Malayalam and the problem of conveying it in translation – English Phrase, verbs. Meaning difference of Sanskrit loan words in Hindi and Malayalam and its implication in translation. The absence of relative pronoun in Malayalam and the resulting problem. Non correspondence in the use of case endings or post positions in Hindi and Malayalam and prepositions in English. Formal incompatibility of foreign names in Hindi, Malayalam and English. Lexical items having a local colour.

Module 6: Practice of commendation and translation-Translating from Hindi to Malayalam and English, from Malayalam to Hindi and from English to Hindi. The candidate is required to comment and evaluate his own translation. Passages for translation will be of about 100 words related to creative and non-creative writings.

REFERENCES (TEXT FOR READING)

1. Anuvad Vigyan-Dr. Bholanath Tiwari

REFERENCE (GENERAL)

- Anuvad Abhyas 3 & 4-Dakshin Bharath Hindi Prachar Sabha
- Anuvad Kala- Dr. N.E. VishwanathaIyer
- Anuvad Kala: KuchVichar- Anand Prakash Khemani
- Anuvad Sidhanth ki Rooprekha –Dr. Suresh Kumar

QUESTION PATTERN

HL - CC 243 TRANSLATION : THEORY AND PRACTICE

(ANUVAD : SIDHHAANT EVAM PRAYOG)

Time :3 hrs

Maximum Marks :75

I. Answer Two essays out of four

Each question carries 10 marks

(2x 10 = 20 Marks)

II. Answer any five out of eight short answer questions

Each question carries 5 marks

(5 x 5 = 25 Marks)

III. Translate the given passage from Hindi to English (1x8= 8 Marks)

IV. Write a note on the problems occurred in the translation of the given passage (1x 2 = 2 Marks)

V. Translate the given passage from English to Hindi (1x8= 8 Marks)

VI. Write a note on the problems occurred in the translation of the given passage

(1 x 2 = 2 Marks)

VII. Translate the given passage from Malayalam to Hindi (1x8= 8 Marks)

VIII. Write a note on the problems occurred in the translation of the given passage

(1 x 2 = 2 Marks)

SEMESTER 4

COURSE : COMPARITIVE LITERATURE : HINDI AND MALAYALAM

(TULANATMAK SAAHITYA : HINDI -MALAYALAM)

COURSE CODE : HL - DSE 244

Credits : 4

Hours /week: 6

Aim: To acquaint students with how comparison of literature of two languages is done .

To familiarize students with fiction of Malayalam & Hindi

Objectives : This course covers the theory of comparison and the nature and techniques of comparative literary study with special reference of Hindi and Malayalam

Course outcomes

CO 1 : Understands the nature and techniques of comparative study and the difference between the comparison in western and Indian literature

CO 2 : Understands the early poetical trends in Malayalam and Hindi

CO 3 : Understands the modern trends of Malayalam and Hindi poetry

CO 4 : Understands the trends in Hindi Malayalam fiction and Novels

CO 5 : Understands the trends in Hindi Malayalam drama

CO 6 : Understands the women and Dalit writing in Hindi and Malayalam and compare both literature

Module 1 :

Introduction to comparative studies The nature and Techniques of comparative literary study . The difference between comparison in western literature & Indian literature

Module 2 :

Early poetical trends in Malayalam and Hindi ,devotional literature in Hindi and Malayalam .comparison of Ezhuthachan and Thulsi : Soordas and Cherusseri
Manipravala kavyas of Malayalam

Module 3:

National spirit in Hindi and Malayalam poetry ,Romanticism,progressivism,new poetry in both Hindi and Malayalam

Module 4 :

comparison of Hindi Malayalam short stories and Novel , Prominent authors and their works

Module 5 :

comparison of drama in Hindi and Malayalam

Module 6 :

women and Dalit writings in Hindi and Malayalam

Reference : Edited Text Book

Malayalam sahithy ka ithihas : Parameswaran Nair ,sahithya academy

Malayalam sahithy ka ithihas :Dr.Bhaskaran Nair

VallatholaurMaithileesharanGupt :Dr.Mani,NPH Delhi

Malayalam keenayeekavithayein :Rjanprakasan

Hindi aur Malayalam keadhuniknatak : N I Nrayanan

Malayalam sahithy : Dr Ramachandr Dev

Hindi aur Malayalam ka Krishna bhakti kavy :Dr.Bhaskaran Nair

History of Malayalam Literature :Ulloor s ParameswarIyer

Hindi aur Malayalam ka adhunik khanda kavy ka adhyayan
:Dr.K.KunjiramanD B H P Sabha ,Madras

QUESTION PATTERN

HL –DSE 244 :COMPARATIVE LITERATURE: HINDI AND MALAYALAM

(TULANATMAK SAAHITYA : HINDI -MALAYALAM)

Time: 3 hrs

Maximum Marks: 75

I .Answer the following 10 objective questions

Each question carries 1 marks

(10 x 1 = 10 Marks)

II.Answer any two essays out of four

Each question carries 10 marks

(2 x 10 = 20 Marks)

III..Answer any two essays out of two

Each question carries 10 marks

(2 x 10 = 20 Marks)

IV. Answer five short questions out of seven

Each question carries 4 marks

(5 x 5 = 25 Marks)

SEMESTER 4

COURSE : SANSKRIT

COURSE CODE : SG-GC 244 A

CREDITS : 4

Hours /week: 6

SEMESTER 4

COURSE : SPOKEN HINDI

COURSE CODE : HL – GC 245

Credits : 4

Hours /week: 6

Aim : This course aims at the spoken skills and communicative contexts of Hindi.

Course Objectives : This course includes pronunciation, script and spelling, syntax and discourse, spoken skills, communicative contexts of Hindi and building up the basic structure of language.

Course Outcome

CO 1 : Acquire a strong knowledge on Pronunciation, Script and Spelling. Introduction and practice of pronunciation of Hindi alphabets with pitch intonation etc. Create a strong practice in spelling and clear pronunciation of Hindi alphabets thus building up the basic structure of language.

CO 2 : Understand the detailed study of Hindi alphabets comprising of vowels, consonants with mode of writing. Achieve the verbal and writing efficiency through a broad study of Hindi alphabets.

CO 3 : Practice of sufficient and appropriate vocabulary used in various situations at different places that promotes their vocabulary enrichment. Acquire the skill of vocabulary building pertaining to the respective situations through the ample practice.

CO 4 : Comprehend the introductory concepts of grammar in Syntax and Discourse. Develop the writing skills through the usage of sentences in various tense forms.

CO 5 : Achieve the spoken skills through moods and tenses that focuses on the usage of imperative, interrogative sentences and also deals with the applicability of present, future and past tense with 'Ne' construction. Streamline the importance of the language in spoken mode through the idea of sentence structure.

CO 6 : Enrich the communicative contexts of Hindi that involves the situation based conversation in Hindi and practicing the communication skill to develop the proficiency of the language. Achieve a good communication skill through the practice of communicative contexts of Hindi.

Course Content

Module 1 : Pronunciation, Script and Spelling. Practice of pronunciation of Hindi alphabets with pitch, intonation etc.

Module 2 : Detailed study of Hindi alphabets comprising of vowels, consonants with mode of writing.

Module 3 : Practice of sufficient vocabulary used in various situations at different places.

Module 4 : Syntax and Discourse Simple Hindi Sentence, Imperative, Interrogative with present, future and past tense.

Module 5 : Spoken Skills- Moods and tenses that focuses on the usage of imperative, interrogative sentences and also deals with the applicability of present, future and past with 'Ne' construction.

Module 6 : Communicative contexts of Hindi that involves the situation based conversation in Hindi and practicing the communication skill to develop the proficiency of the language.

References

- 1) Bolchal Ki Hindi – Dr. Suseela Gupta, Lokbharati Prakashan, Allahabad.
- 2) Vyavaharik Hindi Vyakaran Anuvad Tatha Rachna – Dr.H.Parameswaran

QUESTION PATTERN

HL – GC 245 SPOKEN HINDI

Time: 3 hrs

Maximum Marks: 75

I .Answer the following 10 objective questions

Each question carries 1 marks

(10 x 1 = 10 Marks)

II.Answer any seven short questions out of Ten

Each question carries 5 marks

(7 x 5 = 35 Marks)

III.Answer any Three essays out of five

Each question carries 10 marks

(3 x 10 = 30 Marks)

UNIVERSITY OF KERALA

M. A. ECONOMICS PROGRAMME (Semester System)

REVISED SYLLABUS

(With effect from 2018 Admission Onwards)

2018

Syllabus for M.A. Economics Programme (Semester System) Offered in Affiliated Colleges.

(with effect from 2018 Admission Onwards)

Course Structure and Distribution of Marks

Semester	Paper Code	Title of the paper	Distribution of Instructional hours (Lecture) per semester	Instructional hours (Lecture) per week	Duration of ESA (Hrs.)	Maximum Marks		
						CA	ESA	Total
I	EC 211	Micro Economics I	120	7	3	25	75	100
	EC 212	Economics of Growth and Development	110	6	3	25	75	100
	EC 213	Indian Economic Policy I	110	6	3	25	75	100
	EC 214	Quantitative Methods for Economics	110	6	3	25	75	100
II	EC 221	Micro Economics II	120	7	3	25	75	100
	EC 222	Economics of Social Sector and Environment	110	6	3	25	75	100
	EC 223	Indian Economic Policy II	110	6	3	25	75	100
	EC 224	Econometrics and Research Methodology	110	6	3	25	75	100
III	EC 231	Macro Economics -I	120	7	3	25	75	100
	EC 232	International Economics I	110	6	3	25	75	100
	EC 233	Public Economics	110	6	3	25	75	100
		Optional I	110	6	3	25	75	100
IV	EC 241	Macro Economics -II	120	7	3	25	75	100
	EC 242	International Economics II	110	6	3	25	75	100
	EC 243	Financial Securities Market Analysis	110 [#]	6	3	25	75	100
		Optional II	110	6	3	25	100	100
	EC 244	Dissertation	-	-	-	-	-	100
		Viva-Voce	-	-	-	-	-	100
		Total	1800		-	-	-	1800

[#] Out of 110 hours, 5 hours for practical session.

CA : Continuous Assessment.

ESA : End Semester Assessment

OPTIONAL PAPERS

(One paper each in Semester III and Semester IV)

Semester	Paper Code	Title
III	EC 201	Agricultural Economics
	EC 202	Economics of Insurance
	EC 203	Labour Economics
	EC 204	Law and Economics
	EC 205	Mathematical Economics
	EC 206	Urban Planning
IV	EC 207	Advanced Econometrics
	EC 208	Demography
	EC 209	Economics of Infrastructure
	EC 2010	Industrial Economics
	EC 2011	Welfare Economics
	EC 2012	Women and Development

Scheme of Assessment

Continuous Assessment (C A): 25 marks

For the Papers other than the Paper “EC 243: Financial Securities Market Analysis”

Components	Marks
Attendance	5
Assignment	5
Seminar	5
Test Paper (average of the marks in two test papers)	10
Total	25

For the Paper “EC 243: Financial Securities Market Analysis”

Components	Marks
Attendance	5
Assignment	5
For attending 5 hours of practical work on online trade	5
Test Paper (average of the marks in two test papers)	10
Total	25

End Semester Assessment (ESA): 75 marks

This will be through a three hour written examination consisting of 10 very short answer questions (with no choices), each carrying 1 mark, 7 short answer questions to be chosen out of 10 questions, each carrying 5 marks, and 3 descriptive questions to be chosen out of five questions, each carrying 10 marks.

CORE PAPERS IN FIRST SEMESTER

EC 211: MICRO ECONOMICS – I

(Hours per semester: 120

Hours per week: 7)

Objectives

The purpose of the course is to provide an understanding of the principles of economics in application to individual decision makers, both consumers and firms. This course equips the students themselves with the various aspects of the conventional as well as the recent developments in microeconomic theory.

Course Contents

Module I: Recent Developments in Demand Theory (16 hours)

Pragmatic approach to demand analysis - constant elasticity demand function - distributed lag models (Nerlov's stock adjustment principle, Houthakker's and Tylors dynamic model) - linear expenditure system.

Module II: Production & Cost Analysis (24 hours)

Production function - homogenous and non-homogenous production functions - technical progress and production function - capital deepening, labor deepening and neutral technical progress - exogenous and endogenous technical progress - empirical production functions - Cobb-Douglas and Constant Elasticity Substitution production function - production function of a multi product firm.

Modern theories of cost - short run and long run - engineering cost curves - short run and long run - analysis of economies of scale - real and pecuniary economies of scale.

Module III: Imperfect Market Structures (32 hours)

Monopoly - monopoly power - social cost of monopoly - price discrimination - international price discrimination and dumping – inter-temporal price discrimination and peak load pricing - two-part tariff - tying and bundling - public policies towards monopolies - antitrust laws, regulations, public ownership - monopoly welfare loss.

Monopolistic competition- Chamberlin's (large group) model - equilibrium with new firm entering the industry; with price competition; with price competition and free entry- excess capacity – mark up over marginal cost - debate over advertizing.

Oligopoly- Non-collusive oligopoly - Cournot's duopoly, Bertrand duopoly, Chamberlin's small group model, Sweezy's kinked demand curve model.

Collusive oligopoly - cartels aiming at joint profit maximization and market sharing cartels – price leadership models; by low cost firm, by a dominant firm -brometric price leadership.

Public policy towards oligopoly: Antitrust laws, predatory pricing, tying.

Module IV: Theory of Games (24 hours)

Pay of matrix-Pure vs. mixed strategy – dominant strategy and Nash equilibrium - Prisoner's dilemma - Zero-sum game & non zero-sum game - Repeated games - enforcing a cartel – sequential games – game of entry deterrence.

Game Applications - important issues in game theory - cooperation, competition, coexistence and commitment.

Module V: Marginalist Controversy & Managerial and Behavioral Theories of the Firm (24 hours)

Hall and Hitch Report and full cost pricing principle - Gordon's attack on marginalism - Bain's limit pricing - collusion with and without new entrant - Sylos Labini's Limit pricing model - Baumol's theory of sales revenue maximization - single product model without advertizing-Marris' model of managerial enterprise - Williamson's model of managerial discretion – Cyert and March's behavioural model.

Reading List

Module-I

1. Koutsyiannis, A (2013), *Modern Microeconomics*, Macmillan Press, London (P-53-61)
2. Baumol, W.J (2009), *Economic Theory and Operations Analysis*, Prentice-Hall (P) Ltd, New Delhi.

Module-II

1. Mandal, RK (2007), *Micro Economic Theory*, Atlantic Publishers (P) Ltd (P-155-162,169-178,181-206)
2. Besanko, David & Braeutigam, Ronald (2015), *Micro Economics*, Wiley India (P) Ltd, New Delhi (P-163-169,191-195)
3. Raa, Thijsten (2013) *Micro Economics, Equilibrium and Efficiency*, Palgrave Macmillan (P.122-126)

4. Varian H.R (2003), *Intermediate Micro Economics*, East – West Press Edition (P-364-393)
5. Costa Da G.C (2001), *Value and Distribution* (P.79-81, 89-95)
6. Koutsyiannis, A (2013), *Modern Microeconomics*, Macmillan Press, London (P-77-78, 85, 99-101,114-121,126-137)
7. Snyder, Christopher & Nicholson, Walter (2012), *Microeconomic Theory-Basic Principles and Extensions*, Cengage learning (P-273-332)

Module-III

1. Salvatore, Dominick (2009), *Principles of Microeconomics* (P-301-303,309-314)
2. Mankiw, Gregory.N (2012), *Principles of Microeconomics*, 6th Edn, Cengage Learning (P-313,318-323,335-344,355-365)
3. Koutsyiannis, A (2013), *Modern Microeconomics*, Macmillan Press, London (P-202-212,216-232,237-252,412-413)
4. Krugman, Paul & Wells, Robin (2005), *Micro Economics'*, Worth Publishers, New York (P-325-328)
5. Mandal, RK (2007), *Micro Economic Theory*, Atlantic Publishers (P) Ltd (P-227-241,242-265,266-287)
6. Pindyck, Robert.S, Rubinfeld, Daniel, L, Mehta, Premal, L (6th edition), *Micro Economics* (P. 346-348,351-354,460-479)
7. Serrano, Roberto, Feldman, Allan, M (2013), *A short course in intermediate micro economics with Calculus*, Cambridge University Press (204-212,223-235)
8. Mandal, RK (2007), *Micro Economic Theory*, Atlantic Publishers (P) Ltd (P-227-241,242-265)
9. Varian H.R (2010), *Intermediate Micro Economics: A Modern Approach*, East– West Press Edition (440-520)
10. Snyder, Christopher & Nicholson, Walter (2012), *Microeconomic Theory-Basic Principles and Extensions*, Cengage learning (449-477)

Module-IV

1. Varian H.R (2013), *Intermediate Micro Economics*, East – West Press Edition (P-525-565)

2. Pindyck, Robert.S, Rubinfeld, Daniel, L, Mehta, Premlal, L(6th edition), *Micro Economics* (P. 355-365,369-391)
3. Serrano, Roberto, Feldman, Allan, M (2013), Snyder, Christopher &Nicholson, Walter (2012), *Microeconomic Theory-Basic Principles and Extensions*, Cengage learning (225-269)
4. *A short course in intermediate micro economics with Calculus*, Cambridge University Press (242-260)
5. Salvatore, Dominick (2009) *Principles of Microeconomics* (P-365-371)
6. Koutsyiannis, A (), *Modern Microeconomics*, Macmillan Press, London (P-406-412)
7. Snyder, Christopher &Nicholson, Walter (2012), *Microeconomic Theory-Basic Principles and Extensions*, Cengage learning (225-269)

Module-V

1. Koutsyiannis, A (), *Modern Microeconomics*, Macmillan Press, London (P-256-267,284-287,305-313,325-331,352-364,368-370)
2. Archibald G.C (Ed) (1971), *Theory of the firm*, Penguin (P) Ltd
3. Bain,J (1958),*Barriers to New Competition*, Harvard University Press, USA

EC 212: ECONOMICS OF GROWTH AND DEVELOPMENT

(Hours per semester: 110

Hours per week: 6)

Objectives

Development Economics represents an engaging branch of Economics. A course on the Economics of Growth and Development connects students of Economics to academic concerns, policies and practical solutions relevant for progression of all economies. The objective of this paper is to familiarizing students with the conceptual routes, theoretical dynamics and practical strategies of growth and development. It is expected that this course would orient them towards major themes of development, lead them towards more methodical probes and equip them with adequate analytical knowledge.

Course Contents

Module 1: Approaches to Development (20 hours)

Evolution of Development Economics-Approaches to development-Utilitarian- Social indicators- Basic needs- Quality of life- Redistribution with growth- Sustainable development- Responsible well being- Development ethics- Entitlements approach- Capabilities and functionings- Human development- Development as freedom- Human rights based approach- social capital.

Measurement of human development-Income poverty and Human poverty-Multidimensional Poverty Index-Institutions and economic development- Market- State- Civil Society-Behavioural development economics- Migration and development - Todaro Model.

Module 2: Theories of Economic Growth and Development-I (20 hours)

Classical theory-Adam Smith, Ricardo, Marx. Theory of Schumpeter - Harrod-Domar. Mahalanobis model-Joan Robinson. Solow-Swan model.Mead Kaldor-Mirrlees-Pasinetti.

Module 3: Theories of Economic Growth and Development-II (20 hours)

Production Function approaches: Learning by doing; Total Factor Productivity; Ramsay's rule and optimal savings; Golden Rule of Accumulation; Hicks and Harrod; Endogenous growth models (Romer; Uzawa-Lucas, AK).

Module 4: Structural aspects of development (20 hours)

Dualistic theories- Fei Ranis - Modernisation theory, Structuralist approaches: Furtado Singer-Prebisch - Dependency Theories: Samir Amin; Gundar Frank - Neo-Marxist approach, Baran - World systems approach-Emmanuel Wallerstein - Basic principles of Neo Liberalism.

Module 5: Emerging Issues (30 hours)

Inequality: Convergence Vs Divergence - Globalisation and Development: Views of Stiglitz - Participatory Development: tyranny / transformation Post 2015 development agenda - Impasse in development studies - Alternatives to the impasse.

Reading List

Module 1:

Basic reading list:

1. Thirlwall,A.P. 2006.Growth and Development :With Special Reference to Developing Economies. Macmillan.UK.
2. Todaro,M.P and Smith. 2014. Economic Development. Pearson Education.USA.
3. Fukuda-Parr and Shiva Kumar (eds.).Readings in Human Development.OUP.Oxford.

Additional reading List:

1. Sen, Amartya.1999. Development as Freedom. OUP.Oxford.
2. UNDP.Human Development Reports.1991;1994; 1995;1997;2000;2010
3. World Development Report.2015.Mind, Society and Behaviour. World Bank.Washington.
4. Chambers,R. 2005.Ideas for Developemnt.Earthscan.London
5. Gasper, D.2004.The Ethics of development.Edinburgh Uty.Press.Edinburgh
6. Ros,Jaime.2013.Rethinking Economic Development,Growth and Institutions. OUP.Oxford
7. Howell, Jude and J.Pearce.2002.Civil Society and Development. Lynne Rienner.London
8. Desai, Vandana and R.B.Potter.2014. The Companion to Development Studies. Routledge.London
9. Galbraith,J.K..1962. Economic Development in Perspective.Harvard University Press.USA

10. Mahbub-ul Haq.1995.Reflections on Human development. OUP.Oxford.

Modules 2, 3&4

Basic reading list:

1. Thirlwall,A.P. 2006.Growth and Development :With Special Reference to Developing Economies. Macmillan.UK.
2. 2.Todaro,M.P and Smith. 2014. Economic Development. Pearson Education.USA.
3. Ghatak, Subrata.1998.Introduction to Development Economics.Routledge.NY.
4. Jomo.K.S (ed.). 2005. The Pioneers of Development Economics. Zed Books. London
5. Meier,G.M and Rauch.2005.Leadng Issues in Economic Development. Oxford University Press. Oxford.
6. 6.Palgrve Dictionary of Economics

Additional reading List:

1. 1.Meier.G.M &Seers.2000.Pioneers in Development.OUP.Oxford.
2. Dasgupta, Dipankar.2010. Modern Growth Theory. OUP.Oxford.
3. Solow.R.M. 2000. Growth Theory: An Exposition. OUP.Oxford.
4. 4.Ray,Debaraj.1998. Development Economics. Princeton .New Jersey.
5. Becker.G.S.1993. Human Capital. The University of Chicago Press. Chicago.
6. 6.Behrmans and Srinivasan.1995. Handbook of Development Economics. Vol.3. Elsevier.Amsterdam.
7. Kant, Rajani.1994. (ed.)Paradigms in Economic Development. M.E.Sharpe.NY.
8. Cypher,J.M. and J.L.Dietz. (eds.) 2004. The Process of Economic Development. Routledge.London.

Module 5.

Basic reading list:

1. Khan, Sharukh Rafi. 2014. A History of Developemnt Economics Thought.:Challenges and Counter Challenges. Routledge.London.
2. Krugman, P. 1995. The fall and rise of development Economics. In Development, Geography and Economic Theory, Chapter 1. Cambridge: MIT Press.
3. Schuurman,F.J.(eds.). 2004. Beyond the Impasse: New Directions in Development Theory. Zed Books.London.
4. Stiglitz,J. 2002. Globalisation and its Discontents.Norton&Co.USA.

5. Cooke,B. and Uma Kothari (eds.) . 2004. Participation: the New Tyranny? Zed Books.London.
6. Shorrocks, A. and Ralph Hoven (eds.).2004. Growth, Inequality and Poverty. OUP.Oxford.
7. Thomas Eicketty.Capital in the 21st Century

Additional reading List:

1. Cypher,J.M. and J.L.Dietz. (eds.) 2004. The Process of Economic Development. Routledge.London.
2. Munck and Hearn. (eds.).1999.Critical Development Theory. Zed Books.London.
3. Odekon, M (ed.). 2006.Encyclopedia of World Poverty.Sage.London.Vol.I
4. Sunna.C and Gualerzi (eds.).2016. Development economics in the Twenty –First Century.Routledge.London.
5. Odekon, M (ed.). 2006.Encyclopedia of World Poverty.Sage.London.Vol.I
6. Stiglitz,J. 2007. Making Globalisation Wok. Norton&Co.USA.
7. Kuznets, Simon. Economic Growth and Income Inequality. *The American Economic* Leeson and Minogue.(eds.) 1988.Perspectives on Development. Routledge.London.

EC 213: INDIAN ECONOMIC POLICY - I

(Hours per semester: 110

Hours per week: 6)

Objectives

The Purpose of this course on Indian Economy is to enable the students to have an understanding of the various issues of the Indian Economy with a policy perspective. The focus of the syllabus is on the development perspectives of Indian Economy during the post Liberalization period since 1991.

Course Contents

Module 1 Economic Policy prior to 1991 (10 hours)

Mixed Economy- Centralized planning and Five Year Plans- Market intervention Policies-Public Sector Investment Policies.

Module 2 Structural Adjustment Reforms (20 hours)

Liberalization, Privatization and Globalization-Changes in reforms implemented by successive central Governments in India-NITI Ayog and discontinuation of Central Planning- Global Economic Crisis and its impact on Indian Economy- Recent Trends in Economic Growth and Structural Change-Demonetization and its effects on Indian Economy

Module 3 Population, Unemployment and Poverty (24 hours)

Demographic Changes- Trends and Patterns, New Population Policy, Urbanisation and its trend-Unemployment- Methods of estimating Unemployment and their limitations, Various committees for measuring Unemployment and their recommendations , Recent Employment Guarantee Programmes- Global Migration and Foreign Remittances - Poverty in India - Estimation of Poverty and their limitations, Recent committee Reports - Tendulkar, Saxena, Hashim and Rangarajan - Poverty Eradication Programmes .

Module 4 Agricultural Policies and Agricultural Development (20 hours)

Trends, Pattern and Performance of Agriculture Growth – Land Reforms and its impact, Changes in land use and cropping pattern, New Agriculture Policy 2000 onwards, Agricultural marketing, credit and finance - WTO and Indian Agriculture- Current Issues in Indian agriculture(agriculture credit, debt problems, subsidy etc).

Module 5 Industrial Policy and Industrial development (18 hours)

New Industrial Policies, Structural changes in Indian Industries since the reform period- Role of FDI in India's industrialization process, ICT based industrial development strategy - Impact of economic reforms on Small Scale industries.

Module 6 Service Sector in India (18 hours)

An overview of Service Sector in India - Transport and Communication, IT, Tourism (Growth, Performance , Market size and exports) - Power Policy and Power Development- FDI inflow in Service Sector, Role of WTO in Service Sector, Contribution of Service Sector to India's GDP.

Basic Reading List

1. Kapila Uma (ed) (2016) *Indian Economy Since Independence: A Comprehensive and Critical Analysis of India's Economy 1947-2016*, Academic Foundation, New Delhi
2. Ruddar Dutt and Sundaram (2016): *Indian Economy*, S Chand and Company, New Delhi
3. J K Mishra and V K Puri (2014): *Indian Economy: The Development Experience*, Himalaya Publishing House, Mumbai
4. B A Prakash (ed) (2012) *The Indian Economy Since 1991: Economic Reforms and Performance*, Pearson, New Delhi
5. India 2016, Publication Division, New Delhi
6. Government of India, *Economic Survey* (Annual Issues), Ministry of Finance, New Delhi, Accessible via URL-<http://indiabudget.nic.in/>

Additional Reading List

1. Ahulwalia, I.J. and I.M.D. Little (Eds) (1999), *India's Economic Reforms and Development*, (Essays in honour of Manmohan Singh), Oxford University Press, New Delhi.
2. Anne. O. Krueger. (ed) (2002), *Economic Policy Reforms and Indian Economy*, Oxford University Press, New Delhi.
3. Bhramananda P R and V A Panchamukhi (Ed) (2001) *Development Experience in Indian Economy*, Interstate Perspectives, Bookwell, New Delhi
4. Banik Nilanjan (2015) *The Indian Economy: A Macro Economic Perspective*, Sage Publications, New Delhi

5. Balakrishnan Pulapre (ed) (2012) *Economic Reforms and Growth in India*, Orient Black Swan, New Delhi
6. Chakravarthi S (1996). *Development Planning: The Indian Experience*, Oxford University Press
7. M.M.Sury, Vibha Mathur (2013), *Five Year Plans of India: First Five Year Plan(1951-52 to 1955-56 to Twelfth Five Year Plan(2012-13 to 2016-17)*, Volume I ,New Century Publication.
8. R K Mishra and K Trivikraman(ed)(2013) *The Global Financial Crisis: Challenges and Opportunities*, Academic Foundation, New Delhi
9. Reddy Rammohar C (2017) *Demonetization and Black Money*, Orient Blackswan, New Delhi
10. Jalan, B. (1992), *The Indian Economy – Problems and Prospects*, Viking, New Delhi
11. Joshi, V. and I.M.D. Little (1999) *India : Macro Economics and Political Economy, 1964-1991*, Oxford University Press, New Delhi.
12. Kaushik Basu (ed) (2004), *India's Emerging Economy*, Oxford University Press, New Delhi.
13. Bhattacharya, Aditya and Marzit, Sugata(Eds)(2004),*Globalization and Developing Economies; Theory and Evidence*, Manohar, New Delhi
14. Jha Raghbendra (Ed)(2003); *Indian Economic Reforms*, Hampshire, U.K.
15. Chug, Ram L. and Uppal.J.S. (1985) *Black Income in India*. Tata McGraw Hill, New Delhi.
16. Aravind Panagariya(2004) *India in the 1980s and 1990s: Triumph of Reforms*, IMF Working Paper, W/P 04/43, Washington DC.
17. Jagadisg Bhagwati, Aravind Panagariya(2012), *Reforms and Economic Transformation in India*, Oxford University Press.
18. Montek S Ahluwalia (2002), *Economic Reforms in India Since 1991: Has gradualism worked?* Journal of Economic perspective, Vol.16, No.3, PP6788
19. Ashim Goyal(Ed), *The Oxford Hand book of the Indian Economy in the 21st century: Understanding the Inherent Dynamism*, Oxford University Press, New Delhi.
20. Gopalji and Suman Bhakri(2013), *Indian Economy, Performance and Policies*, Pearson, New Delhi.

21. Agarwal A N (2013), *Indian Economy: Problems of Development and Planning*, Vikas Publishing House, New Delhi.
22. Kapila Uma(2013), *Two Decades of Economic Reforms in India: Towards Faster, Sustainable and more Inclusive growth*(3rd edition), Academic Foundation, New Delhi.
23. Mahendra K Premi (2009), *India's Changing Population Profile*, National Book Trust, New Delhi.
24. Sivaramakrishna K C, Amitabh Kundu, *Hand book of Urbanisation*, Oxford University Press, New Delhi.
25. Radhakrishnan R, Shovan Roy(Ed), *Hand book of Poverty in India*, Oxford University Press, New Delhi.
26. Byres TJ (Ed) (1998), *The Indian Economy: Major Debates since Independence*, Oxford University Press, New Delhi.
27. Dipak Mazumdar, Sandip Sarkar(2008), *Globalization, Labour Markets and Inequality in India*, International Development Research Centre.

EC 214: QUANTITATIVE METHODS FOR ECONOMICS

(Hours per semester: 110

Hours per week: 6)

Objectives

The key objective of this paper is to provide the students an insight into the importance of quantitative methods in Economics and enable them to introduce and apply these techniques in finding solutions to economic problems. The course also aims at: (1) familiarizing the students the basic quantitative techniques used in economic analysis, (2) enabling the students in making use of a quantitative approach in formulating economic problems, and (3) inculcating analytical ability in finding solutions to mathematically formulated economic problems.

Course Contents

Module I Matrix Algebra (25 hours)

Evaluation of higher order determinant- Minors and Cofactors- Laplace method-Bordered Hessian determinant- Solution of simultaneous equations - Cramer's rule and inverse method - Characteristic equations and Eigen values- Cayley Hamilton theorem - Quadratic forms- Leontiff open input- output model.

Module II Optimisation Techniques (25 hours)

Optimisation of economic functions- Optimisation with equality constraints -Lagrange method - Optimisation with inequality constraints - Linear programming -Characteristics of Linear Programming Problem(LPP) - Formulation of LPP - Solution of LPP using Simplex method – Duality - Uses of dual LPP and Shadow prices.

Module III Differential and Difference Equations (30 hours)

Concept of Differential equations - First order linear differential equations and their solutions - Concept of difference equations - First order linear difference equations and their solutions - Uses of differential and difference equations in economics-Dynamic stability-Lagged income determination model, Harrod and Cobweb models.

Module IV Statistical Methods (30 hours)

Theoretical Probability Distributions- Binomial, Poisson and Normal Distribution- Tests of Normality-Histogram, P-P plot, Q-Q plot , Jarque – Bera test -Methods of Sampling - Parameters and statistics - Sampling distribution of mean - Standard error- Z, t, F, and chi- square distributions –

Hypothesis :meaning and types - Type I and Type II errors - Confidence interval - Procedure of testing hypotheses - Z, t, F, and chi-square tests.

Basic Reading List

Module - I, II and III

1. Allen, R.G.D. (2008). Mathematical Analysis for Economists. New Delhi: AITBS Publishers.
2. Yamane, Taro. (2012). Mathematics for Economists: An Elementary Survey. New Delhi: Prentice Hall of India.

Module – IV

1. Gupta, S.P. (2014). Statistical Methods. New Delhi: Sulthan Chand and Sons.
2. Olive, David. (2014). Statistical Theory and Inference. Switzerland: Springer International Publishing.

Additional Reading

1. Baumol, V.J. (1997). Economic Theory and Operations Analysis. New Delhi: Prentice Hall of India.
2. Chiang, A.C. & Wainwright, K. (2005). Fundamental Methods of Mathematical Economics - 4th Edition. New Delhi: McGraw-Hill.
3. Chiang, A.C. (1984). Fundamentals of Mathematical Economics. New Delhi: McGraw Hill.
4. Dowling, E.T. (2011). Introduction to mathematical Economics, Schaum's Outline Series. New Delhi: McGraw Hill.
5. Gupta, S.C. (2012). Fundamentals of Statistics. Mumbai: Himalaya Publishing House.
6. Hoy, Michael., John, Livernois., Chris, McKenna., Ray, Rees. & Thanasis, Stengos. (2012). Mathematics for Economics, Third Edition. PHI Learning.
7. Monga, G.S. (2001). Mathematics and Statistics for Economics. New Delhi: Vikas Publishing House.
8. Nagaraja, H.N., Sen, P.K. & Morrison, D.F. (2012). Statistical Theory and Applications. New York: Springer.
9. Thod, C.H. (2002). Testing for Normality. New York: Marcel Dekker Inc.

CORE PAPERS IN SECOND SEMESTER

EC 221: MICRO ECONOMICS - II

(Hours per semester: 120

Hours per week: 7)

Objectives

This course is intended to give insights into developments in the areas of theories of distribution, general equilibrium, welfare economics, uncertainty and informational asymmetry and behavioral economics.

Course Contents

Module I: Distribution (25 hours)

Marginal productivity theory – adding up problem - Euler’s theorem - technical progress and factor shares: Hicks & Harrod.

Macro theories of distribution - Ricardo’s dynamic model - Marxian theory of distribution - degree of monopoly theory - Neo-Keynesian model.

Module II: General Equilibrium (20 hours)

General Vs. partial equilibrium - Walrasian system - tatonnement process - existence, uniqueness and stability of an equilibrium - graphical treatment of general equilibrium 2×2×2 model.

Module III: Welfare Economics (25 hours)

Concerns of welfare economics - role of value judgments – Bergson’s social welfare function -Arrow’s impossibility theorem - the theory of second best – Scitovsky’s double compensation criterion - Rawl’s theory of justice- A.K Sen’s social welfare function – equity-efficiency trade-off.

Module IV: Economics of Information (20 hours)

Economics of search - search cost - search and advertizing - asymmetric information and market for lemons - adverse selection - market signalling - moral hazard – principal-agent problem.

Module V: Behavioral Economics and Bounded Rationality (30 hours)

Classical and neo-Classical views of human nature - behavioral economics – framing - anchoring effect – bracketing - uncertainty – law of small numbers - asset integration and loss aversion -role of time and emotions in economic decisions - role of constraints and information -

satisficing – ameliorating - path dependence - bounded rationality - altruism and common good- strategic interaction and social norms .

Reading List

Module I

1. Krugman, Paul & Wells, Robin (2005), *Micro Economics*, Worth Publishers, New York (P-290-297)
2. Costa Da G.C (2001), *Value and Distribution* (P-213-246,423-435)
3. Mandal, RK (2007), *Micro Economic Theory*, Atlantic Publishers (P) Ltd (P-288-297)

Module II

1. Costa Da G.C (2001), *Value and Distribution* (P-247-249,264-266)
2. Koutsiyannis, A (), *Modern Microeconomics*, Macmillan Press, London (P-486-488,489-491,495-504,510-515)
3. Pindyck, Robert.S, Rubinfeld, Daniel, L, Mehta, Premal, L (6th edition), *Micro Economics* (P. 450-460)
4. Mandal, RK (2007), *Micro Economic Theory*, Atlantic Publishers (P) Ltd, Noida (P-311-323)
5. Basu.K, Pattanaik.P, & Suzumura(Ed)(2001), *Choice ,Welfare and Development*,clarendon Press, Oxford University Press (P.32-64)
6. Snyder, Christpher &Nicholson, Walter (2012), *Microeconomic Theory-Basic Principles and Extensions*, Cengage learning (P-409-428)

Module III

1. Maddala, G.S, Miller Ellen (2004), *Micro economics*, Tata Mc Graw Hill (P-519-522)
2. Salvatore, Dominick (2009) *Principles of Microeconomics* (P-502-509)
3. Cowell Frank, A (2005), *Microeconomics, Principles and Analysis*, Oxford University Press (P-225-227)
4. Yew-Kwang Ng (2004), *Welfare Economics, Towards a more complete analysis*, Palgrave Macmillan (P-1-18, 34, 92-98)
5. Basu.K, Pattanaik.P, & Suzumura(Ed)(2001), *Choice ,Welfare and Development*,clarendon Press, Oxford University Press

6. Farrell M.J(Ed) (1973), *Readings in Welfare Economics*, The Mac Millan Press, London (P-144-166)
7. Feldman, Allan, M, & Serrano, Roberto (2nd Edn), *Welfare Economics and Social Choice Theory*, Springer
8. Snyder, Christopher & Nicholson, Walter (2012), *Microeconomic Theory-Basic Principles and Extensions*, Cengage learning (P-428-446)

Module IV

1. Pindyck, Robert.S, Rubinfeld, Daniel, L, Mehta, Premal, L (6th edition), *Micro Economics* (P. 511-525,567-585)
2. Salvatore, Dominick (2009) *Principles of Microeconomics* (P-545-560)
3. Hubbard, Glen.R, Patrick, Anthony, Brien, O, *Microeconomics* (P-536-545)
4. Varian H.R (2003), *Intermediate Micro Economics*, East – West Press Edition (P-667-688)
5. Snyder, Christopher & Nicholson, Walter (2012), *Microeconomic Theory-Basic Principles and Extensions*, Cengage learning (P-579-618)

Module V

1. Pindyck, Robert.S, Rubinfeld, Daniel, L, Mehta, Premal, L (6th edition), *Micro Economics* (P. 561-564)
2. Goodwin, Harris, Roach & Torras (3rd edn), “*Microeconomics in context*, M.E Sharpe. Inc, USA (visit www.gdae.org/micro)
3. Varian H.R (2013), *Intermediate Micro Economics*, East – West Press Edition (566-581)
4. Koutsyiannis, A (2013), *Modern Microeconomics*, Macmillan Press, London (P-258,389-390)

EC 222: ECONOMICS OF SOCIAL SECTOR AND ENVIRONMENT

(Hours per semester: 110

Hours per week: 6)

Objectives

This course is designed to enable students to: (1) Understand and apply the key economic concepts in the context of social sectors like education, environment and healthcare, (2) Appreciate how economic factors contribute to the development and implementation of educational policies, (3) Identify the major theories governing the development of human resources, school improvement and development, (4) Recognize the important linkages between the environment and economics, (5) Be aware of the key environmental issues around the globe, and (6) Understand approaches to identify and value costs and outcomes to include in economic evaluation of the environment through benefit cost analysis.

Course Contents

Module 1: Economics of Education (20 hours)

Human Capital – Components of Human Capital – Education as an instrument for economic Growth – Demand for Education – Supply of Education – Determinants of demand for Education – Costs of Education - Private Costs and Social Costs- Benefits of Education – Direct, Indirect and Social Benefits – Wastage and Stagnation in Education – Causes and Measures- Manpower Planning-Meaning and Techniques of Forecasting.

Module 2: Economics of Health (20 hours)

Nature and Scope of Health Economics – Health Dimensions of Development – Determinants of Health – Economic Dimensions of Healthcare – Demand for and Supply of Healthcare – Healthcare Financing – Inequalities of Health – Class and Gender Perspectives – Healthcare Sector in India-Health Insurance Schemes in India-RSBY,ESIS,AABY, JBY.

Module 3: Economics of Environment and Environmental Valuation (25 hours)

Environmental Economics – Meaning and Significance – Interlinkage between economy and Environment – Material Balance Model – Law of Entropy – Environmental Kuznets' Curve

Environmental Valuation – Use Values, Non-use Values, Option Values – Approaches to Environmental Valuation – Direct Methods – Contingent Valuation Method, Trade off Games Method, Costless Choice Method, Delphi Method – Indirect Methods – Revealed Preference

Methods – Travel Cost Method, Hedonic Pricing Method, Preventive Expenditure Method, Surrogate Market Approach, Wage Differential Approach– Cost Based Methods and Other methods of Valuation – Cost Benefit Analysis.

Module 4: Environmental Policies and Issues (25 hours)

Environmental Externalities – Design of Environmental Policy – Quantity Based Instruments – Market based Instruments – Pigouvian tax and Subsidy Approach – Non-Market Instruments – Command and Control – Mixed Instruments – Marketable permits – Tradeable Pollution Permits -Bargaining Solution – Coase Theorem – Informal Regulation – Collective Action – Grass Root Movements (Chipko Movement, Save Silent Valley Movement, Narmada Bachao Andolan, Appiko Movement)– Monitoring and Enforcement – The New Model of Pollution Control – Major Environmental Policies and Legislations in India.

Global Environmental Issues – Climate Change Problems, Global Warming, Bio Diversity Loss, Acid Rain, Deforestation, Environmental Pollution.

Module 5: Economics of Natural Resource Management (20 hours)

Natural Resources – Resource Taxonomy – Theories of Optimum Use of Exhaustible and Renewable Resources – Common Property Resource Management – Tragedy of Commons.

Environment Development Trade off – Sustainable Development – Indicators of Sustainable Development – Equity and Sustainable Development – Environment and Trade in the WTO Regime – Environment and System of National Accounts – Green GDP.

Reading List

Module 1

1. Environmental Education in India (2002) Association of Indian Universities, New Delhi.
2. Schultz., T.W. (1971) Investment in human Capital, Free Press, New York
3. Joy A. Palmer, 1998, Environmental Education in 21st century, Routledge, London.
4. Kolstad, D. Charles (2010), Environmental Economics, Oxford University Press.
5. Cohn E. and T. Gaske (1989), Economics of Education, Pergamon Press, London.
6. McMohan, W.W. (1999), Education and Development: Measuring the Social Benefits, Oxford University Press.
7. Becker G.S. (1974), Human Capital (2nd Edition), National Bureau of Economic Research, New York.

8. McMohan, W.W. (1999), Education and Development: Measuring the Social Benefits, Oxford University Press, Oxford.
9. Padmanabhan, C.B. (1984), Financial Management in Education, Select Books, New Delhi.
10. Tilak, J.B.G. (1994), Education for Development in Asia, Sage Publications, New Delhi.
11. Vaizey, J. (1962), Economics of Education, Faber and Faber, London.
12. Woodhall, M. (1992), Cost Benefit Analysis in Educational Planning, UNESCO, Paris.

Module 2

1. Klarman H. E. (1965), The Economics of Health, Columbia University Press. New York.
2. Olsen, Jan Abel (2010); Principles in Health Economics and Policy, Oxford University Press
3. Berman P. and M.E. Khan (1993), Paying for India's Health Care, Sage publications, New Delhi
4. Anand, N.K. & Shikha Goel (2008); Health Economics, AITBS Publishers, New Delhi.
5. Folland, Sherman, Allen C. Goodman and Miron Stano (2007), The Economics of Health and Health Care, Pearson Prentice Hall.
6. Baru, R.V. (1998), Private Health Care in India: Social Characteristics and Trends, Sage Publications, New Delhi.
7. Berman, P. and M.E. Khan (1993), Paying for India's Health Care, Sage Publications, New Delhi.
8. Panchamukhi, P.R. (1980), Economics of Health: A Trend Report in ICSSR, A Survey of Research in Economics, Vol. VI, Infrastructure, Allied, Delhi.
9. World Bank (1993), The World Development Report, (1993): Investing in Health, Oxford University Press, New York.
10. Bhattacharya, Jay, Timothy Hyde, and Peter Tu. *Health Economics*. Basingstoke: Palgrave Macmillan, 2014. Print.

Module 3

1. M. Karpagam (1999); Environmental Economics, Sterling Publishers.
2. Hanley N., J.F. Shogren and B. White (1997), Environmental Economics in Theory and Practice, Macmillan.

3. Smith V. Kerry (1996), Estimating Economic values for Nature: Methods for Non Market Valuation, Edward Elgar, Cheltenham, UK Case Studies (India)
4. Hussen, A M (2005), Principles of Environmental Economics, Routledge, London & New York.
5. Eugene, T. (2004), "Environmental Economics" B.K. Offset Press, New Delhi.
6. Hanley, N. (1997), Environmental Economics in Theory and Practice, Macmillan, London.
7. Mitchell, R.C. and R.T. Carson (1993), Using Surveys to Value Public Goods: Resources for the Future, Washington, D.C.

Module 4

1. Kolstad, D. Charles (2010), Environmental Economics, Oxford University Press.
2. Bhattacharya N. Rabindra (ed.) (2001); "Environmental Economics An Indian Perspective", Oxford University Press.
3. Eugene, T. (2004), "Environmental Economics" B.K. Offset Press, New Delhi.
4. Hanley N., J.F. Shogern and B. White (1997), Environmental Economics in Theory and Practice, Macmillan.
5. Hoel, M. (1997), 'International Coordination of Environmental Policies' in New Dimensions in the Economic Theory of Environment, Carrao Carlo and Domenico Siniscalco (Eds.), Cambridge University Press, Cambridge.
6. Larsen, B. and A. Shaw (1994), Global Tradable Carbon Permits, Participation Incentives, and Transfers, Oxford Economic Papers, Vol. 46.
7. Ostrom, E. (1990), Governing the Commons: The Evolution of Institutions for Collective Actions, Cambridge University Press, Cambridge
8. Karan P.P. (1994), "Environmental Movements in India", Geographical Review, American Geographical Society.
9. www.unep.org

Module 5

1. Sankar, U (Ed.) (2001), Environmental Economics, Oxford University Press, New Delhi.
2. Bhattacharya; Environmental Economics-OUP, 2002.
3. M. Karpagam (1999); Environmental Economics, Sterling Publishers.
4. Rangarajan, Mahesh (Ed.) (2007); Environmental Issues in India A Reader, Pearson.

5. Kolstad, D. Charles (2010), Environmental Economics, Oxford University Press.
6. Hanley N., J.F. Shogern and B. White (1997), Environmental Economics in Theory and Practice, Macmillan.
7. Tom Tietenberg- Environmental and Natural Resource Economics- Addison Wesley publishers- seventh edition
8. David Anderson, Environmental Economics and Natural resource management- Routledge publishers- fourth edition
9. David W Pearce, R Kerry Turner- Economics of Natural Resources and Environment- John Hopkins University Press
10. John Blewitt- Understanding Sustainable Development- Earth scan publishers
11. Michael D Kaplowitz- Property rights, Economics and Environment- Volume 5- Routledge publishers
12. Thomas Sterner- Policy instruments for Environmental and Natural resource management- Routledge publishers

EC 223: INDIAN ECONOMIC POLICY - II

**(Hours per semester: 110
Hours per week: 6)**

Objectives

The objectives of this course are: (1) to introduce the basic concepts of economics to the students so as to enable them for further learning in Indian and Kerala Economy, (2) to equip the students with the basic idea for further learning, and (3) to help them to analyze the sectoral development that has taken place India as well as in Kerala economy.

Course Contents

Module -1 Changing Structure of Labour Market (20 hours)

Structural Changes in India's Labour market – Challenges and Reforms, Labour market informalisation , Feminization and Gender inequality –Its Impact and effects, Job insecurity, New Industrial Policy and changing role of Trade Union, Child labour, Reforms in Labour laws.

Module -2 Financial Sector in India (24 hours)

Money and Capital markets - Growth of Banking Sector in India – RBI and Monetary Management – Internal and external balances – Money supply, sources and measurement- Modern functions of commercial banks – Recent initiatives in banking sector (Mergers, foreign banks, NPA, Digitalization, Privatization) - Monetary and Financial Sector Reforms - Financial Inclusion

Module – 3 External Sector in India (24 hours)

External sector reforms since 1991- Recent developments in India's external sector – Current account deficit, exchange rate policy , foreign trade and capital flows, EXIM policy, Role of FDI in India's economic development - recent changes in the structure , composition and direction of India's foreign trade – recent policy changes and India's export.

Module 4 Financial and Social Sector –Kerala Economy (18 hours)

GSDP – Recent trends and pattern - Public expenditure in Kerala – Composition and trends – Financial issues – Social Sector in Kerala – Health and Education.

Module 5 Sectoral Issues of Kerala Economy (24 hours)

Changes in the cropping and land use pattern, Problems faced by Agriculture sector - Industrial backwardness in the State – Educated Unemployment – urbanization - Development of

IT – Tourism - Impact of Migration and remittances on Kerala economy - In-migrant workers in Kerala.

Basic Reading List

1. Kapila Uma (ed) (2016) *Indian Economy Since Independence: A Comprehensive and Critical Analysis of India's Economy 1947-2016*, Academic Foundation, New Delhi
2. Ruddar Dutt and Sundaram (2016): *Indian Economy*, S Chand and Company, New Delhi
3. J K Mishra and V K Puri (2014): *Indian Economy: The Development Experience*, Himalaya Publishing House, Mumbai
4. B A Prakash (ed) (2012) *The Indian Economy Since 1991: Economic Reforms and Performance*, Pearson, New Delhi
5. India 2016, Publication Division, New Delhi
6. Government of India, *Economic Survey* (Annual Issues), Ministry of Finance, New Delhi, Accessible via URL-<http://indiabudget.nic.in/>
7. State Planning Board, *Kerala Economic Review (Annual Issues)*.

Basic Reading List (Kerala Economy)

1. Centre for Development Studies, *Poverty Unemployment and development policy*, Orient Longman, Bombay.
2. B.A.Prakash (Ed) (1994). *Kerala's Economy: Performance, Problems Prospects*, Sage Publications, New Delhi.
3. B.A.Prakash (Ed.) (2004) *Kerala's Economic Development: Performance and Problems in the Post-Liberalisation period*. Sage Publications, New Delhi.
4. M..Oommen (Ed) (1999) *Rethinking Development: Kerala's Development Experience*.
5. B.A.Prakash (Ed) 1999, *Kerala's Economic Development: Issues and Problems*, Sage Publications. New Delhi.
6. P.P.Pillai (1994) *Kerala Economy: Four Decades of Development*, John Mathai Foundation Trichur.
7. M.A.Oomen 1993, *Essays on Kerala's Economy*, Oxford and IBH.
8. K.C.Zachariah, K.P.Kannan and S.IrudayaRajan (Ed) 2002. *Kerala's Gulf Connection* C.D.S, Thiruvananthapuram.

9. Mathew Kurian and Raju John (Ed) (2014) *Kerala Economy and its Emerging Issues*, National Book Stall, Thiruvananthapuram
10. Asokan A, Mary Oommen and Priyesh C A (Ed) (2016) *Kerala Economy in Retrospect and Prospect*, Kerala Economic Association, Thiruvananthapuram
11. Zachariah K.C. and S. IrudayaRajan (2012):*Kerala's Demographic Future:Issues and Policy Options*, Academic Foundation, New Delhi
12. Jerry Alwin(2014):*Recent Trends in Kerala State Finances*, Serials Publications, New Delhi
13. *Kerala Perspective Plan 2030*, Volume I to IV, Kerala State Planning Board
14. Siddharth Sasthri (1992) , *Financing of State Five Year Plan in India*, Mittal Publications.

Additional Reading List

1. National council of Applied Economic Research (1962), *Techno Economic Survey of Kerala*, NCAER, New Delhi.
2. E.T.Mathew 1997, *Employment and Unemployment in Kerala* , Sage Publications, NewDelhi
3. K.K.George, 1993, *Limits to Kerala Model of Development*, C.D.S Thiruvananthapuram.
4. K.C. Zachariah ET Mathew and IrudayaRajan, (2003), *Dynamics of Migration in Kerala*, Orient Longman, New Delhi.
5. Planning Commission (2008), *Kerala Development Report*, Academic Foundation, New Delhi.
6. B A Prakash& V R Prabhakaran Nair(ed) (2008) *Kerala's Development Issues in the New Millenium*, Serials Publications, New Delhi
7. B N Ghosh&Padmaja D Namboothiri (ed)(2009) *The Economy of Kerala: Yesterday,Today and Tommorow*, Serial Publications,New Delhi
8. State Planning Board ,*Economic Review*, Various Years, , Thiruvananthapuram
9. Tapas K Sen(2012)*Recent Developments in Kerala State Finances*,WP 449,CDS
10. Parayil Govindan (2000) (ed.), *Kerala : The Development Experience – Reflections on Sustainability and Replicability*, Zed Books, London
11. R. Sthanumoorthy (ed) (2006) *Kerala Economy: Achievements and Challenges*, ICFAI University Press, New Delhi.

12. Rajasenan, D. and Gerard De Groot (ed) (2005), *Kerala Economy : Trajectories, Challenges and Implications*, CUSAT, Kochi.
13. K Rajan(ed)(2009):*Kerala Economy:Trends During the Post Reform Period* ,Serials Publication,New Delhi
14. Zachariah K.C. and S. IrudayaRajan(2012):*Kerala`s Gulf Connection 1998-2011:Economic and Social Impacts of Migration*,OrientBlackswan,New Delhi
15. Government Kerala (2001) White paper on State Finance, Govt of Kerala, Thiruvananthapuram.
16. Government Kerala (2016) White paper on State Finance, Govt of Kerala, Thiruvananthapuram.
17. Govt of Kerala: *Report of Public Expenditure Review Committee, Various Years*
18. NCAER (2001) *South India; Human Development Report*, Oxford University Press, New Delhi.
19. A.K.G Centre for Research and studies (1994) International Congress on Kerala Studies, Abstracts of paper, 5 volumes AKG Centre, Thiruvananthapuram.
20. Institute of Social Sciences (1996) International Conference on Kerala's Development Experience, Abstracts of papers, Institute of social sciences New Delhi.
21. Mahendradev S (2010), *Inclusive Growth in India*, Oxford University Press , New Delhi
22. Bhavani T A, Bhanumurthy N R,(2011), *Financial Access in Post Reform India*, Oxford University Press , New Delh
23. Mohan Rakesh(Eds) (2011), *Growth with Financial Stability*, Oxford University Press , New Delhi
24. MihirRakshit (2010), *Money and Finance in the Indian Economy*, Oxford University Press, New Delhi
25. Indian Institute of Bank and finance; *Bank Financial Management*, Mac Millan Publishers(2010)
26. Prasanna Chandra (9th edition) ,*Financial Management Theory and Practice*, MC Graw Hill Education.
27. Manoranjan and Sharma(2007), *India's Transforming Financial Sector*, Atlantis
28. Benson Kunjukunju,*Commercial banking in India- Growth,Challanges and Strategies*

29. K.N.Harilal, K.J.Joseph(2003), Stagnation and Revival of Kerala Economy: An Open Economy Perspective, EPW, Vol.38, No.23(Jun7-13)PP -2286-2294.
30. Thomas Isaac TM, Michael Tharakan PK(1995), *Kerala Emerging Persepective: Overview of International Congress on Kerala Studies* ;Social Scientist, Vol.23, No,13, (Jan – Mar.1995), PP3-36.
31. Suraj B Gupta, *Monetary Economics*, S.Chand and Company, New Delhi.

EC 224: ECONOMETRICS AND RESEARCH METHODOLOGY

(Hours per semester: 110

Hours per week: 6)

Objectives

The objectives of this course are: (1) to create an understanding among the students on basic econometric methodology, (2) to train the students in applying economic theories to real economic data by means of empirical models, and (3) to give a comprehensive idea on the process of doing research in economics.

Course Contents

Module I: Introduction to Econometrics (25 hours)

Meaning, scope and methodology of Econometrics - Sample Regression Function and Population Regression Function - Simple linear Regression Model – Assumptions, Estimation through Ordinary Least Squares (OLS) Approach - Gauss Markov Theorem - Multiple Regression Model - Testing the Significance of Regression – t, Analysis of variance (ANOVA), F and the concept of R^2 and adjusted R^2 .

Module II: Violation of the CLRM Assumptions (20 hours)

Auto-correlation, Heteroscedasticity, Multicollinearity, Specification Errors, Errors of Measurement - Nature, Consequences, Tests and Remedial measures.

Module III: Dummy Variables Regression Models (20 hours)

Dummy Variable Technique and its Applications - Comparing two regressions, interaction effects, seasonal analysis, piece-wise linear regression.

Module IV: Introduction to Time series Econometrics (20 hours)

Basic Concepts: Stationarity and Non Stationarity – Random Walk Models – Testing Stationarity - Unit Root- Integrated Process - Basic Concepts of ARMA and ARIMA Process.

Module V: Introduction to Research Methodology (25 hours)

Meaning, purpose and scope of Social Science Research - Types of Research - Stages of Research Process - Formulation of research problem, Research Design Setting, Theoretical Frame, Review of Literature, Objectives and Hypothesis, Methods of Data Collection, Analysis of Data, Hypothesis Testing and drawing conclusions, Report Writing and Lay out of the Research Report.

Reading List

Modules I, II, III & IV

1. Gujarathi , D.&Sangeetha, N. (2007). Basic Econometrics (4thed) New Delhi: McGraw Hill
2. Koutsoyianis, A. (1977). Theory of Econometrics (2nded). London .The Macmillian Press Ltd.

Modules V

1. Kothari, C. R. (2004). Research Methodology Methods & Techniques, New Age International Publishers, Delhi.
2. Gerald Guthrie(2012),Basic Research Methods, Sage, New Delhi.
3. Majumdar, P.K. (2011), Research Methods in Social Sciences, Viva Books, New Delh
4. Rowena Murray(2010), How to Write a Thesis, Tata McGraw Hill, New Delhi.

Additional Reading List

1. Cochran, W. G. (1999).Sampling Techniques, John Wiley & Sons (Asia) Ltd.
2. Greene W. H. (1997). Econometric Analysis, New Delhi, Pearson.
3. Johnston J. (1991).Econometric Methods, NewYork, McGraw Hill.
4. Intriligator M. D. (1991) Econometric Methods, Techniques and Applications, Prentice Hall, Englewood Cliffs, New Jersey.

CORE PAPERS IN THIRD SEMESTER

EC 231: MACRO ECONOMICS - I

(Hours per semester: 120

Hours per week: 7)

Objectives

Macro Economics paper has two parts, spread across third and fourth semesters. In the third semester, the important areas covered under Macro Economics I are development of macro economics after Keynesian revolution including Neo-classical and Keynesian synthesis, behaviour foundations of macro economics, theoretical foundations of demand and supply of money and macroeconomic model in an open economy context. The important objective of the paper is that the students should be able to understand the structural underpinnings of theoretical development of macroeconomic thoughts and their application.

Course Contents

Module 1: Introduction (5 hours)

A brief introduction to competing schools of macroeconomic thought-Market clearing and non market clearing approaches to macroeconomics-Determination of output, employment and price level in Classical and Keynesian models

Module 2: Neo-classical and Keynesian Synthesis (25 hours)

The ISLM model- Keynesian and Neo-Classical Version- Extensions of ISLM model with govt sector- Relative efficiency of fiscal and monetary policies- ISLM model with labour market and flexible prices- Three Sector Macro Model

Module 3 Behavioral Foundations of Macro economics (30 hours)

Consumption function: Current Income Theories (views of Keynes, Kuznet's consumption puzzle, Drift hypothesis of Smithies and views of Duesenberry)- Fischer's Intertemporal Choice model- Normal Income Theories (views of Friedman and Modigliani and others)- Endogenous Income Theory – Robert Hall Random Walk Hypothesis- David Laibson Behavioral Hypothesis- Empirical Evidence

Investment function: Neo-classical theory of investment – MEC and Keynesian theory of investment - Cost of capital and MEC- Accelerator theory of investment (simple and flexible)- Capital Stock Adjustment Principle –Interaction of Accelerator and Multiplier – Profit theory of

investment- Financial theory of investment – Tobin's q ratio- Modigliani-Miller theory - Investment under Uncertainty, Asymmetric Information and Irreversible Investment.

Module 4: Demand and Supply of Money (30 hours)

Demand for money: Keynesian view- Post Keynesian approaches of demand for money- Patinkin's Real balance effect- Approaches of Tobin, Baumol and Friedman- Modern monetary theory of Randall and Wray

Supply of money: Financial Intermediation- Mechanistic model of bank deposit determination- Behavioral model of money determination- Money Multiplier and its determination- Demand determined view of money supply process- Methods of monetary control- Interest elasticity of money supply – central bank's policy alternatives- Inside money and Outside money- Money supply determination in an open economy- Asset market equilibrium – Fisher effect-Disequilibrium money and Buffer stock models

Module 5: Macro economics of an open economy (30 hours)

Balance of payment and Keynesian analysis - Internal and External Equilibrium- Money and Capital Flows and Equilibrium in an Open Economy– Mundel-Fleming model- Fixed and Flexible Exchange Rate with Capital Mobility –Monetary and fiscal policy under fixed and flexible exchange of capital mobility- the Impossible Trinity -Monetary Approach to Balance of Payment

Basic Reading List

1. Mankiw, G. (2011), Macro Economics, Worth Publishers, New York
2. Rudiger Dornbusch, Stanley Fischer and Richard Startz (2006), Macroeconomics, McGraw-Hill.
3. Levacic, R. and A. Rebman (2006), Macro Economics, Mac Millen Press Ltd.
4. Froyen, R.(2008). Macroeconomics, Pearson India
5. Snowdon, B. H. Vane and P. Wynarezyk (2002), A Modern Guide to Macro Economics: An Introduction to Competing Schools of Thought, Edward Elgar.
6. Kamran Dadkhah (2010), Evolution of Macro Economic Theory and Policy, Springer
7. David Romar (2011), Advanced Macro Economics, McGra-Hill, 4th Edition
8. Andre B.Abel and Ben S. Bernanke (2010), Macro Economics, 4th Edition, Pearson
9. G.K.Shaw, Michael J, Mc Croshie and David Greenway, Macro economics, Theory and Practice, Blackwell.

Additional Reading List

Module 1

- 1) Nattrass, Nicholi and Vishaka Varma (2014) Macroeconomics Simplified: Understanding Keynesian and Neo Classical Macroeconomic systems, Sage Publications India, New Delhi
- 2) Branson W.A (1989), Macro Economic Theory and Policy, 3rd edition, Harper and Row, New Delhi.
- 3) Leteris Tsoulfidis (2010), Competing Schools of Economic Thought, Springer

Module 2

1. Hicks J.R (1937) Mr Keynes and the Classics: A Suggested Interpretations, Econometrica, April
2. Nattrass, Nicholi and Vishaka Varma (2014) Macroeconomics Simplified: Understanding Keynesian and Neo Classical Macroeconomic systems, Sage Publications India, New Delhi
3. Branson W.A (2005), Macro Economic Theory and Policy, 3rd edition, Harper and Row, New Delhi

Module 3

1. Garner Ackley (1989), Macroeconomics Theory and Policy, Collier Macmillian
2. Edward Shapiro (2001 Reprint), Macroeconomic Analysis, Galgotia Publications Ltd, New Delhi
3. Fred R. Glahe (1985), Macro Economics: Theory and Policy, Harcourt College Pub
4. A.J. Westaway and T.G.Weyman Johnes (1978), Macro Economics, Theory, Evidence and Policy, Longman
5. M.Farrel (1966), New Theories of Consumption Function, in Readings in Macro Economics by Mullar (Ed.) Holt,Rinehart & Winston of Canada Ltd

Module 4

1. Laidler D.E.W (1977), Demand for Money: Theory and Evidence, Dum-Don Valley, New York
2. McKinen, G,E (1978), Money, The Price Level and Interest Rates, Prentice Hall of India, New Delhi

3. Friedman, M (1956), *Studies in Quantity Theory of Money*, The University of Chicago Press, Chicago
4. Éric Tymoigne and L. Randall Wray, "Modern Money Theory 101: A Reply to Critics," Levy Economics Institute of Bard College, Working Paper No. 778 (November 2013).
5. Scott T. Fullwiler, "Modern Monetary Theory—A Primer on the Operational Realities of the Monetary System," Wartburg College; Bard College - The Levy Economics Institute (August 30, 2010)
6. Wray, L. Randall (2000), The Neo-Chartalist Approach to Money (Working Paper No. 10), UMKC Center for Full Employment and Price Stability
7. Wray, L. Randall (December 2010), Money (Working Paper No. 647), Levy Economics Institute of Bard College

Module 5

1. Gordon R and S.G.Harris (1988), *Macroeconomics*, Addison Wesley, Massachusetts
2. Mankiw, N.G and D.Romar (Eds.) (1991), *New Keynesian Economics*, (2 Vols.) MIT Press, Cambridge
3. D.Fisher (1978), *Monetary Theory and the Demand for Money*, Martin Robertson
4. Dornbush R (1980), *Open Economy Macro Economics*, Basic Books
5. Frankel J and Johnson H.G (1976), *Monetary Approach to Balance of Payments*

EC 232: INTERNATIONAL ECONOMICS – I

(Hours per semester: 110

Hours per week: 6)

Objectives

This course offers an introduction to the main theoretical tools and policies that are central to the study of international trade, but with an emphasis on application to the trade flows, trading blocks and international macroeconomic events that characterize the global economy today. The ability to use economic analysis to reach a deeper understanding of international trade will be an important formative element for those who intend to develop careers in international business and management.

Course Contents

Module I: New Trade Theories: Salient Features (30 hours)

Neo-technological trade theories- Kravis theory of Availability, Linder's theory of Volume of Trade and Demand pattern, Posner's Imitation gap, Vernon's Product Cycle Theory. Intra-industry Trade Models- Krugman's Model (1979), Brander-Krugman Model (1983). Empirical work on Intra-industry trade- Strategic Trade Theory Models: Krugman's Model (1984), Brander and Spencer's Model (1985)- Neo –Heckscher –Ohlin Theory, Monopolistic Competition and International trade, Oligopoly and International trade.

Module II: Trade in Services (20 hours)

Emerging pattern of services trade- The scope and potential of Services trade in Developing Countries- GATS. Trade in Factors of Production and in Intermediate Good- Capital inflow and welfare- Emigration versus capital inflow- Fragmentation, Outsourcing and trade. Traded vs non-traded goods.

Module III: New Protectionism (20 hours)

The political economy of protectionism- Non-tariff barriers- Voluntary Export restraints and Import Expansion- Subsidies, Administered and Contingent Protection and fair trade: Dumping and Antidumping- Countervailing duty, Safeguard actions- Neo Protectionism.

Module IV: Economic Integration (20 hours)

Types of integration- Customs union: Partial and general equilibrium analysis- Trade creation and Trade diversion- Free trade areas, Emerging issues in SAFTA, ASEAN and EU.

Module V: Trade and Development. (20 hours)

Terms of Trade and UDCs - Theory of Immiserising growth-Dutch disease - Rybenzynski theorem – Technical progress and trade- Structural changes in trade and Economic development- Global and National scenario.

Basic Reading List

1. Oliver Cattaneo, International Trade in Services: New Trends and Opportunities for Developing Countries, World bank, Washington DC, 2010.
2. Feenstra Robert C (2004), Advanced International Trade- Theory and Evidence, Princeton University Press, Princeton
3. Carbaugh, R J (2008) - International Economics, (11th Edition) Thomson South Western, New Delhi
4. Salvatore, D (2008) - International Economics, (8th Edition). Wiley India, New Delhi
5. Krugman P R and Obsfeld M (2009) - International Economics- Theory and Policy, (8th Edition) Pearson, Dorling Kindersley (India) Pvt. Ltd, New Delhi
6. Soderston, B and Reed G.(1994) - International Economics, 3rd Edition, McMillan Press Ltd. London
7. Kindleberger, C P -International Economics, R.D. Irwin, Homewood
8. Bhagwati and Srinivasan (1983), Lectures on international trade, The MIT Press.
9. Bhagwati, J. N. (1987), International trade: Selected readings, Second Edition, MIT Press, Cambridge, Massachusetts
10. Appleyard D. R and Field A J (2014) -International Economics (8th Edition) McGraw Hill, New Delhi
11. Richard E Caver and Harry G Johnson, Readings in International economics
12. Grimwade Nigel (2001), International Trade, (Second Edition), Routledge, London
13. Grubel H G and Lloyd P J (1975), Intra-industry Trade, Macmillan, London.
14. Haberler G (1961), A Survey of International Trade Theory, International Finance Section, Department of Economics, Princeton University.
15. Reinert K A (2012), An Introduction to International Economics, Cambridge university Press, New York
16. Richard Baldwin and Charles Wyplosz (2004), The Economics of European Integration, McGraw Hill, New York.

17. Gandolfo, Giancarlo,(2016), International Finance and Open Economy Macro economics, Springer.
18. Gandolfo, Giancarlo,(2014), International Trade Theory and Policy, Springer.

Additional Readings List

1. J. N. Bhagwati, A. Panagariya and T.N. Srinivasan. Lectures on International Trade, MIT Press, 1998.
2. L. Rivera-Batiz and M. Olivia. International Trade: Theory, Strategies and Evidence, Ch.3, Oxford University Press, 2003.
3. Stolper W. F. & Samuelson P. A. (1941) – “Protection & Real Wages” – Review of Economic Studies, Vol. 9, No. 1, pp. 58 -73.
4. Kravis I. B. (1956) – “Availability & Other Influences on the Commodities Composition of Trade ”– Journal of Political Economy, Vol. LXIV, April, pp. 143 – 155.
5. Linder S. B. (1961) – An Essay on Trade & Transformation - New York, John Wiley .
6. Posner M. V. (1961) – “International trade & Technical change” – Oxford Economic Papers, Vol. 13, No. 3, pp. 323 - 341.
7. Vernon R. (1966) – “International Investment & International Trade in the Product Cycle” - Quarterly Journal of Economics, Vol. 80, No. 2, pp. 190 – 207.
8. Grubel H. & Lloyd P. (1975) – Intra – Industry Trade: The Theory and Measurement of International Trade in Differentiated Products- London, Macmillan.
9. Dixit A. K. & Stiglitz J. (1977) – “Monopolistic competition & Optimum Product Variety” – American Economic Review, Vol. 67, No. 3, pp. 297 -308.
10. Krugman Paul R. (1979) – “Increasing Returns, Monopolistic Competition and International Trade ”– Journal of International Economics, Vol. 9, No. 4, pp. 469 - 479.
11. Brander James & Krugman Paul (1983)- “A Reciprocal Dumping Model of International Trade ”– Journal Of International Economics, Vol. 16, Nos. 3 – 4, pp. 313 – 321.
12. Brander James (1981) –“ Intra-Industry Trade in Identical Commodities” – Journal of International Economics, Vol. 11, No. 1, pp. 1 – 14.
13. Krugman Paul R. (1984) – “Import Promotion as Export Promotion” in - Henry Kierzkowski (Ed) - Monopolistic Competition and International Trade – Oxford, Oxford University Press.

14. Brander James & Spencer Barbara (1985) – “Export subsidy and International Market share rivalry”– Journal of International Economics, Vol. 18, Nos. 1 – 2, pp. 83 – 100.
15. Krugman Paul R. & Obstfeld Maurice (2000) – International Economics – Theory & Policy - New Delhi, Addison –Wesley Longman, pp. 138 – 140.

EC 233: PUBLIC ECONOMICS

(Hours per semester: 110

Hours per week: 6)

Objectives

The important objective of this course is that the student should be able to understand the regulatory and developmental responsibilities of government in a democratic country like India. It covers the theoretical and empirical dimensions of public goods and public choice, fiscal instruments and fiscal federalism with special reference to Indian context. It also covers the present fiscal management issues of India.

Course Contents

Module 1: Role of Government (18 hours)

Economic rationale of the Modern State: Market Failure and the Rationale for Government Intervention; Natural Monopolies; Asymmetric Information; The Problem of Externalities and their Internalization - Government failure.

Module II: Theory of Public Goods and Public Choice (22 hours)

Concepts, Characteristics of Public Goods: Economic analysis of Public Goods, Efficient Provision of public good; Partial Equilibrium Analysis, Optimal Provision of Public Good; General Equilibrium Analysis. Merit goods, Impure Public Goods and The Theory of Clubs: Buchanan Model-Tiebout Model, Common property Resources; Tragedy of the commons. Public Choice theory: Problem of Collective Choice Defined, Majority Voting, An economic Theory of politics.

Module III: Fiscal Policy Instruments (28 hours)

Fiscal policy for Stabilization: Classical and Keynesian - Principles of Taxation: Benefit and ability to pay approaches; Theory of Tax Incidence; Theory of optimal Taxation: Trade off between equity and efficiency ; Theory and measurement of dead weight losses- The Problem of Double Taxation.

Theoretical and Empirical Analysis of Public Expenditure: Pure Theories of Public Expenditure, Wagner and Wiseman Peacock Hypothesis. Criteria of public Investment; Social cost- benefit analysis- Public Expenditure Management & Control: Concepts.

Theories of Public debt: classical and Compensatory views; Sources of Public debt; Burden of Public Debt; Principles of Management and Repayment.

Module IV: Fiscal Federalism: Theory and Practice (20 hours)

Principles of Federal (Multi Unit) Finance: Imbalances in Federal Finance; Vertical and horizontal imbalance; Fiscal federalism in India: Constitutional Assignment of Functions and Sources of Revenue- Reports of Finance Commissions: Union and State - Local finance in India: Issues in Fiscal Decentralisation in India in the context of 73rd and 74th constitutional amendments.

Module V: Indian Public Finance: Current Scenario (22 hours)

Indian Tax System: An Assessment; Tax and non- Tax Revenue of the Union, States and local bodies; VAT, CENVAT, Organisational structure of Goods and Services Tax (GST), Practical Issues in Tax reforms in India. - Structure, Trends and Pattern of Public Expenditure in India- Public debt in India: liabilities, Growth and Problems - **Fiscal imbalance: Revenue, Fiscal and Primary Deficits**; Fiscal Responsibility and Budget Management Act- Budget Analysis.

Basic Reading List

1. Jean-Jacques Laffont (1989) Fundamentals of Public Economics, MIT press, Boston.
2. Brown .C.V & Jackson P.M (1991), Public Sector Economics, Blackwell Publishers Inc, Massachusetts, USA.
3. Holley H.Ulbrich (2003), Public Finance in Theory and Practice, Thompson South-Western, Singapore.
4. Musgrave, R.A. and P.B. Musgrave (2004), Public Finance in Theory and Practice, Fifth Edition, McGraw Hill, Kogakusha, Tokyo.
5. David N. Hyman (2005), Public Finance: A Contemporary Application of Theory to Policy, 8th Edition, Cengage Learning.
6. Rosen, Harvey (2013), Public Finance, McGraw Hill, New York.

Additional Reading List

Module I

1. Anthony B. Atkinson & Joseph E. Stieglitz, (1980), Lectures on Public Economics, Mc Graw-Hill. Book Company (UK) Limited, Great Britain
2. Allan H. Meltzer and Scott F. Richard, (1981) “A Rational Theory of the Size of Government”, Journal of Political Economy, Vol. 89, No. 5
3. Joseph E. Stieglitz, (2010), Economics of Public Sector, W.W. Norton & Company.
4. Francesco Forte (2011) Principles of Public Economics a Public Choice Approach, Sapienza – University of Rome, Italy.
5. Joaquim Silvestre (2013) Public Microeconomics Efficiency and Equity in Public Policy, University of California, Davis, US.

Module II

1. Alan J. Auerbach and Martin Feldstein, (1985 & 1987) Handbook of Public Economics Vol. 1 & 2, Elsevier, Amsterdam, North Holland.
2. Thomas A. Husted and Lawrence W. Kenny, (1997) “The Effect of the Expansion of the Voting Franchise on the Size of Government”, Journal of Political Economy, Vol. 105, No. 1.
3. John Cullis and Phillip Jones (1998), Public Finance and Public Choice, Second Edition, Oxford University Press, New York.
4. Dennis C. Mueller, (2003) “The size of government”, In Public Choice III, Cambridge University Press, Cambridge.
5. Hindriks J and Myles GD. (2006), Intermediate Public Economics, Prentice Hall of India Ltd. New Delhi.
6. Jonathan Gruber, (2009) “Public Goods”, In Public Finance and Public Policy, Worth Publishers, Chapter- 7.

Module III

1. Ramsey F.P., (1927) “A Contribution to the Theory of Taxation”, The Economic Journal, Vol. 37, No. 145.
2. Paul A. Samuelson, (1955) “Diagrammatic Exposition of a Theory of Public Expenditure”, Review of Economics and Statistics, Vol. 37, No. 4.

3. Alan T. Peacock, (1979) *The Economic Analysis of Governments, and Related Themes*, St Martin Press, New York.
4. Alan J. Auerbach and Martin Feldstein, (1985 & 1987) *Handbook of Public Economics* Vol. 1 & 2, Elsevier, Amsterdam, North Holland.
5. Michael J. Boskin, (1988) "Concepts and Measures of Federal Deficits and Debt", In Kenneth Joseph Arrow and Michael J. Boskin (eds.), *The Economics of Public Debt*, International Economic Association, Macmillan Press, New York.
6. Joel Slemrod, (1990) "Optimal Taxation and Optimal Tax Systems", *The Journal of Economic Perspectives*, Vol. 4, No. 1.
7. Sijbren Cnossen, (1992) *Key Questions in Considering a Value Added Tax for central and Eastern Europe Countries*, IMF Staff Papers, Vol. 39, No. 2.
8. Raghbendra Jha, (1998) *Modern Public Economics*, Routledge, London.
9. Alan J. Auerbach and James R. Hines, (2002) "Taxation and economic efficiency", In Alan J. Auerbach and Martin Feldstein (eds.), *Handbook of Public Economics: vol. 3*, North-Holland, Amsterdam, Chapter- 21.
10. Alan J. Auerbach and James R. Hines, (2002) "Taxation and economic efficiency", In Alan J. Auerbach and Martin Feldstein (eds.), *Handbook of Public Economics: vol. 3*, North-Holland, Amsterdam,
11. Don Fullerton and Gilbert E. Metcalf, (2002) "Tax Incidence", In Alan J. Auerbach and Martin Feldstein (eds.), *Handbook of Public Economics: vol. 4*, North-Holland, Amsterdam, Chapter- 26.
12. Amaresh Bagchi, (2005) *Readings in Public Finance*, Oxford University Press, USA.
13. Jonathan Gruber, (2009) "Public Goods", In *Public Finance and Public Policy*, Worth Publishers

Module IV

1. Charles M. Tiebout, (1956) "A pure theory of local expenditures", *Journal of Political Economy*, Vol. 64, No. 5.
2. Wallace E. Oates, (1999) "An Essay on Fiscal Federalism", *Journal of Economic Literature*, Vol. 37, No. 3.

3. Richard A. Musgrave, (1999) “Fiscal federalism”, In James M. Buchanan and Richard A. Musgrave (eds.), Public Finance and Public Choice: Two contrasting Visions of the State, MIT Press, Cambridge, .
4. Amaresh Bagchi and Pinaki Chakraborty, (2004) “Towards a Rational System of Centre-State Revenue Transfers”, Economic and Political Weekly, Vol. 39.
5. Rangarajan C. and Srivastava D.K. (2011) Federalism and Fiscal Transfers in India, Oxford
6. Per Molander (2012) Fiscal Federalism in Unitary States ,ZEI Studies in European Economics and Law.

Module V

1. Gulati, I. S., (1991) “Reducing the Fiscal Deficit: Soft and Hard Options”, Economic and Political Weekly, Vol. 26, No. 29.
2. National Institute of Public Finance and Policy (India) (1994) Reform of Domestic trade Taxes in India: Issues and Option: Report of a Study Team, New Delhi.
3. Sudipto Mundle, (1997) Public Finance Policy Issues for India, Oxford University Press, New Delhi.
4. Amaresh Bagchi, (2005) Readings in Public Finance, Oxford University Press, New Delhi.
5. Pinaki Chakraborty, (2005) “Debt Swap in a Low Interest Rate Regime: Unequal Gains and Future Worries”, Economic and Political Weekly, Vol. 40, No. 40, pp. 4357-4362.
6. Prabhat Patnaik, (2001) “On Fiscal Deficits and Real Interest Rates”, Economic and Political Weekly, Vol. 36.
7. Mihir Rakshit, (2000) “On Correcting Fiscal Imbalances in the Indian Economy - Some Perspectives”, Money and Finance, ICRA Bulletin, July September.
8. Reserve Bank of India (1985) Report of the Committee to Review the Working of Monetary System, Mumbai. 43
9. Rao, M. Govinda, (2003) “Reform in Central Sales Tax in the Context of VAT”, Economic and Political Weekly, Vol. 38, No. 7, pp. 627-636
10. Mahesh C. Purohit and Vishnu Kanta Purohit (2014), The Oxford Handbook of Tax System in India: An Analysis of Tax Policy and Governance, Oxford.

11. Jalan, Marjit, Santra (2016) India Public Finance and Policy Report 2016: Fiscal Issues and Macro Economy , Oxford.
12. Bimal Jain, IshaBansal (2016) Goods and Services Tax introduction and way forward, Bloomsbury, New Delhi.

CORE PAPERS IN FOURTH SEMESTER

EC 241: MACRO ECONOMICS - II

(Hours per semester: 120

Hours per week: 7)

Objectives

The important areas included in this portion are the theoretical development of the macroeconomic issues of inflation, unemployment and business fluctuations. The development of macro economics after Keynesian revolution, divided into classical school and Keynesian school, and the impacts of various macroeconomic policies in the society are also covered here. By learning this paper, the students should be able to keep abreast with the latest development of macroeconomics development.

Course Contents

Module 1: Theory of Inflation and Unemployment (20 hours)

Classical, Keynesian and monetarists approaches of inflation- Structuralist Theory of Inflation – Measuring inflation- Costs of inflation and Inflation Targeting –Benefits of inflation

Philips curve analysis- Short run and Long Run Philips curve- Samuelson and Solow's views- the Natural Rate Unemployment Hypothesis- Tobin's modified Philips curve- NAIRU- Adaptive Expectations- Expectation Augmented Philips curve- Cost of reducing inflation and unemployment- Increasing Natural Rate of Unemployment and Hysteresis Hypothesis –Philips curve and Rational expectation- New Micro Economics in Labour Market- Search theory- DMP (Diamond, Mortenson, Pissarides) model.

Module 2: Business Cycle (20 hours)

Cyclical behaviour of economic variables – Direction and Timing – Aggregate demand Shocks and Aggregate Supply Shocks – Business cycle theories of Keynes, Samuelson, Hicks, Kaldor and Goodwin – Real Business Cycle Theory- Political Business Cycle theories (views of Nordhaus, Hibbs and Alesina) – Financial and economic crisis 2007-2009- Causes and consequences (Financial Innovation, Asset Risk and Diversification, Impact on Real Sector)– View points by Conservative and Keynesian economists (Eugene Fama, Paul Krugman etc)

Module 3: Modern Development in Macro Economics –Classical school (25 hours)

Monetarism- Rational Expectations- New Classical Macro Economics- Views of Muth, Wallace, R.E.T Sargent and Lucas (Lucas Surprise Labour Function, the Inter Temporal

Substitution Model, Policy Ineffectiveness Argument, The Lucas Critique)- Supply Side Economics- Supply Shocks and Stagflation- Wedge Model- Laffer Curve- Policy Implication- The Dynamically Stochastic General Equilibrium model (DSGE)

Module 4: Modern Development in Macro Economics – Keynesian school (25 hours)

Neo-Keynesianism- Disequilibrium Keynesians: Reinterpretation of Keynes by Clover and Leijonhufvud- the Dual Decision Hypothesis- Quantity Constrained Model of Malinvaud and Barro- Coordination Failure

Fundamental arguments of Post Keynesians- Kalecki's Pricing Model- Financial Instability Model of Hymn Minsky

New Keynesian macro economics- Nominal Rigidities- Real Rigidities- Small Menu Cost Model-Implicit Wage Contract Model- Efficiency Wage Theories- Insider Outsider Model and Hysteresis- Coordination Failure- Policy Implications – New Political Macro Economics-New Neo Classical Synthesis

Module 5: Macroeconomic Policy Issues (30 hours)

The theory of economic policy- Target and Instrumental variables – Tinbergen Rule- Case for and Against Activists Policy- Policy Lags

Monetary Policy –Conduct of Monetary Policy –Rules vs Discretion – The Time Inconsistency Proposition –Rules of Monetary policy- Taylor Rule- Monetary Targeting and Inflation Targeting –Central Bank Independence and credibility

Fiscal policy –Crowding out – Budget deficits and Debt– Seignorage- Measurement problem of Govt Debt- Views on Govt Debt – Traditional View- Barro-Ricardo Equalization Problem –Political Economy Theories of Budget Deficit- Effects of deficits- Income Policy and Wage Guideposts-Alternative Strategies to Reduce inflation – Gradualism vs Cold Turkey – Disinflation and Sacrifice Ratio – Okun's Law – Growth vs Stability.

Basic Reading List

1. Mankiw, G. (2011), Macro Economics, Worth Publishers, New York
2. Rudiger Dornbusch, Stanley Fischer and Richard Startz (2006), Macroeconomics, McGraw-Hill.
3. Levacic, R. and A. Rebman (2006), Macro Economics, Mac Millan Pres Ltd.
4. Froyen, R.(2008). Macroeconomics, Pearson India

5. Snowdon, B. H. Vane and P. Wynarezyk (2002), A modern Guide to Macro Economics: An introduction to competing schools of thought, Edward Elgar.
6. Kamran Dadkhah (2010), Evolution of Macro Economic Theory and Policy, Springer
7. David Romar (2011), Advanced Macro Economics, McGraw-Hill, 4th Edition
8. Andre B. Abel and Ben S. Bernanke (2010), Macro Economics, 4th Edition, Pearson
9. G.K. Shaw, Michael J. Mc Croshie and David Greenway, Macro economics, theory and Practice, Blackwell.

Additional Reading List

Module 1

1. Garner Ackley (1989) Macro Economics: Theory and Practice, Collier Macmillan
2. I. Frisch H (1983), Theories of Inflation, Cambridge University Press, Cambridge
3. Haggard, A. J (1977), Inflation: Theory and Policy, Macmillan, London
4. Hudson, J (1982), Inflation: A Theoretical Survey and Synthesis, George Allen and Unwin, London
5. Oliver Blanchard (2011), Macro Economics, Pearson
6. A. J. Westaway and T. G. Weyman (1978), Macro Economics, Theory, Evidence and Policy, Longman
7. Errol D'Souza (2008), Macro Economics, Pearson

Module 2

1. A. J. Westaway and T. G. Weyman (1978), Macro Economics, Theory, Evidence and Policy, Longman
2. Stanley Bober (2010), Economics of Cycles and Growth, Wiley.
3. Lucas, Robert E, "Understanding Business Cycle" in K. Brunner and A. Meltzer (eds.) Stabilisation of the Domestic and International Economy, Carnegie-Rochester Series on Public Policy 5 (Amsterdam: North-Holland) 1976.
4. Kydland, Finn E. and Edward C. Prescott "Time to Build and Aggregate Fluctuations", Econometrica 50: 1345-1370, 1982.

Module 3

1. Friedman A (1968), The Role of Monetary Policy, The American Economic Review, Vol 58, No 1 (March 1968)

2. G.Mankiew (1989) Real Business Aspects- A Keynesian Perspective, Journal of Economic Perspective, Vol 3
3. David Laidler, New Classical Contribution to Macro Economics (In Macro Economic Reader) ed by B.Snowdon and H.R.Vane, Routledge
4. Finn E Kydland, Edward C. Prescott, Rules Rather than Discretion, The Journal of Political Economy, Vol 85, N.3 (June 1977)
5. Thomas Mayer, The Structure of Monetarism (in Macro Economic Reader) ed by B.Snowden and H.R.Vane, Routledge
6. Charles A Plosser, Understanding Real Business Cycles, (ibid.) Routledge
7. Leteris Tsoulfidis (2010), Competing Schools of Economic Thought, Springer
8. Farrokh K Langdana (2009), Macro Economic Policy: Demystifying Monetary and Fiscal Policy,
9. Brian Snowden and Howard R.Vane (Ed) (2003), A Macro Economic Reader, Routledge.
10. Ben J. Haijdra Frederick Van Der Ploeg (2002), Macroeconomics, OUP
11. A.J.Westaway and T.G.Weyman Johnes (1978), Macro Economics, Theory, Evidence and Policy, Longman

Module 4

1. Robert J Gordon, What is now Keynesian Economics? (in Macro Economic Reader) ed by B.Snowden and H.R.Vane, Routledge
2. Finn E Kydland, Edward C. Prescott, Rules Rather than Discretion, The Journal of Political Economy, Vol 85, N.3 (June 1977)
3. Leteris Tsoulfidis (2010), Competing Schools of Economic Thought, Springer
4. Ben J. Haijdra Frederick Van Der Ploeg (2002), Macroeconomics, OUP
5. M.J.C Surrey (1976), Macroeconomic Themes, Wiley Eastern.
6. James K Galbraith and William Darity Jr (1994), Macroeconomics, Houghton.
7. Goodfriend, Marvin; King, Robert G (1997), "The New Neoclassical Synthesis and the Role of Monetary Policy", NBER Macroeconomics Annual, NBER Chapters, National Bureau of Economic Research, **12**: 231–83
8. Kocherlakota, Narayana R (May 2010), "Modern macroeconomic models as tools for economic policy", Federal Reserve Bank of Minneapolis

9. Woodford, Michael (2009), "Convergence in Macroeconomics: Elements of the New Synthesis", *American Economic Journal: Macroeconomics*, **1** (1): 267–79

Module 5

1. Friedman A (1968), The Role of Monetary Policy, *The American Economic Review*, Vol 58, No 1 (March 1968)
2. Finn E Kydland, Edward C. Prescott, Rules Rather than Discretion, *The Journal of Political Economy*, Vol 85, N.3 (June 1977)
3. *Frederic S. Mishkin* (2011), *Macroeconomic: Policy and Practice*, Pearson Education Limited.
4. Prabhat Patnaik (1995), *Macroeconomics* (edt.), OUP, New Delhi
5. Kocherlakota, Narayana R (May 2010), "Modern macroeconomic models as tools for economic policy", Federal Reserve Bank of Minneapolis

EC 242: INTERNATIONAL ECONOMICS - II

(Hours per semester: 110

Hours per week: 6)

Objectives

The objective of this course is to introduce to students the theories of international finance flows, determination of interest and exchange rates in interconnected economies, macroeconomic policies available to the government, and the nature of financial crises. The course also aims to provide a framework for consistent reasoning about international flows of goods, factors of production, and financial assets, trade policy and monetary policy in open economy.

Course Contents

Module – 1: Foreign Exchange Market (28 hours)

Evolution of foreign exchange rate determination mechanism. Speculation and arbitrage, role of expectations, currency swaps, future and options – Asset approach to exchange rate – Portfolio balance approach – FOREX management strategy – Management of foreign exchange with special reference to India – Indian Rupee and its fluctuations in international currency market.

Module – 2: BOP Approach (24 hours)

Monetary model of BOP under fixed and flexible exchange rates – Devaluation and BOP crisis – Effects of Devaluation- Elasticity and Absorption Approach-Marshall - Lerner Condition – Foreign trade multiplier– Recent trends in BOP in India

Module – 3: Open Economy Adjustment Policies (20 hours)

Internal and external balance – Swan diagram – Assignment problem – Expenditure Switching and Changing policies – Combining monetary and fiscal policies

Module – 4: International Financial Management (19 hours)

Euro currency market and international bond market – Analysis of international capital budgeting – Issues in overseas funding choices – Funding and risk management – Aspects of European debt crisis –Euro crisis and Brexit.

Module – 5: International Financial Institutions (19 hours)

Institutions for International Relations and Liquidity-Evolutionary and operational developments in international institutions- IMF, IBRD, IDA, UNCTAD, ADB, WTO. Problems and prospects of WTO Agreement in present Global trading- India and International institutions

Basic Reading List

Module 1

1. Copeland L. (CL) Exchange rates and International Finance, 5th edition, 2008
2. Foreign Exchange and Risk Management C . Jeevanandam Sulthan Chand and Son
3. Maurice .D.Levi-International Finance: The Markets and Financial Management of Multinational Business Mc Graw Hills 1990 1995

Module 2

1. Appleyard, D.R. and Field. A.J. International Economics, New York: Irwin McGraw Hill, 1998.
2. Francis Cherunilam-International Economics Mc Graw Hills Education 2008
3. International Economics by Dennis R. Appleyard; Steven Cobb; Alfred J. Field
4. Paul.R.Krugman and Maurice Obsterfeld – International Economics, Pearson Education 2009 Dorling Kindersley (India) Pvt Ltd.

Module 3

1. Peter Isard - Exchange Rate Economics,Cambridge University Press, 1995 Business & Economics
2. Kenen, Peter B. International Economics. Cambridge. Cambridge University Press,1996

Module 4

1. Shapiro - Capital Budgeting And Investment Analysis, Pearson Education India, 2008
2. G. Shailaja, International Finance, University Press Hyderabad
3. Bierman, H. and S. Smidt, 1992, The Capital Budgeting Decision, Macmillan Company, New York.

Module 5

1. Krugman, P.R. International Economics. New Delhi: Pearson, 2007.
2. Salvatore, D. International Economics. Singapore: John Wiley & Sons, 2002.

3. Carbaugh, R.J. International Economics. Singapore: Thompson Asia, 2002.
4. K C Rana and K N Verma – International Economics, Vishal Publishing House P O 2012

Additional Reading List

1. Paul.R.Krugman and Maurice Obsterfeld – International Economics, Pearson Education 2009 Dorling Kindersley (India) Pvt ltd.
2. Krugman and Obsterfield-International Economics: Theory and Policy, Education Dorrbusch, Open Economy Macro Economics, Basic Books,Inc Publishers
Stern R.M-International Trade and Finance Cambridge University Press
3. Avadhani.V.M. International Finance Theory and Practice-Himalaya Publishing House Delhi
4. Cooper R.N.(ed) International Finance Penguin books U.K. 1969
5. Apte.P G.International Finance Management Tata Mc Graw Hills Delhi 1995
6. Rodrigues .R.M. and Carter International Financial Management, Prentice Hall New Delhi 1984
7. A Textbook of Foreign Trade and Foreign Exchange B.K.Chaudhri O.P.Agarwal Himalaya Publishing House
8. International Financial Management-Madhu V.J. Excel Books,New Delhi

EC 243: FINANCIAL SECURITIES MARKET ANALYSIS

(Hours per semester: 110

Hours per week: 6)

Objectives

This course is designed to provide comprehensive study of the significance of Securities Market in modern financial system. It includes a discussion of the efficient securities markets theory in finance, covers bond pricing, price-earnings models of share valuation, and introduces the top down approach to investment decisions. The emphasis is on a thorough coverage of modern finance theory as applied to investment analysis, balanced with a consideration of new developments in the discipline, and of the application of both old and new theoretical perspectives to understand the current environment for financial investment decisions.

Course Contents

Module I : Securities Market (20 hours)

The role and significance of Securities Market in modern financial system - Levels of Securities Market: Primary Market (New issue market) and Secondary Market (Stock exchange and Over the counter market) - Primary stages in issue of shares (origination, underwriting and distribution) – IPO – FPO - Methods of floatation of new issues (public issue, rights issue, bonus issue, private placement, offer to the employees) - Listing procedure of shares in securities market: objectives and advantages.

Module II : Stock Market in India (20 hours)

Nature and functions of stock exchanges - Stock exchanges in India: NSE and BSE, National Commodities and Derivatives Exchange Ltd (NCDEX). Stock exchange indices and its construction- Nifty (Mini Nifty, Sectoral indices like Bank Nifty), Sensex. Stock market participants: individual retail investors, institutional investors (mutual funds, banks, insurance companies and hedge funds), corporations and foreign institutional investors (FIIs). Dematerialization and depository system - Major depositories (NSDL & CDSL). Credit Rating Agencies (CRISIL, ICRA, CARE). Speculation and other Issues in stock market (Insider trading). Regulatory aspect: SEBI.

Module III : Stock Investment Decision Analysis (20 hours)

Security Analysis - Fundamental analysis - PE Ratio (price to earnings), EPS (earning per share), Book value (price to book value ratio), Working Capital Ratio, Return on Equity Ratio (ROE), Debt Equity Ratio, Dividend yield, Price-Sales Ratio(P/S ratio) - Technical analysis: Significance of Trend lines, Dow Theory and Elliot-Wave Theory - Efficient Market Hypothesis (Weak form-Semi strong form-Strong form). Portfolio Management: Definition, Objectives and **Markowitz Portfolio Theory.**

Module IV: Stock Market Trading in India (25 hours)

Basic requirements for Stock Investment/Trading (Stock Broker, Saving Account, Demat Account, Trading Account, Internet Facilities). Types of investment in stock market (short term and long term investment). Methods of buying and selling stocks (Market order, Limit order and Stop loss order). Types of stock trading (Day trading and Delivery trading). Online share trading and Offline share trading. Current Settlement System in the stock market. Tax implications of investing in stocks (Exemption of dividend and long- term capital gains from tax).

Basic Concepts in share trading- Open, High, Low, Close, Volume, Bid price, Offer price, Bid quantity, Offer quantity, Short selling, Penny stocks, Large cap stocks, Mid cap stocks, Small cap stocks, Transaction cycle, Margin trading, Bull phase, Bear phase, Dividend (interim and final dividend) and Bonus shares. Brokerage charge and Securities transaction tax.

Module V: Market for Derivatives and Mutual Funds (20 hours)

Economics of Derivatives (Forwards, Swaps, Futures and Options), Futures Contracts- Pricing of Futures Contracts, Hedging with Futures Contracts, Financial Futures, Commodity Futures, Use of Future Contracts, Economics of Options Contracts – Call Option, Put Option, Option premium, Payoffs of option before expiration, Major factors in Option Pricing: Intrinsic value and Time value. Hedging Strategies in Futures and Options: Short Hedges and Long Hedges. Mutual Funds: Liquid Funds, Debt Funds, Equity Funds, Balanced Funds. NAV of mutual fund schemes. Systematic Investment Plan (SIP).

MODULE VI: Practical Session (5 Hours)

Online trading- live markets-trade related aspects and derivatives.

[Note: Scheme for Continuous Assessment (CA) of this paper: (a) attendance – 5 marks, (b) assignment -5 marks, (c) for attending 5 hours of practical work on online trade - 5 marks, and (d) test paper - 10 marks; total - 25 marks]

Reading List

Module I

1. Bhalla, V.K. (2013). Investment Management: Security Analysis and Portfolio Management, New Delhi, S.Chand and Company Pvt Ltd.
2. Bhole, L. M. (2009). Financial Institutions and Markets: Structure, Growth and Innovations, New Delhi, Tata McGraw – Hill Education Pvt Ltd.
3. Gurusamy, S. (2009). Indian Financial System, New Delhi, Tata McGraw – Hill Education Pvt Ltd.
4. Kevin, S. (2015). Security Analysis and Portfolio Management, New Delhi, Prentice-Hall of India Pvt Ltd.
5. Khan, M. Y. (2013). Indian Financial System, New Delhi, McGraw Hill Education (India) Pvt Ltd.
6. Mahipal Singh (2011). Security Analysis with Investment and Portfolio Management, Delhi, ISHA Books.
7. Pandya, F.H. (2013). Security Analysis and Portfolio Management, Mumbai, Jaico Publishing House.
8. Ranganatham, M & Madhumathi, R. (2012). Investment Analysis and Portfolio Management, New Delhi, Dorling Kindersley (India) Pvt Ltd.
9. Sasidharan, K & Mathews, Alex.K. (2011). Security Analysis and Portfolio Management, New Delhi. Tata McGraw- Hill Education Private Ltd.
10. Subhash Chandra Das (2015). The Financial System in India: Markets, Instruments, Institutions, Services and Regulations, Delhi, PHI Learning Private Ltd.

Module II

1. Avadhani, V.A. (2012). Marketing of Financial Services, Mumbai, Himalaya Publishing House.
2. Bhalla, V.K. (2013). Investment Management: Security Analysis and Portfolio Management, New Delhi, S.Chand and Company Pvt Ltd.
3. Chandra, Prasanna (2009). Investment Analysis and Portfolio Management, New Delhi, Tata McGraw- Hill Education Pvt Ltd.

4. Dhanesh Khatri (2010). Security Analysis and Portfolio Management, Delhi, Macmillan Publishers India Ltd.
5. Gurusamy, S. (2009). Indian Financial System, New Delhi, Tata McGraw – Hill Education Pvt Ltd.
6. Khan, M. Y. (2013). Indian Financial System, New Delhi, McGraw Hill Education (India) Pvt Ltd.
7. Pandya, F.H. (2013). Security Analysis and Portfolio Management, Mumbai, Jaico Publishing House.
8. Raghunathan, V. (2005). Stock Exchanges and Investments, New Delhi, Tata McGraw-Hill Publishing Company Ltd.
9. Ramesh Babu, G. (2007). Portfolio Management: Including Security Analysis, New Delhi, Concept Publishing Company.
10. Samuel Thomas (2014). Security Analysis and Portfolio Management, Delhi, PHI Learning Private Ltd.

Module III

1. Bhalla, V.K. (2013). Investment Management: Security Analysis and Portfolio Management, New Delhi, S.Chand and Company Pvt Ltd.
2. Fischer, D. E and Jordan, R.J. (2009). Security Analysis and Portfolio Management, New Delhi, Prentice-Hall of India Pvt Ltd.
3. Graham, B & David Dodd (2008). Security Analysis, New Delhi, McGraw- Hill Professional.
4. Gurusamy, S. (2009). Indian Financial System, New Delhi, Tata McGraw – Hill Education Pvt Ltd.
5. Kevin, S. (2015). Security Analysis and Portfolio Management, New Delhi, Prentice-Hall of India Pvt Ltd.
6. Ramesh Babu, G. (2007). Portfolio Management: Including Security Analysis, New Delhi, Concept Publishing Company.
7. Ranganatham, M & Madhumathi, R. (2012). Investment Analysis and Portfolio Management, New Delhi, Dorling Kindersley (India) Pvt Ltd.
8. Sasidharan, K & Mathews, Alex.K. (2011). Security Analysis and Portfolio Management, New Delhi. Tata McGraw- Hill Education Private Ltd.

9. Subhash Chandra Das (2015). The Financial System in India: Markets, Instruments, Institutions, Services and Regulations, Delhi, PHI Learning Private Ltd.
10. Teweles.R.J & Bradley.E.S. (2012). The Stock Market, John Wiley& Sons, Inc.

Module IV

1. Bhalla, V.K. (2013). Investment Management: Security Analysis and Portfolio Management, New Delhi, S.Chand and Company Pvt Ltd.
2. Border, John & Evan J. Houpt (2015). Stock Market for Beginners Book, Publisher: John Border.
3. Dhanesh Khatri (2010). Security Analysis and Portfolio Management, Delhi, Macmillan Publishers India Ltd.
4. Gurusamy, S. (2009). Indian Financial System, New Delhi, Tata McGraw – Hill Education Pvt Ltd.
5. Mahipal Singh (2011). Security Analysis with Investment and Portfolio Management, Delhi, ISHA Books.
6. Orli Zuravicky (2005). The Stock Market, New York, The Rosen Publishing Group, Inc.
7. Ranganatham, M & Madhumathi, R. (2012). Investment Analysis and Portfolio Management, New Delhi, Dorling Kindersley (India) Pvt Ltd.
8. Ramesh Babu, G. (2007). Portfolio Management: Including Security Analysis, New Delhi, Concept Publishing Company.
9. Sasidharan, K & Mathews, Alex.K. (2011). Security Analysis and Portfolio Management, New Delhi. Tata McGraw- Hill Education Private Ltd.
10. Subhash Chandra Das (2015). The Financial System in India: Markets, Instruments, Institutions, Services and Regulations, Delhi, PHI Learning Private Ltd.

Module V

1. Bhole, L. M. (2009). Financial Institutions and Markets: Structure, Growth and Innovations, New Delhi, Tata McGraw – Hill Education Pvt Ltd.
2. Brahmaiah, B. & Subba Rao, P. (1998). Financial Futures & Options, New Delhi, Himalaya Publishing House.
3. Chandra, Prasanna (2008). Financial Management: Theory and Practice, New Delhi, Tata McGraw- Hill Publishing Company Ltd.

4. Dhanesh Khatri (2010). Security Analysis and Portfolio Management, Delhi, Macmillan Publishers India Ltd.
5. Fischer, D. E and Jordan, R.J. (2009). Security Analysis and Portfolio Management, New Delhi, Prentice-Hall of India Pvt Ltd.
6. Hull, John.C. (2004). Options, Futures and Other Derivatives, New Delhi, Prentice-Hall of India Pvt Ltd.
7. Kevin, S. (2015). Security Analysis and Portfolio Management, New Delhi, Prentice-Hall of India Pvt Ltd.
8. Kumar, S.S.S. (2010). Financial Derivatives, New Delhi, PHI Learning Pvt Ltd.
9. Ranganatham, M & Madhumathi, R. (2012). Investment Analysis and Portfolio Management, New Delhi, Dorling Kindersley (India) Pvt Ltd.
10. Sasidharan, K & Mathews, Alex.K. (2011). Security Analysis and Portfolio Management, New Delhi. Tata McGraw- Hill Education Private Ltd.
11. Somanathan, T.V. & Nageshwaran, V. Anantha (2015), The Economics of Derivatives, Cambridge University Press, Delhi.
12. Bouchaud, Jean – Philippe and Potters, Marc (2011), Theory of Financial risk and Derivative pricing- From Statistical Physics to Risk management, Cambridge University Press, Delhi.

EC 244: DISSERTATION

Objectives

The objective of dissertation work is to develop research aptitude and skills among the students.

Course Description

A well structured dissertation work meeting standard requirements of academic writing.

Dissertation Format

General Guidelines

1. Selection of a Topic
2. Pilot Survey, if needed
3. Significance of the Study
4. Review of Literature
5. Research Gap (Optional for PG)
6. Formulation of Research Questions /Issues
7. Research objectives
8. Hypotheses (Optional for PG)
9. Theoretical framework (Optional for PG)
10. Conceptual Framework – Conceptualization & Operationalization (precise and specific meaning of the terms / concepts /variables)
11. Coverage (Universe/ Sample & period of study)
12. Data source (Primary/Secondary)
13. Tools of analysis (Analytical Framework)
14. Social Relevance of the study
15. Limitations of the study
16. Chapter outlines
 - i. Introductory Chapter
 - ii. Other Background Chapters
 - iii. Result/Analysis Chapter(s)
 - iv. Conclusion Chapter
17. Appendices
18. Bibliography /References & Webliography

Structure of the Report

A. Title Page/ Cover Page

- a. Title page
- b. Title of the project
- c. Name of the candidate/candidate code
- d. Degree for which project is submitted.
- e. Name of the college
- f. Month and year the project is presented

B. Declaration of the student

C. Certificate of the supervising teacher

D. Acknowledgments

E. Table of contents

- a. List of Tables
- b. List of Figures
- c. Glossary
- d. List of abbreviations

F. Chapter Outlines (Chapter Titles and Page Numbers)

G. Abstract/ Executive Summary (One page)

H. The Main Text

- a. Introductory Chapter: Items 3 to 15 mentioned above
- b. Other Chapters - Analysis, Results Interpretation
- c. Conclusion Chapter: Conclusions, Recommendations & Summary

I. End Notes (after each Chapter)

J. Bibliography (at the end of the thesis)

K. Appendices

- a. Questionnaire
- b. Interview Schedule
- c. Observation Schedule (optional)
- d. Coding Frame (optional)
- e. Letters sent to sample members (optional)

f. Any Other

Length of the Project

1. Report length 50 to 70 pages excluding Appendix and Certificates
2. Alignment : Justify
3. Font :Times New roman
4. Font size : 12
5. Line spacing : 1.5
6. No Page Border

Departmental Requirement

(To be kept at the Department by the Supervisor)

Supervisor- Student Meeting Log

Date/Time	Discussion Areas	Summary of Discussions	Signature of the Supervisor
	Topic selection		
	Clarify Objectives		
	Literature Review		
	Seminar 1		
	Research Design		
	Collect Data		
	Analyze Data		
	Write up		
	Supervisor's Comments		
	Final Draft -Seminar 2		

Name of the Supervisor:

Name of the Student:

Notes: The dissertation work may be started in the Third Semester itself for timely completion of the work at the end of the IV Semester.

OPTIONAL PAPERS IN THIRD SEMESTER

EC 201: AGRICULTURAL ECONOMICS

(Hours per semester: 110

Hours per week: 6)

Objectives

The objective of this course is to develop the knowledge and understanding of basic principles and practice of Economics as required in Agricultural Economics. The course also aims at equipping the students with the knowledge and skills required to analyze the agricultural economic issues for efficient use of scarce resources in agriculture sector and its development, consistent with the interest of all stake holders.

Course Contents

Module 1 Agricultural Economics (15 hours.)

Scope of Agricultural Economics-Farming systems; types-Organizational structure; traditional (subsistence), corporate, co-operative, collective, state farming- Theories of agricultural development ; Schultz, Mellor, Lewis and Boserup.

Module 2: Agricultural Production (30 hours)

Production function in Agriculture; factor-product relationships, product-product relationships, factor-factor relationships - Supply response models; Cobweb, Nerlove models- Resource use efficiency - Farm size productivity relationship in Indian Agriculture-Cost concerned supply- price relationship-Farm management; principles, need, relevance-Farm management decisions -Principles of factor substitution - Cost principles; opportunity cost, comparative advantage - Limitations of farm management-Farm Budgeting; types, techniques-RAINBOW Revolution -Green Revolution –Second green revolution –Ever green revolution-Farm mechanization

Module 3: Agricultural Marketing and Supply Response (25 hours)

Agricultural Marketing; distinction-Marketed and marketable surplus- Efficiency in Agricultural marketing; need, criteria for judging efficiency, problems- Agricultural marketing system in India; current scenario, problems, measures, institutional set up, support systems- Regulated Markets –Co-operative markets.

Behavior of agricultural prices –Demand and supply of agricultural products –Supply response in Agriculture;different views - Uncertainty and crop insurance-Commission on Agricultural Cost and Prices; role, functions, performance.

Module 4 : Determination and Behaviour of Agricultural Prices (20 hours)

Nature of agricultural prices- Price income elasticity and stability-Procurement, support prices- Input subsidies; issues, challenges-PDS and food security

Module 5-Leading issues in Indian Agriculture (20 hours)

Agricultural development in India; share, contribution, impact on economy- Post reform agriculture- Land reforms in India and its impact on agrarian structure-National Agricultural policy-Agriculture and environment-Rural indebtedness;causes, effects counter measures-Issue of commercialization of agriculture-New economic policy and agriculture –Globalization of Indian agriculture –Role of MNCs –privatization and corporatization-AoA and its impacts.

Reading List

Module 1

1. Bilgrami, SAI: (1996). Agricultural Economics, Himalaya Publishing House, Delhi.
2. Soni.R.N. (2004) Leading Issues in agricultural Economics, Vishal Publishing Co. Jalandhar.
3. Sadhu.A.N and Amarjith Singh, (IS 11). Fundamentals of Agricultural Economics, Himalaya Publishing House, Bombay.
4. Y. Haymi and V. Rutan, (1971), Agricultural Development, An International prospective, John Hopkins.

Module 2

1. E.D-Heady (1961), Economics of Agricultural production and Resource use. Prentice Hall.
2. A. Rudra, (1982), Indian Agricultural Economics
3. D.Metcalf, (1969). The Economics of Agriculture.
4. Soni.R.N. (2004), Leading Issues in Agricultural Economics, Vishal Publishing. Co Jalandhar.
5. C.H. Hanumantha Rao. (1965). Agricultural Production Functions, Costs and Returns in India, Tata. McGraw Hill

6. R.K.Lekhi and Jogindersingh (2004) Agricultural Economics ,Kalyani Publications ,Liudhiana

Modules 3

1. S.S.Acharya and N. Argwall (1998), Agricultural Marketing in India.
2. Soni.R.N. (2004),. Leading Issues ii Agricultural Economics, Vishal Publishing Co Jalandhar.
3. Tyagi.D.S. (1974). Fanners Responses to Agricultural Prices in India, A Study in decision making. New Delhi, Heritage Publishers.
4. Khusro. AM (1968), Readings in Agricultural Economics, Bombay, Allied.
5. Sidhu D.S. (1990), Some Aspects of Agricultural Marketing and Pricing Policies India, UAE, Oct- December.
6. Acharya.S.S. (1998), "Agricultural Marketing in India: Some facts and Emerging Issues: UAE, July-Sept.
7. H.Evan Drummond John W.Godwin (2004) Agricultural Economics, Pearson Education, Delhi.

Module 4

1. K Subbaran and D.E.Janvry, (1985), Agricultural price policy and Income Distribution in India.OUP.
2. S.Subba Reddy ,P.RaghuRam,T.V.NeelakandaSastry and I.Bhavani Devi (2004)Agricultural Economics ,Oxford and IBH,Newdelhi
3. A.S.Kahlon and D.S.Tyagi. Agricultural pace policy on India, Hentage Publishers.
4. Rath, N.K.(1985). "Prices, costs of Production and Terms of Trade of Indian Agriculture, IJAE, Oct-Dec.
5. R.N. Soni, (2004), Leading Issues in Agricultural Economics, Vishal Publishers, Jalandhar.
6. Umakapila (1999) Indian Economy since Independence - academic Foundation
7. G.S. Bhalla and Y.K. Alagh (1979), Performance of Indian Agriculture - wise study, sterling.
8. M.L. Dantwada (ed.) (1985) Agricultural Growth in India, Indian Agricultural Economics.
9. R.K. Sampath (1980) Economic Efficiency in Indian Agriculture.

10. Datwala M.J et.al (1991) Indian Agricultural Development since India Oxford and IBH, New Delhi.

Module 5

1. Raj.K.N.etal. (1988), Essays in the commercialisation of Indian -Agriculture New Delhi.
2. Soni,R.N.(2004),. Leading Issues in agricultural Economics, Vishal Publications, Jalandhar.
3. Robet.E.B. .Lacas, G.A.Papanck (Ed.) The Indian Economy, OUP 2000.
4. R.K.Lekhi and Jogindersingh (2004) Agricultural Economics ,Kalyani Publications ,Liudhiana

EC 202: ECONOMICS OF INSURANCE

(Hours per semester: 110

Hours per week: 6)

Objectives

This course on Insurance Economics attempts to give a fairly comprehensive view of the subject to the post-graduate students in Economics and pave the way for possible future expansion of the teaching of an important branch of Economics. The objectives of the paper are: (1) to obtain an overview of the essential concepts in insurance economics, (2) to develop an understanding of the structure of the insurance industry, (3) to understand the main types of insurance available to business and individual, (4) to understand the implications of asymmetric information for insurance contracting, and (5) to be able to explain and evaluate real-life insurance product design from an economic point of view.

Course Contents

Module 1 : The Economic Foundations of Insurance and Risk Management (27 hours)

Pure risk and speculative risk, Expected utility and decision making under uncertainty-St Petersburg paradox, NM theory, Friedman – Savage Hypothesis and modification of Markowitz.

Insurance-Definition- Mathematical, Legal and Economic Principles-Probability, Law of large numbers, Utmost good faith, proximate cause, Insurable interest, Risk pooling and risk sharing.

Social vs. Private insurance.Reinsurance-Fundamentals, types and distribution systems.

Module 2 : Insurance and Economic Development (20 hours)

Role of insurance in Economic development-insurance and risk management, saving, financial intermediary, Economies of scale in Investment and efficiency in capital allocation. Relationamong Economic development, insurance density and insurance penetration- case study of international comparison.

Module 3 : Life and Health Insurance (27 hours)

Meaning and types of life insurance products - Motives of life insurance demand-Human Life Value principle of S.S Huebner - Selection and classification of risk- Basics of Actuarial valuations of life and health insurance premium - Underwriting- concept and mechanisms.

Life insurance in India- Historical evolution, post-reform developments, market for annuities - Distribution channels - Operational behavior of LIC - Health insurance in India.

Module 4 : Non-life or General Insurance (18 hours)

Meaning, Types of products - Basic concepts-Comprehensive, Liability, Working principles, TPAs - General insurance in India- History, Post-reform growth and developments, tariff issues. GIC of India.

Module 5: Regulatory Intervention (18 hours)

Different types of information asymmetry in Insurance market- Role and need of regulation-History of Insurance regulation in India- Insurance reforms and birth of IRDA - Performance of IRDA - Indian insurance in the Global platform-Future potential in Indian insurance business.

Basic Reading List

1. Bailey R (Ed.) (1999) Underwriting in Life and insurance, LOMA, Atlanta,
2. Bhargava, B .D (2008): *Insurance: Meaning and Principles*, Pearl Books, New Delhi
3. Bhave, S R (1970): *Saga of Security: Story of Indian Life Insurance (1870-1970)*, Life Insurance Corporation of India, Vakil and Sons, Bombay.
4. Bhole, LM (1990) The Indian Financial System, Tata McGraw Hill, New Delhi.
5. Bickelhaupt, D.L. (1992) General insurance, Irwin Inc. Burr Ridge, III.
6. Black K. J. and H.D. SKipper, In (2000) Life and Health insurance, Prentice Upper Saddle, River, New Jerssey.
7. Desai, G R (1973): *Life Insurance in India: Its History and Dimensions of Growth*, Mac Millan India, New Delhi.
8. Finsinger, and M.V.Pauly, (eds) (1986), The Economic of insurance Regulation A Cross National Study, Macmillan, London.
9. Graves EE and L. Hayes (Eds) (1998) (1999) Mc Gill's Life insurance, The American College, ElynMawr, .
10. Huebner S S, Kenneth Black Jr (1982): *Life Insurance*, 10th Edition, Prentice Hall, INC, Englewood Cliffs, New Jersey,
11. Skipper, Jr. H.D. (Ed.) (1998) International Risk and insurance : An Environmental Managerial Approach Erwin McGraw Hill, Boston.

12. Srivastava, D. C and Srivastava,S (2001) : *Indian Insurance Industry – Transition and Prospects* , New Century Publication , Delhi,

Additional Reading List

Module 1

1. Dionne.G. and S.E. Harrington (Eds.) (1997), *Foundations of Insurance Economics*, Kluwer Academic Publishers, Boston.
2. Pteffer I. and D.R.Klock (1974); *Perspectives on Insurance*. Prentice Hall. Inc. Engleworth, Cliffs.
3. Rejda, George E (2004) : *Principles of Risk Management and Insurance* , 8th Edition, Pearson Education, Delhi.
4. Skipper, Harold D Jr and Jean Kwon (2007) : *Risk Management and Insurance: Perspectives in a Global Economy*. , Blackwell Publication, Malden.
5. Yaari ME (1995) *Uncertain Life insurance and the Theory of Consumer*, *Review of Economic Studies*, vol.32.

Module 2

1. Karl, Borch (1974): *Research Papers in Insurance Model*, Lexington Books, Massachusetts.
2. Kutty, Shashidar, K (2008): *Management of Life insurance*, Phh publishing, New Delhi.
3. Warsaw, B and Hill, R D (1986) : *The Insurance Industry in Economic Development* , New York University Press.

Module 3

1. Agarwala, A. N. (1961): *Life Insurance in India: A Historical and Analytical Study*, Allahabad Law Journal Press, Allahabad.
2. Bawa, SumninderKaur (2007): *Life Insurance Corporation of India, Impact of Privatisation and Performance*, Regal Publications, New Delhi.
3. Black, Kenneth Jr and Skipper, Harold D.Jr (1987): *Life Insurance*, 11th Edn, Englewood Cliffs, Prentice Hall, New Jersey,
4. Desai, G R (1973): *Life Insurance in India: Its History and Dimensions of Growth*, Mac Millan India, New Delhi.

Module 4

1. Benjamin B (1991): *General Insurance*, Heinemann, London

2. Gopalakrishnan, G (1994): *Insurance Principle and Practice*, Sterling Publishers, New Delhi.
3. Insurance Institute of India, General Insurance (IC- 34) Mumbai.

Module 5

1. Conant, Susan et.al (1996): *Managing for Solvency and Profitability in Life and Health Insurance Companies*, Life Office Management Association Inc, Atlanta.
2. Cummins, David J and Bertrand Vernad (2006): *Handbook of International Insurance; between Global dynamics and Local contingencies.* , Huebner International Series of Risk, Insurance and Economic Security; Springer, New York.
3. Skipper, Jr., Harold D (1998) : *The Structure of Insurance Markets Worldwide*, International Risk and Insurance , Irwin Mc Graw Hill , Boston.

EC 203: LABOUR ECONOMICS

(Hours per semester: 110

Hours per week: 6)

Objectives

The objective of this course is to develop abilities in understanding the functioning of labour markets. It introduces students to the economics of labour market through a blend of theoretical and empirical analyses. It also deals with different aspects of the labour market such as labour organization, labour relations and labour legislations, wage and employment theory, collective bargaining theory and social security and welfare measures, etc.

Course Contents

Module I: Introduction to Labour Market (24 hours)

Nature of Labour - labour market - nature and characteristics (with special emphasis on developing countries like India) - demand for labour - theories of demand for labour (Wage Fund theory and Marginal Productivity theory) - supply of labour - supply curve of labour to the firm – short run and long run.

Module II: Employment and Unemployment (27 hours)

Employment and development – concept and measurement of unemployment in India - issues relating to employment - rationalization, technological change and modernization- rural unemployment and educated unemployment in India – India's employment policy under the five year plans – Its evaluation – Task force on employment opportunities (2001)

Module III: Wage Determination (18 hours)

Concept of wages- - classical, neo-classical and bargaining theories of wage determination- -wage determination in different market conditions - wage and non-wage components of labour remuneration - wage differentials - wage policy in India.

Module IV: Organized Labour (27 hours)

Industrialization and emergence of unionism- collective bargaining – concept and process - the goals of organized labour – growth and relevance of trade unions in India- achievements and failures of trade union movements- industrial disputes - methods to settle industrial disputes- Collective – grievance redressal - worker's participation in management.

Module V: State and Labour (14 hours)

Changing role of state in Indian Labour market - institutional framework – directive principles of state policy - labour legislations in India - Labour Laws (India and ILO)-Labour reforms (India and WTO)- Structural reforms and labour markets.

Reading List

1. Jetli N K(2004), India: Economic Reforms and labour Policy, New century publications, new Delhi, India
2. Punekar S D(1978), Labour Welfare, Trade Unionism and Industrial Relations, Himalaya publications
3. Dtt G,(1996), Bargaining power wages and Employment: An Analysis of Agricultural Labour Market, Indu publication, New Delhi
4. Lester.R.A (1 964), Economics of Labour (2nd Edition), Macmillian, New York.
5. Hicks J R(1932), The Theory of Wages, Oxford
6. Ramaswamy, K.V. (Ed.)(2015), Labour, employment and Economic Growth in India, Cambridge University Press, Delhi

Module I

1. Mc Cormic C B and Smith (Ed) (1968), The Labour Market, Penguin,.
2. Rees A, (1978), Economics of Work and Pay, New York ; London : Harper and Row
3. Sen A K, Employment, (1975), Technology and Development, Oxford University Press
4. Hunter and Mulvey, (1983), Economics of Labour, Macmillan,
5. Lester R A, (1964), Economics of Labour, Macmillan,
6. Bloom and Northrup (1955), Economics of Labour relations, Richard D Irvin, INC, Homewood, Illimois
7. Saxena R C(1986), Labour Problems and Social Welfare, K. Nath & co, Educational Publishers, New Kotwali, Meerut
8. Phelps W Orme (1961) Introduction to Labour Economics, McGraw-Hills Book Company, INC, New York

Module II

1. Das N, (1960), Unemployment, Full Employment and India, Asia

2. Deshpande L K, P R Brahmanand and E A G Robinson (Ed.) (1983) Employment Policy in Developing Economy, Macmillan.
3. Kannappan S (1983), Employment Problems and Urban Labour Markets in Developing Nations, University of Michigan

Module III

1. Binswange, H.P M,R Rosen, Weg (Eds)(1984) Contractual Arrangements, Employment and Wages in rural Labour Markets in Asia, Yale University Press, New Haven
2. Deshpande L K and J C Jandesara (Eds)(1970) : Wage Policy and Wage Determination in India, Bombay University,.
3. Hicks J R(1932), The Theory of Wages, Oxford,
4. Madan B K (1977), The Real Wages of Industrial Labour in India- Management Development, Institute, New Delhi,
5. Mazuman, D (1986) Microeconomics Issues of labour markets in developing countries, EDI Service Paper no.40, World Bank, Washington D C

Module IV

1. Breman, J (1996) Footloose Labour Working in india's Informal Economy Cambridge university press, Cambridge
2. Mamoria C B (1966) Labour Problems and Social Welfare in India, Kitab Mahal,
3. Punekar S D,(1978) Labour Welfare, Trade Unionism and Industrial Relations, Himalaya Publications
4. Singh V B (Eds), (1970) Industrial Labour in India- Popular Prakasham,

Module V

1. Deshpandi, S G Standing and K Deshpande (1998), Labour Flexibility in a Third world Metropolis, Common Wealth publisher, NewDelhi
2. Hauseman,S (1991) Industrial restructuring with Job Security, Harvard university Press, Cambridge
3. MHRD, GoI (1987), Sham Shak Report of the national Commission on Self employed Women and women workers in the informal sector, Ministry of human Resource Development
4. Jetli N K(2004) ,India:Economic Reforms and labour Policy, New century publications.

EC 204: LAW AND ECONOMICS

(Hours per semester: 110

Hours per week: 6)

Objectives

The course covers the descriptive, theoretical and empirical analysis of various issues in the law and economics. This includes how the legal aspect influences the economic behavior and how economic tools can be used for the better understanding of law etc. It covers the method of law and economics, property rights, Contract, accidents and liabilities, crime and punishment, the legal procedures of dispute resolution. The course should enable the students to analyse the legal issues in connection with economic situation concretely.

Course Contents

Module 1 Method of Law and Economics (20 hours)

Economic Analysis of Law: Why lawyers study economics and economists study law – Law in L&E and Economics in L&E, Positive and normative approach of L&E, Criteria for analyzing legal and economic issues – Efficiency criteria – Pareto, Kaldor-Hicks and Nash Equilibrium, Fairness Criteria – Markets and efficiency and Market failure – Coase Theorem – Civil Law and Common Law traditions – Indian Court Structure – Nature of legal disputes, evolution of legal rules

Module 2 Economic Analysis of Property Rights (16 hours)

The Nature and Function of Property Rights: the definition – emergence – incentives – enforcement of property rights – Property Law and Coase Theorem – Normative Coase and Hobbes Theorem - Acquisition and Transfer of Property – Limited and Divided Ownership – Public Property – Eminent domain and regulation of property

Module 3 Economic Analysis of Contract and Consumers (17 hours)

Complete and Incomplete Contracts: Bargaining theory – Economic Theory of Contract – Remedies as Incentives - The Elements of Valid and Invalid Contracts, Contracts and Efficient Exchange – Performance of Contract and Breach – Duress - mutual assent – Fraud Mistake – Disclosure - Efficient Breach Model – Specific Performance, Self-Enforcement of Contracts

Module 4 Economic Analysis of Accidents and Product Liability (17 hours)

Liability and Deterrence: Basic Theory – Unilateral and Bilateral Accidents, Levels of Care and Activity – Victims Are Strangers to Firms, Victims Are Customers of Firms,

Extensions of the Analysis of Deterrence - Problems in the Negligence Determination, Implications of Findings of Negligence, Deterrent Rules of Negligence and Liability, Risk-Bearing, Risk Aversion and Insurance

Module 5 Economic Analysis of Crime and Punishment (20 hours)

Distinguishing Crimes and Torts - Property Rules, Liability Rules, and Criminal Sanctions, The Economic Model of Crime - The Offender's Decision to Commit a Crime and the Supply of Offenses, Does punishment deter crime - Optimal Punishment, The Optimal Fine, Gain Versus Harm-Based Fines, Fines and Imprisonment, Economics of the Death Penalty, Constitutional Issues, The Bail System, Private Protection, Plea Bargaining

Module 6 Legal Structures of Business and Economic Organizations (20 hours)

Corporations as Legal Entity – Governance of Capital, Shares, Debentures through Law – Legal Structure of Economic Institutions: RBI, IRD, MRTP, Competition Commission, SEBI – Rules of Merging and Acquisition – Distributive Justice under Property, Contract and Liability – Efficiency and Equity Principal for Taxation Law – Centre State Relations and Legality for Efficiency – Trade Agreements : WTO, GATT, TRIPS AND TRIMS, FEMA, Regional Trade Agreements

Basic Reading List

1. Bouckaert, B and G De Geest (1999) Encyclopedia of Law and Economics, Vol. 1-5, Edward Elgar
2. David Friedman (2000) Law's Order: What Economics has to do with Law and Why It Matters, Princeton University Press. New Jersey
3. Posner, Richard A (1998) Economic Analysis of Law, (5th edition) Little Brown, Boston
4. Robert D Cooter and Thomas Ulen (2012) Law and Economics, Addison Wesley-Pearson
5. Seervai H M (1991) Constitutional Law of India, Vol. 1-3 NM Tripathi
6. Steven Shavell (1987) Economic Analysis of Accident Law" Harvard University Press: Cambridge MA
7. Steven Shavell (2004) "Foundations of Economic Analysis of Law, Harvard University Press: Cambridge MA
8. Thomas J Micely (2004) "Economic Approach to Law", Stanford University Press
9. Massey I T (1995) Administrative Law, Eastern Book Company
10. Yoram Barzel (1997) "Economic Analysis of Property Rights", Cambridge University Press

Additional Readings List (Articles)

1. Becker, Gary (1968) "Crime and Punishment: An Economics Analysis," *Journal of Political Economy*, Vol. 76, pp. 169-217.
2. Brown, John (1973) "Toward an Economic Theory of Liability," *Journal of Legal Studies*, Vol. 2, pp. 323-349.
3. Calabresi, Guido (1961) Some Thoughts on Risk Distribution and the Law of Torts, *The Yale Law Journal*, 70, 4, 499-553
4. Calabresi, Guido, and A. Douglas Melamed (1972) "Property Rules, Liability Rules, and Inalienability: One View of the Cathedral," *Harvard Law Review*, Vol. 85: 1089-1128.
5. Coase, Ronald (1960) "The Problem of Social Cost," *Journal of Law and Economics*, Vol. 3, pp. 1-44.
6. Coleman, Jules (1980) "Efficiency, Utility, and Wealth Maximization." *Hofstra Law Review* 8(3): 509-51.
7. Cooter, Robert (1985) "Unity in Torts, Contracts, and Property: The Model of Precaution," *California Law Review*, Vol. 73, pp. 1-51.
8. Cooter, Robert and Daniel L. Rubinfeld (1989) "Economic Analysis of Legal Disputes and Their Resolution," *Journal of Economic Literature*, Vol. 27, pp. 1067-1097.
9. Demsetz, Harold (1967) "Toward a Theory of Property Rights," *American Economic Review*, Vol. 57, pp. 347-359.
10. Donohue, John J. III and Steven D. Levitt (2001) "Legalized Abortion and Crime," *Quarterly Journal of Economics* 116(2): 379-420.
11. Dworkin, Ronald (1980) "Why Efficiency: A Response to Professors Calabresi and Posner." *Hofstra Law Review* 8(3): 563-90.
12. Farmer, Amy and Dek Terrell (2001) "Crime versus Justice: Is There a Trade-off?" *The Journal of Law and Economics*, Vol. XLIV (October): pp. 345- 366.
13. Friedmann, Daniel (1989) "The Efficient Breach Fallacy," *Journal of Legal Studies*, Vol. 18, pp. 1-24.
14. Gilbert, Richard and Oliver Williamson (1998) "Antitrust Policy," in *The New Palgrave Dictionary of Economics and the Law*, P. Newman, ed., Vol. 1, pp. 82-88.
15. Hardin, Garrett (1968) "The Tragedy of the Commons" *Science* 162: 1243-48.

16. Hirshleifer, Jack (1971) "The Private and Social Value of Information and the Reward to Inventive Activity," *American Economic Review*, Vol.61, pp. 561- 574.
17. Klein et al. (2002) "Economics of Copyright 'Fair Use' in a Networked World." *American Economic Review*. May
18. Kronman, Anthony (1978) "Mistake, Disclosure, and Information," *Journal of Legal Studies*, Vol. 7, pp. 1-34.
19. Landes, William (1971) An Economic Analysis of Courts, *Journal of Law and Economics*, 14, 1, 61-107
20. Landes, William and Richard Posner (1985) "A Positive Economic Theory of Products Liability," *Journal of Legal Studies*, Vol. 14, pp. 535-567.
21. Levitt, Stephen (2004) "Why Crime Fell in the 1990s: Four Factors that Explain the Decline and Six That Do Not" *Journal of Economic Perspectives* 18(1): 163-190
22. Miceli, Thomas J. and Kathleen Segerson (2007) *The Economics of Eminent Domain: Private Property, Public Use, and Just Compensation*, Foundations and Trends in Microeconomics, Vol. 3, Issue 4.
23. Murthy, Ramana and Siddik Rabiyyath (2010) Disposal Rates, Pendency and Filing in Indian Courts: an Empirical Study of the Two States of Andhra Pradesh and Kerala, in Babu, P G, Thomas Eger, A V Raja, Hans Bernd Schafer and T S Somasekar (eds.) *Economic Analysis of Law in India: Theory and Application Oxford University Press*, New Delhi
24. Posner, Richard (1977) "Gratuitous Promises in Economics and Law," *Journal of Legal Studies*, Vol. 6, pp. 411-426.
25. Posner, Richard A. (2005) "Intellectual Property: The Law and Economics Approach" *JEP* 19(2): pp. 57-73.
26. Posner, Richard and Andrew Rosenfield (1977) "Impossibility and Related Doctrines in Contract Law: An Economic Analysis," *Journal of Legal Studies*, Vol. 6: 83- 118.
27. Priest, George (1977) "The Common Law Process and the Selection of Efficient Rules," *Journal of Legal Studies*, Vol. 6, pp. 65-82.
28. Rubin, Paul (1977) "Why is the Common Law Efficient?" *Journal of Legal Studies*, Vol. 6, pp. 51-63.
29. Shavell, Steven (1980) "Damage Measures for Breach of Contract," *Bell Journal of Economics*, Vol. 11, pp. 466-490.

30. Stigler, George (1970) "The Optimum Enforcement of Laws," *Journal of Political Economy*, Vol. 78, pp. 526-536.

EC 205: MATHEMATICAL ECONOMICS

(Hours per semester: 110

Hours per week: 6)

Objectives

The objectives of this course are: (1) to help the students to study the nature and extent of relationships among economic variables by using mathematical tools, and (2) to apply these tools in solving the economic and business problems.

Course Content

Module 1 Theory of Consumer (25 hours)

Estimation of price, income and cross elasticities, Utility maximization- Marshall, Hicks and Samuelson, ordinary and compensated demand functions, direct and indirect utility functions, Slutsky equation- income, substitution, and price effects, Linear expenditure systems.

Module 2 Theory of Production (30 hours)

Homogenous and non-homogenous Production functions, Properties of linear homogenous production functions, Euler's Theorem, output elasticity and elasticity of substitution, Producer equilibrium- output maximization, cost minimization and profit maximization, cost functions and cost curves, properties of Cobb-Douglas, CES and VES production functions.

Module 3 Price and output Determination (25 hours)

Equilibrium under discriminating monopoly, Multi plant model, Cournot and Stackelberg models, Price leadership model, Baumol's static model of sales maximization, Williamsons model (illustrations with examples).

Module 4 Linear Programming and Game Theory (30 hours)

Dual theorem and its uses, slack and surplus variables, Maximisation simplex method, applications of linear programming, Basic concepts in game theory, maximin and minimax strategies, saddle point solutions, Two person zero sum game with examples, Solution with mixed strategies, Cooperative and non cooperative games (illustrations with examples necessary).

Reading List

1. Henderson, J. M. and R.E. Quandt (1980), Microeconomic Theory: A Mathematical Approach, McGraw Hill, New Delhi.
2. Koutsoyiannis, A. (2011), Modern Microeconomics, Macmillan Press, London.
3. Chiang, A.C. (1986), Fundamental Methods of Mathematical Economics, Mc Graw Hill, New York.
4. Mustafi, C. K. (1992), Operations Research: Methods and Practice, Wiley Eastern, New Delhi.
5. R.G.D.Allen, Mathematical Economics, Manmillan, London

EC 206: URBAN PLANNING

(Hours per semester: 110

Hours per week: 6)

Objectives

The important objective of this course is to introduce the discipline of planning and planning history; to expose planning theory and practice; and to make aware of the institutional mechanism involved in planning and implementation process. After studying this course students should be able to understand the planning process, theory and practice and its role in planning of cities; appreciate the role of historical developments in planning and its evolution and trace these influences to the current situation; understand the institutional mechanisms involved in urban planning and to develop capacity to understand multiple often conflicting factors to be balanced in planning for an urban area

Course Contents

Module I: Planning- History (20 hours)

Town planning history – Ancient Egypt, Mesopotamia and Indus valley. Greece and Rome, Medieval, Renaissance, Industrial and post industrial age, Colonial cities. Town planning in India. Contribution of individuals to city planning: Patrick Geddes, Lewis Mumford, Le-Corbusier, C.A.Doxiadis, Clarence Stein, Peter Hall etc.

Module II: Theories of City planning (22 hours)

Theories of city development including Concentric Zone Theory, Sector Theory, Multiple Nuclei Theory and other latest theories; Ebenezer Howard's Garden City Concept; and Green Belt Concept; City as an organism: a physical, social, economic and political entity; Emerging Concepts: globalcity, inclusive city, safe city, etc.; City of the future and future of the city; Shadow cities, divided cities; Models of planning

Module III: Urbanisation and Growth of Towns (22 hours)

Definition and process of Urbanisation, Urban- Rural Relationship, hierarchy of cities-urban growth and system of cities, growth of metropolitan cities and mega cities and its impact on natural development, with focus on the issues in metropolitan management and governance and possible alternative strategies to metropolitan growth control – development of new towns, and small and medium town development.

Module IV: Urban Planning Policy (26 hours)

Urban policy and planning – origin , development and goals of planning- nature of urban policy - Neighbourhoods in planning, Birth and development of the neighbourhood idea, The Indian neighbourhood, Urban renewal and its aftermath -rise of advocacy planning- role of NGOs in planning- Urban social movements Post-war developments –masterplan to structure plan and beyond – urban modelling – political influences and planning -nature of Urban programmes by international agencies like World Bank, UNCHS etc.

Institutional arrangements of urban planning with special reference to India– edicts, laws–New Towns and IDSMT, regional contexts of metropolitan plans, - Proposals of National Commission on Urbanization

Module V: Urban Planning Practice and Process (20 hours)

Planning system in India, Master plan, Structure plan, Detailed development plans, Comparison of planning systems in UK & USA with that of India.

Planning Surveys, Different types used for data identification for plan preparation, Aerial photography and remote sensing techniques in planning

Reading List

1. AEJ Morris (1979): History of Urban Form from Pre-history to Renaissance, John Wiley and Sons, New York
2. Ministry of Urban Affairs & Employment, Govt. of India, New Delhi: Urban
3. Development Plans Formulation & Implementation Guidelines.
4. Aidan Southall (1998) – The City Time and Space, Cambridge University Press, Cambridge
5. H Carter (1972): The study of Urban Geography, Edward A Old, London.
6. F S Chaplin (1965): Urban Landuse Planning, Higg & Brothers, New York.
7. K V Sundaram(Ed) (1985): Geography & Planning”, Concept Publishing Co., New Delhi.
8. Jacob S. Siegel (2002): Applied Demography: Applications to Business, Government, Law and Public Policy, Academic Press, San Diego

9. Dr. Ashal A. Bende & Mrs. Tara Kanitkar (1980): Principles of Population Studies, Himalaya Publishing House, Bombay.
10. Dand M. Heu (1978): Society & Population, Eastern Economy Edition
11. Aurthur J. Gallion (1993): Urban Pattern, John Wiley & Sons
12. Le Corbusier (2000): The City of Tomorrow, Dover Publications Inc.
13. Peter Hall (1978): Urban and Regional Planning, Routledge
14. Reading material on Urban Planning – ITPI New Delhi.
15. Kaiser Edward J., et.al.,(1995): Urban Landuse Planning, 4th (ed) Urbana, University of Illinois Press
16. Bola Ayeni (1979): Concepts and Techniques in Urban Analysis, Croom Helm, London.

OPTIONAL PAPERS IN FOURTH SEMESTER

EC 207: ADVANCED ECONOMETRICS

(Hours per semester: 110

Hours per week: 6)

Objectives

The objectives of this course are: (1) to develop analytical skills needed to work successfully with real economic data and (2) to make the students understand empirical research techniques thus equipping them in the formulation, specification and estimation of econometric models.

Course Contents

Module I: Dynamic Econometric Models (20 hours)

Autoregressive and Distributed Lag Models -Koyck Model, Nerlove's Partial Adjustment Model, Cagan's Adaptive Expectations Model - Instrumental Variables - Detecting Autocorrelation in Autoregressive models - Almon's Approach to Distributed Lag Models.

Module II: Estimation of Simultaneous Equation Models (26 hours)

Simultaneous Equation Models - Structural and Reduced form Equations, Simultaneous Equation Bias, Instrumental Variable Estimation - Identification Problem, The Rank and Order Condition, Methods of estimating simultaneous equation system, Recursive methods and OLS - Indirect Least Squares, 2SLS, 3SLS, FIML estimation techniques - Durbin – Wu – Hausman Test.

Module III: Introduction to Non Stationary Time Series (24 hours)

Stationarity and Non stationarity - Stationary time series and Non stationary time series Deterministic Trend- Difference Stationary and Trend-Stationary - Spurious Regressions -Tests of Non stationarity - Graphical Tests & Augmented Dickey-Fuller tests -Cointegration& Error Correction Model (ECM).

Module: IV Time Series Econometrics : Forecasting (20 hours)

AR, MA and ARIMA Modelling of Time Series Data - The Box- Jenkins (BJ) Methodology -Vector Auto Regressive (VAR) and Causality - Measuring Volatility – The ARCH and GARCH Model

Module V: Introduction to Panel Data Models (20 hours)

Panel Data Set – Example to investigate dynamics - Fixed Effects Regressions –
Withingroups fixed effects, First differences fixed effects - Random Effects Regressions -
Assessing the appropriateness of fixed effects and random effects estimation.

Basic Reading List

Module I

1. Dougherty, Christopher (2011). Introduction to Econometrics, Oxford University Press, New York.
2. Gujarathi, D, &Sangeetha, N. (2007). Basic Econometrics (4thed) New Delhi: McGraw Hill.

Module II

1. Gujarathi, D.&Sangeetha, N. (2007). Basic Econometrics (4thed) New Delhi: McGraw Hill.
2. Woolridge, J. M. (2007). Introductory Econometrics: A Modern Approach (3rded.). New Delhi: Akash Press.

Modules III, IV & V

1. Dougherty, Christopher (2011). Introduction to Econometrics, Oxford University Press, New York.
2. Gujarathi, D,&Sangeetha, N. (2007). Basic Econometrics (4thed) New Delhi: McGraw Hill.
3. Woolridge, J. M. (2007). Introductory Econometrics: A Modern Approach (3rded.). New Delhi: Akash Press.

Additional Reading List

1. Amemiya, T.(1995). Advanced Econometrics, Harvard University Press.
2. Baltagi, B. H. (1998). Econometric Analysis of Panel Data, New York: Springer.
3. Enders, Walter (2014). Applied Econometric Time series (4th edition) Wiley E-Text Student Package
4. Goldberger, A. S. (1998). Introductory Econometrics, Harvard University Press Cambridge Mass
5. Greene, W. H. (1997). Econometric Analysis, New Delhi, Pearson.
6. Johnston, J. (1991). Econometric Methods, New York, McGraw Hill.

7. Kennedy, I. (1998). A Guide to Econometrics (4th edition) MLT Press, NewYork
8. Kmenta, J. (1997).Elements of Econometrics (Reprint Edition), University of Michigan Press, Newyork.
9. Krishna, K. L. (ed) (1997). Econometric Application in India, Oxford University Press, New Delhi
10. Maddala (ed) 1993. Econometric Methods and Application Aldershot, U K
11. Pindyck andRubinfeld (1976) Econometric Models and Economic Forecasts, McGraw Hill Kogakus Tokyo

EC 208: DEMOGRAPHY

(Hours per semester: 110

Hours per week: 6)

Objectives

The course covers the dynamics of population growth, theoretical side of population, demographic data sources and the link between demography and socio-economic development of a society. The course should enable the students to understand the theoretical, empirical and policy implications of demographic issues in a developing country like India

Course Contents

Module I: Introduction to Demography (20 hours)

Evolution of demography; Meaning, subject matter and importance of Demography. Concepts of population change and composition of population. Sources of Demographic data: Census, meaning, characteristics, importance, methods, problems; Sample surveys; Registration.

Module II: Population Dynamics (28 hours)

Fertility-Meaning; Concepts-CBR, ASBR, GFR, TFR, GRR, NRR; Factors affecting fertility; Theories of fertility; Mass education and fertility decline-Co-operation, Inequality and the family (Amartya Sen).

Mortality -Meaning; Concepts –CDR, ASDR, IMR, CMR, MMR, NMR, NNMR, CSDR, SDR. Factors affecting Mortality; Life tables-construction and uses. Demographic Dividend and Age pyramids. Concept of stationary, stable and quasi - stationary population.

Nuptiality-Meaning; Concepts-CMR, SMR, GMR; Determinants of Nuptiality; Marital Dissolution.

Migration- meaning, measurement. Urbanisation- concept and measurement

Module III: Theories of population (20 hours)

Malthusian Theory; Optimum theory; Theories of Demographic Transition-views of C. P. Blacker, Boserup. Biological Theories of Population; Socio- economic theories of population-views of Marx and Leibenstein; Approaches of Meadows, and Simon.

Module IV: Demographic Data Base in India (26 hours)

Census-Nature of information collected—1991,2001, 2011; NFHS-I, II and III; District Level Household Survey(DLHS); Sample surveys India; Registration system in India. Methods

of measurement of population growth; Population Projection-Meaning, Importance and methods. Evolution of population policy in India-Shift from population control to reproductive and child health approach, National Population Policy 2000; Tasks before the National Population Commission.

Module V: Demographic Issues in India (16 hours)

Rural and urban demographics- Population, economy and environment linkages– Population aging in India –Causes, trends, issues and consequences.

Basic Reading List

1. Bouge, D.J. (1971), Principles of Demography, John Wiley, New York.
2. Bhende Asha A. And Tara Kanitkar, Population of Population Studies, Himalaya Publishing House.
3. Chiang, C.L. (1974), Life Tables and Mortality Analysis, WHO, Geneva.
4. Novell, C., Methods and Models in Demography, Bellhaven , Washington D.C.
5. NFHS Report.
6. Preston, Samuel H., Heuveline, Patrick, and Guillot, Michel (2001) Demography: Measuring and Modeling Population Processes. Oxford: Blackwell Publishers.
7. Sharma, Rajendra K., Demography and Population Problems, Atlantic Publications.
8. Shyrock, H., et al (1973), The Methods and Materials of Demography, U.S. Deptt. Of Commerce Press, London.
9. Srinivasan, K. And A. Shariff (1998), India: Towards Population and Demographic goals, Oxford University Press, New Delhi.

Supplementary Reading List

1. Agarwal, S.N. (1985), India's Population Problems, Tata McGraw Hill, Mumbai.
2. Bose, A., (1996), India's Basic Demographic Statistics, B. Publishing Corporation, New Delhi.
3. Chaubey, P.K. (2000), Population Policy in India, Kanishka Publishers .
4. Chenery, H. And T.N. Srinivisan (Eds)(1989), Handbook of Development Economics.
5. Coale, A.J. and E.H. Hoover(1958), Population Growth and Economic Development in low Income Countries –A Case Study of India's Prospects, Princeton University Press, Princeton.

6. Gulati, S.C. (1988), Fertility in India: An Econometric Study, Sage Publications, New Delhi.
7. Jacob S. Siegel and David A. Swanson (2004): The Methods and the materials of Demography, Second Edition, Elsevier Science. USA.
8. John weeks (2005): Population: An introduction to concepts and issues, Wordsworth Learning. Singapore 9th edition.
9. Pathak, K.B. AND F. Ram (1998):Techniques of Demographic Analysis, Himalaya Publishing House.
10. Simon, J. (1992), Population and Development in Poor Countries, Princeton University Press, Princeton.
11. Srinivasan, K. (1998): Basic Demographic Techniques and Applications, Sage Publications.

EC 209: ECONOMICS OF INFRASTRUCTURE

(Hours per semester: 110

Hours per week: 6)

Objectives

The role and significance of infrastructure in a country's development need to be thoroughly examined. The paper 'Economics of Infrastructure' deals with the various segments of infrastructure and its contribution as growth stimulants. The content of the paper expose the student wholly to the issues involved in the development of infrastructure in developing countries like India.

Course Contents

Module 1: Introduction (18 hours)

Infrastructure and economic development- Economic and social infrastructure- Characteristics of public utilities- The peak-load, off-load problem, Dual Principle Controversy- Economies of scale of joint supply- Methods of pricing in public utilities; Cross subsidization, free prices- Problem of Equity Vs Efficiency.

Module 2: Transport Economics (18 hours)

The structure of Transport Costs and Location of Economic Activities. Demand for transport- Models of Freight and passenger Demand- Pricing principles -Role of government in transport sector- Ports and Maritime Economics -Special problems of modes of transport in Indian context;

Module 3: Communications (20 hours)

Characteristics of postal services; Telephone services; coverage, traffic, pricing- Rate making in telephone utilities; principles of decreasing cost in telephone industry- Trends and growth in courier, mobile and cellular services in India; Internet connectivity and IT enabled services with special reference to developing economies-Technology and communication Policy in India.

Module 4: Energy and Water (26 hours)

Forms of energy and its primacy in economic development- Energy ratios as indices of economic development-Sustainability concerns and effect of energy shortages- The relative economics of thermal, hydel and nuclear power plants -Energy modelling - Issues in renewable

and non-renewable sources of energy- Energy policy of India-Water supply, management and conservation; rural and urban scenario.

Module 5: Social Infrastructure (28 hours)

Concept of social infrastructure; models of public and private infrastructure management; PPP models -Pricing of social services- Emerging role of social services in the Indian context- Education and manpower planning; problem of education financing and human resources development in India- Education policy of India- economic dimensions of health care- demand and supply of health care; financing of health care and resource constraints; institutional issues in health care delivery-Challenges in health care- poverty, malnutrition, illiteracy, gender inequality; global and Indian context-Health care policies in India.

Basic Reading List

1. Dash, L.N.(2007), *Economics of Infrastructure: Growth and Development*. Regal Publications (ISBN 818991711).
2. Das, R.C.(2017), *Social, Health and Environmental Infrastructures for Economic Growth*, in 'Advances, Finance and Accounting', IGI Global Business Reference Book Series, USA (ISSN 2327-5677).
3. Blaug M (1972): 'Introduction to Economics of Education', Penguin, London.
4. Henckel, T. and McKibbin, W. (2010) 'The Economics of Infrastructure in a Globalized World: Issues, Lessons and Future Challenges', 2010-39, Australian National University, Centre for Applied Macroeconomic Analysis.
5. Ahuja, A.K. (2008), *Economics of Education*, Authors Press. 1st edition.

Additional Reading List

1. Tilak, J.B.G (1994): 'Education for Development in Asia', Sage Publications, New Delhi.
2. Christine Kessides (1993) *The Contributions of Infrastructure to Economic Development: A Review of Experience and Policy Implications*, World Bank Discussion Paper No. 213, IBRD, The World Bank, Washington D.C.
3. John M. Cockburn, Yazid Dissou, Jean-Yves Duclos, Luca Tiberti (2013), *Infrastructure and Economic Growth in Asia*, in 'Economic Studies in Inequality, Social Exclusion and Well-Being', Springer International Publishing (ISBN 3319031376, 9783319031378).

4. OECD (2007a) Infrastructure to 2030 – Volume 1 Telecom, Land Transport, Water and Electricity, OECD.
5. OECD (2007b) Infrastructure to 2030 – Volume 2 Mapping policy for Electricity, Water and Transport, OECD.
6. Hanushek, E.A. & Woessmann, L. (2015), The Knowledge Capital of Nations- Education and the Economics of Growth. MIT Press.
7. Mark V. Pauly, Thomas G McGuire, Pedro Pita Barros, (2011), ‘Handbook of Health Economics’, Volume 2 ,Business & Economics.
8. Saith Ashwani, Vijayabaskar, M. (2005), ICTs and Indian Economic Development: Economy, Work, Regulation. SAGE Publications, New Delhi.
9. Vikram Singh (2009), Impact of Information and Communication Technology on Public Life. University Science Press, New Delhi.
10. Eduardo Engel, Ronald D. Fischer, Alexander (2014), *The Economics of Public-Private Partnerships*, Cambridge University Press. (ISBN 978-1-107-03591-1).

EC 2010: INDUSTRIAL ECONOMICS

(Hours per semester: 110

Hours per week: 6)

Objectives

The course is designed to use theoretical models to understand industries and regulatory decision making and so students should expect to use diagrams and some basic mathematical models. It also provide guidelines to urge through knowledge to the students on the basic issues in the industrial development of India. In addition, course aims for the students acquire fair knowledge of international experience of industrial progress.

Course Contents

Module I: Basics and Scope of Industrial economics (15 hours)

Nature and scope – Structure Conduct Performance (SCP) paradigm. Market Power - Market concentration and its relationships .Additional cost concepts: switching costs, transaction costs. Asset specifying and holding up problems.

Module II: Industrial Decisions (20 hours)

Pricing decisions and its strategies - pricing policies: Administered pricing and LRMC based tariffs. Investment decisions- risk and uncertainty in project appraisal - OECD and UNIDO approaches to investment decisions.

Module III: Industrial Location and Regional Development (15 hours)

Determinant of Industrial Location- Theories of Industrial location- Weber, August Losch, Sargent Florence – Regional Growth and Regional imbalances - SEZ

Module IV: Industrial Labour (20 hours)

Structure of Industrial labour - Employment dimensions of Indian industry – industrial legislation, industrial relations, exit policy and social security- wage and problems of bonus – Industrial Labour: roblems, policies and reforms in India- unorganized labour market.

Module V: Industrial Finance (15 hours)

Importance of industrial finance- Sources: Owned, external and other sources of fund- Indian Industrial Finance: IDBI, IFCI, SFCs, SIDC, Commercial and cooperative banks, share market, insurance companies, pension funds, NBFIs etc.

Module VI: Industrial Policy (25 hours)

Public sector enterprises in India: efficiency, productivity and performance constraints - Industrial Policies (from 1948 to till now). Regional disparity and Economic plans – Pande committee, Wanchoo Committee -Govt. policy towards foreign capital- industrial growth and environmental preservation, pollution control policies.

Reading List

1. Barthwal, R.R, Industrial Economics, Wiley Eastern Ltd., New Delhi, 1985
2. Ahluwallia I J , Industrial Growth in India , Oxford University Press, New Delhi, 1985
3. Deepak Nayyar, Industrial Growth And Stagnation. Oxford University Press, 1994.
4. Deepak Nayyar, Trade and Industrialisation, Oxford University Press, New Delhi, 1977.
5. Desai B: Industrial Economy In India, Himalaya Publishing House, Mumbai, 1999.
6. Dilip Mookherjee, Indian Industry Policies and Performances, Oxford University Press 1995.
7. Divine, P.J, Jones, R.M, Lee, N, and Tyson, W.J., An Introduction To Industrial Economics, George Allen And Unwin Ltd., London, 1974.
8. Francis Cherunilam, , Industrial Economics : Indian Perspective , Himalaya Publishing House, Mumbai, 1994.
9. Isher Judge Alhuwalia, Industrial Growth In India, Oxford University Press, New Delhi,1985.
10. Sharma, A.K, Industrial Economics, Anmol Publication Pvt Ltd, New Delhi,2006
11. Stephen Martin, Advanced Industrial Economics, Basic Blackwell, 1993.
12. Paul R Ferguson & Glenys J Ferguson, Industrial Economics: Issues and Perspectives (second edition), New York University Press, Washington square, New York 1994
13. Dr.Renjana Seth, Industrial Economics, AneBooks Pvt. Ltd, New Delhi ,2010
14. Uma Kapila ,Indian Economy : Performance and Policies (14th edition),Academic Foundations 2014

EC 2011: WELFARE ECONOMICS

(Hours per semester: 110

Hours per week: 6)

Objectives

Evaluation of normative significance of economic events and issues forms the framework of welfare economics, branches of economics such as public finance, cost-benefit analysis and economics of government policy use welfare economic criteria as their foundation.

Course Contents

Module 1 : Introductory Welfare Economics (22 hours)

Concerns of welfare economics – value judgments in welfare economics - positive or normative? - concept of social welfare – different welfare criteria - the welfare assumptions behind GDP and NNP - individual and social welfare - determination of individual welfare: goods - determinants of social welfare: individual utilities.

Module 2 : Pre – Paretian Welfare Economics (20 hours)

Benthamite approach to aggregate Welfare - optimum resource allocation and welfare maximization - assumption of uniform income - utility functions of individuals - consumer's surplus and tax-bounty analysis - the neoclassical welfare economics - Marshall and Pigou.

Module 3 : Market Efficiency, Public Goods And Externalities (28 hours)

Welfare properties of market exchange – the 2X2X2 general equilibrium model - competitive equilibrium of an exchange economy - the first and second fundamental theorems of welfare economics - uncertainty in exchange – symmetric uncertainty - asymmetric information - Coase theorem and liability rules.

Public goods - public goods model - private financing of public good - free rider problem - the Wicksell – Lindahl tax system - fixed tax sharing and majority voting - the demand revealing tax scheme.

Divergence between private and social costs - problems of non-market interdependent-externalities of production and consumption - external economies and diseconomies.

Module 4: Welfare criteria (22 hours)

The Pareto- optimality criterion – Kaldor-Hicks Compensation Criterion – Scitovsky's double compensation criterion – Bergson's Social welfare function - Rawls' theory of social justice –Arrow's Impossibility theorem - reactions to Arrow's impossibility theorem.

Module 5: Social Choice (20 hours)

Social choice and individual Values – social interdependencies - external effects - Sen's contribution to welfare economics – the capability Approach - collective choice and social welfare – social choice and political decision-making -the economics of happiness and capability.

Reading List

1. Florio Massimo, (2014), Applied welfare economics: Cost benefit analysis of projects and policies. Routledge, London and New York.
2. Allan M Feldman and Serrano Roberto, Welfare economics and Social choice theory, Springer; 2nd ed. 2006 edition (23 December 2005)
3. Yew- Kwang Ng, Welfare Economics - Towards a more complete analysis, Palgrave Macmillan; 2004 edition (19 December 2003)
4. Luigino Bruni, Flavio Comim and Maurizio Pugno,p (Ed.) Capabilities and happiness, Oxford University Press, Published in 2008 page no 16 – 27
5. Sen Amartya, Collective Choice and Social Welfare, Penguin; Expanded edition edition (10 February 2017)
6. Koutsoyiannis (1997), Modern Microeconomics, Macmillan, London.
7. Baumol, W. J. (Ed.) (2001), Welfare Economics, Edward Elgar Publishing Ltd. U.K.
8. Nicholas, B. (Ed.) (2001), Economic Theory and the Welfare state, Edward Elgar Publishing Ltd., U. K.
9. Myint, H. (1948), Welfare Economics, Macmillan, London.
10. Pigou, A. C. (1962), The Economics of Welfare (4th Edition) Macmillan.
11. Dominick Salvatore, (2002) Microeconomics Theory and ApplicationsOxfordUniversity Press, New York, 2003.
12. Arrow, K. J. (1951), Social choice and Individual Values, Yale University Press,New Haven

EC 2012: WOMEN AND DEVELOPMENT

(Hours per semester: 110

Hours per week: 6)

Objectives

The objectives of this course are: (1) to interpret economic development policy concerns and debates from a feminist economics perspective, (2) to evaluate various popular schemes to reduce gender inequalities and promote women's well-being in developing countries especially India, (3) to introduce the role of women in the development process and the multiple dimensions of the role of women in the production process of the economy, and (4) to gain a critical perspective and knowledge of how gender matters in development economics.

Course Contents

Module 1: Introduction (20 hours)

Key concepts of women's studies –Feminist Economics –The Household – Power and Empowerment -Women in patriarchal and matriarchal societies and structures-patrilineal and matrilineal systems and relevance to present day society in India- Economic basis and functioning of patriarchy in developed and LDCs, particularly India - Gender bias in the theories of value, distribution, and population

Module 2: Women in Development (18 hours)

WID approaches - Welfare – equity - anti-poverty – efficiency – empowerment - critiques of efficiency - Gender planning frameworks and tools–Gender inequality indices: GII, MPI, WEIA, SIGI, GDI, GEM -Gender Inequalities in India– ‘Towards Equality’, Shramshakti - Gender and national planning – ‘Women's role in the planned economy’ - Five year plans – SAP - liberalization.

Module 3: Women in Household (17 hours)

Productive and unproductive work – visible and invisible work - households as a decision-making unit -The triple role of women -Resource Control and Bargaining Power - property rights - access to and control over economic resources – Nutrition - Vulnerability to Violence and Conflict -Sexual and Reproductive health - Education.

Module 4: Women and Social Security (28 hours)

Entitlement in ensuring economic independence and risk coverage - access to credit and insurance markets - Role of voluntary organizations - Self help groups in providing social

security - Effectiveness of collective bargaining - Review of legislation for women's entitlement protection of property rights - Schemes for safety net for women- Need for female labour unions; affirmative action for women and improvement in their economic and social status -Gender Mainstreaming in development policies - Gender sensitive governance - Gender Budgeting - Democratic decentralization (panchayats) and women's empowerment in India – The Kudumbashree experience in Kerala.

Module 5: Challenges to Women and Development (27 hours)

Demographic imbalance of female population: Age structure, Mortality rate, and Sex ratio — Missing Women - Factors affecting female entry in labour market: Wage differentials in agriculture, non-agriculture rural activities, informal sector, cottage and small scale industries, organized industry and services sector – occupational segregation, wage disparity, housewifization, feminization, flexibility and casualization - Ecological and Environmental concerns – Ecofeminism - Challenges posed by Globalizing social order

Reading List

Module I

1. Bonnie G Smith (2013): Women's Studies: The Basics. London: Routledge.
2. Beneria, Lourdes, Günseli Berik, and Maria Floro. 2015. Gender, Development and Globalization: Economics as if all People Mattered. Second Edition. Routledge, London.
3. Kabeer, N. (1994), Reversed Realities: Gender Hierarchies in Development Thought, Kali for Women, New Delhi.
4. Beneria, L. and M. Roldan (1987): The Crossroads of Class and Gender. Chicago: University of Chicago Press.
5. Mies, M. (1986/1998): Patriarchy and Accumulation on a World Scale: Women in the International Division of Labour, Zed books, London.
6. Sen, G. and K. Brown, (1985): Development, Crises and Alternate Visions, Monthly Review Press, New York.
7. Bettio, Francesca and Alina Verashchagina (2008) Frontiers in the Economics of Gender, Routledge: London

Module 2

1. World Bank. (2012). Gender Equality and Development: World Development Report 2012. Washington, D.C: The World Bank. Overview, pp. 2-21.

2. Irene Tinker.(1990): Persistent Inequalities: Women and world development,New York: Oxford University Press
3. Government of India (1987): Shram Shakthi, Report of the National Commission on Self-employed Women and Women works in the Informal Sector, Ministry of Human Resource Development, New Delhi
4. Government of India (1974): Towards Equality - Report of the Committee on the Status of Women in India, Department of Social Welfare, Ministry of Education and Social Welfare, NewDelhi.
5. Leela Kasturi, (2004): Introduction and excerpts from the report of the sub committee women's role in planned economy, National planning committee series 1947, In M Chaudhuri (ed.) Feminism in India, Delhi: Women Unlimited.

Module 3

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Module 5

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SYLLABUS FOR M.A HISTORY
SEMESTER PATTERN IN AFFILIATED COLLEGES
2019 ADMISSION ONWARDS

M.A HISTORY COURSE STRUCTURE & MARK DISTRIBUTION

Semester	Paper Code	Title of the Paper	Distribution hrs/Semester	Instructional hrs/week		Duration ESA Hrs	Maximum marks		
				L	P		CA	ESA	Total
I	HY 211	Historical Method – I	120	7		75	25	75	100
	HY 212	Indian History – I	110	6		75	25	75	100
	HY 213	Kerala History – I	110	6		75	25	75	100
	HY 214	Electives	110	6		75	25	75	100
II	HY 221	Historical Method – II	120	7		75	25	75	100
	HY 222	Indian History – II	110	6		75	25	75	100
	HY 223	Kerala History – II	110	6		75	25	75	100
	HY 224	Electives	110	6		75	25	75	100
III	HY 231	Issues in Historiography	120	7		75	25	75	100
	HY 232	Indian History – III	110	6		75	25	75	100
	HY 233	Kerala History – III	110	6		75	25	75	100
	HY 234	Electives	110	6		75	25	75	100
IV	HY 241	Indian Historiography	120	7		75	25	75	100
	HY 242	Indian History – IV	110	6		75	25	75	100
	HY 243	Kerala History – IV	110	6		75	25	75	100
	HY 244	Electives	110	6		75	25	75	100
		Project							100
		Viva-voce							100

L : Lecture; P : Practical; CA : Continuous Assessment; ESA : End Semester Examination

**MA DEGREE (HISTORY) REGULAR COURSE
SEMESTER SYLLABUS
(2019 ONWARDS)**

I SEMESTER

HY 211	Historical Method – I
HY 212	Indian History – I (Formation of State and Society in Early India - upto 600 C.E)
HY 213	HY 213 - Kerala History – I (Social Formations in the Pre Modern Period - Pre-Historic to 800 C.E)

Electives

HY 214 A	Bronze Age Civilizations or
HY 214 B	Ancient Greece and Rome or
HY 214 C	Archaeology

II SEMESTER

HY 221	Historical Method – II
HY 222	Indian History II (India in Transition - Medieval and Pre-Modern Periods - 600- 1700 C.E)
HY 223	Kerala History II (Social Formations in the Pre Modern Period - From 800 To 1498 C.E)

Electives

HY 224 A	Gender History with Special Reference to India or
HY 224 B	Archival Studies or
HY 224 C	History of Medieval Europe

III SEMESTER

HY 231	Issues in Historiography
HY 232	Indian History III (Colonialism and Indian Responses from 1701 to 1947 C.E)
HY 233	Kerala History III (Colonialism and Nationalism - From 1498 To 1956 C.E)

Electives

HY 234 A	Modern Revolutions – English, American and French or
HY 234 B	Modern Europe from 1789 to 1914 or
HY 234 C	The Rise of Modern China

IV SEMESTER

HY 241 Indian Historiography

HY 242 Indian History IV – Contemporary Period

HY233 Kerala History IV (Contemporary Period From 1956 To 2019 C.E)

Electives

HY 244 A Environmental History of India
 or

HY 244 B Contemporary History of the World
 or

HY 244 C Twentieth Century Revolutions

HY 211 – HISTORICAL METHOD – I

Aim : The paper highlights the importance of history as a branch of knowledge.

Objectives

- To introduce the basic tools and techniques of research as distinguished from methodology.
- To impart knowledge about the different sources and its importance.
- To make the study of history dispassionate and impartial.

Course Content

Module I: Importance of History

Nature and Scope of History – Meaning and Definition – Use and abuse of History

Module II: Relation with other branches of Knowledge

History as Science – History and other auxiliary sciences – Inter-disciplinary and Multi-disciplinary approach

Module III: Sources and History

Nature of Historical Sources – Collection of Sources – Methods and Techniques – Card system – Use of Index

Module IV: Documentary Sources

Primary Sources – Secondary Sources – Tertiary Sources – Audio – Visual – Digital

Module V: Non-Documentary Sources

Audio-Visual – Film – Digital – Oral – Ballads – Folk traditions – ‘Proverbs and Sayings’

Module VI: Historian and Facts

Historical Facts – Causation- Generalization – Objectivity - Subjectivity and Bias

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HY 212 - INDIAN HISTORY - I

(Formation of State and Society in Early India- upto 600 C.E.)

Aim : The paper aims to provide the students with an insight into the early history of India in its correct historical footing.

Objectives

- To introduce various sources and aspects of ancient history of the Indian Sub-continent.
- To unravel the evolution of Indian civilization.
- To understand the genesis of Vedic and heterodox religions, state and early social formation.

Course Content

Module I : Sources of Indian History and Pre-historic Cultures

Sources – Literary, Archaeological, Numismatic and Epigraphical – Pre-historic Cultures – Palaeolithic, Neolithic and Chalcolithic – Copper Hoards

Module II : Bronze Age Culture

Harappan Civilization – Theories of Origin – Features – Debates on decline

Module III : Iron Age Cultures

Early Vedic Age – Debate on Aryan Problem – Society – Polity – Economy – Later Vedic Age – Expansion of Agriculture – Varna System – Social Stratification and caste system – PGW & NBPW cultures – Megalithic culture

Module IV : Socio-Economic Formations - 6th – 3rd B.C.E.

State and Social Formations in the 6th Century B.C.E. – Second Urbanization and Emergence of Heterodox Sects – Jainism, Buddhism, Ajivikas, Charvakas – Foreign Contacts of Ancient India and Development of Trade – Persian and Graeco – Roman contacts – Material Milieu – Growth of Internal trade – Guild system

Module V : Age of Empires

Arthasasthra – Mauryan Polity and Economy – Asoka and Dhamma – Theories on the decline of Mauryas – The Guptas – Land Grants – Urban Decay and Decline of trade – Debate on Gupta Golden Age

Module VI : The Cultural Milieu

Education – Universities – Science and Technology – Ayurveda – Astronomy – Mathematics – Geometry – Grammar – Art – Maurya, Gupta, Gandhara, Mathura, Amaravathi.

References :

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HY 213 - KERALA HISTORY – I

(Social Formations in the Pre Modern Period - Pre-Historic to 800 C.E.)

Aim : The paper highlights the importance of history as a branch of knowledge.

Objectives

- To introduce the basic tools and techniques of research as distinguished from methodology in the context of Kerala
- To impart knowledge about the different sources and its importance pertaining to the History of Kerala.
- To make the study of history dispassionate and impartial.

Course Content

Module I: Geography and Environment

Location and the Environment – Mountain tracks – Plain land and coastal zones – Rivers – Lake – Backwaters – Mountain passes – Monsoon – Nature of Soil – Productivity of Land – Human Geography

Module II: Sources

Archaeological Sources – Monuments – Inscriptions – Coins – Study of Archaeological Reports – Ancient Tamil Anthologies – Sanskrit Mooshakavamsakavya – Malayalam Manipravalam – Champus – Sandesa Kavyas – Classical Accounts – Grandhavaris – Mathilakam – Kozhikode – Vanneri – Koodali – Perumpadappu – Classification – Oral tradition – Myths and legends *Keralaolpathi /Kerala Mahathmyam* – Ballads – Folk songs – Place names – Family traditions – Genealogy – Local memory – ‘Proverbs and sayings’

Module III: Pre – Modern Historical Consciousness and Historiography

Myths & Legends – Vamsa kavya – *Tuhafat-ul-Mujahidin* – Colonial initiatives – Early Missionaries – Malabar – Cochin – Travancore – Surveyors – Samuel Mateer and Herman Gundert – Gazetteers and Manuals – Indigenous initiatives – Vaikath Pachu Moothathu – P.Shungoonny Menon – Modern Trends – K.P. Padmanabha Menon – K.M. Panikkar – Elamkulam P.N.Kunjan Pillai – M.G.S. Narayanan – Emerging Trends

Module IV: Pre-History

Stone Age – Iron Age : Megalithic Phases – Typology – Polity – Society –Economy – Rock art in Kerala

Module V: Social and Cultural Formations

Debate on Sangam Age – Early Tamil Anthologies – Interpretations – Tinai Concept – Material Culture – Tribal Polity – Muvendars – Chieftdom – Forms of Exchange – Status of women – Transmarine Contacts

Module VI: Origin of Indigenous and Semitic Religions

Indigenous Religious practices and beliefs – Hinduism – Jainism – Buddhism – Judaism – Christianity – Islam

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(Elective)

HY 214 A – BRONZE AGE CIVILIZATIONS

Module-I: In Search of Antiquity

Archaeology – Definition – Dating Techniques – Carbon14 – Thermoluminescence – Potassium-Argon Dating – Epigraphy

Module-II: Man in the Making

Anthropology – Definition – Fossilmen – Australopithecus – Homo habilis – Homo erectus – Homo sapiens

Module-III: Early Stages of Evolution

Palaeolithic – Mesolithic – Neolithic Revolution – Chalcolithic – Copper – Bronze Age

Module IV: Mesopotamian Civilization

The Land – Early Cities – Polity – Society – Trade and Commerce – Law – Cuneiform script – Religion

Module V: Egyptian Civilisation

Origin – Political History – Pharaohs – Social and Economic life – Cultural contributions – Hieroglyphic script – Religion

Module VI: Chinese Civilisation

Early Dynasties – Social and Economic life – Arts and Crafts – Chinese Script – Religion

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(Elective)

HY 214 B – ANCIENT GREECE AND ROME

Module I: Beginning of Greek Civilisation

Archaeological Sources – Heinrich Schliemann – Sir Arthur Evans – Minoan Civilisation – Crete – Polity – Economic life – Script – Art – Mycenaean Civilisation – Mycenae – Government – Social life – Art and Architecture

Module II: Early Cultural Heritage and Classical Greece

Homeric Age – Iliad and Odyssey – Government – Society – Religion – Oracles – Age of Pericles – Athenian Democracy – Society – Sparta – Militarism – Government – Society

Module III: Legacy of Greece

Literature – Poetry – Prose – Drama – History – Philosophy – Sophists – Socrates – Plato – Aristotle – Art – Architecture – Sculpture – Painting – Science – Mathematics – Medicine – Astronomy

Module IV: Early Roman Civilization

Beginning – Struggle of Orders – Transformation of Rome into Republic – Constitution – Territorial Expansion – Punic Wars – Fall of the Republic

Module V: Transition to Roman Empire

Julius Caesar – First Triumvirate – Reforms – Augustus Caesar – Second Triumvirate – Administration – Cultural Developments – End of Western Roman Empire – Causes – Barbarian Invasions

Module VI: Legacy of Rome

Political Ideas – *Pax Romana* – Jurisprudence – Language – Literature – History – Philosophy – Science – Religion – Art – Architecture – Sculpture

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(Elective)

HY 214 C – ARCHAEOLOGY

Module I : Introduction to Archaeology

Definition – Nature – Scope and Value – Relation of Archaeology with other Disciplines – Geology, Anthropology, Chemistry, Botany – Archaeology as a Source of History

Module II : Concepts of Archaeology

Artifacts – Eco facts – Assemblage – Industry – Culture – Civilisation – Typology – Stratigraphy – Site – Cell or ‘Mound’ – Insitu – Layer

Module III : Kinds of Archaeology

Marine Archaeology/Underwater Archaeology – Ethno Archaeology – Salvage Archaeology – Settlement Archaeology – Landscape Archaeology – New Archaeology

Module IV : Archaeology in India

ASI-Alexander Cunningham – Robert Bruce Foote – Fleet and Hultzsch – James Burgess – Sir John Marshall – Daya Ram Sahni – R.D.Banerji – Sir Mortimer Wheeler – Lord Curzon and Ancient Monuments’ Preservation Act, 1904 – H.D. Sankalia – S.R. Rao – Fawcett – Anujan Achan – B.K. Thapar – B.K. Gururaja Rao

Module V : Exploration and Excavation

Site Survey – Map Reading – Magnetic Survey – Photography – Types of Excavation – Trial digging – Vertical Excavation – Horizontal Excavation – Open Stripping – Quadrant Method – Disturbances to the Strata – Data Collection – Preparation of Report – Preservation

Module VI : Dating Techniques

Relative Dating Methods: Typological Method and Stratigraphical Method – Absolute Dating Methods: Radio Carbon Dating – Thermoluminescence Dating – Pollen Analysis – Dendrochronology/Tree Ring Method – Palaeontology – Potassium Argon Dating – Archaeomagnetism – Dating of Bones – Fluorine Method – Nitrogen Method

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SEMESTER II

HY 211 – HISTORICAL METHOD – II

AIM : The paper is intended to familiarize the students with the preliminary terminologies of historical research.

Objectives

- To analyze the different stages of historical research.
- To understand the methods of collection of data and analysis
- To familiarize the students how to write History.

Course Content

Module I: Stages of Research

What is Research – Heuristics – Search for materials – Selection of Topic, Review of Literature – Hypothesis Hermeneutics – External and Internal Criticism – Textual Analysis – Synthesis and Exposition

Module II : Theoretical Application

Historicism – Positivism – Semiotics and Symbols, Signifier & Signified, Structuralism, Deconstruction, Epistemology, Discourse Analysis, Ontology

Module III: Unhealthy Practices

Plagiarism, Regionalism, Casteism, Communalism, Distortion of facts

Module IV: Documentation

Citation : Methods of Citation – Foot Note – End Note

Module V : Philosophy in the Practice of History

Empiricist – Speculative – Analytical

Module VI: Writing a Research Monograph

Preface, Content, Introduction, Chapterization, Conclusion, Bibliography, Appendix, Glossary, Index

{Practical: Students should mandatorily Review One Book analyzing: (a) Method and Methodology used; (b) epistemology/historiographical review; (c) sources utilized and documented;(d) Bibliography and (e) proficiency in communicating the findings of Research.}

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HY 222 – INDIAN HISTORY – II

(India in Transition - Medieval and Pre-Modern Periods - 600- 1700 C.E.)

Aim : The paper introduces the ideas, institutions and movements that emerged in medieval India and their impact.

Objectives

- To unravel the History of India from the medieval period to the pre-modern times.
- To understand the causative factors, course and impact of the external interventions.

Course Content

Module I: Sources and Medieval Social Formations

Sources: – Literary and Epigraphical – Debate on Indian Feudalism

Module II: Foreign Invasions

Arab Invasion of Sind – Turkish Incursions – Sultanate of Delhi – Polity – Idea of Kingship – Society – Economy – Trade – Markets and Cantonments – Agriculture – Land grants – *Iqta* System – Sultanate architecture

Module III: Peninsular India

Bhakti Movement – Chola Imperialism – Local self-government – Bahmani and Vijayanagar empire – Polity – Society – Economy – Schools of architecture – Rashtrakutas, Chalukyas, Pallavas, Cholas

Module IV: Mughal Imperialism

Nature of Mughal State and Sovereignty – Mansabdari system – Mughal Economy – Agriculture – Trade – Jagirdari System – Industries – Mughal Art and Architecture – Painting

Module V: Impact of Islam

Bhakti Movement – Sufism in India – Languages and Literature – Arabic and Persian – Sanskrit – Origin and development of Urdu Language and Literature

Module VI: Marathas & Sikhs

Rise of Marathas – Shivaji – Peshwas – Organization of State and Administration – Sikhism in India – Basic doctrines

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HY 223 - KERALA HISTORY – II

(Social Formations in the Pre Modern Period - From 800 To 1498 C.E)

Aim: The paper introduces the history of the pre-modern Kerala from 800 AD to 1498.

Objectives

- To discuss the nature of Kulasekhara state
- To provide knowledge regarding the society, institutions, political process and culture of the medieval period.
- To understand the transitional phases in social formation.

Course Content

Module I: Perumals of Mahodayapuram

Debates on the Nature of Perumal State – Empire or Kingdom? Elamkulam and MGS – Monarchy with strong centre or Brahmin Oligarchy ? – Chronology

Module II: Society in Transition

Formation of Agrarian Society – Early Agrarian Settlements – Development of Trade – Guilds -Anjuvannam, Manigramam and Nanadesikal – Valanchiyar – Debate on Aryanization – Brahmin settlements – Rise of Temples and Emergence of temple centered society – Alwars and Nayanars – Sankaracharya – Education – *Salais* – Theories on Kollam Era

Module III: Nadus and Changing Policy

Political Disintegration and the rise of local powers in the post Perumal period – Naduvazhis and *Swarupams* – *Kurumatsaram* – *Kuruvazhcha* – Ay Kingdom - *Ezhimala* – *Changatham* – *Sanketham* – *Chathiran* – Political disunity – Valluvanad – Rise of the Zamorin of Calicut – Kolathunad – Arakkal Family

Module IV: Socio-Economic Formations

Further expansion of Agrarian Settlements –Brahmaswam and Devaswam land – The temple's pivotal position in the socio-economic formations – Jenmi System – Emergence of land relations – *Uralar* – *Karalar* – *Adiyalar* – *Paniyalar*

Module V: Customs and Practices

Caste System – Marumakkathayam and *Sambandham* – *Smarthavicharam* – *Mamankam* – *Kalari* – *Chaver* – *Ankam* – Slavery – *Pulappedi* and *Mannappedi* – Devadasi System – Trial by Ordeal – Discriminatory taxes

Module VI: Medieval Culture

Development of Malayalam Language and Literature – Manipravalam Works – Sandesa Kavyas – Ezhuthachan and the *Bhakti* Movement in Literature – Cherussery, Poonthanam and Kunjan Nambiyar – Folk Songs – Northern and Southern Ballads – Philosophy and Science –Ayurveda and other Systems of Medicines – Art, Architecture, Sculpture and

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(Elective)

HY 224 A – GENDER HISTORY WITH SPECIAL REFERENCE TO INDIA

Module I : Introduction to Gender History

Gender – Definition – Major Debates on Women's History – Hegemonic – Subaltern – Marginalised – Readings from Foucault to Judith Butler – New Trends

Module II : Theoretical Framework of Women's History

Methodological and Theoretical Questions – Major Debates over Women's History – Liberal – Marxist – Radical Feminist Streams – Feminist Critique of Historical Knowledge

Module III : Social Reform Initiatives and Women Empowerment in India

Deccan Education Society – Ramakrishna Mission – Arya Samaj – SNDT Women's University – Seva Sadan – Feminist Reading of Reform Movements – Phule – Periyar – Pandita Ramabhai – Women in the National Movement

Module IV: Legislative Measures and Women Empowerment in India

Pro Women Legislations in Colonial India – Hindu Code – Post Independence Women Movement in India – Women and Law – Eco feminism – Violence against Women

Module V : Women of Kerala

Transformation to Nuclear Family – Social Reform Movements – Women's Education – Growth of Political Consciousness – Nationalist Movements – Akkamma Cheriyan – Annie Mascarene – A.V. Kuttimalu Amma – Rosamma Punnoose – Women in Left Movements – K.R. Gowri Amma – K. Ajitha – Women in Environmental Movements – Sugatha Kumari – Rise of Adivasi and Dalit Movements – C.K. Janu – Saleena Prakkanam – Women and Local Self Government

Module VI : Transgenders

Basic Terms – Problems of Transgenders – Legislations – Major Studies – Transgender Support Organisations

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(Elective)

HY 224 B – ARCHIVAL STUDIES

Module I

Origin, Scope and Importance of Archives – Public and Private Archives – Colonial Archives – National and Regional Archives – Kerala State Archives – Film Archives – Music Archives – Ecclesiastical Archives – Ethnographical Archives – Oral History Archives

Module II

History of Archives – Archives in India – The Historical Manuscripts Commission – Indian Historical Records Commission – International Council on Archives

Module III

The Archive as an Institution of Social Memory – Repository of Knowledge – Primary Documents – Published and Unpublished – Documentation – Taxonomy – Objectification – Intellectual Property Rights and Archives

Module IV

Archival Administration – Preservation and Conservation of Records – Filing System of Records – Records Management

Module V

Automation of Archives – Use of Visual Aids – Archives and Electronic Data bases – Metadata

Module VI

Archival Theory – Archives and Society – Archives and Researchers-Archives and Performers – Strategies for Archives – Archives and the Future

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(Elective)

HY 224 C- HISTORY OF MEDIEVAL EUROPE

Module I: Historiography

Christian Historiography – Characteristics-Strength and Weakness-Sextus Julius Africanus – Eusebius – St. Augustine – Gregory of Tours – Venerable Bede

Module II: Fifth Century Europe

Decay of Western Roman Empire – Barbarian Invasions – Visigoths-Ostrogoths – Vandals – Huns – Rise of Christian Church

Module III: Frankish Kingdom

Merovingian and Carolingian Periods – Clovis – Charles Martel – Pepin – Charlemagne – Carolingian Renaissance

Module IV: The Holy Roman Empire

Charlemagne and Pope Leo III – Struggle between the Empire and the Papacy – Gregory VII and Henry IV – Pope Boniface VIII – Edward I and Philip IV – Babylonian Captivity – Great Schism

Module V: Feudalism in Transition

Nature of Feudalism – Castles and Lords – Manorial Villages – Merits – Demerits – Crusades – Nature – Causes – Important Crusades – Failure – Consequences – Monastic Foundations – Benedictine – Carthusian – Cistercian – Franciscan – Dominican – Contributions – Decay of Feudalism – Growth of Cities and Trade Routes – Merchant and Craft Guilds

Module VI: Medieval Legacy

Medieval Art – Architecture – Romanesque – Gothic Styles – Sculpture – Painting – Music – Literature – Canon Law – Medieval Universities – Scholasticism – Science

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SEMESTER : III

HY 231 - ISSUES IN HISTORIOGRAPHY

AIM : The paper intends to highlight the major trends and issues in historiography

Objectives

- To familiarize various schools of thought in Historiography
- To understand approaches to History
- To know recent trends and problems in Historiography

Course Content

Module I: Beginnings of Historical Consciousness

Greek historiography – Herodotus and Thucydides – Roman Historiography – Polybius, Livy and Tacitus – Chinese historiography – Su-ma-Chien and Records of the Grand Historian

Module II : Historical Consciousness Taking a Different Turn

Medieval historiography – Features of Church historiography – Arab historiography – Ibn Khaldun and the Science of Culture – St. Augustine

Module III: Impact of Scientific Revolution

Francis Bacon – Descarte and Cartesianism – Anti-Cartesianism and Giambattista Vico – Enlightenment historiography – Edward Gibbon, Voltaire, David Hume

Module IV: Modern Historiography- Philosophy of History

George Wilhelm Friedrich Hegel – Positivism and Auguste Comte – Critique of Positivism – Leopold Von Ranke – Thomas Carlyle, Oswald Spengler, Arnold J Toynbee

Module V : Approaches To History

Marxist Historiography – Changing Functions of Historical Materialism – From Philosophy to Practice – Marx's Epistemology – Annales School – Marc Bloch, Lucien Febvre – Fernand Braudel – Subaltern School – Antonio Gramsci

Module VI: Historical Consciousness Refigured

Gender History – Black History – Oral History – Micro History – Local history – Post-modern Challenge – Michael Foucault – Jacques Derrida – Lyotard – Baudrillard – Critique of Post modernism – Historiography and Post-modernism – Radical History and Hayden White – New Cultural History – Critical modernity – Edward Said –Orientalism– Post Colonialism – Gayathri Chakrvorty Spivak

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HY 232 - INDIAN HISTORY- III

(Colonialism and Indian Responses - From 1701 to 1947 C.E.)

Aim : To familiarise the ideologies of colonialism and nationalism, their reflection on Indian society.

Objectives

- To furnish the nature and method of colonial intervention.
- To expose the factors leading to the emergence of national movement.

Course Contents

Module I: Colonial Policies and Early Resistance

Administration – Economic Policies – Agrarian Settlements – Commercialization of Agriculture – Impact on indigenous crafts and Industries – Drain of wealth – Deindustrialization or Development ? – Famine – Marx on India – Early Resistance Movements – Revolt of 1857 – Interpretations

Module II: Colonial Modernity

British Social Legislations – Creation of a Public Sphere – Reform Movements – limitations – Women's movements – Emancipatory or strengthening of tradition ?

Module III: Political Awakening

Theories regarding the formation of Indian National Congress – Evaluation of the work of Moderates – Partition of Bengal and the Swadeshi Movement – Ideological basis of Extremism

– Government of India Act, 1909 – Impact of the First World War – Home Rule Movement – Annie Besant and Tilak – Government of India Act, 1919

Module IV: Gandhian Interventions in the Struggle for Freedom

Early Struggles of Gandhi – Gandhian ideology – Non Co-operation and Khilafat movements – Swarajist Party – Simon Commission – Nehru Report – Civil Disobedience Movement – Gandhiji and Ambedkar Debate – Communal Award and Poona Pact – Government of India Act, 1935

Module V: Growth of Radical Trends

Revolutionary terrorism in India and abroad – The Communist Party of India and Congress Socialist Party – Trade Union Movements – All India Kisan Sabha and Peasant Movements

Module VI: Towards Independence

Impact of Second World War – Cripps Mission – Quit India Movement – Subhash Chandra Bose and INA – Cabinet Mission – RIN Mutiny – Mountbatten Plan – Growth of Communalism – Theoretical Debate – Two Nation Theory – Partition – Transfer of Power

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HY 233 - KERALA HISTORY –III

(Colonialism and Nationalism - From 1498 To 1956 C.E)

Aim: The paper historically analyses the mode of colonial expansion in the state of Kerala from 1498 to 1956.

Objectives

- To understand the process of colonial expansion and consolidation in Kerala
- To explain the genesis and growth of resistance against colonialism
- To trace the rise and spread of socio-economic changes
- To explore the beginning of nationalism in Malabar.
- To estimate the political awakening in Travancore and Cochin.

Course Contents

Module I: Colonial Relations and Consolidation in Kerala

Expansion of commercial crops cultivation – Growth of craft production – Inland trade – Maritime trade – Arab trade and Chinese trade – Growth of New trade centers – Rise of towns – Monetization and trade – Portuguese and Dutch – Relations with native rulers – Trade and settlements - Marthanda Varma and the rise of Travancore – Early English and French factories and trade relations – Channels of trade and flow of wealth – Invasions of Hyder Ali and Tipu Sultan- Socio – Economic and Cultural Impact – Debates on Mysorean Intervention – Saktan Thampuran and the rise of Cochin

Module II: Resistance Movements

Attingal Revolt – Revolt of the Patinjare Kovilakam Rajas – Revolt of Velu Thampi and Paliyath Achan – Nair Brigade and Carnatic Brigade – Quilon Conspiracy – Kurichya Revolt – 19th Century Mappila Uprising – Nature of Early Resistance Movements

Module III: Beginnings of Socio-Economic Changes

The British Land Revenue Administration in Malabar – Pandarappattam Proclamation and Jenmi Kudiyan Regulation in Travancore – The Situation in the Cochin State – Changes in the Agrarian Relations – Evangelist and Educational Activities of Christian Missionaries – Role of Printing Press – Social Legislations in Travancore and Cochin – Abolition of *Uzhiyam* – Abolition of *Devadasi* System and *Marumakkathayam*

Module IV: Socio-Religious Reform Movements

Factors responsible for the rise of Socio-Religious Reform Movements – Upper Cloth Agitation *Kallumala* Agitation – Temple Entry Movements – Vaikom – Guruvayur – Impact of Socio -Religious Reform Movements

Module V: National Movement in Malabar

National Movement in Malabar – Genesis of political awakening – Home Rule League – Khilafat – Non-Co-operation Movement – Malabar Rebellion of 1921 and its Nature – Civil

Disobedience Movement – Role of Women – Working Class and Peasant Movements – Congress Socialist Party – Communist party – Quit India Movement – Kayyur – Karivallur

Module VI: Political Awakening in Cochin and Travancore

Emergence of Political Consciousness in Travancore – Era of Memorials – Political journalism – Civic Rights League – Nivarthana Agitation – Travancore State Congress and the Struggle for Responsible Government – Role of Women in freedom movement – Annie Mascarene and Akkamma Cheriyan – Political unrest – C.P. Ramaswami Iyer – Punnappa Vayalar Revolt – Aikya Kerala Movement – Early Political Agitations in Cochin – Activities of Cochin State Praja Mandal – Responsible Government in Cochin

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(Elective)

HY234 A- MODERN REVOLUTIONS - ENGLISH, AMERICAN AND FRENCH

Module I:

Background of English Revolution – Struggle between the King and the Parliament – The Restoration Settlement, 1660 – Emergence of Mercantile Class – Decline of Feudalism

Module II

Glorious Revolution, 1688 – Bill of Rights, 1689 – Constitutional Monarchy

Module III

Establishment of British Colonies in America – The American War of Independence – Mercantile Policy – Resistance by the Colonists – Intellectual Background – Treaty of Paris

Module IV

Significance of American War of Independence – Philadelphia Convention – Federal Constitution

Module V

The French Revolution – Background – Social Stratification – The Bourgeoisie – Intellectuals – Rousseau – Voltaire – Montesquieu – Fall of Bastille – National Assembly – Fall of Monarchy

Module VI

Consequences of the French Revolution – Nature – Significance – Republican Constitution

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(Elective)

HY 234 B-MODERN EUROPE 1789-1914

Module I

Socio Economic and Intellectual Background of Europe – French Revolution-Napoleon Bonaparte – Congress of Vienna – The Concert of Europe – The Third French Republic

Module II

Unification of Germany – Nationalism – State Building – William I and Prussia – Rise of Bismarck – Franco Prussian War

Module III

Unification of Italy – Mazzini – Garibaldi – Victor Emmanuel II – Count Cavour – Annexationist Movement – Completion of the Union – Industrialisation

Module IV

Revolutions of 1848 – Era of Metternich – Great Britain and Colonialism – Resurgent Imperialism – Exploitation of the New World – Tribute from Asian Conquests

Module V

Rise of Russia – Modern Industrialisation – Repression – Revolution of 1905 – The Austro Hungarian Monarchy – Magyarism in Hungary

Module VI

The Eastern Question – Turkey and the Balkans

References:

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(Elective)

HY 234 C-THE RISE OF MODERN CHINA

Module I: The Revolution of 1911

Background – Decay of Monarchy – Nationalism– Revolutionary Movements – Tung Meng Hui-Sun Yat Sen – Canton Uprisings – Republic of China – Yuan Shih Kai – Campaign for Constitutional Government – Impact of First World War

Module II: The Revolutionary Movements in China

Impact of the Russian Revolution – The May 4th Movement – Formation of Chinese Communist Party – War Lord Era – Working Class Movements – The First Revolutionary Civil War – Shanghai Uprising – Kuomintang Party and Chiang Kai Shek – The Second Revolutionary Civil War – Agrarian Uprisings – The Long March of the Red Army – The Japanese Invasion and the People's Resistance

Module III: The Birth of the People's Republic

The Communist Victory in the Struggle against Kuomintang – Role of Mao Tse Tung – New Democracy – Formation of the People's Republic

Module IV: China under Mao Tse Tung (1949-1976)

Era of Mao-Policies – Great Leap Forward – Cultural Revolution – Impact

Module V: China as a World Power

Deng Xiao Ping – Change of Policies – Special Economic Zones – Industrial and Military Giant

Module VI: China and Globalisation

Economic Shifts – Growth of GDP – Member of WTO – China and International Organisations– Emerging Super Power

References:

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SEMESTER : IV

HY 241 - INDIAN HISTORIOGRAPHY

AIM : The paper aims at a critical study of the development of analytical skills and accumulation of significant knowledge about Indian historiography in its variegated perspectives.

Objectives

- To trace the evolution of Indian historiography.
- To understand the paradigm shift in Indian historiography.
- To emphasis the scope and importance of Indian historiography in the realm of main stream historiography.

Course Contents

Module I: Ancient Historiography

Debate on Historical Consciousness in ancient India – Vedic – *Ithihasa- Purana* Tradition – *Charithas* : Harsha Charitha - *Kavyas* : Athula and Mushakavamsakavya – *Prasasthis* – *Gadhas* – Buddhist and Jain Literature – Kalhana and Rajatharangini

Module II: Medieval Historiography

Sultanate historiography – Ziauddin Barani – Al-Biruni – Arab travel accounts – Mughal historiography – Abul Fazal – Abdul Faizi – Babur – Autobiography and biographies – Memoires – Chronicles – Travel accounts.

Module III: Colonial Historiography

Indology/ Orientalism – William Jones – Max Muller – James Princep – Charles Wilkins – Utilitarianism and James Mill – Evangelicals and Charles Grant – Imperialist/ Administrative historians – Vincent Smith – New Cambridge Historiography

Module IV: Nationalist Historiography

Nationalist approach – K.P. Jayaswal – R.G. Bhandarkar – R.K. Mukherjee – R.C. Majumdar – J.N. Sankar – K.A. Nilakanta Sastri – Economic Critique of Colonialism – Dadabai Naoroji – R.C. Dutt

Module V: Marxist Historiography

M.N Roy – R.P. Dutt – D.D. Kosambi – R.S. Sharma – D.N. Jha – Romila Thapar – R. Champakalakshmi – Muhammed Habib – Irfan Habib – Sathish Chandra – A.R. Desai – Bipan Chandra – Sumit Sarkar – K.N. Panikker - S. Gopal

Module VI: Paradigm shifts in Historiography

History from below – Ranajith Guha and Subaltern Studies – Partha Chatterji, Shahid Amin – Dipesh Chakravarthi – Gyanendra Pandey – Gayathri Chakravarthi Spivak – Recent Trends – Gender – Uma Chakravarthi – Environmental History – Ramachandra Guha – Madav Gadgil – Dalit – Kancha Ilaiah

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HY 242 - INDIAN HISTORY – IV

(Contemporary India)

Aim: The paper intends to familiarize the history of India since independence.

Objectives

- To understand the process of ‘nation in the making’.
- To familiarize the historical developments that occurred in India since Independence.
- To understand the contemporary issues.

Course Content

Module I: Post Independent Era

Problem of Integration – Sardar Vallabhai Patel – B.R.Ambedkar and framing of Indian Constitution – Linguistic Reorganization of States – The Tribal Problems

Module II: Indian Politics in Transition

Age of Nehru – From Lal Bahadur Shastri to Indira Gandhi – J.P. Movement and Emergency – The Janata Interregnum – Rajiv Gandhi and V.P.Singh – Indian Political scenario since 1990

Module III: Foreign Policy of India

Evolution – Non Alignment – India and International organizations – UNO, Commonwealth, SAARC, BRICS – India and her neighbours – Cooperation and conflict – Trade and Commerce – Sino Indian conflict of 1962 – Indo-Pak Wars of 1965 and 1971 – Shift in India’s Foreign Policy since 1990

Module IV: Transition of Economy and Scientific Developments

Indian Economy: The Nehruvian Legacy – Assessment of Five Year Plans – Niti Aayog – Mixed Economy – Panchayati Raj – Land reforms – Zamindari Abolition and Tenancy reforms – Ceiling and the Bhoodan Movement – Green Revolution – White Revolution – Liberalization and Globalization on Indian Economy – Impact – Present Scenario – India’s Defence Industry and Scientific Developments

Module V: Assimilation, Marginalisation and Conflict

Minorities and depressed communities – Anti-caste and Dalit movement – Question of Reservation – Anti Mandal Agitation – Land Question – Maoists – Environmental Movements – Chipko – Narmada Bachchao Andolan – Farmers Movement

Module VI: Contemporary Culture – Forms of Expression

Print and Electronic Media – Liberal and Performing arts – Social Media – Pros and Cons

References:

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HY 243 - KERALA HISTORY –IV

(Contemporary Period - From 1956 To 2019 C.E)

Aim: The paper covers the contemporary history of Kerala.

Objectives

- To examine the problems of new social movements, development politics, social exclusion and environmental issues.
- To introduce contemporary debates on selected issues
- To review the problems and prospects of Kerala Economy, Education and Health.
- To explore the challenges of women, Dalit and other marginalized sections.
- To attempt a critical assessment of Kerala Model of Development.

Course Content

Module-I: Formation of Kerala State – Communist Ministry

Progressive Legislations – Agrarian Relations Bill – Education Bill – Administrative Reforms Committee Report – Liberation Struggle – Dismissal of Ministry – Coalition Governments and Political Experiments – *Saptamunnani* – Emergence of Regional parties.

Module II: Kerala Economy

Land reform legislations and land ceiling – End of feudalism – Redistribution of surplus land – Forest land and grant of title deeds to the possessors – Tribal land and legislation – Plantations and Investment of Capital – Transformation of agriculture – Changes in land use pattern – Current problems in the agricultural sector – Traditional industries – Public sector undertakings and investment of capital by the central and state Governments – Gulf Migration and its impact – Private enterprise – Impact of economic liberalization – Industrial relations and trade unions

Module III: Education, Health

Growth of education – Education policies – School education – Higher education and technical education – Universities – The Kerala State Higher Education Council – Functions – Institutions of higher learning – Quality – Education reports of Government Agencies on education – Literacy movement – *Grandhasala Prasthanam* – The public health sector – Low mortality and high morbidity – Rural dispensaries and public health awareness – The private health care sector – Kerala health scenario – Health Tourism

Module IV: Women, Dalits and other Marginalized Sections

Women and their Rights – Transgressions on Women Rights – Violence against Women – Women's Movements – Issues of Transgender – Adivasis – Land Question – Muthanga and Chengara – Dalit Movements – Fisher Folk and their problems.

Module-V: Popular Movements

Co-operative Movement – Peoples Science Movement – Protection of environment – Silent Valley – Endosulphan – Plachimada – Vilappil Sala – Alappadu – Peringamala – Waste disposal Management

Module VI: Towards a new Society

Globalization – Impact – Social Media – Use and Abuse – Kerala Model Debate – Paradigm and Parameters – Problems – Flood of 2018 and popular response – *Nava Kerala Nirmithi* – Relevance of Disaster Management

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(Elective)

HY-244 A - ENVIRONMENTAL HISTORY OF INDIA

Module I

Global Trends in Environmental History – Approaches to Indian Environmental History – Colonial and Post Colonial Historiography – Debate over the Emergence of Environmentalism – Scope of Environmental History

Module II

Environmental Approach to Pre historic Studies – Pre Colonial Attitudes towards Environment – Four Modes of Resource Use (Gadgil-Guha Framework) – Emergence of Empires and Assertion of State Monopoly – The Mauryas – The Guptas – The Mughals – Royal Hunting – Preservation of Forests

Module III

Colonialism as a watershed in Indian Environmental History – The question of Deforestation – Impact of Ship Building Industry, Railways and World Wars on the Forests – Forest Legislations – Botanical Gardens and Plant Transfer – Ecological Imperialism – Contestations over Forests – Jhum Cultivation – Tribal Protest and Resistance

Module IV: Post Colonial Scenario – Industrialisation Drive – Hydro Electric Projects, Dams, Mines – Deforestation and Pollution – Dehabitation – Development vs Deprivation – Emergence of Environmental Movements – Chipko – Narmada Bachao Andolan – Women and Environmental Movements

Module V: Sustainable Development – Using Sustainable Energy – Creating Eco friendly Habitats – Laurie Baker, a Kerala Experience – Pros and Cons of Sustainable Environment

Module VI: Environmental Disasters – Recent Floods – Disaster Management in India – Global Warming – Impact

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(Elective)

HY 244 B- CONTEMPORARY HISTORY OF THE WORLD

Module I: New Imperialism

Theories- Stages – Scramble for Colonies and International Crises – The World War of 1914-18 and Consequences – The October Revolution of Russia – Its Legacy – The Rise of Dictatorships – Nazism – Fascism – Outbreak of Second World War – Repercussions

Module II: The Cold War

Post War Diplomacy – Soviet Union and the Socialist Bloc – Emergence of US Imperialism – Ideological Conflicts – The Nuclear Arms Race and Efforts to Control Proliferation – Intervention of the UN

Module III: National Liberation Movements in Asia and Africa

Decolonisation Concept – Process of Decolonisation – South Africa and Fight against Apartheid – Nelson Mandela – Non Aligned Movement

Module IV: Disintegration of the Socialist Bloc

Developments in Eastern Europe – *Glasnost and Perestroika* – Fall of Soviet Union – End of the Cold War – Détente – Unipolar World and Counter Currents

Module V: New Architecture of Power

Neo Liberalism – Globalisation – Clash of Civilisations – Poverty and Global Discontentment – Emergence of Asia

Module VI: Problems of Ethnic Nationalism

Terrorism – Ecological Movements – International Trade Agreements

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(Elective)

HY 244C- TWENTIETH CENTURY REVOLUTIONS

Module I

The Russian Revolution – Causes - Czarist Regime – Russian Society – Working Class Movements – Entry of New Ideas – Marxism, Nihilism, Anarchism – Revolution of 1905 – Mensheviks and Bolsheviks – Provisional Government – Alexander Kerensky – Triumph of Bolshevism

Module II

Leaders of the Russian Revolution – Vladimir Lenin – Soviet Constitution – War Communism – New Economic Policy – Results and Significance of Russian Revolution

Module III

The Chinese Revolution of 1911 – Decay of Manchu Monarchy – Rise of Nationalism – Revolutionary Movements – Sun Yat Sen – Three Principles – Republic of China – Yuan Shih Kai – Impact of First World War

Module IV

Revolution of 1949 in China – Impact of Russian Revolution in China – The May 4th Movement – Rise of Communist Party – Strengthening of Kuomintang Party under Chiang Kai Shek – Civil War – Long March and Red Army – Japanese Invasion – United Front – Triumph of the Communists – Establishment of the People's Republic of China – Character of Chinese Communism

Module V: The Cuban Revolution – Background and Causes – Revolutionary Movements – Che Guevara – Fidel Castro – US Intervention – International Reactions – Triumph of Cuban Communism

Module VI: The Vietnamese Revolution – Indo China and French Colonialism – Growth of Capitalism – Revolutionary Movements – Communist Party and Ho Chi Minh – Geneva Accords – US Interventions – Unification and Reconstruction

References:

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UNIVERSITY OF KERALA

(Abstract)

M.A Degree Programme in Political Science – Revised Scheme & Syllabus for affiliated colleges and SDE with effect from 2020 admissions – Approved – Orders issued

AC A II

3446/2020/UOK

Dated: 04.11.2020

*Read:-*1. .U.O.No.Ac.AII/2/31968/M.A.Political Science/2013 dated 27.06.2013

2.Item no IV.G.I of the Minutes of the meeting of the Faculty of Science held on 13th August , 2020

3.Item no II.viii of the Minutes of the meeting of the Academic Council held on 27th August , 2020

ORDER

The syllabus of M.A Degree Programme in Political Science had been revised as per U.O read as (1) above.

The Academic Council vide paper read as (3) above approved the revised scheme and syllabus of M.A Degree Programme in Political Science for affiliated colleges and SDE, as recommended by the Board of Studies in Political Science(PG) and as endorsed by the Faculty of Social Sciences vide paper read as (2) above.

The revised syllabus will come into effect from 2020 admissions onwards.

A copy of the syllabus is appended.

Orders are issued accordingly.

ANITHA D

DEPUTY REGISTRAR
For REGISTRAR

To

- 1) PS to VC/PVC
- 2) PA to Registrar/CE
- 3) The Dean, Faculty of Social Sciences
- 4) The Chairman, BoS in Political Science (PG)
- 5) Principals of the colleges offering MA Political Science
- 6) The Director, Computer Center/SDE
- 7) JR(Acad)/JR(Exams II)
- 8) DR(Acad)/DR(Exams IV)/DR (EB & MNC)
- 9) AR(Acad)/AR(PG Semester) /AR (EB)
- 10) IT Cell/Ac.H
- 11) Academic sections, SDE
- 12) Tabulation sections,Concerned

- 13) Librarian, University Library,Tvpm/Kvtm
- 14) PRO/RO/Enquiry
- 15) Stock File/File Copy

Forwarded / By Order

Sd/-

Section Officer

M.A. POLITICAL SCIENCE SYLLABUS

**FOR
AFFILIATED COLLEGES & SDE
2020-21**



**UNIVERSITY OF KERALA
THIRUVANANTHAPURAM**



UNIVERSITY OF KERALA
MA POLITICAL SCIENCE SYLLABUS
FOR AFFILIATED COLLEGES & SDE 2020-21

SEMESTER I

CORE PAPERS

- POL C-1-1. Modern Western Political Thought
- POL C-1-2. State and Society in Kerala
- POL C-1-3. Indian Government & Politics

ELECTIVES

- POL E-1-1. U.N & World Peace
- POL E-1-2. Public Policy Analysis
- POL E-1-3. Political Theory: Marxian Tradition
- POL E-1-4. Financial Administration

SEMESTER II

CORE PAPERS

- POL C-2-1. Comparative Politics
- POL C-2-2. Theories and Concepts of Public Administration
- POL C-2-3. Theories and Concepts of International Politics

ELECTIVES

- POL E-2-1. Politics of Social Justice in India
- POL E-2-2. Contemporary West Asian Politics
- POL E-2-3. Human Resource Management
- POL E-2-4. Gender Politics
- POL E-2-5. Theories of Democracy

SEMESTER III

CORE PAPERS

- POL C-3-1. Research Methods in Political Studies
- POL C-3-2. Contemporary Political Theory
- POL C-3-3. Issues in Indian Politics

ELECTIVE

- POL E-3-1. Human Rights in India
- POL E-3-2. India's Foreign Policy
- POL E-3-3. Development Administration and Rural Development
- POL E-3-4. Comparative Federalism

SEMESTER IV

CORE PAPERS

- POL C-4-1. Indian Political Thought
- POL C-4-2. Environment, Development and Politics
- POL C-4-3. Issues in International Politics

ELECTIVES

- POL E-4-1. New Social Movements
- POL E-4-2. International Political Economy
- POL E-4-3. Indian Administration
- POL E-4-4. Politics of Globalization
- POL E-4-5. Politics of South Asia

SEMESTER: I (CORE)

COURSE CODE: POL C-1-1

COURSE TITLE: MODERN WESTERN POLITICAL THOUGHT

CREDITS: 4

AIM:

Western political thought has a foundational role in the evolution of the discipline in its current form. The course aims at making students familiar with the foundational ideas and thinkers in Western political thought.

OBJECTIVES:

The course should familiarise the students with the classics in political philosophy. Students should gain interest and ability to read and interpret the works of classical thinkers along with the context in which they have written.

The course has the prime objective of enabling the student to realise the manner in which the ideas of these thinkers influenced the development of the discipline and their significance in modern human history.

Students should also be made to explore how ideas of thinkers translate into the political practice in the form of institutions and political action.

COURSE CONTENT

UNIT I. Origin and Context of Modern Political Thought

Machiavelli: Theory of Government, Double Morality.

UNIT II. Social Contract Tradition

Hobbes: Political Absolutism.

Locke: Double Contract, Political Obligation.

Rousseau: Human Nature, General Will.

UNIT III. Utilitarianism

Bentham: Quantitative Utilitarianism.

J.S. Mill: Revision of Quantitative Utilitarianism, On Liberty.

Democracy and Representative Government.

UNIT IV. Idealistic and Conservative Tradition

Immanuel Kant: Critique of Pure Reason.

Hegel: Dialectics, Theory of State, Theory of Alienation.

Edmund Burke: Modern Conservatism, Critique of French Revolution.

UNIT V. Marxian Tradition

Karl Marx: Dialectical Materialism, Historical Materialism,

Critique of Political Economy, Theory of Alienation.

Lenin: Theory of Imperialism, Vanguard role of the Party

Reading list

Bevir Mark (ed.) (2010) *Encyclopedia of Political Theory*, London, Sage.

Bidet Jacques and Stathis Kouvelakis (eds.) (2008) *Critical Companion to Contemporary Marxism*, Boston, Brill.

Boucher David and Paul Kelly (eds.) (2003) *Political Thinkers: From Socrates to the Present*, New York, OUP.

Brian Nelson R. (2013) *Western Political Thoughts: From Socrates to the Age of Ideology*, Delhi, Pearson.

Cohen Martin (2001) *Political Philosophy: From Plato to Mao*, London, Pluto.

Ebenstein William and Alan O. Ebenstein (1991) *Great Political Thinkers: Plato to the Present*, Fort Worth, Harcourt College Publishers.

Gauthier David P. (2000) *The Logic of Leviathan: The Moral and Political Theory of Thomas Hobbes*, Oxford, OUP.

Haywood Andrew (2004) *Political Theory: An Introduction*, London, Palgrave Macmillan.

Matravers Derek and John Pike (eds.) (2003) *Debates in Contemporary Philosophy: An Anthology*, London, Routledge.

Miskelly Matthew and Jaime Noce (eds.) (2002) *Political Theories for Students*, Farmington Hills: Gale Group Inc.

Plant Raymond (1991) *Modern Political Thought*, London, Blackwell.

Sabine G.H. (1968) *A History of Political Theory*, New Delhi, Oxford.

Schmitt Carl (1996) *The Leviathan in the State Theory of Thomas Hobbes*, London, Greenwood Press.

Simmons John (1992) *The Lockean Theory of Rights*, Princeton: Princeton University Press.

Skinner Quentin (2002) *The Foundations of Modern Political Thought (Vol. 1, The Renaissance)*, Cambridge, Cambridge University Press.

Sparks Chris and Stuart Isaacs (2004) *Political Theorists in Context*, London, Routledge.

Stephon K. White (2002) "Pluralism, Platitudes, and Paradoxes: Fifty Years of Western Political Thought", *Political Theory*, Vol.30 No.4, August 2002, pp.472-481.

Volin Sheldon S. (2004) *Politics and Vision: Continuity And Innovation in Western Thought*, Princeton, Princeton University Press.

White Michael J. (2003) *Political Philosophy: An Historical Introduction*, Oxford, One World Publications.

SEMESTER: I (CORE)

COURSE CODE: POL C-1-2

COURSE TITLE: STATE AND SOCIETY IN KERALA

CREDITS: 4

AIM:

The course aims at enabling the student to have a deep knowledge of the history and politics of Kerala.

OBJECTIVES:

The student should develop a keen interest in the history and politics of modern kerala. It is expected that it will enable the student to analyse the politics of her immediate surroundings.

The course should prompt the student to explore the diverse debates about the development trajectory followed by Kerala.

The course should enable the student to go through the works of political thinkers and reformers who has contributed to the emergence of the present day Kerala society.

COURSE CONTENT

UNIT. I. Historical Background

Traditional Society, Economy and Power structure

Impact of Colonialism

Life and Ideas of Social Reformers and thinkers: Ayya Guru, VaikundaSwamikal,

SreeNarayana Guru, Chattambi Swamikal, Ayyankali, V.T.Bhattathiripad,

Pandit Karuppan, Vakkom Abdul Khader Maulavi, K. Damodaran.

UNIT.II. Political Movements

Malayali Memorial

Press Freedom (Swadeshabhimani Ramakrishna Pillai)

Civil Rights Movement

Struggle for Responsible Government in Travancore and Cochin

National Movement in Malabar

Peasant and Trade Union Movements

Socialist and Communist Movements

UNIT III. Institutions and the Democratic Process

Movement for *Aikya Keralam*
 Nationality Question and Class-Caste Analysis of E M S Namboothiripad
 Evolution of Legislature, Executive and Civil Service
 Land Reforms and socio-economic changes
 Kerala Model of Development
 Panchayat Raj experiment and People's Planning

UNIT IV. Issues in State Politics

Coalition Politics
 Interest groups and Pressure Groups
 Marginalisation and Social Exclusion: Women, Dalit, Adivasi and
 Environmental Movements.

UNIT.V. Disquieting Trends in Kerala Politics

Communalism/Casteism
 Mafia politics
 Corruption

Reading List

Balakrishnan Nair A. (1994) *The Government and Politics of Kerala*, Thiruvananthapuram.
 Chandrika C.S. (1998) *Keralathile Sthree Munneettangalude Charithram* (Mal.), Kerala Sahithya Academy, Thrissur.
 Das Jaya Deva (1983) *Working Class Politics in Kerala*, Lily Publishers, Trivandrum.
 EMS Namboodiripad, (2008) *Kerala Charithravum Samskaravum Oru Marxist Veekshanam* (Mal.) Chintha Publishers, Thiruvananthapuram.
 Gangadharan M. (2007) *Sthree Avastha Keralathil* (Mal.) Sign Books, Thiruvananthapuram.
 Gopa Kumar G. (1984) *Congress Party and State Politics*, Delhi, Deep and Deep.
 Gopa Kumar G. (1986) *Regional Political Parties and State Politics*, Deep and Deep, Delhi.
 Gopa Kumar G. (ed.) (2008) *Gulf Return Migration and Dilemmas of Rehabilitation*, Icon, New Delhi.
 Jeffrey Robin (1976) *The Decline of Nair Dominance: Society and Politics in Travancore, 1848-1908*, Vikas, New Delhi.
 John John P. (1983) *Coalition Governments in Kerala*, Thiruvananthapuram, The Kerala Academy of Political Science.
 Jose Chander N. (1981) *Legislative Process in Kerala*, Trivandrum, The Kerala Academy of Political Science.
 Kusuman K. K. (1976) *The Abstention Movement*, The Kerala Historical Society, Trivandrum, Kerala History Association.

- Menon P.K.K. (1970) *The History of Freedom Movement in Kerala, (Vol.I)* , The Regional Records Survey Committee Kerala State, Thiruvananthapuram.
- Menon P.K.K. (1972) *The History of Freedom Movement in Kerala, (Vol.II)*, The Regional Records Survey Committee, Kerala State, Thiruvananthapuram.
- Nossiter T. J. (1988) *Marxist State Governments in Kerala*, Pointer Publishers, London.
- Oommen M.A. (ed.) (1999) *Kerala's Development Experience*, Concept, New Delhi. K. N. Panicker (1989) *Against Lord and State: Religion and Peasant Uprisings in Malabar (1936-42)*, New Delhi, Oxford.
- Osella Filippo ,and Carolena Osella (2000) *Social Mobility in Kerala: Modernity and Identity in Conflict*, Pluto, London.
- Prabash J.(2000) *Affirmative Action*, Anmol, Delhi.
- Prakash B.A. (2004) *Kerala's Economic Development: Performance and Problems in the Post – Liberalisation Period*, New Delhi, Sage.
- Radhakrishna Kurup (2004) *Politics of Congress Factionalism in Kerala Since 1982*, New Delhi, Kalpaz.
- Ramakrishnan Nair R. (1982) *The Middle Class in Kerala*, Thiruvananthapuram, The Kerala Academy of Political Science.
- Raman Pillai, K. (ed.) (2000) *Kerala Rashtriyathinte Andhardharakal (Mal.)*, Thiruvananthapuram, Kerala Bhasha Institute.
- Raman Pillai. K. (2010) *Land Reforms*, APH, New Delhi.
- Shah Gyanashyam (1994) *Dalit Movement Today: Politics of Dalit Movement from Direct Action to Pressure Group*, Mumbai, Vikas Adhyayan Kendra.
- Somarajan C.N. (1992) *Movement for Aikya Kerala*, S.N. Publishing House, Kollam.
- Somarajan, C. N. (1990) *Pressure Groups and Democratic Politics*, S.N. Publishing House, Kollam.
- Somarajan C.N. (1990) *Aspects of Kerala Society and Politics*. S.N. Publishing House, Kollam.
- Sreedhara Menon (1993) *Kerala Charithram (Mal)* Kottayam, SPSS.
- Sreedhara Menon (1978) *A Cultural Heritage of Kerala: An Introduction*, Trivandrum, S. Viswanathan.
- Sreedhara Menon (1994) *A Survey of Kerala History*, Trivandrum, S. Viswanathan.
- Sukumaran Nair V.K. (1965) *State and Society in Kerala*, Thiruvananthapuram, The Kerala Academy of Political Science.
- Suresh Kumar R. K. and Suresh Kumar P. (2007) (eds.) *Governance and Development: Lessons and Experiences of Kerala*, New Delhi APH.
- Suresh Kumar, R.K. and Suresh Kumar P. (2009) *Development, Politics and Society: Left Politics in Kerala- A Disinterested Perspective*, New Delhi, APH.
- Vijayan Abraham (1994) *Caste, Class and Agrarian Relation in Kerala*, Reliance, New Delhi.

SEMESTER	: I (CORE)
COURSE CODE	: POL C-1-3
COURSE TITLE	: INDIAN GOVERNMENT AND POLITICS
CREDITS	4

AIM:

Teaching politics in a country has to be grounded in understanding and analysis of politics of the country concerned. Thus, this paper seeks to introduce students the key institutions and processes of governance in India.

OBJECTIVES:

Students would be encouraged to make a meticulous reading of the Constitution, its socio-ideological base, the manner in which state- society relationship is structured, the nature of state power and the manner in which it is allocated between the Centre-State and Urban and Rural Local bodies. The students will also be exposed to the judicial process, particularly the way in which the higher judiciary seeks to protect the Constitution from legislative and executive encroachment and the resultant tension between these institutions.

COURSE CONTENT**UNIT I. Ideological Base of Indian Constitution**

Constituent Assembly: Nature of Constitutional debate

Preamble: Philosophy – Significance, Basic Structure Doctrine

UNIT II. Rights and Judicial Intervention

Fundamental Rights and Directive Principles of State Policy- Political and Jurisprudential Dimensions- Fundamental Duties

UNIT III. Rule Making Process and Federal Process

Structure and Process: Legislature, Executive, Amendment procedure

Nature of Federation – Constitutional Provisions – Contentious Areas (Article 202,256, 257, 352, 356, 360) and issues in Centre- State Relations –Issues of state autonomy

Committees on Centre State Relations.

Changing nature of Centre State relations in the context of Globalisation

UNIT IV. Judicial Process in India

Structure of the Judiciary

Judiciary and Social change: Problems and Prospects- Judicial Review, Judicial Activism, PIL, Independent v/s Committed Judiciary, Judicial Reforms

UNIT V. Grass roots Level Democracy

Constitutional Provisions – 73rd and 74th Amendments- Participatory Democracy

Reading List

- Arora, Balveer and Douglas Verney (eds.) (1995) Multiple Identities in a Single State: Indian Federalism in Comparative Perspective, Delhi, Konark.
- Austin Granville (1999) The Indian Constitution: Corner Stone of a Nation, Oxford, OUP.
- Austin Granville (2000) Working of a Democratic Constitution, Delhi, Oxford.
- Bakshi P.N. (2008) The Constitution of India, Allahabad, Law Publishers.
- Basu D.D. (1981) The Shorter Constitution of India, New Delhi, Prentice-Hall of India.
- Basu D.D. (2000) An Introduction to the Constitution of India, Nagpur, Wadhwa.
- BaxiUpendra (1982) The Crisis of Indian Legal System, New Delhi, Vikas.
- GuhaRamachandra (2007) India After Gandhi: The History of the Words's Largest Democracy, London, Macmillan.
- Jain M.P. (2008) Indian Constitutional Law, Delhi, Butterworths.
- Jalal Ayesha (1995) Democracy and Authoritarianism in South Asia: A Contemporary Historical
- JayalNirajaGopal (ed.) (2001) Democracy in India, New Delhi: OUP.
- Jones Morris (1964) The Government and Politics of India, London, Hutchinson University Library.
- KavirajSudipta (1997) Politics in India, Calcutta, OUP.
- Kohli, Atul (ed.) (1988) India's Democracy: An Analysis of Changing State Relations, New Jersey, Princeton.
- Kothari, Rajni (1993) Growing Amnesia: An Essay on Poverty and Human Consciousness, New Delhi: Viking.
- Noorani A.G. (2000) Constitutional Questions in India: The President, Parliament and the States, New Delhi, Oxford.
- Omvedt Gail (2007) Dalit Politics and Democratic Revolution, New Delhi, OUP.
- Pandey J.N. (2010) The Constitutional Law of India, Central Law Agency, Allahabad.
- Pylee M.V. (1995) An Introduction to the Constitution of India, New Delhi, Vikas.
- Raman Pillai K. (2010) Facets of Indian Politics, New Delhi, APH Publishing Corporation.
- Ray Amal, S.K. Chatterjee et.al., (1982) Political Development and Constitution, New Delhi, Vikas.
- Verma andKusum (eds.) (2000) Fifty Years of the Supreme Court of India, New Delhi, Oxford.

SEMESTER: I (ELECTIVE)

COURSE CODE: POL E-1-1

COURSE TITLE: UN AND WORLD PEACE

CREDITS: 4

AIM:

The course aims at giving the students a vibrant and critical understanding about the United Nations Organisations. Within this larger objective, it precisely focuses on the functioning of the UN as an agency to maintain international peace and security and scope for its reforms.

OBJECTIVES:

It facilitates them to understand the functioning of the UN as an agency to maintain international peace and security. It also helps the students to critically evaluate the contribution of the UN in the political, economic and social sphere. Role of UN in protecting human rights and need to restructure it in the context of changing world power structure.

COURSE CONTENT:

UNIT I. Emergence of UN

Understanding International Power equations at the End of World War II

UN and Postcolonial States

UN and the Cold War Politics

UNIT II. International Peace and Security

UN and Collective Security

UN Peace keeping operations: Case Study of Kosovo, Kashmir and Iraq

Disarmament and Arms Control (WMD)

UNIT III. UN and Social Development

Women, Children, Disabled, Refugees, Migrant Workers

UN and Global environmental regime

Development: FAO, WHO

UNIT IV. UN and Human Rights

UDHR: Relevance

UN Organisations for the protection of Human Rights

International Criminal Court

UNIT V. Restructuring the UN

UN and the Global South, India's Admission to the UN Security Council

UN and Global Governance

Reading List

BasuRumki (2004) The United Nations Structure and Functions of an International Organisations, Sterling Publishers.New Delhi,

Bhaskar, C.Uday, Santhanam.K, Sinha K. Uttam and MeenaiTasneem (2005) United Nations Multilateralism and International Security, , Institute for Defense Studies and Analyses.New Delhi

Bieber Florian and DaskalovskiZidas (2003) Understanding the War in KosovoFrank Cass Publishers., London.

CholewskiRyszard, Pecoud Antoine and Guchteneire de Paul, (2009) Migration and Human Rights: The United Nations Convention on Migrant Workers Rights, University PressCambridge, Cambridge.

DwivediDhirendra (2005) Collective Security under United Nation: Retrospects and Prospects,KanishkaPublishers.New Delhi,

Fanning W. Richard, (1995) Peace and Disarmament: Naval Rivalry and Arms Control 1922-33, The University Press of Kentucky.Kentucky,

GoldblatJozef (2002) Arms Control The New Guide to Negotiations and Agreements, New Sage.Delhi,

Hennessy M. A. and McKercher B. J. C. (2003) War in the Twentieth Century; Reflections at Century's End, Preger.Westport,

Hordon Joy, (2010), Invisible War: The United States and the Iraq Sanctions, Harvard University Press.Boston,

Islam Nazrul (2005) Reforming the United Nations, , Viva Books.New Delhi

JohanesVarwick and Garies Seven Bernard, (2005) The United Nations: An Introduction, , Palgrave Macmillan.New York

Johnson M.GlenandSymonidesJanusz, The Universal Declaration of Human Rights: A History of its Creation and Implementation, 1948-1998, Part 295,(1998), UNESCO. Paris,

Juyal, Shreesh and Babu B. Ramesh (1990) United Nations and World Peace, Sterling Publishers.New Delhi,

- Karns P. Margaret and Karen A. Mingst (2005) *International Organisations: The Politics and Process of Global Governance*, , Viva Books. New Delhi
- Kayathwal, Mukesh Kumar (1997) *The United Nations Retrospects and Prospects*, , Pointer Publishers. New Delhi
- Suresh R (2009) *Foreign Policy and Human Rights: An Indian Perspective*, Madhav Books. Gurgaon
- UNEP (1997) *Environmental Law Training Manual*, United Nations Environment Programme.
- United Nations Department of Public Information, (1998) *The UN Peace Keeping, 50 Years: 1948-1998*, United Nations Department of Public Information.
- United Nations Department of Public Information, (2016) *Basic Information about the United Nations*, United Nations Department of Public Information, New York.
- Kilgannon Thomas P. (2006) *Diplomatic Divorce: Why America Should End Its Love Affair with the United Nations*, Stroud & Hall. New York
- Mehrish B.N. (2007) *The United Nations in the New Millennium: A Changing Scenario*, , Academic Excellence. New Delhi.
- Mehrish B. N (1999) *International Organisations*, Academic Excellence. New Delhi.
- Meisler Stanley (1995) *United Nations The First Fifty Years*, , The Atlantic Monthly Press New York.
- Miller Mara (2011) *The Iraq War: A Controversial War in Perspective*, Issues in Focus Today, : Enslow Publishers. Berkeley Heights NJ.
- Muller Joachim (2006) *Reforming the United Nations The Struggle for Legitimacy and Effectiveness*, Martinus Nijhoff, Leiden.
- Parsons Anthony (1995) *From Cold War to Hot Peace, UN Interventions 1947-1995*, Penguin Books. London.
- Paul Taylor and Curtis Devon (2011) "The United Nations" in John Baylis, Steve Smith and Patricia Owens, *The Globalization of World Politics: An Introduction to International Relations*, Oxford University Press. New York.
- Ramcharit, Sujatha (1998) *United Nations and World Politics*, , Kanishka Publishers. New Delhi.
- Roberts Adam and Kingsburg Benedict (1988) *United Nations Divided World: The UN's Roles in International Relations*, Oxford University Press. New York.
- Saksena K.P. (1993) *Reforming the United Nations: The challenge of Relevance*, Sage. New Delhi.
- Sarooshi Dan, (1999) *The United Nations and Development of Collective Security The Delegation by the UN Security Council of its Chapter VII Powers*, Clarendon Press. Oxford.
- Smith B. Courtney (2007) *Politics and Process at the United Nations: The Global Dance*, Viva Books. New Delhi.
- Streich Michel (2008) *The Universal Declaration of Human Rights*, , Allen and Unwin, London.
- Suresh R (2015) *The Changing Dimensions of Security: India's Security Policy Options*, (Ed.) Vij Books India Pvt. Ltd. New Delhi .
- Twitchett J. Kenneth (1971) *The Evolving United Nations: A Prospect for peace?*

SEMESTER: I (ELECTIVE)

COURSE CODE: POL E-1-2

COURSE TITLE: PUBLIC POLICY ANALYSIS

CREDITS: 4

AIMS:

To understand the theories and concepts of Public Policy

To analyse the major approaches, stages and actors of Public Policy

To examine the Education, Health, Environmental and Social Welfare Policies of India

OBJECTIVES:

This paper would help us to understand the approaches and theories of Public Policy. Contributions made by various thinkers are also included in this paper. Besides, the stages and actors involved in the policy process are also considered for having better awareness on Public Policy. Policy Analysis in Indian context is also made in this paper.

COURSE CONTENT

UNIT I. Nature, Scope, and Importance of Public Policy

Public Policy: Nature, scope and significance- Evolution of public policy analysis;
Laswell, Y Dror, Thomas R Dye, Henry Kissinger, David Easton

UNIT II. Major Approaches to the Study of Public Policy

System Approach, Elite theory, Group Theory, Political Economy Approach, Incremental Approach, Rational Approach, Cost-Benefit Analysis approaches

UNIT III. Stages of Public Policy

Policy Initiation; Policy Deliberation and Policy Making, Agencies for Public Policy Making, Policy Evaluation, Monitoring and feedback

UNIT IV. Major Actors in Public Policy Making

Legislature and Executive –Bureaucracy-media-Political Parties-Interest Groups-NGOs

UNIT V. Public Policy and Indian Society

Education policy –Environmental Policy- Health Policy-Social Welfare policies in India

Reading List

Core

Cairney Paul (2011), Understanding Public Policy: Theories and Issues, Basingstoke, Palgrave
Dunn, William N. (2004), Public Policy Analysis – An Introduction, New Jersey, Prentice Hall.

John Peter (2012), *Analyzing Public Policy*, London, Routledge
 Knoepfe Peter (2007), *Public Policy Analysis*, Bristol, The Policy Press
 Larry N. Gerston (2011), *Public Policy Making: Process and Principles*, New York, M.E. Sharpe
 R.K. Sapru (2004), *Public Policy: Formulation, Implementation and Evaluation*, New Delhi: Sterling Publishers.
 R.K.Sapru (2010), *Public Policy, Art and Craft of Policy Analysis*, New Delhi, PHI Learning Private Limited
 W. Parsons (1995), *Public Policy: An Introduction to the Theory and of Policy Analysis*, Cambridge, CUP

Additional

Fischer Frank; Gerald J. Miller and Mara S. Sidney (ed.) (2007), *Handbook of Public Policy Analysis: Theory, Politics and Methods*, New York, Taylor & Francis.
 Knill Christoph and Jale Tosun (2012), *Public Policy: A New Introduction*, Basingstoke, Palgrave Macmillan
 Lindblom E. Charles (1968), *The Policy Making Process*, New Jersey, Englewood Cliffs.
 Michael Hill (2009), *The Public Policy Process*, Harlow, Longman
 Michael Howlet (2011), *Designing Public Policies: Principles and Instruments*, London, Taylor & Francis
 Moran Michael, Martin Rein and Robert E. Goodin (Eds.), *The Oxford Handbook of Public Policy*, Oxford, Oxford University Press
 P.R. Rijal (1995), *Fundamentals of Public Policy Analysis*, Kathmandu, Mrs. Indira Rijal
 Parsons Wayne (1995), *Public Policy: An Introduction to the Theory and Practice of Policy Analysis*, Aldershot, Edward Elgar.
 Quade E. (1989), *Analysis for Public Decisions*, New Jersey, Englewood Cliffs.
 Rose Richard (1993), *Lesson Drawing in Public Policy: A Guide to Learning Across Time and Space*, New Jersey, Catham House.
 Sahni Pardeep (1987), *Public Policy, Conceptual Dimension*, Allahabad, Kitab Mahal.
 Stewart Joseph, Jr., David M. Hedge, James P. Lester (2007), *Public Policy: An Evolutionary Approach*, Stamford, Cengage Learning

Journal Article

Shulock, N. 'The Paradox of Policy Analysis: If It Is Not Used, Why Do We Produce So Much of It?' *Journal of Policy Analysis and Management* 18, no. 2 (1999): 226-44.
 Wolf Jr., C 'Markets and Non-Market Failures: Comparison and Assessment'. *Journal of Public Policy* 7, no. 1 (1987): 43-70

SEMESTER: I (ELECTIVE)

COURSE CODE: POL E-1-3

COURSE TITLE: POLITICAL THEORY: MARXIAN TRADITION

CREDITS: 4

AIMS:

The course aims at introducing the foundational ideas of Marxian thought to the students.

OBJECTIVES:

Students should develop a keen understanding of evolution of Marxist thought. They should be familiarised with the Marxian method of analysis. Key ideas of thinkers should be taken as entry points to motivate further learning and exploration.

COURSE CONTENT

Unit I. Marx and Engels: Influences on Marx

Dialectical Materialism – Base-Superstructure analysis
Alienation – Critique of Political Economy.

Unit II. Revolutionary Marxism

Lenin: Theory of Imperialism, Theory of State and Party
Mao: On Contradiction and Peasants and Revolution

Unit III. Euro-Communism

Gyorgy Lukacs – Negative Dialectics
Antonio Gramsci – Concept of Hegemony

Unit IV. Marxist Theories of State

Instrumentalist View of State (Ralph Miliband)
(Louis Althusser)
Relative Autonomy (Nicos Poulantzas)

Unit V. Contemporary Marxism

Frankfurt School: Herbert Marcuse and Jurgen Habermas
Post-Marxism and Radical Democracy: Ernesto Laclau and Chantal Mouffe

Reading List

- Althusser Louis (1971) *Lenin: Philosophy and Other Essays*, New York, Monthly Review Press.
- Always Joan (1995) *Critical Theory and Political Possibilities*, London, Greenwood.
- Bartolovich Crystal and Neil Lazarns (2002) *Marxism, Modernity and Post Colonial Studies*, Cambridge, Cambridge University Press.
- Bhargava Rajeev and Ashok Acharya, (2012) *Political Theory*, Delhi, Pearson Education.
- Boggs Carl (1977) *Politics of Euro Communism*, New York, Black Rose Books.
- Bottomore Tom (ed.) (1991) *A Dictionary of Marxist Thought*, Oxford, Blackwell.
- Callinicos Alex (1976) *Althusser's Marxism*, London, Pluto.
- Carver Terrell (2011) *The Marxian Tradition*, Oxford, Oxford University Press.
- Donnacha Beachan O. (2012) *Life in Post-Communist Eastern Europe*, London, Routledge.
- Eric Bronner Stephen (2011) *Critical Theory: A Very Short Introduction*, New York: OUP.
- Fischer Ernest (2008) *How to Read Karl Marx*, Delhi, Aakar.
- George Schwab (1981) *Euro Communism*, Connecticut, Greenwood Press.
- Giddens Anthony (2009) *Capitalism and Modern Social Theory*, Cambridge University Press.
- Glaser Daryl and David M. Walker (2007) *Twentieth Century Marxism: A Global Introduction*, London, Routledge.
- Hampton Jean (1997) *Political Philosophy: An Introduction*, Oxford, Oxford University press.
- Haywood Andrew (1992) *Political Ideologies: An Introduction*, London, Macmillan.
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- Hunt Carew. R.N (1975) *The Theory and Practice of Communism*, Harmondsworth, Penguin.
- Jay Douglas (1962) *Socialism in the New Society*, London, Longman.
- John Lewis (1976) *Marxism and the Open Mind*, Connecticut, Greenwood Press.
- Kolakowski Leszek (1982) *Main Currents of Marxism: Its Origin, Growth and Dissolution*, Oxford, Oxford University Press.
- Laclau Ernesto and Chantal Mouffe (2001) *Hegemony and Socialist Strategy: Towards a Radical Democratic Politics*, London, Verso.
- Lefebvre Henri (1968) *The Sociology of Marx*, Harmondsworth, Penguin.
- Luke Ferretter (2006) *Louis Althusser*, New York, Routledge.
- Maguire John M. (1978) *Marx's Theory of Politics*, Cambridge, Cambridge University Press.
- Martin James (ed.) (2008) *The Poulantzas Reader: Marxism Law and the State*, London, Verso.
- McLellan David (1979) *Marxism after Marx: An Introduction*, Mac Millan, Oxford, Oxford University Press.
- McLellan David (2007) *Marxism After Marx*, Hampshire: Palgrave Macmillan.
- Miliband Ralph (1977) *Marxism and Politics*, Oxford, Oxford University Press
- Paul Resch Robert (1992) *Althusser and Renewal of Marxist Social Theory*, Berkely: University of California Press.
- Paul Wetherly et. al., (eds.) (2008) *Class Power and State the State in Capitalist Society: Essays on Ralph Miliband*, Hampshire, Palgrave Macmillan.
- Stuart Sim (1998) *Post-Marxism: A Reader*, Edinburgh, Edinburgh University Press.
- Vincent Andrew (1992), *Modern Political Ideologies*, Blackwell, Oxford.
- Waypes C.L (1973) *Political Thought*, London, St.Paul's House.
- Wright Erik Olin (1997) *Class Counts*, Cambridge, CUP.

SEMESTER: I (ELECTIVE)

COURSE CODE: POL E-1-4

COURSE TITLE: FINANCIAL ADMINISTRATION

CREDITS: 4

AIMS:

To examine in general the significance, process and agencies of financial administration

To understand the fiscal policies and the budgetary system in India

To analyse the contemporary development in the taxation policies of India

OBJECTIVES:

This paper covers various dimensions of financial Administration. It explains the process and significance of financial administration, public expenditure, parliamentary committees and throws light on the recent development in taxation policies also. It also focuses on the role of Finance Commission, NITI Aayog and National Development Council in bringing out efficiency in the Financial Administration of India.

COURSE CONTENT

UNIT I. Introduction

Nature, Scope and importance of Financial Administration

Process and Agents in Financial Administration

Financial Administration in the era of Globalisation

UNIT II. Dimensions of Financial Administration

Resource mobilisation for different level of government

Monetary and Fiscal Policies –Tax and Non tax sources

Public borrowings, Public Debt and its management

UNIT III. Budget

Concept of Budget-Types of Budget –Performance Budget, PPBS

Capital Budgeting –Zero based Budgeting

Budgetary process in India

Accounts and Audit

UNIT IV. Control Over Public Expenditure

Parliamentary Control over Public Expenditure

Public Account Committee-Estimated Committee

Committee on Public undertakings, Comptroller and Auditor General

Role of Financial Ministry

UNIT V. Indian Public Finance

Union, State, and Local finances in India
 Finance Commission
 Taxation Policies in India –Recent Developments –GST
 NITI Ayog
 National Development Council

Reading List**Core**

Mukerjee Radhakamal (1995), Economic Problems of Modern India: Finance, Taxation and New Economic Policy, New Delhi, Allied Publishers
 Panda Snehalata (1989), Financial Administration and Personnel Management in Public Enterprises, New Delhi, Mittal Publications
 Prakash B.A. (ed.) (2009), The Indian Economy Since 1991, New Delhi, Dorling Kindersley
 R.K. Gupta and P.K. Saini (2008), Financial Administration In India : Changing Contours And Emerging Challenges, New Delhi, Deep and Deep Publications
 S.L. Goel (2008), Public Financial Administration, New Delhi, Deep and Deep Publications.
 Saket Nikhil (2006), Public Debt and Economic Planning in India, New Delhi, Deep and Deep Publications.
 Sury M. M. (2009), Budgets and Budgetary Procedures in India: 1947-48 to 2009-10 , New Delhi, New Century Publications

Additional

Ahmed Abdullahi Dahir, Sardar M. N. Islam (2010), Financial Liberalization in Developing Countries: Issues, Time Series Analysis and Policy Implications, New York, Springer
 Bird Richard Miller (1992), Improving Tax Administration in Developing Countries, USA, International Monetary Fund.
 Bland Robert L. (2009), A Budgeting Guide for Local Government Municipal Management Series, Washington, International City County Management Association (ICMA).
 Chakrabarty Bidyut and Prakash Chand (2012), Public Administration in a Globalizing World: Theories and Practices, New Delhi, Sage Publications
 Chandra Prakash Bhambhri (1959), Parliamentary Control over Finance in India: A Study in Financial Administration, Meerut, Jai Prakash Nath
 Chen Greg G ,Dall W Forsythe,Lynne a Weikart andDaniel W Williams (2008), Budget Tools: Financial Methods in the Public Sector, USA, CQ Press
 Commonwealth Secretariat (2003), Contingent Liability Management: A Study on India (Commonwealth Secretariat Debt Management Series), UK, Commonwealth Secretariat
 Dornbusch Rudiger and Mario Draghi (2008), Public Debt Management: Theory and History, UK, Cambridge University Press

- Frank Howard A. (2006), *Public Financial Management Public Administration and Public Policy*, USA, CRC Press
- Jalan P. K. (2004), *Industrial Sector Reforms In Globalization Era*, New Delhi, Sarup & Sons
- Melecky Martin (2007), *A Cross-Country Analysis of Public Debt Management Strategies*, New York, World Bank Publications.
- Miller Gerald J. (Ed.) (1996), *Handbook of Debt Management Public Administration and Public Policy*, USA, CRC Press
- Prasad K.N. (2003), *Indian Economy*, New Delhi, Atlantic Publishers
- R .K. Gupta. (Ed.), (2008), *Liberalisation And Globalisation Of Indian Economy Vol# 7*, New Delhi, Atlantic Publishers
- Rahman Taiabur (2007), *Parliamentary Control and Government Accountability in South Asia: A Comparative Analysis of Bangladesh, India and Sri Lanka*, USA, Routledge
- Raj J. Felix (ed.) (2008), *Indian Economy: Economic Ideas, Development, and Financial Reforms*, New Delhi, Deep and Deep Publications.
- Rubin Irene S. (2009), *The Politics of Public Budgeting: Getting and Spending, Borrowing and Balancing*, USA, CQ Press
- Sharan Vyuptakesh (2009), *Fundamentals of Financial Management*, New Delhi, Dorling Kindersley
- Sharma Urmila and S.K. Sharma (2002), *Public Administration*, New Delhi, Atlantic Publishers
- Singh Hoshier and Pankaj Singh (2011), *Indian Administration*, New Delhi, Dorling Kindersley
- Singh Hoshier and Pradeep Sachdeva (2012), *Public Administration: Theory and Practice*, New Delhi, Dorling Kindersley
- Sinha U.P. and K.D. Prasad (2010), *Monetary and Fiscal Actions in India: An Empirical Evidence*, New Delhi, Concept Publishing Company

Journal Articles

- KalyanRaipuria, 'Financial Transfers to States – Issues and Outlook', *Economic and Political Weekly*, December 5, 1992.
- Hall, M. and C. Winstein (1959), 'The Ambiguous Notion of Efficiency', *The Economic Journal*, Vol. 69.

SEMESTER: II (CORE)

COURSE CODE: POL C-2-1

COURSE TITLE: COMPARATIVE POLITICS

CREDITS: 4

AIM:

The course aims at enabling student to understand the theories and concepts of comparative politics and make them understand the significance of comparative politics in the evolution and practice of the discipline.

OBJECTIVES:

The course should enable the student to appreciate the diversity of theoretical approaches in comparative politics. They should be able to locate these theories in their historical background. The course enrich the understanding of world politics and enable the students to analyse global politics more critically.

Country studies should be used as an opportunity to enhance empirical knowledge of the students.

COURSE CONTENT

UNIT I. History and Evolution of Comparative Politics

Theories of Comparative Politics: Institutionalism and Neo-institutionalism
Structural-functionalism, Political Economy, Rational Choice Approach
Dependency and World System Theory,
Colonialism and decolonization: forms of Colonialism, anti colonial struggles and decolonization.

UNIT II. State Theory

Debate over the nature of state in capitalist and socialist societies; Post colonial state, Welfare state; Globalisation and nation states .

UNIT III. Political Regimes

Democratic (Electoral, Liberal, Majoritarian and Participatory) and non democratic regimes (Patrimonialism, Bureaucratic authoritarianism, Military dictatorship , Totalitarian and Fascist)

UNIT IV. Federalism and Political Process

Federalism- characteristics- Dual Federalism and Competitive Federalism

Federal-State Relations- Canada, India, Australia

UNIT V. Actors and Processes

Electoral Systems , Political Parties and Party systems (Draw examples from France, Sri Lanka and Brazil), Interest Groups (Draw examples from USA, Poland and Russia), New Social Movements , Non Governmental Organisations (NGOs) and Civil Society Campaigns (Draw examples from Brazil, Egypt and India)

UNIT VI. Major Concepts

Constitutionalism, Polyarchy, Civic Culture, Patrimonialism, Failed State, Third Wave Democratisation, Glasnost and Perestroika, Multiculturalism.

Reading List

- Alavi H. and T. Shanin (1982) *Sociology of Developing Societies*, London, Macmillan.
- Alford Robert A. and Roger Friedland (1985) *Powers of Theory*, Cambridge, Cambridge University Press.
- Almond G.A. and G.B. Powell (1966) *Comparative Politics: A Developmental Approach*, Boston, Little Brown.
- Almond G.A. and J.S. Coleman (1971) *The Politics of the Developing Areas*, New Jersey, Princeton University Press.
- Blondel Jean *Comparative Government: A Reader* (1975) London, Macmillan.
- Boix Carles and Susan C Stokes (ed.) (2009) *Comparative Politics*, New York, Oxford University Press.
- Bottomore T.B. *Elites and Society*, Harmondsworth, Penguin.
- Cantori L.J. and A. H. Ziegler (eds.) *Comparative Politics in the Post-Behaviouralist Era*, London, Lynne Rienner.
- Caramani Daniele (ed.) (2008) *Comparative Politics*, New York, Oxford University Press.
- Chilcote Ronald (1994) *Theories of Comparative Politics: The Search for a Paradigm Reconsidered*, Boulder, Westview.
- Curtis M. (1978) *Comparative Government & Politics: An Introductory Essay in Political Science*, New York, Harper & Row.
- Green December and Laura Luehrmann (2010) *Comparative Politics of the Third World: Linking Concepts and Cases*, New York, Lynne Rienner.
- Hague Rod and Martin Harrop (2007) *Comparative Government and Politics – an Introduction*, New York, Palgrave Macmillan.
- Hardt Michael and Antonio Negri (2000) *Empire*, Cambridge, Harvard University Press.
- Huntington Samuel P. (1991) *The Third Wave: Democratization in the Late Twentieth Century*, Norman, University of Oklahoma Press.

- Kamrava Mehran (2008) *Understanding Comparative Politics: A Framework for Analysis*, New York, Routledge.
- Kopstein Jeffrey and Mark Lichbach (eds.) (2000) *Comparative Politics: Interests, Identities and Institution in a Changing Global Order*, Cambridge, Cambridge University Press.
- Lichbach Mack Irving and Alan S. Zuckerman (eds.) (2009) *Comparative Politics: Rationality, Culture and Structure*, Cambridge, Cambridge University Press.
- Malik S.C. (ed.) (1978) *Indian Movements: Some Aspects of Dissent, Protest and Reform*, Simla, IIAS,
- Manor James (ed.) (1991) *Rethinking Third World Politics*, London, Longman.
- McCornick John (2010) *Comparative Politics in Transition*, Wadsworth, Cengage Learning.
- Mills Wright C. (1959) *The Power Elite*, New York, John Wiley.
- Moore Barrington Jr. (1966) *The Social Origins of Dictatorship and Democracy*, Harmondsworth, Pelican.
- Newton Kenneth and Jan W. Van Deth (2010) *Foundations of Comparative Politics: Democracies of the Modern World*, Cambridge, Cambridge University Press.
- Oommen T.K. (1990) *Protest and Change: Studies in Social Movements*, New Delhi, Sage.
- Pye Lucian W. (1966) *Aspects of Political Development*, New Delhi, Amerind Publications.
- Pye Lucian W. and Sidney Verba (1972) *Political Culture and Political Development*, New Jersey, Princeton University Press.
- Rahnema Majid and Victoria Bawtree (eds.) (1997) *The Post-Development Reader*, London, Zed.
- Rao M.S.A. (1987) *Social Movements and Social Transformation: A Study of Two Backward Classes Movement in India*, New Delhi, Manohar Publications.
- Sartori G. (2005) *Parties and Party Systems: A Framework for Analysis*, Colchester, ECPR Press.
- Sen Amartya (1999) 'Democracy as a Universal Value', *Journal of Democracy* Vol.10 pp. 3-17.
- Shah Ghanshyam (1990) *Social Movements in India: A Review of the Literature*, New Delhi, Sage.
- Stephan Alfred (2001) *Arguing Comparative Politics*, Oxford, Oxford University Press.
- Tornquist Olle (1999) *Politics and Development: A Critical Introduction*, New Delhi, Sage.
- Wayne Ellwood (2001) *The No-Nonsense Guide to Globalisation*, London, Verso.
- Wiarda H. J. (ed.) (1986) *New Developments in Comparative Politics*, Boulder, Westview.
- William Roberts Clark, Matt Golder and Sona N. Golder (2009) *Principles of Comparative Politics*, Washington, CQ Press.
- Zargorski Paul W. (2009) *Comparative Politics : Continuity and Breakdown in the Contemporary World*, New York, Routledge.

SEMESTER: II (CORE)

COURSE CODE: POL C-2-2

COURSE TITLE: THEORIES AND CONCEPTS OF PUBLIC ADMINISTRATION

CREDITS: 4

AIMS:

To introduce the concepts and theories of Public Administration

To analyse the changes in the discipline of Public Administration in the globalised era

To understand the dimensions of contemporary governance

OBJECTIVES:

This paper stresses on providing a detailed picture on the evolution and development of Public Administration as a discipline and throws light on various theories of classical and neo –classical and modern period. This paper further emphasises on the paradigm shifts in the field of Public Administration. In addition, some innovations of contemporary governance are included for strengthening the awareness on participatory governance.

COURSE CONTENT

UNIT I. Introduction to Public Administration

Meaning; Nature, Scope and Significance of Public Administration: Evolution of Public Administration -from dichotomy to governance; Globalisation and Public Administration

UNIT II. Paradigm Shift in Public Administration

Comparative Public Administration –Contribution of FW Riggs, New Public Administration –Minnowbrook 1st, 2nd, 3rd, New Public Management, New Public Service

UNIT III. Theories of Administration

Scientific Management Theory (F.W. Taylor), Classical Theory (Fayol, Gullick, and Urwick),

Bureaucratic Theory (Max Weber), Human Relation Theory (Elton Mayo), Behavioural Approach (M.P Follet, Chester Bernard), Decision Making Theory (Herbert Simon), Systems Theory (Nobert Weiner)

UNIT IV. Theories of Motivation and Leadership

Abraham Maslow, Fredrick Herzberg, Victor Vroom, M C Gregor, Blake and Moutain, Rensis Likert

UNIT V. Contemporary Discourse

Good Governance, E-Governance, Right to Information, Citizens Charter, Right to Service, Social Auditing

Reading List

Core

Batley, Richard and Larbi, George (2004), *The Changing Role of Government: The Reform of Public Services in Developing Countries*, London, McMillan.

Chakrabarty, Bidyut (2007), *Reinventing Public Administration: The Indian Experience*, New Delhi, Orient Longman

Fadia BL, Fadia Kuldeep (2008), *Public Administration: Administrative Theories and Concepts*, Agra, Sahitya Bhawan Publications.

Hooja, Rakesh & R.K. Arora (2007), *Administrative Theories: Approaches, Concepts and Thinkers in Public Administration*, Jaipur, Rawat Publications.

Maheswari, S.R (1994), *Administrative Theories*, New Delhi Allied Publishers Ltd.

Medury Uma (2011), *Public Administration in the Globalization Era: The New Public Management Perspective*, Hyderabad, Orient Black Swan.

Sharma, MP and Sadana, BL (2008), *Public Administration in Theory and Practice*, Allahabad, Kitab Mahal

Additional

Ali, Shum Sun Nisa (1990), *Eminent Administrative Thinkers*, New Delhi, Associated Publishing House.

Arora, R.K. & Meena Sogani (2010), *Governance in India: Paradigms and Practices*, Jaipur, Aalekh Publishers.

Baghel, CL and Kumar (2005), *Yogendra: Public Administration*, Volumes I and II, New Delhi, Kanishka Publishers..

Bhattacharya Mohit(2008), *New Horizons of Public Administration*, Jawahar Publishers & Distributors , New Delhi, JNU Old Campus.

Bhattacharya, Mohit (1979), *Bureaucracy & Development Administration*, New Delhi, Uppal Publishing House.

Donald Menzel and Harvey White (eds) 2011. *The State of Public Administration: Issues, Challenges and Opportunity*. New York: M. E. Sharpe.

Jeong Chun Hai @Ibrahim, & Nor Fadzlin Nawi. (2007). *Principles of Public Administration: An Introduction*. Kuala Lumpur, Karisma Publications.

Lynn Jr., Lawrence (2006), *Public Management: Old and New*, New York, Routledge.

Maheswari, S.R (1994), *Administrative Theories*, New Delhi Allied Publishers Ltd.

Nigro, Felix A Lloyd G & Nigro (1989), *Modern Public Administration*, New York, Harper & Row.

Osborne and Gaebler, T. (1992), *Reinventing Government: How the Entrepreneurial Spirit is Transforming the Public Sector*, New York, Addison-Wesley Publication.

Prasad, D. Ravindra, Prasad, VS, and Satyanarayan, P (2004), *Administrative Thinkers*, New Delhi, Sterling Publishers,

Riggs F W (2011), *The Ecology of Public Administration*, 50th Anniversary Edition, New Delhi, IIPA.

Journal Articles

Noordhoek, P. and Saner, R. (2005). 'Beyond New Public Management: Answering the Claims of both Politics and Society'. *Public Organization Review: A Global Journal*, Volume 5.

Rhodes, R. A. W. (1996). 'The New Governance: Governing without Government'. *Policy Studies*, XLIV, pp. 653–667.

SEMESTER: II (CORE)

COURSE CODE: POL C-2-3

COURSE TITLE: THEORIES AND CONCEPTS IN INTERNATIONAL RELATIONS

CREDITS: IV

AIM:

To introduce theories and concepts with an emphasis on the dynamics of power in international relations

To demonstrate how theory provides a toolkit by which international events can be explained

To assess the contributions and shortcomings of mainstream and critical International Relations theories

OBJECTIVES:

This course is intended to connect International Relations with Great Debates, both methodological and theoretical, in order to familiarize the students on major epistemological shifts in Social Sciences. The objective is to deal with both mainstream and critical theoretical persuasions in the discipline of IR and to familiarize the students with major intellectual tools available to them in analyzing global politics. A reading of original theoretical literature is mandatory for this course.

COURSE CONTENT

UNIT I. MAJOR CONCEPTS

National Power, Alternative notions of Power, Hegemony, International Peace, Human Security

UNIT II. THE GREAT DEBATES IN IR THEORY

Realism V/S Idealism, Traditionalism V/S Behaviouralism, Neorealism V/S Neoliberalism, Rationalism V/S Reflectivism

UNIT III. THEORETICAL PERSPECTIVES

Marxist approaches in IR, World Systems theory, Dependency theory, Transnational Capitalist School

UNIT IV. CONTEMPORARY IR THEORY

International Society/English School, Social Constructivism, Postmodernism, Post-colonialism and Critical Theory

UNIT V. ALTERNATIVE APPROACHES TO IR THEORY

Green Politics in International Relations, Feminist Theories in International Relations and Non-Western IR Theory.

Reading List

Core

- Amitav Acharya and Barry Buzan (2007). Why is there No Non-Western International Relations Theory?, *International Relations of the Asia-Pacific*, 7 (3), pp.287-312
- Burchill, Scott and Andrew Linklater, eds.(1996). *Theories of International Relations*. London: Macmillan Press
- Carr, E.H. (1939). *The Twenty Years Crisis*, London: Macmillan.
- Columbia University Press.
- Cox, Robert W. (1983). Gramsci, Hegemony and International Relations: An Essay in Frank, Andre Gunder, "The Development of Underdevelopment", *Monthly Review*,
- Harvey, David. (2005). *A Brief History of Neoliberalism*. Oxford: Oxford University Press
- Hedley Bull and Adam Watson, eds. (1989). *The Expansion of Contending International Society*, Oxford: Clarendon Press.
- Hedley Bull. (1989). *The Emergence of a Universal International Society & The Revolt*
- Immanuel Wallerstein.(1974). *The Modern World System*, 4 vols. New York: Academic Press.
- Kaplan,Morton (1966). The New Great Debate: Traditionalism vs. Science in *InternationalRelations*", *World Politics*, 19 (1) pp. 1-20.
- Keohane, Robert O. and Joseph S. Nye. (1989). *Power and Interdependence*, 2nd ed., NewYork: Longman.
- Lenin, V.I. (1967). *Imperialism: The Highest Stage of Capitalism*, New York: international Publishers.
- Method, *Millennium: Journal of International Studies* 12, 162-75.
- Morgenthau, H.J. (1976). *Politics among Nations*, Calcutta:Scientific Book Agency.
- Power Politics, *International Organization* 46 (2), pp. 391-425.
- Reformulation, *Millennium: Journal of International Studies* 17 (3), pp.429-440.
- Tickner, J. Ann (1988). *Hans Morgenthau's Principles of Political Realism: A Feminist*
- V. Spike Peterson (2000). *A Gendered Global Hierarchy*, Grey Fry and S O' Hagan, eds.,
- Waltz, Kenneth N.(1954). *Man, the State and War: A Theoretical Analysis*, New York:

Additional

Ahmad, Aijaz. 2004. "Imperialism of Our Time". In *The New Imperialist Challenge*, Socialist Register, edited by P Leo Panitch and Colin Leys, 49-71, London: Merlin Press.

Alex Callinicos, "Does Capitalism Need the State System?", Cambridge Review of Booth and Marysia Zalewski, eds., *International Theory: Positivism and Beyond*, Cambridge: Cambridge University Press.

Gilpin, Robert (1988). *The Theory of Hegemonic War*, *Journal of Interdisciplinary History* 18 (4), pp. 591-613.

Harvey, David. (2003). *The New Imperialism*. New York: Oxford University Press.

International Affairs 20 (4), 2007, pp. 533-549.

International Relations 19 (3), pp. 567-587.

Krasner, Stephen D. (1982). *Structural Causes and Regime Consequences: Regimes as Intervening Variables*, *International Organization*, 36 (2), pp.185-205.

Lake, David A. (2013). *Theory is Dead, Long Live Theory: The End of the Great Debates and the Rise of Eclecticism in International Relations*, *European Journal of*

Ruggie, John Gerard. (1982). *International Regimes, Transactions, and Change: Embedded Liberalism in the Postwar Economic Order*, *International Organization*, 36 (2), pp. 379-415.

Vendulka Vubálková and Albert Cruickshank. (1985). *Marxism and International Relations*, Oxford: Clarendon Press.

Waeber, Ole (1996). *The Rise and the Fall of Inter-Paradigm Debate*, Steve Smith, Ken

Waltz, Kenneth N (1979). *Reductionist and Systemic Theories*, Kenneth N. Waltz, *Theory of International Politics*, New York: McGraw-Hill.

SEMESTER: II (ELECTIVE)

COURSE CODE: POL E-2-1

COURSE TITLE: POLITICS OF SOCIAL JUSTICE IN INDIA

CREDITS: 4

AIM:

The aim of the course is to inculcate in students the immortal value of justice. Justice, which is enshrined as an important objective of our Constitution is presented in this course along with its theoretical moorings. This course also helps the students to understand different dimensions of Social Justice by discussing specific issues.

OBJECTIVES:

The student should develop a keen interest in the core principle of Justice.

It is expected that it will enable the student to analyse the problems of social justice and its various dimensions.

The course should prompt the student to explore the diverse debates about the problems of affirmative action and issues like social exclusions.

COURSE CONTENT

UNIT I. Social Justice: Theoretical Perspective

Concept of Justice: Distributive and Procedural Justice, Deontological and Consequentialist

Theories of Justice: Aristotle, Rawls, Ambedkar, Amartya Sen

Feminist and Communitarian Critique of Justice

UNIT II. Indian Constitution and Social Justice

Fundamental Rights

Directive Principles

Special Provisions Relating to Certain Classes (Arts.330-342)

UNIT III. Dimensions of Social Justice in India

Socio- Cultural, Political and Economic

Social Justice in the Post-industrial society

Globalization and Social Justice in India

State of Environmental Justice in India

UNIT IV. Social Categories and Social Exclusion

Caste, Class, Ethnicity
 Poverty, Unemployment
 Religion
 Gender

UNIT V. Affirmative Action

Affirmative Action in India- The Politics of Reservation
 Decentralized Governance and Politics of Inclusion
 Gender Mainstreaming and Inclusive development
 Inclusive Politics-Role of Civil Society

Reading List

- Basu D.D. (1999) *The Shorter Constitution of India*, Delhi, Wadhwa.
- Baxi Upendra (1982) *Introduction of Indian Legal System*, New Delhi, Vikas
- Bhattacharyya Harihar, Partha Sarkar and Angshuman Kar (2009) *The Politics of Social Exclusion in India-Democracy at the Crossroads* New Delhi, Routledge.
- Burman J.J. Roy (2009) 'Beyond Social Exclusion', *Mainstream*, Vol. XLVII, No 41.
- Chandhoke Neera (1999) *Beyond Secularism: The Rights of Religious Minorities*, New Delhi, Oxford University Press.
- Dhavan Rajeev and Alice Jacob (1978) *Indian Constitution: Trends and Issues*, New Delhi, Indian Law Institute.
- Guru Gopal (2000) 'Dalits: Reflections on the Search for Inclusion' in Peter Ronald de Souza (ed.) *Contemporary India: Transitions* New Delhi, Sage.
- Hasan Zoya and Ritu Menon (2005) *The Diversity of Muslim Women's Lives in India*, New Delhi, Oxford University Press.
- Ilaiah Kancha, (1996) *Why I am not a Hindu*, Calcutta, Samya Publications.
- Kaviraj Sudipta (2005) 'Democracy and Inequality in India', in Zoya Hasan and Francine Frankel (eds.) *Transforming India*, New Delhi, Oxford University Press.
- Kurien C. T. (1992) *Growth and Justice: Aspects of India's Development Experience*, Madras, Oxford University Press.
- Mehta Pratap Bhanu(2003) *The Burden of Democracy*, New Delhi, Penguin.
- Mohanty Manoranjan (2008) *Caste, Class and Gender*, New Delhi, Sage.
- Nigam Aditya (2000) "Secularism, Modernity, Nation: Epistemology of the Dalit Critique", *Economic and Political Weekly*, 35 (48), 25 November.
- Noorani A.G. (2002) *Constitutional Question and Citizens Right*, New Delhi, Oxford University Press.
- Pandey J.N. (2010) *The Constitutional Law Of India*, Allahabad, Central Law Agency.
- Pantham Thomas (2009) "Against Untouchability: The Discourses of Gandhi and Ambedkar", in Gopal Guru (ed.) *Humiliation: Claims and Context*, New Delhi, Oxford University Press.
- Raju Saraswati (2006) 'Locating Women in Social Development in India', *Social Development Report*, New Delhi, Oxford University Press.

- Rawls J. (1971) *A Theory of Justice*, Cambridge, Mass: Harvard University Press.
- Samaddar Ranabir (ed.) (2009) *State of Social Justice in India: Issues of Social Justice* New Delhi, Sage.
- Sarukkai Sundar (2007) “Dalit Experience and Theory”, *Economic and Political Weekly*, 42 (40), 6-12 October.
- Seervai H. M. (1988) *The Constitutional Law of India*, Bombay, N.M. Tripathi.
- Sen Amartya (1999) *Development as Freedom*, New Delhi, Oxford University Press.
- Shah Ghanshyam et. al., (2006) *Untouchability in Rural India*, New Delhi, Sage.
- Thorat Sukhadeo (2006) “Empowerieing Marginalised Groups: Policies and Change in India”, *Social Development Report*, New Delhi, Oxford University Press.
- Verma and Kusm (eds.) (2000) *Fifty Years of Supreme Court of India*, New Delhi, Oxford University Press.
- Verma H.S. (2005) *The OBCs and the Dynamics of Social Exclusion in India*, New Delhi, Serials Publication.
- Verma Vidhu (1999), “Colonialism and Liberation: Ambedkar’s Quest for Distributive Justice”, *Economic and Political Weekly*, Vo.34, No. 39. 2804-2810.

SEMESTER: II (ELECTIVE)

COURSE CODE: POL E-2-2

COURSE TITLE: CONTEMPORARY WEST ASIAN POLITICS

CREDITS: 4

AIM:

To give a bird's eye view of West Asian society polity and to explain the politics of Orientalism

To familiarize the students about major movements and regional organisations in West Asia

To discuss the international political power play in West Asia and its impacts

To trace the historical relations between India, particularly Kerala, with West Asia

OBJECTIVES:

The course is intended to discuss the socio-political configuration of West Asia, its strategic position in world politics and the politics of oil and its impact on the region. There will be specific discussion on the Orientalist perceptions on West Asia and its political consequences. Emphasis is added to Arab-Israel conflict and such regional issues and the ascendancy of the non-state actors and its implications. The course is also intended to discuss the democratisation process in the region and also the historical relations between India and West Asia. The course will give an outline of the politics in West Asia and it will be useful for further research in the area.

COURSE CONTENT

UNIT I. Society in West Asia

West Asian Society: Ethnicity-Sectarianism: Sunni/Shia divides

Islam and the West: Orientalism (Edward Said)

Islam and Nationalism in West Asia

UNIT II. Major Issues in West Asia

Geo-Strategic Significance of West Asia

Arab-Israeli Conflicts: Palestine Question-Zionism

Nuclearization in West Asia

Terrorism: Al Qaeda, IS

UNIT III. Democracy and Authoritarianism in West Asia

People's Movements: Muslim Brotherhood

Islamic Revolution in Iran

Arab Spring-Tunisia, Egypt and Libya

UNIT IV. Regionalism and Great Powers

Major Regional Organisations: Arab League, OIC, OPEC and GCC

Regional Instability and Politics of Oil

Oil Diplomacy and Great Powers: USA, EU, RUSSIA and CHINA

UNIT V. India and West Asia

India and West Asia: Historical relations

Gulf Oil and India's energy security

Kerala and West Asia: Nitaquat Laws and its impact

Reading List

Core:

Akthar, Naseema (2004), West Asian Politics, Authors Press, Delhi, 2 vols.

Butt, Gerald (1997), The Arabs: Myth and Reality, St-Martin's Press, New York.

Cheema, Ashwarya Cheema, (2010), West Asia: Civil Society, Democracy & State, New Century, New Delhi.

Cheema, Sujata Ashwarya (Ed.) (2010), West Asia: Civil Society, Democracy and State, New Century Publications, New Delhi.

Esposito, John L. (1999), The Islamic Threat: Myth or Reality, Oxford University Press, New York.

Esposito, John L., (1996), Islam, Democracy and Politics, Oxford University Press, New York.

Hammer, Julianne (2009), Palestinians Born in Exile: Diaspora and the Search for a Homeland, University of Texas Press.

Ibrahim, Sajad K.M, (2005) "Peace and Terrorism in the Middle East: An Insight into Hamas and Islamic Jihad" in G.Gopa Kumar (ed.) Iraq War and the Future World Order, Icon Publications, New Delhi, pp.95-109.

Ibrahim, Sajad K.M. (2007), Palestinian Distress: The Ambiguity of Former Soviet Policy, Abhijeet Publications, New Delhi.

Ibrahim, Sajad K.M.,(2006), “ Hamas and the Right of Return of the Palestinian Refugees: A Standstill in the Peace Talks”, *India Quarterly* (New Delhi), Vol.LXII, No.2, April-June.
 Mernissi, Fatima,(1994), *Islam and Democracy : Fear of the Modern World*, Virago Press, London.

Neff, Donald, (1995), *Fallen Pillars: US Policy Towards Palestine and Israel since 1945*, Institute of Palestine Studies, Washington, DC.

Said, Edward W. (1979), *Orientalism*, New York, Vantage.

Shlaim, Avi (1994), *War and Peace in the Middle East : A Critique of American Policy*, New York, Whittle Books in Association with Viking.

Sisoda, N.S. and Ashok K. Behuri (2007), *West Asia in Turmoil: Implications for Global Security*, Academic Foundation, New Delhi.

Additional Readings

Alam , Anwar (2010), *Contemporary West Asia Politics and Development*, New Century Publications, New Delhi.

Alam, Anwar (2008), *India and West Asia in the Era of Globalisatio*, New Century Publications, New Delhi.

Additional

Ali, Sheikh Rustum (1986), *Oil, Turmoil, and Islam in the Middle East*, CT: Praeger, Westport.
 Esposito, John L. (2003), *Unholy War : Terror in the Name of Islam*, Oxford University Press, New York.

Hiro, Dilip (1996), *Dictionary of the Middle East*, St-Martin's, New York.

Mohammed M.A. Ahmed & Michael M. Gunter (2000), *The Kurdish Question and International Law: An Analysis of the Legal Rights of the Kurdish People*, North Carolina, Ahmed Foundation for Kurdish Studies.

Said, Edward W. (1993), *Peace and its Discontents: Essays on Palestine in the Middle East Peace Process*, . Vintage Books, New York.

Said, Edward W. (1994), *Politics of Dispossession: The Struggle for Palestinian Self-Determination 1969-1994* , . Pantheon Books, New York.

Said, Edward W.(1999), *Out of Place : A Memoir*, New York, Alfred A.Knopf, 1999.

Rubin, Barry, (2002), *The Tragedy of the Middle East*, Cambridge University Press, New York.

Sajad Ibrahim K.M, (2006), “Palestinian Refugees in Lebanon: Towards Dubious Future”, *Human Rights Global Focus* (Thiruvananthapuram), Vol.3, No.2, December.

Semester : II (ELECTIVE)

Course Code : POL E-2-3

Course Title : HUMAN RESOURCE MANAGEMENT

Credits 4

AIM:

To introduce the concepts of Human Resource Management

To understand the functions and skills needed for requirement of effective HRM

To familiar with the controlling mechanism of HR

OBJECTIVES:

Scope of HRM is limitless. Any organisation whether it is public or private the most important resource is human being. So students of any discipline must possess a basic knowledge in the management of human being.

COURSE CONTENT

UNIT I. Introduction to HRM

Meaning, Scope and importance of HRM, HRD, Strategic HRM , Need and importance of HR planning, Barriers to HRP.

UNIT II. Functions of HRM

Recruitment - Selection - Placement - Training - On the job and off the job training - Performance Appraisal - Employee Welfare.

UNIT III. Skills in HRM

Decision Making - Process of effective decision making

Communication - Types of communication, Barriers to communication,

Official communication - letters, circulars, memo, order

UNIT IV. Measures of Controlling HR

Changing concept of Employment, HR Auditing, Employee turnover, Promotion, Transfer, Demotion and Discipline.

UNIT V. Resourcing the Organisation

The nature of Labour market, Labour demand, Changing pattern of Labour demand, Definition of talent management, Selecting and retaining talent, Talent development.

Reading List

Aswathappa K, Human Resource Management(Text& Cases),Mc GrawHill, Greater Noida, 2017

A M Sheikh, Human Resource Development and Management, S Chand and Co., New Delhi

Bhatia & Singh, Personal Management, Deep and Deep Publishers, New Delhi.

David A. Decenzo, Stephen P Robbins, Susan L Verhulst, Human Resource Management, Wiley, USA,2015

Gary Dessler & BijuVarkkey, Human Resource Management, Pearson, New Delhi, 2010

K.K.Ahuja Balvinder Shukla, Human Resource Management: Kalyani Publishers, New Delhi,2007

Prof. (Dr.) Shikha Kapoor, Human Resource Management(Text& Cases), Taxmann, NewDelhi,2015

P.R.N. Sinha, Indu Bala Sinha, Seema Priyadarshini Shekhar, Industrial Relations, Trade Unions and Labour Legislations: Pearson, New Delhi,2017

Piyali Ghosh and Shefali Nandan, Industrial Relations and Labour Laws, Mc GrawHill, Greater Noida,2017

Robbins P Stephen, Judge A Timothy, Vohra Neharika, Organisational Behaviour: Pearson, New Delhi,2016

Stephen P Robbins, Mary Coulter, Management, Pearson , New Delhi, 2008

SEMESTER: II (ELECTIVE)

COURSE CODE: POL E-2-4

COURSE TITLE: GENDER POLITICS

CREDITS: 4

AIM:

This course will introduce students the key concepts and central issues in gender politics. It is structured around the major theories that have an impact on the way gender relations are addressed in political studies.

OBJECTIVES:

By integrating perspectives from social theory and development discourses, the course focuses on having students understand the current intellectual advances in gender politics.

COURSE CONTENT

UNIT I. Contextualising Gender

Concepts and Definitions: Sex, Gender, Transgender, Masculinity, Femininity, Patriarchy and Sexual Politics

Politics of the Body – Michel Foucault

The Gender Trouble - Judith Butler

Theories of Gender Relations - Structural functionalism, Conflict Theory

Symbolic Interactionism, Feminist theory

UNIT II. Feminism

Feminist Perceptions on Family - Personal is Political

Streams of Feminism - Liberal, Marxist and Socialist, Radical and Postmodern

Three Waves of Feminism, The Public-Private distinction

Eco-feminism, Nature-Culture Dichotomy

UNIT III. Gender and Development

Basic Concepts - Gender Analysis, Gender Discrimination, Gender Division of Labour, Gender Equality and Equity

Gender Related Indices - Gender-related Development Index (GDI), Gender Empowerment Measure (GEM), Women in Development (WID) Gender and Development (GAD), Gender Inequality Index (GII), Global Gender Gap Index

UNIT IV. Women Empowerment

Women Empowerment – Significance, Characteristics and Strategies
Parameters and Dimensions – Personal, Collective, Socio-cultural, Economic and Political
Women Empowerment in India - Prospects and Challenges

UNIT V. Major Issues in Gender Politics

Political Representation of Women – Gender Quota in Legislative bodies Reservation of Women in Panchayat Raj Institutions
The Women Reservation Bill
Women and the Kerala Model of Development

Reading List

- Ackerly, Brooke A. (2000), *Political Theory and Feminist Social Criticism*, Cambridge, Cambridge University Press.
- Arun, Shoba (2017), *Development and Gender Capital in India: Change, Continuity and Conflict in Kerala*, Routledge.
- Beauvoir, Simone de (2015), *The Second Sex* (Vintage Books, London), Random House.
- Beasley, Chris (1999), *What is Feminism?: An Introduction to Feminist Theory*, Sage.
- Bhardwaj, Prem R. (2011) *Gender Discrimination: Politics of Women Empowerment*, New Delhi, Anamika Publishers.
- Butler, Judith (1995), *Gender Trouble: Feminism and Subversion of Identity*, New York, Routledge.
- Butler, Judith and Scott, Joan (eds.) (1992), *Feminists Theorise the Political*, New York, Routledge.
- Chopra, J.K. (1999), *Gender Politics*, New Delhi, Aadi Publications.
- Connell, R. W. (2005), *Masculinities*, California, University of California Press.
- Dryzek, John S., Bonnie Honig and Anne Phillips (2008), *The Oxford Handbook of Political Theory*, Oxford, Oxford.
- Eaton, Heather & Lois Ann Lorentzen (2003), *Ecofeminism and Globalization: Exploring Culture, Context, and Religion*, Maryland, Rowman and Little Field.
- Evans, Mary & Carolyn Williams (2013), *Gender: The Key Concepts*, Routledge.
- Fausto-Sterling, A. (1993), *Myths of Gender: Biological Theories about Women and Men*, New York, Basic Books.
- Fausto-Sterling, A. (2008), *Sexing the Body: Gender Politics and the Construction of Sexuality*, Hachette UK.
- Fridman, Marilyn F. (2003) *Autonomy, Gender Politics*, New York, Oxford University Press.
- Georgina, Waylen & Vicky Rondall (1998) *Gender, Politics and the State*, London, Routledge.
- Glover, David & Cora Kaplan (2000), *Genders*, London, Routledge.
- Geert, H. Hofstede & Geert Hofstede, Willem A. Arrindell (1998), *Masculinity and Femininity: The Taboo Dimension of National Cultures*, Sage.

- Goel, Aruna (2000), *Women Empowerment: Myth or Reality*, Deep and Deep Publications.
- Hasan, Zoya (ed.) (2010), *Forging Identities: Gender, Communities and the State*, Delhi, Kali for Women.
- Gareth, S. Hill (2001), *Masculine and Feminine: The Natural Flow of Opposites in the Psyche*, Shambhala Publications,
- Jackson, Stevi & Sue Scott (eds.) (2002), *Gender*, London, Routledge.
- Jaquette, Jane S., Gale Summerfield (eds.) (2006) *Women and Gender Equality in Development Theory and Practice: Institutions, Resources, and Mobilization*, Durham, Duke University Press.
- Jeffrey, Robin (2016), *Politics, Women and Well-Being: How Kerala became 'a Model'*, Springer.
- Kimmel, M. (2000), *The Gendered Society*, New York, OUP.
- Lips, Hilary M. (2017), *Sex and Gender: An Introduction, Sixth Edition*, Waveland Press.
- Kumar, Hajira (2005), *Women's Empowerment, Issues, Challenges, and Strategies: A Source Book*, Daya Books.
- MacKinnon, C. (1989), *Toward a Feminist Theory of State*, Cambridge, Mass.: Harvard University Press.
- Menon, Nivedita (2001), *Gender and Politics in India*, New Delhi, Oxford University Press.
- Menon, Nivedita (2004), *Recovering Subversion: Feminist Politics Beyond The Law*, Urbana, University of Illinois Press.
- Mies, Maria (2014), *Patriarchy and Accumulation on a World Scale: Women in the International Division of Labour*, Zed Books.
- Momsen, Janet (2009), *Gender and Development*, Routledge.
- Millett, Kate (2000), *Sexual Politics*, Urbana, University of Illinois Press.
- Swapna Mukhopadhyay (2007), *The Enigma of the Kerala Woman: A Failed Promise of Literacy*, Berghahn Books.
- Pateman, Carole (2018), *The Sexual Contract*, John Wiley & Sons.
- Paxton, Pamela & Melanie M. Hughes (2015), *Women, Politics, and Power: A Global Perspective*, CQ Press.
- Parpart, Jane L., M. Patricia Connelly & V. Eudine Barriteau (eds.) (2000), *Theoretical Perspectives on Gender and Development*, Ottawa, IDRC.
- Phipps, Alison (2014), *The Politics of the Body: Gender in a Neoliberal and Neoconservative Age*, Wiley.
- Rahman, Momin & Stevi Jackson (2010), *Gender and Sexuality: Sociological Approaches*, Polity Press.
- Reinisch, June Machover Leonard A. Rosenblum, Stephanie A. Sanders (1987), *Masculinity/femininity: Basic Perspectives*, Oxford University Press.
- Rhode, Deborah L. (1990), *Theoretical Perspectives on Sexual Difference*, Yale University Press.
- Sahay, Sushama (1998), *Women and Empowerment: Approaches and Strategies*, Discovery Publishing House.
- Sawer, Marian & Manon Tremblay & Linda Trimble (2006), *Representing Women in Parliament: A Comparative Study*, Routledge.
- Sawicki, Jana (1991), *Disciplining Foucault: Feminism, Power, and the Body*, Psychology Press.
- Sen, Gita and Caren, Grown (1988), *Development Crises, and Alternative Visions: Third World Women's Perspectives*, Oxford, Earthscan.
- Stoller, R. J. (1968) *Sex and Gender: On the Development of Masculinity and Femininity*, New York, Science House.
- Sturgeon, Noël (1997), *Ecofeminist Natures: Race, Gender, Feminist Theory, and Political Action*, New York, Routledge.
- Stryker, Susan (2009), *Transgender History*, Hachette UK.
- Shiva, Vandana & Maria Mies (2014), *Ecofeminism*, Zed Books.
- Teich, Nicholas M. (2010), *Transgender 101: A Simple Guide to a Complex Issue*, Columbia University Press.
- Tandon, Neeru (2008), *Feminism: A Paradigm Shift*, Atlantic Publishers.
- Warren, Karen J. (1997), *Ecofeminism: Women, Culture, Nature*, Indiana University Press.
- Walters, Margaret (2005), *Feminism: A Very Short Introduction*, Oxford.
- Zack, N. (2005), *Inclusive Feminism*, Lanham, MD: Rowman & Littlefield Publishers.

SEMESTER: II (ELECTIVE)

COURSE CODE: POL E-2-5

COURSE TITLE: THEORIES OF DEMOCRACY

CREDITS: 4

AIM:

Apart from developing a deep knowledge of the evolution and practice of democracy, the course should be used to drive home the idea that political concepts have genealogies rather than definitions.

OBJECTIVES:

The student should develop an indepth understanding of the history of democracy. A deep knowledge of the latest developments and practices like deliberative democracy should be developed.

COURSE CONTENT

UNIT I. Democracy - Concept and History

Democracy/Authoritarianism

The value of Democracy

UNIT II. Classical Theory of Democracy

Jean-Jacques Rousseau

John Stuart Mill

De Tocqueville

Classical Democratic Theory in Question

Democratic revisionism

UNIT III. Aggregative Democracy

The Social Choice Approach to Democracy:

UNIT IV. Deliberative Democracy

Sites and Forms of Deliberation

Public Sphere

UNIT V. Elitist, Pluralist and Participatory Democracy

UNIT VI. Democratization and Global Democracy

Problems in Democratic Theory

Reading List

- Almond Gabriel and Sydney Verba (1965) *The Civic Culture: Political Attitudes and Democracy in Five Nations*, Boston, Little Brown and Co.
- Birch Anthony H. (2007) *The Concepts and Theories of Modern Democracy*, London, Routledge.
- Birch Anthony Harold (2007) *The Concepts And Theories of Modern Democracy*, London, Routledge.
- Cunningham Frank (2001) *Theories of Democracy*, London, Routledge.
- Dahl Robert A. (1991) *Democracy and its Critics*, New Haven, Yale University Press
- Dahl Robert A. (1998) *On Democracy*, New Haven, Yale University Press.
- Dahl Robert A. (2006) *A Preface to Democratic Theory*, Chicago, The University of Chicago Press.
- Ebenstein William (1974) *Modern Political Thought*, New Delhi, Oxford and IBH.
- Germino D. (1972) *Modern Western Political Thought: Machiavelli to Marx*, Chicago, Chicago University Press.
- Huntington Samuel P. (1991), *The Third Wave: Democratization in the Late Twentieth Century*, Oklahoma, University of Oklahoma Press.
- Kelly, Jamie Terence (2012) *Framing Democracy: A Behavioral Approach To Democratic Theory*, Princeton, Princeton University Press.
- Kioupkiolis Alexandros (2012) *Freedom After the Critique of Foundations Marx, Liberalism, Castoriadis and Agonistic Autonomy*, Basingstoke, Palgrave Macmillan
- Medearis John (2001) *Joseph Schumpeter's Two Theories of Democracy*, London : Harvard University Press.
- Mukherjee Subrata (2005) *Democracy in Theory and practices*, New Delhi, Macmillan Publishers India.
- Przeworski Adam (2010) *Democracy and the Limits of Self-government*, Cambridge, Cambridge University Press.
- Putnam Robert D. (2002) *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton, Princeton University Press.
- Raffaele Marchetti (2009) *Global Democracy*, London, Routledge.
- Schumpeter Joseph (1942), *Capitalism, Socialism, and Democracy*. New York, Harper.

SEMESTER: III (CORE)

COURSE CODE: POL C-3-1

COURSE TITLE: RESEARCH METHODS IN POLITICAL STUDIES

CREDITS: 4

AIM:

The course aims at introducing the students to methods of knowledge production in political science. The course is supposed to be of immediate help to the students in the preparation of their dissertation.

OBJECTIVES:

The course should make students aware of the complexity of knowledge production in social sciences and the philosophical debates involved.

The course should give them the ability to plan and carry out a research project with methodological clarity.

The course should train the students in the use of qualitative and quantitative methods.

COURSE CONTENT

UNIT I. Methodological Debates In Political Science

Positivist (Behavioural) and Post positivist (Post Behavioural) Approaches.

Question of Objectivity (Kuhn- Popper debate)

Scientific explanation and interpretative understanding of Social Sciences.

Qualitative vs. Quantitative research.

UNIT II.

Concept, Hypothesis and Variables in Political Science- Selection and Formulation of Research Problem.

UNIT III.

Synopsis Preparation

Research Design: Types of Research Designs: Exploratory, Descriptive, Diagnostic and Experimental. Research ethics, Plagiarism and Citation techniques.

UNIT IV. Quantitative Methods

Survey Research, Preparation of questionnaire, Sampling-Types of Sampling:
Probability Sampling Techniques and Non-Probability Sampling Techniques.

UNIT V. Qualitative Methods

Life history approach, Interviews, Focus Group discussions, Situational Analysis,
Content Analysis, Ethnography.

Reading List

- Aneshensel, C.S. (2002) *Theory-Based Data Analysis for the Social Sciences*, London, Pine Forge Press.
- Bernard Russell H. (2012) *Social Research Methods*, New Delhi, Sage.
- Blalock H.M. (1970) *An introduction to Social Research*, Englewood Cliffs, Prentice Hall.
- Blackburn R. (ed.) (1972) *Ideology and Social Science*, London, Fontana.
- Blondel J. (1976) *Thinking Politically*, London, Wildwood House.
- Bryman A. (1988) *Quantity and Quality in Social Research*, London, Unwin Hyman.
- Chalmers, A .F. (1990) *Science and Its Fabrication*, Milton Keynes, Open University Press.
- Creswell J. W. (2012) *Qualitative Inquiry and Research Design*, New Delhi, Sage.
- Crick B. (1993) *In Defence of Politics*, Harmondsworth, Penguin.
- David E. McNabb (2010) *Research Methods for Political Science: Quantitative and Qualitative Approach*, London, M.E Sharpe.
- De Vaus D. (2002) *Surveys in Social Research*, London, Routledge.
- De Vaus D. (2001) *Research Design in Social Research* London, Sage.
- De Vaus D. (2002) *Analyzing Social Science Data*, London, Sage.
- Denzin N. K. (2011) *The Sage Handbook of Qualitative Research*, New Delhi, Sage.
- Devine, F. and S. (1999) *Heath Sociological Research Methods in Context*. Basingstoke, Palgrave.
- Fieldin N, (2002) 'Ethnography' in Gilbert, N. (ed.) *Researching Social Life*. London, Sage.
- Fielding J. (2002) "Coding and Managing Data" in Gilbert N. (ed.) *Researching Social Life*, London, Sage.
- Flick Uwe, (2011) *Introducing Research Methodology: A Beginner's Guide to Doing a Research Project*, London, Sage.
- Gellner E. (1985) *Relativism and the Social Science*, Cambridge, Cambridge University Press.
- Giddens A. (1982) *Profiles and Critiques in Social Theory*, London, Macmillan.
- Gilbert N. (ed.) (2002) *Researching Social Life*. London, Sage.
- Goode J. William and Hatt K. Paul, (1952) *Methods in Social Research*. McGraw Hill Book Company, New Delhi.
- Hammersley M. (1995) *The Politics of Social Research*. London, Sage.
- Hart Chris (2005) *Doing Your Masters Dissertation: Realizing Your Potential as a Social Scientist*, New Delhi, Sage.

- Healey J. (2005), *Statistics: a Tool for Social Research*, Belmont, Thomson Wadsworth.
- Johnson J. B. and H. T. Reynolds (2012) *Political Science Research Methods*, New Delhi, CQ Press Publication.
- Kirk J. Miller (1986) *Reliability and Validity in Qualitative Social Research*. London, Sage.
- Kothari C.R. (2008) *Research Methodology: Methods and Techniques*, Delhi, New Age International.
- Kumar Ranjit (2010) *Research Methodology: A Step-by-Step Guide for Beginners*, New Delhi, Sage.
- Layder D. (1998) *Sociological Practice: Linking Theory and Social Research*. London, Sage.
- Lewins A. (2002) "Computer Assisted Qualitative Data Analysis" in Gilbert N. (ed.) *Researching Social Life*, London, Sage.
- Marsh C. (1982) *The Survey Method: the Contribution of Surveys to Sociological Explanation*. London, Unwin Hyman.
- Mukherji Partha Nath (2000) *Methodology in Social Research*, New Delhi, Sage Publications.
- Procter M. (2002) 'Analysing Survey Data' in Gilbert, N. (ed.) *Researching Social Life*. London, Sage.
- Punch K. F. (2007) *Developing Effective Research Proposals*, New Delhi, Sage.
- Ritchie J. Lewis (2003), *Qualitative Research Practice*. London, Sage.
- Robson C. (2002) *Real World Research*. Oxford, Blackwell Publishers Ltd.
- Ryan A. (1970) *The Philosophy of Social Sciences*, London, Macmillan.
- Ryan A. (ed.) (1973) *The Philosophy of Social Explanation*, Oxford, Oxford University Press.
- Seale C. et. al., (1999) *The Quality of Qualitative Research*, London, Sage.
- Seale. C. (ed.) (2004) *Researching Society and Culture*, London, Sage.
- Thakur, Devendra, (1998) *Research Methodology in Social Science*, New Delhi, Deep and Deep.
- Walliman Nicholas, (2004) *Your Undergraduate Dissertation: Essential Guide for Success*, New Delhi, Sage.
- Warwick, Donald P. and Bulmer M. (eds.) (1993), *Social Research in Developing Countries: Surveys and Consciousness in the Third World*, Delhi, Research Press.
- Wilkinson, Bhandarkar, (ed.) (1996), *Methodology and Techniques of Social Research*, Delhi, Himalaya Publishing House.
- Wooffitt R. (2005) *Conversation Analysis and Discourse Analysis* London, Sage.
- Young Pauline V. and Calvin F. Schmidt (2001) *Scientific Social Surveys and Research* New Delhi, Prentice Hall.

Semester : III (CORE)

Credits 4

Course Code : POL C-3-2

Course Title : CONTEMPORARY POLITICAL THEORY

Credits 4

AIM:

The objective of the course is to introduce the latest developments in the field of political philosophy. Background knowledge in the form of an in-depth understanding of the classical, liberal and socialist traditions and familiarity with the genealogy of the major concepts will be essential for achieving the learning objectives of this course.

Key concepts of thinkers who belong to these traditions have been identified for a *detailed study* which will help the student to observe the evolution of concepts. Specific concepts have been mentioned to foster the habit of making an *in-depth study of the concept*. Instructor could use this course as an opportunity to introduce the major works of these thinkers and prompt the habit of reading original works.

OBJECTIVES:

Students should develop a *general understanding* of the major tenets of intellectual traditions like Feminism, Post Modernism, Post Colonialism, Multiculturalism, Structuralism, Communitarianism, Libertarianism, Critical Theory and Post Marxism.

It will inspire them to explore the theoretical contributions of these thinkers going beyond what is mentioned in the syllabus.

COURSE CONTENT

UNIT I. Significance of Contemporary Political Theory

Major Concepts:

Feminism, Post modernism, Post colonialism, Multiculturalism

Liberty (Isaiah Berlin and Charles Taylor)

Equality and Justice (John Rawls and Amartya Sen)

Power (Michael Foucault and Steven Lukes)

UNIT II. Theories of State and Civil Society

Hegemony (Gramsci)

Structuralism (Althusser)

Nature of the state (Miliband–Poulantzas debate)

Civil society and Public sphere (Habermas)

UNIT III. Communitarianism and Libertarianism:

Entitlement theory (Robert Nozick)

Stockholder Theory (Milton Friedman)

Communitarianism (Michel Sandel)

UNIT IV. Critical Theory: Frankfurt School

One Dimensional Man (Herbert Marcuse)

Culture Industry (Theodor Adorno)

UNIT V. Post Marxism

Radical Democracy (Ernest Laclau and Chantal Mouffe)

Reading List

- Bhargava Rajeev (1998) *Secularism and its Critics in India*, New Delhi, OUP.
- Calhoun Craig J. (1996), *Habermas and Public Sphere*, Massachusetts, MIT.
- Calhoun Craig J. et. al. (eds.) (2011), *Rethinking Secularism*, New York: OUP.
- Cohen Jean L. and Andrew Arato (1992) *Civil Society and Political Theory*, Massachusetts, MIT.
- DeLaney C. F. (1994) *The Liberalism Communitarianism Debate: Liberty and Community Values*, London, Rowman and Littlefield.
- Farrelly C. P. (2004), *Contemporary Political Theory: A Reader*, New Delhi, Sage.
- Farrelly C. P. (2004): *An Introduction to Contemporary Political Theory*, New Delhi, Sage.
- Finlayson James Gordon (2005) *Habermas: A Very Short Introduction*, London: OUP.
- Gaus Gerald F. (2000) *Political Concepts and Political Theories*, Boulder, Westview Press.
- Gaus Gerald F. and Chandran Kukathas (2004) *Handbook of Political Theory*, London, Sage.
- Harvey David (2005) *A Brief History of Neoliberalism*, New York, OUP.

- Howell Jude A. and Jenny Pearce (2002) *Civil Society & Development: A Critical Exploration*, Boulder, Lynne Reiner.
- Kaviraj Sudipta and Sunil Khilnani (2001) *Civil Society: History and Possibilities*, Cambridge, Cambridge University Press.
- Keane John (1998) *Civil Society: Old Images, New Visions*, Stanford, Stanford University Press.
- Kymlicka Will (1995) *Multicultural Citizenship: A Liberal Theory of Minority Rights*, Oxford, OUP.
- Lukes Steven (2005) *Power: A Radical View*, London, Palgrave Macmillan.
- Mahajan Gurpreet (2002) *Multicultural Path: Issues of Diversity and Discrimination in Democracy*, New Delhi, Sage.
- McKinnon Catriona (2008) *Issues in Political Theory*, New Delhi, OUP.
- Parekh Bhikhu C. (2002) *Rethinking Multiculturalism: Cultural Diversity and Political Theory*, London, Macmillan.
- Parsons Stephen D. (2005) *Rational Choice and Politics: A Critical Introduction*, London, Continuum.
- Pettit Phillip (ed.) (1991) *Contemporary Political Theory*, London, Macmillan.
- Porter John, (1965) *The Vertical Mosaic: An Analysis of Social Class and Power in Canada*, Toronto, University of Toronto Press.
- Rattansi Ali (2011) *Multiculturalism: A Very Short Introduction*, Oxford, Oxford University Press.
- Sandel Michael (ed.) (2007) *Justice: A Reader*, Oxford, OUP.
- Simon Robert L. (ed.) (2002) *The Blackwell Guide to Social and Political Philosophy*, Oxford, Blackwell.
- Steger Manfred B. and Ravi K. Roy (2010) *Neoliberalism: A Very Short History*, New York, OUP.
- Taylor Charles (2002): *A Secular Age*, New York, Belknap Press.
- Taylor Charles (2011) *Multiculturalism*, Princeton, Princeton University Press.
- Vincent Andrew (2007) *The Nature of Political Theory*, Oxford, OUP.
- Volin Sheldon S. (2004) *Politics and Vision: Continuity and Innovation in Western Political Thought*, Princeton, Princeton University Press.
- Wessendorf Susanne (2010) *The Multiculturalism Backlash: European Discourses, Policies and Practices*, New York, Routledge.

Semester : III (CORE)

Credits 4

Course Code : POL C-3-3

Course Title : ISSUES IN INDIAN POLITICS

Credits 4

AIM:

The central objective of the course is to offer the students an insight into the dynamics of Indian politics. Within this overall objective, management of conflicts over the distribution of resources, legitimacy of the authority, challenges to democratic governance in the country, and problems of development are looked into.

OBJECTIVES:

This paper introduces students to key issues and debates that occupied a central place in Indian politics since India became an independent democratic republic. The Students are expected to develop a critical perspective on the actual political process of the country through a deeper analysis of the party system, electoral politics and political economy, and the extent to which this tried could address the larger issues of social justice. It then examines the politics of major social identities in Indian politics, viz, caste, class, tribe and gender.

COURSE CONTENT

UNIT I. Politics of Identities in India

Caste, Class and Gender: Domination, recognition, mobilisation and Social Justice

UNIT II. Party and Party System

Evolution and Shifts in Party System

Dominant Party System, Coalition Politics – Social and Ideological Base of Political Parties: BJP, Congress, Left Parties (CPM and CPI)

Regional Political Parties – An Overview

UNIT III. Electoral Politics

Political Participation – Electoral Behaviour- Electoral Reforms

Electoral Politics: Emerging Trends since 1990's

UNIT IV. Major issue Areas

Secularism, Communalism, Migration, Maoism, Populism, Agrarian Crisis

UNIT V. Political Economy Development

Critique of India's Development Experience – Economic Liberalisation and the emerging Paradigm of Development- Civil Society Movements: Dalit, Adivasi, women and Environmental Movements

Reading List

- Bhambri C. P. (1999) *The Indian State: Fifty Years*, New Delhi: Shipra.
- Bhargava Rajeev (2010) *The Promise of India's Secular Democracy*, New Delhi: Oxford University Press.
- Chakrabarty Bidyut (2008) *Indian Politics and Society Since Independence, Events, Processes and ideology*, USA, Routledge.
- Chandhoke Neera and Praveen Priyadarshi (2009) (Ed.) *Contemporary India:Economy, Society, Politics*, New Delhi, Dorling Kindersley.
- Chandra Kanchan (2004) *Why Ethnic Parties Succeed?: Patronages and Ethnic Head Counts in India*, Cambridge: Cambridge University Press.
- De Souza Peter, Ronald and E. Sridharan (2006) (eds.) *India's Political Parties*, New Delhi, Sage.
- Hasan Mushirul (ed.) (2004) *Will Secular India Survive?* Gurgaon, Imprint One.
- Hasan Zoya (ed.) (2000) *Politics and State in India*, New Delhi, Sage.
- Hasan, Zoya (ed.) (2001): *Parties and Party Politics in India*, New Delhi, Oxford University Press.
- Katharine Adeney and Lawrence Saez (2005) *Coalition Politics and Hindu Nationalism*, London, Routledge.
- Kohli Atul (1988) *India's Democracy : An Analysis of Changing State- Society Relations:* Princeton N. J. Princeton University Press.
- Kohli Atul (2001) *The Success of India's Democracy*, Cambridge, Cambridge University Press.
- Mohanty Manoranjan (ed.) (2004) *Readings in Indian Government and Politics: Class, Caste, Gender*, New Delhi, Sage.
- Mohanty Manoranjan, Mukherji and O. Tornquist (eds.) (1998) *People's Rights: Social Movements and the State in the Third World*, New Delhi, Sage.
- Narayan Badri (2009) *Fascinating Hindutva: Saffron Politics and Dalit Mobilisation*, New Delhi, Sage.
- Omvedt Gail (1993) *Reinventing Revolution, New Social Movements and the Socialist Tradition in India*, New Delhi, Shipra.
- Pai Sudha (2000) *State Politics, New Dimension: Party System, Liberalization and Politics of Identity*, New Delhi, Shipra.

- Prasad Mahendra Singh and Ranjan Subhendu Raj (eds.) (2012) *The Indian Political System*, Delhi, Pearson.
- Ray Raka Kazenstein, Mary Fainsod, (2005) *Poverty, Power and Politics*, Lanham, Littlefield.
- Roy Srirupa (2007) *Beyond Belief: India and the Politics of Post Colonial Nationalism*, New Delhi: Permanent Black.
- Rudolph L. I. and S. Rudolph (2008): *Explaining Indian Democracy*, Vol. I-III, Delhi: Oxford University Press.
- Rudolph L.I. and Susanne H Rudolph (1987) *In Pursuit of Lakshmi: The Political Economy of the Indian State*, New Delhi: Orient Longman.
- Sathyarmurthy T.V. (1999) *Social Change and Political Discourse in India*, Delhi: Oxford University Press.
- Shah Ghanashyam (ed.) (2008) *Caste and Democratic Politics in India*, New Delhi: Permanent Black.
- Shah, Ghanshyam (ed.) (2002): *Social Movements and the State*, New Delhi: Sage.
- Singh M.P. and Rekha Saxena (2008) *Indian Politics: Contemporary Issues and Concerns*, New Delhi, Prentice Hall.
- Srinivasan T. N. (ed.) (2007) *The Future of Secularism*, New Delhi: Oxford University Press.
- Tiwari Lalan (1995) *Issues in Indian Politics*, New Delhi, Mittal Publications.
- Vanaik Achin (1990) *The Painful Transition: Bourgeois Democracy in India*, London: Verso.
- Vora Rajendra and Suhas Palshikar (2004) *Indian Democracy: Meanings and Practices*, New Delhi, Sage.

Semester : III (ELECTIVE)

Course Code : POL E-3-1

Course Title : HUMAN RIGHTS IN INDIA

Credits 4

AIM:

To draw the attention of students to the basic concepts of Human Rights and its practice in the contemporary India. It aims to provide a clear vision to the students about the various instrumentalities that can be employed in context of the violation of various kinds of human rights especially in a globalised era.

OBJECTIVES:

The course offers an opportunity to the students to clearly understand the emergence, development and various dimensions of Human Rights in an indepth manner. It also critically studies the formulation of the Universal Declaration of Human Rights and various Covenants that are framed by UN for the protection and promotion of Human Rights. The course tries to present the current human rights scenario in India and various instrumentalities and institutions that are in place to ensure the fundamental human rights to various sections of the population. Finally, it critically examines the impact of globalisation on the protection and promotion of human rights.

COURSE CONTENT

UNIT I. Human Rights

Conceptualization and Evolution – Approaches; Western Socialist, Third World and Feminist Approach – Three Generations of Human Rights – UDHR – Millennium Development Goals.

UNIT II. Human Rights in India

The Constitutional Context – fundamental Rights (including Inferred Fundamental Rights) – Directive Principles.

UNIT III. Instrumentalities for the Protection of Human Rights

Judiciary; Judicial Review – Judicial Activism – PIL – Protection of Human Rights Act (1993) – NHRC – Media – Globalization and Human Rights

UNIT IV. Human Rights and Social Groups

Rights; Scheduled Caste – Scheduled Tribe – Minorities – Women – Children – LGBT – Differently Abled.

UNIT V. Human Rights and Environment

Environmental Justice – Right to Livelihood – Right to Food and Water – Right to Development.

Reading List

- Agarwal H.O. (1983) Implementation of Human Rights Covenants with Special Reference to India, Allahabad, Kitab Mahal.
- Agarwal R.S. (1978) Human Rights in the Modern World, New Delhi: Chetna Publications.
- Anu Saksena (2004) Gender and Human Rights, Delhi, Shipra Publications.
- Ashishkumar Das (2007) Human Rights in India, New Delhi, Sarup Sons.
- Babu Brijesh (2010) Human Rights and Social Justice, New Delhi, Global Ppublications.
- Darren O'Byrne (2007) Human Rights: An Introduction, New Delhi, Pearson.
- Desai A.R. (ed.) (1990) Repression and Resistance in India, Bombay, Popular Prakashan.
- Falk Richard (1991) Human Rights and State Sovereignty, New York, Helnes and Meier Publishers.
- Fernandez Walter (1991) Caste and Conversion Movements in India: Religion and Human Rights, New Delhi, Indian Social Institute.
- Forsythe David. P. (ed.) (1989) Human Rights and Development: International Views, London, Macmillan.
- Iyer V.R. Krishna (1990) Human Rights and the Law, Indore, Vedpal Law House.
- Iyer V.R. Krishna (1999) The Dialectics and Dynamics of Human Rights in India: Yesterday, Today and Tomorrow, Calcutta, ELH.
- Jadhav, P.B. (2010) Dalits and Human Rights: Emerging Scenario, Jaipur, Vital Publications.
- Jayapalan N. (2000) Human Rights, New Delhi, Atlantic Publishers.
- Kazai Farced (1987) Human Rights: Myth and Reality, New Delhi, International Publishing House.
- Kerr Joanna (ed.) (1993) Ours by Right: Women's Rights as Human Rights London: Zed Books.
- Khare Subhas Chandra (1977) Human Rights and UN, New Delhi: Metropoliton Books
- Macfarlane L.J. (1985) The Theory and Practice of Human Rights, London, Maurice Temple South.
- Michel R. Anderson and Sumit Guha (2006) Changing Concepts of Rights and Justice in South Asia, New Delhi, OUP.
- Monshipouri Mahmood, Englehart Neil, Nathan J. Andrew, Philip Kavita (eds.) (2004) Constructing Human Rights in the Age of Globalization, New Delhi, Prentice Hall of India.
- Perry Michael J. (1998) The Idea of Human Rights, New York, OUP.
- Rao Venketeswaran D. (2004) Child Rights: A Perspective on International and National Law, New Delhi, Manak Publication.

- Sastry. T.S.N. (2005) *India and Human Rights: Reflections*, New Delhi, Concept Publishing Company.
- Singh B.P (2008), *Human Rights in India, Problems and Perspectives*, New Delhi, Deep and Deep.
- Singh Segal B.P. (ed.) (2008) *Human Rights in India*, New Delhi, Deep & Deep Publications.
- Sinha P.C. (2002) *Encyclopaedia of Human Rights*, New Delhi, Anmol Publishers.
- South Asia Human Rights Documentation Ce (2010) *Oxford Hand Book of Human Rights and Criminal Justice in India*, New York, OUP.
- Sukumaran Nair P. (ed.) (2011) *Human Rights in a Changing World*, New Delhi, Kalpaz Publications.
- Surya Yadav (2009) *Human Rights in the 21st Century*, New Delhi, Jamamda Prakasam.
- Syed Mehartaj Begum (2000) *Human Rights in India: Issues and Perspectives*, New Delhi, APH Publishing.
- Tapan Biswal (2006) *Human Rights, Gender and Environment*, New Delhi, Viva Books.
- Varun Naik, Mukesh Sahni (2010) *Encyclopedia of Human Rights*, New Delhi, Crescent Publishing Corporation.

SEMESTER: III (ELECTIVE)

COURSE CODE: POL E-3-2

COURSE TITLE: INDIA'S FOREIGN POLICY

CREDITS: 4

AIM:

Aim of the course is to understand the basic principles, purposes, policy priorities, and strategies of India's Foreign policy;; Examine India's relationship with its Neighbours, Indian Ocean, South East Asia, Indo-Pacific, and big powers such as USA, China and Russia; Articulate their own perspectives and arguments on India's Foreign policy; Broaden and deepen students' knowledge of the contextual factors, elements, challenges and strategies of India's Foreign policy; Strengthen students' analytic and comprehension skills through student-led discussions, simulations, and policy papers based on the content of the course.

OBJECTIVES:

The course envisages studying various facets of India's Foreign Policy; The basic factors, key values and principles, goals, Non aligned movement, outlooks and strategies of India's Foreign Policy along with the security concerns and challenges, India as an emerging power, defense and military policies, and world view of India's foreign policy will be clarified and evaluated.

COURSE CONTENT

UNIT I. Basic Determinants of India's Foreign Policy

Ideology, Identity, Geo-politics and Political Economy

Political Tradition: Role of Nehru in the making of India's Foreign Policy

Politics of NAM

UNIT II. Formulation of India's Foreign Policy

MEA, Political Parties, Ruling Class, Civil Society, Media and Public Opinion, Global Capital

UNIT III. India's Neighborhood and Extended Neighborhood Policies

India's Relations with South Asia (1990 onwards) (Pakistan, Sri Lanka, Bangladesh and Nepal)

India and SAARC

India's Look East/ Act East Policy

India and West Asia

UNIT IV. India and Major Powers

United States, Russia

India's Relations with China: Critical Issues

Role of India in BRICS

UNIT V. Understanding Shift in India's Foreign Policy

India's New Economic Policy, the impact of Neoliberal Globalisation on Indian Foreign Policy.

Understanding the evolution of India's Nuclear Policy (Pokhran I and Pokhran II)

International Nuclear Regime and India (CTBT, NPT)

India as an emerging Power

Reading List

Alagappa, Muthiah (2008) (ed) *Nuclear Weapons and Security in 21st Century Asia, The Long Shadow*, Oxford University Press, New Delhi.

Bajpai, P. Kanti and Pant, V. Harsh (2013) *India's Foreign Policy a Reader*, Oxford University Press, New Delhi.

Bajpai, P. Kanti and Pant, V. Harsh (2013) *India's National Security: A Reader*, Oxford University Press, New Delhi.

Centre for Policy Research (2012) *NAM 2.0: A Foreign and Strategic Policy for India in the Twenty First Centuries*, Centre for Policy Research, New Delhi.

Chandra, Subash and Jacob T. Jabin (2011) *India's Foreign Policy: Old Problems, New Challenges*, New York, Macmillan.

Dahiya, Rumel and Behuria, Ashok (eds) (2012) *Indias Neighborhood Challenges in the Next Two Decades*, Pentagon Security International, Pentagon Press, New Delhi.

Dubey, Muchkund (2012): *India's Foreign Policy Coping with the Changing World*, Pearson Education, New Delhi.

Dutt V.P. (1993) *India's Foreign Policy*, Vikas Publishing House, New Delhi.

Edwardes, Michael (Jan., 1965), Illusion and Reality in India's Foreign Policy, *International Affairs*, Vol. 41, No. 1pp. 48-58

Ganguly, Sumit (2010) *India's Foreign Policy: Retrospect and Prospect*, Oxford University Press, New Delhi.

George, Perkovich (1999) *India's Nuclear Bomb: The Impact on Global Proliferation*, University of California Press, Los Angeles.

Ghosh, Anjali (2009) *A History of India's Foreign Policy*, Pearson, New Delhi.

Khanna V.N. (2010) *Foreign Policy of India*, Vikas Publishing House, New Delhi.

- Kumar, Rajiv and Kumar, Santosh (2010) *In the National Interest: A Strategic Foreign Policy for India*, India, Business Standard Books
- Kumar, Rajiv and Menon, Raja (2010) “*The Long View from Delhi: To Define the Indian Grand Strategy for Foreign Policy*,” Amazon, Academic Foundation
- Kumar, Sanjeev H.M. (2007) *Domestic Politics and Foreign Policy*, Uppal Publishing House, New Delhi.
- Malik, Mohan (2012) *China and India Great Power Rivals*, USA, Lynne Rienner Publishers.
- Malone, David M. (2011) *Does the Elephant Dance? Contemporary Indian Foreign Policy*, OUP, New Delhi.
- Mathur, Vibha (2009) *Foreign Trade Policy and Trends in India: 1947-2009*, New Century Publications, New Delhi.
- Mattoo, Amitabh and Jacob, Happyman (2010) *Shaping India's Foreign Policy*, Haranand Publications, New Delhi.
- Mohan, C. Raja (2003) *Crossing the Rubicon: The Shaping of India's Foreign Policy*, Penguin, New Delhi.
- Muni S.D. (2009) *India's Foreign Policy – The Democracy Dimension with special reference to Neighbours*, Foundation Books, New Delhi.
- Pant, V. Harsh (2009) *Indian Foreign Policy in a Unipolar World*, .Routledge, New Delhi.
- Parameswaran, Prashanth (2012) “*Indian Strategic Thinking Comes Of Age*”, World Politics Review.
- Perkovich, George (1999) *India's Nuclear Bomb: The Impact on Global Proliferation*, University of California Press, Los Angeles.
- Rathod P.B (2009) *Foreign Policy of India*, Commonwealth Publishers, New Delhi
- Ray, Jayant Kumar (2011) *India's Foreign Relations-1947-2007*, Routledge, New Delhi.
- Sikai, Rajani (2009) *Challenge and Strategy: Rethinking India's Foreign Policy*, Sage, New Delhi.
- Tharoor, Shashi (2012) *PaxIndica: India and the World of the 21st Century*, . Penguin Books, New Delhi.

SEMESTER: III (ELECTIVE)

COURSE CODE: POL E-3-3

COURSE TITLE: DECENTRALISED GOVERNANCE IN INDIA

CREDITS: 4

AIM:

To introduce the concepts and theories of Decentralisation and Development Administration
 To understand the constitutionalisation of decentralised governance in India
 To examine the contemporary issues in decentralised governance

OBJECTIVES:

Focus is given to introductory information on Decentralisation and Development Administration in India. Constitutional status to local self government through 73rd and 74th amendment acts will also be covered. Both urban and rural poverty in India have been significantly considered with special focus on poverty alleviation programmes.

COURSE CONTENT

UNIT I. Introduction

Decentralisation –Meaning and significance
 Theories of Decentralisation
 Development Administration -Meaning and characteristics
 Decentralisation and Development Administration

UNIT II. Decentralisation in India

Role of LSGs in Decentralisation
 Indian Constitution and Decentralisation- 73rd and 74th Amendments

UNIT III. Urban Governance in India

Urbanisation - issues and challenges-Social, Economical and Environmental
 Urban Poverty in India
 Urban Poverty Alleviation Programmes

UNIT IV. Rural Governance in India

Strategies for rural development in India
 Major Rural Development Programmes-Special Reference to MGNREGP
 Rural Poverty Alleviation Programmes

UNIT V. Decentralised Governance: Contemporary Issues

Globalisation and Decentralised Governance
 Decentralised Governance: Issues and Challenges in Indian Society

Reading List

Core

- Arora Ramesh, K. and S. Sharma (1992) *Comparative Development Administration*, Jaipur, Arihant Publishers.
- Biju M.R. (2010) *Development Issues in Contemporary India*, New Delhi, Concept.
- Biju M.R. (2010) *Rural Development under Decentralised Governance*, New Delhi, Concept.
- Choudhury R. C. and S. P. Jain (eds.) (2008) *Patterns of Decentralised Governance in India*, Hyderabad, National Institute of Rural Development.
- Riggs Fred W. (ed.)(1970) *Frontiers of Development Administration*, Durham: N.C. Duke University Press.
- Sharma R. D. (2000) *Administrative Systems of Developing Countries*, New Delhi, Mittal.
- Shepherd, Andrew (1998), *Sustainable Rural Development*, Macmillan, London.
- U.B. Singh (2009) *Decentralised Democratic Governance in New Millennium*, New Delhi, Concept.
- Viswambhar Nath (2011) *Administration and Development Planning in India*, New Delhi, Concept Publishing Co.

Additional

- B.K. Sinha and K. Gopal Iyer (2009), *Panchayati Raj and Local Governance*, Hyderabad, NIRD.
- Davey, Kenneth (1989): *Strengthening Urban Governance; Discussion Paper; Urban Development Department*, The World Bank.
- Dutta, Abhijit (1999): *Institutional Aspects of Urban Governance in O.P. Mathur (ed.) India- The Challenges of Urban Governance*; National Institute of Public and Policy, New Delhi..
- E.A. Narayana (2008), *Panchayati Raj in Action*, Concept, New Delhi, ..
- G. Palanithurai (2002), *Dynamics of New Panchayati Raj System in India (vol 1 to VII)*, New Delhi, Concept.
- G. Palanithurai (2009), *Decentralisation in India: Critical Issues from the Field*, New Delhi, Concept.
- H. Singh (1995), *Administration of Rural Development in India*, Sterling, New Delhi.
- Khanna B.S. (1982) *Rural Development in India*, New Delhi, Deep & Deep.
- Kumar, Girish (2006), *Local Democracy in India: Interpreting Decentralization*, New Delhi, Sage.
- La Palombara Joseph (ed.) (1963) *Bureaucracy and Political Development*, Princeton: NJ, Princeton University Press.
- M.A. Oommen (2007), *A Decade of Decntralisation in Kerala*, New Delhi, Institute of Social Sciences.
- Maheswari S.R. (1984) *Local Government in India*, New Delhi, Orient Longman.

Mathew Abraham (2005) , *Role of Panchayats in Welfare Administration: A Study with Special Reference to Centrally Sponsored Schemes*, Delhi, Kalpaz Publications.

Mohinder Singh (1992), *Rural Development in India – Current Perspectives*, New Delhi, Intellectual Publishing House.

Narayana E.A. (2008) *Panchayati Raj in Action*, New Delhi, Concept.

Palanithurai G. (2002) *Dynamics of New Panchayati Raj System in India* (vol 1 to VII), New Delhi, Concept.

Palanithurai G. (2009) *Decentralisation in India: Critical Issues from the Field*, New Delhi, Concept.

Pandikar V.A. Pai (1975) *Development Administration in India*, New Delhi, Macmillan.

Singh Sahib and Swinder Singh (1992) *Local Government in India*, Jalandhur, New Academic Publishing House.

Srivasthava, K.B (1994), *New Perspectives in Development Administration*, Concept, New Delhi.

Journal Articles

Jha, Shikha (2002): ‘Strengthening Local Governments’ Rural Fiscal Decentralisation in India ’; *Economic and Political Weekly*; Vol. XXXVII; No. 36.

Kundu Amitabh, S. Bagchi & D. Kundu (1999): ‘Regional Distribution of Infrastructure and Basic Amenities in Urban India- Issues Concerning Empowerment of Local Governments’. *Economic and Political Weekly*; Vol. XXXIV; No.28.

SEMESTER: III (ELECTIVE)

COURSE CODE: POL E-3-4

COURSE TITLE: COMPARATIVE FEDERALISM

CREDITS: 4

AIM:

To make students aware of the history of the concept of federalism and the reasons for its success as a political practice in the modern world.

OBJECTIVES:

To develop an in-depth understanding of the evolution of federalism as an idea and political practice.

To develop an understanding of the actual functioning of federal institutions in the present world.

COURSE CONTENT

UNIT I. Federalism

Concept of Federalism

Confederation and Federation

Types: Fiscal Federalism, Cooperative Federalism, Unitarian Federalism, Asymmetrical Federalism, Bargaining Federalism, Market Friendly Federalism.

UNIT II. Evolution of Federal Democracy

USA, Canada, India and Australia.

UNIT III. Federal Relationship

Judiciary and Federal –State relationships and Inter-State Relationships.

UNIT IV. Federal Institutions

Institutions in Ensuring Co-operation

Inter State Council in India

National Association of American Countries and National Governors' Association in USA Inter Provincial Conference and Premises Association in Canada and Australia.

UNIT V. Decentralisation

Local Govt. and Decentralization Process in Federal System

Debate on Devolution

Devolution and Participatory Democracy.

Reading List

- Arora K. and D.V. Vermey (eds.) (1995) *Multiple Identities in a Single State: Indian Federalism in Comparative Perspective*, New Delhi, Centre for Policy Research.
- Bagchi A. K. (ed.) (1995) *Democracy and Development*, New York, St. Martin's Press.
- Basu D. .D. (2008) *Comparative Federalism*, Nagpur, Wadhwa and Company.
- Basu D.D. (2011) *Commentary on the Constitution of India* (Volume 9), Nagpur, Lexis Nexis Butterworths.
- Blindenbacher Raoul and Arnold Koller (2002) *Federalism in a Changing World: Learning From Each Other*, McGill, Queen's University Press.
- Brown David and Louis Swanson (2003) *Challenges for Rural America in the Twenty First Century*, Pittsburg, Penn State University Press.
- Burgess Michael and Gagnon Alain (2010) *Federal Democracies*, London, Routledge.
- Crawford K.G. (1954) *Canadian Municipal Government*, Toronto, University of Toronto Press.
- Gani H.A. (1990) *Centre State Relations and Sarkaria Commission: Issues, Institutions, Challenges*, New Delhi, Deep and Deep Publishers.
- Gress Franz and Jackson Janes (2001) *Reforming Governance: Lessons from the United States of America and the Federal Republic of Germany*, Sydney, Palgrave Macmillan.
- Ishiyama John T. (2012) *Comparative Politics: Principles of Democracy and Democratization*, London, Wiley Blackwell.
- Issac T.M and Vijayanand S.M (2000) *Status of Panchayati Raj in the States and Union Territories of India*, New Delhi, Concept Publishing Company.
- Jackson L. and N. Lynn (2002) *Constructing 'Federal Democracy' in Russia: Debates Over Structures of Power in the Regions*, London, Routledge.
- Jayal Niraja Gopal, Amit Prakash and Pradeep Sharma (2006) *Local Governance in India: Decentralization and Beyond*, New Delhi, Oxford University Press.
- Kincaid John (ed.) (2011) *Federalism* (Four-Volume), London, Sage.
- Kincaid John and G. Alan (2005) *A Global Dialogue on Federalism: Constitutional Origins, Structure and Change in Federal Countries*, (Vol. I), McGill, Queen's University Press.
- Kincaid John and Nico Steytler (2009) *Local Government and Metropolitan Regions in Federal Systems*, McGill, Queen's University Press.

- Le Roy Katy and Cheryl Saunders (2005) *A Global Dialogue on Federalism: Legislative, Executive and Judicial Governance in Federal Countries*, (Vol.III), Mc Gill, Queen's University Press.
- Liebschutz Sarah F. (1991) *Bargaining Under Federalism: Contemporary New York*, New York, State University of New York Press.
- Little Laura E. (2010) *Federal Courts: Examples and Explanations*, New York, Aspen Publishers.
- Low Peter W., John C. Jeffries and Curtis A. Bradley (2010) *The Federal Courts and The Federal-State Relations*, Washington, Foundation Press.
- MacMillan Margaret and Francine McKenzie (2003) *Parties Long Estranged: Canada and Australia in the Twentieth Century*, Vancouver, University of British Columbia.
- Mukharji N. and B. Arora (eds.) (1992) *Federalism in India: Origins and Development*, New Delhi, Centre for Policy Research.
- Shah Anwar (2005) *A Global Dialogue on Federalism. The Practice of Fiscal Federalism-Comparative Perspectives*, (Vol. II), Mac Gill, Queen's University Press.
- Suri K.C. (2004) "Democracy, Economic Reforms and Election Results in India", *Economic and Political Weekly*, 39(51), December 18-24, 2004, pp. 5404-11.
- Watson Richard A. (1985) *Promise and Performance of American Democracy*, New York, John Wiley & Sons.
- White W.L., R.H. Wagenberg and R.C. Nelson (1985) *Introduction to Canadian Government and Politics*, Toronto, Holt, Rinehart and Winston.
- Wibbels Erik (2005) *Federalism and the Market: Intergovernmental Conflict and Economic Reform in the Developing World*, Cambridge, Cambridge University Press.

SEMESTER: IV (CORE)

COURSE CODE: POL C-4-1

COURSE TITLE: INDIAN POLITICAL THOUGHT

CREDITS: 4

AIM:

The course aims at enabling the student to appreciate the richness and diversity of political thought in India. The student should be able to critically analyse Indian political thought in the context of the theoretical debates about Eurocentrism in the discipline. Though specific concepts are mentioned for the convenience in teaching, the students should be enabled to understand the historical context of the evolution of thought and the diversity of ideas.

OBJECTIVES:

The course should familiarise the students with the life and thoughts of the thinkers and reformers in India.

The course should enable the student to explore and interpret the ideas of Indian political thought.

COURSE CONTENT

UNIT I. Ancient Thought

Dharmasastra, Kautilya (Saptanga theory of State) , Agannasutta (*DighaNikaya* Theory of Kingship) , Ziauddin Barani (Ideal Polity) , Kabir (Syncretism)

UNIT II. Modern Thought

Aurobindo (Integral Reason), Vivekananda (Socialism) , MN Roy (Radical Humanism) Jawaharlal Nehru (The idea of India as expressed in the *Objective Resolution* In Constituent Assembly debates) Rabindra Natha Tagore (Critique of Nationalism: Cosmopolitanism) Allama Iqbal (Pan Islamism) , Savarkar (Hindutva)

UNIT III. Mahatma Gandhiji

Gandhi's Critique of Modernity: Western Civilization, Science and Technology Modern State vs Ramarajya , Majoritarian Democracy

Major Gandhian Ideas: Ahimsa Satyagraha Trusteeship Sarvodaya Swadeshi

UNIT IV. Ambedkar

Nation and Nationalism and Inclusive citizenship

Constitution and Democracy

Buddhism and Conversion

Caste Untouchability and the critique of Hindu Social Order

Ways to annihilate caste –Social Justice

Gandhi- Ambedkar debate

UNIT V. Contemporary Thought

Partha Chatterjee (Political Society)

Christoffe Jaffrelot (Hindu Nationalism)

Ranajit Guha (Subaltern critique of Indian National Movement)

Sudipta Kaviraj (‘Fuzzy Communities’ as expressed in his work *The imaginary institution of India*)

Reading List

Almust Ajay Singh (1998) *Lohia The Rebel Gandhian*, New Delhi, Mittal Publications.

Appadurai A. (1973) *Documents on Political Thought in Modern India* (two vols.) Bombay, OUP.

Bandhopadhyay Sekhar (2009) (ed.) *Nationalist Movement in India: A Reader*, New Delhi, Oxford University Press.

Burton Zweibach (2010) *Civility and Disobedience*, Cambridge, Cambridge University Press.

Chanchreek Kanyalal (2006) (ed.) *Social Reform Movement and Jyothiba Phule*, New Delhi, Shree Publishers and Distributors.

Damodaran K. (1967) *Indian Thought*, New York, Asia Publishing House .

Damodaran N. N. (2007) *M N Roy: Sathyanveshiyaya Viplavakari*” (Malayalam), Kozhikode, Pusthaka Bhavan.

De Brey Theodore et. al., (1967) (eds.) *Sources of Indian Tradition*, New York, Colombia University Press.

Ghattak B. K. (1997) *Dr B R Ambedkar’s Thought*, New Delhi, APH publishing Corporation.

Ghosh Gautham (2003) *The Prophet of Modern India: A Biography of Swami Vivekananda*, New Delhi, Ajantha.

- Gupta Manmathanath (1962) *History of Indian Revolutionary Movement*, Bombay, Somajan.
- Heimsath C.H. (1970) *Indian Nationalism and Hindu Social Reform*, Bombay, OUP.
- Iyer Raghavan, (1978) *The Moral and Political Thought of Mahatma Gandhi*, Delhi, Oxford University Press.
- Jayakumar Vijayalayam (1924) *Sreenarayana Guru: A Critical Study*, New Delhi, Print World.
- Johari J. C. (1998) *M.N. Roy: A Great Radical Humanist*, New Delhi, Sterling.
- Karunakaran K. P. (1964) *Continuity and Change in Indian Politics*, New Delhi, PPH.
- Kaura Uma (1977) *Muslims and Indian Nationalism*, New Delhi, Manohar.
- Keer Dhananjay (1966) *Veer Savarkar*, Bombay, Popular Prakashan.
- Lal Shyam and Saxsena K. S. (1998) (Ed.) *Ambedkar And Nation Bulding*, New Delhi, Rawath Publications.
- Majumdar Bemanbehari (1967) *History Of Indian Social and Political Ideas: From Ram Mohan to Dayanand*, Ann Arbor, University of Michigan Press.
- Mohanthi Manoranjan (1977) *Revolutionary Violence: A Study of Maoist Movement in India*, New Delhi, Sterling.
- Namboothiripaad E.M.S. (1959) *Mahatma and His Ism*, New Delhi, People Publishing House.
- Pantham Thomas & Kenneth Deutsch (1986) *Political Thought in Modern India*, New Delhi Sage.
- Prasad Muni Narayana (2003) *The Philosophy of Narayana Guru*, Delhi, D.K.Print World.
- Rao M.B. (1970) (ed.) *Gandhi A Marxist Symposium*, New Delhi , People Publishing House.
- Rasheed M. K Damodaran ,(Malayalam), Kottayam, DC Books.
- Seal Anil (1971) *Emergence of Indian Nationalism: Competition and Collaboration in the Later 19th Century*, Cambridge, Cambridge University Press.
- Shankar Sumith (1973) *Swadeshi Movement in Bengal 1903 to 1908*, New Delhi, People Publishing House.
- Shukla S.K. (2008) *Swamy Vivekanand: Educational Philosopher and His Work*, New Delhi, Omega Publications.
- Sreenivasan K. (1980) *Sreenarayanaguru*, Thiruvananthapuram, Jayasree Publications.
- Tarkunde V. M. (1983) *Radical Humanism*, Delhi, Ajantha.
- Yati Nitya Chaithanya (1985) *Epistemology of Gnosis*, Narayana Gurukula, Varkala: Thiruvananthapuram.

SEMESTER: IV (CORE)

COURSE CODE: POL C-4-2

COURSE TITLE: ENVIRONMENT, DEVELOPMENT AND POLITICS

CREDITS: 4

AIM:

The course aims at developing an indepth understanding of the centrality of environment in contemporary politics.

OBJECTIVES:

The course should make the student aware of the historical trajectory of the changing notions of environment in social and political discourse.

The course should develop a rich empirical understanding of the history of humanity's engagement with nature and environment.

COURSE CONTENT

UNIT I. Environmental and Social Theory:

- Eco-centrism Vs. Anthro-centrism
- Industrial Revolution and ecological transformation
- Colonial Environmental policy
- Marxist Theory of Environment
- Green Politics
- Eco-feminism

UNIT II. Global Environmental Governance – Role of UN Agencies

- Stockholm Conference
- UNEP
- Brundtland Report
- Earth Summit
- Sustainable Development

UNIT III. Environmental Degradation of the Global Commons

- Politics of Water
- Tropical Forest Lands and Developmental Initiatives
- Politics of Climate Change

UNIT IV. Environment vs. Development Debate

Chipko Movement

Narmada Dam Issue

Mining and the displacement of Tribals in Eastern India

UNIT V. Environmental Conservation and the Indian State

Principles of Environmental Legislation in India:

(Precautionary Principle, Polluter Pays Principle, Absolute Liability,
Public Trust Doctrine and Sustainable Development)

Conservation of the Western Ghats (Gadgil Committee Report)

Reading List

B. Doherty and M. De Geus (eds.) (1996) *Democracy and Green Political Thought: Sustainability, Rights and Citizenship*, London, Routledge.

Biehl Janet (1991) *Rethinking Ecofeminist Politics*, Boston, MA: South End Press.

Black Maggie (2002) *The No-Nonsense Guide to International Development*, London, Verso.

C. M. Abraham (1999) *Environmental Jurisprudence in India*, The Hague, Kluwer Law International.

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D. Bull (1982) *A Growing Problem: Pesticides and the Third World Poor*, Oxford: Oxfam.

D. Pepper (1993) *Eco-Socialism: From Deep Ecology to Social Justice*, London, Routledge.

Dobson Andrew (1990) *Green Political Thought*, London, Unwin Hyman.

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E.F. Schumacher (1973) *Small is Beautiful*, London, Sphere.

Eckersley Robyn (ed.) (1995) *Markets, the State, and the Environment: Towards Integration*, Melbourne, Macmillan.

Escobar Arturo (1995) *Encountering Development: The Making and Unmaking of the Third World*, Princeton, NJ: Princeton University Press.

Eugene Linden (2006) *The Winds of Change: Climate, Weather, and the Destruction of Civilizations*, New York, Simon & Schuster.

Gadgil Madhav and Ramachandra Guha (1992) *This Fissured Land: An Ecological History of India*, Berkeley, University of California Press.

Gadgil Madhav and Ramachandra Guha (1995) *Ecology and Equity: The Use and Abuse of Nature in Contemporary India*, London, Routledge.

Guha Ramachandra (1990) *Unquiet Woods*, Berkeley, University of California Press.

H.G. Stephens Piers with John Barry and Andrew Dobson (eds.) (2006) *Contemporary Environmental Politics: From Margins to Mainstream*, New York, Routledge.

- J.C. Scott (1985) *Weapons of the Weak: Everyday Forms of Peasant Resistance*, New Haven, Yale University Press.
- M. Jacobs (1991) *The Green Economy*, London, Pluto.
- M.A Hajer. (1995) *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*, Oxford, Oxford University Press.
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- Pearce Fred (2006) *When the Rivers Run Dry: The Defining Crisis of the Twenty-First Century*, New York, Beacon Press.
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- Sachs Wolfgang. (1992) (ed.) *The Development Dictionary*, London, Zed Books.
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- Shiva Vandana (1991) *The Violence of the Green Revolution*, London, Zed Books.
- Shiva Vandana (1989) *Staying Alive: Women, Ecology, and Development*, London, Zed Books.
- W. Cronon (ed.) (1996) *Uncommon Ground: Rethinking the Human Place in Nature*, New York, Norton.
- W.M. Adams (1991) *Green Development: Environment and Sustainability in the Third World*, London, Routledge.
- World Commission on Environment and Development (1987) *Our Common Future*, New York, Oxford University Press.

SEMESTER: IV (CORE)

COURSE CODE: POL C-4-3

COURSE TITLE: ISSUES IN GLOBAL POLITICS

CREDITS: 4

AIM:

To understand the structural transformations in global politics in the post-cold war period

To equip the students to critically approach the issues in global politics beyond the conventional theories and methods

To give a comprehensive picture of the process of globalisation, its impact and responses from the Global South

OBJECTIVES:

The course is intended to provide a comprehensive view of the issues in global politics especially in the era of globalisation. Contemporary character of international relations and international society in the background of global power relations is one of the focuses in the class. The course deals with the main problematic issues and conflicts of recent times by the way of a couple of theoretical approaches and case studies. In the case studies, main problematic issues and conflicts in the realm of international relations will be examined in detail.

COURSE CONTENT

UNIT I. Emerging Trends in Post Cold War Era

US Hegemony: Reading Michel Hardt and Antonio Negri; William I Robinson

Rise of China and Asia: Reading A. G. Frank

UNIT II. Politics of Intervention

US Exceptionalism in Foreign Policy

Right to Protection and Interventions: Humanitarian Intervention in Somalia,

First and Second Iraq War and Afghan Intervention

UNIT III. International Political Economy and Global Governance

Reforming the UN: International Development, Peace and Security

Monetary Institutions: IMF, World Bank and WTO

Regionalism and World Politics: EU, ASEAN, BRICS, SCO and G-20

UNIT IV. Globalization and Nation States

Changing Role of the State: Transformation of the Concept of Sovereignty

Global Civil Society, Global Public Sphere, New Social Movements

UNIT V. Major Contemporary Issues in World Politics

Rise of Right-Wing Populism (US and India)

International Terrorism, Ethnicity and Violence

International Migration: Syria, Rohingya

Energy Security and Environment

Nuclear Politics

Democratic Movements in the Arab World

Resurgence of Socialism in Latin America: Case of Venezuela

Reading List

Core

Fukuyama, Francis. (2018). Identity: Contemporary Identity Politics and the Struggle for Recognition, Profile Books. London.

Josh, P.M. & K.M. Seethi. (2015). State and Civil Society under Siege: Hindutva, Security and Militarism in India, Sage India. New Delhi.

Ahmad, Aijaz. 2004. "Imperialism of Our Time". In The New Imperialist Challenge, Socialist Register, edited by P Leo Panitch and Colin Leys, 49-71. Merlin Press. London.

Falk, Richard. 1999. Predatory Globalization: A Critique. Polity Press. London

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Hardt, Michael., and Antonio Negri. 2000. Empire. Harvard University Press. London

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Lieber, J Robert. (2012). Power and Willpower in the American Future: Why the United States Is Not Destined to Decline Cambridge University Press, Cambridge.

Dalacoura, Katerina. (2011). Islamist Terrorism and Democracy in the Middle East, , Cambridge University press. Cambridge.

- Diehl, F Paul (Ed.). (2005). *The Politics of Global Governance: International Organizations in an Interdependent World*. Viva Books. New Delhi.
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- Nye, Joseph S. (2002) *The Paradox of American Power; Why the World's only Super Power Can Do It Alone*, Oxford University Press, New York.
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- Dalacoura, Katerina (2012) *The 2011 uprisings in the Arab Middle East: Political Change and Geopolitical Implications*, *International Affairs* 88: 1) 63–79, The Royal Institute of International Affairs, , Blackwell Publishing, London.
- Petras, James., and Morris Morely.1975. *The United States and Chile: Imperialism and the Overthrow of the Allende Government*. Monthly Review Press. New York.

Additional Readings:

- Betz, D.J. and Stevens T. (2011) *Cyberspace and the State: Toward a Strategy for Cyber Power*, Routledge, Oxon.
- Gilley, Bruce (2011) *Beyond the Four Percent Solution: Explaining the Consequences of China's Rise*, *Journal of Contemporary China* 20, no. 72
- Dittner, Lowell and Tyu, George (eds.) (2012) *China, the Developing World and the New Global Dynamic*, Lynne Rienner Publishers, New Delhi.
- Zakaria ,Fareed (2008) *The Post -American World*, NewYork, W.W.Norton& Company.
- Schmidt, Eric and Cohen, Jared (2013) *The New Digital Age: Reshaping the Future of People, Nations and Business*, John Murray Publications.
- Derek, S. Reveron (2012) *Cyberspace and National Security Threats, Opportunities and Power in a Virtual World*, Georgetown University Press.
- Baylis, John and Smith, Steve (eds.) (2001) *The Globalization of World Politics*, Oxford University Press, Oxford.
- Karns, P. Margaret, Mingst, A .Karen (2005) *International Organizations: The Politics and Process of Global Governance*, Lynne Rienner Publishers, New Delhi.

SEMESTER: IV (ELECTIVE)

COURSE CODE: POL E-4-1

COURSE TITLE: NEW SOCIAL MOVEMENTS

CREDITS: 4

AIMS:

The course aims enabling the students to understand the evolution of New Social Movements and their significance in contemporary politics.

OBJECTIVES:

To develop an understanding of the history of the new social movements.

To analyse the significance of New Social Movements in understanding contemporary politics .

COURSE CONTENT

UNIT I. New Social Movements

Defining New Social Movement

Difference between Old and New Social Movements

Features of New Social Movement.

Theories of Social Movement: Collective Behaviour, Relative Deprivation, Rational Choice, Resource Mobilization.

UNIT II. NSM and Society

State, Civil Society and New Social Movements.

New Social Movements and new forms of democratic practices.

NSMs and Discourses on Development

UNIT III. NSM and Globalisation

Globalization and New Social Movements:

From Class politics to Movement politics.

NSMs and Anti-globalization

Identity, culture and NSMs

Social movements and the construction of a transnational public sphere

UNIT IV. New Social Movements in India

Environmental Movement
 Women Movement
 Farmer's Movement
 Dalit Movement
 NGOs and New Social Movements

UNIT V. New Social Movements in Kerala

The Fishermens' Movements
 Environmental Movement
 Dalit Movement
 Women Movemen

Reading List

- Ahluwalia S. K. (2005) *Environment Problems in India*, Jaipur, ADB Publishers.
- Amites Mukhopadhyaya (ed.) (2012) *Social Movements in India*, Delhi, Pearson.
- Barker Jonathan et. al.,(1999) *Street Level Democracy: Political Settings at the Margins of the Global Power*, Toronto, Between the Lines.
- Barrington Michele (1998), *New Social Movements: An Exchange Perspective*, Dublin, University College Dublin.
- Basu Amrita (ed.) (1999) *The Challenge of Local Feminisms: Womens' Movements in Global Perspective*, New Delhi, Kaali for Women.
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- Chaliand Gerard (1976) *Revolutions in the Third World: Myths and Prospects*, Sussex, Harvester Press.
- Foran, John (ed.) (1997) *Theorizing Revolutions*, London, Routledge.
- Gary Taylor (2004) *Democracy and Participations: Popular Protest and New Social Movements*, New York, Merlin Press.
- Goldstone J. A. (1991), et. al. (eds.), *Revolutions of the Late Twentieth Century*. Boulder, Oxford, Westview Press.
- Guha Ramachandra (1989) *The Unquiet Woods: Ecological Change and the Peasant Resistance in the Himalayas*, New Delhi, Oxford University Press.
- Guha Ramachandra and Juan Martinez-Alier (1998) *Varieties of Environmentalism: Essays on North and South*, New Delhi, OUP.
- Kaldor Mary (2003) *Global Civil Society: An Answer to War*, Cambridge, Polity Press.

- Krejci, Jaroslav (1983) *Great Revolutions Compared: The Search for a Theory*, Sussex, Wheatsheaf Books.
- Larana Enrique et. al., (1994) (eds.) *New Social Movements: From Ideology to Identity*, Philadelphia, Temple University Press.
- Lutz William and Harry Brent (1971) (eds.), *On Revolution*. Cambridge, Winthrop Publishers.
- Malik H. (1997) *State and Civil Society in Pakistan: Politics of Authority, Ideology and Ethnicity*, London, Macmillan.
- Nash K. (2000) *Readings in Contemporary Political Sociology*, New York, Wiley. New Delhi.
- Omvedt Gail (1993) *Reinventing Revolutions: New Social Movements and the Socialist Tradition in India*, New York, ME Sharp.
- Peter Waterman (2001) *Globalisation, Social Movements and New Internationalism*, London, Continuum.
- Rangarajan Mahesh (ed.) (2011) *Environmental Issues in India*, Delhi, Pearson.
- Reddy K. Venkata (2009) *Social Movements in India*, Delhi, Manglam Publications.
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- Shah Ganashyam (2004) *Social Movements in India: A Review of Literature*, Sage New Delhi.
- Shah Ganashyam (ed.) (2002) *Social Movements and the State*, New Delhi, Sage.
- Singh Rajendra (2001) *Social Movements Old and New-A Post Modernist Critique*, New Delhi, Sage.
- Sooryamoorthy R. and K.D. Gangrade, *NGO's in India: A Cross Sectional Study*, New Delhi, Rawat.
- Sreekumar T. T. and Govindan Parayil (2002) "Democracy Development and New Forms of Social Movements: A Case Study of Indigenous People's Struggle in Kerala", *The Indian Journal of Labour Economics*, vol. 45 Issues 1-3.
- Wilkinson Paul (1973), *Social Movement*, London, Praeger.

SEMESTER: IV (ELECTIVE)

COURSE CODE: POL E-4-2

COURSE TITLE: INTERNATIONAL POLITICAL ECONOMY

CREDITS: 4

AIM:

To equip the students to critically engage with the issues in international political economy

To familiarize the available theoretical tools to analyze the power relations in the international economic system

To discuss the pros and cons of financial globalisation and also the resistance movements from the global south

OBJECTIVES:

The course will survey the evolution of the present international economic system and the role of major international financial institutions in the shaping of the global economic system. There will be discussions on mainstream and critical approaches to the nature and functioning of the present global economic system. There will critical engagements on the issues such as North- South economic relations, resistance movements against neoliberalization, debates and responses from India on neoliberal globalisation.

COURSE CONTENT

UNIT I. International Political Economy: History and Development

Theoretical Perspectives: Liberal, Protectionism, Marxist and Dependency School

Political Ecology Perspective and Feminist Critique

UNIT II. International Monetary System, Trade and Finance

Bretton Woods System (World Bank, IMF)

North-South Issues (UNCTAD and NIEO)

WTO and emergence of Neoliberal Regime

Regional Integration (EU, ASEAN and BRICS)

UNIT III. Globalisation and International Political Economy

Transnational Corporations (TNCs & MNCs)

Globalisation of production relations and process

Globalisation of trade and finance

Global financial crisis (2008) and the future of globalisation

UNIT IV. Global Resources and Environmental Governance

Evolution of Environmental Regimes

Global Environmental Governance

Rio-Summit, Kyoto Protocol, Paris Conference

UNIT V. India and Global Economic System

Indian approaches to Development:

Gandhi-Nehru Debate, Neoliberal approach

Impact of Neoliberalism

Reading List

Core:

A. M. Hoogvelt. 1997. Globalization and the Post-colonial World: The New Political Economy of Development, Basingstoke, Macmillan.

Aaditya Mattoo, The WTO and the poorest countries: the stark reality, World Trade Review (2004), 3: 3, 385–407.

Andreas Marschner, The New Lobbying: Interest Groups, Governments, and the WTO in Seattle, SAIS Review vol. XXI no. 1 (Winter-Spring 2001).

Andrew d. Mitchell, A legal principle of special and differential treatment for WTO disputes, World Trade Review (2006), 5: 3, 445–469.

Asif H. Qureshi, Participation of Developing Countries in the WTO dispute settlement system, Journal of African Law, 47, 2 (2003), 174-198.

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- Baogang He and Hannah Murphy, Global social justice at the WTO? The role of NGOs in constructing global social contracts, *International Affairs* 83: 4 (2007) 707–727.
- Bernard Hoekman, Expanding WTO membership and heterogeneous interests, *World Trade Review* (2005), 4: 3, 401–408.
- Brien O Robert. 2000. *Contesting Global Governance: Multilateral Economic Institutions and Global Social Movement*, Cambridge: Cambridge University Press.
- Caroline Dommen, Raising Human Rights Concerns in the World Trade Organization: Actors, Processes and Possible Strategies, *Human Rights Quarterly*, 24 (2002) 1–50.
- Croome John. 1995. *Reshaping the World Trade System: A Study of Uruguay Round*, Geneva, WTO.
- D. Blake and R. Walters. 2001. *The Politics of Global Economic Relations*, 5th edn., Englewood Cliffs NJ, Prentice Hall.
- D. K. Fieldhouse. 1999. *The West and the Third World: Trade, Colonialism, Dependence and Development*, Oxford, Blackwell.
- F. B. Tipton. 1998. *The Rise of Asia: Economics, Society and Politics in Contemporary Asia*, Basingstoke, Macmillan.
- F. Fukuyama. 1992. *The End of History and the Last Man*, Harmondsworth Penguin.
- Falk, Richard. 1999. *Predatory Globalization: A Critique*. Polity Press. London
- Harvey, David. 2003. *The New Imperialism*. Oxford University Press. New York.
- Harvey, David. 2005. *A Brief History of Neoliberalism*. Oxford University Press. Oxford
- Jan Aart Scholte, *Defining Globalization, The World Economy*, (2007), Blackwell Publishing Ltd, USA.
- Joseph Fewsmith, The Political and Social Implications of China's Accession to the WTO, *The China Quarterly*, No. 167. (Sep., 2001), pp. 573–591.
- K. Ohmae. 1990. *The Borderless World*, New York, Harper Business.
- Kent Jones, Who's Afraid of the WTO?, *World Trade Review* (2005), 4: 1, 125–126.
- Margaret Levi and Gillian H. Murphy, Coalitions of Contention: The Case of the WTO Protests in Seattle, *Political Studies*: 2006 VOL 54, 651–670.
- Michael Friis Jensen and Peter Gibbon, Africa and the WTO Doha Round: An Overview, *Development Policy Review*, 2007, 25 (1): 5–24.
- Michael Tomz, Institutions in International Relations: Understanding the Effects of the GATT and the WTO on World Trade, *International Organization* 61, Winter 2007, pp. 37–67.
- Niall Meagher, So far, so good: but what next? The Sutherland Report and WTO dispute settlement, *World Trade Review* (2005), 4: 3, 409–417.
- P. Aghin and J. Williamson. 1998. *Growth, Inequality and Globalization*. Cambridge. Cambridge. University Press.
- Peter Lloyd, When should new areas of rules be added to the WTO?, *World Trade Review* (2005), 4: 2, 275–293.
- Rajesh Pillai, National Treatment and WTO Dispute Settlement, *World Trade Review* (2002), 1: 3, 321–343.
- Richard Blackhurst, The future of the WTO: some comments on the Sutherland Report, *World Trade Review* (2005), 4: 3, 379–389.

- Richard H. Steinberg, In the Shadow of Law or Power? Consensus-Based Bargaining and Outcomes in the GATT/WTO, *International Organization* 56, 2, Spring 2002, pp. 339–374.
- Robert Wolfe, Regulatory transparency, developing countries and the WTO, *World Trade Review* (2003), 2: 2, 157–182.
- Rutsel Silvestre J. Martha, Capacity to sue and be sued under WTO law, *World Trade Review* (2004), 3: 1, 27–51.
- S. D. Krasner.1985.Structural conflict; The Third World against Global liberalism, Berkeley, University of California press.
- SupachaiPanitchpakdi, Reflections on the last three years of the WTO, *World Trade Review* (2005), 4: 3, 367–378.
- Urs P. Thomas,Trade and the Environment: Stuck in a Political Impasse at the WTO after the Doha and Cancun Ministerial Conferences, *Global Environmental Politics* 4:3, August 2004.
- V.N.Viswanathan (1994)Dunkel Draft: It's Implications for India, New Delhi, Academic Publishers.
- William R. Cline, Evaluating the Uruguay Round, the World Economy, (1995), Blackwell Publishing Ltd, USA.
- Wolfgang Weiss, Security and predictability under WTO law, *World Trade Review* (2003), 2: 2, 183–219.

Additional

- David Henderson, WTO 2002: imaginary crisis, real problems, *World Trade Review* (2002), 1: 3, 277–296.
- Gary P. Sampson, The Future of the WTO in World Economic Affairs, *World Trade Review* (2005), 4: 3, 419 – 428.
- Gregory Shaffer, The challenges of WTO law: strategies for developing country adaptation, *World Trade Review* (2006), 5: 2, 177–198.
- J. N. Bhagwati, A Stream of Windows: Unsettling Reflections on Trade, Immigration, and Democracy, Cambridge Massachusetts, MIT Press, 1998.
- Jan NederveenPieterse, Democratic Globalization: To WTO or not to WTO?, *Development and Change* 35(5): 1057–1063 (2004).
- Joanne Gowa and SooYeon Kim, an exclusive country club: The effects of the GATT on trade, 1950–94, *World Politics*, 57 (July 2005), 453–78.
- John H. Jackson, Perceptions about the WTO Trade Institutions, *World Trade Review* (2002), 1: 1, 101–114.
- Sol Picciotto, The WTO's Appellate Body: Legal Formalism as a Legitimation of Global Governance, *An International Journal of Policy, Administration, and Institutions*, Vol. 18, No. 3, July 2005 (pp. 477–503

Semester : IV (ELECTIVE)

Course Code : POL E-4-3

Course Title : INDIAN ADMINISTRATION

Credits 4

AIM:

To understand the legendary administrative background of India.

To develop a knowledge on administrative systems at Union, State and Local levels.

To create an awareness of issues in Indian Administration

OBJECTIVES:

A learned person in India should have the knowledge in his or her nation's administrative system.

This paper will give a clear picture on ancient administrative as well as modern administrative system of India.

COURSE CONTENT

UNIT I. Evolution of Indian Administration

Kautilya's contribution, Mughal administration, Legacy of British Administration in Indian Administration - Pre independence scenario.

UNIT II. Administration at Union Level

Central Secretariat, Ministries and Departments, Prime Minister's Office, Cabinet Secretariat,
Boards, Commissions, Attached offices

UNIT III. Administration at State Level

Governor, Chief Minister, Council of Ministers, Chief Secretary, State Secretariat
Organization and Role

UNIT IV. Administration at District Level

District Administration - Changing role of district collector, 74th Constitutional Amendment - Urban Development, 73rd Constitutional Amendment - Local Development.

UNIT V. Issues in Indian Administration

Values in public services, Problems of administration in coalition regimes, Corruption and administration, Disaster Management - Concept - National Disaster Management Authorities - Disaster Management Responsive Mechanism.

Reading List

- Arora K Ramesh, Goyal Rajni, Indian Public Administration;Institutions &Issues: New age International Publishers, New Delhi,2012
- Avasthi & Avasthi, Indian Administration: LaxmiNarayan Agarwal Educational Publishers,Agra, 2017
- Dr. Bhagwan Vishnoo and Dr. Bhushan Vidya,Indian Administration: S Chand & Company,New Delhi,2000
- Dr.Prasad Ravindra, Prasad V.S, Satya Narayana P, Prasad Saradhi.Y, Administrative Thinkers, Sterling Publishers Pvt Ltd, New Delhi,2010
- Hoshier Singh &Pankaj Singh, Indian Administration, Pearson, Chennai, 2010
- J.K. Chopra, Indian Administration: Unique Publishers, New Delhi, 2014
- Laxmikanth.M, Indian Polity: McGrawHill,Greater Noida, 2016
- Laxmikanth M, Governance in India: Mc GrawHill Education,Greater Noida, 2014
- Maheswari.S.R, Indian Administration: Orient BlackSwan, Hyderabad, 2001
- Prof.Fadia B.L and Dr. Fadia Kuldeep, Indian Administration, Sahitya Bhawan Publications, Agra,2017
- Subrata K. Mitra, The Puzzle of India's Governance, Cambridge University Press, New Delhi, 2011.

SEMESTER: IV (ELECTIVE)

COURSE CODE: POL E-4-4

COURSE TITLE: POLITICS OF GLOBALISATION

CREDITS: 4

AIM:

The course will help the students to understand the structural transformations in global politics.

This course is intended to examine the evolution, the nature and the causes of globalisation; and its political, economic, cultural and environmental consequences in the Global South.

The course will provide a comprehensive picture of the resistance movements from the Global South against neoliberal globalisation

OBJECTIVES:

The course will introduce a couple of theoretical approaches to the study of globalization and examine how the globalisation process has been shaping social/political groups and vice versa. It will examine how the very process affects patterns of conflict, cooperation and competition between a wide range of actors locally, nationally and globally. The course will also assess the challenges to and opportunities for democracy in a global age.

COURSE CONTENT

UNIT I. Globalisation

Debates on Evolution: Immanuel Wallenstein, A.G. Frank

Theories of Globalisation: J. Stiglitz, Michel Hardt and Antonio Negri, William I Robinson, James Petras

UNIT II. Globalisation and State

Global finance capital and the changing role of the State, Challenges to State sovereignty

Retreat of State, Decentralization vs Centralisation

UNIT III. Globalisation and Democracy

Liberal Democracy vs Authoritarianism

Global civil society, ICT, Media and Global Public Sphere

UNIT IV. Globalisation and Development

State vs Market: Reading David Harvey (Accumulation by dispossession)

Development and marginalization: North-South Divide

UNIT V. Globalisation and Resistance

Global-Local Linkages (Plachimada Issues)

Water War in Bolivia: Cochabamba

World Social Forum, Global Cosmopolitanism, Global Civil Society

Reading List

Core:

- Hardt, Michael., and Antonio Negri. 2000. *Empire*. Harvard University Press. London
- Harvey, David. 2003. *The New Imperialism*. Oxford University Press. New York.
- Harvey, David. 2005. *A Brief History of Neoliberalism*. Oxford University Press. Oxford
- Fukuyama, Francis. (2018). *Identity: Contemporary Identity Politics and the Struggle for Recognition*, Profile Books. London.
- Joshy, P.M. & K.M. Seethi. (2015). *State and Civil Society under Siege: Hindutva, Security and Militarism in India*, Sage India. New Delhi.
- Ahmad, Aijaz. 2004. "Imperialism of Our Time". In *The New Imperialist Challenge*, Socialist Register, edited by P Leo Panitch and Colin Leys, 49-71. Merlin Press. London.
- Falk, Richard. 1999. *Predatory Globalization: A Critique*. Polity Press. London
- Fukuyama, F. 1992. *The End of History and the Last Man*. Free Press. New York
- Mohanan B Pillai & P.M. Joshy. 2014. *Conflict and Resistance under Globalization*. Shaji Varkey (ed): *Globalisation, State and Governance*. New Delhi. New Century Publications
- Amin, Samir. 2004. *The Liberal Virus: Permanent War and the Americanization of the world*. Delhi. Aakar Books.
- Bijoy C R. 2006. *Kerala's Plachimada Struggle: A narrative on water and governance Rights*, *Economic and Political Weekly*, Oct. 14. pp. 4332-4339.
- Bijoy C R. 2008. *The Plachimada Struggle*, *Economic and Political Weekly*, Nov. 15.

Bijulal, M.V. 2004. Livelihoods Rights Question at Mumbai World Social Forum: Reminiscence of a Delegate, Mumbai: Social Action Quarterly Review of Social Trends, April-June 17-23, Pp. 141-154.

Krishnayyar V.R, Water Patriotism-Plachimada Terrorism, New Delhi, Mainsteram Weekly, March 27, 2004, Pp.7-9.

Nair,KN, Antoyto Paul and Vineetha Menon.2008. Water Insecurity, Institutions and Livelihood Dynamics: A Study in Plachimada, Kerala, India. Delhi: Daanish Books.

Raman, Ravi K. 2005. Corporate Violence, Leagal Nuances and Political Ecology: Cold War in Plachimada, Economic and Political Weekley, June 18.

Renjith, K.R. 2004. Holly Water from the West, Thrissur, Kerala, Alter Media Publication.

Additional

Seethi, K M, Postmodernism, Neoliberalism and Civil Society: A Critique of the Development Strategies in the Era of Globalisation, in The Indian journal of Political sciences, Vol. 62, No.3 September (2001).

Sidney Tarrow, Struggle, Politics and Reform: Collective Action, Social Movements, and Cycles of Protest (New York: Center for International Studies, Cornel University Press 1989).

Melucci, Alberto, A strange kind of Newness: What's new in new social movements, in Vincenzo Ruggiero & Nicola Montagna (2008).

Dalton, Russel J & Manfred Kuecher (eds) 1990. Challenging the Political Order: New Social and Political Movements in Western Societies. Oxford. Polity Press.

Gustavo Estavo& Madhu Suri Prakash 1998. Grassroots Post Modernism: Remaking the Soil of Cultures. London: Zed Books.

Bulmer, Herber. 2008. Social Movements in Vincenzo Ruggiero&NicoloMontagnaed; Social Movements: A Reader .London. Routledge.

Antony Elliott and Bayan S. Turner. 2001. Profiles in Contemporary Social Theory. New Delhi. Sage Publications.

Mohanan B. Pillai & P.M. Joshy. 2012. Old Elite are Co-opted, Subdued or oppressed? - The Politics of Anti-corruption Crusade in India in Perspective. Indian Journal of Public Administration (Sage India) Vol.58 (1), pp. 1-14

Cole, Mike, Might. 2003. It be in the Practice that it Fails to Succeed? A Marxist Critique of Claims for Postmodernism and Poststructuralism as Forces for Social Change and Social Justice, British Journal of Sociology of Education, Vol.24, No.4.

SEMESTER: IV (ELECTIVE)

COURSE CODE: POL E-4-5

COURSE TITLE: STATE AND POLITICS IN SOUTH ASIA

CREDITS: 4

AIM:

The course aims to provide an understanding about the major political developments having trans-boundary impact in South Asia. The course unravels the making of South Asia over the last half century with select contributions from various countries in the region. A study of varied political, social and economic experimentations that countries of South Asia have carry out would yield rich academic dividends to students.

OBJECTIVES:

This course attempts to study the intricacy of South Asian politics without losing sight of the underlying social and economic processes. Being one of the most volatile regions in the world, the study of South Asian politics is both challenging and rewarding. Despite the diversity, and territorial divisions, certain common cultural and social threads run through the region and provide the necessary binding force. Security threats, both conventional and non-conventional are examined in detail. As South Asia has opened up towards the world outside, its relations with great powers assume importance. The future of South Asia lies in its capacity to mend boundaries and strive towards greater incorporation without negotiating on individual county's socio-cultural diversities and practices.

COURSE CONTENT

UNIT I. Colonialism and Nationalism

Impact of colonialism in south Asia (case of India)

Growth of Nationalism: Evolution and Recent Trends

Modernization and social change

UNIT II. Democracy in south Asia

Democracy in South Asia: Assessment

Authoritarianism and democratic movements in south Asia (India, Nepal and Afghanistan)

Militarism in south Asia (Pakistan)

UNIT III. Developmental issues in south Asia

South Asia in the context of globalization

Problems of governance (corruption)

Poverty and Human Development in South Asia

Issues of migration

Regionalism in south Asia: SAARC

UNIT IV. Problems of Nation-Building

Ethnicity in Sri Lanka

Regionalism in India and Pakistan

UNIT V. South Asia and the International System

Security in south Asia (Traditional and Non-Traditional Security issues)

Nuclearization in south Asia (India and Pakistan)

Impact of International terrorism in South Asia

Security issues in the Indian Ocean

South Asia and major powers (US, China and Russia)

Reading List

Core

Alavi Hamza and John Harriss eds. (1987) *The Sociology of Developing States: South Asia*, Macmillan Houndsmill.

Basrur Rajesh M. ed. (2001) *Security in the New Millennium: Views from South Asia*, India Research Press, New Delhi.

Baxter Craig (2002) *Government and Politics in South Asia*, Perseus Books, New York.

Bertsch Gary K., Seema Gahlaut and Anupam Srivastava (1999) *Engaging India: US Strategic Relations with the World's Largest Democracy*, Routledge, New York.

Bhandari Surendra (2014), *Self-Determination & Constitution Making in Nepal: Constituent Assembly, Inclusion and Ethnic Federalism*, Springer, Singapore.

- Brass Paul R. (2010) *South Asian Politics: India, Pakistan, Bangladesh, Sri Lanka and Nepal* Routledge, London.
- Carranza Mario Esteban (2009) *South Asian Security and International Nuclear Order*, Aldershot, Ashgate.
- Chakma Bhumitra ed. (2011) *The Politics of Nuclear Weapons in South Asia*, Aldershot, Ashgate.
- Chari P. R. ed. (2001) *Security and Governance in South Asia*, , Manohar, New Delhi.
- Cloughley Brian (2006) *A History of the Pakistan Army*, Oxford University Press Karachi.
- Cohen Stephen P. (2005) *The Idea of Pakistan*, Oxford University Press, New Delhi.
- Cohen Stephen P. (2001) *India: Emerging Power*, Brookings Institution Press, Washington D.C.
- De Votta Neil (2016), *An Introduction to South Asian Politics*, Routledge, Abingdon.
- Dittmer Lowell ed. (2014), *South Asia's Nuclear Security Dilemma: India, Pakistan, and China*, Routledge, New York.
- Dutt Sagarika and Alok Bansal eds. (2012) *South Asian Security 21st Century Discourse*, Routledge, London.
- Einsiedel Von Sebastian, David M. Malone and Suman Pradhan eds. (2012) *Nepal in Transition*, Cambridge University Press, New Delhi.
- Ganguly Sumit and S Paul Kapur (2012), *India, Pakistan, and the Bomb: Debating Nuclear Stability in South Asia*, Columbia University Press, New York.
- Ganguly Sumit ed. (2006) *South Asia*, New York University Press, New York.
- Kodikara Shelton U. ed. (1993) *External Compulsion of South Asian Politics*, Sage, New Delhi.
- Kohli Atul and Perna Singh ed. (2013) *Routledge Handbook of Indian Politics*, Routledge, Oxon.
- Kukreja Veena (2005) *Contemporary Pakistan: Political Processes, Conflicts and Crises*, Sage, New Delhi.
- Lange Klans, Klara Knapp and Jagannath P. Panda eds.(2012) *Revisiting Contemporary South Asia*, Pentagon Press, New Delhi.
- Ludden David (2006) *India and South Asia: A Short History*, One World Publication, Oxford.
- Nizamani Haider K. (2001) *The Roots of Rhetoric: Politics of Nuclear Weapon in India and Pakistan*, India Research Press, New Delhi.
- Pervez Muhammad Shoaib (2013), *Security Community in South Asia: India-Pakistan*, Routledge, Abingdon.
- Saez Lawrence (2011) *The South Asian Association for Regional Cooperation (SAARC): An Emerging Collaboration Architecture*, Routledge, Abingdon.
- Stern Robert W. (1990) *Democracy and Dictatorship in South Asia*, India Research Press, New Delhi.

Additional

- Ahmed, Imtiaz ed. (2006), *Understanding Terrorism in South Asia: Beyond Statistic Discourses*, Manohar, New Delhi.
- Bhola P.L and Ramakant eds. (1995) *Post Cold War Developments in South Asia*, aipur, RBSA Publisher, Jaipur.

- Bidwai P. and A. Vanaik (2001) *South Asia on a Short Fuse: Nuclear Politics and the Future of Global Disarmament*, Oxford University Press, Oxford.
- Bose Sugata and Ayesha Jalal (2004), *Modern South Asia: History, Culture, Political Economy*, Routledge, New York.
- Butt Usama and Julian Schofield eds. (2012) *Pakistan: The US, Geopolitics and Grand strategies*, Pluto Press, London.
- Chandran D. Suba and P.R. Chari eds. (2012) *Armed Conflicts in South Asia*, Routledge, New Delhi.
- Chatterjee Partha (2014), *State Politics in India*, New Delhi, Oxford.
- Chaudhary Saurabh and N.P. Chaudhary eds. (2012) *Constitutional Evolution in Nepal*, Pentagon Press, New Delhi.
- Chitty Naren (2000) *Framing South Asian Transformations: An Examination of Regional Views on South Asian Cooperation*, Academic Books, New Delhi.
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- Cohen Stephen P. ed. (1998) *The Security of South Asia: American and Asian Perspectives*, Vistaar Publications, New Delhi.
- Derges Jane (2013) *Ritual and Recovery in Post Conflict Sri Lanka*, Routledge, London.
- Dev S. Mahendra (2007) *Inclusive Growth in India: Agriculture, Poverty and Human Development*, Oxford University Press, New Delhi.
- Ganguly Sumit and S Paul Kapur eds.(2009) *Nuclear Proliferation in South Asia: Crisis Behavior and the Bomb*, Routledge, London.
- Gerharz Eva (2013) *The Politics of Reconstruction and Development in Sri Lanka*, Taylor & Francis, London.
- Ghosh Partha S. (1995) *Cooperation and Conflict in South Asia*, Manohar, New Delhi.
- Hagerty David T. (2005) *South Asia in World Politics*, Oxford, Rowman and Hewitt Vernon
- (1997) *The New International Politics of South Asia*, Littlefield, Manchester.
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- Jayal N. G. ed. (2010), *Democracy in India*, Oxford, New Delhi.
- Kodikara Shelton U. ed. (1990) *South Asian Strategic Issues*, Sage, New Delhi.
- Kothari Smitu and Zia Mian eds. (2001) *Out of the Nuclear Shadow*, Lokayan and Rainbow Publishers, New Delhi.
- Kukreja Veena and Mahendra Prasad Singh (eds.) (2008) *Democracy, Development and Discontent in South Asia*, Sage, New Delhi.
- Kumaraswamy P.R. and Ian Copland eds. (2009) *South Asia: The Specter of Terrorism*, Routledge, New Delhi.
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- Lawoti Mahendra, and Susan Hongen eds. (2012) *Nationalism and Ethnic Conflict in Nepal*, Routledge, London.
- Lawoti Mahendra (2005) *Towards a Democratic Nepal: Inclusive Political Institutions for a Multicultural Society*, Sage, New Delhi.
- Lewis David (2012) *Bangladesh Politics, Economy, and Civil Society*, Cambridge University Press, New Delhi.

- McCartney Matthew (2011) *Pakistan - The Political Economy of Growth, Stagnation and the State, 1951-2009*, Routledge, Oxon.
- Malik Yogendra K. (2008) *Government and Politics in South Asia*, Westview Press, Boulder.
- Nawas Shuja (2008) *Crossed Swords: Pakistan its Army, and the Wars within*, Oxford University Press, Karachi.
- Oldenburg Philip (2010) *India, Pakistan and Democracy*, Routledge, London.
- Pandey Aditya (2005) *South Asia*, Gyan Publishing House, New Delhi.
- Paulino Amelia, V. Santos and Wan Guanghua eds. (2011) *The Rise of China and India: Impacts, Prospects and Implications*, Macmillan, Hampshire.
- Rajagopalan Swarna ed. (2006) *Security in South Asia: Ideas, Institutions and Initiatives*, Routledge, New Delhi.
- Ruparelia Sanjay et al. eds. (2011), *Understanding India's New Political Economy: A Great Transformation?*, Routledge, Abingdon.
- Samaranayake, Gamini (2008) *Political Violence in Sri Lanka*, Gyan Publishing House, New Delhi.
- Sharma, D. Shalendra (2009) *China and India in the age of Globalization*, Cambridge University Press, New Delhi.
- Siddiqi Farhan Hanif (2012), *The Politics of Ethnicity in Pakistan: The Baloch, Sindhi and Mohajir Ethnic Movements*, Routledge, Abingdon.
- Tellis, Ashley J. (2001) *India's Emerging Nuclear Posture*, Oxford University Press, New Delhi.
- Vishwakarma R.K ed. (2006) *People's Power in Nepal*, Manak Publications, New Delhi.



UNIVERSITY OF KERALA

DRAFT

Syllabus for
M.Sc. Programme in Mathematics [PG]
with effect from 2020 Admission

SUBMITTED BY BOARD OF STUDIES IN MATHEMATICS [PG]

KERALA UNIVERSITY SYLLABUS FOR M.Sc. MATHEMATICS SEMESTER PATTERN IN
AFFILIATED COLLEGES 2020 ADMISSION ONWARDS

M.Sc. MATHEMATICS COURSE STRUCTURE & MARK DISTRIBUTION

Semester		Title of the paper	Distribution hrs per semester	Instructional hrs./ week		Dur ESA hrs.	Maximum Marks		
I				L	P		CA	ESA	Total
	MM 211	Linear Algebra	108	6	-	3 hrs	25	75	100
	MM 212	Real Analysis - I	108	6	-	“	25	75	100
	MM 213	Ordinary Differential Equations	108	6	-	“	25	75	100
	MM 214	Topology - I	126	7	-	“	25	75	100
II	MM 221	Abstract Algebra	108	6	-	3 hrs	25	75	100
	MM 222	Real Analysis-II	108	6	-	“	25	75	100
	MM 223	Topology-II	126	7	-	“	25	75	100
	MM 224	Partial differential Equations and Calculus of Variation	108	6		“	25	75	100
III	MM 231	Complex Analysis	126	7	-	3 hrs	25	75	100
	MM 232	Functional Analysis-I	108	6	-	“	25	75	100
	MM 233	Elective-I	108	6	-	“	25	75	100
	MM 234	Elective-II	108	6	-	“	25	75	100
IV	MM 241	Analytic Number Theory	126	7	-	3 hrs	25	75	100
	MM 242	Functional Analysis-II	108	6	-	“	25	75	100
	MM 243	Elective-III	108	6	-	“	25	75	100
	MM 244	Elective-IV	108	6	-	“	25	75	100
	MM 245	Dissertation/ Project						80+20	100
		Comprehensive Viva							100
		GRAND TOTAL	1800						1800

L: Lecture; P: Practical; CA: Continuous Assessment; ESA: End Semester Examination

M.Sc MATHEMATICS
(Revised Syllabus from 2020 Admissions)
LIST OF COURSES

SEMESTER– I

MM211 Linear Algebra (Previous Syllabus)
MM212 Real Analysis - I (Revised Syllabus)
MM213 Ordinary Differential Equations (New Syllabus)
MM214 Topology – I (Previous Syllabus)

SEMESTER – II

MM221 Abstract Algebra (New Syllabus)
MM222 Real Analysis - II(Revised Syllabus)
MM223 Topology – II (Previous Syllabus)
MM224 Partial Differential Equation and Calculus of Variation(New Syllabus)

SEMESTER– III

MM231 Complex Analysis (Previous Syllabus Complex Analysis- I)
MM232 Functional Analysis – I (Revised Syllabus)
MM233 Elective (One among the following)
 Automata Theory (Previous Syllabus)
 Probability Theory(Previous Syllabus)
 Operations Research (New Syllabus)
 Algebraic Topology (Previous Syllabus)
 Numerical Analysis with Python(New Syllabus)
 Algebraic Geometry(New Syllabus)

MM234 Elective (One among the following)

 Approximation Theory (Previous Syllabus)
 Curves, Surfaces and Manifolds(New Syllabus)
 Geometry of Numbers (Previous Syllabus)
 Differential Geometry (Revised Syllabus)
 Graph Theory (Previous Syllabus)
 Fractal Geometry (New Syllabus)

SEMESTER – IV

MM241 Number Theory (New Syllabus)
MM242 Functional Analysis – II (Revised Syllabus)
MM243 Elective (One among the following)

 Mathematical Statistics (Previous Syllabus)

Difference Equations (Previous Syllabus)
Theory of Wavelets (Previous Syllabus)
Coding Theory (New Syllabus)
Advanced Algebra (New Syllabus)
Mechanics (Previous Syllabus)
Cryptography (New Syllabus)

MM244 Elective (One among the following)

Advanced Graph Theory (Previous Syllabus)
Commutative Algebra (Previous Syllabus)
Advanced Complex Analysis(New Syllabus-previous syllabus
of Complex Analysis II)
Representation Theory of Finite Groups (Previous Syllabus)
Category Theory (Previous Syllabus)
Spectral Graph Theory(New Syllabus)

MM 211 LINEAR ALGEBRA

Text

Sheldon Axler, Linear Algebra Done Right 2nd Edition, Springer.

Unit I

Vector spaces: Definition, Examples and properties, Subspaces, Sum and Direct sum of subspaces, Span and linear independence of vectors, Definition of finite dimensional vector spaces, Bases: Definition and existence, Dimension Theorems.

[Chapters 1,2 of Text]

Unit II

Linear maps, their null spaces and ranges, Operations on linear maps in the set of all linear maps from one space to another, Rank-Nullity Theorem, Matrix of linear map, its invertibility.

[Chapter 3 of Text]

Unit III

Invariant subspaces, Definition of eigen values and vectors, Polynomials of operators, Upper triangular matrices of linear operators, Equivalent condition for a set of vectors to give an upper triangular operator, Diagonal matrices, Invariant subspaces on real vector spaces. [Chapter 5 of Text]

Unit IV

Concept of generalized eigen vectors, Nilpotent operators, Characteristic polynomial of an operator, Cayley-Hamilton theorem, Condition for an operator to have a basis consisting of generalized eigen vectors, Minimal polynomial. Jordan form of an operator (General case of Cayley-Hamilton Theorem may be briefly sketched from the reference text) [Chapter 8 of Text]

Unit V

Change of basis, trace of an operator, Showing that trace of an operator is equal to the trace of its matrix, determinant of an operator, invertibility of an operator and its determinant, relation between characteristic polynomial and determinant, determinant of matrices of an operator w.r.t. two bases are the same. Determinant of a matrix (except the section volumes) [Chapter 10 of Text]

References

1. Kenneth Hoffman and Ray Kunze, Linear Algebra, Prentice Hall, 1981.
2. I.N Herstein, Linear Algebra, Wiley Eastern.
3. S. Kumaresan, Linear Algebra, Prentice Hall, 2000.

MM 212 REAL ANALYSIS-I

Text: Tom M. Apostol, Mathematical Analysis, Second Edition, Narosa 1974

UNIT I

Functions of Bounded Variation and Rectifiable Curves: Properties of monotonic functions, Functions of bounded variation, Total variation, Additive property of total variation, Total variation on $[a, x]$ as a function of x , Function of bounded variation expressed as the difference of increasing functions, Continuous functions of bounded variation, Curves and paths, Rectifiable paths and arc-length, Additive and continuity of arc length, Equivalence of paths, Change of parameter.
[Chapter 6 of Text]

UNIT II

The Riemann-Stieltjes Integral: The definition of Riemann-Stieltjes integral, Linear properties, Integration by parts, Change of variable in a Riemann –Stieltjes integral, Reduction to a Riemann integral, Step functions as integrators, Reduction of a Riemann-Stieltjes integral to a finite sum, Euler's summation formula, Monotonically increasing integrators, Upper and lower integrals, Additive and linearity properties of upper and lower integrals, Riemann's condition, Comparison Theorems, Integrators of bounded variation, Sufficient conditions for the existence of Riemann-Stieltjes integrals, Differentiation under the integral sign.
[Chapter 7, Sections 7.1-7.16, 7.24 of Text]

UNIT III

Sequences of Functions: Point-wise convergence of sequences of functions, Examples of sequences of real-valued functions, Definition of uniform convergence, Uniform convergence and continuity. The Cauchy condition for uniform convergence, Uniform convergence of infinite series of functions, Uniform convergence and Riemann-Stieltjes integration, Non-uniformly convergent series that can be integrated term by term, Uniform convergence and differentiation, Sufficient conditions for uniform convergence of a series.
[Chapter 9, Sections 9.1-9.9 except 9.7 of text . Do sufficient problems to study the uniform convergence of sequences and series]

UNIT IV

Multivariable differential Calculus: The directional derivative, Directional derivative and continuity, the total derivative, total derivative in terms of partial derivatives, the matrix of a linear function, the Jacobian matrix, the chain rule, matrix form of the chain rule, the mean value theorem for differentiable functions, sufficient condition for differentiability, sufficient condition for equality of mixed partial derivatives, Taylor's formula for functions from $\mathbb{R}^n$ to $\mathbb{R}$ Chapter 12(all sections except 12.6) of the text book.

UNIT V

Implicit Functions and Extremum problems: Functions with nonzero Jacobian determinant, the inverse function theorem, the implicit function theorem, Extrema of real valued functions of several variables, extremum problems with side conditions. Chapter 13(all sections) of the text.

References:

1. J.A Dieudonne, Foundations of Modern Analysis, Academic Press
2. W.Rudin, Principles of Mathematical Analysis, Third Edition
3. Tom M Apostol, Calculus, Volume 1, Wiley Edition.
4. Tom M Apostol, Calculus, Volume 2, Wiley Edition.

MM213 ORDINARY DIFFERENTIAL EQUATIONS

TEXT: Differential Equations with Applications and Historical Notes, Simmons G.F, Third Edition, CRC Press, 2017.

Unit I

The Method of Successive Approximations, Picard's Theorem, Systems. The Second Order Linear Equation, A Review of Power Series, Series Solutions of First Order Equations, Second Order Linear Equations, Ordinary Points, Regular Singular Points, Regular Singular Points (Continued), Two Convergence Proofs. [Chapter 13(sections 69, 70 and 71) and Chapter 5(sections 26, 27, 28, 29, 30 and Appendix A)]

Unit II

Gauss's Hypergeometric Equation, The Point at Infinity, Legendre Polynomials, Properties of Legendre Polynomials [Chapter 5 (sections 31 and 32), Chapter 8(sections 44 and 45)]

Unit III

Bessel Functions. The Gamma Function, Properties of Bessel Functions, Additional Properties of Bessel Functions[Chapter 8(sections 46 and 47; Appendix C)]

Unit IV

Systems of First Order Equations: General Remarks on Systems, Linear Systems, Homogeneous Linear Systems with Constant Coefficients, Nonlinear Systems, Volterra's Prey-Predator Equations[Chapter 10 (sections 54, 55, 56 and 57)]

Unit V

Nonlinear Equations: Autonomous Systems, The Phase Plane and its Phenomena, Types of Critical Points, Stability, Critical Points and Stability for Linear Systems, Stability by Liapunov's Direct Method, Simple Critical Points of Nonlinear Systems[Chapter 11(sections 58, 59, 60, 61 and 62)]

References

- [1] G. Birkhoff and G.C. Rota: Ordinary Differential Equations(3rd Edn.); Edn. Wiley & Sons;1978
- [2] W.E. Boyce and R.C. DiPrima: Elementary Differential Equations and boundary value problems(2nd Edn.); John Wiley & Sons, NY; 1969
- [3] A. Chakrabarti: Elements of Ordinary Differential Equations and special functions; Wiley Eastern Ltd., New Delhi; 1990
- [4] E.A. Coddington: An Introduction to Ordinary Differential Equations; Printice Hall of India, New Delhi; 1974
- [5] R.Courant and D. Hilbert: Methods of Mathematical Physics- vol I; Wiley Eastern Reprint;1975
- [6] P. Hartman: Ordinary Differential Equations; John Wiley & Sons; 1964
- [7] L.S. Pontryagin : A course in Ordinary Differential Equations Hindustan Pub. Corporation, Delhi; 1967

MM 214: TOPOLOGY I

Text book:

Principles of Topology by Fred H. Croom, Baba Barkha Nath Printers (India), Third Reprint 2009.

In this course we discuss the basics of topology , based on chapters 3 and 6. Students should be motivated as discussed in the first two chapters of the Text book.

Unit I

Metric Spaces:-Definition, Examples, Open sets, Closed sets, Interior, closure and boundary
Sections 3.1, 3.2, 3.3

Unit II

Continuous functions, Equivalence of metric spaces, Complete metric spaces-Cantor's Intersection Theorem.
Sections 3.4, 3.5, 3.7, Exercise 3.7(3).

Unit III

Topological spaces:-Definition, Examples, Interior, Closure, Boundary, Base, Sub base, Continuity, Topological Equivalence, Subspaces.
Sections 4.1, 4.2, 4.3, 4.4, 4.5

Unit IV

Connectedness and disconnected spaces, Theorems on connectedness, Connected subsets of real line, Applications of connectedness, Path connected spaces.
Sections 5.1, 5.2, 5.3, 5.4, 5.5

Unit V

Compact spaces, compactness and continuity, Properties related to compactness, One point compactification.
Sections 6.1, 6.2, 6.3, 6.4

References

- 1. Gerald Buskes, Arnoud van Rooij, Topological Spaces from Distance to Neighbourhood**
- 2. James R. Munkres, Topology, PHI Learning Private Limited, Second Edition, 2009.**
- 3. Stephen Willard, General Topology, Addison-Wesley, Reading, 1970.**
- 4. G.F. Simmons, Topology and Modern Analysis, Mc Graw-Hill, New York, 13th reprint, 2010.**
- 5. J Arthur Seebach, Lynn Arthur Steen, Counter Examples in Topology, Dover Publications, 1995.**
- 6. Sheldon W. Davis, Topology, Tata Mc Graw-Hill Edition, 2006.**

MM221 ABSTRACT ALGEBRA

Text: J A Gallian, Contemporary Abstract Algebra, 8th Edition, Cengage Learning.

Unit I

External direct product of groups – Definition and examples, Properties, Representing groups of units modulo n as an external direct product. Normal subgroups and Factor groups, Application of factor groups, Internal direct products, Fundamental theorem of abelian groups, Isomorphism classes, Proof of the fundamental theorem. (Chapter 8, 9 and 11).

Unit II

Sylow theorems, Conjugacy classes, Class Equation, Sylow theorems and Applications. Simple groups, Examples, Non simplicity tests. (Chapter 24 and 25). Theorems 25.1, 25.2 and 25.3 and corollary 1 (Index Theorem), corollary 2 (embedding Theorem) may be discussed without proof.

Unit III

Extension fields, Fundamental Theorem of Field Theory, Splitting fields, Zeros of irreducible polynomial, Perfect field. Algebraic extensions, Characterization of extensions, Finite extensions, Properties of algebraic extensions. (chapter 20 and 21).

Unit IV

Finite fields, Classification of finite fields, Structure of finite fields, Subfields of a finite field. Historical discussion of Geometric Constructions, Constructible Numbers, Angle – Trisectors and Circle – Squarers. (Chapter 22 and 23).

Unit V

Fundamental theorem of Galois Theory (without proof), Solvability of polynomials by radicals, Insolubility of Quintic. Cyclotomic polynomials, The Constructible regular n - gons (Chapters 32 and 33).

References:

- 1. J. B. Fraleigh, *A first course in Abstract Algebra*, Seventh Edition, Pearson Education Inc.**
- 2. I. N. Herstein, *Topics in Algebra*, Second Edition, Wiley**
- 3. P.B. Bhattacharya, S.K. Jain and S.R. Nagpaul, *Basic Abstract Algebra*, 2 nd Edition, U.K., Cambridge University Press, 2004.**
- 4. David. S. Dummit, and Richard M. Foote, *Abstract Algebra*, 3rd Edition, New Delhi, Wiley, 2011.**

MM 222 REAL ANALYSIS II

Text: G de Barra, Measure Theory and Integration, New Age International Publishers, Second Edition 2013.

Unit I

Lebesgue Outer Measure, Measurable sets, Regularity, Measurable functions, Borel and Lebesgue Measurability (Chapter 2, sections 2.1 to 2.5 of Text).

Unit II

Integration of non – negative functions, The General Integral, Integration of Series, Riemann and Lebesgue Integrals, The four Derivatives, Lebesgue Differentiation Theorem(theorem 7 and 8 -statement only), Differentiation and Integration.

(Chapter 3, sections 3.1 to 3.4, Chapter 4, sections 4.1, 4.4 (statements only), 4.5 (up to theorem 15) of Text).

Unit III

Abstract Measure Spaces, Measure and outer Measure, Extension of a Measure, Uniqueness of extension, Completion of Measure, Measure spaces, Integration with respect to a Measure. (Chapter 5, sections 5.1 to 5.6 of Text).

Unit IV

The L^p spaces, Convex functions, Jensen's Inequality, The Inequalities of Holder and Minkowski, Completeness of $L^p(\mu)$.

(Chapter 6, sections 6.1 to 6.5 of Text).

Unit V

Convergence in Measure, Signed Measures and Hahn Decomposition, The Jordan Decomposition, The Radon – Nikodym Theorem.

(Chapter 7 section 7.1, Chapter 8, sections 8.1 to 8.3).

References:

- 1. H L Royden, P M Fitzpatrick, Real Analysis, Fourth Edition, Pearson, 2017.**
- 2. W Rudin, Real and Complex Analysis, Third Edition, Tata Mc – Graw Hill Edition 2017.**
- 3. P R Halmos, Measure Theory, Springer**
- 4. Measure and Integration: A First Course, M Thamban Nair, First Edition, Chapman and Hall/CRC, 2019.**

MM 223: TOPOLOGY II

Text book I: Principles of Topology by Fred H. Croom, Baba Barkha Nath Printers (India), Third Reprint 2009.

Text book II: Topology by Sheldon W. Davis, Tata Mc Graw-Hill Edition, 2006.

Unit I

Product and Quotient spaces:- Finite and arbitrary products, Comparison of topologies, Quotient spaces.

Sections 7.1, 7.2, 7.3, 7.4 of Text I, (Alexander sub basis theorem and Theorem 7.11 excluded).

Unit II

Separation axioms:- T_0 ; T_1 and T_2 -spaces, Regular spaces, Normal spaces, Separation by continuous functions

Sections 8.1, 8.2, 8.3, 8.4 of Text I

Unit III

Convergence, Tychonoff's Theorem

Chapter 16, Theorem 18.21 and Theorem 18.22 of Text II

Unit IV

Algebraic topology:- The fundamental group, The fundamental group of S^1 .

Sections 9.1, 9.2, 9.3 of Text I

Unit V

Examples of fundamental groups, The Brouwer Fixed Point Theorem.

Sections 9.4 and 9.5 of Text I

References

1. Gerald Buskes, Arnoud van Rooij, Topological Spaces from Distance to Neighbourhood

2. James R. Munkres, Topology, PHI Learning Private Limited, Second Edition, 2009.

3. Stephen Willard, General Topology, Addison-Wesley, Reading, 1970.

4. G.F. Simmons, Topology and Modern Analysis, Mc Graw-Hill, New York, 13th reprint, 2010.

5. J Arthur Seebach, Lynn Arthur Steen, Counter Examples in Topology, Dover Publications, 1995.

6. Sheldon W. Davis, Topology, Tata Mc Graw-Hill Edition, 2006.

MM 224 PARTIAL DIFFERENTIAL EQUATIONS AND INTEGRAL EQUATIONS

Text 1: An introduction to partial differential equations, Yehuda Pinchover and Jacob, Cambridge University Press, 2005

Text 2: Methods of Applied Mathematics (second Edition), Hildebrand F.B, Prentice-Hall of India, New Delhi, 1965.

Text 3: Differential equations with applications and historical notes(third edition), George F. Simmons, McGraw-Hill International Edn, 2017

Unit I

Introduction : Preliminaries, classification, differential operators and the superposition principle.

First-order equations: Introduction, quasilinear equations, the method of characteristics, examples of the characteristics method, the existence and uniqueness theorem, the Lagrange method, General nonlinear equations [Chapter 1 (sections 1.1 to 1.3), chapter 2 (sections 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.9, 2.10 from Text 1)]

Unit II

Second-order linear equations in two independent variables: Introduction, classification, canonical form of hyperbolic equations, canonical form of parabolic equations, canonical form of elliptic equations, the one-dimensional wave equation: Introduction, canonical form and general solution, the Cauchy problem and d'Alembert's formula, domain of dependence and region of influence, the Cauchy problem for the nonhomogeneous wave equation [Chapter 3, 4 from Text 1]

Unit III

The method of separation of variables: Introduction, heat equation: homogeneous boundary condition, Separation of variables for the wave equation, Separation of variables for nonhomogeneous equations, The energy method and uniqueness, Further applications of the heat equation Elliptic equations: Introduction, Basic properties of elliptic problems, The maximum principle, Applications of the maximum principle, Green's identities, The maximum principle for the heat equation, Separation of variables for elliptic problems, Poisson's formula. [Chapter 5 and 7 from Text 1]

Unit IV

Integral Equations: Introduction, Relations between differential and integral equations,

The Green's functions, Fredholm equations with separable kernels, Illustrative examples,

Hilbert-Schmidt Theory, Iterative methods for solving Equations of the second kind. The

Newmann Series, Fredholm Theory [chapter 3(Sections 3.1, 3.2, 3.3, 3.6, 3.7, 3.8, 3.9, 3.10, 3.11) from the Text 2]

Unit V

Calculus of variations: Introduction, some typical problems of the subject, Euler differential equation for an extremal, isoperimetric problems [Chapter 12 (sections 66, 67, and 68) from Text 3]

References:

[1] Amaranath T.:Partial Differential Equations, Narosa, New Delhi, 1997.

[2] A. Chakrabarti: Elements of ordinary Differential Equations and special functions;
Wiley Eastern Ltd, New Delhi; 1990

[3] E.A. Coddington: An Introduction to Ordinary Differential Equations Printice Hall
of India ,New Delhi; 1974

[4] R. Courant and D. Hilbert: Methods of Mathematical Physics-Vol I; Wiley Eastern
Reprint; 1975

[5] P. Hartman: Ordinary Differential Equations; John Wiley & Sons; 1964

MM 231 COMPLEX ANALYSIS

**Text: John. B. Conway, *Functions of Complex Variables*, Springer-Verlag, New York, 1973.
(Indian Edition: Narosa)**

UNIT I

Elementary properties and examples of analytic functions, Power series, Analytic function, Riemann- Stieltjes integrals.

(Chapter 3- Sections 1, 2 and Chapter 4- Section 1 of Text)

UNIT II

Power series representation of an analytic function, Zeros of an analytic function, The index of a closed curve.

(Chapter 4 – Sections 2, 3 and 4 of Text)

UNIT III

Cauchy's Theorem and integral formula, Homotopic version of Cauchy's Theorem, Simple connectivity, Counting zeros: The open Mapping Theorem, Goursat's Theorem.

(Chapter 4 - Sections 5, 6, 7 and 8 of Text)

UNIT IV

Singularities: Classification, Residues, The argument principle.

(Chapter 5 Sections 1, 2, and 3 of Text)

UNIT V

The extended plane and its spherical representation, Analytic function as mapping, Mobius transformations, The maximum principle, Schwarz's Lemma.

(Chapter 1- Section 6, Chapter 3- Section 3, Chapter 6- Section 1 and 2 of Text)

References:

- 1. L.V. Ahlfors, *Complex Analysis*, Mc-Graw Hill (1966)**
- 2.S. Lang, *Complex Analysis*, Mc-Graw Hill (1998).**
- 3.S. Ponnusamy & H. Silverman, *Complex Variables with Applications*, Birkhauser**
- 4.H. A. Priestley, *Introduction to Complex Analysis*, Oxford University Press Tristan Needham, *Visual Complex Analysis*, Oxford University Press(1999)**
- 5.V. Karunakaran, *Complex Analysis*, Narosa Publishing House, 2002**

MM 232: FUNCTIONAL ANALYSIS- I

Text: B. V. Limaye, FUNCTIONAL ANALYSIS (3rd Edition)

A quick review of chapter I of the Text is to be done as a prerequisite to the Functional Analysis course.

UNIT I

Normed spaces and continuity of linear maps. (Section 5 and 6 of the Text, Except 6.5 (d) and Theorem 6.8).

UNIT II

Hahn-Banach theorems and Banach spaces. (Section 7 and 8 of the Text, Theorem 7.12 statement only).

UNIT III

Uniform boundedness principle, closed graph and open mapping theorems (Section 9.1, 9.2, 9.3 and 10 of the Text).

UNIT IV

Bounded inverse theorem, spectrum of a bounded operator (Section 11.1, 11.3, 12 (Except 12.4) and 13.1 of the Text,).

UNIT V

Transpose-Definition as in Section 13 and Theorem 13.5, Weak convergence, reflexivity and compact linear maps (Sections 15.1, 15.2 (a), 16.1, 16.2, 17.1, 17.2 and 17.3, 17.4 (a) of the Text).

References

1. Bryan Rynne, M.A. Youngson, Linear Functional Analysis, Publisher: Springer.

2. Rajendra Bhatia, Notes on Functional Analysis, Publisher: Hindustan Book Agency.

3. M. Tamber Nair, Functional Analysis: A first course, Publisher: Prentice Hall of India Pvt. Ltd.

4. Walter Rudin, Functional Analysis, 2nd Edition, Publisher: Tata Mc Graw-Hill.

5. B. V. Limaye, Linear Functional Analysis for Scientists and Engineers, Springer Singapore, 2016.

MM 233 AUTOMATA THEORY (Elective)

Text: J.E. Hopcroft and J.D. Ullman, *Introduction to Automata Theory, Languages and Computation*, Narosa, 1999

UNIT I

Strings, Alphabets and Languages (Section 1.1 of the Text)
Finite Automata (Chapters 2, Sections 2.1 to 2.4)

UNIT II

Regular expressions and Properties of Regular sets. (Sections 2.5 to 2.8 and 3.1 to 3.4)

UNIT III

Context Free grammars (Section 4.1 to 4.5)

UNIT IV

Pushdown Automata & properties of Context free languages
Theorem 5.3, 5.4 (without proof), (Section 5.1 to 5.3 and 6.1 to 6.3)

UNIT V

Turning Machine and Chomski hierarchy, (Sections 7.1 to 7.3 and 9.2 to 9.4)

References

1. J.E. Hopcroft, R. Motwani and J.D. Ullman, *Introduction to Automata Theory, Languages and Computation*, 3rd edition, Pearson, 2008.
2. P. Linz, *An introduction to Formal Languages and Automata*, 6th edition, Jones & Bartlett student Edition, 2012.
3. K. L. P. Mishra, N. Chandrasekharan, *Theory of computer science: Automata languages and computation*, PHI, 2006.
4. G. E. Revesz, *Introduction to Formal Languages*, Dover, 2012.
5. M. Sipser, *Introduction to the theory of computation*, 2nd edition, Thomson, 2006.

MM 233 PROBABILITY THEORY(Elective)

Texts:

- (1) Laha R.G and Rohatgi V.K ,“ *Probability Theory*”, JohnWiley, New York (1979)
- (2) Johnson N.L and KotzS “*Distributions in Statistics: Discrete Distributions*”, John Wiley, New York (1969)
- (3) Johnson N.L, and Kotz S “ *Distributions in Statistics: Continuous Univariate Distributions*”, Vol 1 and 2 ,John Wiley, New York (Paperback, 1970)

UNIT I

Probability, $\liminf$, $\limsup$, and
limit of sequence of events, Monotone and continuity property of probability measure, Addition Theorem, Independence of finite number of events, Sequence of events, Borel Cantalls Lemma, Borel Zero one law

UNIT II

Random variable, Its probability distribution function, Properties of distribution function, Discrete and continues type random variables, Discrete, Continuous and other types of distributions, Expectation and moments of random variables, Inequalities of Liaponov (for moments) , Random vectors, Independence of random variables and sequence of random variables, Markov and Chebychev's inequalities.

UNIT III

Standard distributions and their properties Bernoulli, Binomial, Geometric, Negative Binomial, Hyper geometric, Beta, Cauchy, Chi square, Double Exponential, Exponential, Fisher's F, Gamma, Log Normal, Normal,, Parents, Students's t, Uniform and Heibull.

UNIT IV

Characteristic functions and their elementary properties, Uniform continuity and non negative definiteness of characteristic functions, Characteristic functions and moments, Statement (without proof) and application of each of the three theorems Inversion Theorem, Continuity Theorem and Bochner Khintchine Theorem of characteristic functions, Statement and proof of Fourier Inversion Theorem.

UNIT V

Stochastic convergence of sequence of random variables, Convergence in distributions, Convergence in probability, Almost sure convergence and convergence in the r th mean, Their inter-relation ship - Examples and counter examples, Slutsky's Theorem.

References:

- (1). Ash R.B- “*Basic Probability Theory*”, John wiley, New York (1970)
- (2). Bhat B.R-“*Modern Probability Theory: An Introduction Text Book*”, Wiley Eastern (Second Edition) 1985

- (3). Gnedenko B.V-“*The Theory of Probability*”,
Mir Publishers Moscow (1969)**
- (4). Luckacs.E-“*Characteristic Functions*”, Hafner, New York (Second Edition, 1970)**
- (5). Luckacs. E- “*Stochastic Convergence*”, Academic Press (Second Edition, 1975)**
- (6). Johnson N.L, Kots,S and Balakrishnan.N-“*Continuos Univariate Distribution*”,
Vol.1 and 2 , John Wiley, New York (Second Edition, 1994 vol.1 1995 Vol.2)**
- (7). Johnson N.L, Kots.S and Kemp A.W-“*Univariate Discrete Distributions*”,
JohnWiley, New York” Second Edition 1992)**

MM 233 OPERATIONS RESEARCH (Elective)

Text 1 : J K Sharma. Operations Research - Theory and Applications, Sixth Edition, 2016

Text 2 :

K V Mital, C Mohan. Optimization Methods in Operation Research and System analysis, Third Edition, New Age International Publishers, New Delhi.

Unit I

Linear Programming - Definitions, Graphical solution methods for LP problems.

Simplex Method - Standard form of an LP problem, simplex algorithm (Maximization case), simplex algorithm (Minimization case) - Two Phase method, Big-M Method

Chapter 3 of text 1 - sections 3.1 to 3.3, Chapter 4 of text 1 - sections 4.1 to 4.4

Unit II

Transportation Problem : Mathematical model of TP, The transportation algorithm, Methods for finding initial solution, Test for optimality Assignment Problems : Mathematical model of AP, Solution methods of AP Chapter 9 of text 1 - Section 9.1, 9.2, 9.3, 9.4, 9.5; Chapter 10 of text 1 - Section 10.1, 10.2, 10.3.

Unit III

Project Management : Basic differences between PERT and CPM, Phases of Project Management, PERT/CPM network components and precedence relationships, Critical path analysis Chapter 13 of text 1 - Section 13.1 to 13.5

UNIT IV

Kuhn Tucker Theory and Nonlinear Programming: Lagrangian function, saddle point, Kuhn Tucker conditions, Primal and dual problems, Quadratic Programming.
[Chapter 8 of text 2, sections 1 to 6]

UNIT V

Dynamic Programming: Minimum path, Dynamic Programming problems, Computational economy in DP, serial multistage model, Examples of failure, Decomposition, Backward recursion.
[Chapter 10 of text 2, sections 1 to 10]

Reference:

Hamdy A. Taha, Operations Research, Fifth edition, PHI

MM 233 ALGEBRAIC TOPOLOGY (Elective)

Text Book : **Basic Concepts of Algebraic Topology, Fred H. Croom** Springer – Verlag

Unit I

Introduction, Examples, Geometric Complexes and Polyhedra, Orientation of Geometric complexes.
(Sections 1.1, 1.2, 1.3, 1.4 of Chapter 1)

Unit II

Simplicial Homology Groups - Chains, cycles, Boundaries, Homology groups, examples of Homology Groups, The structure of Homology Groups, The Euler Poincare Theorem, Pseudo manifolds and the Homology Groups of S^n . (Sections 2.1, 2.2, 2.3, 2.4, 2.5 of chapter 2).

Unit III

Simplicial Approximation- Introduction, Simplicial Approximation, Induced Homomorphisms on the Homology groups, the Brouwer fixed point theorem and related results .
(Sections 3.1, 3.2, 3.3, 3.4 of Chapter 3)

Unit IV

The Fundamental group - Introduction, Homotopic paths and the fundamental group, the covering homotopy property for S^1 . Examples of Fundamental group, the relation between $H_1(K)$ and $\pi_1([K])$.
(Sections 4.1, 4.2, 4.3, 4.4 and 4.5 of chapter 4)

Unit V

Covering Spaces – Definition and examples, basic properties of Covering spaces, Classification of covering spaces, Universal covering spaces, and applications
(Section 5.1, 5.2, 5.3, 5.4 and 5.5 of Chapter 5)

References :

- (1) I.M Singer, J.A Thorpe, **Lecture Notes on Elementary Topology and Geometry, Springer International Edition, Springer (India) Private Limited, New Delhi, 2004**
- (2) Satya Deo, **Algebraic Topology A Primer, Hindustan Book Agency, New Delhi, 2003.**
- (3) Allen Hatcher, **Algebraic Topology , Published 2001 by Cambridge University Press**

MM 233 NUMERICAL ANALYSIS WITH PYTHON(Elective)*

Texts:

- 1.Vernon L. Ceder, *The Quick Python Book*, Second Edition, Manning.
- 2.Richard L. Burden and J. Douglas Faires, *Numerical Analysis*, Ninth Edition, Brooks/Cole, Cengage Learning.
- 3.Amit Saha, *Doing Math with Python*, No Starch Press, 2015.

Unit I

In this unit we discuss the basics of python based on chapters 4,5,6,8, 9, 10 and 18 of Text 1. All topics of chapters 4-9 must be discussed using examples from mathematics. In chapter 10, only sections 10.1-10.4 need to be discussed. Chapter 18 also should be discussed to get an overview of the packages in python. The students should be encouraged to write programs related with mathematical problems. (Some of the problems are listed in the syllabus)

Unit II

Visualizing Data with Graphs - learn a powerful way to present numerical data: by drawing graphs with Python. The unit is based on Chapter 2 of Text 3. The sections Creating Graphs with Matplotlib and Plotting with Formulas must be done in full. In the section Programming Challenges, the problems Exploring a Quadratic Function Visually, Visualizing Your Expenses and Exploring the Relationship Between the Fibonacci Sequence and the Golden Ratio must also be discussed.

Unit III

The unit is based on chapters 4 and 7 of Text 3. Here we discuss Algebra and Symbolic Math with SymPy and Solving Calculus Problems. In Chapter 4 the sections Defining Symbols and Symbolic Operations, Working with Expressions, Solving Equations and Plotting Using SymPy should be done in full. In the section Programming Challenges, the problems Factor inder, Graphical Equation Solver, Summing a Series and Solving Single-Variable Inequalities also should be discussed. In chapter 7, some problems discussed namely, Finding the Limit of Functions, Finding the Derivative of Functions, Higher-Order Derivatives and Finding the Maxima and Minima and Finding the Integrals of Functions are to be done. In the section Programming Challenges, the problems Verify the Continuity of a Function at a Point, Area Between Two Curves and Finding the Length of a Curve also should be discussed.

Unit IV

In this unit we discuss some numerical methods for solving system of linear equations, for finding roots of equations and polynomial interpolation from Text 2. We first discuss bisection method, methods of Newton, secant method and method of false position for solving equations of the form $f(x)=0$. The topics can be found in sections 2.1 (only upto example 2) and 2.3. Interpolation and the

Lagrange Polynomial as per section 3.1 (only upto example 2) is to be discussed. Next we discuss Gauss Elimination with backward substitution method and LU decomposition method as per sections 6.1 (only upto Algorithm 6.1) and 6.5 (Theorem 6.19 statement only and exclude subsection Permutation Matrices. Also avoid the discussion of matrix factorization using Maple). Students should be encouraged to do problems and write python program for each method (see ref 1).

Unit V

Here we discuss some numerical methods for integration, differentiation and solving initial value problems of ordinary differential equations from Text 2. The methods for approximating first derivative of a function as per section 4.1 are to be discussed. They include forward-difference formula, $(n+1)$ -point formula, in particular three-point formulas. Rest of the topics in this section need not be discussed. Next we discuss the methods for numerical integration. Trapezoidal rule and Simpson's rules are to be discussed from section 4.3. Then we discuss $(n+1)$ -point closed Newton-Cotes formula and derive trapezoidal, Simpson's rule and Simpson's 3/8 rules from it. Remaining topics in the section need not be done. We also discuss Composite Simpson's rule and Composite Trapezoidal rule from section 4.4 (theorems 4.4 and 4.5 only). Our discussion about numerical methods for solving initial value problems of ordinary differential equations include Euler's method, Runge-Kutta methods of second and fourth order. The topics can be found in sections 5.2 (excluding subsection Error Bounds for Euler's Method) and section 5.4 (only Midpoint Method for Runge-Kutta Methods of order two and Runge-Kutta method of order four need to be discussed without any proof). Students should be encouraged to do problems and write python program for each method (see ref 1).

Some problems for Unit I are listed below

- Factorial of a number
- Checking primality of a number
- Listing all primes below a given number
- Prime factorization of a number
- Finding all factors of a number
- gcd of two numbers using the Euclidean Algorithm
- Finding the multiples in Bezout's Identity
- checking the convergence and divergence of sequences and series.

(For more problems visit <https://www.nostarch.com/doingmathwithpython/>, <https://doingmathwithpython.github.io/author/amit-saha.html> and <https://projecteuler.net/>.)

- The course is aimed to give an introduction to mathematical computing with Python as tool for computation.
- The students should be encouraged to write programs to solve the problems given in the sections as well as in the exercises.
- The end semester evaluation should contain a theory and a practical examinations.
- The duration of the theory examination will be 3 hours, with a maximum of 50 marks.
- In the question papers for the theory examination, importance should be given to the definition, concepts and methods discussed in each units, and not for writing long programs.
- Practical examination shall also be of 3 hours duration for a maximum of 25 marks.
- Weightage of marks for theory and a practical examinations is listed below

Unit	Theory	Practical
I	10 (one question out of two)	10 (two questions out of four)
II		5 (one question out of two)
III		5 (one question out of two)
IV	20 (two questions out of four)	5 one question out of two (one from each unit)
V	20 (two questions out of four)	

- Continuous evaluation follows the pattern - 5 marks for attendance, 10 marks for the internal examination and 10 marks for the practical record. The record should contain at least 20 programs.
- The practice of writing the record should be maintained by each student throughout the course and it should be dually certified by the teacher in charge/internal examiner and evaluated by the external examiner of practical examination.

References:

- 1.Jaan Kiusalaas, *Numerical Methods in Engineering with Python3*, Cambridge University Press, 2013.
- 2.NumPy Reference Release 1.17.0, Written by the NumPy community. (available at <https://docs.scipy.org/doc/>)
- 3.<https://docs.python.org/3/tutorial/>

4. Ward Cheney and David Kincaid, *Numerical Mathematics and Computing*, Sixth Edition, Thomson Brooks/Cole.

5. R. W. Hamming, *Numerical Methods for Scientists and Engineers*, Second Edition, Dover Publications Inc.

MM 233 ALGEBRAIC GEOMETRY (Elective)

Text Book

1. Elementary Algebraic Geometry, K. Hulek (translated by H. Verrill), Student Mathematical Library, vol 20, American Mathematical Society, 2003.

Unit I

Introduction, affine varieties, Hilbert's Nullstellensatz, polynomial functions and maps.

Unit II

Rational functions and maps, projective space, projective varieties, rational functions and morphisms.

Unit III

Smooth and singular points, algebraic characterizations of the dimension of a variety, plane curves,

Unit IV

Intersection multiplicity, classification of smooth cubics, the group structure of an elliptic curve.

Unit V

The existence of lines on a cubic, configuration of the 27 lines, rationality of cubics.

References

1. Introduction to Algebraic Geometry, Brendan Hassett, Cambridge University Press, 2007.
2. Algebraic Geometry, R. Hartshorne, Springer-Verlag, 1977.
3. Algebraic Geometry: A First Course, J. Harris, Springer-Verlag, 1992.
4. Algebraic Curves: An Introduction to Algebraic Geometry, William Fulton, Advanced Book Program, Redwood City, Addison-Wesley, 1989.
5. Principles of Algebraic Geometry, Phillip Griffiths and Joseph Harris, New York: Wiley-Interscience, 1978.

MM 234 APPROXIMATION THEORY (Elective)

Text: EW Cheney, *“Introduction to Approximation Theory”*, Mc Graw Hill

UNIT 1

Metric spaces- An existence Theorem for best approximation from a compact subset; Convexity- Caratheodory's Theorem- Theorem on linear inequalities; Normed linear spaces - An existence Theorem for best approximation from finite dimensional subspaces - Uniform convexity - Strict convexity (Sections 1,2,5,6 of Chapter 1)

UNIT II

The Tchebycheff solution of inconsistent linear equations -Systems of equations with one unknown- Three algebraic algorithms; Characterization of best approximate solution for m equations in n unknowns- The special case $m=n+1$; Poly's algorithm. (Section 1,2,3,4,5 of Chapter 2)

UNIT III

Interpolation- The Lagrange formula-Vandermonde's matrix- The error formula- Hermite interpolation; The Weierstrass Theorem- Bernstein polynomials- Monotone operators- Fejer's Theorem; General linear families- Characterization Theorem- Haar conditions- Alternation Theorem. (Sections 1,2,3,4, of Chapter 3)

UNIT IV

Rational approximation- Conversion of rational functions to continued fractions; Existence of best rational approximation- Extension of the classical Theorem; Generalized rational approximation- the characterization of best approximation- An alternation Theorem- The special case of ordinary rational functions; Unicity of generalized rational approximation. (Sections 1,2,3,4 of Chapter 5)

UNIT V

The Stone Approximation Theorem, The Muntz Theorem - Gram's lemma, Approximation in the mean- Jackson's Unicity Theorem- Characterization Theorem, Marksoff's Theorem. (Section 1,2,6 of Chapter 6)

Reference:

P.J Davis. *“Interpolation and Approximation”*, Blaisdell Publications.

MM 234 CURVES, SURFACES AND MANIFOLDS(Elective)

Text Books

1. Elementary Differential Geometry, Andrew Pressley (2nd Edn) Springer-Verlag 2010.
2. Introduction to Smooth Manifolds, John M Lee, Springer-Verlag 2006.

Unit - I

What is a curve, Arc-length, Reparametrization, Closed curves, Level curves versus parametrized curves,

Curvature, Plane curves, Space curves.

[Chapter 1 – Sections 1- 5, Chapter 2 – Sections 1 – 3 **from Text – 1**]

Unit - II

What is a surface, Smooth surfaces, Smooth maps, Tangents and derivatives, Normals and orientability,

Applications of the Inverse Function Theorem.

[Chapter 4 – Sections 1 – 5, Chapter 5 – Section 6 **from Text – 1**]

Unit - III

Lengths of curves on surfaces, The second fundamental form, The Gauss and Weingarten maps, Normal and geodesic curvatures, Gaussian and mean curvatures, Principal curvatures of a surface.

[Chapter 6 – Sections 1, Chapter 7 – Sections 1 – 3, Chapter 8 – Sections 1 – 2 **from Text - 1**]

Unit – IV

Topological Manifolds, Smooth structures, Examples of smooth manifolds,

Smooth functions and smooth maps.

Tangent vectors, Pushforwards, Computations in coordinates. The tangent bundle, Vector fields on manifolds.

[Chapter 1 sections 1, 3, 4, Chapter 2 section 1, Chapter 3 sections 1-3, Chapter 4 sections 1-2 **from Text - 2**]

Unit - V

Covectors, tangent covectors on manifolds, the cotangent bundles, the differential of a function, pullbacks, line integrals.

Maps of constant rank, Embedded submanifolds.

[Chapter 6 sections 1-6, Chapter 7 section 1, Chapter 8 section 1 **from Text - 2**]

References

1. Differential Geometry of Curves and surfaces, M P do Carmo, Prentice-Hall, 1976.
2. A course in Differential Geometry, W Klingenberg, Walter de Gruyter, 1995.
3. Elementary Differential Geometry, D B. O'Neil, Academic Press NY 1966.
4. Calculus on Manifolds, Michael Spivak, Westview Press, 1971.
5. An Introduction to Manifolds, Loring W. Tu, Springer-Verlag (2nd edn.) 2011.
6. Analysis on Manifolds – J R Munkres, Addison-Wesley 1991.
7. Lectures on classical differential geometry, Dirk Jan Struik, Dover Publications (2nd edn.) 1988.
8. A Panoramic View of Riemannian Geometry, Marcel Berger, Springer 2002.

MM 234 GEOMETRY OF NUMBERS (Elective)

**Text Book: D.D Olds, Anneli Lax and Guilian P. Davidoff, *The Geometry of Numbers*,
The Mathematical Association of America 2000**

UNIT 1

Lattice points and straight lines, Counting of lattice points (Chapters 1 and 2)

UNIT 2

Lattice points and area of polygons, Lattice points in circles (Chapter 3 and 4)

UNIT 3

Minkowski fundamental Theorem and Applications (Chapters 5 and 6)

UNIT 4

Linear transformation and integral lattices, Geometric interpretations of Quadratic forms (Chapters 7 and 8)

UNIT 5

Blichfeldts and applications, Tchebychev's and consequences (Chapter 9 and 10)

References

1. J.W.S Cassels, *Introduction to Geometry of Numbers*, Springer Verlag 1997
2. C.I Siegel, *Lectures in Geometry of Numbers*, Springer Verlag 1989.

MM 234 DIFFERENTIAL GEOMETRY (Elective)

Text: John.A. Thorpe, *Elementary Topics in Differential Geometry*, Springer Verlag

UNIT I

Graphs and level sets, Vector fields, Tangent Spaces . (Chapter 1,2,3 of Text)

UNIT II

Surfaces, Vector fields on surfaces, Orientation, The Gauss map (Chapter 4,5 6 of Text)

UNIT III

Geodesics, Parallel transport (Chapter 7,8 Text)

UNIT IV

The Weingarten map, Curvature of plane curve. (Chapter 9.10 of Text)

UNIT V

Arc length, Line integral, Curvature of surfaces (Chapter 11,12 of Text, except the proofs of Theorem 1, Theorem 2 of Chapter 11 and Theorem 1 of Chapter 12)

References:

[1] I Singer and J.A Thorpe, *Lecture notes on Elementary Topology and Geometry*, Springer-Verlag

[2] M Spivak, *Comprehensive introduction to Differential Geometry (Vols 1 to 5)*, Publish or Perish Boston.

MM 234 GRAPH THEORY (Elective)

**Text: Gary Chartrand and Ping Zhang , *Introduction to Graph Theory*, Tata Mc Graw Hill,
Edition 2006**

An overview of the concepts-Graphs, Connected graphs, Multi graphs, Degree of a vertex, Degree Sequence, Trees.

UNIT I

Definition of isomorphism, Isomorphism as a relation, Graphs and groups, Cut-vertices, Blocks, Connectivity.
(Sections 3.1, 3.2, 3.3, 5.1, 5.2 and 5.3)

UNIT II

Eulerian graphs, Hamilton graphs, Hamilton walks and numbers
(Sections 6.1, 6.2 and 6.3)

UNIT III

Strong diagrams, Tournaments, matching, Factorization.
(Sections 7.1, 7.2, 8.1,8.2)

UNIT IV

The Four colour problem, Vertex colouring, The Ramsey number of graphs, Turan's Theorem.
(Sections 10.1, 10.2, 10.3, 11.1 and 11.2)

UNIT V

The centre of a graph, Distant vertices, Locating numbers, Detour and Directed distance.
(Sections 12.1, 12.2, 12.3, 12.4)

References:

1. Bondy J.A and Murthy U.S.R, "*Graph Theory with Applications*", the Macmillan Press Limited.
2. Hararay F., "*Graph Theory*", Addison-Wesley
3. Suesh Singh G., "*Graph Theory*", PHI Learning Private Limited
4. Vasudev.C , "*Graph Theory Applications*".
5. West D.B, "*Introduction to Graph Theory*", PHI Learning Private Limited

MM 234 FRACTAL GEOMETRY (Elective)

Text

Kenneth Falconer, Fractal Geometry Mathematical Foundation and Application, Third edition, Wiley, 2014

Unit 1

Basic set theory , Functions and limits, Measures and mass distributions, Box-counting dimensions, properties of box –counting dimensions

(sections 1.1,1.2,1.3,2.1,2.2 of text)

Unit II

Hausdorff measure, Hausdorff dimension, Calculation of Hausdorff dimension, Basic method for calculating dimensions.

(sections 3.1,3.2,3.3,4.1 of text)

Unit III

Iterated functions systems, Dimensions of self similar sets, Some variations, Continued fraction examples

(sections 9.1,9.2,9.3,10.2 of text)

Unit IV

Dimensions of Graphs, The Weierstrass function and self –affine graphs, Repellers and iterated function system, The logistic map

(sections 11.1,13.1,13.2 of text)

Unit V

Sketch of general theory of Julia sets, The Mandelbort set, Julia sets of quadratic functions

(sections 14.1,14.2,14.3 of text)

References

- 1. Falconer K.J, The Geometry of Fractal sets ,Cambridge University Press, Cambridge, 1986**
- 2. Barnsley M F, (1988), Fractals Every where, Academic press**

MM 244 NUMBER THEORY

Text Book: Tom M. Apostol, *Introduction to Analytical Number Theory*, Springer, 1998

UNIT I

Arithmetical function and Dirichlet multiplication

(Section 2.1 to 2.14 of Text)

UNIT II

Finite Abelian Groups and Their Characters

(Theorem 4.1 of Chapter 4 (Abel's identity), Section 6.5 to 6.10 of Chapter 6
(*Theorem 6.6 Statement Only*))

UNIT III

Dirichlet's Theorem on Primes in Arithmetic Progressions

(Section 3.2 of Chapter 3, Sections 7.1 to 7.8)

UNIT IV

Quadratic residues, Reciprocity law, Jacobi symbol

(Sections 9.1 to 9.8 of Chapter 9)

UNIT V

Primitive roots, Existence and number of primitive roots.

(Sections 10.1 to 10.9 and Sections 10.11 to 10.13 of Chapter 10)

References

- [1] Kenneth Ireland, Michael Rosen, *A Classical Introduction to Modern Number Theory*, Second Edition, Springer 1990.
- [2] Emil Grosswald, *Topics from the Theory of Numbers*, Birkhauser 1984
- [3] G.H Hardy and E.M Wright , *Introduction to the Theory of Numbers*, Oxford Press.

MM 242: FUNCTIONAL ANALYSIS II

Text: B. V. Limaye, FUNCTIONAL ANALYSIS (3rd Edition)

UNIT I

Spectrum of a compact operator (Section 18.1, 18.2, 18.3, 18.4, 18.5 and 18.7 (a) only).

UNIT II

Inner product spaces, orthonormal sets (Section 21 and 22 of the Text, omitting 21.3 (d), 22.3 (b), 22.8 (c), 22.8 (d), 22.8 (e)).

UNIT III

Approximation and optimization, projection and Riesz representation theorems. (Section 23 and 24 of the Text, omitting 23.6).

UNIT IV

Bounded operators and adjoints, normal, unitary and self-adjoint operators (Section 25 and 26.1 to 26.5 of the Text omitting 25.4 (b)).

UNIT V

Spectrum and numerical range, compact self-adjoint operators (Section 27.1, 27.2, 27.4(statement only), 27.5, 27.7, 28.1, 28.4, 28.5, 28.6 of the Text).

References

- 1. Bryan Rynne, M.A. Youngson, Linear Functional Analysis, Publisher: Springer.**
- 2. Rajendra Bhatia, Notes on Functional Analysis, Publisher: Hindustan Book Agency.**
- 3. M. Tambar Nair, Functional Analysis: A first course, Publisher: Prentice Hall of India Pvt. Ltd.**
- 4. Walter Rudin, Functional Analysis, 2nd Edition, Publisher: Tata Mc Graw-Hill.**
- 5. B. V. Limaye, Linear Functional Analysis for Scientists and Engineers, Springer Singapore, 2016.**

MM 243 MATHEMATICAL STATISTICS (Elective)

Text: **V.K.Rohatgi**, *An Introduction to Probability Theory and Mathematical Statistics*, Wiley Eastern Ltd.

Unit I: The theory of point estimation:

The problem of point estimation, properties of estimates, unbiased estimation, unbiased estimation (continued): A lower bound for the variance of an estimate, the method of moments, maximum likelihood estimates.(Chapter 8 (Sec 8.2 – sec 8.7) of text)

Unit II: Neyman – Pearson theory of testing of hypothesis:

Introduction, some fundamental notions of hypothesis testing, the Neyman – Pearson Lemma, families with monotone likelihood ratio, unbiased and invariant tests.(Chapter 9 of text)

Unit III: Some further result on hypothesis testing:

Introduction, the likelihood ratio tests, the Chi-square tests, the t-tests, the F-tests, Bayes and minimax procedure.(Chapter 10 of text)

Unit IV: Confidence estimation:

Introduction, Some fundamental notions of confidence estimation, shortest length confidence intervals, relation between confidence estimation and hypothesis testing, unbiased confidence intervals, Bayes confidence intervals(Chapter 11 of text)

Unit V: Nonparametric statistical inference:

Introduction, nonparametric estimation, some single – sample problems, some two – sample problems, tests of independence.(Chapter 13 (Sec 13.1 – 13.5) of text)

References:

Lehmann. E.L, *“Theory of Point Estimation”*, John Wiley, New York, 1983.

1.**Lehmann E.L**, *“Testing of Statistical Hypothesis”*, John Wiley, New York (Second Ed.), 1986.

2.**Randles R H and Wolf D A**, *“Introduction to the Theory of Non parametric Statistics”*, Wiley, New York, 1979.

3.**Kendall M G and Stuart A**, *“The Advanced Theory of Statistics”*, Vol 2, Mac Millan, New York (Fourth Ed.), 1979.

4.**Mood Ali, Gray Bill, Fhardoes D C**, *“Introduction to the Theory of Statistics”*, McGraw Hill International, New York (Third Ed.), 1972.

MM 243 Difference Equations (Elective)

Unit – I: Linear Difference Equations of Higher Order

Difference calculus – General theory of linear difference equations – Linear homogenous equations with constant coefficients – Linear non-homogenous equations – Method of undetermined coefficients. (Chapter 2: Sections: 2.1 to 2.4)

Unit – II: System of Linear Difference Equation

Autonomous (time invariant) systems – The basic theory – The Jordan form: Autonomous (time-invariant) systems - Linear Periodic Systems. (Chapter 3: Sections: 3.1 to 3.4)

Unit – III: The Z-Transform Method

Definitions and examples – Properties of Z-Transform – The inverse Z-Transform and solutions of difference equations - Power series method - Partial fraction method – Inversion integral method. (Chapter 6: Sections: 6.1, 6.2)

Unit – IV: Oscillation Theory

Three-term difference equations – Self-adjoint second order equations – Nonlinear difference equations. (Chapter 7: Sections: 7.1 to 7.3)

Unit – V: Asymptotic Behaviour of Difference Equations

Tools of approximations - Poincaré's theorem – Asymptotically diagonal systems. (Chapter 8: Sections: 8.1 to 8.3)

Book for Study

Saber N. Elaydi, An Introduction to Difference Equations, Third Edition, Springer International Edition, First Indian Reprint, New Delhi, 2008.

Books for Reference

1. S. Goldberg, Introduction to Difference Equations, Dover Publications, 1986.
 2. Walter G. Kelley, Allan C. Peterson, Difference Equations An Introduction with Applications, Academic Press, Indian Reprint, New Delhi, 2006.
 3. V. Lakshmikantham, Donato Trigiante, Theory of Difference Equations: Numerical Methods and Applications, Second Edition, Marcel Dekker, Inc, New York, 2002.
 4. Ronald E. Mickens, Difference Equations, Van Nostrand Reinhold Company, New York, 1987.
 5. Sudhir K. Pundir, Rimple Pundir, Difference Equations (UGC Model Curriculum), Pragati Prakashan, First Edition, Meerut, 2006.
- E – Learning source:

MM 243 THEORY OF WAVELETS (Elective)

Text Book:

Michael Frazier, *An Introduction to Wavelets through Linear Algebra*, Springer

Prerequisites: Linear Algebra, Discrete Fourier Transforms, elementary Hilbert Space Theorems
(No questions from the pre-requisites)

UNIT I

Construction of Wavelets on $\mathbb{Z}$ the first stage. (Section 3.1)

UNIT II

Construction of Wavelets on $\mathbb{Z}$ the iteration sets, Examples - Shamon, Daubiehe and Haar
(Sections: 3.2 and 3.3)

UNIT III

$\ell^2(\mathbb{Z})$, Complete Orthonormal sets, $L^2[-\pi, \pi]$ and Fourier Series.
(Sections: 4.1, 4.2 and 4.3)

UNIT IV

Fourier Transforms and convolution on $\ell^2(\mathbb{Z})$, First stage wavelets on $\mathbb{Z}$.
(Section: 4.4 and 4.5)

UNIT V

The iteration step for wavelets on $\mathbb{Z}$, Examples, Shamon Haar and Daubiehe

References:

Mayor (1993), *Wavelets and Operators*, Cambridge University Press

Chui. C(1992), *An Introduction to Wavelets*, Academic Press, Boston

MM 243 CODING THEORY(Elective)

Text: *Coding Theory – An Introduction*, San Ling and Chaoping Xing

Cambridge Univ.Press, 2004.

Unit I

Introduction to Coding theory - Error Detection, Correction and Decoding - Basics of Finite Fields.

(Chapters 1, 2 and Sections 3.1, 3.2 , 3.3 of the Text)

Unit II

Linear Codes – Generator and Parity check matrices – Coding and decoding of linear codes.

(Chapter 4 of the Text)

Unit III

Some Bounds in Coding theory – Sphere Covering bound – Hamming bound and Perfect codes – Binary Hamming codes – Singleton bound and MDS codes.

(Sections 5.1, 5.2, 5.3.1, 5.4 of the Text)

Unit IV

Reed – Muller Codes – Cyclic codes – Generator and Parity check polynomials – Generator and parity check matrices – Decoding of Cyclic codes.

(Sections 6.2, 7.1, 7.2, 7.3, 7.4 of the Text)

Unit V

(A review of Section 3.3 of the Text is to be done as a prerequisite to this Unit)

BCH Codes – Decoding of BCH Codes – Reed-Solomon Codes

(Sections 8.1, 8.2 of the Text)

(Simple exercise problems of the corresponding sections are to be practiced).

References:

1. The Theory of Error Correcting Codes, F.J.MacWilliams and N.J.A.Sloane, North Holland, Amsterdam (1998).
2. Error Control Coding – Fundamentals and Applications, Shu Lin and Daniel J.Costello, Pearson Education India, 2011.
- 3.R. Lidl and H.Neiderreiter, Introduction to Finite Fields and their Applications, Cambridge University Press.

MM 243 ADVANCED ALGEBRA (Elective)

Text Book: David S. Dummit, Richard M. Foote, Abstract Algebra, 3rd Edition, Wiley 2011

UNIT I

Basic theory of field extensions, Algebraic extensions,

(Sections 13.1, 13.2)

UNIT II

Straight edge and compass constructions, Splitting fields and algebraic closures, Cyclotomic fields,

(Sections 13.3, 13.4)

UNIT III

Separable and inseparable extensions, Existence and uniqueness of finite fields, (Section 13.5)

UNIT IV

Cyclotomic polynomials and extensions, Basic definitions and examples related to fundamental theorem of Galois theory

(Section 13.6, 14.1)

UNIT V

The fundamental theorem of Galois theory, Finite fields

(Sections, 14.1, 14.2, 14.3)

References

- [1] Joseph Gallian, Contemporary Abstract Algebra, 8th Edition, Cengage Learning
- [2] J B Fraleigh, A first course in Abstract Algebra, Seventh Edition, Pearson Education
- [3] P B Bhattacharya, S K Jain, and S R Nagpaul, Basic Abstract Algebra, 4th Edition, Cambridge University Press, 2004
- [4] Michael Artin, Algebra, Prentice-Hall of India, 2003

MM 244 MECHANICS (Elective)

Text: Herbert Goldstein, Charles P. Poole and John Safko, *Classical Mechanics*, Third Edition, Pearson, 2011.

Unit I: Mechanics of a particle, Mechanics of a system of particles, Constraints, D'Alembert's principle and Lagrange's equations, Velocity dependent potentials and the dissipation function, Simple applications of the lagrangian formulation.(Chapter 1 of text)

Unit II: Hamilton's principle, Some techniques of the calculus of variations, derivation of Lagrange's equation from Hamilton's principle, Extending Hamilton's principle to systems with constraints, Conservation theorems and symmetry properties. (Sections 2.1, 2.2, 2.3, 2.4 and 2.6)

Unit III: Reduction to the equivalent one body problem, the equations of motion and first integrals, the equivalent one dimensional problem and classification of orbits, the Virial theorem, the differential equation for the orbits and integrable power law potentials, the Kepler problem: Inverse square law of force.(Sections 3.1, 3.2, 3.3, 3.4, 3.5 and 3.7)

Unit IV: The independent coordinates of a rigid body, orthogonal transformation, the Euler angles, the Cayley – Klein parameters and related quantities, Euler's theorem on the motion of a rigid body, the coriolis effect. (Sections 4.1, 4.2, 4.4, 4.5, 4.6, 4.10)

Unit V: Angular momentum and kinetic energy of motion about a point, tensors, the inertial tensor and the moment of inertia, the eigen values of the inertial tensor and the principal axis transformation, solving rigid body problems and the Euler equations of motion.

(Sections 5.1 to 5.5)

References:

Synge J.L and Griffith B.A, *Principles of Mechanics*, McGraw – Hill.

244 CRYPTOGRAPHY(Elective)

TEXT : Douglas R. Stinson and Maura B. Paterson, *Cryptography Theory and Practice*, CRC Press, Taylor and Francis, 4th Edition. (2019)

Unit 1

Cryptosystems and Basic Cryptographic Tools: Secret-key Cryptosystems, Public-key Cryptosystems, Block and Stream Ciphers, Hybrid Cryptography, Message Integrity, Message Authentication Codes, Signature Schemes, Nonrepudiation, Certificates, Hash Functions, Cryptographic Protocols, Security

Classical Cryptography: Some Simple Cryptosystems, The Shift Cipher, The Substitution Cipher, The Affine Cipher, The Vigen`ere Cipher, The Hill Cipher, The Permutation Cipher , Stream Ciphers. [*Chapter 1 and chapter 2(section 2.1)*]

Unit 2

Cryptanalysis: Cryptanalysis of the Affine Cipher, Cryptanalysis of the Substitution Cipher, Cryptanalysis of the Vigen`ere Cipher, Cryptanalysis of the Hill Cipher, Cryptanalysis of the LFSR Stream Cipher

Shannons Theory: Elementary Probability Theory, Perfect Secrecy, Entropy, Huffman Encodings, Properties of Entropy, Spurious Keys and Unicity Distance,[*Chapter 2(section 2.2) and Chapter 3*]

Unit 3

Block Ciphers and Stream Ciphers: Introduction, Substitution-Permutation Networks, Linear Cryptanalysis, The Piling-up Lemma, Linear Approximations of S-boxes, A Linear Attack on an SPN , Differential Cryptanalysis , The Data Encryption Standard Description of DES , Analysis of DES, The Advanced Encryption Standard Description of AES , Analysis of AES , Modes of Operation, Padding Oracle Attack on CBC, Mode Stream Ciphers, Correlation Attack on a Combination Generator, Algebraic Attack on a Filter Generator, Trivium [Chapter 4]

Unit 4

Hash Functions and Message Authentication: Hash Functions and Data Integrity, Security of Hash Functions, The Random Oracle Model, Algorithms in the Random Oracle Model, Comparison of Security Criteria, Iterated Hash Functions, The Merkle-Damgard Construction, Some Examples of Iterated Hash Functions, The Sponge Construction, SHA-3 , Message Authentication Codes, Nested MACs and HMAC , CBC-MAC, , Authenticated Encryption , Unconditionally Secure MACs , Strongly Universal Hash Families, Optimality of Deception Probabilities[Chapter 5]

Unit 5

The RSA Cryptosystem and Factoring Integers: Introduction to Public-key Cryptography, More Number Theory, The Chinese Remainder Theorem , Other Useful Facts, The RSA Cryptosystem, Implementing RSA , Primality Testing, Legendre and Jacobi Symbols, The

Solovay-Strassen Algorithm, The Miller-Rabin Algorithm, Square Roots Modulo n , Factoring Algorithms, The Pollard $p-1$ Algorithm, The Pollard Rho Algorithm, Dixon's Random Squares Algorithm, Factoring Algorithms in Practice, Other Attacks on RSA, The Decryption Exponent, Wiener's Low Decryption Exponent Attack, The Rabin Cryptosystem, Security of the Rabin Cryptosystem, Semantic Security of RSA, Partial Information Concerning Plaintext Bits, Obtaining Semantic Security[Chapter 6]

References

6. Jeffrey Hoffstein: Jill Pipher, Joseph H. Silverman, An Introduction to Mathematical Cryptography, Springer International Edition.

7. H. Deffs & H. Knebl: Introduction to Cryptography, Springer Verlag, 2002.

8. Alfred J. Menezes, Paul C. van Oorschot and Scott A. Vanstone: Handbook of Applied Cryptography, CRC Press, 1996.

9. William Stallings: Cryptography and Network Security Principles and Practice, Third Edition, Prentice-hall India, 2003.

MM 244 ADVANCED GRAPH THEORY (Elective)

Text:

Fred Buckley, Frank Harary, *Distance in Graphs*, Addison-Wesley Publishing Company

UNIT 1

Graphs: Graphs as Models, Paths and connectedness, Cutnodes and Blocks, Graph Classes and Graph Operations, Polynomial Algorithms and NP-Completeness
(Chapter 1 and Section 11.1 of Text)

UNIT II

The Center and Eccentricity, Self Centered Graphs, The Median, Central Paths Path Algorithms and Spanning Trees, Centers.
(Chapter 2, Sections 2.1, 2.2, 2.2; Chapter 11, Sections 11.2, 11.3)

UNIT III

External Distance Problems: Radius, Small Diameter, Diameter, Long Paths and Long Cycles
(Chapter 5 of Text)

UNIT IV

Convexity: Closure in variants, Metrics on Graphs, Geodetic Graphs, Distance Hereditary Graphs.

Diagraphs: Diagraphs and Connectedness, Acyclic diagraphs
(Chapter 7 and sections 10.1, 10.2 of Text)

UNIT V

Distance Sequences: The eccentric sequences, Distance sequence, The Distance distribution, Long Paths in Diagraphs, Tournaments
(Sections 9.1, 9.2, 9.3, 10.3, 10.4 of Text)

References:

- (1) Bondy and Murthy, *Graph Theory with Applications*, The Macmillan Press Limited, 1976
- (2) Chartrand G and L.Lesniak, *Graphs and Diagraphs*, Prindle, Weber and Schmidt, Boston, 1986
- (3) Garey M.R, D.S Johnson , *Computers and Intractability, A Guide to the Theory of NP-Completeness*, Freeman, San Francisco 1979.
- (4) Harary. F, *Graph Theory*, Addison Wesley Reading Mass 1969 (Indian Edition, Narosa)
- (5) K.R Parthasarathy, *Basic Graph Theory*, Tata Mc Graw-Hill, Publishing Co, New Delhi, 1994.

MM 244 COMMUTATIVE ALGEBRA (Elective)

Text: N.S Gopalakrishan, *Commutative Algebra*, Oxonian Press

UNIT I

Modules, Free projective, Tensor product of modules, Flat modules
(Chapter 1 of Text)

UNIT II

Ideals, Local rings, Localization and applications
(Chapter 2 of Text)

UNIT III

Noetherian rings, modules, Primary decomposition, Artinian modules
(Chapter 3 of Text)

UNIT IV

Integral domains, Integral extensions, Integrally closed domain, Finiteness of integral closure
(Chapter 4 of Text)

UNIT V

Valuation rings, Dedekind domain
(Chapter 5 of Text, Theorems 4 and 5 omitted)

References:

- [1] M.F Atiyah and I.G Mac Donald, *Introduction to Commutative Algebra*, Addison Wesley
- [2] T.W Hungerford, *Algebra*, Springer-Verlag

MM 244: ADVANCED COMPLEX ANALYSIS (Elective)

***Text: John. B. Conway, Functions of Complex Variables, Springer-Verlag, New York, 1973.
(Indian Edition: Narosa)***

UNIT I

Compactness and Convergence in the space of Analytic functions, The space $C(G, \Omega)$, Space of Analytic functions, Riemann Mapping Theorem.

(Chapter 7- Sections 1, 2 and 4 of the Text)

UNIT II

Wierstrass factorization Theorem, Factorization of sin function, The Gamma function.

(Chapter 7- Sections 5,6 and 7 of the Text)

UNIT III

Riemann Zeta function, Runge's Theorem, Simple connectedness, Mittag-Leffler's Theorem.

(Chapter 7- Section 8 and Chapter 8 of the Text)

UNIT IV

Analytic continuation and Riemann surfaces, Schwarz Reflexion Principle, Analytic continuation along a path, Monodromy Theorem.

(Chapter 9- Sections 1, 2 and 3 of the Text)

UNIT V

Basic properties of Harmonic functions, Harmonic function on a disc, Jensen's formula, The genus and order of an entire function, Hadamard factorization Theorem.

(Chapter 10- Sections 1, 2 and Chapter 11 of the Text)

References:

- 1. L.V. Ahlfors, Complex Analysis, Mc-Graw Hill (1966)**
- 2. S. Lang, Complex Analysis, Mc-Graw Hill (1998).**
- 3. S. Ponnusamy & H. Silverman, Complex Variables with Applications, Birkhauser.**
- 4. H. A. Priestley, Introduction to Complex Analysis, Oxford University Press Tristan Needham, Visual Complex Analysis, Oxford University Press(1999)**
- 5. V. Karunakaran, Complex Analysis, Narosa Publishing House,**

**MM 244 REPRESENTATION THEORY OF FINITE GROUPS
(Elective)**

Text: Walter Ledermann, *Introduction to Group Characters*, Cambridge University Press

UNIT I

G-module, Characters, Reducibility, Permutation representations, Complete reducibility, Schur's Lemma
(Sections 1.1 to 1.7 of Text)

UNIT II

The commutant algebra, Orthogonality relations, The groups algebra
(Section 1.8, 2.1, 2.2 of Text)

UNIT III

Character table, Character of finite abelian groups, The lifting process, Linear characters
(Section 2.3, 2.4, 2.5, 2.6 of Text)

UNIT IV

Induced representations, Reciprocity law, A_5 , Normal subgroups, Transitive groups, Induced characters of S_n
(Sections 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3 of Text)

UNIT V

Group theoretical applications, Burnside's (p,q) Theorem, Frobenius groups
(Chapter 5 of Text)

Reference: S.Lang, *Algebra*, Addison Wesley

MM 244 CATEGORY THEORY (Elective)

Text Book: S. MacLane, *Categories for the working Mathematician*, Springer, 1971

UNIT-I

Categories, Functors and Natural Transformations - Axioms for categories, categories, Functors. Natural Transformations, Monoids, Epis and Zeros Foundations, Large Categories, Hom-sets.

UNIT II

Constructions on categories - Duality Contravariance and opposites, Products of Categories. Functor Categories, The category of all categories, Comma categories, Graphs and Free categories, Quotient Categories.

UNIT III

Universals and Limits - Universal Arrows, Yoneda Lemma Coproducts and Colimits, Products and Limits, Categories with Finite products, Groups in categories.

UNIT IV

Adjoints – Adjunctions, Examples of Adjoints, Reflective subcategories, Equivalence of categories, Adjoints for pre orders, Cartesian closed categories, Transformations of Adjoints, Compositions of Adjoints.

UNIT –V

Limits – Creation of Limits by products and Equalizers, Limits with parameters, Preservation of Limits, Adjoints on Limits, Freyd's Adjoint Functor Theorem, Subobjects and Generation, The Special Adjoint Functor Theorem, Adjoint in Topology.

References:

1. M.A. Arbib and E.G Maneswarrows, *Structures and Functors, The categorical Imperative*, Academic Press-1975
2. H. Herrlich and G.E Strecker, *Category Theory*, Allyn & Bacon, 1973
3. M. Barmand, C. Wells, *Category Theory for Computer Science*, Prentice Hall , 1990
4. F. Borceux, *Handbook of Categorical Algebra*, Vol. I, II, III, Cambridge, University Press, 1994
5. P. Freyd, *Abelian Categories*, Harper & Row, 1964
6. R.F,C Walters, *Categories and Computer Science*, Cambridge University Press, 1991

MM 244 SPECTRAL GRAPH THEORY

Text: Bogdan Nica, A Brief Introduction to Spectral Graph Theory, European Mathematical Society Publishing House, 2018.

Unit I

A quick review of chapter I, Invariants - Chromatic number and independence number (Section 2.1 of Chapter II), Eigenvalues of graphs – Adjacency and Laplacian eigenvalues, First properties, First examples (Chapter 7).

Unit II

Eigenvalue computations - Cayley graphs and bi-Cayley graphs of abelian groups, Strongly regular graphs, Two gems, Design graphs (Chapter 8) (Except Example 8.10 and Example 8.23).

Unit III

Largest eigenvalues - Extremal eigenvalues of symmetric matrices, Largest adjacency eigenvalue, The average degree, A spectral Turán theorem, Largest Laplacian eigenvalue of bipartite graphs, Sub graphs, Largest eigenvalues of trees (Chapter 9).

Unit IV

More eigenvalues - Eigenvalues of symmetric matrices: Courant–Fischer, A bound for the Laplacian eigenvalues, Eigenvalues of symmetric matrices: Cauchy and Weyl, Sub graphs (Chapter 10).

Unit V

Spectral bounds - Chromatic number and independence number, Isoperimetric constant, Edge counting (Chapter 11).

References:

- 1. D. Cvetkovic, M. Doob, H. Sachs, Spectra of Graphs - Theory and Application, Academic Press, New York, 1980.**
- 2. Andries E. Brouwer, William H. Haemers, Spectra of graphs – Monograph, Springer.2011.**

UNIVERSITY OF KERALA

**Revised Syllabus for
M.Sc Degree Programme in Physics**

(With effect from 2018 admissions)



Edit with WPS Office

UNIVERSITY OF KERALA

M.Sc Degree Programme (effective from 2018 - 19) Branch II PHYSICS

A: COURSE STRUCTURE & MARK DISTRIBUTION

Semester	Paper Code	Title of Paper	Contact hours per week			UE duration (hrs)	Maximum mark		
			L	T	P		IA	UE	Total
I	PH 211	Classical Mechanics	6	1	...	3	25	75	100
	PH 212	Mathematical Physics	6	1	...	3	25	75	100
	PH 213	Basic Electronics	6	1	...	3	25	75	100
	PH 251	General Physics Practicals	...	1	3	...	...	...	...
	PH 252	Electronics & Computer Science Practicals	...	1	4	...	...	...	...
	Total for Semester I (S1)		18	5	7	...	75	225	300
II	PH 221	Modern Optics & Electromagnetic theory	6	1	...	3	25	75	100
	PH 222	Thermodynamics, Statistical Physics & Basic Quantum Mechanics	6	1	...	3	25	75	100
	PH 223	Computer Science & Numerical Techniques	6	1	...	3	25	75	100
	PH 251	General Physics Practicals	...	1	3	6	25	75*	100
	PH 252	Electronics & Computer Science Practicals	...	1	4	6	25	75*	100
	Total for Semester II (S2)		18	5	7	...	125	375	500



III	PH 231	Advanced Quantum Mechanics	6	1	...	3	25	75	100
	PH 232	Advanced Spectroscopy	6	1	...	3	25	75	100
	PH 233 X	Special Paper I	6	1	...	3	25	75	100
	PH 261	Advanced Physics Practicals	...	1	4	...	...	...	...
	PH 262	Advanced Electronics Practicals	...	1	3	...	...	...	...
	Total for Semester III (S3)		18	5	7	...	75	225	300
IV	PH 241	Condensed Matter Physics	6	1	...	3	25	75	100
	PH 242	Nuclear & Particle Physics	6	1	...	3	25	75	100
	PH 243 X	Special Paper II	6	1	...	3	25	75	100
	PH 261	Advanced Physics Practicals	...	1	3	6	25	75*	100
	PH 262	Advanced Electronics Practicals	...	...	4	6	25	75*	100
	PH 201	Project	...	...	...	...	25	75	100
	PH 202	Viva Voce	...	...	...	...	...	100	100
	Total for Semester IV (S4)		18	5	7	...	150	550	700
	Grand Total		72	20	28	...	425	1375	1800

* 10 marks for records

L – Lecture IA - Internal Assessment,

T - Tutorial UE - University Exam

P - Practical

X: E (Electronics), M (Materials Science)

N (Nuclear Physics), S (Space Physics)

T (Theoretical Physics)



Special paper Category	Code Nos of Special Papers	Name of Special Papers
1 ELECTRONICS	PH 233 E PH 243 E	Advanced Electronics-I Advanced Electronics-II
2 MATERIALS SCIENCE	PH 233 M PH 243 M	Materials Science-I Materials Science-II
3 NUCLEAR PHYSICS	PH 233 N PH 243 N	Advanced Nuclear Physics Radiation Physics
4. SPACE PHYSICS	PH 233 S PH 243 S	Space Physics and Plasma Physics Advanced Astrophysics
5.THEORETICAL PHYSICS	PH 233 T PH 243 T	Theoretical Physics-1 Theoretical Physics-2

C:GENERAL GUIDELINES**C-1 Theory papers**

Books of study and corresponding chapters are given for most of the theory papers in the syllabus to define the scope of the syllabus.

For internal evaluation of theory papers at least one Viva must be conducted for each paper

For assignments and seminars current developments in the areas of the syllabus may be chosen for improving the general awareness of the student

In tutorial sessions of theory papers problem solving in different topics of the syllabus may be discussed.

C-2 Lab Courses

Rough records may be properly maintained for each practical paper and should be produced during the University Practical Examinations along with original record book.

Each student is encouraged to include critical comments on each experiment done in the original records including sources and estimates of errors, limitations in the experiments done and scope for improvements/additions in the experimental work.

In performing Electronics Practicals: Bread Board Practice is recommended in addition to soldering of electronic circuits.

C-3 Special papers

Depending on the expertise and facilities available in a College (with approval of the University and Government as per rules) one of the five Specializations (Special paper Category) may be chosen by a student for the third and fourth semesters of the M.Sc Programme in Physics. At present for all specializations, practical courses are common.



C4-Project work and Project Evaluation

The Project may be started during the second semester of the M.Sc programme.

25 marks of the project are to be awarded on the basis of internal assessment carried out in the College for each student concerned. A Project rough record may be maintained by each student to help to evaluate the progress of the project. Each student is required to present the completed project along with experimental demonstration if any in the college before the final University examinations in the Fourth Semester of the MSc (Physics) Programme.

For University Examinations for the Project: 50 marks is allotted for Project report evaluation and 25 marks allotted for Project based Viva Voce to be conducted along with General Viva Voce examination by the University.

D Pattern of University Question papers

D-1 Theory Papers

Each question Paper has three parts: Part A, Part B and Part C

Part A: Eight short answer questions covering the entire syllabus. *One of the questions from this section may be used to test the CURRENT AWARENESS (general knowledge) of the student in the areas of syllabus covered for this paper.* Each question carries 3 marks.

Part B: Contains three compulsory questions with internal choice. Questions cover all the three units in the syllabus. Each question carries 15 marks.

Part C: Contains six problems covering the entire syllabus. The student needs to answer any three. Each question carries five marks.

The question paper pattern for the theory papers is given separately.

D-2 PRACTICALS

Each practical paper carries a total of 75 marks. 10 marks are allotted for practical records.

PH 252: Electronics and Computer Science:

Unit A-Electronics Practical (4h, 45 marks)

Unit B- Computer Science (2h, 20 marks)

PH261: Advanced Physics has two parts:

Physics Experiment (5h, 45 marks)

Data Analysis of given scientific data (1 h, 20 marks)

PH 262: Advanced Electronics has two parts:

(i) Electronics Practicals (4h, 45 marks)

(ii) Microprocessor Practicals (2h, 20 marks)

PH 201 Project: Internal Evaluation for project is 25 marks

For University Examinations: **50 marks** for Project Dissertation/report evaluation and **25 marks** for Project based Viva Voce

PH 202 General Viva Voce:

University Examinations: For General Viva Voce covering the entire MSc Syllabus: 100 marks



(University Question Paper pattern given separately)



MSc Degree Examination
Branch II PHYSICS

PH 2xy.....

Duration: 3 hours

Maximum marks: 75

Instructions to questionpaper setter

1. Each question paper has three parts - Part A, Part B and Part C
2. Part A contains eight short answer questions spanning the entire syllabus, of which the candidate has to answer any *five* question carries *three* marks.
3. Part B contains *three* compulsory questions with internal choice. Each question shall be drawn from each unit of the syllabus. Each question carries 15 marks
4. Part C contains six problems spanning the entire syllabus. The candidate has to answer any *three*. Each question carries *five* marks

PART A

(Answer any five questions. Each question carries three marks)

- I (a)
(b)
(c)
(d)
(e)
(f)
(g)
(h)

(5 x 3 = 15 marks)

PART B

- II A (a)
(b)

OR

- II B (a) (15 marks)
(b)

- III A (a)
(b)

OR



III B (a) (15 marks)
(b)

IV A (a)
(b)

OR

IV B (a) (15 marks)
(b)

Part C

(Answer any three questions. Each question carries five marks)

V (a)
(b)
(c)
(d)
(e)
(f)

(3 x 5= 15 marks)



Unit I**Lagrangian Mechanics (12 hours)**

Mechanics of a particle and system of particles- constraints- D'Alembert's principle and Lagrange's equations-simple applications of Lagrangian formulation-Hamilton's principle- techniques of calculus of variations-derivation of Lagrange's equations from Hamilton's principle-conservation theorems and symmetry properties

Two body central force problem (14 hours)

Reduction to one body problem-equations of motion-equivalent one-dimensional problem-differential equation for the orbit in the case of integrable power law potentials- Virial theorem- Kepler's problem-inverse square law of force-scattering in central force field - transformation of the scattering problem to laboratory coordinates

Theory of small oscillations (10 hours)

Equilibrium and potential energy-theory of small oscillations-normal modes- two coupled pendula- longitudinal vibrations of carbon dioxide molecule

Unit II**Hamiltonian Mechanics (12 hours)**

Generalized momentum and cyclic coordinates-conservation theorems-Hamilton's equations-examples in Hamiltonian dynamics (harmonic oscillator, motion of a particle in a central force field, charged particle in an electromagnetic field, compound pendulum)- canonical transformations-generating functions- Poisson brackets- Liouville's theorem

Hamilton-Jacobi equations (10 hours)

Hamilton-Jacobi equation-harmonic oscillator as an example-separation of variables in Hamilton-Jacobi equation-action angle variables-Kepler's problem

Rigid body dynamics (14 hours)

Generalised coordinates of rigid body-Euler's angles- infinitesimal rotations as vectors- angular momentum and inertia tensor- Euler's equations of motion of a rigid body-force free motion of symmetrical top-motion of heavy symmetrical top

Unit III**Special and General Theory of Relativity (16 hours)**

Postulates of special theory- four-vectors and tensors- relativistic particle dynamics- Lorentz transformations -relativistic Lagrangian- mass-energy equivalence- covariant Lagrangian, Relativistic Lagrangian, Mass energy equivalence.

General theory of relativity- principle of equivalence-applications - ideas of Riemannian geometry-space time curvature geodesics -Einstein's equations of General theory of relativity- Observational evidence to general theory of relativity.



Introduction to non-linear dynamics (12 hours)

Linear and nonlinear systems-integration of second order non-linear differential equations pendulum equation-phase plane analysis of dynamical systems-linear stability analysis-limit cycles

Elements of classical chaos (10 hours)

Bifurcation- logistic map-strange attractors- Lyapunov exponent and Chaos-ideas of fractals- solitary waves- KdV equations and solutions

Books for study

1. H. Goldstein, C.Poole& S. Safko, *Classical Mechanics*,3rd Edn, Pearson Education Inc (2008 Print)
2. V.B. Bhatia, *Classical Mechanics with introduction to nonlinear oscillations and chaos*, Narosa Publishing House (1997)
3. J.C. Upadaya, *Classical Mechanics*, Revised Edition, Himalaya Publishing Company (2005)
4. G. Aruldas, *Classical Mechanics*, Prentice Hall of India Pvt Ltd (2008 Print)
5. K.D.Krori, *Fundamentals of Special and General Relativity*, PHI Learning Pvt Ltd (2010)
6. S.K. Srivastava, *General Relativity and Cosmology*, PHI learning Pvt Ltd (2008)
7. P.G Drazin and R.S Johnson, *Solitons – an Introduction*, Cambridge University Press(1989)

References

1. N.C. Rana and B.S. Joag, *ClassicalMechanics*,TataMcGrawHill (1991)
2. M. Tabor *Chaos and integrability in nonlinear dynamics*,Johnwiley& Sons (1989)
3. R.K. Pathria, *The Theory of Relativity*, Second Edition, Over Publications (2003)



Unit I

Vector analysis and matrices (8 hours)

Review of vector analysis-vector calculus operators-orthogonal curvilinear coordinates-gradient, divergence, curl, Laplacian in cylindrical and spherical polar coordinates-orthogonal and unitary matrices- Hermitian matrices- diagonalization of matrices- normal matrices- Cayley-Hamilton theorem

Complex analysis (8 hours)

Cauchy-Riemann conditions-Cauchy's integral theorem and formula-singularities and mapping-calculus of residues-dispersion relations

Fourier series and applications (8 hours)

General principles of Fourier series-advantages and applications-Gibbs phenomenon-Discrete Fourier Transform-Fast Fourier transform

Probability (12 hours)

Definitions and simple properties of probability-random variables- Chebychev inequality and moment generating function-discrete and continuous probability distributions-binomial distributions- Poisson distributions- Gauss Normal distribution-error analysis and least square fitting-chi-square and student 't' distributions

Unit II

Differential equations (16 hours)

Partial differential equations-first order equations-separation of variables-singular points-series solutions and Frobenius method- non-homogeneous partial differential equations-Green's functions-Laplace transforms and inverse Laplace transforms-applications to solution of simple differential equations

Special functions (20 hours)

Bessel functions of the first kind-orthogonality-Neumann functions-Hankel functions-modified Bessel functions-spherical Bessel functions-Legendre functions-generating function-recurrence relations and orthogonality-associated Legendre functions-spherical harmonics-Hermite functions-Laguerre functions-Chebyshev polynomials-hypergeometric functions

Unit III

Tensor analysis (18 hours)

Notations and conventions in tensor analysis-Einstein's summation convention-covariant and contravariant and mixed tensors-algebraic operations in tensors-symmetric and skew symmetric tensors-tensor calculus- Christoffel symbols-kinematics in Riemann space-Riemann- Christoffel tensor.



Group theory (18 hours)

Definitions of a group-elementary properties-sub groups-homomorphism and isomorphism of groups-representation of groups-reducible and irreducible representations-simple applications in crystallography and molecular symmetry- Lie groups- $SU(2)$ groups and their representations

Books for study

1. G.B. Arfken and H.J. Weber, *Mathematical methods for Physicists*, 6th Edition, Elsevier (2005).
2. H.K. Dass and R. Verma, *Mathematical Physics*, S.Chand & Co Pvt Ltd (1997)
3. A.W. Joshi, *Matrices and Tensors in Physics*, 3rd Edition, New Age International Pub (1995)
4. B.D. Gupta, *Mathematical Physics*, 4th Edition, Vikas Publishing House (2004)
5. A.W. Joshi, *Elements of Group Theory for Physicists*, Fourth Edition, New Age International Pub (1997).
6. S.C. Bagchi, S.Madan, A. Sitaram, V.B Tewari, *A first course in representation theory and linear Lie groups*, Universities Press (India) Pvt Ltd (2000).
7. C. Harper, *Introduction to Mathematical Physics*, Prentice Hall (1986)

References

1. Harry Lass, *Vector and Tensor Analysis*, McGraw Hill Pub (1950)
2. M.L. Jain, *Vector Spaces and Matrices in Physics*, Alpha Science International (2001)
3. W.W. Bell, *Special Functions for Scientists and Engineers*, Dover Publications (2004)
4. W.K. Tung, *Group theory in Physics*, World Scientific Pub Co (1999)
5. A.K. Ghatak, I.C. Goyal and S.T. Chua, *Mathematical Physics*, Macmillan India (1985)



PH 213: BASIC ELECTRONICS(6L,1T)

Unit I:

Selections from electronic circuits (10 hours)

Frequency response of amplifier circuits-power and voltage gain- impedance matching- Bode plots- Miller effects- rise time bandwidth relations- frequency analysis of BJT and FET amplifier stages

Operational amplifier and its applications (18 hours)

Opamp - frequency response, poles and zeroes, transfer functions (derivation not required), expression for phase angle- Active filters-first order and second order Butterworth transfer function-first order and second order active filters- low pass, high pass and band pass filters-comparators-OP Amp as a voltage comparator-zero crossing detectors-Schmitt trigger-voltage regulators- square, triangular and saw tooth wave form generators-Weinberg oscillator- monostable and astablemultivibrator circuits using IC 555 timer- Phase Locked Loop circuits (PLL)

Microwave solid state electronic devices (8 hours)

Tunnel diode-varacter diode-IMPATT diode- QWITT diode- TRAPATT diode- Gunn diode

Unit II (Digital electronics):



Arithmetic and data processing digital circuits (16 hours)

Binary adder and subtractor- arithmetic logic unit- binary multiplication and division- arithmetic circuits using HDL- multiplexers- demultiplexers- BCD to decimal decoder- seven segment decoder- parity generators and checkers- magnitude comparator- programmable logic arrays

Sequential digital circuits (20 hours)

Flip flops- edge triggered- SR flip flops- JK flip flop- D- flip flop- JK master-slave flip flop- different types of registers (SISO, SIPO, PISO, PIPO)- universal shift registers- applications counter asynchronous and synchronous electronic counters- decade counters- digital clock

Unit III

Optoelectronics (22 hours)

Optical fiber as a wave guide-mode theory of circular wave guide- modes in step index fibers- signal distortion in optical fibers- group delay, material dispersion, wave guide dispersion- sources of attenuation- absorption, scattering, bending loss, core and cladding loss- optical sources- LED's- structure, quantum efficiency and power- laser diodes- modes and threshold conditions, rate equations, efficiency and resonant frequency- photo detector - pin and avalanche photodiodes- principles- optical amplifier- basic applications and types, semiconductor optical amplifiers, erbium doped fiber amplifiers.

Electronic Instrumentation (14 hours)

Electronic measurements and instruments-comparison between analog and digital instruments performance and dynamic characteristics-ideas of errors and measurement standards-voltmeters-ammeters- CRO- Block diagram, CRT, CRT circuits, vertical deflection system- delay line, multiple trace, horizontal deflection system, oscilloscope probes and transducers, oscilloscope techniques, storage oscilloscope, digital storage oscilloscope- classification of transducers-active and passive transducers-force and displacement transducers-strain gauges-temperature measurements-thermistors-thermocouples-flow measurements.

Books for study

1. A. Malvino and D.J.Bates, *Electronics Principles*, 7th Edition, Tata McGraw Hill (2007)
2. R.A. Gayakwad, *Operational Amplifiers and Linear integrated Circuits*, Prentice Hall of India (2000)
3. M.S. Tyagi, *Introduction to semiconductor materials and devices*, Wiley India (2005)
4. B.G. Streetman, S.K. Banerjee, *Solid state electronic devices*. Pearson Inc (2010)
5. J. Millman, C. Halkias and C.D. Parikh, *Integrated Electronics*, Tata McGraw Hill (2010)
6. D.P. Leach, A.P. Malvino, and G. Saha, *Digital principles and applications*, Tata McGraw Hill (2011)
7. G. Keiser, *Optical Fibre Communication*, 3rd edition, McGraw Pub (2000)
8. Lal Kishore, *Electronic measurements and Instrumentation*, Dorling Kindersley (India) Pvt Ltd (2010)
9. W.D. Cooper, A.O. Helfrik and H. Albert, *Electronic Instrumentation and measurement Techniques*, PHI (1997)



References

1. T.F. Bogart Jr, J.S. Beasley and G. Reid, Electronic devices and circuits, Sixth Edition, Pearson Inc (2004)
2. Thomas. L. Floyd, Digital Fundamentals, 10th edition, Dorling Kindersley (India) Pvt Ltd (2011)
3. JoachionPiprek, Semiconductor Optoelectronic Devices, Academic Press (2003)

PH 221: MODERN OPTICS AND ELECTROMAGNETIC THEORY (6L, 1T)

Unit I

Modern optics (24 hours)

Multiple beam interference-Fabry-Perot interferometer- theory of multilayer films- antireflection films and high reflectance films -Fresnel- Kirchoff integral theorem and formula- Fraunhofer and Fresnel diffraction patterns and theory-applications of Fourier transforms to diffractionacoustic- optic modulation- basic ideas of Raman-Nath diffraction and Bragg diffractionholography as wavefront reconstruction-propagation of light in crystals-optical activity and Faraday rotation

Non-linear optics (12 hours)

Harmonic generation- second harmonic generation- phase matching- third harmonic generation- optical mixing- paramagnetization of light- self focusing- multiquantum photoelectric effect- two photon process and theory- multiphoton processes- three



photon processes- second harmonic generation- parametric generation of light.

Unit II

Electromagnetic waves (12 hours)

Electromagnetic wave equations-electromagnetic waves in non-conducting media-plane waves in vacuum-energy and momentum of electromagnetic waves-propagation through linear media-reflection and transmission at normal and oblique incidence-electromagnetic waves in conductors-modified wave equations and plane waves in conducting media-reflection and transmission at a conducting interface

Relativistic electrodynamics (14 hours)

Vector and scalar potential- gauge transformations- Coulomb gauge and Lorentz gauge-Magnetism as a relativistic phenomena- transformation of the field-electric field of a uniformly moving point charge-electrodynamics in tensor notation-electromagnetic field tensor-potential formulation of relativistic electrodynamics

Radiation (10 hours)

Dipole radiation- electric dipole radiation- magnetic dipole radiation- radiation from an arbitrary source- point charges- power radiated by a point charge- radiation reaction

Unit III

Transmission lines (12 hours)

Transmission line parameters and equations-input impedance-standing wave ratio and power-The Smith Chart-applications of transmission lines

Waveguides (12 hours)

Rectangular wave guides-transverse magnetic (TM) modes-Transverse electric (TE) modes-wave propagation in the wave guide-power transmission and attenuation

Antennas (12 hours)

Radiation from Hertzian dipole-half wave dipole antenna-quarter wave monopole antenna-antenna characteristics -antenna arrays-effective area and Friis's equations

Books for study

1. G.R. Fowles,, *Introduction to Modern Optics*, Second Edition, Dover Publications (1989)
2. A. Yariv, *Introduction to Optical electronics*, Holt, Reinhart and Winston (1976)
3. A. Ghatak and K. Thyagarajan, *Optical Electronics*, Cambridge University Press (1998)
4. D. Roody and J. Coolen, *Electronic Communications*, Fourth Edition, Dorling Kindersley (India) Pvt Ltd (2008)
5. D.J. Griffiths ,*Introduction to Electrodynamics*, PHI Learning India Pvt Ltd (2007)
6. M.N.O. Sadiku, *Elements of electromagnetics*, Oxford University Press (2007)
7. B.B. Laud, *Lasers and Non-linear Optics*, Second Edition, Wiley-Eastern Limited (1991)

References

1. J.R. Meyer-Arendt, *Introduction to Classical and Modern Optics*, Prentice Hall Intl (1995)
2. J.C. Palais, *Fibre optic communications*, Fifth Edition, Pearson Education Inc (2005)



3. E.C. Jordan and K.G. Balmain, Electromagnetic waves and radiating systems, Second Edition, Pearson Education (2002)
4. D.K.Cheng, Field and Wave electromagnetics , Second Edition ,Addison Wesley (1999)
5. L.Ganesan and S.S.Sreejamole,Transmission lines and wave guides, Second Edition, Tata McGraw Hill (2010)

PH 222: THERMODYNAMICS, STATISTICAL PHYSICS AND BASIC QUANTUM MECHANICS (6L, 1T)

Unit I

Thermodynamic relations and consequences (20 hours)

Thermodynamic functions and Maxwells's equations-Clausius -Clapeyron's equations- Properties of thermodynamic potentials-Gibbs-Helmholtz relation-thermodynamic equilibrium, Nernst –heat theorem and its consequences-Gibb's phase rule-chemical potential-vapour pressure relation and chemical constants

Foundations of classical statistical physics (16 hours)

Phase space-ensembles-Liouville's theorem-statistical equilibrium-microcanonical ensemblepartition functions and thermodynamic quantities-Gibb's paradox-Maxwell-Boltzmann distribution laws-grand canonical ensemble

Unit II



Quantum statistics (26 hours)

Quantum statistics of classical particles-density matrix in microcanonical, canonical and grand canonical ensembles-Bose Einstein statistics and Bose Einstein distribution law-Maxwell Boltzmann statistics and Maxwell Boltzmann distribution law-Fermi Dirac statistics and Fermi Dirac distribution law-comparison of three types of statistics-applications of quantum statistics-Planck radiation laws-Bose Einstein gas and Bose Einstein condensation-Fermi Dirac gas-electron gas in metals-thermionic emission-statistical theory of white dwarfs

Phase transitions (10 hours)

Triple point-Vander Wal's equation and phase transitions-first and second order phase transitions- Ehrenfest's equations- Ising model

Unit III

Foundations of quantum mechanics (14 hours)

Basic postulates of quantum mechanics- Hilbert's space- observables- Hermitian operators-general statistical interpretation-Uncertainty principle-minimum uncertainty wave packet-energy time uncertainty principle-Dirac notation-Matrix representation of state vectors and operators-change of representations- eigenvalue problem in matrix mechanics-energy and momentum representations-unitary transformations involving time- Schrodinger, Heisenberg and interaction pictures.

Exactly solvable problems in quantum mechanics (22 hours)

One dimensional eigen value problems-square well potential-potential barrier-alpha particle emission-Bloch waves in periodic potential-linear harmonic oscillator problem using wave mechanics and operator methods-free particle wave functions and solutions-three dimensional eigen value problems-particle moving in spherical symmetric potential-rigid rotator-hydrogen atom problem-three-dimensional potential well- Deuteron

Books for study

1. R. K. Pathria, *Statistical Mechanics*, Pergamon Press (1991)
2. Satya Prakash, *Statistical Mechanics*, Kedarnath Ram Nath Publishers, Meerut and Delhi (2009)
3. B.K. Agarwal and Hari Prakash, *Quantum Mechanics*, Prentice Hall of India (2002)
4. S. Devanarayanan, *Quantum Mechanics*, Sci Tech Publications (India) Pvt Ltd (2005)
5. D.J. Griffiths, *Introduction to Quantum Mechanics*, Second Edition, Pearson Education Inc (2005)
6. G. Aruldas, *Quantum Mechanics*, Second Edition, PHI learning Pvt Ltd (2009).

References

1. R.K. Srivastava and J. Asok , *Statistical Mechanics*, Wiley Eastern Ltd (2005)
2. S.K. Sinha, *Statistical Mechanics-Theory and Applications*, Tata Mc Graw Hill
3. P.M. Mathews and K.Venkatesan, *A Text Book of Quantum Mechanics*, Tata Mc Graw Hill (2010)
4. A. Ghatak and S. Lokanathan ,*Quantum Mechanics Theory and Applications*, Kluwer Academic Publishers (2004).
5. V.K. Thankappan, *Quantum Mechanics*, Second Edition, New Age International Pvt Ltd



PH 223: COMPUTER SCIENCE AND NUMERICAL TECHNIQUES (6L, 1T)

Unit I

Foundations of computer science (12 hours)

Introduction to computers-computer architecture-memory (RAM and ROM, cache) and storage-I/O devices- operating systems-data communications, computer networks and topology

Introduction to microprocessors (12 hours)

Evolution of microprocessors-microcontrollers and digital signal processors- Intel 8085 8 bit microprocessor- pin description-functional description- 8085 instruction format-



Introduction to Python Programming (12 hours)

Python - Python shell, number, variables, comparisons and logic, Python objects - strings, lists, tuples, loops; control flow, file input and output functions

Unit II

Programming with C++ (36 hours)

C++- flow control-conditional statements-iterative statements-switch statements-conditional operators as an alternative to IF-nested loops-break statements-ext() functions-structured data types-arrays-storage classes-multidimensional arrays-sorting of strings-functions-built in and user defined- accessing function and passing arguments to functions-calling functions with arrays-scope rule for functions and variables-structures in C++-classes and objects –definitionclass declaration-class function definitions-creating objects-use of pointers in the place of arrays-file handling in C++-basic file operations-serial and sequential files-reading and writing on to disks.

Unit III

Numerical Techniques (36 hours)

Solution of simultaneous linear algebraic equations-Gauss elimination method-Gauss Jordan method-inverse of a matrix using Gauss elimination method-Finite differences-forward and backward differences-central differences-difference of a polynomial-error propagation in difference table-Interpolation with equal intervals-Gregory Newton forward and backward formula- error in polynomial interpolation-central difference interpolation formula-Gauss's forward and backward formula- Stirling's formula-Lagrange interpolation formula-numerical differentiation-numerical integration using general quadrature formula-Trapezoidal ruleSimpsons 1/3 and 1/8 rules-numerical solutions to ordinary differential equations-Euler and modified Euler methods-Runge Kutta methods-numerical solution to partial differential equations-solutions to Poisson and Laplace equations.

Books for study

1. ITL Education Solutions Ltd, *Introduction to Computer Science*, Second Edition, Dorling Kindersley (India) Pvt Ltd (2011)
2. V.N. VEDAMURTY and N. IYENGAR, *Numerical Methods*, Vikas Publishing Pvt Ltd (1998)
3. K. UDAYAKUMAR, and B.S. UMASANKAR, *The 8085 microprocessor*, Dorling Kindersley (India) Pvt Ltd (2008)
4. Christian Hill, *Learning Scientific Programming with Python*, Cambridge University Press (2015)
5. V. Carl Hamacher, Z.G.Vranesic and S.G. Zaky, *Computer Organization*, Fourth Edition, McGraw Hill International Edition (1996)
6. Peter Norton et al., *Beginning Python*, Wiley Publishing (2005)
7. Abishek Yadav, *Microprocessor 8085 8086*, University Science Press, New Delhi (2008)
8. D.Ravichandran, *Programming in C++*, Tata McGraw Hill (2011)
9. M.T.Somasekhara, *Programming in C++*, PHI Pvt Publishing (2005)



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1. V. Rajaraman, Fundamentals of Computers, Fifth Edition, PHI (2010)
2. R.S.Gaonkar, Microprocessor-Architecture, Programming and Applications with 8085
3. S.S. Sastry, Introductory method of Numerical analysis, Fifth Edition, PHI
4. P. Ghosh, Numerical Methods with computer programs in C++, PHI learning Pvt Ltd
5. BjorneStroustrup, The C++ Programming Language ,Fourth Edition, Addison Wesley

PH231: QUANTUM MECHANICS (6 L, 1 T)

Unit I

Variation method (10 hours)

The variational principle-Rayleigh Ritz method-variation method for excited states-ground state of Helium and Deuteron-time independent perturbation theory-non-degenerate energy levels-anharmonic oscillator-ground state of He atom using perturbation theory-Stark effect in hydrogen atom-time dependent perturbation theory-first order and harmonic



perturbation absorption and emission of radiation-Einstein's A and B coefficients

Time dependent and time-independent perturbation theory (16 hours)

Time independent perturbation- basic concepts- non-degenerate energy levels- anharmonic oscillator- ground state of helium- effect of electric field on the ground state of hydrogen- degenerate energy levels- effect of electric field on the $n=2$ state of hydrogen- spin-orbit interaction- time dependent perturbation- first order, harmonic, transition to continuous states, absorption and emission of radiation- Einstein's coefficients- selection rules

WKB approximation (10 hours)

WKB method-connection formulas-barrier potential-penetration-alpha particle emission-bound states in a potential well.

Unit II

Symmetry and conservation laws (10 hours)

Symmetry transformations-space translation and conservation of angular momentum-time translation and conservation of energy- rotation in space and conservation of angular momentum-space inversion-time reversal

Quantum theory of scattering (12 hours)

Scattering cross section and scattering amplitude-partial wave analysis and scattering by a central potential- scattering by attractive square well potential-scattering length-expression for phase shifts-Born approximation-scattering by Coulomb potential- Laboratory and center of mass coordinate transformations.

System of identical particles (14 hours)

Identical particles- Pauli's exclusion principle- inclusion of spin-spin function for a two-electron system-Helium atom-central field approximation-Thomas Fermi model of an atom-Hartree and Hartree-Fock equations.

Unit III

Angular momentum (12 hours)

Angular momentum in operators and commutation relations- eigen values and eigen functions of L^2 and L_z -general angular momentum- eigen values of J^2 and J_z -angular momentum matrices-spin angular momentum -spin vectors for a spin $\frac{1}{2}$ system-addition of angular momentum-Clebiz-Jordan coefficients

Relativistic quantum mechanics (24 hours)

Klein-Gordon equations and its relevance-particle in a Coulomb's field- Dirac's relativistic theory-Dirac's equation for a free particle-Dirac matrices-covariant form of Dirac's equations-probability density-plane wave solutions-negative energy states-spin in Dirac's theory-magnetic moment of electron-relativistic corrections of Hydrogen atom spectrum-spin orbit correction,Lamb shift

Book for study

1. G. Aruldas, *Quantum Mechanics*, Second Edition, PHI learning Pvt Ltd (2009)



2. D.J. Griffiths, *Introduction to Quantum Mechanics*, Second Edition, Pearson Education Inc (2005)

References

1. J.J. Sakurai, *Advanced Quantum Mechanics*, Pearson Education Inc (2009)
2. P.M. Mathews and K.Venkatesan, *A Text Book of Quantum Mechanics*, Tata Mc Graw Hill (2010)
3. A. Ghatak and S. Lokanathan, *Quantum Mechanics Theory and Applications*, Kluwer Academic Publishers (2004)
4. V.K. Thankappan, *Quantum Mechanics*, Second Edition, New Age International Pvt Ltd (2003)
5. S.Devanarayanan, *Quantum Mechanics*, Sci Tech Publications (India) Pvt Ltd (2005)
6. L.H.Ryder, *Quantum Field Theory* Second Edition, Cambridge University Press (1996)
7. Steven Weinberg, *Quantum Theory of Fields* (in Three Volumes), Cambridge University Press (2002)

PH 232: ATOMIC AND MOLECULAR SPECTROSCOPY (6L, 1T)

Unit I

Atomic Spectroscopy (14 hours)

Spectra of Atoms - Spectroscopic terms- selection rules- exchange symmetry of wave functions- Pauli's exclusion principle. Many electron atoms- Building principle- the spectra of Li and hydrogen like elements, The L-S and j-j coupling schemes- total angular momentum - term symbols- The spectra of Helium-Zeeman effect - The magnetic moment of atom, Lande's g factor- The normal Zeeman effect- Emitted frequencies in



anomalous Zeeman transitions- Nuclear spin and Hyperfine structure, Stark Effect, Paschen Bach effect

Molecular symmetry (10 hours)

Symmetry operations-symmetry elements-algebra of symmetry operations-multiplication tables-matrix representation of symmetry operators-molecular point groups-reducible and irreducible representations-great orthogonality theorem-character tables for C_{2v} and C_{3v} point groups, symmetry species of point groups-IR and Raman activity

Photoelectron and Photo-acoustic spectroscopy (12 hours)

Photoelectron spectroscopy-experimental methods-photoelectron spectra and their interpretation-Auger electron and X ray Fluorescence Spectroscopy-Photo-acoustic effect-basic theory-experimental arrangement-applications.

Unit II

Molecular rotational spectroscopy (12 hours)

Classification of molecules-rotational spectra of diatomic molecules-isotope effect and intensity of rotational lines-non-rigid rotator-linear polyatomic molecules-symmetric and asymmetric top molecules-microwave spectrometer-analysis of rotational spectra.

IR spectroscopy (12 hours)

Vibrational spectra of diatomic molecules-characteristic IR spectra-vibrations of polyatomic molecules- anharmonicity- Fermi resonance-hydrogen bonding-normal modes of vibration in a crystal- interpretation of vibrational spectra- IR spectrometer- Fourier transform IR spectroscopy

Electronic spectra of molecules (12 hours)

Vibrational coarse structure and analysis of bound systems- Deslanders table-Frank-Condon principle-vibrational electronic spectra-rotational fine structure- Fortrat parabola-electronic angular momentum in diatomic molecules

Unit III

Raman spectroscopy (12 hours)

Theory of Raman scattering-rotational and vibrational Raman spectra-Raman spectrometer-structure determination using Raman and IR spectroscopy-nonlinear Raman effects-Hyper Raman effectstimulated Raman scattering- coherent anti-stokes Raman scattering

ESR and NMR spectroscopy (16 hours)

Principle of NMR-Magnetic properties of nuclei-resonance condition-NMR instrumentation-chemical shift-NMR spectra of solids-NMR imaging-interpretation of NMR spectra-ESR spectrometer-Hyperfine structure-ESR spectra of Free radicals

Mossbauer spectroscopy (8 hours)

Recoilless emission and absorption-Mossbauer spectrometer-experimental techniques-isomer shift- quadrupole interaction-magnetic hyperfine interaction

Books for study

1. J.M. Hollas, *Modern Spectroscopy*, Fourth Edition, John Wiley & Sons (2004)



2. G. Aruldas, *Molecular Structure and Spectroscopy*, PHI learning Pvt Ltd (2007)
3. Suresh Chandra, *Molecular Spectroscopy*, Narosa Publishing Co (2009)
4. H E White, *Introduction to Atomic Spectroscopy* McGraw-Hill Inc. 1st Edition. (1934).

References

1. C.N. Banwell and E.M. McCash, *Fundamentals of Molecular Spectroscopy*, Fourth edition, Tata McGraw Hill (1995).
2. D.N. Satyanarayana, *Vibrational spectroscopy-Theory and applications*, New Age International Pvt Ltd (2004)
3. J.L.McHale, *Molecular Spectroscopy*, Pearson education Inc (2008).

SYLLABUS FOR SPECIAL PAPERS (SPECIAL PAPER I)

PH 233 E: ADVANCED ELECTRONICS -I (6L, 1T)

Unit I



Analog radio frequency communications (16 hours)

Different types of analog continuous wave modulation-analog baseband signal transmissionsignal distortions and equalization-linear continuous wave modulation schemes-amplitude modulation-DSB and SSB schemes-frequency conversion-angle modulation-spectra of angle modulated signals-power and bandwidth of FM signals-generation and demodulation of FM signals-commercial radio broadcasting techniques-AM and FM radio broadcasting and reception.

Microwave radio communications (10 hours)

Advantages and disadvantages of microwave radio communications-digital and analog systemsfrequency and amplitude modulation techniques-FM microwave radio system-FM microwave repeaters-FM microwave radio stations-line of sight path characteristics

Pulse modulation (10 hours)

Different types of pulse modulation-pulse amplitude modulation (PAM)-PAM spectrum-pulse code modulation (PCM)-sampling and quantization of analog signals-quantization error-signal to noise ratio-differential PCM delta modulation-other pulse modulation schemes-applications of pulse modulation.

Unit II

Digital communications (16 hours)

Basics of information theory-ideas of digital codes –noise in information carrying channelDigital carrier modulation -binary ASK, PSK and FSK schemes-bandwidth and power requirements-synchronization methods-ideas of error control coding and error correctionsdigital transmission of analog signals-transmission using PCM – frequency and time division multiplexing (TDM) –TDM in PCM telephone system.

Optical fiber communications (20 hours)

Overview of the optical communication system and its components-optical communication receiver and its equivalent circuit-direct and coherent detection systems- digital modulation and demodulation schemes for coherent optical communication receivers-heterodyne and homodyne detection –principles of wavelength division and code division multiplexing in optical communication-optical solitons- soliton based optical communication systems

Unit III

Mobile cellular communications (12 hours)

Mobile telephone services-cellular telephone-frequency reuse-cell splitting-sectoring, segmentation and dualization-cellular system topology-roaming and handoffs-cellular telephone network components and call processing-first and second-generation cellular telephone services-digital cellular telephone system-global system for mobile communication-personal satellite communication system

Digital Signal processing (24 hours)

Basics of signals and systems (6 hours)

Classification of signals-amplitude and phase spectra-classification of system-simple manipulations of discrete time signals-representation of systems-analog to digital



conversion of signals

Fourier analysis of signals and systems (12 hours)

Trigonometric Fourier series-exponential form-Parseval's identity-power spectrum of a period function-Fourier transform-properties of Fourier transform-Fourier transform of important signals-Fourier transform of power and energy signals-Discrete time fourier transform - Fast Fourier transform (FFT).

Z-transforms (8 hours)

Definition of z transform-properties of z-transform-evaluation of the inverse z-transform

Digital Filters (10 hours)

Magnitude and phase response of Digital filters- Finite Impulse Response (FIR) digital filtersfrequency response of linear phase FIR filters-design techniques of FIR filters-ideas of Infinite Impulse Response filters.

Books for study

1. K. Sam Shanmugam, *Digital and Analog communication systems*, John Wiley & Sons (2006).
2. W. Tomasi, *Electronic communications systems: Fundamentals through Advanced*, Dorling Kinderley (India) Pvt. Ltd (2009)
3. G. Kennedy and B. Davis, *Electronic communication systems*, Fourth Edition, Tata Mc Graw Hill (2003)
4. G. Keiser, *Optical Fibre Communication*, 3rd edition, McGraw Pub (2000)
5. G. P. Agrawal, *Fibre optic communication systems*, John Wiley & Sons (1993)
6. S. Salivahanan and G. Ganapriya, *Digital Signal Processing*, Tata Mc Graw Hill (2011)

References

1. Taub ,D. Schilling and G. Saha, *Principle of Communication systems*, 3rd Edition, Tata Mc Graw Hill (2008)
2. W.C.Y. Lee, *Mobile Communications- design, Fundamentals*, Second Edition, John Wiley & Sons (1993)
3. J.S. Chitode, *Digital Communications*, Technical Publications Pune (2008)
4. J.M. Senior, *Optical Fibre Communications-Principles and Practice*, Second Edition, Pearson Education (2006).
5. J.J. Carr, *Microwave and Wireless communications Technology*, Butterworth-Heinemann (1996)

PH 233 M: MATERIALS SCIENCE –I



Unit I (36 hrs)

Classification of materials, Functional classification of materials

Size effects on the optical, electrical, magnetic and mechanical properties. Size effects on the optical properties of semiconductor nanostructures, weak excitonic confinement, strong excitonic confinement. Materials for Aerospace, Biomedical, Electronic, Energy technology, Environmental technology, Magnetic, Photonic and Structural Applications- Smart materials. Structural classification of Materials- Crystalline-Single crystals-polycrystalline materials- Grains and grain boundaries.

Crystal structures of ionic materials-Cesium chloride, Fluorite, Perovskite and Corundum type structures-Covalent structures.

Imperfections in crystals

Types of imperfections in crystals -Point defects-Interstitial defects-Substitutional defects -Frenkel and Schottky defects-Line Kröger-Vink notation for defect chemical reaction- Dislocations and Diffusion in crystals - Dislocations- Burgers vectors – edge and screw dislocations –slip-significance of dislocations Schmid's law-Surface defects-Domain boundaries- Importance of defects –Diffusion- Applications of Diffusion-Stability of atoms and ions-Mechanism for diffusion-Activation energy for diffusion- Permeability of polymers-Composition profile-Diffusion and materials processing.

Unit II (36 hrs)

Formation of crystalline materials

Ambient phase equilibrium – Super saturation – Equilibrium of finite phases - Equation of Thomson-Gibbs – Types of nucleation – Formation of critical nucleus – Classical theory of nucleation – Homo and heterogeneous formation of 3D nuclei – Rate of nucleation – Growth from vapor phase, solutions and melts – Epitaxial growth – Growth mechanism and classification – Kinetics of growth of epitaxial films – Mechanisms and controls for nanostructures in 0 and 1 dimensions.

Crystallization Principles and Growth Techniques

Classes of crystal system – Crystal symmetry – Solvents and solutions – Solubility diagram – Super solubility – Expression for super saturation – Metastable zone and induction period – Miers TC diagram – Solution growth – Low and high temperatures solution growth – Slow cooling and solvent evaporation methods – Constant temperature bath as a crystallizer.

Gel, Melt and Vapor Growth Techniques

Principle of gel technique – Various types of gel – Structure and importance of gel – Methods of gel growth and advantages – Melt technique – Czochralski growth – Floating zone – Bridgman method – Horizontal gradient freeze – Flux growth – Hydrothermal growth – Vapor-phase growth – Physical vapor deposition – Chemical vapor deposition – Stoichiometry.

Unit III

Thin Film Physics (36 Hours)

Film Preparations: Vacuum evaporation - Evaporation theory - Rate of evaporation - Hertz-Kundsen equation - Free evaporation and effusion - Evaporation mechanisms - Directionality of evaporating molecules - vapour sources - wire and metal foils - Electron beam gun - flash evaporation - sputtering - Glow discharge sputtering - Bias sputtering -



Reactive sputtering - Triode sputtering - Magnetron sputtering - Ion beam sputtering – Pulsed laser deposition – Molecular beam epitaxy- Chemical methods – Thermal CVD – Plasma enhanced CVD – Spray Pyrolysis – Sol Gel method – Spin and Dip coating – Electro plating and Electroless plating – Deposition mechanisms.

Nucleation Theories: Condensation process - Theories of Nucleation – Capillarity theory – Atomistic theory – Comparison – stages of film growth – Incorporation of defects during growth - Film thickness measurements - Optical methods - Ellipsometry –

Reference Books

1. S.V. Gaponenko, Optical properties of semiconducting nanocrystals, Cambridge University Press (1997)
2. A. K. Bandhyopadhyay, Nanomaterials, New Age International Publishers (2007)
3. Solid State Physics, A.J.Dekker, Macmillan, (1967).
4. The Science and Engineering of Materials: Donald R Askeland and Pradeep P Phule 6 Edition Thomson Brooks/Cole.
5. I.V. Markov, *Crystal Growth for Beginners: Fundamentals of Nucleation, Crystal Growth and Epitaxy* (2004) 2nd edition.
6. P. Santhanaragavan and P. Ramasamy, *Crystal Growth Process and Methods* (KRU Publications, Kumbakonam, 2001).
7. A. Goswami, *Thin Film Fundamentals* (New Age, New Delhi, 2008).
8. Maissel and Glang, Hand Book of Thin Film Technology
9. K.L. Chopra, Thin Film Phenomena
10. Dupuy and Kachard, Physics of Non-Metallic Thin Films
11. T. Pradeep: NANO: The Essentials: Understanding Nanoscience and Nanotechnology, McGrawHill Education



Unit I

Nuclear properties and structure (36 hours)

Nuclear structure – charge, mass, shape, and size of nucleus, spin, parity, electric and magnetic moments, isospin, binding energy, packing fraction, Experimental determination of nuclear mass, Aston's mass spectrograph, Measurement of nuclear spin (using Zeeman effect) and magnetic moment (using NMR), nature of nuclear forces, ground and excited states of deuteron, spin dependence, effective range theory, non-central force, n-p scattering and p-p scattering at low energies, nature of two nucleon potential, charge independence and saturation of nuclear force, exchange forces, meson theory of nuclear force.

Nuclear models - liquid drop model: Bethe-Weizsacker formula and its applications, shell model, evidence and limitations of shell model, single particle shell model, nuclear vibrations and rotations, optical model, collective model.

Unit II

Nuclear instrumentation (36 hours)

Gas filled detectors, Ionization Chamber, Proportional counter, GM Counter, Scintillation counter, Cerenkov counter, semiconductor detectors [Si(Li), Ge(Li), HPGe], Solid state nuclear track detectors, Nuclear emulsion, neutron detectors, scaling circuits.

Classification of accelerators, cyclotron, synchro-cyclotron, Betatron, Tandem accelerators, linear accelerator (LINAC). Nuclear Reactor – self sustained reaction, four factor formula, reactor theory, critical size, reactor materials, reactor control, breeder reactor, thermonuclear fusion, fusion in plasma, fission reactor, conditions for sustained fusion, magnetic confinement, toroidal confinement: Tokomak.

Unit III

Nuclear reactions and Particle Physics (36 hours)

Types of nuclear reactions, conservation laws, energetics of nuclear reactions, nuclear transmutations, cross section of nuclear reaction, compound nucleus hypothesis, Breit-wigner one level formula, direct reactions, stripping and pick up reactions, heavy ion induced reactions, Nuclear fission, energetic of nuclear fission, Bohr-wheeler theory, nuclear fusion, stellar energy and nucleosynthesis.

Neutrons, Kinematics in high energy collisions, particles in high energy reactions, classification of elementary particles, interactions among particles, states of particles in terms of quantum numbers, Yukawa hypothesis, properties of pi mesons, muons, K-mesons and hyperons, particle interactions and Feynman diagrams, symmetries and conservation laws, CPT invariance, GellmannNishijima Formula, Quark Model, Quantum Chromo Dynamics (QCD), symmetry classifications of elementary particles, weak interactions, Grand Unification Theory (GUT).

Books for Study

1. S.N. Goshal. *Atomic and Nuclear Physics*, S Chand & Company Ltd. 1998
2. Kenneth S Krane. *Introductory Nuclear Physics*, John Wiley & Sons, 1987
3. Sathya Prakash. *Nuclear Physics & Particle Physics*, S Chand 2005



References

1. Irving Kaplan, "Nuclear Physics", Narosa Book Distributors, 2002.
2. R.D. Evans, "The atomic Nucleus", McGraw-Hill, 1955.
3. D.C.Tayal, Nuclear Physics, Himalayan Publication house, Bombay, 1980
4. R.R. Roy & B P Nigam, Nuclear Physics Theory and Experiments, Wiley Eastern, 2000.
5. D.J. Griffiths, Harper & Row, Introduction to elementary particles, Wiley Eastern, 1987



Unit I

Basic Plasma Phenomena (6 hours)

Plasma Concepts – Debye shielding – plasma parameters – Plasma as a fluid - Fluid equations – Fluid drift perpendicular to B – Fluid drift parallel to B .

Waves in plasma (20 hours)

Plasma oscillations – Electron plasma waves – sound waves – ion waves – Electrostatic electron oscillations perpendicular to B - Electrostatic ion waves perpendicular to B – Lower hybrid frequency – Electromagnetic waves perpendicular to B_0 – cut offs and resonances - Electromagnetic waves parallel to B_0 – Hydromagnetic waves – Magnetosonic waves. Diffusion and Resistivity- Decay of plasma by diffusion – steady state solutions – Recombinations – Diffusion across a magnetic field – Collisions in fully ionized plasma – Single fluid MHD equations.

Magnetohydrodynamics (10 hours)

Maxwell's equations in MHD – MHD Induction equation – Magnetic Reynold's number – Momentum equation, Pressure force – Magnetic tension force – Magnetic Buoyancy – Acoustic waves – Alfvén waves – Internal gravity waves – MHD waves – Whistlers.

UNIT II

Solar Physics (16 hours)

Solar interior and energy production – Neutrino problem – Helioseismology – solar activity – sunspot cycle - Sun's magnetic field – solar rotation - Photosphere – Chromosphere – Corona – Coronal heating – Solar flares – Solar wind – importance of solar terrestrial studies.

Solar wind Physics (16 hours)

Coronal expansion – Parker's hydrodynamic theory – solar wind parameters – interplanetary magnetic field – sector structure – solar wind variations and its relationship with solar phenomena.

Cosmic rays and energetic particles (4 hours)

Galactic cosmic rays – solar cycle modulation of galactic cosmic rays – solar energetic particles – Interstellar pick up ions – Anomalous cosmic rays – Cosmic ray detectors.

UNIT III

Neutral atmosphere (8 hours)

Neutral atmosphere – scale height – Variation of temperature with altitude – Troposphere – Stratosphere – Mesosphere – Thermosphere – Heat balance equation – Exosphere.

Ionosphere and Magnetosphere (16 hours)



Ion composition and chemistry – D, E, F₁ and F₂ regions – Ionospheric conductivities and currents – Equatorial anomaly. Magnetosphere, intrinsic magnetic field – Interaction of solar wind with magnetosphere – Bow shock and magnetopause – Magnetospheric current systems – Magnetic diffusion – Magnetic reconnection – magnetic activity and substorms – magnetic storms – geomagnetic activity indices.

Observational technique (12 hours)

Upper atmosphere sensing – direct, indirect and remote – Direct methods for neutral atmosphere – Direct methods for ionized component – Langmuir probe – Impedance and resonance probes – Mass spectrometers – Detectors for energetic particles and radiation environment – Satellite drag and related methods – Remote sensing of the neutral atmosphere – Remote sensing by radio propagation – Experimental technique for ionospheric studies – Ionosonde technique – Incoherent scatter technique.

References

1. Chen F. F.: Introduction to Plasma Physics and Controlled Fusion, Plenum Press.
2. Dendy R. O.: Plasma Dynamics (Clarendon Press, 1990).
3. Tamas I. Gombosi: Physics of the Space Environment (Cambridge University Press, 1998)
4. Harra L. K. and Mason K. O.: Space Science (Imperial College Press)
5. Peter Foukal: Solar Astrophysics (Wiley, 1990)
6. Ratcliffe: Introduction to ionosphere and magnetosphere (CUP, 1972)
7. Robert G. Fleagle and Joost A. Businger: An Introduction to Atmospheric Physics, Academic Press, London, 1971.
8. Banks P. M. and G. Kocharts: Aeronomy, Academic Press, London, 1973.
9. Savindra Singh: Climatology, Prayag Pustak Bhavan, 2005.
10. Michael D. Pappagiannis: Space Physics and Space Astronomy, Gordon and Breach Science Publishers Ltd., 1972.



PH 233 T: THEORETICAL PHYSICS-I (6L, 1T)

Unit I - Quantum Mechanics (36 hours)

Formalism

Linear vector space, linear operators, normed spaces, Hilbert spaces, self-adjoint operators, representation of operators and states in suitable basis, spectral properties of self-adjoint operators - spectral theorem.

Groups and Symmetry

Review of groups: Irreducible representations of groups, discrete and continuous groups, Lie groups, Lie algebra, how symmetries form a group, unitary and anti-unitary symmetry operators, Rotation and $O(3)$ group, $SU(2)$ group, angular momentum algebra, vector operators, Tensor operators, Wigner-Eckart theorem Discrete symmetries - space and time inversion symmetries.

Relativistic quantum mechanics

Lorentz group - generators, representation of Lorentz group extended by parity and Dirac equation, hydrogen atom

Field theory

Lagrangian formalism, Noether's theorem, Hamiltonian density, quantization of fields, secondquantization, quantization of EM field.



Unit II Statistical Physics (36 hours)

Stochastic processes

Review of probability and measure, equilibrium vs non-equilibrium, Brownian motion, Langevin equation, Ito vs Stratanovic, Markov processes, Fokker-Planck equation, Fluctuation-Dissipation theorem.

Special topics in non-equilibrium systems

Einstein diffusion equation - derivation and boundary conditions, free diffusion in one-dimensional half-space, fluorescence micro photolysis.

Unit III - General relativity (36 hrs)

Differential geometry

Tensors, differentiable manifolds, geodesics, curvature, Riemannian tensor

Relativity

Principle of equivalence, Einstein equations, centrally symmetric gravitational fields, Schwarzschild solution, singularities.

References

1. F. Scheck, *Quantum Physics*, Springer (2007).
2. G. Teschl, *Mathematical Methods in Quantum Mechanics*, American Mathematical Society (2009). P. Szekeres, *Modern Mathematical Physics*, Cambridge University Press (2004).
3. M. T. Vaughn, *Introduction to Mathematical Physics*, Wiley - VCH Verlag (2007).
4. Arfken, *Mathematical Physics for Physicists*, Academic Press (2013).
5. J. J. Sakurai, *Modern Quantum Mechanics*, Addison-Wesley Publishing Company (1994).
6. L. I. Schiff, *Quantum Mechanics*, McGraw-Hill Book Co. (1968).
7. R. Shankar, *Principles of Quantum Mechanics*, Springer (1994).
8. L. E. Ballentine, *Quantum Mechanics*, World Scientific Publishing Co. (2000).
9. L. H. Ryder, *Quantum Field Theory*, Cambridge University Press (2008).
10. J. J. Sakurai, *Advanced Quantum Mechanics*, Addison-Wesley (1967).
11. M. Le Bellac, *Quantum and Statistical Field Theory*, Oxford University Press (2001).
12. K. Schulten and I. Kosztin, *Lectures in Theoretical Biophysics*, University of Illinois at Urbana-Champaign (2000). R. Kubo, M. Toda and N. Hashitsume, *Statistical Physics II: Non equilibrium Statistical Mechanics*, Springer-Verlag (1985).
13. G. F. Mazenko, *Non equilibrium Statistical Mechanics*, Wiley-VCH Verlag (2006).
14. V. Balakrishnan, *Elements of Non equilibrium Statistical Mechanics*, CRC Press (2008).
15. B. F. Schutz, *A First Course in General Relativity*, Cambridge University Press (2009).
16. S. Carroll, *Spacetime and Geometry: An Introduction to General Relativity*, Addison-Wesley (2004).
17. A. Altland and B. Simons, *Condensed Matter Field Theory*, Cambridge University Press (2008).
18. J. W. Negele and H. Orland, *Quantum Many-particle Systems*, Levant Books (2006).
19. E. Fradkin, *Field Theories of Condensed Matter Systems*, Levant Books (2006).
20. P. M. Chaikin and T. C. Lubensky, *Principles of Condensed Matter Physics*, Cambridge University Press (2004).
21. A. M. Tsvelik, *Quantum Field Theory in Condensed Matter Physics*, Cambridge



PH 241: CONDENSED MATTER PHYSICS

Unit I

Crystal physics (10 hours)

Lattice points and space lattice-basis and crystal structure-unit cells and lattice parameters-symmetry elements in crystals –space groups-Bravais lattice-density and lattice constant relation-crystal directions, planes and Miller indices-reciprocal lattice-allotropy and polymorphism in crystals-imperfections in crystals.

Lattice vibrations and thermal properties (10 hours)

Dynamics of identical atoms in crystal lattice-dynamics of linear chain-experimental measurement of dispersion relation-anharmonicity and thermal expansion-specific heat of solids-classical model-Einstein's model-Debye model-thermal conductivity of solids-role of electrons and phonons-thermal resistance of solids.

Free electron and band theory (16 hours)

Electrons moving in one dimensional potential well-Fermi-Dirac statistics-effect of temperature on Fermi distribution-electronic specific heat-electrical conductivity of metals-Wiedemann- Franz- Lorentz law-electrical resistivity of metals-Hall effect-energy bands in solids-KronigPenny model-construction of Brillouin zones-nearly free electron model-conductors, semiconductors and insulators-elementary ideas of Fermi surfaces



Unit II

Semiconductors (12 hours)

Free carrier concentration in semiconductors-mobility of charge carriers-temperature effect-electrical conductivity of semiconductors-Hall effect in semiconductors - semiconductor junction properties

Dielectric and magnetic properties of materials (24 hours)

Dipole moment-polarization-local electric field in an atom-dielectric constant and its measurement-polarizability-classical theory-Piezoelectric, Pyro and Ferro electric properties of Crystals-Ferroelectric domains-classification of magnetic materials-atomic theory of magnetism- Langevin's theory-Para magnetism and quantum theory-Weiss molecular exchange field-ferromagnetic domains-anti ferromagnetism-Ferrites.

Unit III

Superconductivity (20 hours)

Experimental attributes to superconductivity-critical temperature, critical current and critical magnetic field of superconductors-effects of magnetic field on superconductors-Type I and II superconductors-intermediate and vortex states-thermal conductivity, specific heat and energy gap in superconductors-microwave and IR properties-coherence length-Theories of superconductivity-London equations-Ginzberg-Landau theory-BCS theory-AC and DC Josephson effects in superconductors- Examples and properties of High Temperature Superconductors.

Introduction to nano science and technology (16 hours)

Introduction to nanomaterials, properties, classification of nanomaterials, quantum confinement effects, Density of states-nano material preparation techniques-sputtering-chemical vapor deposition-pulsed laser deposition-sol-gel technique-characterization of nano materials-X-Ray diffraction- Scanning Probe Microscopy-atomic force microscopy-SEM and TEM techniques-carbon nano structures-elements of nano electronics.

Books for study

1. N.W. Ashcroft and N.D. Merwin, *Solid State Physics*, Cenage Learning India (2001)
2. Charles.C. Kittel, *Introduction to Solid State Physics*, wiley Student Edition (2007)
3. M. Ali Omar, *Elementary Solid State Physics*, Pearson Education Inc (1999)
4. K.K. Chattopahyay, A.N. Banerjee, *Introduction to Nano Science and NanoTechnology*, Prentice Hall of India (2009)
5. Gabor L Hornyak, H F Tibbals and Joydeep Dutta, *Introduction to Nanoscience and Nanotechnology*, CRC press (2009)

References

1. S.O. Pillai, *Solid State Physics*, Third Edition New Age International Pvt. Ltd (1999).
2. M.A. Wahab, *Solid State Physics*, Narosa Publishing House (1999)
3. R.J. Singh, *Solid State Physics*, Dorling Kindersley (India) Pvt Ltd (2012)
4. P. Phillips, *Advanced Solid State Physics*, Second Edn, Cambridge University Press (2012)



PH242: NUCLEAR AND PARTICLE PHYSICS (6L, 1T)

Unit I

Nuclear forces (10 hours)

Deuteron-neutron –proton scattering and proton-proton scattering at low energies-non-central forces nuclear exchange force-meson theory of nuclear forces

Nuclear models (12 hours)

Detailed studies on liquid drop, shell and collective models of the nuclei.

Nuclear reactions (14 hours)

Conservation laws-energetic nuclear reactions-Q value equation-partial wave analysis of nuclear reaction cross section- compound nuclear hypothesis-resonance reactions-Breit-Wigner one level formula-optical model-theory of stripping reactions.

Unit II

Nuclear fission (20 hours)

Mechanism of nuclear fission-calculation of critical energy based on liquid drop model-fission products and energy release-fission chain reactions-neutron cycle and four factor



formula-general features and classification of nuclear fission reactors.

Nuclear fusion (16 hours)

Nuclear fusion in stellar interiors-proton-proton reactions-carbon-nitrogen cycle-thermo nuclear reactions in the laboratory-conditions for the construction of nuclear fusion reactor-critical ignition temperature-Lawson criterion-plasma confinement in fusion- principles of pinch, magnetic and inertial confinements.

Unit III

Nuclear detectors and particle accelerators (20 hours)

Gas filled detectors-ionization chamber and proportional counters-GM counter-scintillation detectors-semiconductor detectors- Cerenkov detector-bubble chamber. Particle accelerator-electrostatic accelerators-cyclotron accelerators-synchrotrons-linear accelerators-colliding beam accelerators.

Elementary particle physics (16 hours)

Elementary particle interactions-symmetries and conservation laws-quark model of elementary particles-colored quarks and gluons-ideas of charm, beauty and truth-quark dynamics-ideas of grand unified theories of fundamental forces

Books for study

- 1 D.C. Tayal, *Nuclear Physics*, 5th Edition, Himalaya Publishing Co (2008)
- 2 J. Verma, R.C.Bhandari, D.R.S.Somayajulu, *Fundamentals of Nuclear Physics*, CBS Publishers and Distributors (2005).
- 3 K.S. Krane, *Introductory Nuclear Physics*, Wiley India Pvt. Ltd (1988)

References

- 1 S.B. Patel, *Nuclear Physics-An Introduction*, New Age International Pvt. Ltd (1996).
- 2 B.R. Marhu, *Nuclear and Particle Physics- an Introduction*, Second Edition, Wiley (2012)
- 3 S.N. Ghoshal, *Nuclear Physics*, S. Chand Ltd (1997)
- 4 M.P. Khanna, *Introduction to Particle Physics*, PHI (2011)
- 5 J. Freidberg, *Plasma Physics and Fusion Energy*, Cambridge University Press (2007)
- 6 F.F.Chen, *Introduction to Plasma Physics*, Springer, London (2002)



SPECIAL PAPER SYLLABUS: SPECIAL PAPER -II

PH 243 E: ADVANCED ELECTRONICS-II (6L, 1T)

Unit I

Microprocessor 8086: Introduction and Programming (22 hours)

Internal architecture of 8086-pin configuration of 8086-memory organization of 8086addressing modes of 8086-minimum and maximum mode configurations-instructions set of 8086-data movement instructions-arithmetic and logic instructions-programming of 8086-flow charts and programming steps- Simple programs- One's complement of a 16 bit number - BCD to ASCII, ASCII to BCD - addition of 2-16 bit numbers – generation of Fibonacci series.

Microprocessor interfacing devices and advanced microprocessors (14 hours)

Programmed I/O –direct memory access-micro controllers-8251A USART-8257 DMA controller-8259A programmable interrupt controller-8279 programmable keyboard/display interface-analog to digital and digital to analog converters-advanced microprocessors80186/80188 high integration 16-bit microprocessors-80386 and 80386 processors-RISC processors.



Unit II

Elements of embedded systems (6 hours)

Example of an embedded system-processor chips for embedded applications-a simple micro controller using embedded systems-embedded processor families

Introduction to artificial intelligence and expert systems (20 hours)

Overview of artificial intelligence (AI)-knowledge representation in AI-problem solving in AI-search methods-predicate and propositional logic-Formal symbolic logic-LISP and PROLOG basics-network representations of knowledge-natural language study in AI-Fuzzy sets and Fuzzy logic- Expert systems-rule based expert systems-nonproduction system architectures-examples of expert systems.

Artificial Neural Networks (10 hours)

Basic concepts of artificial neural networks –neural network architectures- neural network systems- ADALINE and MADALINE networks-advantages and disadvantages of artificial neural networks-neural network application domains- basics of neuro fuzzy systems.

Unit III

Radar (12 hours)

Basic principles of radar-Radar equation-MTI, Pulse and Doppler Radars-Radar signal analysis-ideas of Radar transmitters and receivers-hyperbolic systems for navigation-LORAN and DECCA systems.

Satellite communications (10 hours)

Satellite orbits-Geosynchronous satellites-antenna look angles-satellite classifications-spacing and frequency allocations-satellite antenna radiation patterns-satellite system link models – satellite system parameters and link equations.

Fundamental Concepts of Data Communication (12 hours)

Data communication codes – Baudot code, ASCII code, EBCDIC code, Bar codes – Code 39, Universal product code, Error control, Error detection- Redundancy checking, Error correction- retransmission, Forward error correction, Character synchronization- Asynchronous serial data and Synchronous serial data, Data communication hardware- Data communication circuits- line control unit- universal synchronous Receiver/Transmitter.

Books for study

1. Sunil Mathur, *Microprocessor 8086-Architecture, Programming and Interfacing*, PHI learning Pvt Ltd (2011)
2. Abishek Yadav, *Microprocessor 8085 8086*, University Science Press, New Delhi (2008)
3. Carl Hamacher, Z.G. Vranesic, S.G. Zaky, *Computer organization*, 5th Edition, McGraw Hill Education (2002).
4. B. Ram, *Fundamentals of microprocessors and microcontrollers*, Dhanpat Rai



- Publications, New Delhi (2016).
5. Robert J Schalkoff, *Artificial Neural Networks*, Mc Graw Hill International Edition (1997).
 6. V.S. Janakiraman, K. Sarukesi and P. Gopalakrishnan, *Foundations of Artificial Intelligence and Expert systems*, Macmillan Publishers India Ltd (2011).
 7. E.Rich and K.Knight, *Artificial Intelligence*, Second Edition, Tata McGraw Hill Pub Co (2006).
 8. D.W. Patterson, *Introduction to Artificial Intelligence and Expert Systems*, Prentice Hall of India Pvt Ltd (2001)
 9. S. Rajasekharan and G.A. VijalekshmiPai, *Neural Networks Fuzzy logic and Geneticalgorithms*, PHI learning Pvt Ltd (2010).
 10. S.N. Sivanandan, S.Sumathi and S.N. Deepa, *Introduction to Fuzzy logic using MATLAB*, Springer (2007).
 11. A.Veera Lakshmi and R.Srivel, *Television and Radio engineering*, Ann Books Pvt Ltd (2010)
 12. Skolini. M.I, *Introducion to Radar systems*, Third editon, Tata Mc Graw Hill (2001)
 13. Nagaraja, *Elements of Electronic navigation*, Second Edition, Tata Mc GrawHill (2006)

PH 243 M: MATERIALS SCIENCE –II

Unit I Optical and thermal properties (36 hrs)

Electronic materials and properties

Electrical Conductivity-Conductivity of metals and alloyssuperconductivity-conduction in ionic materials-semiconductors-Insulators-dielectrics-polarisation in dielectrics-Photonic materials and properties- Electromagnetic Spectrum-Reflection, refraction, absorption and transmission-Selective absorption and transmission-Emission phenomenon luminescent and phosphorescent materials

Optical Properties of Materials

Absorption, Photo conductivity, General consideration of Luminescence, excitation, absorption and emission processes of luminescence, configuration coordinate diagram, energy level diagram. Radiative and non-radiative processes. Different kinds of Luminescence – Electroluminescence, photoluminescence. Color centers, different kinds of color centers in the context of luminescence in alkali halides

Electrostriction-piezoelectricity piezoelectricity and ferroelectricity



Thermoelectric power- Seebeck effect, Peltier effect, and Thomson relation, figure of merit, Concept of phonon, Thermal conductivity due to phonons and electrons, conflicting thermoelectric properties,

Unit-II Nanostructured materials and properties (36 Hrs)

Size and dimensionality effects - size effects - potential wells - partial confinement - conduction electrons and dimensionality – quantum well-quantum wires-quantum dots-Fermi gas and density of states - Carbon based nano-materials-Fullerenes-carbon nanotubes- nanoshells-graphene- biological and smart nanomaterials. Properties of nanomaterials- electrical-optical-mechanical-and thermo dynamical properties. Synthesis of nanomaterials- CVD-Sol-gel-Combustion-hydrothermal- Colloidal growthnanotube synthesis-Lithographic process: Lithography, Nanolithography, split gate technology, self assembly, limitation of lithographic process. Nonlithographic techniques: Plasma arc discharge, sputtering, evaporation.Tools of nanomaterials: X-ray diffraction-FTIR spectroscopy-Raman spectroscopy-Band assignments-UV-Vis spectroscopy-Determination of band gap-Tauc's plot – ***For qualitative study only(Non evaluative)*** .Scanning probe microscopy-STMAFM- NSOM- Electron Microscopies-TEM-HRTEM and SEM.

Unit III-Nano-electronics (36 Hrs)

Introduction to Nanoelectronics

Properties dependent on density of states - excitons - single-electron tunneling– applications-infrared detectors - quantum dot lasers-. Introduction to Spintronics-History and overview of spin electronics; Classes of magnetic materials; Quantum Mechanics of spin; Spin relaxation mechanisms; spin relaxation in a quantum dots. Magneto resistance, Ordinary Magneto resistance, Giant Magneto resistance, Colossal Magnetoresistance, Micro-electromechanical systems (MEMSs) and Nano-electro-mechanical systems (NEMSs),

Qualitative study only (Non evaluative)

Resonant Tunnelling Diode, Quantum Cascade lasers, Single electron transistor-: Coulomb Blockade, single electron transistor, other SET and FET structures. Molecular Machines, Nano-biometrics- Molecular and Nano-electronics-Microbial Fuel Cells-Hydrogen storage-Nano medicine-Biological applications-Photonic nano crystals and integrated circuits-Quantum computers Introduction to Spintronics- :Spin Galvanic effect; Spin LEDs: Fundamental and applications, Spin photoelectronic devices, Electron spin filtering, Materials for spin electronics,. Spin-Valve and spin-tunneling devices: Read Heads, MRAMS, Field Sensors, Spintronic Biosensors, Spin transistors, Quantum Computing with spins.

Reference Books

1. M.S. Ramachandra Rao, Shubra Singh, Nanoscience and Nanotechnology, Fundamentals to Frontiers, Wiley 2017,
2. Thermoelectrics: Basic Principles and New Materials Development, by G.S. Nolas, J. Sharp, H.J. Goldsmid, Springer, 2001
3. Introduction to Thermoelectricity, by H. HulianGoldsmid, Springer, 2010
4. Nano The Essential-T Pradeep; Mc Graw Hill Education
5. The Science and Engineering of Materials: Donald R Askeland and Pradeep P Phule 6 EditionThomson Brooks/Cole.
6. Guozhong Cao Nano Structures and Nano materials , Synthesis Properties and



Applications.

7. Principles of Electronic Materials and Devices , S.O.Kasap .Tata Mc Graw Hill
8. Crystallography and crystal defects, A. Kelley, G.W. Groves & P. Kidd, Wiley
9. Crystallography applied to Solid State Physics, A.R. Verma, O.N. Srivastava, NAI
10. Solid State Physics, A.J.Dekker, Macmillan, (1967).
11. Solid State Physics, S.L. Gupta and V.Kumar, Pragati Prakashan.
12. Introduction to Theory of Solids, H.M. Rosenberg, Prentice Hall.
13. Solid State Physics, J.S. Blakemore, W.B. Saunders & Co. Philadelphia.
14. Solid State Physics, N.W. Ashcroft & N.D. Mermin, Brooks/ Cole (1976).
15. Crystal Defects and Crystal Interfaces, W. Bollmann, Springer Verlag.
16. Elementary solid State physics M.Ali Omar-Pearson
17. Solid State Physics R.J.singh-Pearson
18. Introduction to Nanotechnology, Charles P. Poole, Jr. and Frank J.Owens, Wiley, (2003) 92
19. Nanotechnology An Introduction to Synthesis properties and Applications of Nanomaterials: Thomas Varghese and K.M.Balakrishna-Atlantic Publishers.
20. MEMS/NEMS: micro electro mechanical systems/nano electro mechanical systems Volume1, Design Methods, Cornelius T.Leondes, Springer, (2006).
21. Mick Wilson, KamaliKannangara, Geoff Smith, Michelle Simmons and Burkhard Raguse "Nanotechnology", Overseas Press New Delhi 2005
22. W. R. Fahrner (Ed.) "Nanotechnology and Nanoelectronics", Springer 2006. S. Bandyopadhyay, M. Cahay

PH 243 N: RADIATION PHYSICS (6L, 1T)

Unit –I

Interaction of radiation with matter (36 hours)

Ionizing radiations, terrestrial sources, extraterrestrial sources, non-ionizing radiations, natural and man-made sources, interaction of radiation with matter, energy loss rate, bremsstrahlung, range energy relation, stopping power, photoelectric absorption, Compton scattering, pair production, properties of gamma rays and neutrons.

Particle flux and fluence, Energy flux and fluence , Cross section, Linear and mass attenuation coefficients , Mass energy transfer and mass energy absorption coefficients, Stopping power – Linear Energy Transfer (LET) - Weighing Factors(W-values), Radiation and tissue weighting factors, absorbed dose- equivalent dose, effective dose, committed equivalent dose, committed effective dose – Concept of KERMA (Kinetic Energy Released per unit Mass)



Unit II

Radioactivity, detection and dosimetry (36 hours)

Law of radioactive decay, half life, mean life, specific activity, successive disintegration, radioactive equilibria, age of minerals and rocks, α -decay: barrier penetration, range energy relationship, β decay: Fermi theory, parity violation, Kurie-plot, γ -decay, radiative transitions in nuclei, selection rules.

Thermo luminescent Dosimeters (TLD) – Optically stimulated Luminescence dosimeters (OSLD) – Neutron Detectors – Nuclear track emulsions for fast neutrons – Solid State Nuclear track (SSNTD) detectors, Radon dosimetry, Instruments for personnel monitoring – TLD badge readers – Digital pocket dosimeters using solid state devices and GM counters - Contamination monitors for alpha, beta and gamma radiation – Scintillation monitors for X and gamma radiations - Neutron Monitors, Tissue equivalent survey meters – Flux meter and dose equivalent monitors – Pocket neutron monitors

Unit III

Biological effects of radiation (36 hours)

Somatic effects of radiation – Physical factors influencing somatic effects – Dependence on dose, dose rate, type and energy of radiation - Acute radiation sickness – Effects of chronic exposure to radiation – Induction of leukemia – Radiation Carcinogenesis – Risk of carcinogenesis – Genetic effects of radiation – Factors affecting frequency of radiation induced mutations – Dose-effects relationship- first generation effects – Effects due to mutation of recessive characteristics – Genetic burden – Prevalence of hereditary diseases and defects – Spontaneous mutation rate – Concept of doubling dose and genetic risk estimate.

Books for study

1. G.F. Knoll, *Radiation detection and Measurement*, John Wiley & Sons, 2000
2. K. Thyayan, *Basic Radiological Physics*, Jaypee brothers medical publishers, New Delhi, 2003
3. Alan Martin and Samuel A. Harbison, *An Introduction to Radiation Protection*, Third edition, Chapman and Hall, New York 1986

References

1. R.R. Roy & B P Nigam, *Nuclear Physics Theory and Experiments*, Wiley Eastern, 2000
2. UNSCEAR Report, United Nations Scientific Committee on the Effects of Atomic Radiation, 2008.

PH 243 S: ADVANCED ASTROPHYSICS (6L, 1T)

UNIT I

General features of observational astronomy (36 hours)

Emergence of modern astronomy - Astronomy in different bands of electromagnetic radiation. Celestial co-ordinates – Spherical coordinates – Altazimuth system – Local equatorial system – universal equatorial system – Ecliptic system – Galactic coordinates – conversion of coordinates. Apparent luminosity of stars – measurement of apparent



luminosity – various magnitude systems – correction for apparent magnitude. Stellar distances and absolute luminosities – measurement of distances within the solar system – trigonometric parallaxes of stars – method of measurement of luminosity – surface temperature of stars – spectral classification of stars – stellar magnetic fields.

UNIT II

Stellar physics and Stellar evolution (36 hours)

Theory of radiative transfer – Radiative transfer equation – Thermodynamic equilibrium – radiative transfer through stellar atmosphere – formation of spectral lines – Basic equation of stellar structure – Hydrostatic equilibrium in stars – Virial theorem – energy transport inside stars – convection inside stars – stellar models – some relations among stellar quantities – determination of stellar parameters – main sequence – red giants and white dwarfs

Nucleosynthesis and Nuclear reactions in stars – calculation of nuclear reaction rates – Important nuclear reactions in stellar interiors – Helioseismology – solar neutrino experiments – Stellar evolution – Evolution of binary systems – mass loss from stars – stellar winds – Stellar collapse – Degeneracy pressure of Fermi gas – structure of white dwarfs – Chandrasekhar limit – neutron stars – pulsars – binary X – ray sources. Accretion disks.

UNIT III

Galactic Physics and elements of Cosmology (36 hours)

Normal galaxies – morphological classification – physical characteristics and kinematics – expansion of the universe – active galaxies – super luminal motion in quasars – black hole as central engine – unification scheme – cluster of galaxies – large scale distribution of galaxies – gamma ray bursts.

Space time dynamics of the universe – general relativity – the metric of the universe – Friedman equation for the scale factor – cosmic background radiation – evolution of matter dominated universe – evolution of radiation dominated universe – Primordial nucleosynthesis – cosmic neutrino background – nature of dark matter.

References

1. Abhyankar K. D. - Astrophysics Stars and Galaxies, Universities Press.
2. Arnab Rai Choudhuri - Astrophysics for Physicists, Cambridge University Press.
3. Padmanabhan T. – Theoretical Astrophysics, Cambridge University Press.
4. Narlikar J. B - Introduction to Cosmology, Cambridge University Press.

PH 243 T; THEORETICAL PHYSICS – II (6L, 1T)

Unit I -Functional Integrals in Physics (36 hours)

Functionals

Function vs functional, functional derivatives, functional integration, Gaussian integrals.



Path integrals in quantum mechanics

Single particle systems- Feynman path integral, propagator as a functional integral, Born approximation, Coulomb scattering,

Many particle systems - Second quantization, coherent states and many-body path integrals, field integral for the quantum partition function.

Quantum Fields - Path integrals for fields, functionals for bosonic and fermionic fields, generating functions for free and interacting fields, Wick's theorem, Perturbation theory.

Unit II -Many particle physics (36 hours)

Broken symmetry and collective phenomena

Mean field theory, Bose-Einstein condensation and superfluidity, superconductivity, interacting electron gas and disorder

Response functions

Linear response theory, analytic structure of correlation functions, electromagnetic linear response

Unit III

Critical phenomena (36 hours)

Continuous phase transitions, critical behaviour, scaling, renormalization group, Ising model, RG analysis of ferromagnetic transition.

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1. F. Scheck, Quantum Physics, Springer (2007).
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15. G. F. Mazenko, Non equilibrium Statistical Mechanics, Wiley-VCH Verlag (2006).
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18. S. Carroll, Space time and Geometry: An Introduction to General Relativity, Addison-



- Wesley (2004).
19. A. Altland and B. Simons, Condensed Matter Field Theory, Cambridge University Press (2008).
 20. J. W. Negele and H. Orland, Quantum Many-particle Systems, Levant Books (2006).
 21. E. Fradkin, Field Theories of Condensed Matter Systems, Levant Books (2006).
 22. P. M. Chaikin and T. C. Lubensky, Principles of Condensed Matter Physics, Cambridge University Press (2004).
 23. A. M. Tsvelik, Quantum Field Theory in Condensed Matter Physics, Cambridge University Press (2003).



PH 251: GENERAL PHYSICS PRACTICALS

(Total of 10 experiments to be done from Section A and B)

Section A *(atleast 5 experiments to be done in this section)*

1. Determination of elastic constants by Cornu's method (*elliptical and hyperbolic fringes*)
2. Analysis of absorption spectra of liquids using spectrometer
3. Study of ultrasonic waves in liquids
4. Determination of e/k using Ge and Si transistors
5. Anderson Bridge –determination of self and mutual inductance
6. Michelson Interferometer experiments
7. Identification of Fraunhofer lines in solar spectra
8. Verification of Richardson's equation using diode valve
9. LED experiments (a) wavelength determination (b) I-V characteristics (c) output power variations with applied voltage etc.
10. Thermal diffusivity of brass

Section B *(atleast 2 experiments to be done from this section)*

1. BH curve-anchor ring
2. Study of photoelectric effect and determination of Planck's constant
3. Determination of Stefan's constant
4. Experiments using Laser:
(a) Laser beam characteristics (b) Diffraction grating (c) Diffraction at different types of slits and apertures (d) refractive index of liquids (e) particle size determination
5. Young's modulus of different materials using strain gauge
6. Determination of magnetic force in a current carrying conductor
7. Optical fibre characteristics – numerical aperture, attenuation and bandwidth of given



specimen.

8. Variation of dielectric constant with temperature of ferroelectric material.
9. Dielectric constant of non-polar liquid.
10. Cauchy's constants of liquids and liquid mixtures using hollow prism and spectrometer
11. Surface tension of a liquid using Jaeger's method
12. Experiments using Phoenix Kit
 - (a) Capacitor charging/discharging experiments
 - (b) Dielectric constant of glass

PH 252 ELECTRONICS AND COMPUTER SCIENCE PRACTICALS

Unit I – Electronics Experiments (A total of 10 experiments to be done)

Section A (*atleast 5 experiments to be done*)

1. Single stage CE amplifier –Design and study of frequency response
2. Study of RC Phase shift oscillator circuits using Transistors
3. Construction and study of astablemultivibrator and VCO circuits using Transistors
4. Study of OP Amp circuits (a) summing amplifier (b)difference amplifier
5. OP Amp as an integrator and differentiator
6. Characteristics of JFET and MOSFET
7. Characteristics of SCR
8. Design and study of negative feedback amplifier circuits
9. Study of Clipping and Clamping circuits
10. UJT Characteristics and UJT relaxation Oscillator

Section B (*atleast 3 experiments to be done*)

1. Emitter follower and source follower circuits
2. Weinberg oscillator using OP Amp
3. SR and JK Flip Flops -construction using Logic Gates and study of truth tables
4. Study of the frequency response of a tuned amplifier



5. Study of power amplifier circuits
6. Frequency multiplier using PLL
- 7 Study of Schmitt trigger circuits using transistors
8. Construction and study of cascade amplifier circuit using transistors.
9. Simple electronics experiments using Phoenix and Python based Kits.

Unit II Computer Programming

(A minimum of 8 experiments to be done, programs should be written in C++language)

1. Least square fitting
2. First derivative of tabulated function by difference table
3. Numerical integration (Trapezoidal rule and Simpson method)
4. Solution of algebraic and transcendental equations using Newton-Ralphson method
5. Solution of algebraic equations using bisection method
6. Numerical interpolation using Newton and Lagrangian methods
7. Monte Carlo simulation
8. Evaluation of Bessel and Legendre functions
9. Matrix addition, multiplication, trace, transpose and inverse.
10. Fourier series analysis
11. Study of motion of projectile in a central force field
12. Study of Planetary motion and Kepler's laws



PH 261 ADVANCED PHYSICS PRACTICALS

(A total of 10 experiments to be done)

Unit I: Physics experiments

Section A*(atleast 5 experiments to be done)*

1. e/m of an electron-Thompson's method
2. Charge of an electron-Millikan's method
3. Determination of Fermi energy of Copper
4. Study of variation of resistance of a semiconductor with temperature and determination of band gap
5. Magnetic Susceptibility of a liquid using Quincke's method
6. Ferromagnetic studies using Guoy's method
7. Hall effect in a semiconductor
8. Rydberg constant determination using grating, spectrometer and discharge tubes.
9. Thermo-emf of bulk samples like Al, Cu. Brass etc.
10. Zeeman effect using Fabry-Perot Interferometer.

Section B *(at least two experiments to be done)*

1. Electrical characteristics of a solar cell
2. Studies using UV visible spectrophotometer
3. Refractive index of liquids and liquid mixtures using Abbe's refractometer
4. Optical activity studies using Polarimeters
5. Determination of temperature characteristics of a Flame
 - (a) Candle flame using digital photography and image analysis
 - (b) Sodium flame in comparison with incandescent lamp using a spectrometer
6. LDR and photodiode characteristics



7. Simple experiments using GM counter
8. Determination of dielectric constant of materials
9. Experimental determination of Avogadro's number using an electrochemical cell
10. Study of arc spectra and hydrogen spectra using an imager (CCD) and photoelectric/electronic recorder.

Unit II: Data Analysis (Five experiments to be done)

1. Analysis of the given band spectrum
2. Analysis of given rotation-vibration spectrum
3. Interpretation vibration spectra of simple molecules using Raman and IR spectra
4. Dissociation energy of diatomic molecules
5. Analysis of powder XRD data
6. Study of stellar spectral classification from low dispersion stellar spectra
7. Study of HR diagram of stars
8. Radioactive material counting statistics
9. Interpretation of UV- visible spectra of materials
10. Weather and astronomy related image processing

PH 262 E ADVANCED ELECTRONICS PRACTICALS

Unit I- ELECTRONICS (a total of seven experiments to be done)

Section A (at least 5 experiments to be done)

1. Study of active filters using OP amps (a) low pass (b) high pass (c) band pass for both first order and second order-gain/ roll off determination
2. Wave form generation using OP amp circuits:
(a) astable and monostable multivibrators (b) square, triangular and saw-tooth wave generation
3. IC 555 timer experiments (a) monostable and astable multivibrators (b) VCO



4. D/A convertor circuits using OP Amp 741
5. Differential amplifier circuits using transistors
6. Design of series pass voltage regulators using
(a) transistors with load and line regulation (b) OP Amp

Section B (*at least 2 experiments to be done*)

1. Study of IF tuned amplifier and Amplitude modulation (generation and detection) using transistor, diode etc.
2. Frequency modulator and detector circuits.
3. Pulse modulation circuits using 555 timer (a) PAM (b) PWM
4. Digital modulation circuits (a) BFSK generation using 555 timer (b) BFSK detector using 555 timer and PLL (c) BPSK generation
5. Shift register and ring counter circuits using flip flops
6. Miscellaneous transistor applications (a) automatic night light with LDR
(b) inverter circuit (transistors as a switch) (c) time delay circuit using SCR
7. BCD to decimal decoder and seven segment display using IC
8. Design of Electronic counters (up and down counters)

Unit II: Microprocessor Based Experiments (*Five experiments to be done*)

1. 8085 /8086 program to find out largest from a group of 8bit/16 bit numbers
2. Square wave generation using 8255A interface using 8085/8086
3. 8086 program for block additions
4. Interfacing LED display board with 8085/8086
5. 8086 program to convert binary to ASCII and ASCII to BCD
6. 8086 program to arrange a given data in ascending and descending order
7. 8086-simple traffic light controller
8. 8086 program for binary to BCD conversion and vice versa
9. Program of Fibonacci series using 8086







UNIVERSITY OF KERALA

**Syllabus for
M. Sc. Programme in Branch III
CHEMISTRY**

**(Revised Syllabi under Semester System
with effect from 2020 Admissions)**

PREAMBLE

The syllabi of M.Sc programmes in Chemistry offered in the affiliated colleges of the University under Semester system have been revised and the revised syllabi are to be effective from 2020 admission. There are two independent PG programmes in Chemistry, namely **M.Sc. Programme in Branch III–Chemistry and M.Sc. Programme in Branch IV–Analytical Chemistry**. Both these PG programmes are equivalent in all respect for employment and higher studies. Each of these two PG programmes shall extend over a period of two academic years comprising of four semesters, each of 450 hours in 18 weeks duration. The syllabi and scheme of examinations of these two programmes are detailed below. The theory courses of the first three semesters and the practical courses of the first two semesters of the two programmes are common, and therefore, the examinations of these two PG programmes are to be conducted with common question papers for the first three semesters by a common Board of Examiners. These syllabi are effective from 2020 admission in affiliated colleges of the university.

M.Sc. PROGRAMME IN BRANCH III – CHEMISTRY

(Revised syllabus under semester system with effect from 2020 admission)

SYLLABUS AND SCHEME OF EXAMINATION

Course No and Title		Hours per week		Duration of ESA	Marks for CA	Marks for ESA	Total Marks
		L	P				
SEMESTER I*							
CH 211	Inorganic Chemistry I	5		3	25	75	100
CH 212	Organic Chemistry I	5		3	25	75	100
CH 213	Physical Chemistry I	5		3	25	75	100
CH 214	Inorganic Chemistry Practicals I		3	(To be continued in Semester II)			
CH 215	Organic Chemistry Practicals I		3	(To be continued in Semester II)			
CH 216	Physical Chemistry Practicals I		4	(To be continued in Semester II)			
Total marks for Semester I							300
*Distribution of teaching hours/week: Theory–15 hours, Practical’s –10 hours							
SEMESTER II*							
CH 221	Inorganic Chemistry II	5		3	25	75	100
CH 222	Organic Chemistry II	5		3	25	75	100
CH 223	Physical Chemistry II	5		3	25	75	100

CH 214	Inorganic Chemistry Practicals II		3	6	25	75	100
CH 215	Organic Chemistry Practicals II		3	6	25	75	100
CH 216	Physical Chemistry Practicals II		4	6	25	75	100
Total marks for Semester II							600
*Distribution of teaching hours/week: Theory–15 hours, Practical's –10 hours							
SEMESTER III*							
CH 231	Inorganic Chemistry III	5		3	25	75	100
CH 232	Organic Chemistry III	5		3	25	75	100
CH 233	Physical Chemistry III	5		3	25	75	100
CH 234	Inorganic Chemistry Practicals II		3	(To be continued in Semester IV)			
CH 235	Organic Chemistry Practicals II		3	(To be continued in Semester IV)			
CH 236	Physical Chemistry Practicals II		4	(To be continued in Semester IV)			
Total marks for Semester III							300
*Distribution of teaching hours/week: Theory–15 hours, Practical's –10 hours							
SEMESTER IV*							
CH 241	Chemistry of Advanced Materials	5		3	25	75	100
CH 242 (a)	Inorganic Chemistry IV	5		3	25	75	100
CH 242 (b)	Organic Chemistry IV						
CH 242 (c)	Physical Chemistry IV						
CH 234	Inorganic Chemistry Practicals II		3	6	25	75	100
CH 235	Organic Chemistry Practicals II		3	6	25	75	100
CH 236	Physical Chemistry Practicals II		4	6	25	75	100
CH 243 (a)	Dissertation**					50	50
CH 243 (b)	Visit to R&D Centre					5	5
Comprehensive viva-voce						45	45
Total marks for Semester IV							600
Grand Total (for semesters I – IV)							1800
*Distribution of teaching hours/week: Theory–10 hours, Practical's –10 hours , 5 hours for discussion on project							

** 10 marks out of the 50 marks for dissertation will be for dissertation viva-voce.

The remaining 40 marks is to be distributed as follows_

Introduction to the work/ Statement of the Problem – 5, Review of Literature – 5
Materials and Methods – 5, Results and Discussion – 15, Language and style of presentation – 2, References – 3, Quality and Innovation – 5.

Programme Specific Outcomes

- PSO 1 Develop a better understanding of the current chemical principles, methods and theories with the ability to critically analyse at an advanced level.
- PSO 2 Acquire solid knowledge of classical and modern experimental techniques and interpretation of results; thereby acquire the ability to plan and carry out independent projects.
- PSO 3 Develop the qualities of time management and organization, planning and executing experiments.
- PSO 4 Have a good level of awareness of the problems associated with health, safety and environment.
- PSO 5 Understand how chemistry relates to the real world and be able to communicate their understanding of chemical principles to a lay audience and as well apply the knowledge when situation warrants.
- PSO 6 Learn to search scientific literature and databases, extract and retrieve the required information and apply it in an appropriate manner.
- PSO 7 Demonstrate proficiency in undertaking individual and/or team-based laboratory investigations using appropriate apparatus and safe laboratory practices.
- PSO 8 Develop analytical solutions to a diversity of chemical problems identified from application contexts; critically analyse and interpret qualitative & quantitative chemical information's.
- PSO 9 Set the scene to make use of the wide range of career options open to chemistry graduates.

M.Sc. PROGRAMME IN BRANCH III – CHEMISTRY
(Revised syllabus Under Semester System w.e.f. 2020 Admission)

SEMESTER I

CH 211 INORGANIC CHEMISTRY I

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	employ crystal field theory in analysing the splitting of d orbitals in octahedral, tetragonal, square planar, tetrahedral, trigonal bipyramidal and square pyramidal fields, calculate Crystal Field Stabilization Energy and Interpret Octahedral Site Stabilization Energy.	Ap, An U	1
2.	apply Jahn-Teller theorem and demonstrate evidence for JT effect, static and dynamic JT effect.	Ap	1
3.	illustrate MOT for octahedral and tetrahedral complexes with and without pi bonds and construct MO diagrams.	An C	1
4.	critically evaluate data from a variety of analytical chemistry techniques and apply knowledge of the statistical analysis of data.	Ap, E	1, 2
5.	interpret complexometric titrations, redox titrations, gravimetric titrimetry and titrations in non-aqueous solvents.	E, U	1, 2
6.	apply TG, DTA and DSC in the study of metal complexes.	Ap, An	1, 2
7.	explain the functioning of the frontier materials in inorganic chemistry like Solid Electrolytes, Solid oxide fuel cells, Rechargeable battery materials, Molecular materials and fullerenes.	U	1, 4, 6
8.	explain the preparation, properties and structure of isopoly acids of Mo, W and V and heteropoly acids of Mo and W.	U	1
9.	explain preparation and properties of xenon fluorides, and noble gas compounds, aluminosilicates, zeolites and silicones and identify the importance of shape selectivity.	U	1
10.	identify the chemical processes occurring naturally in earth's atmospheric, aquatic and soil environments and evaluates the impacts of human perturbations to these processes.	An, E	4

PSO–Programme Specific Outcome

Cognitive Level: R–Remember
An–Analyse

CO–Course Outcome

U–Understanding Ap–Apply
E–Evaluate C–Create

Module	Course Description	No. of Hrs	CO No.
1.0	Coordination chemistry-I: Theories of metal complexes	18	
1.1	Crystal field theory: Splitting of d orbitals in octahedral, tetragonal, square planar, tetrahedral, trigonal bipyramidal and square pyramidal fields.	4	1
1.2	Jahn-Teller theorem, evidence for JT effect, static and dynamic JT effect.	2	2
1.3	Crystal Field Stabilization Energy. CFSE for d^1 to d^{10} systems. Octahedral Site Stabilization Energy. Factors affecting the splitting parameter.	4	1
1.4	Spectrochemical series. Evidence of covalency in Metal-Ligand bond, introduction to Ligand field theory.	2	1
1.5	Molecular Orbital Theory. Sigma and pi bondings in complexes. MO diagrams of octahedral and tetrahedral complexes with and without pi bonds.	4	3
1.6	Experimental evidence of pi bond on the stability of sigma bond. Nephelauxetic effect.	2	3
2.0	Analytical principles	18	
2.1	Evaluation of analytical data: Accuracy and precision. Standard deviation, variance and coefficient of variation. Student 't' test, 'Q' test, and 'F' test. Confidence limits.	2	4
2.2	Errors: Classification, distribution, propagation, causes and minimization of errors. Significant figures and computation rules.	2	4
2.3	Correlation analysis: Scatter diagram. Correlation coefficient, r. Calculation of r by the method of least squares.	2	4
2.4	Volumetric methods: Classification of reactions in volumetry. Theory of indicators.	2	4
2.5	Complexometric titrations: Titration using EDTA-direct and back titration methods. Precipitation titrations. Redox titrations.	4	5
2.6	Titration in non-aqueous solvents. Organic reagents used in gravimetry: Oxine, dimethylglyoxime and cupferron.	2	5
2.7	Applications of TG, DTA and DSC in the study of metal complexes.	4	6
3.0	Frontiers in Inorganic Chemistry	18	
3.1	Solid Electrolytes: Mixed oxides, cationic, anionic solid electrolytes, mixed ionic-electronic conductors,	4	7
3.2	Solid Oxide Fuel Cells (SOFC), Rechargeable battery	3	7

	materials.		
3.3	Solid state chemistry of metal nitrides and fluorides, chalcogenides, intercalation chemistry and metal-rich phases.	4	7
3.4	Inorganic pigments, Inorganic phosphors.	3	7
3.5	Molecular materials and fullerides, basic idea of molecular materials chemistry like One dimensional metals, Molecular magnets and Inorganic liquid crystals.	4	7
4.0	Isopoly & Heteropoly acids, Silicon-Oxygen compounds, Xenon compounds	18	
4.1	Isopoly: Preparation, properties and structure of isopoly acids of Mo, W and V.	4	8
4.2	Heteropoly acids: Heteropoly acids of Mo and W. Keggin Structure, Keggin anions, Polyoxometalates .	5	8
4.3	Silicon-oxygen compounds: Aluminosilicates, Zeolites as microporous materials and molecular sieves, Silicones and Polysiloxanes.	5	9
4.4	Xenon fluorides, Structure of XeF ₂ (MO theory only), Perxenate ion, Organo xenon compounds, Coordination compounds of Xenon.	4	9
5.0	Chemistry of Natural Environmental Processes	18	
5.1	Chemistry of processes in atmosphere: Composition of the atmosphere. Automobile pollutants and the catalytic converter. Photochemical smog. Chemistry of the stratosphere. Catalytic destruction of ozone. Depletion of the ozone layer. Hazards of common air pollutants on the human health.	6	10
5.2	Chemistry of processes in hydrosphere: The hydrologic cycle. Cycling and purification. The unique properties of water. Acid-base properties.	6	10
5.3	Chemistry of processes in Lithosphere: Redox status in soil. pE, pH predominance diagrams for redox sensitive elements Fe and Cr. Acidity in soil materials. Acid neutralization capacity and the quantification of the soil acidity. Ion speciation in soil solution. Cation exchange capacity and exchange phase composition.	6	10

References

1. F. A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry, John Wiley and Sons, 6th edition, 1999.
2. J. E. Huheey, Inorganic Chemistry- Principles of Structure and Reactivity, Harper Collins College Publishing, 4th edition, 2011.
3. K. F. Purcell and J. C. Kotz, Inorganic Chemistry, Saunders, 1977.
4. S. F. A. Kettle, Physical Inorganic Chemistry, Oxford University Press, 1st edition, 1998.

5. Shriver and Atkins, Inorganic Chemistry, Oxford University Press, 2010.
6. A. I. Vogel, A Text Book of Quantitative Inorganic Analysis, Longman, 5th edition, 1989.
7. D. A. Skoog, D. M. West and F. J. Holler, Fundamentals of Analytical Chemistry, Saunders College Publishing, 7th edition, 1996.
8. D. A. Skoog and D. M. West, Principles of Instrumental Analysis, Saunders College Publishing, 5th edition, 1998.
9. F.A. Cotton, Chemical Applications of Group Theory, Wiley Eastern, 3rd edition, 2009.
10. A. S. Kunju and G. Krishnan, Group Theory and its Applications in Chemistry, PHI Learning, 2010.
11. R. L. Carter, Molecular Symmetry and Group Theory, John Wiley & Sons, 1998.
12. E. James Girard, Principles of Environmental Chemistry, Jones and Bartlett Publishers, 3rd Edition, 2013
13. H.V. Jadhav, Elements of Environmental Chemistry, Himalya Publication House, 2010.
14. E. Michael Essington, Soil and water Chemistry, CRC Press, 2nd edition, 2015.

CH 212 ORGANIC CHEMISTRY I

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	write down the IUPAC name of polycyclic, spirocyclic and heterocyclic compounds and draw the structures from the IUPAC name of these compounds.	U	1
2.	determine R and S, P and M, E and Z configuration of compounds with chiral centres, biphenyls, allenes, spiranes and draw the configurations in dash and wedge formula, or zig –zag configurations.	E	1
3.	detect prochirality in a compound and explain relevance of prochirality .	U, An	1
4.	explain chiral centre, chiral axis and chiral plane with examples, stability of conformations, stereoselective and stereospecific reactions.	An, E	1
5.	calculate Cotton effect of a compound from its structure and configuration.	E	1
6.	explain different methods for generation of free radical and different types of free radical reactions- Predict the products in a free radical reaction.	U, An	1
7.	describe different types mechanism of substitution, elimination, hydrolysis and addition reactions.	Ap	1
8.	differentiate the rate, mechanism and stereochemistry influenced by solvent, substrate structure, intermediate stability.	An	1
9.	predict the products or reactants or reagents in selected	U	1

	types of reactions.		
10.	design the mechanism of selected reactions.	C	1

Module	Course Description	No. of Hrs	CO No.
1.0	Stereochemistry	18	
1.1	Nomenclature of organic compounds - Cyclic, fused polycyclic and bridged polycyclic hydrocarbons, bridged and fused hydrocarbon systems, Spirocyclic hydrocarbon systems, Heterocyclic systems containing Nitrogen and Oxygen.	3	1
1.2	Introduction to molecular symmetry and chirality, axial chirality, planar chirality and helicity, relative configuration, stereochemical nomenclature, R and S, E and Z (use only 3D formula, dash and wedge).	3	2
1.3	Prostereoisomerism, stereotopicity & stereoprojections. Prochiral centre and prochiral faces - Pro R and Pro S, Re face and Si face, Importance of prochirality in biological systems.	3	3
1.4	Axial stereochemistry: atropisomerism and its designation - biphenyls, allenes, spiranes- M and P configurations. Stereoselectivity: enantioselectivity, diastereoselectivity & stereoconvergence. Stereospecific and stereoselective synthesis.	2	4
1.5	Application of Cram's rule, Felkin-Ahn model. Basic introduction to chiral separation methods and estimation of enantiomeric excess, chiral pool, chiral auxiliary, chiral reagents, BINAP.	2	4
1.6	Conformational analysis of substituted cyclohexane, decalin and biased systems. Effect of conformation on reactivity of cyclohexanes.	2	4
1.7	Introduction to ORD, CD - their application in assigning configuration. Sector rules such as octant and axial haloketone rules. Cotton effect.	2	5
1.8	Importance of stereochemistry in drugs-Pthalidomide, Dopa, Ibuprofen.	1	2
2.0	Reactions Involving Free Radicals, Nitrenes and Carbenes	18	
2.1	Free radical Structure, stability and reactivity, Preparation of free radicals- Triphenyl methyl, TEMPO, AIBN, Dibenzoyl peroxide, NBS, Tributyl Tinhydride and AIBN.	5	6
2.2	Free radical reactions- Chlorination of alkane, addition of HX, SRN1 mechanism, Gomberg reaction, Pschorr	5	6

	ring closure, Hunsdieckers reaction, Ullman reaction, Kolbes electrolytic reaction.		
2.3	Acyloin condensation, Alkyne coupling reactions,. Mc Murry reaction, Pinacol coupling reaction.	3	6
2.4	Structure, formation, stability and reactions of carbenes and nitrenes (rearrangement reactions excluded).	5	6
3.0	Nucleophilic substitution reaction	18	
3.1	Nucleophilic substitution at sp^3 carbon - S_N1 and S_N2 mechanisms. Competition between S_N1 and S_N2 reactions. Walden inversion, stereochemistry. Effect of solvent, leaving group and substrate structure on rates of S_N1 and S_N2 substitutions.	4	7, 8
3.2	Neighbouring group participation, Nonclassical carbocations, S_N1' , S_N2' , S_Ni mechanisms.	3	7, 8
3.3	Mitsunobu reaction, Mechanism of esterification and ester hydrolysis-acid catalysed and base catalysed reactions.	3	7, 8
3.4	Aromatic Substitution reactions - Electrophilic substitution: mechanism and evidence- Reactions involving nitrogen, sulphur, carbon, halogen and oxygen electrophiles. Reimer-Tiemann, Vilsmeier-Haack reactions.	4	7, 8
3.5	Directive and rate controlling factors in aromatics with one or more substituents. Aromatic Nucleophilic Substitution reactions - S_N1 , S_NAr , Elimination – Addition reactions (benzyne), evidence with examples, Chichibabin reaction.	4	7, 8
4.0	Addition Reactions	18	
4.1	Addition of H_2O , X_2 , HX , and boranes to $C=C$ systems, (hydroboration followed by oxidation only), stereo aspects, effect of substituents on the rate of additions, iodo lactonisation, one or two examples.	5	9, 10
4.2	Prilezhaev reactions. Cis and trans hydroxylation of cycloalkenes. Nucleophilic addition to activated $C=C$ systems. Michael addition and Robinson Annulation.	5	9, 10
4.3	Aldol condensation (normal, crossed and directed), evidence for normal Aldol condensation. Stork enamine, Cannizzaro, Perkin, Ritter, Stobbe, Knoevenagel, Darzen, Reformatsky and benzoin condensations.	4	9, 10
4.4	Grignard, Mannich, Thorpe reactions, Dieckmann condensation, sulfur ylides (stabilized and unstabilised)-direct and conjugated addition to carbonyl. (Mechanisms expected for all reactions)	4	9, 10

5.0	Elimination Reactions	18	
5.1	Elimination reactions leading to C=C bond formation and their mechanisms. E ₁ , E ₂ and E ₁ cb mechanisms.	5	9, 10
5.2	Stereo aspects of C=C bond formation in cyclic and acyclic systems. Regioselectivity in elimination, Hoffmann and Saytzeff elimination. Effect of basicity, temperature, leaving group and substrate structure.	5	9, 10
5.3	Elimination vs substitution, Shapiro reaction, Peterson and Julia olefination, Wittig and Wittig - Horner reaction-stereochemistry.	4	9, 10
5.4	Cis elimination-esters, sulfoxides, selenoxides, Chugaev reaction, Cope elimination, Stereo aspects of cis elimination - cyclic bicyclic systems Sodium in liquid ammonia and Lindlars catalyst in conversion of alkynes to alkenes.	4	9, 10

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CH 213 PHYSICAL CHEMISTRY I

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	outline the development of quantum mechanics and its tools and apply them in determining the wave functions and energies of moving particles.	U, Ap, An	1
2.	recognize the nature of adsorption and propose theories and choose theoretical and instrumental methods of measurements of surface property.	U, Ap, An	1
3.	understand theory and mechanism of catalytic action.	U	1
4.	correlate thermodynamic properties and apply them in systems.	U, Ap, An	1
5.	understand theories, mechanism and, kinetics of reactions and solve numerical problems.	U, Ap, An	1
6.	identify point groups and construct character table and predict hybridisation and spectral properties of molecules.	U, Ap, C	1

Module	Course Description	No. of Hrs	CO No.
1.0	Quantum Chemistry I	18	
1.1	Classical mechanics and its limitations –need of quantum mechanics, de Broglie relation and its experimental proof, uncertainty principle and its consequences.	1	1
1.2	Postulates of quantum mechanics: State function postulate: Born interpretation of the wave function, well behaved functions, orthonormality of wave functions.	2	1
1.3	Operator postulate: Operator algebra, linear and nonlinear operators, Laplacian operator, commuting and non-commuting operators, Hermitian operators and their properties.	2	1
1.4	Eigen value postulate: eigen value equation, eigen functions of commuting operators.	2	1
1.5	Expectation value postulate. Postulate of time Dependent Schrödinger equation, Quantization of angular momentum, quantum mechanical operators corresponding to angular momenta (L_x , L_y , L_z and L^2) - expression for (L_x , L_y , L_z and L^2) in polar coordinates.	2	1
1.6	Application of Quantum mechanics to Exactly Solvable Model Problems Translational motion: free particle in one dimension, particle in a box with infinite potential barrier one	3	1

	dimensional box three-dimensional box and cubical box-degeneracy.		
1.7	Particle with finite potential barriers, one potential barrier, two finite barriers. Quantum mechanical tunnelling (Qualitative concept only).	3	1
1.8	Vibrational motion: one-dimensional harmonic oscillator (complete treatment), Hermite equation (solving by method of power series), Hermite polynomials, recursion relation, wave functions and energies-important features of wave functions, Harmonic oscillator model and molecular vibrations.	3	1
2.0	Surface Chemistry and Catalysis	18	
2.1	The gas-solid interphase, types of adsorption. Heat of adsorption and its determination, differences between chemisorptions and physisorption.	2	2
2.2	Adsorption isotherms - Freundlich and Langmuir isotherms. Thermodynamic and statistical derivation of Langmuir adsorption isotherm. Multilayer adsorption-the BET theory and Harkins-Jura theory.	3	2
2.3	Determination of surface area of solids-Harkins-Jura absolute method, point B method, Langmuir method and BET method.	2	2
2.4	Adsorption from solutions: Gibb's adsorption equation and its verification. Adsorption with dissociation. Adsorption with interaction between adsorbate molecules.	2	2
2.5	Different types of surfaces, properties of surface phase. Thermodynamics of surface. Surface tension of solutions. Surfactants and micelles. Examination of surfaces- Low Energy Electron Diffraction (LEED).	2	2
2.6	Photoelectron spectroscopy, ESCA, scanning probe microscopy, Auger electron spectroscopy, SEM and TEM.	3	2
2.7	Surface films-different types, surface pressure and its measurement.	2	3
2.8	Catalysis: Mechanism and theories of homogeneous and heterogeneous catalysis. Bimolecular surface reactions. Langmuir-Hinshelwood mechanism. Enzyme catalysis.	2	3
3.0	Classical Thermodynamics	18	
3.1	Entropy - Dependence of entropy on variables of a system (S, T and V; S, T and P). Thermodynamic equations of state. Criteria for equilibrium and spontaneity, Euler's relation, Gibbs and Helmholtz free energy.	2	4
3.2	Maxwell relations and significance, temperature	2	4

	dependence of free energy, Gibbs Helmholtz equation and its applications.		
3.3	Partial molar quantities - Chemical potential, Gibbs Duhem equations, determination of partial molar properties-partial molar volume and partial molar enthalpy.	2	4
3.4	Fugacity - relation between fugacity and pressure, determination of fugacity of a real gas, variation of fugacity with temperature and pressure. Fugacity of liquid mixtures, fugacity of mixture of gases, Lewis-Randall rule.	3	4
3.5	Activity, activity coefficients, dependence of activity on temperature and pressure. Determination of activity and activity coefficients of electrolytes and non-electrolytes.	2	4
3.6	Thermodynamics of mixing, Duhem-Margules equation, Konowaloff's first and second laws, Henry's law, excess thermodynamic functions-determination of excess enthalpy and volume.	4	4
3.7	Chemical affinity and thermodynamic functions, effect of temperature and pressure on chemical equilibrium-van't Hoff reaction isochore and isotherm.	3	4
4.0	Chemical kinetics	18	
4.1	Theories of reaction rates: Collision theory and its failure. Transition state theory - Eyring equation. Comparison of the two theories. Thermodynamic formulation of the reaction rates. Potential energy surfaces.	3	5
4.2	Theories of unimolecular reactions - Lindemann theory. Lindemann-Hinshelwood mechanism, qualitative idea of RRKM theory.	2	5
4.3	Kinetics of complex reactions- Parallel reactions, opposing reactions, consecutive reactions and chain reactions, steady state treatment, kinetics of $\text{H}_2\text{-Cl}_2$ and $\text{H}_2\text{-Br}_2$ reactions, decompositions of ethane, acetaldehyde and N_2O_5 . Rice-Herzfeld mechanism, branching chain reactions, Hinshelwood mechanism of chain reactions and explosion.	4	5
4.4	Fast reactions: Relaxation method, relaxation spectrometry, flow method, shock method, fast mixing method, field jump method, pulse method, flash photolysis and NMR method.	3	5
4.5	Reactions in solution: Factors affecting reaction rates in solutions, effect of dielectric constant and ionic strength, cage effect, Bronsted-Bjerrum equation.	3	5
4.6	Kinetic effects: Primary and secondary kinetic salt effect, influence of solvent on reaction rates,	3	5

	significance of volume of activation, linear free energy relationship. Hammett equation and Taft equation.		
5.0	Molecular symmetry	18	
5.1	Symmetry elements and symmetry operation. Matrix representation of symmetry operations. Block factored matrices, Character of a matrix. Conditions for a set of elements to form a group. Point groups and their systematic identification.	2	6
5.2	Multiplication of operations. Group multiplication table. Similarity transformation and classification of symmetry operation, Matrix representation of point group. Reducible and Irreducible representations.	3	6
5.3	The Great Orthogonality Theorem. Rules derived from GOT (proof not required).	1	6
5.4	Setting up of character table of C_{2v} , C_{3v} and C_{2h} groups. Direct product representations. Reduction formula, reduction of reducible representation to IRs. Transformation properties of atomic orbitals. Molecular symmetry and optical activity.	4	6
5.5	Applications of character tables: Hybridisation-identification of atomic orbitals taking part in hybridisation of triangular planar, square planar, trigonal bipyramidal, square pyramidal and tetrahedral molecules.	4	6
5.6	Spectroscopy-Determination of number of active IR and Raman lines taking simple molecules belongs to C_{2v} , C_{3v} and D_{4h} point groups as example.	4	6

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CH 214 INORGANIC CHEMISTRY PRACTICALS – I

Total 125 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	interpret data from an experiment, including the construction of appropriate graphs and the evaluation of errors.	U, E	3, 7, 8
2.	estimate volumetrically the concentration of Zn, Mg and Ni using EDTA and the volumetric estimation of Fe.	Ap, An	7, 8
3.	estimate volumetrically the hardness of water and concentration of Ca in water samples using EDTA.	Ap, An	7, 8
4.	estimate colorimetrically the concentration of Chromium – (using Diphenyl carbazide), Iron (using thioglycollic acid), Iron (using thiocyanate), Manganese (using potassium periodate), Nickel (using dimethyl glyoxime).	Ap, An	7, 8
5.	carry out the preparation of the metal complexes Potassium trioxalatochromate (III), Tetraammoniumcopper (II) sulphate, Hexamminecobalt (III) chloride.	Ap	7, 8
6.	record the UV spectra, IR spectra, magnetic susceptibility, TG, DTA and XRD of the complexes prepared.	Ap, An	2, 7, 8

Module	Course Description	No. of Hrs	CO No.
1.	Volumetric estimation using EDTA - Zn, Mg, Ni (back titration), Hardness of water, Ca (using murexide).	25	1, 2, 3
2.	Determine the hardness of water and the concentration of Ca in water samples using EDTA.	20	1, 2, 4
3.	Volumetric estimation of Fe.	10	1, 2, 3
4.	Colorimetric estimation of Chromium – (Diphenyl carbazide), Iron (thioglycollic acid), Iron (thiocyanate), Manganese (potassium periodate), Nickel (dimethyl glyoxime).	35	1, 2, 5
5.	Preparation of metal complexes - Record UV, IR, magnetic susceptibility, TG, DTA and XRD of the complexes prepared (a) Potassium trioxalatochromate (III) (b) Tetraammoniumcopper (II) sulphate (c) Hexamminecobalt (III) chloride	35	1, 2, 6, 7

References

1. A. I. Vogel, A Text Book of Quantitative Inorganic Analysis, Longman, 4th edition, 1978.
2. A. I. Vogel, A Text Book of Qualitative Inorganic Analysis, Longman 5th edition, 1979.
3. D. A. Skoog and D. M. West, Analytical Chemistry: An Introduction, Saunders College Publishing, 4th edition, 1986.
4. W. G. Palmer, Experimental Inorganic Chemistry, Cambridge University,

CH 215 ORGANIC CHEMISTRY PRACTICALS – I

Total 125 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	interpret data from an experiment, including the construction of appropriate graphs and the evaluation of errors.	U, E	3, 7, 8
2.	determine the correct method for separation of a binary mixture and make the separated compounds in pure form.	An, E	2, 7, 8
3.	develop thin layer chromatogram of a compound and determine its purity.	C	2, 7, 8
4.	separate two compounds by column chromatography.	An	2, 7, 8
5.	utilize the synthetic procedures and reagents to convert a compound into another. Differentiate the products by spectroscopic methods.	An	2, 7, 8
6.	use green chemical principles in the synthesis.	Ap	2, 4
7.	solve GC MS and LC MS of a compound to ascertain purity and identity, apply the basic principles	Ap, E	2, 7

Module	Course Description	No. of Hrs	CO No.
1.	Separation and identification of organic compounds- a. Quantitative wet chemistry separation of a mixture of two components by solvent extraction. b. TLC of the purified samples along with the mixture in same TLC plates (component 1 with mixture and component 2 with mixture on separate TLC plate) and calculation of R _f values- Reporting and recording TLC in standard formats- preparation of sample solution, adsorbent, dimensions of the plate, saturation time, developing time, visualization and detection, R _f Value, Drawing - in the form of a table.	30	1, 4, 5
2.	Separation of a mixture by column chromatography (not for end semester evaluation) a. Malachite green and methylene blue, b. o-nitroaniline and p-nitroaniline.	20	1, 4
3.	Preparation of compounds by two stages. - Recording UV, IR, ¹H-NMR and ¹³C-NMR and EI mass spectra of synthesized compounds. - Record and interpret GC-MS and LC-MS of the purified compound. - TLC analysis-Stage 1 reactants and products on TLC plate 1 and stage 2 reactants and products on plate 2). - Record TLC in standard format as in separation. All preparations must be restricted to 1 g level I. Nitration (1) Acetanilide → p-nitroacetanilide → p-nitroaniline (2) Methylbenzoate → methyl m-nitrobenzoate → m-nitrobenzoic acid II. Bromination (3) Acetanilide → p-bromoacetanilide → p-bromoaniline <i>using CAN for bromination</i> III. Aldol condensation- Synthesis of heterocycles. (4) Benzaldehyde → Dibenzylideneacetone → 1,5-Diphenyl-3-styryl-2-pyrazoline IV. Diazocoupling (5) Aniline → Diazoaminobenzene → p-aminoazobenzene V. Rearrangement (6) Phthalic anhydride → Phthalimide → Anthranilic acid VI. Synthesis of Dyes (7) N,N-Dimethylaniline → N,N-dimethyl-4-nitrosoaniline → methylene blue	75 (average 12.5 hrs for preparation and analysis of each)	1, 5, 6, 7

The board of examiners have to select either TLC of separated components OR TLC of preparation for an examination. But both TLC examinations are to be practiced and entered in the record of experiments.

References

1. B. S. Furniss, Vogel's text book of practical organic chemistry, 5th Edition, Longman, 1989.
2. D. L. Pavia, G. M. Lampman, G. S. Kriz and R. G. Engel, A microscale approach to organic laboratory techniques," Wadsworth Publishing, 5th Edition, 2012.
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7. P. F Shalz, Journal of Chemical Education, 1996, 173: 267.
8. Monograph on green laboratory experiments, DST, Government of India, pp 1-79.
9. For spectral data of organic compounds, see:
<http://sdb.sriodb.aist.go.jp/sdb/cgi-bin/direct frame top.cgi>.

CH 216 PHYSICAL CHEMISTRY PRACTICALS – I

Total 125 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	interpret data from an experiment, including the construction of appropriate graphs and the evaluation of errors.	U, E	3, 7, 8
2.	construct the Freundlich and Langmuir isotherms for adsorption of acetic/oxalic acid on active charcoal/alumina and determine the concentration of acetic/ oxalic acid	C, Ap, An	7, 8
3.	determine the rate constant, Arrhenius parameters, rate constant and concentration using kinetics	Ap	7, 8
4.	construct the phase diagram and determine the composition of an unknown mixture	Ap, An	7, 8
5.	construct the ternary phase diagram of acetic acid chloroform-water system and out the procedure in an unfamiliar situation to find out the composition of given homogeneous mixture.	C, Ap, An	7, 8
6.	construct the tie-line in the ternary phase diagram of acetic acid chloroform-water system	C, Ap, An	7, 8
7.	determine distribution coefficient using distribution law.	Ap	7, 8
8.	determine the equilibrium constant employing the distribution law.	Ap	7, 8
9.	determine the coordination number of Cu^{2+} in copper-	Ap	7, 8

	ammonia complex.		
10.	determine K_f of solid solvent, molar mass of non-volatile solute, mass of solvent and composition of given solution	Ap, An	7, 8
11.	determine K_T of salt hydrate, molar mass of solute, mass of salt hydrate and composition of given solution.	Ap, An	7, 8
12.	determine surface tension and parachor of liquids.	Ap	7, 8
13.	ascertain the relationship between surface tension with concentration of a liquid and use this to find out the composition of given homogeneous mixture.	Ap, An	7, 8
14.	determine the concentration of given strong acid/alkali.	Ap, An	7, 8
15.	determine the heat of ionisation of acetic acid.	Ap, An	7, 8
16.	determine the heat of displacement of Cu^{2+} by Zn.	Ap, An	7, 8

Module	Course Description	No. of Hrs	CO No.
1.	Adsorption a) Freundlich and Langmuir isotherms for adsorption of acetic/oxalic acid on active charcoal/ alumina. b) Determination of concentration of acetic/ oxalic acid.	15	1, 2,
2.	Kinetics a) Determination of rate constant of acid hydrolysis of methyl acetate. b) Determination of Arrhenius parameters. c) Determination of concentration of given acid. d) Determination of rate constant of the saponification of ethyl acetate and evaluation of Arrhenius parameters. e) Determination of rate constant of reaction between $\text{K}_2\text{S}_2\text{O}_8$ and KI.	15	1, 3
3.	Phase rule I. Solid-liquid equilibria a) Construction of phase diagram and determination of the composition of unknown mixture (naphthalene/ biphenyl, naphthalene/ benzophenone, naphthalene/ diphenyl amine). b) Construction of phase diagram with simple eutectic - naphthalene/ metadinitrobenzene. II. Partially miscible liquid pairs a) CST of phenol-water system. b) Three component system - Construction of ternary phase diagram of acetic acid chloroform-water system and hence the composition of given homogeneous mixture. Construction of tie-line.	16	1, 3, 4, 5, 6
4.	Distribution law a) Distribution coefficient of ammonia between hexane and water. Determination of equilibrium constant of	20	1, 7, 8, 9

	copper - ammonia complex by partition method or coordination number of Cu^{2+} in copper-ammonia complex. b) Distribution coefficient of benzoic acid between toluene and water. c) Distribution coefficient of iodine between hexane and water. d) Determination of the equilibrium constant of the reaction $\text{KI} + \text{I}_2 \rightleftharpoons \text{KI}_3$ and hence the concentration of given KI in hexane and water.		
5.	Dilute Solutions a) Determination of K_f of solid solvent, molar mass of non-volatile solute, mass of solvent and composition of given solution (Solvent-Naphthalene/ Biphenyl/ Benzophenone etc. Solute-Naphthalene/ Biphenyl/ Diphenylamine etc.) b) Determination of vant Hoff's factor for benzoic acid in Naphthalene. c) Determination of atomicity of sulphur.	17	1, 10
6.	Transition temperature Determination of K_T of salt hydrate, molar mass of solute, mass of salt hydrate and composition of given solution (Solvent - $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$/ $\text{CH}_3\text{COONa} \cdot 3\text{H}_2\text{O}$, Solutes glucose, sucrose, urea).	12	1, 11
7.	Surface tension a) Determination of surface tension of various liquids (water - ethanol, water - glycerol, water - sorbitol, nitrobenzene-toluene) by Stalagmometric method (drop number/ drop weight) and by Capillary rise method. b) Determination of parachors of molecules and various groups. c) Determination of concentration of a mixture. d) Determination of surface tension and parachor of liquids using double capillary method. e) Variation of surface tension with concentration. Unknown concentration of a mixture. Interfacial tension. f) Determination of surface excess and area per molecule.	15	1, 12, 13
8.	Thermochemistry a) Determination of the concentration of given strong acid/alkali. b) Thermometric titration of NaOH vs standard HCl. c) Heat of displacement of Cu^{2+} by Zn. d) Determination of the heat of ionisation of acetic acid.	15	1, 14, 15, 16

References

1. V. D. Athawal, Experimental Physical Chemistry, New Age International, 1st edn., 2001.
2. B. P. Levitt and J.A. Kitchener, Findlay's Practical Physical Chemistry, Longmans, London, 9th edn., 1973.
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6. B. Viswanathan, Practical Physical Chemistry, Viva Publications, 2012.
7. P.S. Sindhu, Practicals in Physical Chemistry-A Modern Approach, McMillan India, 2005.
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Model Question Papers

General Instruction to question paper setters

- There will be a 15 main questions in each question paper divided into 3 sections – A, B and C
- Each of the sections A, B and C will have 5 questions each, **1 from each module**.
- Each question in Section A will have 3 sub questions (a), (b) and (c), of which the candidate has to answer any two (2 marks each).
- Each question in Section B will have 2 sub questions (a) and (b), of which the candidate has to answer any one (5 marks each).
- Candidate should answer any three out of the five questions in Section C (10 marks each).
- Section A carries a total of 20 marks, Section B carries 25 marks, and Section 3 carries 30 marks.
- The maximum marks will be 75 and the duration of the exam will be 3 hrs.

First Semester M.Sc. Degree Examination – Model question paper
Branch III – Chemistry/ Branch IV – Analytical Chemistry
CH/CL 211: INORGANIC CHEMISTRY – I
(2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among (a), (b) and (c) from each. Each sub question carries 2 marks

1. (a) Sketch the splitting of d orbitals in a trigonal bipyramidal complex.
(b) Which among CN^- and NH_3 have a higher nephelauxetic effect? Why?
(c) Calculate the CFSE for a d^4 ion.
2. (a) Differentiate accuracy from precision.

- (b) What are metallochromic indicators? Give an example.
 - (c) What is a Student t test used for?
3. (a) CdS is an yellow pigment while CdSe is red. Given reason.
 (b) What is NASICON?
 (c) What are anti-stokes phosphors?
 4. (a) What are zeolites? Explain their use as water softeners?
 (b) Determine the probable structure of perxenate ion using VSEPR theory.
 (c) What are polysiloxanes? Give it structure.
 5. (a) List two conditions that favour the formation of photochemical smog.
 (b) Discuss briefly a method to quantify soil acidity.
 (c) How does chlorine free radicals tamper the ozone layer?

[2 × 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) State and illustrate Jahn-Teller distortion.
 (b) Discuss the factors affecting the magnitude of Δ_o .
7. (a) What is a scatter diagram? What is its significance?
 (b) Discuss briefly the principle behind EDTA titrations.
8. (a) What are SOFCs?
 (b) Briefly discuss the structure of fullerenes.
9. (a) Zeolites find applications as microporous materials and molecular sieves. Substantiate this statement.
 (b) What are isopoly acids?
10. (a) List out five unique properties of water.
 (b) Discuss on the various air pollutants and their effect on human health.

[5 × 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Describe the Molecular orbital energy level diagrams for octahedral metal complexes with and without π -bonds.
12. Explain the utility of TG, DTA and DSC in the study of metal complexes.
13. Detail the types of solid electrolytes giving due importance to structural aspects.
14. Elaborate the properties of the heteropoly acids of Mo and W.

15. What are pourbaix diagrams? Outline its role in explaining the chemistry of processes in lithosphere.

[10 × 3 = 30]

First Semester M.Sc. Degree Examination – Model question paper
Branch III – Chemistry/ Branch IV – Analytical Chemistry
CH/CL 212: ORGANIC CHEMISTRY – I
 (2020 Admission Onwards)

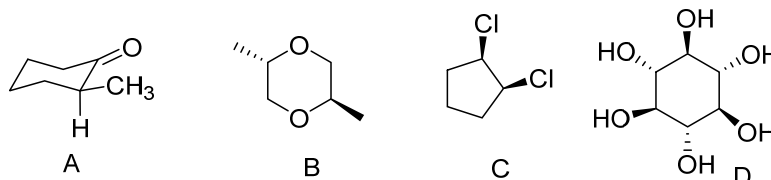
Time: 3 Hrs

Max. Marks: 75

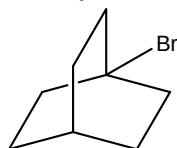
SECTION A

Answer **two** among (a), (b) and (c) from each. Each sub question carries 2 marks

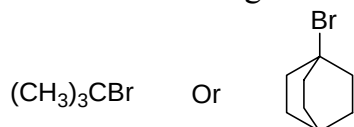
1. (a) Distinguish between conformation and configuration.
 (b) Draw the structure corresponding to diazabicyclo[2,2,2]octane.
 (c) Pick out the chiral/ achiral/ meso structures from the following.



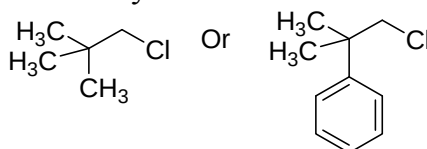
2. (a) What is AIBN?
 (b) Explain the peroxide effect in the addition of HBr to propene.
 (c) How you can synthesize the following molecule?



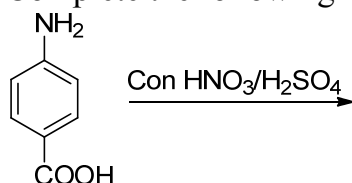
3. (a) Which of the following bromides will undergo a faster solvolysis? Explain



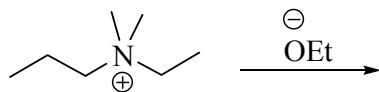
- (b) Given below are two chlorides. Which among them will go through a faster solvolysis? Give reasons for your answer.



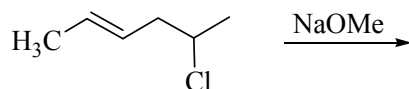
- (c) Complete the following reaction.



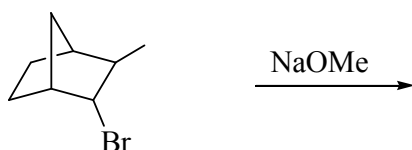
4. (a) Predict the product of the following reaction and indicate the major one. Give reasons.



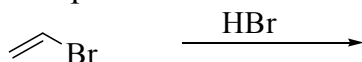
- (b) What are the products obtained the reaction given below. Identify the major product in this case citing reasons.



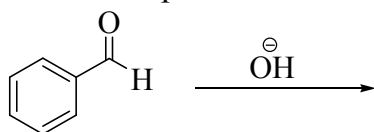
- (c) Identify the major product in the following reaction. Substantiate your answer.



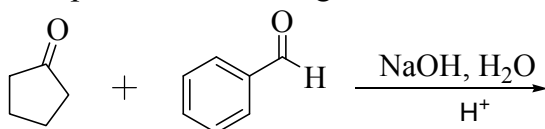
5. (a) Complete the reaction



- (b) Predict the products in the following reaction



- (c) Complete the following reaction

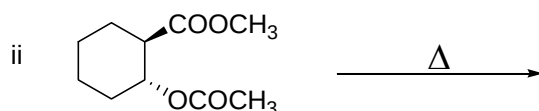
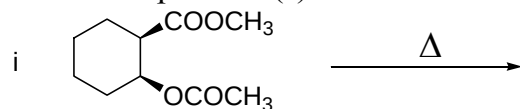


[2 × 10 = 20]

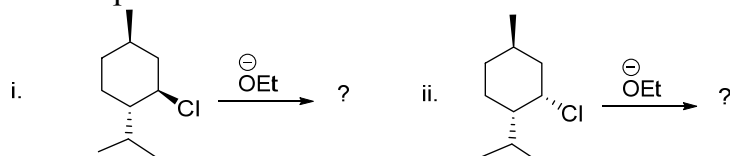
SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

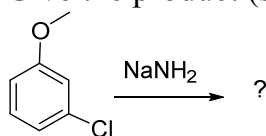
6. (a) Predict the product (s) of the following reactions



- (b) Predict the product (s) of the following reaction and indicate the major one. Explain?



7. (a) Give the product (s) with mechanism. Explain?

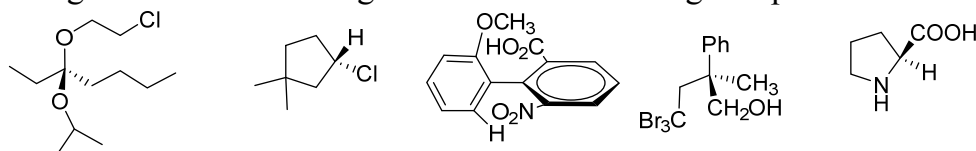


- (b) Discuss the mechanism of allylic bromination using NBS. Explain the stability of allyl radical.

8. (a) How will you convert isopropanol to n-propanol using a boron reagent? How does the addition of borane reagents to alkene differ from hydration? Illustrate with the help of an example.

- (b) Discuss benzoin condensation. What is the importance of cyanide in the reaction?

9. (a) Assign the absolute configuration to the following compounds.



- (b) What are atropisomers? Explain why atropisomerism disappears at higher temperature?

10. (a) How does leaving group affect the rate of S_N^1 and S_N^2 reactions? Explain.
(b) Give the major product obtained when methoxybenzene is nitrated. Discuss the directive effect with the help of resonance structures

[5 × 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Discuss Cotton effect? What is octant rule? Explain ORD curve.
12. Discuss the structure, stability and reactions of carbenes. How will you distinguish between singlet and triplet carbenes by a chemical method?
13. Discuss the mechanism of

a) Robinson Annulation	b) Mannich reaction
c) Thorpe reaction	d) Ritter reaction and
e) Darzen reaction	
14. Neighbouring group participation results retention in configuration. Justify the given statement with the help of suitable examples. What is meant by anchimeric assistance?
15. Explain Wittig and Wittig –Horner reactions with stereochemistry. Compare Witting reaction with Julia olefination.

[10 × 3 = 30]

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(2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among (a), (b) and (c) from each. Each sub question carries 2 marks

1. (a) Check whether the function e^{-x^2} is an eigen function for kinetic energy operator. If so what is the eigen value?
(b) Show that the momentum of particle in 1D box is quantised.
(c) Write the general expression for Hermite polynomial. Deduce first two polynomials.
2. (a) Distinguish between associative and dissociative chemisorption.
(b) Under what condition can multilayer adsorption become more important than monolayer adsorption?
(c) Explain one method of determination of surface pressure.
3. (a) Calculate ΔS of mixing when 2 moles of H_2 , 3 moles of He and 2 moles of O_2 are mixed at fixed temperature assuming ideal behaviour and no chemical change.
(b) Write any two Maxwell's relations and give their significance.
(c) State 'Konowaloff's' rule.
4. (a) Give two reasons to show that conventional techniques are not suitable for the study of kinetics of fast reactions.
(b) Explain steady state principle?
(c) How volume of activation affects the reaction rate?
5. (a) Identify the symmetry elements present in the following and assign the point group
(i) H_2 (ii) HCl
(b) Explain improper axis of symmetry.
(c) Cyclic groups are abelian. Explain.

[2 × 10 = 20]

SECTION B

Answer either (a) or (b) from each question. Each sub question carries 5 marks

6. (a) For a particle in 3D box with $L_x = L_y = \frac{L_z}{2}$, what would be the energy when $n_x = 1$, $n_y = 2$ and $n_z = 2$ and when $n_x = 1$, $n_y = 1$ and $n_z = 4$. Use the calculations to explain the meaning of the term accidental degeneracy.

- (b) $H(x)$ is written as a power series in x as $H(x) = \sum_{j=0}^n a_j x^j$. Derive recursion formula.
7. (a) Write any two methods for the determination of surface area of a solid.
(b) Explain Langmuir-Hinshelwood mechanism of surface catalyzed reactions.
8. (a) Derive Van't Hoff isotherm. How is this useful in the study of chemical equilibria?
(b) Derive Gibbs-Duhem equation.
9. (a) Compare the rate constant as given by Arrhenius equation and collision theory and show that $E_a = E_0 + \frac{RT}{2}$
(b) Derive the rate law for the decomposition of N_2O_5 .
10. (a) Construct the group multiplication table for the symmetry operations of NH_3 molecule.
(b) Determine the number of active IR and Raman lines in the vibrational spectrum of $POCl_3$.

[5 × 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Set up the Schrodinger wave equation for a simple harmonic oscillator. Find the eigen functions and eigen values.
12. Explain any two instrumental techniques used for surface characterization.
13. Write a brief account of the methods for the determination of activity coefficient of electrolytes and non-electrolytes.
14. Explain chain reactions. Discuss Semionoff-Hinshelwood theory of branching chain reactions
15. a) Explain the hybridization scheme in BF_3 molecule using group theory.
b) Show that the four elements of C_{2v} point groups forms 4 classes?

D_{3h}	E	$2C_3$	$3C_2$	σ_h	$2S_3$	$3\sigma_v$		
A'_1	1	1	1	1	1	1	R_z (x, y)	$x^2 + y^2, z^2$
A'_2	1	1	-1	1	1	-1		$(x^2 - y^2, xy)$
E'	2	-1	0	2	-1	0		
A''_1	1	1	1	-1	-1	-1	z (R_x, R_y)	
A''_2	1	1	-1	-1	-1	1		
E''	2	-1	0	-2	1	0		(xz, yz)

[10 × 3 = 30]

SEMESTER II

CH 221 INORGANIC CHEMISTRY II

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	obtain the term symbols of d^n system and determine the splitting of terms in weak and strong octahedral and tetrahedral fields.	E	1
2.	explain the correlation diagrams for d^n and d^{10-n} ions in octahedral and tetrahedral fields and interprets electronic spectra of complexes.	U, E	1
3.	applies magnetic measurements in the determination of structure of transition metal complexes.	Ap	1
4.	relates crystalline structure to X-ray diffraction data and the reciprocal lattice and explains the diffraction methods	U	1
5.	explains crystal defects .	U	1
6.	elaborates the structure of selected compounds of AX , AX_2 , A_mX_n , ABX_3 and spinels.	C	1
7.	explains the electronic structure of solids using free electron theory and band theory.	E	1
8.	understands the differences in semiconductor and dielectric materials and their electrical and optical properties	U, E	1
9.	explain the structure and reactions of S–N, P–N, B–N, S–P compounds and boron hydrides.	U, E	1
10.	analyse the topological approach to boron hydride structure and estimates styx numbers and apply Wade's rules in borane and carboranes.	Ap, An, E	1
11.	identify the electronic configurations and term symbols of lanthanides and actinides.	Ap	1
12.	sketches the shapes of f orbital and shows their splitting in cubic ligand field.	U	1
13.	elaborates the importance of the beach sands of Kerala and their important components.	C	1

PSO–Programme Specific Outcome

Cognitive Level: R–Remember

An–Analyse

CO–Course Outcome

U–Understanding

E–Evaluate

Ap–Apply

C–Create

Module	Course Description	No. of Hrs	CO No.
1.0	Coordination chemistry-II: Spectral and magnetic properties of transition metal complexes	18	
1.1	Electronic spectra of metal complexes-Term symbols of d^n system, Racah parameters, splitting of terms in weak and strong octahedral and tetrahedral fields.	4	1

1.2	Correlation diagrams for d^n and d^{10-n} ions in octahedral and tetrahedral fields (qualitative approach), d-d transition, selection rules for electronic transition, effect of spin orbit coupling and vibronic coupling.	3	2
1.3	Interpretation of electronic spectra of complexes- Orgel diagrams, Tanabe-Sugano diagrams, calculation of Dq , B and β (Nephelauxetic ratio) values, charge transfer spectra.	3	2
1.4	Magnetic properties of complexes-paramagnetic and diamagnetic complexes, molar susceptibility, Gouy's method for the determination of magnetic moment of complexes, spin only magnetic moment.	4	3
1.5	Temperature dependence of magnetism. Temperature Independent Paramagnetism (TIP). Spin state crossover, Antiferromagnetism - inter and intra molecular interaction.	2	3
1.6	Application of magnetic measurements in the determination of structure of transition metal complexes.	2	3
2.0	Crystalline state	18	
2.1	Crystal symmetry- Introduction to point groups and space groups. Miller indices. Reciprocal lattice concept.	2	4
2.2	Close packed structures: BCC, FCC and HCP. Voids. Coordination number.	2	4
2.3	X-ray diffraction by crystals: Function of crystals. Transmission grating and reflection grating. Bragg's equation.	2	4
2.4	Diffraction methods: Powder and rotating crystal. Indexing and determination of lattice type and unit cell dimensions of cubic crystals.	3	4
2.5	Crystal defects: Perfect and imperfect crystals. Point, line and plane defects. Thermodynamics of Schottky and Frenkel defects.	2	5
2.6	Colour centers in alkali halide crystals. Defect clusters. Extended defects: Crystallographic shear structure and stacking faults. Dislocations and crystal structure.	3	5
2.7	Structure of compounds of AX (Zinc blende, Wurtzite), AX_2 (Rutile, fluorite, antiferroite), A_mX_2 (Nickel arsenide), ABX_3 (Perovskite, Ilmenite), Spinel. Inverse spinel structures.	4	6
3.0	Solid state chemistry	18	
3.1	Electronic structure of solids. Free electron theory, band theory. Refinements to simple band theory, k space and Brillouin zones.	4	7
3.2	Conductors, insulators and semiconductors. Band	3	7

	structure of conductors, insulators and semiconductors and their applications.		
3.3	Intrinsic and extrinsic semiconductors, doping of semiconductors and conduction mechanism, the band gap.	3	7
3.4	Temperature dependence of conductivity, carrier density and carrier mobility in semiconductors.	2	7
3.5	Superconductivity, Photoconductivity, Photovoltaic effect. Colour in inorganic solids.	3	7
3.6	Dielectric properties. Dielectric materials. Ferroelectricity, pyroelectricity, piezoelectricity and ionic conductivity. Applications of ferro, piezo and pyroelectrics.	3	8
4.0	Compounds of S, N, P and B	18	
4.1	Sulphur-Nitrogen compounds: S_4N_4 , S_2N_2 , S_4N_2 and polythiazyl S_xN_y compounds. S-N cations and anions.	2	9
4.2	Sulphur-Phosphorus compounds: Molecular sulphides such as P_4S_3 , P_4S_7 , P_4S_9 and P_4S_{10} .	2	9
4.3	Phosphorous-Nitrogen compounds: Phosphazines. Cyclo and linear phosphazines.	2	9
4.4	Boron-Nitrogen compounds: Borazine, substituted borazines and boron nitride.	2	9
4.5	Boron hydrides: Reactions of diborane. Structure and bonding. Polyhedral boranes: Preparation, properties, structure and bonding.	3	9
4.6	The topological approach to boron hydride structure. Styx numbers. Importance of icosahedral framework of boron atoms in boron chemistry. Closo, nido and arachno structures. Wade's rules.	5	10
4.7	Carboranes and metallocarboranes.	2	10
5.0	Lanthanides and actinides	18	
5.1	Lanthanides: Characteristic properties. Electronic configurations and term symbols. Occurrence and extraction. Separation techniques.	4	11
5.2	Oxidation states of lanthanides. Spectral and magnetic properties of lanthanides. Lanthanide complexes as shift reagents.	3	11
5.3	Shapes of f orbital and their splitting in cubic ligand field.	2	12
5.4	Actinides: Occurrence and general properties. Extraction of thorium and uranium. Electronic configuration and term symbol. Oxidation states. Spectral and magnetic	4	11

	properties.		
5.5	Comparative properties of lanthanides and actinides. Trans-uranium elements and their stabilities.	2	11
5.6	Applications of lanthanide and actinide compounds.	1	13
5.7	Comprehensive study of the beach sands of Kerala and their important components such as monazite, ilmenite, zircon and sillimanite.	2	13

References

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7. S. Cotton, Lanthanides and Actinides, Macmillan, 1991.
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9. A. Syamal and R. L. Datta, Elements of Magnetochemistry, Affiliated East-West Press, 1980.
10. C. Kittel, Introduction to Solid State Physics, Wiley and Sons, 8th edition, 2004.
11. N. N. Greenwood and A. Earnshaw, Chemistry of Elements, REPP Ltd, 2nd edition, 2005.
12. A. Earnshaw, Introduction to Magnetochemistry, Academic Press, 1968.

CH 222 ORGANIC CHEMISTRY II

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	discuss the fundamentals, operating principles and instrumentation of separation techniques.	R	1,
2.	differentiate the principle and applications of phase transfer catalysis with examples.	An	1
3.	describe the various methods of determining reaction mechanisms and basic thermodynamic principles of organic reactions.	U	1
4.	explain the Hammett parameters of reaction and design an experiment to confirm the mechanism of a reaction.	R, C	1
5.	identify different types of rearrangement reactions, determine the product of the reaction applying migratory aptitude, and reproduce the evidences for the mechanism of the reaction.	R, E	1

6.	understand that the outcomes of pericyclic reactions may be understood in terms of frontier orbital interactions, correlation diagram, Mobius and Huckel approach.	R	1
7.	recall and define the various types of pericyclic reaction; define such terms as 'conrotatory', 'suprafacial'.	R	1
8.	predict and rationalise the outcomes of pericyclic reactions including stereospecificity, regioselectivity, and stereoselectivity.	U	1
9.	state the synthetic importance of the above cycloaddition and rearrangement reactions, and give disconnections of target compounds corresponding to these reactions.	R	1
10.	describe the fate of excited molecule based on Jablonowski diagram, predict the course of an organic photochemical reaction and identify the product with the type of functional group.	R, An	1
11.	propose synthetic routes to a variety of molecules, starting from simple precursors with correct stereochemistry and reagents of selected reactions.	Ap	1

Module	Course Description	No. of Hrs	CO No.
1.0	Separation Techniques	18	
1.1	Classification of chromatographic methods. Theory of chromatography. Applications of chromatographic methods. Adsorption and partition chromatography. Paper, thin layer and column chromatographic methods.	4	1
1.2	Common Spray reagents and Developing agents in chromatography.	2	1
1.3	Centrifugal TLC, LC, pressure column chromatography, HPLC and GC, column matrices. Detectors. Affinity and chiral separations using HPLC.	4	1
1.4	GC MS and LC MS Principle, instrumentation and applications.	4	1
1.5	Normal and ultra-centrifugation. Gel and capillary electrophoresis and their applications.	2	1
1.6	Solvent extraction. Extraction using supercritical liquid CO ₂ , Craig's technique of liquid-liquid extraction.	2	1
2.0	Physical Organic Chemistry	18	
2.1	Phase transfer catalysis and its applications.	2	2
2.2	Kinetic and thermodynamic control of reactions with examples.	1	3
2.3	Reaction coordinates- difference between transition state and intermediates, Energy profiles, Curtin – Hammet Principle, Hammond postulate. Principle of microscopic	3	3

	reversibility. Reactivity in relation to molecular structure and conformation. Steric effects, F strain. Ortho effect, Bond angle strain.		
2.4	Solvent polarity and parameters, Y, Z and E parameters and their applications. Primary, secondary, inverse kinetic isotope effects. Salt effects and special salt effects in SN reactions.	3	3
2.5	Methods of determining reaction mechanisms-Product analysis, Isotopic studies, Primary and secondary kinetic isotope effects, Isolation and detection of intermediates, Cross over experiments.	4	3
2.6	Linear Free Energy Relations, The Hammett equation and its applications. Significance of sigma (σ) and rho (ρ) reactions with negative and positive ρ , low and high ρ , abnormal Hammet plot, Taft equation. Hammet plot for aromatic nucleophilic, electrophilic, S_N^1 , S_N^2 , electrophilic addition, Wittig reactions.	5	4
3.0	Molecular Rearrangement and Transformation Reactions	18	
3.1	Types of organic rearrangements: Anionic, cationotropic, prototropic, rearrangements involving carbene and nitrene intermediates.	4	5, 11
3.2	Mechanism with evidence of Wagner – Meerwein, Pinacol, Demjanov, Hofmann, Curtius, Schmidt, Lossen, Beckmann.	3	5, 11
3.3	Mechanism with evidence of Fries, Fischer–Hepp, Hofmann–Martius, von-Richter, Orton, Bamberger, Smiles.	3	5, 11
3.4	Mechanism with evidence of Dienone–phenol, Benzilic acid, Benzidine, Favorskii, Stevens, Dakin.	3	5, 11
3.5	Bucherer reaction, Rupe, Stevens, Claisen rearrangement.	2	5, 11
3.6	Rearrangements involving diazomethane – Arndt Eistert reaction, Wolf rearrangement.	3	5, 11
4.0	Aromaticity and Pericyclic Reactions	18	
4.1	Aromaticity and antiaromaticity. Non aromatic, homoaromatic, hetero and non-benzenoid aromatic systems. Aromaticity of annulenes, mesoionic compounds, metallocenes, cyclic carbocations, carbanions.	2	6, 7
4.2	Influence of aromaticity on physical and chemical properties, Diamagnetic anisotropic – benzene and paracyclophane.	1	6, 7
4.3	Classification of pericyclic reactions, FMO, Correlation	4	6, 7,

	diagram, Mobius and Huckel theory of electrocyclic and cyclo addition reactions.		8, 9
4.4	Diels–Alder reaction–Stereo and regio selectivity , industrial applications–Aldrene, Dialdrene, endosulfan, anti stroke drug, Reserpine synthesis, fire retardant , Retro–Diels Alder, Alders ene, intramolecular Diels Alder reaction.	4	6, 7, 8, 9
4.5	1,3–Dipolar cycloaddition, nitrones, nitrile oxide, construction of heterocycles–oxazole, triazole, tetrazole, ozonide, Huisgen reaction.	3	6, 7, 8, 9
4.6	Sigmatropic rearrangement–classification [i,j], examples of [1,3], [1,5], [1,7], [3,3], [2,3] – FMO theory, stereochemistry of cope rearrangement, Claisen rearrangement.	4	6, 7, 8, 9
5.0	Organic Photochemistry	18	
5.1	Photochemical processes. Singlet and triplet states and their reactivity, Jablonski diagram, Energy transfer, sensitization and quenching.	3	10
5.2	Photoreactions of carbonyl compounds, enes, dienes and arenes. Norrish Type I and Type II reactions of acyclic ketones.	4	10
5.3	Patterno-Buchi and Barton reactions, Hofmann- Löffler-Freytag reaction, photo-Fries and Di- π methane, oxa di- π methane rearrangements.	4	10
5.4	Photoreactions of Vitamin D. Photosynthesis, photochemistry of vision.	3	10
5.5	Singlet oxygen generation and its reactions. Introduction to chemiluminescence.	2	10
5.6	Applications of photochemistry.	2	10

References

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18. L. M. Harwood, Polar rearrangements, Oxford University Press, 1995.
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CH 223 PHYSICAL CHEMISTRY II

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	apply quantum mechanical principles in solving both real and imaginary spherical harmonics systems-multi electron systems and analyse spectral lines.	U, Ap, An	1
2.	describe and explain the physical and chemical principles that underlie molecular structure determination techniques like microwave, vibrational, Raman and electronic spectroscopy.	R, U	1
3.	predict likely spectral characteristics of given molecular species, and be able to rationalise those characteristics on the basis of structural and electronic arguments.	Ap, An	1
4.	acquire knowledge of basics of statistical mechanics and compare statistical methods.	U, Ap	1
5.	understand and apply of theories of heat capacity.	U, Ap	1
6.	understand theories of electrolytes and electrochemical reactions.	R, U, Ap, An	1
7.	ascertain the application of electrochemistry in industrial fields.	An	1
8.	understand the theories and applications behind various types of analytical techniques in electrochemistry.	U	1
9.	acquire skill in solving numerical problems.	Ap	1

Module	Course Description	No. of Hrs	CO No.
1.0	Quantum Chemistry II	18	
1.1	Rotational motion: The wave equation in spherical polar coordinates-particle on a ring, the phi equation and its solution, wave functions in the real form.	3	1, 9
1.2	Non-planar rigid rotor and particle on a sphere-separation of variables, the phi and the theta equations and their solutions, Legendre and associated Legendre equations, Legendre and associated Legendre polynomials. Spherical harmonics (imaginary and real forms)-polar diagrams of spherical harmonics.	5	1, 9
1.3	Quantum Mechanics of Hydrogen-like systems: The wave equation in spherical polar coordinates: separation of variables – r, θ and ϕ equations and their solutions, wave functions and energies of hydrogen-like systems.	4	1, 9
1.4	Radial distribution functions, angular functions and their plots.	2	1
1.5	Wave functions for multi electron systems, wave equation for multi electron systems, symmetric and anti-symmetric wave functions, Pauli's anti-symmetry principle, and the postulate of spin. Spin orbitals. Spin-orbit coupling. Vector atom model-Term symbols, selection rules and explanation of spectral lines of hydrogen atom.	4	1
2.0	Spectroscopy I	18	
2.1	Rotational spectrum, selection rules, intensity of spectral lines, calculation of inter-nuclear distance.	2	2, 3
2.2	Non-rigid rotors and centrifugal distortion. Rotational spectra of polyatomic molecules-linear and symmetric top molecules. Introduction to instrumentation.	2	2, 3, 9
2.3	Vibrational spectra of harmonic and anharmonic oscillator. Selection rules. Morse curve, fundamentals and overtones. Determination of force constant.	3	2, 3, 9
2.4	Rotational fine structure, P, Q, R branches of spectra.	1	2, 3
2.5	Vibrational spectra of polyatomic molecules: Normal modes, classification of vibrational modes into stretching (asymmetric, symmetric), bending, parallel and perpendicular vibrations.	2	2, 3
2.6	Finger print region and group frequencies. Introduction to FTIR and instrumentation.	1	2, 3
2.7	Raman scattering, polarizability and classical theory of Raman spectrum.	1	2, 3
2.8	Rotational and vibrational Raman spectrum. Raman	2	2, 3

	spectra of polyatomic molecules. Complementarity of IR and Raman spectra. Mutual exclusion principle.		
2.9	Introduction to instrumentation. Laser Raman spectrum.	1	2, 3
2.10	Electronic spectra of diatomic molecules. Vibrational coarse structure and rotational fine structure of electronic spectrum. Franck-Condon principle.	2	2, 3, 9
2.11	Types of electronic transitions. Fortrat diagram. Predissociation.	1	2, 3
3.0	Statistical Thermodynamics	18	
3.1	Basic principle of permutation, combination, thermodynamic probability and entropy.	3	4
3.2	Microstates, concept of ensembles canonical and grand canonical ensemble.	1	4
3.3	Maxwell Boltzmann distribution.	2	4
3.4	Molecular partition functions - Translational (1D, 2D and 3D), vibrational, rotational and electronic partition functions. Total partition functions.	4	4
3.5	Relationship between partition functions and thermodynamic properties, Sackur-Tetrode equation. The principle of equi-partition of energy.	4	4
3.6	Chemical equilibrium, Law of mass action, Transformation of the equilibrium expressions. Statistical derivation.	4	4
4.0	Quantum statistics	18	
4.1	Bose-Einstein statistics, Thermodynamic probability, Bose Einstein distribution function. Examples of particles.	3	4
4.2	Fermi-Dirac statistics. Examples of particles- Fermi-Dirac distribution function. Thermionic emission	3	4
4.3	Relation between Maxwell Boltzmann, Bose Einstein and Fermi-Dirac statistics.	3	4
4.4	Quantum theory of heat capacity - calculation of heat capacity of gases; limitation of the method.	3	5
4.5	Heat capacity of solids. Dulong and Petit's law, Kopp's law; limitations.	2	5
4.6	Einstein theory of heat capacity; limitations.	2	5
4.7	The Debye theory of specific heat capacity of solids.	2	5
5.0	Electrochemistry	18	
5.1	Ionics: Activity and activity coefficient of electrolytes, determination of activity coefficient.	1	6
5.2	Debye-Huckel theory of strong electrolytes, Debye-Huckel-Onsager equation and its derivation, limitation of the model, conductance at high frequencies and high	2	6

	potentials –Wein effect and Debye - Falkenhagen effect.		
5.3	Ionic strength, Debye - Huckel limiting law, mean ionic activity coefficient.	1	6, 9
5.4	Electrodeics: Different type of electrodes. Electrochemical cells, EMF of concentration cells, liquid junction potential and its determination, cells without liquid junction potential.	2	6, 9
5.5	Calculation of thermodynamic properties. Electrical double layer and electro capillarity.	2	6, 9
5.6	Electrokinetic phenomena.	1	6, 7
5.7	Over potentials: Butler-Volmer equation. Tafel and Nernst equation, Tafel plot and its significance.	3	6 7
5.8	Fuel cells: H ₂ -O ₂ , zinc-air and solid oxide fuel cells.	1	7
5.9	Potentiometric titrations involving redox reaction. Conductometric titrations. Coulometric titrations.	2	8
5.10	Voltammetry: principle and method of polarography, cyclic voltammetry, stripping voltammetry and amperometry.	3	8

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Model Question Papers

General Instruction to question paper setters

- There will be a 15 main questions in each question paper divided into 3 sections – A, B and C
- Each of the sections A, B and C will have 5 questions each, **1 from each module.**
- Each question in Section A will have 3 sub questions (a), (b) and (c), of which the candidate has to answer any two (2 marks each).
- Each question in Section B will have 2 sub questions (a) and (b), of which the candidate has to answer any one (5 marks each).
- Candidate should answer any three out of the five questions in Section C (10 marks each).
- Section A carries a total of 20 marks, Section B carries 25 marks, and Section 3 carries 30 marks.
- The maximum marks will be 75 and the duration of the exam will be 3 hrs.

Second Semester M.Sc. Degree Examination – Model question paper
Branch III – Chemistry/ Branch IV – Analytical Chemistry
CH/CL 221: INORGANIC CHEMISTRY – II
(2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among (a), (b) and (c) from each. Each sub question carries 2 marks

1. (a) Which among $\text{Ni}(\text{CO})_4$ and $\text{Fe}(\text{CO})_5$ has an intense d–d transition ? Why?
(b) The effective magnetic moment of a complex is 4.90 BM. Calculate the number of unpaired electrons per unit complex.
(c) The electronic spectra of metal complexes are broad. Why?
2. (a) Differentiate H-centre from V-centre in NaCl crystals.
(b) What effects do Schottky and Frenkel defects have on the density of a crystal?
(c) What are spinels? Give the general formula of spinels.
3. (a) What is meant by band gap of a substance?
(b) The conductance of metals decreases with increase in temperature. Why?
(c) What are intrinsic and extrinsic semiconductors
4. (a) Complete the reactions given below
(i) $\text{B}_2\text{H}_6 + \text{H}_2\text{O} \rightarrow$
(ii) $\text{S}_4\text{N}_4 + \text{Cl}_2 \rightarrow$
(b) Which undergoes addition reactions faster – Benene or Borazine? Why?
(c) Clasify the following into closo, nido and archano.
 B_2H_6 , $\text{C}_2\text{B}_9\text{H}_{11}$, $\text{B}_{12}\text{H}_{12}^{2-}$, B_5H_{11} ,
5. (a) Actinides form oxocations but lanthanides don't. Give reason?
(b) What is misch metal?
(c) Which among lanthanides and actinides has a higher tendency to form complexes? Why?

[2 × 10 = 20]

SECTION B

Answer either (a) or (b) from each question. Each sub question carries 5 marks

6. (a) Discuss the Orgel diagram and electronic spectra of $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$.
(b) What is meant by a charge transfer spectra?
7. (a) Detail the line and plane defects in solids.
(b) Describe the principle and procedure of X-ray diffraction method.
8. (a) Examine the various types of dielectric properties exhibited by crystals.

- (b) What is photovoltaic effect? Which type of materials exhibit this property?
9. (a) How is polythiazyl synthesized? Describe its structure. Why is it treated as a one dimensional conductor?
 (b) Obtain the styx number of B_4H_9 .
10. (a) Detail the ion exchange method employed in the separation of lanthanides.
 (b) Briefly describe the industrial importance of the beach sands of Kerala.
- [5 × 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Explain the Guoy's methods used to determine magnetic susceptibility. How is it important in structure determination?
12. Discuss in detail the perovskite structure by taking $SrTiO_3$ as the example.
13. Discuss the salient features of the band theory of solids and compare it with the free electron theory of solids.
14. What are carboranes? How are they obtained?
15. Compare the spectral and magnetic properties of lanthanides and actinides.
- [10 × 3 = 30]

Second Semester M.Sc. Degree Examination – Model question paper
Branch III – Chemistry/ Branch IV – Analytical Chemistry
CH/CL 222: ORGANIC CHEMISTRY – II
 (2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among (a), (b) and (c) from each. Each sub question carries 2 marks

1. (a) What is retention time? Explain its significance.
 (b) Write any two spraying reagents for detection of alkaloids.
 (c) What is meant by reversed phase HPLC.
2. (a) What is F strain?
 (b) Explain microscopic reversibility.
 (c) Describe Taft equation and its terms?
3. (a) Show how vicinal diols are converted to ketones by rearrangement?
 (b) Give the mechanism of Curtius rearrangement.
 (c) Briefly explain Fisher-Hepp reaction.

4. (a) Why is [10] annulene a non aromatic compound?
 (b) Azulene posses dipole moment of 1.4 D. Why?
 (c) State Woodward and Hoffman rules for pericyclic reaction?
5. (a) What is photo-Fries rearrangement?
 (b) Distinguish singlet and triplet states in photochemistry.
 (c) Write an example for Barton reaction.

[2 × 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) Describe the instrumentation of GC-MS
 (b) What are the information's obtained from a LC-MS chromatogram?
7. (a) Design a cross over experiment for Claisen rearrangement and predict your observation.
 (b) Hammett ρ value of nitration of benzene is negative while that of Wittig reaction is positive Explain.
8. (a) Explain the migratory aptitude in Baeyer-Villager rearrangement with three examples
 (b) Discuss the mechanism and applications of Dienone-phenol rearrangement
9. (a) Write the product of photochemical ring closure of 2E, 4E hexadiene with correct stereochemistry and FMO explanation
 (b) Draw a correlation diagram to show that supra-supra 4+2 cycloaddition is thermally allowed.
10. (a) Discuss the chemistry behind the process of vision.
 (b) Explain Paterno-Buchi reaction

[5 × 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Describe the experimental procedures for thin layer chromatography and column chromatography.
12. Explain any four reactions where isotopic studies support the mechanism.
13. Describe with evidences the mechanism of

a) Wagner-Meerwein rearrangement	b) Pinacol rearrangement
c) Demjanov rearrangement	d) Hofmann rearrangement
14. Describe the stereoselectivity and regioselectivity of Diels-Alder reactions
15. Write a note on fate of excited state molecule with a Jablonski diagram and

photochemistry of vitamin-D.

[10 × 3 = 30]

Second Semester M.Sc. Degree Examination – Model question paper
Branch III – Chemistry/ Branch IV – Analytical Chemistry
CH/CL 223: PHYSICAL CHEMISTRY – II
(2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among (a), (b) and (c) from each. Each sub question carries 2 marks

1. (a) Write the determinantal form of wave function for lithium atom.
(b) By inspecting the hydrogen like wave function,
$$\varphi_{nlm} = \frac{\sqrt{2}}{81\sqrt{\pi}} Z^{3/2} (6 - Zr) Zr \exp(-Zr/3) \cos \theta$$
, find the quantum numbers n , l and m .
(c) What is a radial distribution function? Mention its importance.
2. (a) How would one determine the theoretical force constant of the C–C bond?
(b) Anti-stokes lines are usually weak. Why?
(c) What is the effect of nuclear spin on the intensity of spectral lines?
3. (a) Differentiate between Bosons and Fermions.
(b) Explain the concept of ensembles and give the difference in properties of each category
(c) How can you explain partition function is a measure of number of available energy levels?
4. (a) Calculate the value of C_v for any element when its temperature is equal to the Debye characteristics temperature.
(b) What is Sterling's approximation? How this approximation helps to arrive at thermodynamic probability.
(c) Distinguish between Dulong Pettit law and Kopps law.
5. (a) Draw the graph and explain the theory of conductometric titration of a weak acid against a strong base.
(b) What is the significance of half-wave potential?
(c) Calculate the mean activity coefficient of 0.01 M BaCl_2 in water at 25°C.

[2 × 10 = 20]

SECTION B

Answer either (a) or (b) from each question. Each sub question carries 5 marks

6. (a) Verify that $F = 1/\sqrt{2} \pi \exp(iM\phi)$ constitute an orthonormal set for particle

- in a ring.
- (b) Write the Schrodinger equation for hydrogen atom in polar coordinates and separate the variables.
7. (a) Spacing between adjacent lines in HCl molecule is 10 cm^{-1} . Force constant is $1.38 \times 10^{-23}\text{ JK}^{-1}$, Calculate maximum population at room temperature.
- (b) Explain the origin of P and R branches in rotational-vibrational spectrum.
8. (a) Deduce Sackur-Tetrode relation using Partition function.
- (b) State and prove Boltzman's theorem connecting entropy and probability.
9. (a) Considering free electrons in a metal to form a Fermi gas. Obtain the Richardson – Dushman equation for thermionic emission for electrons.
- (b) Deduce Fermi-Dirac distribution law; hence obtain an expression for energy.
10. (a) Explain the term ionic mobility. The H^+ ion because of its heavy hydration and consequent large size and shape, should have a low mobility but actually its mobility is very high. How would you account for it? Why does H^+ ion move about 50 times more rapidly in ice than in liquid water.
- (b) The exchange current density of a Pt/H_2 , $\text{H}^+(\text{aq})$ electrode is 0.79 mA cm^{-2} . What current flows through a standard electrode of total area 5 cm^2 when the potential difference across the electrode is 5 mV , the temperature 25°C and the proton activity unity?

[5 × 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. (i) Apply Schrodinger equation for particle in a ring. Find eigen values and eigen functions.
- (ii) Show that any two associated Legendre functions satisfy orthogonality condition.
- (7+3)
12. (i) The rotational Raman spectrum recorded for $^{14}\text{N}_2$ molecule using monochromatic laser source of wave length 336.86 nm , first three Stokes lines were observed respectively at 28677.3 , 29669.3 and 29661.4 cm^{-1} . Find the bond length of the molecule.
- (ii) How is the rotational spectrum of a diatomic molecule affected by isotopic substitution?
- (5+5)
13. (i) How thermo dynamic functions like internal energy, entropy and specific heat capacity are related to partition function? Derive the relation.
- (ii) Explain Maxwell-Boltzman distribution law.
- (7+3)

14. What are the limitations of Einstein's theory of heat capacity? How Debye theory attempted to rectify this? Discuss Debye theory of specific heat capacity of solids.
15. (i) What is exchange current density? How the concept is understood using Butler-Volmer equation?
(ii) Describe the theory and application of cyclic voltametry.

(5+5)

[10 × 3 = 30]

SEMESTER III

CH 231 INORGANIC CHEMISTRY III

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	demonstrate knowledge of advanced content in the areas of inorganic chemistry such as in organometallic compounds, bioinorganic compounds, spectroscopic methods in inorganic Chemistry and nuclear chemistry.	U	1
2.	examine the bonding in simple and polynuclear carbonyls with and without bridging and complexes with linear π donor ligands.	U, An	1
3.	explain the structure and bonding of ferrocene and dibenzenechromium with the help of MO theory.	U, An, C	1
4.	understand fundamental reaction types and mechanisms in organometallics and to employ them to understand selected catalytic processes in industry.	U, An, C	1
5.	contrasts the thermodynamic and kinetic stability of complexes, analyses the factors affecting stability of complexes and explains the methods of determining stability constants.	An, E	1
6.	classifies ligand substitution reactions and explains its kinetics and various mechanisms.	U, E	1
7.	analyze the chemical and physical properties of metal ions responsible for their biochemical action as well as the techniques frequently used in bioinorganic chemistry such as oxygen transport, e-transfer, communication, catalysis, transport, storage etc.	U, An	1
8.	explain the principles of spectroscopic methods employed in inorganic chemistry and their applications in the study of metal complexes.	An, E	1
9.	demonstrate a knowledge of fundamental aspects of the structure of the nucleus, radioactive decay, nuclear reactions, counting techniques.	R, U	1
10.	evaluate the role of nuclear chemistry to find the most suitable measures, administrative methods and industrial solutions to ensure sustainable use of the world's nuclear resources.	U, E, C	1, 4

PSO–Programme Specific Outcome

Cognitive Level: R–Remember

An–Analyse

CO–Course Outcome

U–Understanding

E–Evaluate

Ap–Apply

C–Create

Module	Course Description	No. of Hrs	CO No.
1.0	Organometallic compounds	18	

1.1	Nomenclature of organometallic compounds. Hapto nomenclature. 18 and 16 electron rule, isoelectronic and isolobal analogy.	2	1
1.2	Metal carbonyls, bonding in metal carbonyls. Synthesis, structure and bonding of polynuclear carbonyls with and without bridging.	2	2
1.3	Complexes with linear π donor ligands: Olefins, acetylenes, dienes and allyl complexes. Complexes with cyclic π donors: Cyclopentadiene, benzene complexes.	2	2
1.4	Structure and bonding of ferrocene and dibenzenechromium complexes (MO treatment).	4	3
1.5	Oxidative addition and reductive elimination, insertion and elimination reactions	3	4
1.6	Catalysis by organometallic compounds: Alkene hydrogenation using Wilkinson's catalyst, hydroformylation of olefins using cobalt and rhodium catalyst, polymerization reaction by Ziegler-Natta catalyst, Monsanto acetic acid process, Palladium catalysed oxidation of ethylene-the Wacker process.	5	4
2.0	Coordination chemistry-III: Reactions of metal complexes	18	
2.1	Energy profile of a reaction - Thermodynamic and kinetic stability, Stability of complex ions in aqueous solutions: Formation constants. Stepwise and overall formation constants. Factors affecting stability of complexes.	2	1, 5
2.2	Determination of stability constants: spectro photometric, polarographic and potentiometric methods.	3	1, 5
2.3	Stability of chelates. Thermodynamic explanation, macrocyclic effects.	1	1, 5
2.4	Classification of ligand substitution reactions-kinetics and mechanism of ligand substitution reactions in square planar complexes, trans effect theory and synthetic applications.	3	1, 6
2.5	Kinetics and mechanism of octahedral substitution-water exchange, dissociative mechanism, associative mechanism - Eigen-Wilkins mechanism, Eigen - Fuoss equation, base hydrolysis, racemisation and isomerisation reactions.	3	1, 6
2.6	Electron transfer reactions: Outer sphere mechanism-Marcus theory, inner sphere mechanism - Taube mechanism.	3	1, 6
2.7	Photochemical reactions-substitution and redox reactions of Cr(III), Ru(II), and Ru(III) complexes. Photo-isomerisation and photo-aquation reactions of metal complexes.	3	1, 6

3.0	Bioinorganic chemistry	18	
3.1	Essential and trace elements in biological systems, structure and functions of biological membranes, mechanism of ion transport across membranes, sodium-potassium pump.	2	1, 7
3.2	Photosynthesis, porphyrin ring system, chlorophyll, PS I and PS II. Synthetic model for photosynthesis.	2	1, 7
3.3	Role of calcium in biological systems - blood coagulation, muscle contraction.	1	1, 7
3.4	Oxygen carriers and oxygen transport proteins-haemoglobin and myoglobin.	2	1, 7
3.5	Non-haeme iron-sulphur proteins involved in electron transfer-ferredoxin and rubredoxin.	3	1, 7
3.6	Iron storage and transport in biological systems ferritin and transferrin.	3	1, 7
3.7	Redox metalloenzymes-cytochromes, cytochrome P-450, peroxidases and superoxide dismutase and catalases. Nonredox metalloenzymes- Carboxypeptidase A - structure and functions.	3	1, 7
3.8	Nitrogeases, biological nitrogen fixation. Vitamin B ₁₂ and coenzymes. Toxic effects of metals (Cd, Hg, Cr and Pb).	2	1, 7
4.0	Spectroscopic Methods in Inorganic Chemistry	18	
4.1	Infrared spectra of coordination compounds. Structural elucidation of coordination compounds containing the following molecules/ ions as ligands- NH ₃ , H ₂ O, CO, NO, OH ⁻ , SO ₄ ²⁻ , CN ⁻ , SCN ⁻ , NO ₃ ⁻ , NO ₂ ⁻ , CH ₃ COO ⁻ and X ⁻ (X=halogen). Changes in ligand vibration on coordination with metal ions.	5	1, 8
4.2	Vibrational spectra of metal carbonyls-CD and ORD spectra of metal complexes.	3	1, 8
4.3	ESR spectra: Application to Cu(II) complexes and inorganic free radicals such as PH ₄ , F ₂ ⁻ and [BH ₃] ⁻ .	3	1, 8
4.4	Nuclear Magnetic Resonance Spectroscopy: The contact and pseudocontact shifts, some applications including biological systems, an overview of NMR of metal nuclides with emphasis on ¹¹ B, ³¹ P and ¹⁹ F NMR.	4	1, 8
4.5	Mossbauer Spectroscopy: Application of the technique to the studies of iron and tin complexes.	3	1, 8
5.0	Nuclear Chemistry	18	
5.1	Nuclear structure, mass and charge. Nuclear moments. Binding energy. Semiempirical mass equation. Stability rules. Magic numbers.	3	1, 9

5.2	Nuclear models: Shell, Liquid drop, Fermi gas, collective and optical models.	3	1, 9
5.3	Equation of radioactive decay and growth. Half life and average life. Radioactive equilibrium. Transient and secular equilibria.	3	1, 9
5.4	Nuclear reactions: Direct nuclear reactions, heavy ion induced nuclear reactions, photonuclear reactions. Neutron captures cross section and critical size.	3	1, 9
5.5	Nuclear fission as a source of energy, Nuclear chain reacting systems. Principle of working of the reactors of nuclear power plants. Breeder reactor. Nuclear fusion reaction, stellar energy.	3	1, 10
5.6	Principles of counting technique such as G.M. counter, proportional, ionization and scintillation counters. Cloud chamber.	3	1, 9

References

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CH 232 ORGANIC CHEMISTRY III

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	describe and explain the physical and chemical principles that underlie molecular structure determination techniques such as UV-visible, IR, mass and NMR spectroscopy.	U, An	1
2.	apply knowledge of molecular structure determination using UV-visible, IR, mass and NMR spectroscopic techniques to identify and/or characterise chemical compounds from experimental data.	Ap, An	1, 8
3.	calculate $\lambda_{\max}$ of a compound, apply IR frequency table to determine the functional groups present in the molecule, interpret mass spectrum of compound from fragmentation.	U, Ap	1, 8
4.	predict likely spectral characteristics of given molecular species; solve the structures of unknown molecules using appropriate spectroscopic techniques.	U, Ap, An	1, 8
5.	devise a 2 D NMR of a compound based on learned principles and solve the structure of a compound based on NMR data.	C, Ap	1, 8
6.	discuss organic transformations with organometallic compounds and predict the products of the reactions.	U	1
7.	propose the retro synthetic pathways to a variety of molecules	U, Ap, C	1
8.	propose mechanisms for chemical reactions, given starting materials, reagents, conditions, and/or products.	U, Ap, C	1
9.	compare the reactions and mechanism and determine the products of a selected set of reactions; identify protecting group strategies.	Ap, E	1
10.	devise combinatorial method to create a library of compounds.	C	1, 6
11.	give examples of stereoselective, regioselective and chemoselective reductions and oxidations.	U	1

Module	Course Description	No. of Hrs	CO No.
1.0	UV-vis and IR Spectroscopy and Mass spectrometry	18	
1.1	Electronic transitions and analysis of UV spectra of enes, enones and arenes. Woodward Fieser rules. Effect	4	1, 2, 3

	of solvent polarity on UV absorption.		
1.2	Principle of characteristic group frequency in IR. Identification of functional groups and other structural features by IR, Hydrogen bonding and IR bands. Sampling techniques.	4	1, 2, 3
1.3	Mass spectrometry-Soft and hard ionization techniques; EI, CI, FAB, Electrospray and MALDI ion sources. Magnetic, High resolution (Double focusing), TOF and quadrupole mass analysers. Characteristic EIMS fragmentation modes and MS rearrangements.	6	1, 2, 3
1.4	Mass spectral fragmentation patterns of long chain alkanes, alkenes, alkynes, alcohols, ethers, thiols, aromatic compounds, aldehydes, ketones, acids, amides, nitro, amino and halo compounds.	4	1, 2, 3
2.0	NMR spectroscopy and Structural elucidation	18	
2.1	Theory of NMR spectroscopy, chemical shifts, anisotropic effects and coupling constant. Spin-spin interactions in typical systems. First order and higher order spectra.	5	1, 2,
2.2	Simplification methods of complex spectra by high field NMR, shift reagents, chemical exchange and double resonance.	5	1, 2
2.3	¹³ C NMR chemical shifts. Applications of NOE, DEPT, and 2D techniques such as COSY-HSQC, HMQC and HMBC (basic principles only).	5	1, 2, 5
2.4	Spectral interpretation and structural elucidation. Solving of structural problems on the basis of numerical and spectrum based data.	3	1, 4
3.0	Organometallic compounds in organic synthesis	18	
3.1	Preparation of organo Mg, Al, Li, Cu, Zn, Cr, Grignard reagents in organic synthesis. Alkylation, oxirane addition, carbon dioxide addition, carbonyl addition, enone addition (1,2 - and 1,4 - additions), reduction, and enolisation reactions. Selectivity in Grignard reactions.	5	6, 8
3.2	Reactions of organo Li reagents, Li exchange reaction, its use in the preparation of RLi compounds, addition to C=O, COOH and CONR ₂ , Li dialkylcuprates (Gilman reagent)-preparation and reaction with alkyl halides, aryl halides and enones.	5	6, 8
3.3	Alkynyl Cu(I) reagents, Glasier coupling. Dialkyl cadmium compounds preparation and reaction with acyl halides.	4	6, 8
3.4	Benzene tricarbonyl chromium - preparation and reaction with carbanions. Tebbe's reagent, Silane carbanion and its reactions.	4	6, 8

4.0	Methods in organic synthesis	18	
4.1	Retrosynthetic analysis and disconnection approach-synthons, synthetic strategy, reliable reaction, disconnect after heteroatom, chemoselectivity, two group disconnections (use of epoxide), creation of cis and trans double bonds, retro synthesis of amines.	3	7, 9
4.2	Regioselectivity in enol alkylation, Lithium enolates, Zimmerman-Taxler model, enamine alkylation, aza enolate, silyl enol ether, alkylation of nitriles, nitro compounds, acids, ketones, aldehydes.	3	7, 9
4.3	Olefin metathesis – first and second generation Grubbs' catalysts. Umpolung concept-1,3-Dithiane, benzoin condensation.	3	7, 9
4.4	Coupling reactions - Heck, Negishi, Sonagashira, Kumada and Suzuki coupling, Stepens-Castro coupling, Stille coupling,	4	7, 9
4.5	Protecting group strategy: Tetrahydropyranyl, silyl, t-butyl, trichloroethyl, acetal and thioacetal as hydroxyl, thiol, carboxyl and carbonyl protecting groups in synthesis.	3	7, 9
4.6	Introduction to combinatorial synthesis - split and pool method only.	2	10
5.0	Oxidation and Reduction reactions in organic chemistry	18	
5.1	Reduction using boranes and hindered boranes - 9 BBN, disiamylborane, pinacolborane	2	11
5.2	Sodium borohydride and lithium aluminium hydride, NaCNBH ₃ DIBAL-H, bulky metal hydrides, Li trialkylborohydrides, tri-n-butyltin hydride, diimide, and aluminium alkoxide.	4	11
5.3	Birch reduction, Clemmensen reduction and Wolff - Kishner reduction, Huang - Minlon modification, Rosenmund reduction.	3	11
5.4	McFadayan-Stevens reaction, allylic and benzylic oxidation, Sharpless epoxidation, oxidation using SeO ₂ , manganese (IV) oxide, lead tetraacetate, ozone, peracids, DDQ, silver carbonate and Cr(VI) reagents.	5	11
5.5	Jones oxidation, chemo and region selectivity in reductions and oxidations. Swern oxidation, Moffatt oxidation, Sommelet reaction. Applications of HIO ₄ , Dess-Martin periodinane, OsO ₄ and mCPBA.	4	11

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21. F. A. Carey and R. S. Sundberg, Advanced organic chemistry, Parts A and B,” Fifth Edition, Springer, 2008.
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CH 233 PHYSICAL CHEMISTRY III

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	understand the theories of chemical bonding and their application with help of approximate methods predict the nature of orbitals and molecular spectra.	U, Ap, An	1

2.	compare MO and VBT.	An	1
3.	understand the properties of gases and liquids and the nature of the intermolecular forces in them.	U, Ap, An	1
4.	describe the principle behind the determination of surface tension and coefficient of viscosity.	U	1
5.	describe and explain the physical and chemical principles that underlie molecular structure determination techniques like NMR, ESR, Mossbauer, NQR and PES spectroscopy.	U, Ap, An	1
6.	judge the degrees of freedom of systems and understand theories of irreversible thermodynamic systems.	U, Ap, An, E	1
7.	understand the quantum mechanical and non-quantum mechanical methods in computational chemistry, potential energy surface and basis functions.	U, An	1
8.	write the Z matrix of simple molecules.	U, Ap	1
9.	acquire skill in solving numerical problems.	Ap	1

Module	Course Description	No. of Hrs	CO No.
1.0	Approximate methods and Chemical Bonding	18	
1.1	Approximate methods: Method of Variation-variation theorem and its proof. Linear variation functions. Secular equations and secular determinants.	2	1
1.2	Method of Perturbation-successive correction to an unperturbed problem. Detailed treatment of first order non-degenerate case only. Hartree-Fock Self-Consistent Field (HF-SCF) method for atoms, Hartree-Fock equations (derivation not required) & the Fock operator.	3	1
1.3	MO theory- The Born-Oppenheimer approximation -MO Theory-LCAO MO method applied to H ₂ and H ₂ ⁺ .	2	1
1.4	MO diagram of homo nuclear diatomic molecules Li ₂ , Be ₂ , B ₂ , C ₂ , O ₂ and F ₂ and hetero nuclear diatomic molecules LiH CO, NO and HF.	2	1
1.5	Spectroscopic term symbols for homodiatomc molecules, selection rules for molecular spectra.	1	1
1.6	Valance bond theory - VB treatment of hydrogen molecule only.	2	1
1.7	Comparison of MO and VB theories.	1	2
1.8	Quantum mechanical treatment of sp, sp ² and sp ³ hybridisation.	2	1
1.9	HMO theory of conjugated systems. Bond order and charge density calculations, free valance. Application of HMO method to ethylene, allyl, butadiene and benzene systems.	3	1, 9
2.0	Gaseous and Liquid State	18	
2.1	Maxwell's distribution of molecular velocities,	4	3, 9

	influence of temperature, types of molecular velocities-derivation of molecular velocities from Maxwell's equation.		
2.2	Transport phenomena in gases – viscosity of gases, Chapman equation, determination of viscosity of gases, calculation of mean free path.	3	4, 9
2.3	Thermal conductivity, diffusion	3	3
2.4	Degrees of freedom of gaseous molecules - Translational, Rotational and vibrational.	1	3
2.5	Equation of state of real gases- van der Waal's equation, Other equation of states - Virial equation, second virial coefficient and determination of diameter of a molecule.	3	3, 9
2.6	Inter molecular forces - Dipole-dipole interaction, induced dipole-dipole, induced dipole-induced dipole interactions.	1	3
2.7	Liquid state: Liquid vapour equilibria, vapour pressure-methods of measuring vapour pressure - barometric method and dynamic method - equation of state for liquids, structure of liquids-short range order.	1	3
2.8	X-ray diffraction of liquids. Vacancy model for a liquid, radial distribution function.	1	3
2.9	Surface tension - determination of surface tension by drop weight method and drop number method. Viscosity - determination of coefficient of viscosity by Ostwald viscometer.	1	4, 9
3.0	Spectroscopy II	18	
3.1	Resonance spectroscopy: Nuclear Magnetic resonance Spectroscopy, Nuclear spin. Interaction between nuclear spin and applied magnetic field.	2	5
3.2	Proton NMR. Population of energy levels.	1	5
3.3	Nuclear resonance. Chemical shift. Relaxation methods. Spin-spin coupling. Fine structure.	2	5
3.4	Introduction to instrumentation Fourier Transformation (FT) NMR Spectroscopy: Instrumentation - experimental aspects magnets, radio frequency transmitter, NMR probe and computer. Radio frequency pulses effect of pulses, rotating frame reference, FID, FT technique - data acquisition and storage, signal averaging. Pulse sequences- pulse width, spins and magnetisation vector.	3	5, 9
3.5	ESR spectroscopy: Electron spin. Interaction with magnetic field. Kramer's rule. The g factor. Fine structure and hyperfine structure. Analytical applications of ESR, Determination of reaction rates and mechanisms by ESR, Structural determination by ESR. Elementary idea of ENDOR and ELDOR.	4	5, 9

3.6	Mossbauer spectroscopy: Basic principles. Doppler effect, chemical shift, recording of spectrum, application. Quadrupole effect, Effect of magnetic field.	3	5
3.7	NQR spectroscopy- Principle and application.	2	5
3.8	Photoelectron spectroscopy: Introduction to UV photoelectron and X-ray photoelectron spectroscopy.	1	5
4.0	Applications of Thermodynamics	18	
4.1	Simple examples of irreversible processes.	1	6
4.2	General theory of non-equilibrium processes. The phenomenological relations. Onsager reciprocal relation. Principle of minimum entropy production.	2	6
4.3	Generalized equation for entropy production, Entropy production from heat flow, matter flow and current flow.	3	6, 9
4.4	Application of irreversible thermodynamics to diffusion. Thermal diffusion, thermo osmosis and thermo-molecular pressure difference.	4	6
4.5	Electro-kinetic effects, the Glansdorf-Pregogine equation. Far from equilibrium region.	3	6
4.6	Three component systems: Graphical representation. Three component liquid systems with one pair of partially miscible liquids. Influence of temperature. Systems with two pairs and three pairs of partially miscible liquids.	3	6
4.7	Solid- liquid system: Two salts and water systems-no chemical combination, double salt formation, one salt forms hydrate, double salt forms hydrate, Isothermal evaporation.	2	6
5.0	Computational Chemistry	18	
5.1	Introduction to computational chemistry: As a tool and its scope. Potential energy surface-stationary point, saddle point or transition state, local and global minima. Basis functions-Slater type orbitals (STO) and Gaussian type orbitals (GTO).	3	7
5.2	Basis sets: minimal, split valence, polarized and diffuse basis sets, contracted basis sets, Pople's style basis sets and their nomenclature.	2	7
5.3	Quantum mechanical computational methods - Abinitio methods: Introduction to SCF. RHF, ROHF and URHF. (no need of calculation). Wave functions for open shell state, Slater determinants, Roothan concept.	2	7
5.4	Semi empirical methods: Huckels and extended Huckel methods. Strengths and weaknesses. PPP, ZDO, NDDO, INDO, MNDO (AM1, PM3) and CNDO	2	7

	approach.(Mentioning only).		
5.5	Density functional theory methods (DFT) - Electron correlation and introduction to post HF methods. Hohenberg-Kohn theorems, Exchange correlational functional Kohn-Sham orbitals, Local density approximation. Generalized gradient approximation (Only the basic principles and terms to be introduced).	2	7
5.6	Non-quantum mechanical computational methods - Molecular mechanics: Force fields - bond stretching, angle bending, torsional terms, non-bonded interactions, electrostatic interactions and the corresponding mathematical expressions. Commonly used forcefields - AMBER and CHARMM.	2	7
5.7	Construction of Z-matrix for simple molecules. H ₂ O, H ₂ O ₂ , H ₂ CO, CH ₃ CHO, NH ₃ and CO ₂ .	2	8
5.8	Structure drawing and energy calculation (geometry optimization) using free software Arguslab, Tinker, NAMD, DL-POLY	3	7

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CH 234 INORGANIC CHEMISTRY PRACTICALS – II

Total 125 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	interpret data from an experiment, including the construction of appropriate graphs and the evaluation of errors.	U, An	3, 7, 8
2.	estimate a simple mixture of ions (involving quantitative separation) by volumetric and gravimetric methods.	An	7, 8
3.	perform COD, BOD, DO, TDS analysis.	Ap, An	4, 7, 8
4.	predict likely spectral characteristics of given metal complexes solve the structures of unknown metal complexes using appropriate spectroscopic techniques and magnetic measurements .	Ap, An	6, 8
5.	analyse the XRD of simple substances.	An	8
6.	interpret TG and DTA curves.	An	8

Module	Course Description	No. of Hrs	CO No.
1.	Estimation of simple mixture of ions (involving quantitative separation) by volumetric and gravimetric methods. a) Iron (gravimetric) and Chromium (volumetric) b) Iron (gravimetric) and Zinc (volumetric) c) Copper (volumetric) and Nickel (gravimetric) d) Iron and Copper	40	1, 2

	e) Copper and Nickel		
2.	Environmental Analysis – COD, BOD, DO, TDS	20	1, 3
3.	Spectral Interpretation of metal complexes using IR, UV-vis. spectral data. Supplementary information like metal estimation, CHN analysis, conductivity measurements and magnetic measurements to be provided to the students. Assessment is based on arriving at the structure of the complex and assignment of IR spectral bands.	25	4
4.	Analysis of XRD of simple substances.	15	5
5.	Interpretation of TG and DTA curves .	25	6

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2. Willard , Merrit and Dean, Instrumental Methods of Analysis, 7th edition, 1986.
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CH 235 ORGANIC CHEMISTRY PRACTICALS – II

Total 125 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	interpret data from an experiment, including the construction of appropriate graphs and the evaluation of errors.	U, An	3, 7, 8
2.	predict likely spectral characteristics of given molecular species; solve the structures of unknown molecules using appropriate spectroscopic techniques	Ap, An	6, 7, 8
3.	develop paper chromatogram of a compound and determine its purity	C	7, 8
4.	estimate quantitatively the Aniline, Phenol, glucose, Ascorbic acid and Aspirin in a sample	Ap	7, 8
5.	estimate colorimetrically paracetamol, protein and ascorbic acid	Ap	7, 8
6.	use green chemical principles in the synthesis	Ap	4, 7, 8

Module	Course Description	No. of Hrs	CO No.
A.	Volumetric estimation of 1) Aniline 2) Phenol 3) Glucose 4) Ascorbic acid 5) Aspirin	25	4
B.	Colorimetric estimation 6) paracetamol with potassium ferricyanide 7) protein by biuret method 8) Ascorbic acid by folin-phenol reagent or phosphotungstic acid methods	25	5
C.	Spectral identification 9) UV, IR, ^1H NMR, ^{13}C NMR, EI mass spectral identification of Organic compounds from a library of organic compounds (Each students have to record the spectral analysis of a minimum of 40 compounds)	40	1, 2
D.	Separations of mixtures by Paper Chromatography 10) Identification of amino acids	10	3
E.	Single stage preparation of organic compounds by green chemistry 11) Preparation of p-bromoacetanilide using CAN. 12) Radical coupling – 1,1-Bis-2-naphthol. 13) Synthesis of dihydropyrimidinone. 14) Synthesis of dibenzalacetone - with lithium hydroxide. 15) Photoreduction of benzophenone to benzopinacol (not for end semester evaluation).	25	4
The board of examiners have to choose the combination of a volumetric estimation, a colorimetric estimation, a green synthesis OR paper chromatography and spectral analysis.			

References

1. B. S. Furniss, Vogel's text book of practical organic chemistry, 5th Edition, Longman, 1989.
2. D. L. Pavia, G. M. Lampman, G. S. Kriz and R. G. Engel, A microscale approach to organic laboratory techniques, Wadsworth Publishing, 5th Edition, 2012.
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8. Monograph on green laboratory experiments, DST, Government of India, pp 1-79.
9. For spectral data of organic compounds, see: http://sdbs.riondb.aist.go.jp/sdbs/cgi-bin/direct_frame_top.cgi

CH 236 PHYSICAL CHEMISTRY PRACTICALS – II

Total 125 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	interpret data from an experiment, including the construction of appropriate graphs and the evaluation of errors.	U, E	3, 7, 8
2.	determine the strength of strong/ weak acids by conductometric titrations.	Ap	7, 8
3.	verify Onsager equation and Kohlraush's law conductometrically .	An, E	7, 8
4.	determine the activity and activity coefficient of electrolyte.	Ap, An	7, 8
5.	determine the concentration of a solution potentiometrically or pH metrically.	Ap, An	7, 8
6.	employ spectrophotometry in determining unknown concentration.	Ap, An	7, 8
7.	determine the viscosity of liquid mixtures and use this in determining the concentration of a component in a mixture.	Ap, An	7, 8
8.	determine the concentration of a liquid mixture using a refractometer .	Ap, An	7, 8
9.	determine the unknown concentration of a given glucose solution.	Ap, An	7, 8

Module	Course Description	No. of Hrs	CO No.
1.	Conductometry a) Determination of strength of strong and weak acids in a mixture b) Determination of strength of a weak acid. c) Precipitation titration ($\text{BaCl}_2 \times \text{K}_2\text{SO}_4$) d) Titration of dibasic acid ($\text{H}_2\text{C}_2\text{O}_4/\text{H}_2\text{SO}_4$). e) Verification of Onsager equation. f) Verification Kohlraush's law. g) Determination of activity and activity coefficient of electrolyte.	20	1, 2, 3, 4
2.	Potentiometry a) Determination of emf of Daniel cell and temperature dependence of emf of a cell. b) Titrations involving redox reactions – Fe^{2+} vs KMnO_4 , $\text{K}_2\text{Cr}_2\text{O}_7$, $(\text{NH}_4)_2\text{Ce}(\text{SO}_4)_2$ and KI vs KMnO_4 c) Determination of the emf of various ZnSO_4 solutions and hence the concentration of unknown ZnSO_4	20	1,5

	solution. d) Determination of activity and activity constant of electrolytes. e) Determination of thermodynamic constants of reactions.		
3.	pH metric titrations. a) Acid alkali titrations using Quinhydrone electrode. b) Titrations(double) involving redox reactions – Fe^{2+} vs KMnO_4, $\text{K}_2\text{Cr}_2\text{O}_7$, $(\text{NH}_4)_2\text{Ce}(\text{SO}_4)_2$ and KI vs KMnO_4 c) Determination of strengths of halides in a mixture. d) Determination of pH of buffer solutions and hence to calculate the E° of quinhydrone electrode	15	1, 5
4.	Spectrophotometry a) Verification of Beer-Lambert's law. b) Absorption spectra of conjugated dyes (malachite green, methylene blue). c) Determination of concentration of potassium dichromate and potassium permanganate in a mixture. d) To study the complex formation between Fe^{3+} and salicylic acid. e) Determination of pKa of an indicator.	20	1, 6
5.	Polarimetry a) Measurement specific rotation of glucose. b) Determination of specific rotation of sucrose c) Determination of unknown concentration of glucose solution and rate constant of its hydrolysis in presence of HCl	15	1, 7
6.	Viscosity: a) Viscosity of liquids and mixtures of liquids. b) Verification of Kendall's equation. c) Composition of unknown mixtures. d) Determination of molecular masses polymers by viscosity measurements (Mark-Houwink equation)	15	1, 8
7.	Refractometry a) Determination of molar refraction of pure liquids b) Determination of concentration of KCl solution/glycerol solution c) Determination of solubility of KCl in water. d) Determination of molar refraction of solid KCl e) Study the stoichiometry of potassium iodide-mercuric iodide complex. f) Determination of concentration of KI solution.	20	1, 9

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Model Question Papers

General Instruction to question paper setters

- There will be a 15 main questions in each question paper divided into 3 sections – A, B and C
- Each of the sections A, B and C will have 5 questions each, **1 from each module.**
- Each question in Section A will have 3 sub questions (a), (b) and (c), of which the candidate has to answer any two (2 marks each).
- Each question in Section B will have 2 sub questions (a) and (b), of which the candidate has to answer any one (5 marks each).
- Candidate should answer any three out of the five questions in Section C (10 marks each).
- Section A carries a total of 20 marks, Section B carries 25 marks, and Section 3 carries 30 marks.
- The maximum marks will be 75 and the duration of the exam will be 3 hrs.

Third Semester M.Sc. Degree Examination – Model question paper
Branch III – Chemistry/ Branch IV – Analytical Chemistry
CH/CL 231: INORGANIC CHEMISTRY – III
 (2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among **(a)**, **(b)** and **(c)** from each. Each sub question carries 2 marks

1. (a) Represent diagrammatically the dative bonding seen in metal-cyano complexes.
- (b) Give an example each for a hexahapto ligand and a heptahapto ligand.
- (c) Verify whether $[\text{IrBrCO}(\text{PPh}_3)_2]$ obeys 18 electron rule or not.

2. (a) List the factors that affect the stability of coordination compounds.
(b) What is meant by trans effect?
(c) What is the Kurnakovs test?
3. (a) Give two examples for metallo-enzymes containing iron.
(b) Briefly discuss the coordination environment of the metal ion in Vitamin B₁₂.
(c) Explain the mechanism of oxygen binding in haemocyanin.
4. (a) Explain doppler broadening with an example.
(b) What is superhyperfine splitting in esr spectra?
(c) How many signals are obtained in the ¹⁹F nmr spectra of the following
(i) SF₆ (ii) SF₄ (iii) XeOF₄. Give reasons for your answer
5. (a) List any two differences between GM counter and Proportional counter.
(b) Distinguish between half life and average life. How are they related?
(c) Summarise the liquid drop model of the nucleus.

[2 × 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) IR spectroscopy provides vital information in during the study of metal carbonyls. Explain.
(b) Discuss the characteristics of oxidative addition and reductive elimination reactions of organometallic compounds.
7. (a) Give an account of the photochemical reactions of complexes.
(b) Using [PtCl₄]²⁻ as the starting material, how can the cis and trans isomers of [PtCl₂(NH₃)(PPh₃)] and [PtCl₂(NO₂)(NH₃)]⁻ be prepared
8. (a) Explain the role played by calcium in blood clotting.
(b) Briefly discuss nitrogen fixation.
9. (a) Discuss the application of ESR spectroscopy to Cu (II) complexes.
(b) Discuss the utility of Mossbauer spectroscopy in the study of complexes of iron.
10. (a) Give a brief note on nuclear shell model
(b) What is meant by radioactive equilibrium? The ratio between atoms of two radioactive elements A & B at equilibrium was found to be 3.1×10⁹:1. If the half life period of A is 2×10¹⁰ years what is the half life of B.

[5 × 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Construct the MO diagram of dibenzene chromium and explain the bonding using MOT.

12. What are inner sphere and outer sphere reactions? Explain the salient features.
13. Discuss in detail the function of PS-I and PS-II in photosynthetic activity.
14. How is CD and ORD employed in the structure determination of metal complexes?
15. Explain the principle involved in the working of the reactors in nuclear power plants

[10 × 3 = 30]

Third Semester M.Sc. Degree Examination – Model question paper
Branch III – Chemistry/ Branch IV – Analytical Chemistry
CH/CL 232: ORGANIC CHEMISTRY – III
 (2020 Admission Onwards)

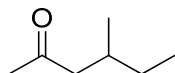
Time: 3 Hrs

Max. Marks: 75

SECTION A

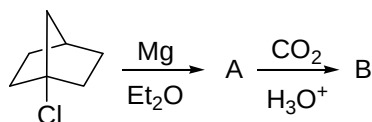
Answer **two** among (a), (b) and (c) from each. Each sub question carries 2 marks

1. (a) What is the effect of solvent polarity on n- π^* transition?
 (b) How will you distinguish between Intramolecular hydrogen bonding and intermolecular hydrogen bonding using IR spectroscopy?
 (c) Predict the fragmentation pattern of the following molecule

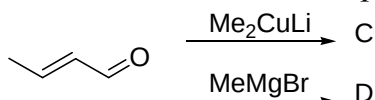


2. (a) How many peaks do you expect in the nmr spectrum of N,N-dimethyl formamide? Explain.
 (b) How does the coupling constant differ between a geminal and vicinal hydrogens?
 (c) What are shift reagents? Give an example

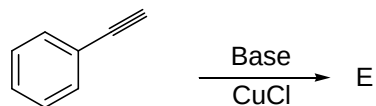
3. (a) Complete the reaction



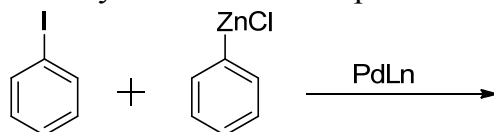
- (b) Predict the structure of the products C and D in the reaction given below



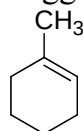
- (c) Write the structure of the compound E in the reaction given below



4. (a) Identify the reaction and predict the product

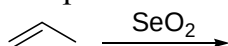


- (b) Suggest a retrosynthetic route for the following compound

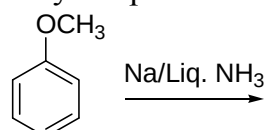


- (c) Give any two protecting groups for hydroxyl group.

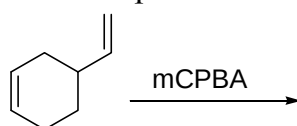
5. (a) Complete the reaction



- (b) Identify the product in the reaction given below



- (c) What is the product obtained in the following reaction?

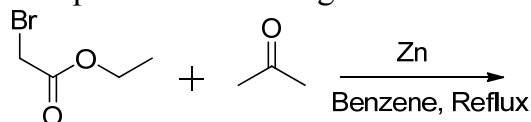


[2 × 10 = 20]

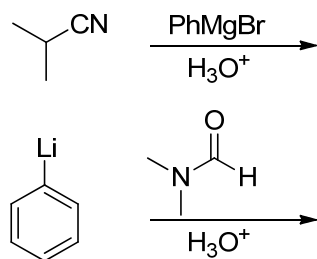
SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) Discuss the principle and applications of MALDI.
 (b) Give the mass fragmentation pattern of toluene and phenol.
7. (a) Explain the anomaly in the chemical shift value of acetylene and benzene.
 (b) Write on any two 2D NMR technique.
8. (a) Complete the following reaction and suggest a suitable mechanism



- (b) Predict the product (s) of the following reactions with mechanism



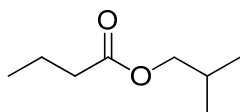
9. (a) Convert benzaldehyde to ethylbenzene using umpolung strategy.
 (b) Discuss the mechanism for Stille coupling with the help of an example.
10. (a) Illustrate Sharpless asymmetric epoxidation with the help of an example.
 (b) Give a brief outline of four Cr(VI) reagents used for oxidation reactions.

[5 × 5 = 25]

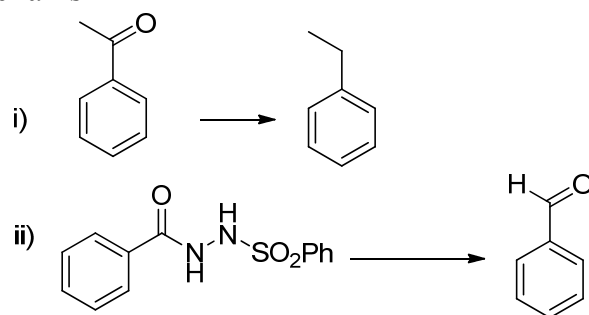
SECTION C

Answer any **three** questions. Each question carries 10 marks

11. a) Discuss the mass spectral fragmentation pattern of aromatic compounds, ketones and amides.
 b) Write on FAB.
12. a) ^1H NMR spectrum of a compound gives the following spectral data.
 δ 9.78(1H, s), 7.75(2H, d), 6.90(2H, d), 3.8(3H, s). Identify the compound
 b) Discuss DEPT nmr of



13. a) Discuss the preparation and reactivity of Tebbe's reagent.
 b) Illustrate the synthetic utility of silyl carbanions using examples
14. a) Discuss Suzuki and Heck coupling with the help of mechanism.
 b) Write in brief on olefin metathesis
15. a) Comment on the reactivity of various bulky metal hydrides using suitable examples.
 b) How will you bring about the following conversion? Suggest a suitable mechanism



[10 × 3 = 30]

Third Semester M.Sc. Degree Examination – Model question paper
Branch III – Chemistry/ Branch IV – Analytical Chemistry
CH/CL 233: PHYSICAL CHEMISTRY – III
(2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among (a), (b) and (c) from each. Each sub question carries 2 marks

1. (a) Arrange O_2 , O_2^+ , O_2^- in the increasing order of stability. Justify your answer.
(b) Write briefly about 'Perturbation theory'.
(c) Write the Hamiltonian for He atom and suggest a suitable trial wave function for it.
2. (a) Predict and justify the condition at which a real gas obeys the following equation of state $PV = RT + Pb$.
(b) The van der Waals constant a for two gases are 4.17 and $0.024 \text{ dm}^6 \text{ atm mol}^{-2}$ respectively. Explain which is easily liquefiable and why?
(c) At what pressure does the mean free path of argon gas at 25°C become comparable to the diameter of the atoms themselves? Given $\sigma = 0.36 \text{ nm}^2$.
3. (a) The shift in frequency shown by a proton from TMS is 180 Hz, when measured on a 100 MHz instrument. Calculate the chemical shift in ppm.
(b) Calculate the ESR frequency of an unpaired electron in a magnetic field 0.33 Tesla. Given for free electron $g=2$, $\beta=9.273 \times 10^{-27} \text{ J/T}$.
(c) Explain the basic principle of X-ray photo electron spectroscopy.
4. (a) Apply phenomenological equation in thermal diffusion.
(b) How is temperature influence the miscibility curve of a three-component system forming one pair of partially miscible liquids?
(c) What are the conditions under which linear relations are valid to understand irreversible processes?
5. (a) How do parameterization techniques help to reduce the task of computation?
(b) Construct the z-matrix of CO_2 molecule.
(c) Differentiate STO and GTO.

[2 × 10 = 20]

SECTION B

Answer either (a) or (b) from each question. Each sub question carries 5 marks

6. (a) Calculate the first order correction to the energy levels for a one dimensional box with a slanted bottom whose potential energy varies as

- v_x/a where a is the length of the box.
- (b) Apply HMO theory to butadiene molecule and discuss the molecular orbitals and their corresponding energy levels.
7. (a) Calculate C_v for the following gases at room temperature.
 i) He ii) HCl iii) CO₂
 Discuss the principle of equipartition of energy.
 (b) Which among CO₂ and O₂ undergo effusion faster. Justify your answer.
8. (a) Write a brief account of NMR spectroscopy.
 (b) Discuss the application of Mossbauer spectroscopy.
9. (a) Derive expressions for entropy production in the case of system contains both the matter flow and current flow.
 (b) Verify the Onsager reciprocal relation in the case of simple chemical reaction $A \rightleftharpoons B$.
10. (a) Write a note on non-quantum mechanical method of energy calculation.
 (b) What is potential energy surface? Explain its significance.

[5 × 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Discuss the bonding in H₂ molecule by valence bond theory.
12. Discuss about the transport properties of gas. Show that the ratio of thermal conductivity to that of coefficient of viscosity = C_v/M
13. a) Explain the principle and applications of NQR spectroscopy.
 b) When N₂ gas is excited with radiation of energy 21.22 eV from a helium lamp, electrons are ejected with kinetic energies 5.63 eV and 4.53 eV. What are their binding energies?
 (7+3)
14. a) Draw the phase diagram of a three-component liquid system with three pairs of partially miscible liquids. Explain.
 b) How would you understand (i) thermo osmosis and (ii) thermal diffusion from irreversible thermo dynamics?
 (5+5)
15. a) Write briefly on ab-initio methods used in computational chemistry? What are the merits and demerits of the method?
 b) Explain the terms i) force field ii) contracted Gaussians.
 (7+3)

[10 × 3 = 30]

SEMESTER IV

CH 241 CHEMISTRY OF ADVANCED MATERIALS

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	understand dimensions, synthesis, physicochemical properties of nanomaterials and its applications.	U, Ap, An	1
2.	understand and apply characterization tools for analysing nano structures.	U, Ap, An	1
3.	outline and recognize the types of polymerization, kinetics and mechanisms.	U, Ap, An	1
4.	understand the stereochemical aspects and methods for the determination of molecular weights of polymers.	U, Ap, An	1
5.	discuss the synthesis and applications of selected classes of speciality polymers.	U, Ap, An	1, 5
6.	distinguish the types and important applications of smart materials.	U, Ap, An	1, 5

PSO–Programme Specific Outcome

Cognitive Level: R–Remember

An–Analyse

CO–Course Outcome

U–Understanding

E–Evaluate

Ap–Apply

C–Create

Module	Course Description	No. of Hrs	CO No.
1.0	Introduction to Nanomaterials and Nanotechnology	18	
1.1	Nanomaterials: 0D, 1D, 2D and 3D nanomaterials-fundamental physicochemical principles - size dependence of the properties of nanomaterials - quantum confinement. Nanocomposites.	3	1
1.2	Synthesis of nanomaterials: Sol-Gel, colloidal precipitation, co-precipitation, hydrothermal, vapour deposition, and sonochemical method.	3	1
1.3	Carbon nanostructures and clusters: Graphenes, carbon nanotubes and fullerenes (C ₆₀) - Synthesis, properties and applications.	4	1
1.4	Metal nanoparticles: Synthesis and properties (optical, electronic, magnetic), surface plasmon resonance.	3	1
1.5	Evolving interfaces of nanotechnology: Nanobiotechnology, nanoelectronics, nano sensors, nano-biosensors, nano tweezers, elementary ideas about nano catalysts, nano photocatalysts, nanofiltration.	3	1
1.6	Nanomedicines-nanoparticles for medical imaging and targeting cancer cells and nano encapsulation for drugdelivery to tumours. Nanotoxicology.	2	1

2.0	Characterization Tools in Nanotechnology	18	
2.1	Electron microscopies: Scanning electron microscopy (SEM), Transmission Electron Microscopy (TEM), High Resolution Transmission Electron Microscopy (HR-TEM).	4	2
2.2	Probe microscopies: Atomic Force Microscopy (AFM), Scanning tunnelling microscopy (STM), Scanning tunnelling electron microscopy (STEM).	4	2
2.3	X-ray methods: X-ray diffraction (XRD), X-ray Photoelectron spectroscopy (XPS), Energy Dispersive X-ray Spectroscopy (EDAX), X-ray Fluorescence (XRF)	4	2
2.4	Laser scattering method: Dynamic light scattering (DLS)	1	2
2.5	Spectroscopic techniques: IR spectroscopy for surface functionalization of nanoparticles, UV-visible - Diffused reflectance spectroscopy, photoluminescence, Raman spectroscopy. (Basic understanding of each technique with special emphasis on characterization at nano scale).	5	2
3.0	Polymerization processes	18	
3.1	Free radical addition polymerization-kinetics and mechanism. Chain transfer. Cationic and anionic polymerization: Kinetics and mechanism. Step growth polymerization - Polymer characterization – Molecular weights.	3	3
3.2	Linear vs cyclic polymerization. Other methods of polymerization - bulk, solution, melt, suspension, emulsion and Dispersion techniques.	3	3
3.3	Polymer stereochemistry: Configuration and conformation, Tacticity, Chiral polymers.	3	4
3.4	Molecular weight distribution and molecular weight control. Methods for determining molecular weights-static, dynamic, viscometry, light scattering and GPC.	4	4
3.5	Crystalline and amorphous states - Glassy and rubbery states. Glass transition temperature and crystalline melting of polymers. Degree of crystallinity - X-ray diffraction.	3	4
3.6	Thermal stability of polymers - Application of DSC.	2	3
4.0	Speciality Polymers	18	
4.1	Industrial Polymers: carbon chain and hetero chain polymers-synthesis and applications. Polymeric reagents, catalysts and substrates.	3	5
4.2	Conducting polymers: Synthesis & applications of	3	5

	polyacetylenes, polyanilines, polypyrroles & polythiophenes.		
4.3	Photo responsive and photorefractive polymers. Polymers in optical lithography.	3	5
4.4	Drug delivery - Drug carriers - Polymer based nanoparticles.	3	5
4.5	Basic concepts about polymer based LEDs and lithium-polymer batteries.	3	5
4.6	Liquid crystalline polymers - Main chain and side chain liquid crystalline polymers. Phase morphology.	3	5
5.0	Smart materials	18	
5.1	Piezoelectric, magnetostrictive, halochromic, chromogenic, electrochromic, thermochromic, magnetocaloric and thermoelectric materials.	4	6
5.2	Chemistry behind photochromism in spiropyrans, spirooxazines, diarylethenes, azobenzenes, quinones. Examples for photochromic coordination compounds.	4	6
5.3	Shape-memory polymers, pH-sensitive polymers, Temperature-responsive polymers, dielectric elastomers.	4	6
5.4	Self-healing polymers and concept of mechanophores.	3	6
5.5	Introduction to ferrofluids, concept of pseudo elasticity.	3	6

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CH 242 (a) INORGANIC CHEMISTRY IV

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	explain the schemes for σ and π bonding with examples.	U	1
2.	explain MO and Ligand field theory with the support of group theory and construct the MO diagram of octahedral complexes.	U, C	1
3.	apply character tables to find out the Infrared and Raman active modes for C_{2v} , C_{3v} and D_{4h} .	Ap, An	1
4.	assimilate the concepts of molecular recognition, self-assembly, dynamic combinatorial chemistry and supramolecular chirality, and be aware of the most important work in the field.	U	1
5.	understand the nature of bonding in metal atom clusters and distinguish Low nuclearity and High nuclearity carbonyl clusters.	U, An	1
6.	perform the electron counting schemes in cluster compounds.	Ap, An	1
7.	differentiate the different types of cluster molecules and understand their utility in catalysis.	An	1
8.	understand and explain the role of metal ions in biological systems and give examples for the use of metals in medicine.	U, An	1
9.	differentiate the defects arising due to deficiency and excess presence of metal ions in the body.	An	1
10.	explain the acid base concept in non aqueous media and identify the reactions taking place in selected non aqueous solvents.	An	1

Module	Course Description	No. of Hrs	CO No.
1.0	Applications of group theory	18	
1.1	Hybrid orbitals and molecular orbitals for simple molecules. Transformation properties of atomic orbitals. Hybridisation schemes for σ and π bonding with examples.	3	1
1.2	MO theory for AB_n type molecules. Molecular orbitals for regular octahedral, tetrahedral and metals and sandwich compounds.	3	2
1.3	Ligand field theory: Splitting of d orbitals in different environments using group theoretical considerations.	3	2
1.4	Construction of energy level diagrams. Correlation diagram. Method of descending symmetry. Tanabe-Sugano diagrams. Selection rules for electronic spectra.	3	2
1.5	Molecular orbitals in octahedral complexes. Formation of symmetry adapted group orbitals of ligands. MO diagram.	3	2
1.6	Symmetry and selection rules: Symmetry properties of common orbitals. Application of character tables to infrared and Raman spectroscopy. Infrared and Raman active modes for C_{2v} , C_{3v} and D_{4h} .	3	3
2.0	Supramolecular Chemistry	18	
2.1	Concepts and language. Molecular recognition: Molecular receptors for different types of molecules, design and synthesis of coreceptors and multiple recognition.	4	4
2.2	Strong, weak and very weak Hydrogen bonds. Utilisation of H-bonds to create supramolecular structures. Use of H bonds in crystal engineering and molecular recognition.	4	4
2.3	Supramolecular reactivity and catalysis. Transport processes and carrier design.	3	4
2.4	Supramolecular devices. Supramolecular photochemistry, supramolecular electronic, ionic and switching device.	4	4
2.5	Some examples of self-assembly in supramolecular chemistry.	3	4
3.0	Metal-Metal bonds and Metal Clusters	18	
3.1	Metal–Metal bonds and metal atom clusters. Conditions favourable for formation of M–M bonds, Compounds with M–M multiple bonds.	4	5
3.2	Dinuclear compounds of Re, Cu and Cr, metal-metal multiple bonding in $(Re_2X_8)^{2-}$.	3	5
3.3	Tri , Tetra and hexa nuclear clusters, Isoelectronic and isolobal relationships, Low nuclearity and High nuclearity carbonyl clusters (LNCCs and HNCCs).	3	5

3.4	Hetero atoms in metal atom clusters, electron counting schemes for HNCCs – Capping Rule.	3	6
3.5	Cubane Clusters, Chalcogenide Clusters, Chevrel Phases. Zintl Anions and Cations.	4	7
3.6	Molecular Clusters in catalysis	1	7
4.0	Selected topics in Bioinorganic Chemistry	18	
4.1	Copper on biochemical systems. Oxidase activity, superoxide dismutase activity. Electron transport in biology.	4	8
4.2	Structure and function of copper proteins in electron transport process. Oxygen transport copper proteins. Hemocyanin-copper transport, copper enzymes-Azurin, plastocyanin.	4	8
4.3	Inorganic medicinal chemistry. Metals in medicine. Metal deficiency and diseases. Toxic effects of metals. Effect of deficiency and excess of essential metal ions.	3	9
4.4	Toxicity due to non essential elements and speciation. Detoxification mechanism.	3	8
4.5	Role of lithium and aluminium in biological systems. Chelation therapy and chemotherapy.	2	9
4.6	Anticancer drugs and vanadium based diabetics drugs.	2	9
5.0	Acids, Bases and Non-aqueous Solvents	18	
5.1	Acid base concept in non aqueous media-HSAB concept, solvent effects, linear free energy relationship – mechanism and methods of determination, super acids	4	10
5.2	Reactions in non-aqueous solvents. Ammonia-solutions of metals in liquid ammonia.	3	10
5.3	Protonic solvents: anhydrous sulfuric acid, hydrogen halides.	3	10
5.4	Aprotic solvents: non-polar solvents, non-ionizable polar solvents, polar solvents undergoing autoionization, liquid halogens, interhalogen compounds, oxyhalides, dinitrogen tetroxide, sulphur dioxide.	8	10

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CH 242 (b) ORGANIC CHEMISTRY IV

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	define secondary metabolites from plants and animals.	R	1
2.	explain the biosynthesis of terpenes and sterols, illustrate the structural elucidation and synthesis of natural products.	U, An	1
3.	list the forces involved in molecular recognition and recognize molecular receptors.	U	1
4.	quote molecular recognition events in biological systems.	U	1
5.	discuss the methods of creating combinatorial libraries and its processing to locate lead molecule.	U	1
6.	explain the various stages in drug development process, and outline the synthesis of paracetamol, phenobarbital, diazepam, sulphamethoxazole, benzylpenicillin, and chloramphenicol.	R, U, C	1
7.	construct a solid phase synthesis of tripeptide from any three amino acids, explain protection, deprotection and automated synthesis of peptides and nucleotides.	U, C	1
8.	describe twelve principles green chemistry.	R	1, 4
9.	illustrate reactions in which green chemistry principles are applied and calculate atom economy.	Ap, An	1, 4

Module	Course Description	No. of Hrs	CO No.

1.0	Chemistry of natural products and biomolecules	18	
1.1	Introduction to primary and secondary metabolites in plants. Extraction methods of chemical constituents from plants, such as fractionation using solvents, specific extraction of alkaloids and supercritical fluid extraction. Characterizations of isolated compounds (terpenes, sterols, alkaloids, carbohydrates, flavonoids and poly phenols) by colour reactions and spray reagents.	6	1
1.2	Biosynthesis of terpenes from acetyl coenzyme A, sterols via squalene.	3	2
1.3	Determination of carbon skeleton of alkaloids (Hofmann, Emde and Von Braun degradation methods). Structural elucidation of ephedrine, atropine.	3	2
1.4	Classification of pigments, structure elucidation of β -carotene.	3	2
1.5	Synthesis of quercetin, synthesis of testosterone, androsterone, progesterone (from cholesterol), estrone.	3	2
2.0	Molecular recognition and supramolecular chemistry	18	
2.1	Introduction to supramolecular chemistry. The concepts of molecular recognition, host, guest and receptor systems. Forces involved in molecular recognition. Hydrogen bonding, ionic bonding, π -stacking, van der Waals and hydrophobic interactions	4	3
2.2	Introduction to molecular receptors, tweezers, cryptands and carcerands, cyclophanes, cyclodextrins and calixarenes- typical examples.	4	3
2.3	Non-covalent interactions in biopolymer structure organization. Role of self-organization and self-association in living systems-tobacco mosaic virus, cell membrane.	4	4
2.4	Importance of molecular recognition in DNA and protein structure, their function and protein biosynthesis – basic aspects only.	4	4
2.5	Supramolecular systems like Organic zeolite, Clathrate hydrates of gases, Helicates, liquid crystals – elementary idea only	2	4
3.0	Medicinal chemistry	18	
3.1	Combinatorial organic synthesis, introduction, methodology, automation, solid supported and solution phase synthesis, study of targeted or focused libraries and small molecule libraries. Application - drug discovery.	5	5

3.2	Drug design and development-Discovery of a drug, a lead compound. Development of drug-Pharmacophore identification, modification of structure, structure-activity relationship, structure modification to increase potency. Lipophilicity.	5	6
3.3	Computer assisted drug design. Receptors and drug action. Natural products and drug development. Different classes of drugs with examples.	4	6
3.4	Synthesis of paracetamol, phenobarbital, diazepam, sulphamethoxazole, benzylpenicillin, chloramphenicol.	4	6
4.0	Chemistry of biopolymers and polymers	18	
4.1	Peptide bond formation methods. SPPS, Mechanism, amino and carboxy protection in SPPS. Synthesis of tripeptides, A, G, C, T, U, adenosine, ADP and ATP. Automated polypeptide and oligonucleotide synthesis.	6	7
4.2	Structure organization of proteins and poly nucleotides. Protein sequencing by Edmans method. Protein denaturation.	6	7
4.3	Synthesis of stereo regular polymers. Ziegler-Natta catalyst. Polymers in organic synthesis - supports, reagents and catalysts. Biodegradable polymers.	6	7
5.0	Green chemistry	18	
5.1	Twelve principles of green chemistry. Green chemical strategies for sustainable development- Reaction mass balance, atom economy evaluation for chemical reaction efficiency, green solvents, reaction media- Synthesis under water, solventless, fluorous and ionic liquid media.	6	8, 9
5.2	Synthesis using scavenger resins, catalysis and biocatalysis. Green computation. Green processes-microwave synthesis- fundamentals of microwave synthesis - Two principal mechanisms for Interaction with matter - The Microwave Effect with examples - Single-Mode and Multimode Microwave cavities.	6	8, 9
5.3	Microwave technology-Techniques and applications. Sonochemical synthesis. Applications of sonication in the synthesis of organic compounds.	6	8, 9

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CH 242 (c) PHYSICAL CHEMISTRY IV

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	apply the group theory in the identification of IR and Raman active normal modes in molecules coming under various point groups such as C_{2v} , C_{3v} , C_{4v} , D_{3h} , Td and Oh.	Ap	1
2.	apply group theory in solving spectroscopic problems.	Ap	1
3.	solve the problems in Exactly solvable systems like Simple Harmonic Oscillator, rigid rotor and the Hydrogen atom.	Ap, An	1
4.	explain the approximation methods used in quantum mechanics	U	1
5.	illustrate trial wave functions for calculation of H atom and particle in a 1D box as examples.	U, Ap	1
6.	set up secular determinants	C	1

7.	explain the variation in the state of a system with time	U, An	1
8.	apply computational methods as potential tools for practicing chemistry	An	1
9	construction of Z-matrices of simple molecules H ₂ , H ₂ O, H ₂ O ₂ , H ₂ CO, CH ₃ CHO, CH ₄ , C ₂ H ₆ and with dummy atom, CO ₂ , NH ₃ , C ₆ H ₆ .	C	1
10.	explain the commonly using force fields (MM3, MMFF, AMBER and CHARMM) and Softwares.	Ap	1
11.	Compare Molecular Mechanics, Ab-initiometmethod, Semi-empirical method and DFT method of computations.	E	1

Module	Course Description	No. of Hrs	CO No.
1.0	Applications of group theory	18	
1.1	Spectroscopic applications: Transition moment integral transition moment operator. Vanishing matrix element. Symmetry selection rule for IR, Raman and electronic spectra. Dipole and polarizability transition moment operator.	3	1, 2
1.2	Identification of IR and Raman active normal modes in molecules coming under various point groups such as C _{2v} , C _{3v} , C _{4v} , D _{3h} , Td and Oh.	3	1, 2
1.3	Mutual exclusion and complementarity principle of IR and Raman spectra and their use in the identification of molecular structures	3	1, 2
1.4	Probability of overtone and combination bands. Identification of allowed and forbidden electronic transitions in carbonyl groups. Vibronic transitions.	3	1
1.5	Application to MO theory: Symmetry adapted LCAO-MO theory of π (pi)-bonded hydrocarbons	3	1
1.6	Projection operator and its use in the construction of wave functions of π – molecular orbitals, secular equations and use of symmetry for simplifying the calculations of energy and wave functions of ethylene, butadiene and carbocyclic systems such as benzene and naphthalene.	3	1
2.	Exactly solvable systems	18	
2.1	Simple Harmonic Oscillator: Wave equation for 1D harmonic oscillator. Complete solution and their properties. 3D Harmonic oscillator. Potential energy in three dimension and Schrodinger wave equation in Cartesian coordinate. Separation of variables and solution of the equation for energy and wave function. Degeneracy.	3	3
2.2	Rigid rotor: Schrodinger equation in polar Coordinate. Angular momentum operator for rigid rotor. Separation of variables and complete solution for ϕ and θ equations.	3	3

2.3	Legendre polynomials and associated Legendre functions. Normalisation of associated Legendre functions and evolution of the values of orbital angular momentum quantum number. Recursion relations. Rigid rotor wave function and energy.	3	3
2.4	The Hydrogen atom: Schrodinger wave equation in polar coordinate. Separation of variables and complete solution of the radial part. The associated Laguerre polynomial. Normalisation. The evolution of the value of the principal quantum number.	3	3
2.5	The spherical harmonics and the radial part of the wave function. The total wave function of H atom. The wave functions of Hydrogen like atomic orbitals and explanations for the shapes of various orbitals.	3	3
2.6	Angular momentum, angular momentum operators (L_x , L_y , L_z and L^2) and their commutation properties. Spherical harmonics as eigen functions of angular momentum operator L and L^2 . Ladder operator method for angular momentum. Space quantisation.	3	3 _z
3.0	Approximate method I	18	
3.1	Schrodinger wave equation for He atom and anharmonic oscillator and difficulty to get the exact solution.	3	4
3.2	The Variation method: Variation theorem and its proof. The variation integral and its properties. Variational parameters. Trial wave functions.	3	4
3.3	Illustration of trial wave functions for calculation of H atom and particle in a 1D box as examples.	3	5
3.4	Trial functions as linear combination of orthonormal functions, linear combinations of functions containing variational parameters as trial functions.	3	5
3.5	Setting up of secular determinants. Variation methods of normal state of He.	3	6
3.6	The SCF method, SCF and variation method. Strength and limitation of the method.	3	6
4.0	Approximate method II	18	
4.1	The perturbation method. The generalised perturbation method. The idea of successive correction to unperturbed systems.	3	4
4.2	First order perturbation. Correction of wave function and energy. Theory of non - degenerate level perturbation. The normal Helium atom.	3	4
4.3	The first order perturbation of the degenerate level. The hydrogen atom.	3	4
4.4	Second order perturbation theory. Correction for wave	3	4

	function and energy. Stark effect.		
4.5	Time dependant wave equation: Variation in the state of a system with time. Emission and absorption of radiation.	3	7
4.6	The Einsteins transition probability and its calculation. Selection rules and intensity of spectrum for harmonic oscillator, rigid rotor and hydrogen atom.	3	4
5.0	Computational methods	18	
5.1	Computational methods as potential tools for practicing chemistry. Potential energy surface, saddle point, local minima and global minima. Geometry optimisation. Exchange and overlap integrals. Difficulty in evaluating them with H-like wave functions. Slater Type functions (STO), approximation of STO with Gaussian type functions. Contracted Gaussians.	3	8
5.2	Basis sets: minimal basis set, split valance basis set, polarised basis set and diffused basis set. Model chemistry and notations. Geometry input - in terms of Cartesian coordinates and internal coordinates. Z-matrix, construction of Z-matrices of simple molecules H ₂ , H ₂ O, H ₂ O ₂ , H ₂ CO, CH ₃ CHO, CH ₄ , C ₂ H ₆ and with dummy atom, CO ₂ , NH ₃ , C ₆ H ₆ .	3	9
5.3	Molecular mechanics method: Force fields, potential energy expressions for bond stretching, bending, torsion, non-bonded interactions, electrostatic interaction and H-bonding. Setting up of force field expressions. Method of parameterisation. Use of molecular mechanics. Brief introduction to commonly using force fields (MM3, MMFF, AMBER and CHARMM) and Softwares.	3	10
5.4	Ab-initio method: Hartree-Fock Self Consistent Field method. Slater determinant. Post Hartree-Fock methods –Configuration Interaction (CI) and Moller Plesset (MP) methods.	3	11
5.5	Semi empirical method: Basic principle of the method. Its variants, ZDO, CNDO and INDO.	3	11
5.6	Density Functional method: Functional. Hohenberg-Kohn theorems. Kohn-Sham orbitals. Basic idea of Local Density (LD) approximation, Generalised Gradient approximation and hybrid (BLYP, B3LYP) methods. Comparative study of Molecular Mechanics, Ab-initiomethod, Semi-empirical method and DFT method of computations.	3	11

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CH 243 (a) Dissertation

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	demonstrate an advanced theoretical and technical knowledge of chemistry as a creative endeavour; analyse, interpret and critically evaluate scientific information.	Ap, An	1
2.	present information, articulate arguments and conclusions, in a variety of modes, to audiences in their field of research.	E, C	5, 8
3.	as part of a team or individually, design, conduct, analyse and interpret results of an experiment, and effectively communicate these in written reports and other formats.	Ap, An	3, 7
4.	develop an understanding of the requirements to undertake independent research in a chemistry field.	U	6, 9
5.	demonstrate an understanding of the relationship between scientific research and the progress of new knowledge in a global scenario.	An	5, 6, 9

CH 243 (b) Visit to R & D Centre

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	Understand the relevance of independent supervised research in a chemistry field and the need of well-developed judgement, adaptability and accountability as a practitioner or learner	U, An	2, 9

Model Question Papers

General Instruction to question paper setters

- There will be a 15 main questions in each question paper divided into 3 sections – A, B and C.
- Each of the sections A, B and C will have 5 questions each, **1 from each module**.
- Each question in Section A will have 3 sub questions (a), (b) and (c), of which the candidate has to answer any two (2 marks each).
- Each question in Section B will have 2 sub questions (a) and (b), of which the candidate has to answer any one (5 marks each).
- Candidate should answer any three out of the five questions in Section C (10 marks each).
- Section A carries a total of 20 marks, Section B carries 25 marks, and Section 3 carries 30 marks.
- The maximum marks will be 75 and the duration of the exam will be 3 hrs.

Fourth Semester M.Sc. Degree Examination – Model question paper
Branch III – Chemistry/ Branch IV – Analytical Chemistry
CH/CL 241: CHEMISTRY OF ADVANCED MATERIALS
(2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among (a), (b) and (c) from each. Each sub question carries 2 marks

1. (a) What is meant by quantum confinement?
(b) Explain the synthesis of metal nanoparticles with an example.
(c) Write a short note on nano toxicology?
2. (a) What is EDAX?
(b) How XPS is used in nano technology?
(c) How diffused reflectance spectroscopy is used in characterisation of nanoparticles?
3. (a) What do you mean by chain transfer in polymerization process?
(b) Mention two advantages and two disadvantages of solution polymerization over bulk polymerization.
(c) Explain briefly “auto acceleration” in radical polymerization? Why does it happen?
4. (a) What are conducting polymers?
(b) Name any two polymeric reagents.
(c) Which are the polymers used in optical lithography?
5. (a) What are halochromic materials?
(b) Write a note on pH-sensitive polymers.

(c) What are piezo electric materials?

[2 × 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) Explain the relation between size and properties of nano-materials.
(b) Explain the CVD method used in the preparation of nanoparticles.
7. (a) Explain the use of powder XRD in determination of particle size of nanomaterials.
(b) How is electron microscopy used as characterisation techniques?
8. (a) What are chain transfer agents? Describe their effect on rate expression and molecular weight obtained in the presence of chain transfer agent.
(b) Unlike radical polymerisation both cationic and anionic polymerization show a marked dependence on the type of solvent used. Discuss on this.
9. (a) Discuss the structure and working principle of lithium polymer batteries.
(b) Explain in detail the synthesis of polythiophenes.
10. (a) Explain the chemistry behind photochromism in spirooxazines and quinones.
(b) Write short note on synthesis and application of ferrofluids.

[5 × 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Explain application and role of metal nano particles in catalysis with examples.
12. Discuss the applications of DLS and IR spectroscopy in the analysis of nanomaterials.
13. Elaborate any two methods to determine the molecular weight of polymers.
14. Explain the application of polymers in drug delivery and in catalysis.
15. Describe with proper examples:
(a) magnetostrictive materials (b) thermoelectric materials
(c) self-healing polymers (d) dielectric elastomers.

[10 × 3 = 30]

Fourth Semester M.Sc. Degree Examination – Model question paper
Branch III – Chemistry
CH 242(a): INORGANIC CHEMISTRY – IV
(2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among (a), (b) and (c) from each. Each sub question carries 2 marks

1. (a) What is the point group of NO_3^- ? How does its symmetry change when complexed as unidentate ligand?
(b) Give the splitting of d-orbitals in a square pyramidal geometry?
(c) Demonstrate that C_3 and C_3^2 belong to the same class in C_{3v} point group.
2. (a) What is meant by macrocyclic effect?
(b) Give any two examples of self-assembly in supramolecular chemistry.
(c) What are the three basic functions of supramolecular species?
3. (a) What are anionic clusters? Give examples
(b) Explain Wade's rules to calculate the number of framework electrons in clusters.
(c) Clusters of $\text{Co}(\text{CO})_{12}$ and $\text{Co}_3\text{FeH}(\text{CO})_{12}$ are isolobal to each other. Explain
4. (a) What is cisplatin? What is its importance?
(b) What is the role of Lithium in biological systems?
(c) Write any two diseases caused by the deficiency of copper in the body.
5. (a) Give examples of room-temperature molten salts that could be used as non-aqueous solvents?
(b) What is meant by levelling effect of solvent?
(c) Which species would act as a base in (1) BrF_2 and (2) liquid SO_2 . Why?
[2 × 10 = 20]

SECTION B

Answer either (a) or (b) from each question. Each sub question carries 5 marks

6. (a) Give the salient features of Tanabe-Sugano diagram taking d^5 ion as an example.
(b) Discuss the application of group theory in arriving at the selection rules for the electronic spectrum of metal complexes.
7. (a) Explain the importance of supramolecular chemistry in the field of catalysis
(b) What are the advantages and applications of supramolecular chemistry in Nanotechnology?
8. (a) Explain the concept of Chevrel phases.
(b) What are LNCC's? Give eg: Discuss their structures.

9. (a) The toxicity of metals have been variously correlated with their (1) electronegativity, (2) insolubility of sulphides and (3) stability of chelates. Discuss.
- (b) What are dismutation reactions? Give eg: What type of metal is in superoxide dismutase?
10. (a) What are the advantages and disadvantages of using protic solvents as non-aqueous solvents?
- (b) Write a note on the reactions in liquid HF.

[5 × 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Deduce the normal modes of trans-N₂F₂ molecule and predict the IR and Raman activity of the modes. Given the character table for C_{2h}.

C _{2h}	E	C ₂	i	σ _h		
A _g	1	1	1	1	R _z	x ² , y ² , z ² , xy
B _g	1	-1	1	-1	R _x , R _y	xz, yz
A _u	1	1	-1	-1	z	
B _u	1	-1	-1	1	x, y	

12. Discuss with suitable examples the different types of interaction in supramolecular compounds.
13. Discuss and draw the structure and bonding of (Re₂X₈)²⁻.
14. Explain the structure and functions of hemocyanin and plastocyanin
15. Write a detailed account of the reactions in the following non-aqueous solvents: (1) NH₃ and (2) N₂O₄.

[10 × 3 = 30]

Fourth Semester M.Sc. Degree Examination – Model question paper
Branch III – Chemistry
CH 242(b): ORGANIC CHEMISTRY – IV
 (2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among (a), (b) and (c) from each. Each sub question carries 2 marks

1. (a) How will you characterize alkaloids and flavonoids by colour reagents?
- (b) Give the structure of an alkaloid. How will you determine its carbon skeleton through Hofmann degradation?

- (c) Explain supercritical fluid extraction method for the chemical constituents from plants.
2. (a) What are calixarenes? Give one example.
(b) Explain the term π - π stacking.
(c) What are the biomaterials needed for protein synthesis?
3. (a) Narrate the importance of chiral drugs.
(b) Draw the structure of paracetamol. Discuss its synthesis.
(c) Differentiate between solid phase and solution phase combinatorial organic synthesis.
4. (a) Explain the synthesis of adenine from thiourea.
(b) Give two examples of amino and carboxy protecting groups.
(c) Explain the structure of glycogen.
5. (a) Define atom economy?
(b) Give two advantages of scavenger resins.
(c) What are designer solvents? Give one example.

[2 × 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) Discuss the biosynthesis of terpenes from acetyl coenzyme A.
(b) Elucidate the structure of atropine.
7. (a) Briefly discuss the 'host-guest' relationship in molecular recognition.
(b) Explain self organization and self association in living systems.
8. (a) Narrate the steps involved in drug design.
(b) Give the synthetic route for diazepam and benzylpenicillin.
9. (a) Write a note on biodegradable polymers.
(b) Briefly discuss Edmans method of protein sequencing.
10. (a) What is sonochemistry? What are the principles of sonochemistry?
(b) Briefly explain organic reactions involving ionic liquids.

[5 × 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. a) Explain primary and secondary metabolites in plants.
b) Discuss the Anner Meischer synthesis of estrone.
12. a) Explain different forces involved in molecular recognition.
b) Write short notes on following supramolecular systems
(i) Liquid crystals (ii) Helicates

13. a) Explain different classes of drugs with examples.
b) Briefly discuss computer assisted drug design.
14. a) Explain Solid Phase Peptide Synthesis. What are the advantages of this method?
b) What is the principle of Ziegler-Natta catalyst?
15. a) What are the twelve principles of green chemistry?
b) Green chemistry is sustainable chemistry. Explain.

[10 × 3 = 30]

Fourth Semester M.Sc. Degree Examination – Model question paper
Branch III – Chemistry
CH 242(c): PHYSICAL CHEMISTRY – IV
 (2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among **(a)**, **(b)** and **(c)** from each. Each sub question carries 2 marks

1. (a) Differentiate SAGO and SALC
(b) Explain vanishing and non vanishing integral with one example each
(c) Discuss the mutual exclusion principle using group theory
2. (a) Explain space quantization
(b) Express the angular momentum operators in terms of spherical coordinates
(c) Write the three Legendre polynomials when $m = 0$ and $l = 1, 2, 3$
3. (a) Write one trial function to solve Helium by variation method. Justify your answer.
(b) Briefly discuss Self Consistent Field method
(c) State and explain variation theorem.
4. (a) State and explain selection rules for vibrational transitions in simple harmonic oscillator
(b) The potential energy term for an harmonic oscillator is $\frac{1}{2}kx^2 + bx^3$.
Predict the correction term according to first order perturbation method.
Justify your answer
(c) What is Stark effect?
5. (a) What is the meaning of the notation 3-21G**?
(b) What is parametrisation?. How does it simplify abinitio calculations?
(c) Write the z-matrix of Ammonia molecule/

[2 × 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) HCHO belongs to C_{2v} point group. Using group theory, find out the lowest energy electronic transition.

- (b) Find the IR and Raman active vibrations of NH_3 ? C_{3v} character table given.

C_{3v}	E	$2C_3$	$3\sigma_v$		
A_1	1	1	1	z	$x^2 + y^2, z^2$
A_2	1	1	-1	R_z	
E	2	-1	0	$(x, y), (R_x, R_y)$	$(x^2 - y^2, xy) (xz, yz)$

7. (a) Write Schrodinger wave equation for a rigid rotor. Transform it into the Legendre equation

- (b) Solve the time independent Schrödinger wave equation for a three dimensional harmonic oscillator whose potential energy is

$$V_{(x,y,z)} = \frac{1}{2}(k_1x^2 + k_1y^2 + k_1z^2)$$

8. (a) Estimate the ground state energy of normal Helium using variation method

- (b) What are the strength and limitations of variation method?

9. (a) Show that the first order Stark effect on the ground state of hydrogen atom is zero.

- (b) Find the ground state energy of a particle in one dimensional box with slanted bottom using first order perturbation method.

10. (a) Explain DFT method of computational chemistry.

- (b) Discuss the need of Post Hartree-Fock method

[5 × 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Find energy of π molecular orbitals of benzene using HMO method. Use C_6 character table.

12. Apply Schrodinger wave equation for simple harmonic oscillator. Find eigen function and eigen values.

13. What is linear variation method? Illustrate using one example.

14. Briefly discuss time dependent perturbation theory.

15. Discuss the various computational methods based on wave function. Make a critical comparison.

[10 × 3 = 30]



UNIVERSITY OF KERALA

DRAFT

Syllabus for
M. Sc . Programme in Branch IV
ANALYTICAL CHEMISTRY

(Revised Syllabi under credit and semester system
with effect from 2020 Admissions)

PREAMBLE

The syllabi of M.Sc programmes in Chemistry offered in the affiliated colleges of the University under Semester system have been revised and the revised syllabi are to be effective from 2020 admission. There are two independent PG programmes in Chemistry, namely **M.Sc. Programme in Branch III-Chemistry** and **M.Sc. Programme in Branch IV-Analytical Chemistry**. These PG programmes are equivalent in all respect for employment and higher studies. Each of these two PG programmes shall extend over a period of two academic years comprising of four semesters, each of 450 hours in 18 weeks duration. The syllabi and scheme of examinations of these two programmes are detailed below. The theory courses of the first three semesters and the practical courses of the first two semesters of the two programmes are common, and therefore, the examinations of these two PG programmes are to be conducted with common question papers for the first three semesters by a common Board of Examiners. These syllabi are effective from 2020 admission in affiliated colleges of the university.

M.Sc. PROGRAMME IN BRANCH IV - ANALYTICAL CHEMISTRY

(Revised syllabus under semester system with effect from 2020 admission)

SYLLABUS AND SCHEME OF EXAMINATION

Course No and Title		Hours per week		Duration of ESA	Marks for CA	Marks for ESA	Total Marks
		L	P				
SEMESTER I*							
CL 211	Inorganic Chemistry I	5		3	25	75	100
CL 212	Organic Chemistry I	5		3	25	75	100
CL 213	Physical Chemistry I	5		3	25	75	100
CL 214	Inorganic Chemistry Practicals I		3	(To be continued in Semester II)			
CL 215	Organic Chemistry Practicals I		3	(To be continued in Semester II)			
CL 216	Physical Chemistry Practicals I		4	(To be continued in Semester II)			
Total marks for Semester I						300	
*Distribution of teaching hours/week: Theory–15 hours, Practical’s –10 hours							
SEMESTER II*							
CL 221	Inorganic Chemistry II	5		3	25	75	100
CL 222	Organic Chemistry II	5		3	25	75	100
CL 223	Physical Chemistry II	5		3	25	75	100

CL 214	Inorganic Chemistry Practicals II		3	6	25	75	100
CL 215	Organic Chemistry Practicals II		3	6	25	75	100
CL 216	Physical Chemistry Practicals II		4	6	25	75	100
Total marks for Semester II							300
*Distribution of teaching hours/week: Theory–15 hours, Practical's –10 hours							
SEMESTER III*							
CL 231	Inorganic Chemistry III	5		3	25	75	100
CL 232	Organic Chemistry III	5		3	25	75	100
CL 233	Physical Chemistry III	5		3	25	75	100
CL 234	Inorganic Chemistry Practicals II		3	(To be continued in Semester IV)			
CL 235	Organic Chemistry Practicals II		3	(To be continued in Semester IV)			
CL 236	Physical Chemistry Practicals II		4	(To be continued in Semester IV)			
Total marks for Semester III							300
*Distribution of teaching hours/week: Theory–15 hours, Practical's –10 hours							
SEMESTER IV*							
CL 241	Chemistry of Advanced Materials	5		3	25	75	100
CL 242	Applied Analytical Chemistry	5		3	25	75	100
CL 234	Inorganic Chemistry Practicals II		3	6	25	75	100
CL 235	Organic Chemistry Practicals II		3	6	25	75	100
CL 236	Physical Chemistry Practicals II		4	6	25	75	100
CL 243 (a)	Dissertation**					50	50
CL 243 (b)	Visit to R&D Centre					5	5
Comprehensive viva-voce						45	45
Total marks for Semester IV							400
Grand Total (for semesters I-IV)							1200
*Distribution of teaching hours/week: Theory–10 hours, Practical's –10 hours , 5 hours for discussion on project							

** 10 marks out of the 50 marks for dissertation will be for dissertation viva-voce. The remaining 40 marks is to be distributed as follows_
Introduction to the work/ Statement of the Problem – 5, Review of Literature – 5
Materials and Methods – 5, Results and Discussion – 15, Language and style of presentation – 2, References – 3, Quality and Innovation – 5.

Programme Specific Outcomes

- PSO 1 Develop a better understanding of the current chemical principles, methods and theories with the ability to critically analyse at an advanced level.
- PSO 2 Acquire solid knowledge of classical and modern experimental techniques and interpretation of results; thereby acquire the ability to plan and carry out independent projects
- PSO 3 Develop the qualities of time management and organization, planning and executing experiments.
- PSO 4 Have a good level of awareness of the problems associated with health, safety and environment
- PSO 5 Understand how chemistry relates to the real world and be able to communicate their understanding of chemical principles to a lay audience and as well apply the knowledge when situation warrants.
- PSO 6 Learn to search scientific literature and databases, extract and retrieve the required information and apply it in an appropriate manner
- PSO 7 Demonstrate proficiency in undertaking individual and/or team-based laboratory investigations using appropriate apparatus and safe laboratory practices.
- PSO 8 develop analytical solutions to a variety of chemical problems identified from application contexts; critically analyse and interpret qualitative & quantitative chemical information's.
- PSO 9 Set the scene to make use of the wide range of career options open to chemistry graduates.
- PSO 10 achieve an understanding and appreciation of the crucial role of analytical chemistry and its impacts on life, environmental and industrial processes

M.Sc. PROGRAMME IN BRANCH III - CHEMISTRY

(Revised syllabus Under Semester System w.e.f. 2020 Admission)

SEMESTER I

CL 211 INORGANIC CHEMISTRY I

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	employ crystal field theory in analysing the splitting of d orbitals in octahedral, tetragonal, square planar, tetrahedral, trigonal bipyramidal and square pyramidal fields, calculate Crystal Field Stabilization Energy and Interpret Octahedral Site Stabilization Energy.	Ap, An U	1
2.	apply Jahn-Teller theorem and demonstrate evidence for JT effect, static and dynamic JT effect.	Ap	1
3.	illustrate MOT for octahedral and tetrahedral complexes with and without pi bonds and construct MO diagrams.	An C	1
4.	critically evaluate data from a variety of analytical chemistry techniques and apply knowledge of the statistical analysis of data.	Ap, E	1, 2
5.	interpret complexometric titrations, redox titrations, gravimetric titrimetry and titrations in non-aqueous solvents.	E, U	1, 2
6.	apply TG, DTA and DSC in the study of metal complexes.	Ap, An	1, 2
7.	explain the functioning of the frontier materials in inorganic chemistry like Solid Electrolytes, Solid oxide fuel cells, Rechargeable battery materials, Molecular materials and fullerenes.	U	1, 4, 6
8.	explain the preparation, properties and structure of isopoly acids of Mo, W and V and heteropoly acids of Mo and W.	U	1
9.	explain preparation and properties of xenon fluorides, and noble gas compounds, aluminosilicates, zeolites and silicones and identify the importance of shape selectivity.	U	1
10.	identify the chemical processes occurring naturally in earth's atmospheric, aquatic and soil environments and evaluates the impacts of human perturbations to these processes.	An, E	4

PSO–Programme Specific Outcome

Cognitive Level: R–Remember

An–Analyse

CO–Course Outcome

U–Understanding

E–Evaluate

Ap–Apply

C–Create

Module	Course Description	No. of Hrs	CO No.
1.0	Coordination chemistry-I: Theories of metal complexes	18	
1.1	Crystal field theory: Splitting of d orbitals in octahedral, tetragonal, square planar, tetrahedral, trigonal bipyramidal and square pyramidal fields.	4	1
1.2	Jahn-Teller theorem, evidence for JT effect, static and dynamic JT effect.	2	2
1.3	Crystal Field Stabilization Energy. CFSE for d^1 to d^{10} systems. Octahedral Site Stabilization Energy. Factors affecting the splitting parameter.	4	1
1.4	Spectrochemical series. Evidence of covalency in Metal-Ligand bond, introduction to Ligand field theory.	2	1
1.5	Molecular Orbital Theory. Sigma and pi bondings in complexes. MO diagrams of octahedral and tetrahedral complexes with and without pi bonds.	4	3
1.6	Experimental evidence of pi bond on the stability of sigma bond. Nephelauxetic effect.	2	3
2.0	Analytical principles	18	
2.1	Evaluation of analytical data: Accuracy and precision. Standard deviation, variance and coefficient of variation. Student 't' test, 'Q' test, and 'F' test. Confidence limits.	2	4
2.2	Errors: Classification, distribution, propagation, causes and minimization of errors. Significant figures and computation rules.	2	4
2.3	Correlation analysis: Scatter diagram. Correlation coefficient, r. Calculation of r by the method of least squares.	2	4
2.4	Volumetric methods: Classification of reactions in volumetry. Theory of indicators.	2	4
2.5	Complexometric titrations: Titration using EDTA-direct and back titration methods. Precipitation titrations. Redox titrations.	4	5
2.6	Titration in non-aqueous solvents. Organic reagents used in gravimetry: Oxine, dimethylglyoxime and cupferron.	2	5
2.7	Applications of TG, DTA and DSC in the study of metal complexes.	4	6
3.0	Frontiers in Inorganic Chemistry	18	
3.1	Solid Electrolytes: Mixed oxides, cationic, anionic solid electrolytes, mixed ionic-electronic conductors,	4	7
3.2	Solid Oxide Fuel Cells (SOFC), Rechargeable battery	3	7

	materials.		
3.3	Solid state chemistry of metal nitrides and fluorides, chalcogenides, intercalation chemistry and metal-rich phases.	4	7
3.4	Inorganic pigments, Inorganic phosphors.	3	7
3.5	Molecular materials and fullerides, basic idea of molecular materials chemistry like One dimensional metals, Molecular magnets and Inorganic liquid crystals.	4	7
4.0	Isopoly & Heteropolyacids, Silicon-Oxygen compounds, Xenon compounds	18	
4.1	Isopoly: Preparation, properties and structure of isopoly acids of Mo, W and V.	4	8
4.2	Heteropoly acids: Heteropoly acids of Mo and W. Keggin Structure, Keggin anions, Polyoxometalates .	5	8
4.3	Silicon-oxygen compounds: Aluminosilicates, Zeolites as microporous materials and molecular sieves, Silicones and Polysiloxanes.	5	9
4.4	Xenon fluorides, Structure of XeF ₂ (MO theory only), Perxenate ion, Organo xenon compounds, Coordination compounds of Xenon.	4	9
5.0	Chemistry of Natural Environmental Processes	18	
5.1	Chemistry of processes in atmosphere: Composition of the atmosphere. Automobile pollutants and the catalytic converter. Photochemical smog. Chemistry of the stratosphere. Catalytic destruction of ozone. Depletion of the ozone layer. Hazards of common air pollutants on the human health.	6	10
5.2	Chemistry of processes in hydrosphere: The hydrologic cycle. Cycling and purification. The unique properties of water. Acid-base properties.	6	10
5.3	Chemistry of processes in Lithosphere: Redox status in soil. pE, pH predominance diagrams for redox sensitive elements Fe and Cr. Acidity in soil materials. Acid neutralization capacity and the quantification of the soil acidity. Ion speciation in soil solution. Cation exchange capacity and exchange phase composition.	6	10

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CL 212 ORGANIC CHEMISTRY I

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	write down the IUPAC name of polycyclic, spirocyclic and heterocyclic compounds and draw the structures from the IUPAC name of these compounds.	U	1
2.	determine R and S, P and M, E and Z configuration of compounds with chiral centres, biphenyls, allenes, spiranes and draw the configurations in dash and wedge formula, or zig –zag configurations.	E	1
3.	detect prochirality in a compound and explain relevance of prochirality .	U, An	1
4.	explain chiral centre, chiral axis and chiral plane with examples, stability of conformations, stereoselective and stereospecific reactions.	An, E	1
5.	calculate Cotton effect of a compound from its structure and configuration.	E	1
6.	explain different methods for generation of free radical and different types of free radical reactions- Predict the products in a free radical reaction.	U, An	1
7.	describe different types mechanism of substitution, elimination, hydrolysis and addition reactions.	Ap	1
8.	differentiate the rate, mechanism and stereochemistry influenced by solvent, substrate structure, intermediate stability.	An	1
9.	predict the products or reactants or reagents in selected	U	1

	types of reactions.		
10.	design the mechanism of selected reactions.	C	1

Module	Course Description	No. of Hrs	CO No.
1.0	Stereochemistry	18	
1.1	Nomenclature of organic compounds - Cyclic, fused polycyclic and bridged polycyclic hydrocarbons, bridged and fused hydrocarbon systems, Spirocyclic hydrocarbon systems, Heterocyclic systems containing Nitrogen and Oxygen.	3	1
1.2	Introduction to molecular symmetry and chirality, axial chirality, planar chirality and helicity, relative configuration, stereochemical nomenclature, R and S, E and Z (use only 3D formula, dash and wedge).	3	2
1.3	Prostereoisomerism, stereotopicity & stereoprojections. Prochiral centre and prochiral faces - Pro R and Pro S, Re face and Si face, Importance of prochirality in biological systems.	3	3
1.4	Axial stereochemistry: atropisomerism and its designation - biphenyls, allenes, spiranes- M and P configurations. Stereoselectivity: enantioselectivity, diastereoselectivity & stereoconvergence. Stereospecific and stereoselective synthesis.	2	4
1.5	Application of Cram's rule, Felkin-Ahn model. Basic introduction to chiral separation methods and estimation of enantiomeric excess, chiral pool, chiral auxiliary, chiral reagents, BINAP.	2	4
1.6	Conformational analysis of substituted cyclohexane, decalin and biased systems. Effect of conformation on reactivity of cyclohexanes.	2	4
1.7	Introduction to ORD, CD - their application in assigning configuration. Sector rules such as octant and axial haloketone rules. Cotton effect.	2	5
1.8	Importance of stereochemistry in drugs-Pthalidomide, Dopa, Ibuprofen.	1	2
2.0	Reactions Involving Free Radicals, Nitrenes and Carbenes		
2.1	Free radical Structure, stability and reactivity, Preparation of free radicals- Triphenyl methyl, TEMPO, AIBN, Dibenzoyl peroxide, NBS, Tributyl Tinhydride and AIBN.	5	6
2.2	Free radical reactions- Chlorination of alkane, addition of HX, SRN1 mechanism, Gomberg reaction, Pschorr	5	6

	ring closure, Hunsdieckers reaction, Ullman reaction, Kolbes electrolytic reaction.		
2.3	Acyloin condensation, Alkyne coupling reactions,. Mc Murry reaction, Pinacol coupling reaction.	3	6
2.4	Structure, formation, stability and reactions of carbenes and nitrenes (rearrangement reactions excluded).	5	6
3.0	Nucleophilic substitution reaction	18	
3.1	Nucleophilic substitution at sp^3 carbon - S_N1 and S_N2 mechanisms. Competition between S_N1 and S_N2 reactions. Walden inversion, stereochemistry. Effect of solvent, leaving group and substrate structure on rates of S_N1 and S_N2 substitutions.	4	7, 8
3.2	Neighbouring group participation, Nonclassical carbocations, S_N1' , S_N2' , S_Ni mechanisms.	3	7, 8
3.3	Mitsunobu reaction, Mechanism of esterification and ester hydrolysis-acid catalysed and base catalysed reactions.	3	7, 8
3.4	Aromatic Substitution reactions - Electrophilic substitution: mechanism and evidence- Reactions involving nitrogen, sulphur, carbon, halogen and oxygen electrophiles. Reimer-Tiemann, Vilsmeier-Haack reactions.	4	7, 8
3.5	Directive and rate controlling factors in aromatics with one or more substituents. Aromatic Nucleophilic Substitution reactions - S_N1 , S_NAr , Elimination – Addition reactions (benzyne), evidence with examples, Chichibabin reaction.	4	7, 8
4.0	Addition Reactions	18	
4.1	Addition of H_2O , X_2 , HX , and boranes to $C=C$ systems, (hydroboration followed by oxidation only), stereo aspects, effect of substituents on the rate of additions, iodo lactonisation, one or two examples.	5	9, 10
4.2	Prilezhaev reactions. Cis and trans hydroxylation of cycloalkenes. Nucleophilic addition to activated $C=C$ systems. Michael addition and Robinson Annulation.	5	9, 10
4.3	Aldol condensation (normal, crossed and directed), evidence for normal Aldol condensation. Stork enamine, Cannizzaro, Perkin, Ritter, Stobbe, Knoevenagel, Darzen, Reformatsky and benzoin condensations.	4	9, 10
4.4	Grignard, Mannich, Thorpe reactions, Dieckmann condensation, sulfur ylides (stabilized and unstabilised)-direct and conjugated addition to carbonyl. (Mechanisms expected for all reactions)	4	9, 10

5.0	Elimination Reactions	18	
5.1	Elimination reactions leading to C=C bond formation and their mechanisms. E ₁ , E ₂ and E ₁ cb mechanisms.	5	9, 10
5.2	Stereo aspects of C=C bond formation in cyclic and acyclic systems. Regioselectivity in elimination, Hoffmann and Saytzeff elimination. Effect of basicity, temperature, leaving group and substrate structure.	5	9, 10
5.3	Elimination vs substitution, Shapiro reaction, Peterson and Julia olefination, Wittig and Wittig - Horner reaction-stereochemistry.	4	9, 10
5.4	Cis elimination-esters, sulfoxides, selenoxides, Chugaev reaction, Cope elimination, Stereo aspects of cis elimination - cyclic bicyclic systems Sodium in liquid ammonia and Lindlars catalyst in conversion of alkynes to alkenes.	4	9, 10

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CL 213 PHYSICAL CHEMISTRY I

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	outline the development of quantum mechanics and its tools and apply them in determining the wave functions and energies of moving particles.	U, Ap, An	1
2.	recognize the nature of adsorption and propose theories and choose theoretical and instrumental methods of measurements of surface property.	U, Ap, An	1
3.	understand theory and mechanism of catalytic action.	U	1
4.	correlate thermodynamic properties and apply them in systems.	U, Ap, An	1
5.	understand theories, mechanism and, kinetics of reactions and solve numerical problems.	U, Ap, An	1
6.	identify point groups and construct character table and predict hybridisation and spectral properties of molecules.	U, Ap, C	1

Module	Course Description	No. of Hrs	CO No.
1.0	Quantum Chemistry I	18	
1.1	Classical mechanics and its limitations –need of quantum mechanics, de Broglie relation and its experimental proof, uncertainty principle and its consequences.	1	1
1.2	Postulates of quantum mechanics: State function postulate: Born interpretation of the wave function, well behaved functions, orthonormality of wave functions.	2	1
1.3	Operator postulate: Operator algebra, linear and nonlinear operators, Laplacian operator, commuting and non-commuting operators, Hermitian operators and their properties.	2	1
1.4	Eigen value postulate: eigen value equation, eigen functions of commuting operators.	2	1
1.5	Expectation value postulate. Postulate of time Dependent Schrödinger equation, Quantization of angular momentum, quantum mechanical operators corresponding to angular momenta (L_x , L_y , L_z and L^2) and expression for (L_x , L_y , L_z and L^2) in polar coordinates.	2	1
1.6	Application of Quantum mechanics to Exactly Solvable Model Problems Translational motion: free particle in one dimension, particle in a box with infinite potential barrier one	3	1

	dimensional box three-dimensional box and cubical box-degeneracy.		
1.7	Particle with finite potential barriers, one potential barrier, two finite barriers. Quantum mechanical tunnelling (Qualitative concept only).	3	1
1.8	Vibrational motion: one-dimensional harmonic oscillator (complete treatment), Hermite equation (solving by method of power series), Hermite polynomials, recursion relation, wave functions and energies-important features of wave functions, Harmonic oscillator model and molecular vibrations.	3	1
2.0	Surface Chemistry and Catalysis	18	
2.1	The gas-solid interphase, types of adsorption. Heat of adsorption and its determination, differences between chemisorptions and physisorption.	2	2
2.2	Adsorption isotherms - Freundlich and Langmuir isotherms. Thermodynamic and statistical derivation of Langmuir adsorption isotherm. Multilayer adsorption-the BET theory and Harkins-Jura theory.	3	2
2.3	Determination of surface area of solids-Harkins-Jura absolute method, point B method, Langmuir method and BET method.	2	2
2.4	Adsorption from solutions: Gibb's adsorption equation and its verification. Adsorption with dissociation. Adsorption with interaction between adsorbate molecules.	2	2
2.5	Different types of surfaces, properties of surface phase. Thermodynamics of surface. Surface tension of solutions. Surfactants and micelles. Examination of surfaces- Low Energy Electron Diffraction (LEED).	2	2
2.6	Photoelectron spectroscopy, ESCA, scanning probe microscopy, Auger electron spectroscopy, SEM and TEM.	3	2
2.7	Surface films-different types, surface pressure and its measurement.	2	3
2.8	Catalysis: Mechanism and theories of homogeneous and heterogeneous catalysis. Bimolecular surface reactions. Langmuir-Hinshelwood mechanism. Enzyme catalysis.	2	3
3.0	Classical Thermodynamics	18	
3.1	Entropy - Dependence of entropy on variables of a system (S, T and V; S, T and P). Thermodynamic equations of state. Criteria for equilibrium and spontaneity, Euler's relation, Gibbs and Helmholtz free energy.	2	4
3.2	Maxwell relations and significance, temperature	2	4

	dependence of free energy, Gibbs Helmholtz equation and its applications.		
3.3	Partial molar quantities - Chemical potential, Gibbs Duhem equations, determination of partial molar properties-partial molar volume and partial molar enthalpy.	2	4
3.4	Fugacity - relation between fugacity and pressure, determination of fugacity of a real gas, variation of fugacity with temperature and pressure. Fugacity of liquid mixtures, fugacity of mixture of gases, Lewis-Randall rule.	3	4
3.5	Activity, activity coefficients, dependence of activity on temperature and pressure. Determination of activity and activity coefficients of electrolytes and non-electrolytes.	2	4
3.6	Thermodynamics of mixing, Duhem-Margules equation, Konowaloff's first and second laws, Henry's law, excess thermodynamic functions-determination of excess enthalpy and volume.	4	4
3.7	Chemical affinity and thermodynamic functions, effect of temperature and pressure on chemical equilibrium-van't Hoff reaction isochore and isotherm.	3	4
4.0	Chemical kinetics	18	
4.1	Theories of reaction rates: Collision theory and its failure. Transition state theory - Eyring equation. Comparison of the two theories. Thermodynamic formulation of the reaction rates. Potential energy surfaces.	3	5
4.2	Theories of unimolecular reactions - Lindemann theory. Lindemann-Hinshelwood mechanism, qualitative idea of RRKM theory.	2	5
4.3	Kinetics of complex reactions- Parallel reactions, opposing reactions, consecutive reactions and chain reactions, steady state treatment, kinetics of $\text{H}_2\text{-Cl}_2$ and $\text{H}_2\text{-Br}_2$ reactions, decompositions of ethane, acetaldehyde and N_2O_5 . Rice-Herzfeld mechanism, branching chain reactions, Hinshelwood mechanism of chain reactions and explosion.	4	5
4.4	Fast reactions: Relaxation method, relaxation spectrometry, flow method, shock method, fast mixing method, field jump method, pulse method, flash photolysis and NMR method.	3	5
4.5	Reactions in solution: Factors affecting reaction rates in solutions, effect of dielectric constant and ionic strength, cage effect, Bronsted-Bjerrum equation.	3	5
4.6	Kinetic effects: Primary and secondary kinetic salt effect, influence of solvent on reaction rates,	3	5

	significance of volume of activation, linear free energy relationship. Hammett equation and Taft equation.		
5.0	Molecular symmetry	18	
5.1	Symmetry elements and symmetry operation. Matrix representation of symmetry operations. Block factored matrices, Character of a matrix. Conditions for a set of elements to form a group. Point groups and their systematic identification.	2	6
5.2	Multiplication of operations. Group multiplication table. Similarity transformation and classification of symmetry operation, Matrix representation of point group. Reducible and Irreducible representations.	3	6
5.3	The Great Orthogonality Theorem. Rules derived from GOT (proof not required).	1	6
5.4	Setting up of character table of C_{2v} , C_{3v} and C_{2h} groups. Direct product representations. Reduction formula, reduction of reducible representation to IRs. Transformation properties of atomic orbitals. Molecular symmetry and optical activity.	4	6
5.5	Applications of character tables: Hybridisation-identification of atomic orbitals taking part in hybridisation of triangular planar, square planar, trigonal bipyramidal, square pyramidal and tetrahedral molecules.	4	6
5.6	Spectroscopy-Determination of number of active IR and Raman lines taking simple molecules belongs to C_{2v} , C_{3v} and D_{4h} point groups as example.	4	6

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CL 214 INORGANIC CHEMISTRY PRACTICALS - I

Total 125 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	interpret data from an experiment, including the construction of appropriate graphs and the evaluation of errors.	U, E	3, 7, 8
2.	estimate volumetrically the concentration of Zn, Mg and Ni using EDTA and the volumetric estimation of Fe.	Ap, An	7, 8
3.	estimate volumetrically the hardness of water and concentration of Ca in water samples using EDTA.	Ap, An	7, 8
4.	estimate colorimetrically the concentration of Chromium – (using Diphenyl carbazide), Iron (using thioglycollic acid), Iron (using thiocyanate), Manganese (using potassium periodate), Nickel (using dimethyl glyoxime).	Ap, An	7, 8
5.	carry out the preparation of the metal complexes Potassium trioxalatochromate (III), Tetraammoniumcopper (II) sulphate, Hexamminecobalt (III) chloride.	Ap	7, 8
6.	record the UV spectra, IR spectra, magnetic susceptibility, TG, DTA and XRD of the complexes prepared.	Ap, An	2, 7, 8

Module	Course Description	No. of Hrs	CO No.
1.	Volumetric estimation using EDTA - Zn, Mg, Ni (back titration), Hardness of water, Ca (using murexide).	25	1, 2, 3
2.	Determine the hardness of water and the concentration of Ca in water samples using EDTA.	20	1, 2, 4
3.	Volumetric estimation of Fe.	10	1, 2, 3
4.	Colorimetric estimation of Chromium – (Diphenyl carbazide), Iron (thioglycollic acid), Iron (thiocyanate), Manganese (potassium periodate), Nickel (dimethyl glyoxime).	35	1, 2, 5
5.	Preparation of metal complexes - Record UV, IR, magnetic susceptibility, TG, DTA and XRD of the complexes prepared (a) Potassium trioxalatochromate (III) (b) Tetraammoniumcopper (II) sulphate (c) Hexamminecobalt (III) chloride	35	1, 2, 6, 7

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3. D. A. Skoog and D. M. West, Analytical Chemistry: An Introduction, Saunders College Publishing, 4th edition, 1986.
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CL 215 ORGANIC CHEMISTRY PRACTICALS - I

Total 125 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	interpret data from an experiment, including the construction of appropriate graphs and the evaluation of errors.	U, E	3, 7, 8
2.	determine the correct method for separation of a binary mixture and make the separated compounds in pure form.	An, E	2, 7, 8
3.	develop thin layer chromatogram of a compound and determine its purity.	C	2, 7, 8
4.	separate two compounds by column chromatography.	An	2, 7, 8
5.	utilize the synthetic procedures and reagents to convert a compound into another. Differentiate the products by spectroscopic methods.	An	2, 7, 8
6.	use green chemical principles in the synthesis.	Ap	2, 4
7.	solve GC MS and LC MS of a compound to ascertain purity and identity, apply the basic principles learned	Ap, E	2, 7

	through a practical example		

Module	Course Description	No. of Hrs	CO No.
1.	Separation and identification of organic compounds, a. Quantitative wet chemistry separation of a mixture of two components by solvent extraction. b. TLC of the purified samples along with the mixture in same TLC plates (component 1 with mixture and component 2 with mixture on separate TLC plate) and calculation of R _f values- Reporting and recording TLC in standard formats- preparation of sample solution, adsorbent, dimensions of the plate, saturation time, developing time, visualization and detection, R _f Value, Drawing - in the form of a table.	30	5
2.	Separation of a mixture by column chromatography (not for end semester evaluation) a. Malachite green and methylene blue, b. o-nitroaniline and p-nitroaniline.	20	
3.	Preparation of compounds by two stages ☐ Recording UV, IR, ¹ H-NMR and ¹³ C-NMR and EI mass spectra of synthesized compounds. ☐ Record and interpret GC-MS and LC-MS of the purified compound. ☐ TLC analysis-Stage 1 reactants and products on TLC plate 1 and stage 2 reactants and products on plate 2). ☐ Record TLC in standard format as in separation. All preparations must be restricted to 1 g level I. Nitration (1) Acetanilide → p-nitroacetanilide → p-nitroaniline (2) Methylbenzoate → methyl m-nitrobenzoate → m-nitrobenzoic acid II. Bromination (3) Acetanilide → p-bromoacetanilide → p-bromoaniline <i>using CAN for bromination</i> III. Aldol condensation- Synthesis of heterocycles. (4) Benzaldehyde → Dibenzylideneacetone → 1,5-Diphenyl-3-styryl-2-pyrazoline IV. Diazocoupling (5) Aniline → Diazoaminobenzene → p-aminoazobenzene V. Rearrangement (6) Pthalic anhydride → Pthalimide → Anthranilic acid VI. Synthesis of Dyes (7) N,N-Dimethylaniline → N,N-dimethyl-4-	75 (average 12.5 hrs for preparation and analysis of each)	1, 5, 6, 7

	nitrosoaniline → methylene blue		

The board of examiners have to select either TLC of separated components OR TLC of preparation for an examination. But both TLC examinations are to be practiced and entered in the record of experiments.

References

1. B. S. Furniss, Vogel's text book of practical organic chemistry, 5th Edition, Longman, 1989.
2. D. L. Pavia, G. M. Lampman, G. S. Kriz and R. G. Engel, A microscale approach to organic laboratory techniques," Wadsworth Publishing, 5th Edition, 2012.
3. R. K. Bansal, Laboratory manual of organic Chemistry, Wiley Eastern, 1994.
4. N. K. Vishnoi, Advanced Practical Organic Chemistry, 3rd Edition, Vikas
5. F. G. Mann and B. C. Saunders, Practical Organic Chemistry, Pearson Education, 2009.
6. J. B. Cohen, Practical organic chemistry, Forgotten Books, 2015
7. P. F Shalz, Journal of Chemical Education, 1996, 173: 267.
8. Monograph on green laboratory experiments, DST, Government of India, pp 1-79.
9. For spectral data of organic compounds, see:
<http://sdb.sriodb.aist.go.jp/sdb/cgi-bin/direct frame top.cgi>.

CL 216 PHYSICAL CHEMISTRY PRACTICALS - I

Total 125 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	interpret data from an experiment, including the construction of appropriate graphs and the evaluation of errors.	U, E	3, 7, 8
2.	construct the Freundlich and Langmuir isotherms for adsorption of acetic/oxalic acid on active charcoal/alumina and determine the concentration of acetic/ oxalic acid	C, Ap, An	7, 8
3.	determine the rate constant, Arrhenius parameters, rate constant and concentration using kinetics	Ap	7, 8
4.	construct the phase diagram and determine the composition of an unknown mixture	Ap, An	7, 8
5.	construct the ternary phase diagram of acetic acid chloroform-water system and out the procedure in an unfamiliar situation to find out the composition of given homogeneous mixture.	C, Ap, An	7, 8
6.	construct the tie-line in the ternary phase diagram of acetic acid chloroform-water system	C, Ap, An	7, 8
7.	determine distribution coefficient using distribution law.	Ap	7, 8
8.	determine the equilibrium constant employing the	Ap	7, 8

	distribution law.		
9.	determine the coordination number of Cu^{2+} in copper-ammonia complex.	Ap	7, 8
10.	determine K_f of solid solvent, molar mass of non-volatile solute, mass of solvent and composition of given solution	Ap, An	7, 8
11.	determine K_T of salt hydrate, molar mass of solute, mass of salt hydrate and composition of given solution.	Ap, An	7, 8
12.	determine surface tension and parachor of liquids.	Ap	7, 8
13.	ascertain the relationship between surface tension with concentration of a liquid and use this to find out the composition of given homogeneous mixture.	Ap, An	7, 8
14.	determine the concentration of given strong acid/alkali.	Ap, An	7, 8
15.	determine the heat of ionisation of acetic acid.	Ap, An	7, 8
16.	determine the heat of displacement of Cu^{2+} by Zn.	Ap, An	7, 8

Module	Course Description	No. of Hrs	CO No.
1.	Adsorption a) Freundlich and Langmuir isotherms for adsorption of acetic/oxalic acid on active charcoal/ alumina. b) Determination of concentration of acetic/ oxalic acid.	15	1, 2,
2.	Kinetics a) Determination of rate constant of acid hydrolysis of methyl acetate. b) Determination of Arrhenius parameters. c) Determination of concentration of given acid. d) Determination of rate constant of the saponification of ethyl acetate and evaluation of Arrhenius parameters. e) Determination of rate constant of reaction between $K_2S_2O_8$ and KI.	15	1, 3
3.	Phase rule I. Solid-liquid equilibria a) Construction of phase diagram and determination of the composition of unknown mixture (naphthalene/ biphenyl, naphthalene/ benzophenone, naphthalene/ diphenyl amine). b) Construction of phase diagram with simple eutectic - naphthalene/ metadinitrobenzene. II. Partially miscible liquid pairs a) CST of phenol-water system. b) Three component system - Construction of ternary phase diagram of acetic acid chloroform-water system and hence the composition of given homogeneous mixture. Construction of tie-line.	16	1, 3, 4, 5, 6
4.	Distribution law a) Distribution coefficient of ammonia between hexane and water. Determination of equilibrium constant of copper - ammonia complex by partition method or coordination number of Cu^{2+} in copper-ammonia complex. b) Distribution coefficient of benzoic acid between toluene and water. c) Distribution coefficient of iodine between hexane and water. d) Determination of the equilibrium constant of the reaction $KI + I_2 \rightleftharpoons KI_3$ and hence the concentration of given KI in hexane and water.	20	1, 7, 8, 9
5.	Dilute Solutions a) Determination of K_f of solid solvent, molar mass of non-volatile solute, mass of solvent and composition	17	1, 10

	of given solution (Solvent-Naphthalene/ Biphenyl/ Benzophenone etc. Solute-Naphthalene/ Biphenyl/ Diphenylamine etc.) b) Determination of vant Hoff's factor for benzoic acid in Naphthalene. c) Determination of atomicity of sulphur.		
6.	Transition temperature Determination of K_T of salt hydrate, molar mass of solute, mass of salt hydrate and composition of given solution (Solvent - $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$/$\text{CH}_3\text{COONa} \cdot 3\text{H}_2\text{O}$, Solutes glucose, sucrose, urea).	12	1, 11
7.	Surface tension a) Determination of surface tension of various liquids (water - ethanol, water - glycerol, water - sorbitol, nitrobenzene-toluene) by Stalagmometric method (drop number/ drop weight) and by Capillary rise method. b) Determination of parachors of molecules and various groups. c) Determination of concentration of a mixture. d) Determination of surface tension and parachor of liquids using double capillary method. e) Variation of surface tension with concentration. Unknown concentration of a mixture. Interfacial tension. f) Determination of surface excess and area per molecule.	15	1, 12, 13
8.	Thermochemistry a) Determination of the concentration of given strong acid/alkali. b) Thermometric titration of NaOH vs standard HCl. c) Heat of displacement of Cu^{2+} by Zn. d) Determination of the heat of ionisation of acetic acid.	15	1, 14, 15, 16

References

1. V. D. Athawal, Experimental Physical Chemistry, New Age International, 1st edn., 2001.
2. B. P. Levitt and J.A. Kitchener, Findlay's Practical Physical Chemistry, Longmans, London, 9th edn., 1973.
3. J. M. Newcombe, R. J. Denaro, A. R. Rickett & R.M.W Wilson, Experiments in Physical Chemistry Pergamon, 1962.
4. A.M. James and F.E. Pichard, Practical Physical Chemistry, Longman.
5. R.C. Das & Behera, Experimental Physical Chemistry, Tata McGraw Hill, 1983.
6. B. Viswanathan, Practical Physical Chemistry, Viva Publications, 2012.
7. P.S. Sindhu, Practicals in Physical Chemistry-A Modern Approach, McMillan India, 2005.

8. D. P. Shoemaker, C. W. Garland and J. W. Nibler. Experiments in Physical Chemistry.

Model Question Papers

General Instruction to question paper setters

- ☐ There will be a 15 main questions in each question paper divided into 3 sections – A, B and C
- ☐ Each of the sections A, B and C will have 5 questions each, **1 from each module**
- ☐ Each question in Section A will have 3 sub questions (a), (b) and (c), of which the candidate has to answer any two (2 marks each).
- ☐ Each question in Section B will have 2 sub questions (a) and (b), of which the candidate has to answer any one (5 marks each).
- ☐ Candidate should answer any three out of the five questions in Section C (10 marks each).
- ☐ Section A carries a total of 20 marks, Section B carries 25 marks, and Section 3 carries 30 marks.
- ☐ The maximum marks will be 75 and the duration of the exam will be 3 hrs.

First Semester M.Sc. Degree Examination - Model question paper
Branch III - Chemistry/ Branch IV - Analytical Chemistry
CH/CL 211: INORGANIC CHEMISTRY - I
(2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among **(a) (b) and (c)** from each. Each sub question carries 2 marks

1. (a) Sketch the splitting of d orbitals in a trigonal bipyramidal complex.
(b) Which among CN^- and NH_3 have a higher nephelauxetic effect? Why?
(c) Calculate the CFSE for a d^4 ion.
2. (a) Differentiate accuracy from precision.
(b) What are metallochromic indicators? Give an example.
(c) What is a Student t test used for?
3. (a) CdS is an yellow pigment while CdSe is red. Given reason.
(b) What is NASICON?
(c) What are anti-stokes phosphors?
4. (a) What are zeolites? Explain their use as water softeners?
(b) Determine the probable structure of perxenate ion using VSEPR theory.
(c) What are polysiloxanes? Give it structure.
5. (a) List two conditions that favour the formation of photochemical smog.
(b) Discuss briefly a method to quantify soil acidity.

(c) How does chlorine free radicals tamper the ozone layer?

[2 · 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) State and illustrate Jahn-Teller distortion.
(b) Discuss the factors affecting the magnitude of Δ_o .
7. (a) What is a scatter diagram? What is its significance?
(b) Discuss briefly the principle behind EDTA titrations.
8. (a) What are SOFCs?
(b) Briefly discuss the structure of fullerenes.
9. (a) Zeolites find applications as microporous materials and molecular sieves. Substantiate this statement.
(b) What are isopoly acids?
10. (a) List out five unique properties of water.
(b) Discuss on the various air pollutants and their effect on human health.

[5 · 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Describe the Molecular orbital energy level diagrams for octahedral metal complexes with and without π -bonds.
12. Explain the utility of TG, DTA and DSC in the study of metal complexes.
13. Detail the types of solid electrolytes giving due importance to structural aspects.
14. Elaborate the properties of the heteropoly acids of Mo and W.
15. What are pourbaix diagrams? Outline its role in explaining the chemistry of processes in lithosphere.

[10 · 3 = 30]

First Semester M.Sc. Degree Examination - Model question paper
Branch III - Chemistry/ Branch IV - Analytical Chemistry
CH/CL 212: ORGANIC CHEMISTRY - I
(2020 Admission Onwards)

Time: 3 Hrs

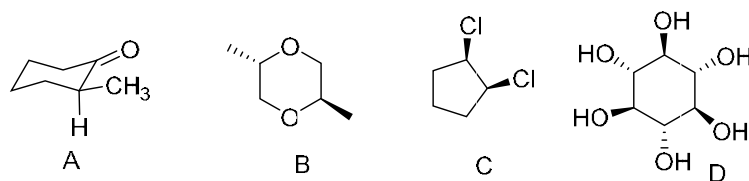
Max. Marks: 75

SECTION A

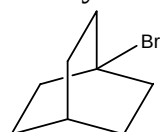
Answer **two** among **(a)**, **(b)** and **(c)** from each. Each sub question carries 2 marks

[23]

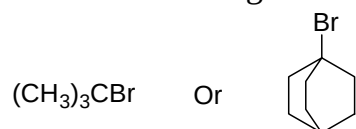
- Distinguish between conformation and configuration.
 - Draw the structure corresponding to diazabicyclo[2,2,2]octane.
 - Pick out the chiral/ achiral/ meso structures from the following.



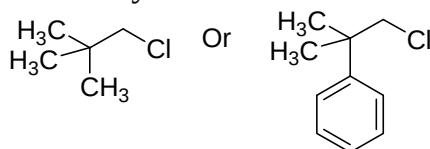
- What is AIBN?
 - Explain the peroxide effect in the addition of HBr to propene.
 - How you can synthesize the following molecule?



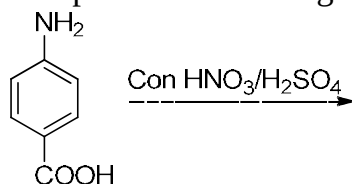
- Which of the following bromides will undergo a faster solvolysis? Explain



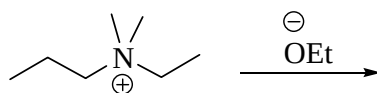
- Given below are two chlorides. Which among them will go through a faster solvolysis? Give reasons for your answer.



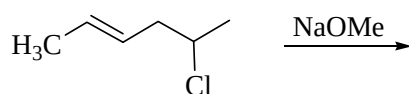
- Complete the following reaction.



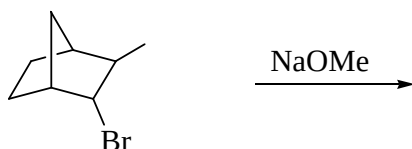
- Predict the product of the following reaction and indicate the major one. Give reasons.



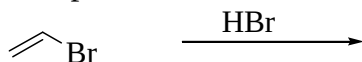
- What are the products obtained the reaction given below. Identify the major product in this case citing reasons.



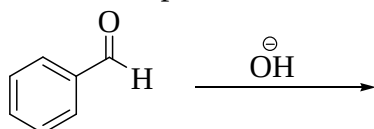
- Identify the major product in the following reaction. Substantiate your answer.



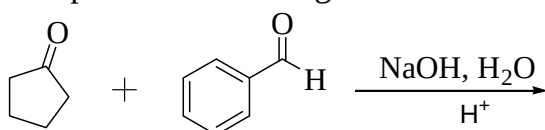
5. (a) Complete the reaction



- (b) Predict the products in the following reaction



- (c) Complete the following reaction

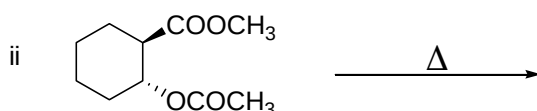
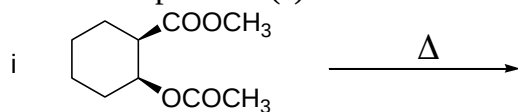


[2 · 10 = 20]

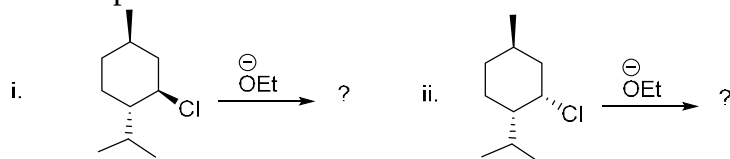
SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

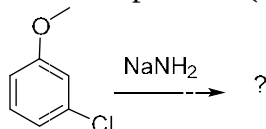
6. (a) Predict the product (s) of the following reactions



- (b) Predict the product (s) of the following reaction and indicate the major one. Explain?



7. (a) Give the product (s) with mechanism. Explain?

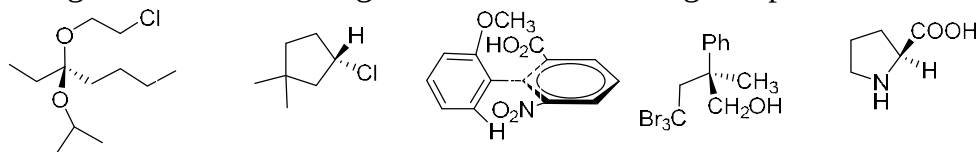


- (b) Discuss the mechanism of allylic bromination using NBS. Explain the stability of allyl radical.

8. (a) How will you convert isopropanol to n-propanol using a boron reagent? How does the addition of borane reagents to alkene differ from hydration? Illustrate with the help of an example.
- (b) Discuss benzoin condensation. What is the importance of cyanide in the

reaction?

9. (a) Assign the absolute configuration to the following compounds.



- (b) What are atropisomers? Explain why atropisomerism disappears at higher temperature?

10. (a) How does leaving group affect the rate of S_N^1 and S_N^2 reactions? Explain.
(b) Give the major product obtained when methoxybenzene is nitrated.
Discuss the directive effect with the help of resonance structures

[5 · 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Discuss Cotton effect? What is octant rule? Explain ORD curve.
12. Discuss the structure, stability and reactions of carbenes. How will you distinguish between singlet and triplet carbenes by a chemical method?
13. Discuss the mechanism of
a) Robinson Annulation b) Mannich reaction
c) Thorpe reaction d) Ritter reaction and
e) Darzen reaction
14. Neighbouring group participation results retention in configuration. Justify the given statement with the help of suitable examples. What is meant by anchimeric assistance?
15. Explain Wittig and Wittig –Horner reactions with stereochemistry. Compare Witting reaction with Julia olefination.

[10 · 3 = 30]

First Semester M.Sc. Degree Examination - Model question paper
Branch III - Chemistry/ Branch IV - Analytical Chemistry
CH/CL 213: PHYSICAL CHEMISTRY - I
(2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among **(a)**, **(b)** and **(c)** from each. Each sub question carries 2 marks

1. (a) Check whether the function e^{-x^2} is an eigen function for kinetic energy

[26]

- operator. If so what is the eigen value?
- (b) Show that the momentum of particle in 1D box is quantised.
 - (c) Write the general expression for Hermite polynomial. Deduce first two polynomials.
2. (a) Distinguish between associative and dissociative chemisorption.
 - (b) Under what condition can multilayer adsorption become more important than monolayer adsorption?
 - (c) Explain one method of determination of surface pressure.
3. (a) Calculate ΔS of mixing when 2 moles of H_2 , 3 moles of He and 2 moles of O_2 are mixed at fixed temperature assuming ideal behaviour and no chemical change.
 - (b) Write any two Maxwell's relations and give their significance.
 - (c) State 'Konowaloff's' rule.
4. (a) Give two reasons to show that conventional techniques are not suitable for the study of kinetics of fast reactions.
 - (b) Explain steady state principle?
 - (c) How volume of activation affects the reaction rate?
5. (a) Identify the symmetry elements present in the following and assign the point group
(i) H_2 (ii) HCl
 - (b) Explain improper axis of symmetry.
 - (c) Cyclic groups are abelian. Explain.

[2 · 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) For a particle in 3D box with $L_x = L_y = \frac{L_z}{2}$, what would be the energy when $n_x = 1$, $n_y = 2$ and $n_z = 2$ and when $n_x = 1$, $n_y = 1$ and $n_z = 4$. Use the calculations to explain the meaning of the term accidental degeneracy.
 - (b) $H(x)$ is written as a power series in x as $H(x) = \sum_{j=0}^n a_j x^j$. Derive recursion formula.
7. (a) Write any two methods for the determination of surface area of a solid.
 - (b) Explain Langmuir-Hinshelwood mechanism of surface catalyzed reactions.
8. (a) Derive Van't Hoff isotherm. How is this useful in the study of chemical equilibria?
 - (b) Derive Gibbs-Duhem equation.
9. (a) Compare the rate constant as given by Arrhenius equation and collision

theory and show that $E_a = E_0 + \frac{RT}{2}$

(b) Derive the rate law for the decomposition of NO_5 .

10. (a) Construct the group multiplication table for the symmetry operations of NH_3 molecule.
 (b) Determine the number of active IR and Raman lines in the vibrational spectrum of POCl_3 .

[5 · 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Set up the Schrodinger wave equation for a simple harmonic oscillator. Find the eigen functions and eigen values.
 12. Explain any two instrumental techniques used for surface characterization.
 13. Write a brief account of the methods for the determination of activity coefficient of electrolytes and non-electrolytes.
 14. Explain chain reactions. Discuss Semionoff Henshelwood theory of branching chain reactions
 15. a) Explain the hybridization scheme in BF_3 molecule using group theory.
 b) Show that the four elements of C_{2v} point groups forms 4 classes?

D_{3h}	E	$2C_3$	$3C_2$	σ_h	$2S_3$	$3\sigma_v$		
A'_1	1	1	1	1	1	1	R_z (x, y)	$x^2 + y^2, z^2$
A'_2	1	1	-1	1	1	-1		$(x^2 - y^2, xy)$
E'	2	-1	0	2	-1	0		
A''_1	1	1	1	-1	-1	-1	z (R_x, R_y)	(xz, yz)
A''_2	1	1	-1	-1	-1	1		
E''	2	-1	0	-2	1	0		

[10 · 3 = 30]

SEMESTER II

CL 221 INORGANIC CHEMISTRY II

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	obtain the term symbols of d^n system and determine the splitting of terms in weak and strong octahedral and tetrahedral fields.	E	1
2.	explain the correlation diagrams for d^n and d^{10-n} ions in octahedral and tetrahedral fields and interprets electronic spectra of complexes.	U, E	1
3.	applies magnetic measurements in the determination of structure of transition metal complexes.	Ap	1
4.	relates crystalline structure to X-ray diffraction data and the reciprocal lattice and explains the diffraction methods	U	1
5.	explains crystal defects .	U	1
6.	elaborates the structure of selected compounds of AX , AX_2 , A_mX_n , ABX_3 and spinels.	C	1
7.	explains the electronic structure of solids using free electron theory and band theory.	E	1
8.	understands the differences in semiconductor and dielectric materials and their electrical and optical properties	U, E	1
9.	explain the structure and reactions of S–N, P–N, B–N, S–P compounds and boron hydrides.	U, E	1
10.	analyse the topological approach to boron hydride structure and estimates styx numbers and apply Wade's rules in borane and carboranes.	Ap, An, E	1
11.	identify the electronic configurations and term symbols of lanthanides and actinides.	Ap	1
12.	sketches the shapes of f orbital and shows their splitting in cubic ligand field.	U	1
13.	elaborates the importance of the beach sands of Kerala and their important components.	C	1

PSO–Programme Specific Outcome

Cognitive Level: R–Remember

An–Analyse

CO–Course Outcome

U–Understanding

E–Evaluate

Ap–Apply

C–Create

Module	Course Description	No. of Hrs	CO No.
1.0	Coordination chemistry-Isomers and magnetic properties of transition metal complexes	18	
1.1	Electronic spectra of metal complexes-Term symbols of d^n system, Racah parameters, splitting of terms in weak and strong octahedral and tetrahedral fields.	4	1

1.2	Correlation diagrams for d^n and d^{10-n} ions in octahedral and tetrahedral fields (qualitative approach), d-d transition, selection rules for electronic transition, effect of spin orbit coupling and vibronic coupling.	3	2
1.3	Interpretation of electronic spectra of complexes- Orgel diagrams, Tanabe-Sugano diagrams, calculation of Dq , B and β (Nephelauxetic ratio) values, charge transfer spectra.	3	2
1.4	Magnetic properties of complexes-paramagnetic and diamagnetic complexes, molar susceptibility, Gouy's method for the determination of magnetic moment of complexes, spin only magnetic moment.	4	3
1.5	Temperature dependence of magnetism. Temperature Independent Paramagnetism (TIP). Spin state crossover, Antiferromagnetism - inter and intra molecular interaction.	2	3
1.6	Application of magnetic measurements in the determination of structure of transition metal complexes.	2	3
2.0	Crystalline state	18	
2.1	Crystal symmetry- Introduction to point groups and space groups. Miller indices. Reciprocal lattice concept.	2	4
2.2	Close packed structures: BCC, FCC and HCP. Voids. Coordination number.	2	4
2.3	X-ray diffraction by crystals: Function of crystals. Transmission grating and reflection grating. Bragg's equation.	2	4
2.4	Diffraction methods: Powder and rotating crystal. Indexing and determination of lattice type and unit cell dimensions of cubic crystals.	3	4
2.5	Crystal defects: Perfect and imperfect crystals. Point, line and plane defects. Thermodynamics of Schottky and Frenkel defects.	2	5
2.6	Colour centers in alkali halide crystals. Defect clusters. Extended defects: Crystallographic shear structure and stacking faults. Dislocations and crystal structure.	3	5
2.7	Structure of compounds of AX (Zinc blende, Wurtzite), AX_2 (Rutile, fluorite, antiferroite), A_mX_2 (Nickel arsenide), ABX_3 (Perovskite, Ilmenite), Spinel. Inverse spinel structures.	4	6
3.0	Solid state chemistry	18	
3.1	Electronic structure of solids. Free electron theory, band theory. Refinements to simple band theory, k space and Brillouin zones.	4	7
3.2	Conductors, insulators and semiconductors. Band	3	7

	structure of conductors, insulators and semiconductors and their applications.		
3.3	Intrinsic and extrinsic semiconductors, doping of semiconductors and conduction mechanism, the band gap.	3	7
3.4	Temperature dependence of conductivity, carrier density and carrier mobility in semiconductors.	2	7
3.5	Superconductivity, Photoconductivity, Photovoltaic effect. Colour in inorganic solids.	3	7
3.6	Dielectric properties. Dielectric materials. Ferroelectricity, pyroelectricity, piezoelectricity and ionic conductivity. Applications of ferro, piezo and pyroelectrics.	3	8
4.0	Compounds of S, N, P and B	18	
4.1	Sulphur-Nitrogen compounds: S_4N_4 , S_2N_2 , S_4N_2 and polythiazyl S_xN_y compounds. S-N cations and anions.	2	9
4.2	Sulphur-Phosphorus compounds: Molecular sulphides such as P_4S_3 , P_4S_7 , P_4S_9 and P_4S_{10} .	2	9
4.3	Phosphorous-Nitrogen compounds: Phosphazines. Cyclo and linear phosphazines.	2	9
4.4	Boron-Nitrogen compounds: Borazine, substituted borazines and boron nitride.	2	9
4.5	Boron hydrides: Reactions of diborane. Structure and bonding. Polyhedral boranes: Preparation, properties, structure and bonding.	3	9
4.6	The topological approach to boron hydride structure. Styx numbers. Importance of icosahedral framework of boron atoms in boron chemistry. Closo, nido and arachno structures. Wade's rules.	5	10
4.7	Carboranes and metallocarboranes.	2	10
5.0	Lanthanides and actinides	18	
5.1	Lanthanides: Characteristic properties. Electronic configurations and term symbols. Occurrence and extraction. Separation techniques.	4	11
5.2	Oxidation states of lanthanides. Spectral and magnetic properties of lanthanides. Lanthanide complexes as shift reagents.	3	11
5.3	Shapes of f orbital and their splitting in cubic ligand field.	2	12
5.4	Actinides: Occurrence and general properties. Extraction of thorium and uranium. Electronic configuration and term symbol. Oxidation states. Spectral and magnetic	4	11

	properties.		
5.5	Comparative properties of lanthanides and actinides. Trans-uranium elements and their stabilities.	2	11
5.6	Applications of lanthanide and actinide compounds.	1	13
5.7	Comprehensive study of the beach sands of Kerala and their important components such as monazite, ilmenite, zircon and sillimanite.	2	13

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CL 222 ORGANIC CHEMISTRY II

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	discuss the fundamentals, operating principles and instrumentation of separation techniques.	R	1,
2.	differentiate the principle and applications of phase transfer catalysis with examples.	An	1
3.	describe the various methods of determining reaction mechanisms and basic thermodynamic principles of organic reactions.	U	1
4.	explain the Hammett parameters of reaction and design an experiment to confirm the mechanism of a reaction.	R, C	1
5.	identify different types of rearrangement reactions, determine the product of the reaction applying migratory aptitude, and reproduce the evidences for the mechanism of the reaction.	R, E	1

6.	understand that the outcomes of pericyclic reactions may be understood in terms of frontier orbital interactions, correlation diagram, Mobius and Huckel approach.	R	1
7.	recall and define the various types of pericyclic reaction; define such terms as 'conrotatory', 'suprafacial'.	R	1
8.	predict and rationalise the outcomes of pericyclic reactions including stereospecificity, regioselectivity, and stereoselectivity.	U	1
9.	state the synthetic importance of the above cycloaddition and rearrangement reactions, and give disconnections of target compounds corresponding to these reactions.	R	1
10.	describe the fate of excited molecule based on Jablonowski diagram, predict the course of an organic photochemical reaction and identify the product with the type of functional group.	R, An	1
11.	propose synthetic routes to a variety of molecules, starting from simple precursors with correct stereochemistry and reagents of selected reactions.	Ap	1

Module	Course Description	No. of Hrs	CO No.
1.0	Separation Techniques	18	
1.1	Classification of chromatographic methods. Theory of chromatography. Applications of chromatographic methods. Adsorption and partition chromatography. Paper, thin layer and column chromatographic methods.	4	1
1.2	Common Spray reagents and Developing agents in chromatography.	2	1
1.3	Centrifugal TLC, LC, pressure column chromatography, HPLC and GC, column matrices. Detectors. Affinity and chiral separations using HPLC.	4	1
1.4	GC MS and LC MS Principle, instrumentation and applications.	4	1
1.5	Normal and ultra-centrifugation. Gel and capillary electrophoresis and their applications.	2	1
1.6	Solvent extraction. Extraction using supercritical liquid CO ₂ , Craig's technique of liquid-liquid extraction.	2	1
2.0	Physical Organic Chemistry	18	
2.1	Phase transfer catalysis and its applications.	2	2
2.2	Kinetic and thermodynamic control of reactions with examples.	1	3
2.3	Reaction coordinates- difference between transition state and intermediates, Energy profiles, Curtin – Hammet Principle, Hammond postulate. Principle of microscopic	3	3

	reversibility. Reactivity in relation to molecular structure and conformation. Steric effects, F strain. Ortho effect, Bond angle strain.		
2.4	Solvent polarity and parameters, Y, Z and E parameters and their applications. Primary, secondary, inverse kinetic isotope effects. Salt effects and special salt effects in SN reactions.	3	3
2.5	Methods of determining reaction mechanisms-Product analysis, Isotopic studies, Primary and secondary kinetic isotope effects, Isolation and detection of intermediates, Cross over experiments.	4	3
2.6	Linear Free Energy Relations, The Hammett equation and its applications. Significance of sigma (σ) and rho (ρ) reactions with negative and positive ρ , low and high ρ , abnormal Hammet plot, Taft equation. Hammet plot for aromatic nucleophilic, electrophilic, S_N^1 , S_N^2 , electrophilic addition, Wittig reactions.	5	4
3.0	Molecular Rearrangement and Transformation Reactions	18	
3.1	Types of organic rearrangements: Anionic, cationotropic, prototropic, rearrangements involving carbene and nitrene intermediates.	4	5, 11
3.2	Mechanism with evidence of Wagner – Meerwein, Pinacol, Demjanov, Hofmann, Curtius, Schmidt, Lossen, Beckmann.	3	5, 11
3.3	Mechanism with evidence of Fries, Fischer–Hepp, Hofmann–Martius, von-Richter, Orton, Bamberger, Smiles.	3	5, 11
3.4	Mechanism with evidence of Dienone–phenol, Benzilic acid, Benzidine, Favorskii, Stevens, Dakin.	3	5, 11
3.5	Bucherer reaction, Rupe, Stevens, Claisen rearrangement.	2	5, 11
3.6	Rearrangements involving diazomethane – Arndt Eistert reaction, Wolf rearrangement.	3	5, 11
4.0	Aromaticity and Pericyclic Reactions	18	
4.1	Aromaticity and antiaromaticity. Non aromatic, homoaromatic, hetero and non-benzenoid aromatic systems. Aromaticity of annulenes, mesoionic compounds, metallocenes, cyclic carbocations, carbanions.	2	6, 7
4.2	Influence of aromaticity on physical and chemical properties, Diamagnetic anisotropic – benzene and paracyclophane.	1	6, 7
4.3	Classification of pericyclic reactions, FMO, Correlation	4	6, 7,

	diagram, Mobius and Huckel theory of electrocyclic and cyclo addition reactions.		8, 9
4.4	Diels–Alder reaction–Stereo and regio selectivity , industrial applications–Aldrene, Dialdrene, endosulfan, anti stroke drug, Reserpine synthesis, fire retardant , Retro–Diels Alder, Alders ene, intramolecular Diels Alder reaction.	4	6, 7, 8, 9
4.5	1,3–Dipolar cycloaddition, nitrones, nitrile oxide, construction of heterocycles–oxazole, triazole, tetrazole, ozonide, Huisgen reaction.	3	6, 7, 8, 9
4.6	Sigmatropic rearrangement–classification [i,j], examples of [1,3], [1,5], [1,7], [3,3], [2,3] – FMO theory, stereochemistry of cope rearrangement, Claisen rearrangement.	4	6, 7, 8, 9
5.0	Organic Photochemistry	18	
5.1	Photochemical processes. Singlet and triplet states and their reactivity, Jablonski diagram, Energy transfer, sensitization and quenching.	3	10
5.2	Photoreactions of carbonyl compounds, enes, dienes and arenes. Norrish Type I and Type II reactions of acyclic ketones.	4	10
5.3	Patterno-Buchi and Barton reactions, Hofmann- Löffler-Freytag reaction, photo-Fries and Di- π methane, oxa di- π methane rearrangements.	4	10
5.4	Photoreactions of Vitamin D. Photosynthesis, photochemistry of vision.	3	10
5.5	Singlet oxygen generation and its reactions. Introduction to chemiluminescence.	2	10
5.6	Applications of photochemistry.	2	10

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CL 223 PHYSICAL CHEMISTRY II

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	apply quantum mechanical principles in solving both real and imaginary spherical harmonics systems-multi electron systems and analyse spectral lines.	U, Ap, An	1
2.	describe and explain the physical and chemical principles that underlie molecular structure determination techniques like microwave, vibrational, Raman and electronic spectroscopy.	R, U	1
3.	predict likely spectral characteristics of given molecular species, and be able to rationalise those characteristics on the basis of structural and electronic arguments.	Ap, An	1
4.	acquire knowledge of basics of statistical mechanics and compare statistical methods.	U, Ap	1
5.	understand and apply of theories of heat capacity.	U, Ap	1
6.	understand theories of electrolytes and electrochemical reactions.	R, U, Ap, An	1
7.	ascertain the application of electrochemistry in industrial fields.	An	1
8.	understand the theories and applications behind various types of analytical techniques in electrochemistry.	U	1
9.	acquire skill in solving numerical problems.	Ap	1

Module	Course Description	No. of Hrs	CO No.
1.0	Quantum Chemistry II	18	
1.1	Rotational motion: The wave equation in spherical polar coordinates-particle on a ring, the phi equation and its solution, wave functions in the real form.	3	1, 9
1.2	Non-planar rigid rotor and particle on a sphere-separation of variables, the phi and the theta equations and their solutions, Legendre and associated Legendre equations, Legendre and associated Legendre polynomials. Spherical harmonics (imaginary and real forms)-polar diagrams of spherical harmonics.	5	1, 9
1.3	Quantum Mechanics of Hydrogen-like systems: The wave equation in spherical polar coordinates: separation of variables – r, θ and ϕ equations and their solutions, wave functions and energies of hydrogen-like systems.	4	1, 9
1.4	Radial distribution functions, angular functions and their plots.	2	1
1.5	Wave functions for multi electron systems, wave equation for multi electron systems, symmetric and anti-symmetric wave functions, Pauli's anti-symmetry principle, and the postulate of spin. Spin orbitals. Spin-orbit coupling. Vector atom model-Term symbols, selection rules and explanation of spectral lines of hydrogen atom.	4	1
2.0	Spectroscopy I	18	
2.1	Rotational spectrum, selection rules, intensity of spectral lines, calculation of inter-nuclear distance.	2	2, 3
2.2	Non-rigid rotors and centrifugal distortion. Rotational spectra of polyatomic molecules-linear and symmetric top molecules. Introduction to instrumentation.	2	2, 3, 9
2.3	Vibrational spectra of harmonic and anharmonic oscillator. Selection rules. Morse curve, fundamentals and overtones. Determination of force constant.	3	2, 3, 9
2.4	Rotational fine structure, P, Q, R branches of spectra.	1	2, 3
2.5	Vibrational spectra of polyatomic molecules: Normal modes, classification of vibrational modes into stretching (asymmetric, symmetric), bending, parallel and perpendicular vibrations.	2	2, 3
2.6	Finger print region and group frequencies. Introduction to FTIR and instrumentation.	1	2, 3
2.7	Raman scattering, polarizability and classical theory of Raman spectrum.	1	2, 3
2.8	Rotational and vibrational Raman spectrum. Raman	2	2, 3

	spectra of polyatomic molecules. Complementarity of IR and Raman spectra. Mutual exclusion principle.		
2.9	Introduction to instrumentation. Laser Raman spectrum.	1	2, 3
2.10	Electronic spectra of diatomic molecules. Vibrational coarse structure and rotational fine structure of electronic spectrum. Franck-Condon principle.	2	2, 3, 9
2.11	Types of electronic transitions. Fortrat diagram. Predissociation.	1	2, 3
3.0	Statistical Thermodynamics	18	
3.1	Basic principle of permutation, combination, thermodynamic probability and entropy.	3	4
3.2	Microstates, concept of ensembles canonical and grand canonical ensemble.	1	4
3.3	Maxwell Boltzmann distribution.	2	4
3.4	Molecular partition functions - Translational (1D, 2D and 3D), vibrational, rotational and electronic partition functions. Total partition functions.	4	4
3.5	Relationship between partition functions and thermodynamic properties, Sackur-Tetrode equation. The principle of equi-partition of energy.	4	4
3.6	Chemical equilibrium, Law of mass action, Transformation of the equilibrium expressions. Statistical derivation.	4	4
4.0	Quantum statistics	18	
4.1	Bose-Einstein statistics, Thermodynamic probability, Bose Einstein distribution function. Examples of particles.	3	4
4.2	Fermi-Dirac statistics. Examples of particles- Fermi-Dirac distribution function. Thermionic emission	3	4
4.3	Relation between Maxwell Boltzmann, Bose Einstein and Fermi-Dirac statistics.	3	4
4.4	Quantum theory of heat capacity - calculation of heat capacity of gases; limitation of the method.	3	5
4.5	Heat capacity of solids. Dulong and Petit's law, Kopp's law; limitations.	2	5
4.6	Einstein theory of heat capacity; limitations.	2	5
4.7	The Debye theory of specific heat capacity of solids.	2	5
5.0	Electrochemistry	18	
5.1	Ionics: Activity and activity coefficient of electrolytes, determination of activity coefficient.	1	6
5.2	Debye-Huckel theory of strong electrolytes, Debye-Huckel-Onsager equation and its derivation, limitation of the model, conductance at high frequencies and high	2	6

	potentials –Wein effect and Debye - Falkenhagen effect.		
5.3	Ionic strength, Debye - Huckel limiting law, mean ionic activity coefficient.	1	6, 9
5.4	Electrodeics: Different type of electrodes. Electrochemical cells, EMF of concentration cells, liquid junction potential and its determination, cells without liquid junction potential.	2	6, 9
5.5	Calculation of thermodynamic properties. Electrical double layer and electro capillarity.	2	6, 9
5.6	Electrokinetic phenomena.	1	6, 7
5.7	Over potentials: Butler-Volmer equation. Tafel and Nernst equation, Tafel plot and its significance.	3	6 7
5.8	Fuel cells: H ₂ -O ₂ , zinc-air and solid oxide fuel cells.	1	7
5.9	Potentiometric titrations involving redox reaction. Conductometric titrations. Coulometric titrations.	2	8
5.10	Voltammetry: principle and method of polarography, cyclic voltammetry, stripping voltammetry and amperometry.	3	8

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Model Question Papers

General Instruction to question paper setters

- ☐ There will be a 15 main questions in each question paper divided into 3 sections – A, B and C
- ☐ Each of the sections A, B and C will have 5 questions each, **1 from each module**
- ☐ Each question in Section A will have 3 sub questions (a), (b) and (c), of which the candidate has to answer any two (2 marks each).
- ☐ Each question in Section B will have 2 sub questions (a) and (b), of which the candidate has to answer any one (5 marks each).
- ☐ Candidate should answer any three out of the five questions in Section C (10 marks each).
- ☐ Section A carries a total of 20 marks, Section B carries 25 marks, and Section C carries 30 marks.
- ☐ The maximum marks will be 75 and the duration of the exam will be 3 hrs.

Second Semester M.Sc. Degree Examination - Model question paper
Branch III - Chemistry/ Branch IV - Analytical Chemistry
CH/CL 221: INORGANIC CHEMISTRY - II
(2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among **(a)**, **(b)** and **(c)** from each. Each sub question carries 2 marks

1. (a) Which among $\text{Ni}(\text{CO})_4$ and $\text{Fe}(\text{CO})_5$ has an intense d-d transition ? Why?
(b) The effective magnetic moment of a complex is 4.90 BM. Calculate the number of unpaired electrons per unit complex.
(c) The electronic spectra of metal complexes are broad. Why?
2. (a) Differentiate H-centre from V-centre in NaCl crystals.
(b) What effects do Schottky and Frenkel defects have on the density of a crystal?
(c) What are spinels? Give the general formula of spinels.
3. (a) What is meant by band gap of a substance?
(b) The conductance of metals decreases with increase in temperature. Why?
(c) What are intrinsic and extrinsic semiconductors
4. (a) Complete the reactions given below
(i) $\text{B}_2\text{H}_6 + \text{H}_2\text{O} \rightarrow$
(ii) $\text{S}_4\text{N}_4 + \text{Cl}_2 \rightarrow$
(b) Which undergoes addition reactions faster – Benene or Borazine? Why?
(c) Clasify the following into closo, nido and archano.
 B_2H_6 , $\text{C}_2\text{B}_9\text{H}_{11}$, $\text{B}_{12}\text{H}_{12}^{2-}$, B_5H_{11} ,
5. (a) Actinides form oxocations but lanthanides don't. Give reason?
(b) What is misch metal?
(c) Which among lanthanides and actinides has a higher tendency to form complexes? Why?

[2 · 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) Discuss the Orgel diagram and electronic spectra of $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$.
(b) What is meant by a charge transfer spectra?
7. (a) Detail the line and plane defects in solids.
(b) Describe the principle and procedure of X-ray diffraction method.
8. (a) Examine the various types of dielectric properties exhibited by crystals.
(b) What is photovoltaic effect? Which type of materials exhibit this?

9. (a) How is polythiazyl synthesized? Describe its structure. Why is it treated as a one dimensional conductor?
(b) Obtain the styx number of B_4H_9 .
 10. (a) Detail the ion exchange method employed in the separation of lanthanides.
(b) Briefly describe the industrial importance of the beach sands of Kerala.
- [5 · 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Explain the Guoy's methods used to determine magnetic susceptibility. How is it important in structure determination?
 12. Discuss in detail the perovskite structure by taking $SrTiO_3$ as the example.
 13. Discuss the salient features of the band theory of solids and compare it with the free electron theory of solids.
 14. What are carboranes? How are they obtained?
 15. Compare the spectral and magnetic properties of lanthanides and actinides.
- [10 · 3 = 30]

Second Semester M.Sc. Degree Examination - Model question paper Branch III - Chemistry/ Branch IV - Analytical Chemistry CH/CL 222: ORGANIC CHEMISTRY - II (2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among **(a)**, **(b)** and **(c)** from each. Each sub question carries 2 marks

1. (a) What is retention time? Explain its significance.
(b) Write any two spraying reagents for detection of alkaloids.
(c) What is meant by reversed phase HPLC.
2. (a) What is F strain?
(b) Explain microscopic reversibility.
(c) Describe Taft equation and its terms?
3. (a) Show how vicinal diols are converted to ketones by rearrangement?
(b) Give the mechanism of Curtius rearrangement.
(c) Briefly explain Fisher-Hepp reaction.
4. (a) Why is [10] annulene a non aromatic compound?

- (b) Azulene possesses dipole moment of 1.4 D. Why?
 - (c) State Woodward and Hoffman rules for pericyclic reaction?
5. (a) What is photo-Fries rearrangement?
- (b) Distinguish singlet and triplet states in photochemistry.
- (c) Write an example for Barton reaction.

[2 · 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) Describe the instrumentation of GC-MS
- (b) What are the information's obtained from a LC-MS chromatogram?
7. (a) Design a cross over experiment for Claisen rearrangement and predict your observation.
- (b) Hammett ρ value of nitration of benzene is negative while that of Wittig reaction is positive Explain.
8. (a) Explain the migratory aptitude in Baeyer-Villiger rearrangement with three examples
- (b) Discuss the mechanism and applications of Dienone-phenol rearrangement
9. (a) Write the product of photochemical ring closure of 2E, 4E hexadiene with correct stereochemistry and FMO explanation
- (b) Draw a correlation diagram to show that supra-supra 4+2 cycloaddition is thermally allowed.
10. (a) Discuss the chemistry behind the process of vision.
- (b) Explain Paterno-Buchi reaction

[5 · 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Describe the experimental procedures for thin layer chromatography and column chromatography.
12. Explain any four reactions where isotopic studies support the mechanism.
13. Describe with evidences the mechanism of
- | | |
|----------------------------------|--------------------------|
| a) Wagner-Meerwein rearrangement | b) Pinacol rearrangement |
| c) Demjanov rearrangement | d) Hofmann rearrangement |
14. Describe the stereoselectivity and regioselectivity of Diels-Alder reactions
15. Write a note on fate of excited state molecule with a Jablonski diagram and photochemistry of vitamin-D.

[10 · 3 = 30]

Second Semester M.Sc. Degree Examination - Model question paper
Branch III - Chemistry/ Branch IV - Analytical Chemistry
CH/CL 223: PHYSICAL CHEMISTRY - II
 (2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among **(a)**, **(b)** and **(c)** from each. Each sub question carries 2 marks

1. (a) Write the determinantal form of wave function for lithium atom.
 (b) By inspecting the hydrogen like wave function,

$$\phi_{nlm} = \frac{\sqrt{2}}{81\sqrt{\pi}} Z^{3/2} (6 - Zr) Z r \exp(-Zr/3) \cos \theta$$
, find the quantum numbers n , l and m
 (c) What is a radial distribution function? Mention its importance.
2. (a) How would one determine the theoretical force constant of the C–C bond?
 (b) Anti-stokes lines are usually weak. Why?
 (c) What is the effect of nuclear spin on the intensity of spectral lines?
3. (a) Differentiate between Bosons and Fermions.
 (b) Explain the concept of ensembles and give the difference in properties of each category
 (c) How can you explain partition function is a measure of number of available energy levels?
4. (a) Calculate the value of C_v for any element when its temperature is equal to the Debye characteristics temperature.
 (b) What is Sterling's approximation? How this approximation helps to arrive at thermodynamic probability.
 (c) Distinguish between Dulong Pettit law and Kopps law.
5. (a) Draw the graph and explain the theory of conductometric titration of a weak acid against a strong base.
 (b) What is the significance of half-wave potential?
 (c) Calculate the mean activity coefficient of 0.01 M BaCl_2 in water at 25°C .

[2 · 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) Verify that $F = 1/\sqrt{2} \pi \exp(iM\phi)$ constitute an orthonormal set for particle in a ring.
 (b) Write the Schrodinger equation for hydrogen atom in polar coordinates and separate the variables.

7. (a) Spacing between adjacent lines in HCl molecule is 10 cm^{-1} . Force constant is $1.38 \cdot 10^{-23} \text{ JK}^{-1}$, Calculate maximum population at room temperature.
(b) Explain the origin of P and R branches in rotational-vibrational spectrum.
8. (a) Deduce Sackur-Tetrode relation using Partition function.
(b) State and prove Boltzman's theorem connecting entropy and probability.
9. (a) Considering free electrons in a metal to form a Fermi gas. Obtain the Richardson – Dushman equation for thermionic emission for electrons.
(b) Deduce Fermi-Dirac distribution law; hence obtain an expression for energy.
10. (a) Explain the term ionic mobility. The H^+ ion because of its heavy hydration and consequent large size and shape, should have a low mobility but actually its mobility is very high. How would you account for it? Why does H^+ ion move about 50 times more rapidly in ice than in liquid water.
(b) The exchange current density of a $\text{Pt}/\text{H}_2, \text{H}^+(\text{aq})$ electrode is 0.79 mA cm^{-2} . What current flows through a standard electrode of total area 5 cm^2 when the potential difference across the electrode is 5 mV , the temperature 25°C and the proton activity unity?

[5 · 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. (i) Apply Schrodinger equation for particle in a ring. Find eigen values and eigen functions.
(ii) Show that any two associated Legendre functions satisfy orthogonality condition.
(7+3)
12. (i) The rotational Raman spectrum recorded for $^{14}\text{N}_2$ molecule using monochromatic laser source of wave length 336.86 nm , first three Stokes lines were observed respectively at 28677.3 , 29669.3 and 29661.4 cm^{-1} . Find the bond length of the molecule.
(ii) How is the rotational spectrum of a diatomic molecule affected by isotopic substitution?
(5+5)
13. (i) How thermo dynamic functions like internal energy, entropy and specific heat capacity are related to partition function? Derive the relation.
(ii) Explain Maxwell-Boltzman distribution law.
(7+3)
14. What are the limitations of Einstein's theory of heat capacity? How Debye theory attempted to rectify this? Discuss Debye theory of specific heat capacity of solids.

15. (i) What is exchange current density? How the concept is understood using Butler-Volmer equation?
(ii) Describe the theory and application of cyclic voltametry.

(5+5)

[10 · 3 = 30]

SEMESTER III

CL 231 INORGANIC CHEMISTRY III

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	demonstrate knowledge of advanced content in the areas of inorganic chemistry such as in organometallic compounds, bioinorganic compounds, spectroscopic methods in inorganic Chemistry and nuclear chemistry.	U	1
2.	examine the bonding in simple and polynuclear carbonyls with and without bridging and complexes with linear π donor ligands.	U, An	1
3.	explain the structure and bonding of ferrocene and dibenzenechromium with the help of MO theory.	U, An, C	1
4.	understand fundamental reaction types and mechanisms in organometallics and to employ them to understand selected catalytic processes in industry.	U, An, C	1
5.	contrasts the thermodynamic and kinetic stability of complexes, analyses the factors affecting stability of complexes and explains the methods of determining stability constants.	An, E	1
6.	classifies ligand substitution reactions and explains its kinetics and various mechanisms.	U, E	1
7.	analyze the chemical and physical properties of metal ions responsible for their biochemical action as well as the techniques frequently used in bioinorganic chemistry such as oxygen transport, e-transfer, communication, catalysis, transport, storage etc.	U, An	1
8.	explain the principles of spectroscopic methods employed in inorganic chemistry and their applications in the study of metal complexes.	An, E	1
9.	demonstrate a knowledge of fundamental aspects of the structure of the nucleus, radioactive decay, nuclear reactions, counting techniques.	R, U	1
10.	evaluate the role of nuclear chemistry to find the most suitable measures, administrative methods and industrial solutions to ensure sustainable use of the world's nuclear resources.	U, E, C	1, 4

PSO–Programme Specific Outcome

CO–Course Outcome

Cognitive Level: R–Remember

U–Understanding

Ap–Apply

An–Analyse

E–Evaluate

C–Create

Module	Course Description	No. of Hrs	CO No.
1.0	Organometallic compounds	18	

1.1	Nomenclature of organometallic compounds. Hapto nomenclature. 18 and 16 electron rule, isoelectronic and isolobal analogy.	2	1
1.2	Metal carbonyls, bonding in metal carbonyls. Synthesis, structure and bonding of polynuclear carbonyls with and without bridging.	2	2
1.3	Complexes with linear π donor ligands: Olefins, acetylenes, dienes and allyl complexes. Complexes with cyclic π donors: Cyclopentadiene, benzene complexes.	2	2
1.4	Structure and bonding of ferrocene and dibenzenechromium complexes (MO treatment).	4	3
1.5	Oxidative addition and reductive elimination, insertion and elimination reactions	3	4
1.6	Catalysis by organometallic compounds: Alkene hydrogenation using Wilkinson's catalyst, hydroformylation of olefins using cobalt and rhodium catalyst, polymerization reaction by Ziegler-Natta catalyst, Monsanto acetic acid process, Palladium catalysed oxidation of ethylene-the Wacker process.	5	4
2.0	Coordination chemistry-III Reactions of metal complexes	18	
2.1	Energy profile of a reaction - Thermodynamic and kinetic stability, Stability of complex ions in aqueous solutions: Formation constants. Stepwise and overall formation constants. Factors affecting stability of complexes.	2	1, 5
2.2	Determination of stability constants: spectro photometric, polarographic and potentiometric methods.	3	1, 5
2.3	Stability of chelates. Thermodynamic explanation, macrocyclic effects.	1	1, 5
2.4	Classification of ligand substitution reactions-kinetics and mechanism of ligand substitution reactions in square planar complexes, trans effect theory and synthetic applications.	3	1, 6
2.5	Kinetics and mechanism of octahedral substitution-water exchange, dissociative mechanism, associative mechanism - Eigen-Wilkins mechanism, Eigen - Fuoss equation, base hydrolysis, racemisation and isomerisation reactions.	3	1, 6
2.6	Electron transfer reactions: Outer sphere mechanism-Marcus theory, inner sphere mechanism - Taube mechanism.	3	1, 6
2.7	Photochemical reactions-substitution and redox reactions of Cr(III), Ru(II), and Ru(III) complexes. Photo-isomerisation and photo-aquation reactions of metal complexes.	3	1, 6

3.0	Bioinorganic chemistry	18	
3.1	Essential and trace elements in biological systems, structure and functions of biological membranes, mechanism of ion transport across membranes, sodium-potassium pump.	2	1, 7
3.2	Photosynthesis, porphyrin ring system, chlorophyll, PS I and PS II. Synthetic model for photosynthesis.	2	1, 7
3.3	Role of calcium in biological systems - blood coagulation, muscle contraction.	1	1, 7
3.4	Oxygen carriers and oxygen transport proteins-haemoglobin and myoglobin.	2	1, 7
3.5	Non-haeme iron-sulphur proteins involved in electron transfer-ferredoxin and rubredoxin.	3	1, 7
3.6	Iron storage and transport in biological systems ferritin and transferrin.	3	1, 7
3.7	Redox metalloenzymes-cytochromes, cytochrome P-450, peroxidases and superoxide dismutase and catalases. Nonredox metalloenzymes- Carboxypeptidase A - structure and functions.	3	1, 7
3.8	Nitrogenases, biological nitrogen fixation. Vitamin B ₁₂ and coenzymes. Toxic effects of metals (Cd, Hg, Cr and Pb).	2	1, 7
4.0	Spectroscopic Methods in Inorganic Chemistry	18	
4.1	Infrared spectra of coordination compounds. Structural elucidation of coordination compounds containing the following molecules/ ions as ligands- NH ₃ , H ₂ O, CO, NO, OH ⁻ , SO ₄ ²⁻ , CN ⁻ , SCN ⁻ , NO ₃ ⁻ , NO ₂ ⁻ , CH ₃ COO ⁻ and X ⁻ (X=halogen). Changes in ligand vibration on coordination with metal ions.	5	1, 8
4.2	Vibrational spectra of metal carbonyls-CD and ORD spectra of metal complexes.	3	1, 8
4.3	ESR spectra: Application to Cu(II) complexes and inorganic free radicals such as PH ₄ , F ₂ ⁻ and [BH ₃] ⁻ .	3	1, 8
4.4	Nuclear Magnetic Resonance Spectroscopy: The contact and pseudocontact shifts, some applications including biological systems, an overview of NMR of metal nuclides with emphasis on ¹¹ B, ³¹ P and ¹⁹ F NMR.	4	1, 8
4.5	Mossbauer Spectroscopy: Application of the technique to the studies of iron and tin complexes.	3	1, 8
5.0	Nuclear Chemistry	18	
5.1	Nuclear structure, mass and charge. Nuclear moments. Binding energy. Semiempirical mass equation. Stability rules. Magic numbers.	3	1, 9

5.2	Nuclear models: Shell, Liquid drop, Fermi gas, collective and optical models.	3	1, 9
5.3	Equation of radioactive decay and growth. Half life and average life. Radioactive equilibrium. Transient and secular equilibria.	3	1, 9
5.4	Nuclear reactions: Direct nuclear reactions, heavy ion induced nuclear reactions, photonuclear reactions. Neutron captures cross section and critical size.	3	1, 9
5.5	Nuclear fission as a source of energy, Nuclear chain reacting systems. Principle of working of the reactors of nuclear power plants. Breeder reactor. Nuclear fusion reaction, stellar energy.	3	1, 10
5.6	Principles of counting technique such as G.M. counter, proportional, ionization and scintillation counters. Cloud chamber.	3	1, 9

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CL 232 ORGANIC CHEMISTRY III

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	describe and explain the physical and chemical principles that underlie molecular structure determination techniques such as UV-visible, IR, mass and NMR spectroscopy.	U, An	1
2.	apply knowledge of molecular structure determination using UV-visible, IR, mass and NMR spectroscopic techniques to identify and/or characterise chemical compounds from experimental data.	Ap, An	1, 8
3.	calculate $\lambda_{\max}$ of a compound, apply IR frequency table to determine the functional groups present in the molecule, interpret mass spectrum of compound from fragmentation.	U, Ap	1, 8
4.	predict likely spectral characteristics of given molecular species; solve the structures of unknown molecules using appropriate spectroscopic techniques.	U, Ap, An	1, 8
5.	devise a 2 D NMR of a compound based on learned principles and solve the structure of a compound based on NMR data.	C, Ap	1, 8
6.	discuss organic transformations with organometallic compounds and predict the products of the reactions.	U	1
7.	propose the retro synthetic pathways to a variety of molecules	U, Ap, C	1
8.	propose mechanisms for chemical reactions, given starting materials, reagents, conditions, and/or products.	U, Ap, C	1
9.	compare the reactions and mechanism and determine the products of a selected set of reactions; identify protecting group strategies.	Ap, E	1
10.	devise combinatorial method to create a library of compounds.	C	1, 6
11.	give examples of stereoselective, regioselective and chemoselective reductions and oxidations.	U	1

Module	Course Description	No. of Hrs	CO No.
1.0	UV-vis and IR Spectroscopy and Mass spectrometry		
1.1	Electronic transitions and analysis of UV spectra of enes, enones and arenes. Woodward Fieser rules. Effect of solvent polarity on UV absorption.	4	1, 2, 3

1.2	Principle of characteristic group frequency in IR. Identification of functional groups and other structural features by IR, Hydrogen bonding and IR bands. Sampling techniques.	4	1, 2, 3
1.3	Mass spectrometry-Soft and hard ionization techniques; EI, CI, FAB, Electrospray and MALDI ion sources. Magnetic, High resolution (Double focusing), TOF and quadrupole mass analysers. Characteristic EIMS fragmentation modes and MS rearrangements.	6	1, 2, 3
1.4	Mass spectral fragmentation patterns of long chain alkanes, alkenes, alkynes, alcohols, ethers, thiols, aromatic compounds, aldehydes, ketones, acids, amides, nitro, amino and halo compounds.	4	1, 2, 3
2.0	NMR spectroscopy and Structural elucidation	18	
2.1	Theory of NMR spectroscopy, chemical shifts, anisotropic effects and coupling constant. Spin-spin interactions in typical systems. First order and higher order spectra.	5	1, 2,
2.2	Simplification methods of complex spectra by high field NMR, shift reagents, chemical exchange and double resonance.	5	1, 2
2.3	¹³ C NMR chemical shifts. Applications of NOE, DEPT, and 2D techniques such as COSY-HSQC, HMQC and HMBC (basic principles only).	5	1, 2, 5
2.4	Spectral interpretation and structural elucidation. Solving of structural problems on the basis of numerical and spectrum based data.	3	1, 4
3.0	Organometallic compounds in organic synthesis	18	
3.1	Preparation of organo Mg, Al, Li, Cu, Zn, Cr, Grignard reagents in organic synthesis. Alkylation, oxirane addition, carbon dioxide addition, carbonyl addition, enone addition (1,2 - and 1,4 - additions), reduction, and enolisation reactions. Selectivity in Grignard reactions.	5	6, 8
3.2	Reactions of organo Li reagents, Li exchange reaction, its use in the preparation of RLi compounds, addition to C=O, COOH and CONR ₂ , Li dialkylcuprates (Gilman reagent)-preparation and reaction with alkyl halides, aryl halides and enones.	5	6, 8
3.3	Alkynyl Cu(I) reagents, Glasier coupling. Dialkyl cadmium compounds preparation and reaction with acyl halides.	4	6, 8
3.4	Benzene tricarbonyl chromium - preparation and reaction with carbanions. Tebbe's reagent, Silane carbanion and its reactions.	4	6, 8

4.0	Methods in organic synthesis	18	
4.1	Retrosynthetic analysis and disconnection approach-synthons, synthetic strategy, reliable reaction, disconnect after heteroatom, chemoselectivity, two group disconnections (use of epoxide), creation of cis and trans double bonds, retro synthesis of amines.	3	7, 9
4.2	Regioselectivity in enol alkylation, Lithium enolates, Zimmerman-Taxler model, enamine alkylation, aza enolate, silyl enol ether, alkylation of nitriles, nitro compounds, acids, ketones, aldehydes.	3	7, 9
4.3	Olefin metathesis – first and second generation Grubbs' catalysts. Umpolung concept-1,3-Dithiane, benzoin condensation.	3	7, 9
4.4	Coupling reactions - Heck, Negishi, Sonagashira, Kumada and Suzuki coupling, Stephens-Castro coupling, Stille coupling,	4	7, 9
4.5	Protecting group strategy: Tetrahydropyranyl, silyl, t-butyl, trichloroethyl, acetal and thioacetal as hydroxyl, thiol, carboxyl and carbonyl protecting groups in synthesis.	3	7, 9
4.6	Introduction to combinatorial synthesis - split and pool method only.	2	10
5.0	Oxidation and Reduction reactions in organic chemistry	18	
5.1	Reduction using boranes and hindered boranes - 9 BBN, disiamylborane, pinacolborane	2	11
5.2	Sodium borohydride and lithium aluminium hydride, NaCNBH ₃ DIBAL-H, bulky metal hydrides, Li trialkylborohydrides, tri-n-butyltin hydride, diimide, and aluminium alkoxide.	4	11
5.3	Birch reduction, Clemmensen reduction and Wolff - Kishner reduction, Huang - Minlon modification, Rosenmund reduction.	3	11
5.4	McFadayan-Stevens reaction, allylic and benzylic oxidation, Sharpless epoxidation, oxidation using SeO ₂ , manganese (IV) oxide, lead tetraacetate, ozone, peracids, DDQ, silver carbonate and Cr(VI) reagents.	5	11
5.5	Jones oxidation, chemo and region selectivity in reductions and oxidations. Swern oxidation, Moffatt oxidation, Sommelet reaction. Applications of HIO ₄ , Dess-Martin periodinane, OsO ₄ and mCPBA.	4	11

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CL 233 PHYSICAL CHEMISTRY III

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	understand the theories of chemical bonding and their application with help of approximate methods predict the nature of orbitals and molecular spectra.	U, Ap, An	1

2.	compare MO and VBT.	An	1
3.	understand the properties of gases and liquids and the nature of the intermolecular forces in them.	U, Ap, An	1
4.	describe the principle behind the determination of surface tension and coefficient of viscosity.	U	1
5.	describe and explain the physical and chemical principles that underlie molecular structure determination techniques like NMR, ESR, Mossbauer, NQR and PES spectroscopy.	U, Ap, An	1
6.	judge the degrees of freedom of systems and understand theories of irreversible thermodynamic systems.	U, Ap, An, E	1
7.	understand the quantum mechanical and non-quantum mechanical methods in computational chemistry, potential energy surface and basis functions.	U, An	1
8.	write the Z matrix of simple molecules.	U, Ap	1
9.	acquire skill in solving numerical problems.	Ap	1

Module	Course Description	No. of Hrs	CO No.
1.0	Approximate methods and Chemical Bonding	18	
1.1	Approximate methods: Method of Variation-variation theorem and its proof. Linear variation functions. Secular equations and secular determinants.	2	1
1.2	Method of Perturbation-successive correction to an unperturbed problem. Detailed treatment of first order non-degenerate case only. Hartree-Fock Self-Consistent Field (HF-SCF) method for atoms, Hartree-Fock equations (derivation not required) & the Fock operator.	3	1
1.3	MO theory- The Born-Oppenheimer approximation -MO Theory-LCAO MO method applied to H_2 and H_2^+ .	2	1
1.4	MO diagram of homo nuclear diatomic molecules Li_2 , Be_2 , B_2 , C_2 , O_2 and F_2 and hetero nuclear diatomic molecules LiH , CO , NO and HF .	2	1
1.5	Spectroscopic term symbols for homodiatomc molecules, selection rules for molecular spectra.	1	1
1.6	Valance bond theory - VB treatment of hydrogen molecule only.	2	1
1.7	Comparison of MO and VB theories.	1	2
1.8	Quantum mechanical treatment of sp , sp^2 and sp^3 hybridisation.	2	1
1.9	HMO theory of conjugated systems. Bond order and charge density calculations, free valance. Application of HMO method to ethylene, allyl, butadiene and benzene systems.	3	1, 9
2.0	Gaseous and Liquid State	18	
2.1	Maxwell's distribution of molecular velocities,	4	3, 9

	influence of temperature, types of molecular velocities-derivation of molecular velocities from Maxwell's equation.		
2.2	Transport phenomena in gases – viscosity of gases, Chapman equation, determination of viscosity of gases, calculation of mean free path.	3	4, 9
2.3	Thermal conductivity, diffusion	3	3
2.4	Degrees of freedom of gaseous molecules - Translational, Rotational and vibrational.	1	3
2.5	Equation of state of real gases- van der Waal's equation, Other equation of states - Virial equation, second virial coefficient and determination of diameter of a molecule.	3	3, 9
2.6	Inter molecular forces - Dipole-dipole interaction, induced dipole-dipole, induced dipole-induced dipole interactions.	1	3
2.7	Liquid state: Liquid vapour equilibria, vapour pressure-methods of measuring vapour pressure - barometric method and dynamic method - equation of state for liquids, structure of liquids-short range order.	1	3
2.8	X-ray diffraction of liquids. Vacancy model for a liquid, radial distribution function.	1	3
2.9	Surface tension - determination of surface tension by drop weight method and drop number method. Viscosity - determination of coefficient of viscosity by Ostwald viscometer.	1	4, 9
3.0	Spectroscopy II	18	
3.1	Resonance spectroscopy: Nuclear Magnetic resonance Spectroscopy, Nuclear spin. Interaction between nuclear spin and applied magnetic field.	2	5
3.2	Proton NMR. Population of energy levels.	1	5
3.3	Nuclear resonance. Chemical shift. Relaxation methods. Spin-spin coupling. Fine structure.	2	5
3.4	Introduction to instrumentation Fourier Transformation (FT) NMR Spectroscopy: Instrumentation - experimental aspects magnets, radio frequency transmitter, NMR probe and computer. Radio frequency pulses effect of pulses, rotating frame reference, FID, FT technique - data acquisition and storage, signal averaging. Pulse sequences- pulse width, spins and magnetisation vector.	3	5, 9
3.5	ESR spectroscopy: Electron spin. Interaction with magnetic field. Kramer's rule. The g factor. Fine structure and hyperfine structure. Analytical applications of ESR, Determination of reaction rates and mechanisms by ESR, Structural determination by ESR. Elementary idea of ENDOR and ELDOR.	4	5, 9

3.6	Mossbauer spectroscopy: Basic principles. Doppler effect, chemical shift, recording of spectrum, application. Quadrupole effect, Effect of magnetic field.	3	5
3.7	NQR spectroscopy- Principle and application.	2	5
3.8	Photoelectron spectroscopy: Introduction to UV photoelectron and X-ray photoelectron spectroscopy.	1	5
4.0	Applications of Thermodynamics	18	
4.1	Simple examples of irreversible processes.	1	6
4.2	General theory of non-equilibrium processes. The phenomenological relations. Onsager reciprocal relation. Principle of minimum entropy production.	2	6
4.3	Generalized equation for entropy production, Entropy production from heat flow, matter flow and current flow.	3	6, 9
4.4	Application of irreversible thermodynamics to diffusion. Thermal diffusion, thermo osmosis and thermo-molecular pressure difference.	4	6
4.5	Electro-kinetic effects, the Glansdorf-Pregogine equation. Far from equilibrium region.	3	6
4.6	Three component systems: Graphical representation. Three component liquid systems with one pair of partially miscible liquids. Influence of temperature. Systems with two pairs and three pairs of partially miscible liquids.	3	6
4.7	Solid- liquid system: Two salts and water systems-no chemical combination, double salt formation, one salt forms hydrate, double salt forms hydrate, Isothermal evaporation.	2	6
5.0	Computational Chemistry	18	
5.1	Introduction to computational chemistry: As a tool and its scope. Potential energy surface-stationary point, saddle point or transition state, local and global minima. Basis functions-Slater type orbitals (STO) and Gaussian type orbitals (GTO).	3	7
5.2	Basis sets: minimal, split valence, polarized and diffuse basis sets, contracted basis sets, Pople's style basis sets and their nomenclature.	2	7
5.3	Quantum mechanical computational methods - Abinitio methods: Introduction to SCF. RHF, ROHF and URHF. (no need of calculation). Wave functions for open shell state, Slater determinants, Roothan concept.	2	7
5.4	Semi empirical methods: Huckels and extended Huckel methods. Strengths and weaknesses. PPP, ZDO, NDDO, INDO, MNDO (AM1, PM3) and CNDO	2	7

	approach.(Mentioning only).		
5.5	Density functional theory methods (DFT) - Electron correlation and introduction to post HF methods. Hohenberg-Kohn theorems, Exchange correlational functional Kohn-Sham orbitals, Local density approximation. Generalized gradient approximation (Only the basic principles and terms to be introduced).	2	7
5.6	Non-quantum mechanical computational methods - Molecular mechanics: Force fields - bond stretching, angle bending, torsional terms, non-bonded interactions, electrostatic interactions and the corresponding mathematical expressions. Commonly used forcefields - AMBER and CHARMM.	2	7
5.7	Construction of Z-matrix for simple molecules. H ₂ O, H ₂ O ₂ , H ₂ CO, CH ₃ CHO, NH ₃ and CO ₂ .	2	8
5.8	Structure drawing and energy calculation (geometry optimization) using free software Arguslab, Tinker, NAMD, DL-POLY	3	7

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- 2 P.W. Atkins, R.S. Friedman, Molecular Quantum Mechanics. 4th Edn., Oxford University Press, 2005.
- 3 D.A. McQuarrie, Quantum Chemistry, University Science Books, 2008.
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- 23 A. Leach, Molecular Modelling: Principles and Applications, 2nd Edn., Longman, 2001.
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CL 234 INORGANIC CHEMISTRY PRACTICALS - II

Total 125 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	interpret data from an experiment, including the construction of appropriate graphs and the evaluation of errors.	U, An	3, 7, 8
2.	estimate a simple mixture of ions (involving quantitative separation) by volumetric and gravimetric methods.	An	7, 8
3.	perform COD, BOD, DO, TDS analysis.	Ap, An	4, 7, 8
4.	predict likely spectral characteristics of given metal complexes solve the structures of unknown metal complexes using appropriate spectroscopic techniques and magnetic measurements .	Ap, An	6, 8
5.	analyse the XRD of simple substances.	An	8
6.	interpret TG and DTA curves.	An	8

Module	Course Description	No. of Hrs	CO No.
1.	Estimation of simple mixture of ions (involving quantitative separation) by volumetric and gravimetric methods. a) Iron (gravimetric) and Chromium (volumetric) b) Iron (gravimetric) and Zinc (volumetric) c) Copper (volumetric) and Nickel (gravimetric) d) Iron and Copper	40	1, 2

	e) Copper and Nickel		
2.	Environmental Analysis – COD, BOD, DO, TDS	20	1, 3
3.	Spectral Interpretation of metal complexes using IR, UV-vis. spectral data. Supplementary information like metal estimation, CHN analysis, conductivity measurements and magnetic measurements to be provided to the students. Assessment is based on arriving at the structure of the complex and assignment of IR spectral bands.	25	4
4.	Analysis of XRD of simple substances.	15	5
5.	Interpretation of TG and DTA curves .	25	6

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2. Willard , Merrit and Dean, Instrumental Methods of Analysis, 7th edition, 1986.
3. W. W. Wendlandt, Thermal Methods of Analysis, Inter-Science, New York, 1964.
4. B. A. Skoog and D. M. West, Principles of Instrumental Analysis, Saunders College, 4th edition, 1991.
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CL 235 ORGANIC CHEMISTRY PRACTICALS - II

Total 125 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	interpret data from an experiment, including the construction of appropriate graphs and the evaluation of errors.	U, An	3, 7, 8
2.	predict likely spectral characteristics of given molecular species; solve the structures of unknown molecules using appropriate spectroscopic techniques	Ap, An	6, 7, 8
3.	develop paper chromatogram of a compound and determine its purity	C	7, 8
4.	estimate quantitatively the Aniline, Phenol, glucose, Ascorbic acid and Aspirin in a sample	Ap	7, 8
5.	estimate colorimetrically paracetamol, protein and ascorbic acid	Ap	7, 8
6.	use green chemical principles in the synthesis	Ap	4, 7, 8

Module	Course Description	No. of Hrs	CO No.
A.	Volumetric estimation of 1) Aniline 2) Phenol 3) Glucose 4) Ascorbic acid 5) Aspirin	25	4
B.	Colorimetric estimation 6) paracetamol with potassium ferricyanide 7) protein by biuret method 8) Ascorbic acid by folin-phenol reagent or phosphotungstic acid methods	25	5
C.	Spectral identification 9) UV, IR, ^1H NMR, ^{13}C NMR, EI mass spectral identification of Organic compounds from a library of organic compounds (Each students have to record the spectral analysis of a minimum of 40 compounds)	40	1, 2
D.	Separations of mixtures by Paper Chromatography 10) Identification of amino acids	10	3
E.	Single stage preparation of organic compounds by green chemistry 11) Preparation of p-bromoacetanilide using CAN. 12) Radical coupling – 1,1-Bis-2-naphthol. 13) Synthesis of dihydropyrimidinone. 14) Synthesis of dibenzalacetone - with lithium hydroxide. 15) Photoreduction of benzophenone to benzopinacol (not for end semester evaluation).	45	4
The board of examiners have to choose the combination of a volumetric estimation, a colorimetric estimation, a green synthesis OR paper chromatography and spectral analysis.			

References

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7. P. F Shalz, Journal of Chemical Education 1996, 173: 267.
8. Monograph on green laboratory experiments, DST, Government of India, pp 1-79.
9. For spectral data of organic compounds, see: http://sdbs.riondb.aist.go.jp/sdbs/cgi-bin/direct_frame_top.cgi

CL 236 PHYSICAL CHEMISTRY PRACTICALS - II

Total 125 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	interpret data from an experiment, including the construction of appropriate graphs and the evaluation of errors.	U, E	3, 7, 8
2.	determine the strength of strong/ weak acids by conductometric titrations.	Ap	7, 8
3.	verify Onsager equation and Kohlraush's law conductometrically .	An, E	7, 8
4.	determine the activity and activity coefficient of electrolyte.	Ap, An	7, 8
5.	determine the concentration of a solution potentiometrically or pH metrically.	Ap, An	7, 8
6.	employ spectrophotometry in determining unknown concentration.	Ap, An	7, 8
7.	determine the viscosity of liquid mixtures and use this in determining the concentration of a component in a mixture.	Ap, An	7, 8
8.	determine the concentration of a liquid mixture using a refractometer .	Ap, An	7, 8
9.	determine the unknown concentration of a given glucose solution.	Ap, An	7, 8

Module	Course Description	No. of Hrs	CO No.
1.	Conductometry a) Determination of strength of strong and weak acids in a mixture b) Determination of strength of a weak acid. c) Precipitation titration (BaCl_2 vs K_2SO_4) d) Titration of dibasic acid ($\text{H}_2\text{C}_2\text{O}_4/\text{H}_2\text{SO}_4$). e) Verification of Onsager equation. f) Verification Kohlraush's law. g) Determination of activity and activity coefficient of electrolyte.	20	1, 2, 3, 4
2.	Potentiometry a) Determination of emf of Daniel cell and temperature dependence of emf of a cell. b) Titrations involving redox reactions – Fe^{2+} vs KMnO_4 , $\text{K}_2\text{Cr}_2\text{O}_7$, $(\text{NH}_4)_2\text{Ce}(\text{SO}_4)_2$ and KI vs KMnO_4 c) Determination of the emf of various ZnSO_4 solutions and hence the concentration of unknown ZnSO_4	20	1,5

	solution. d) Determination of activity and activity constant of electrolytes. e) Determination of thermodynamic constants of reactions.		
3.	pH metric titrations. a) Acid alkali titrations using Quinhydrone electrode. b) Titrations(double) involving redox reactions – Fe^{2+} vs KMnO_4, $\text{K}_2\text{Cr}_2\text{O}_7$, $(\text{NH}_4)_2\text{Ce}(\text{SO}_4)_2$ and KI vs KMnO_4 c) Determination of strengths of halides in a mixture. d) Determination of pH of buffer solutions and hence to calculate the E° of quinhydrone electrode	15	1, 5
4.	Spectrophotometry a) Verification of Beer-Lambert's law. b) Absorption spectra of conjugated dyes (malachite green, methylene blue). c) Determination of concentration of potassium dichromate and potassium permanganate in a mixture. d) To study the complex formation between Fe^{3+} and salicylic acid. e) Determination of pKa of an indicator.	20	1, 6
5.	Polarimetry a) Measurement specific rotation of glucose. b) Determination of specific rotation of sucrose c) Determination of unknown concentration of glucose solution and rate constant of its hydrolysis in presence of HCl	15	1, 7
6.	Viscosity a) Viscosity of liquids and mixtures of liquids. b) Verification of Kendall's equation. c) Composition of unknown mixtures. d) Determination of molecular masses polymers by viscosity measurements (Mark-Houwink equation)	15	1, 8
7.	Refractometry a) Determination of molar refraction of pure liquids b) Determination of concentration of KCl solution/glycerol solution c) Determination of solubility of KCl in water. d) Determination of molar refraction of solid KCl e) Study the stoichiometry of potassium iodide-mercuric iodide complex. f) Determination of concentration of KI solution.	20	1, 9

References

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3. J. M. Newcombe, R. J. Denaro, A. R. Rickett, R.M.W Wilson, Experiments in Physical Chemistry Pergamon.
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Model Question Papers

General Instruction to question paper setters

- ☐ There will be a 15 main questions in each question paper divided into 3 sections – A, B and C
- ☐ Each of the sections A, B and C will have 5 questions each, **1 from each module**
- ☐ Each question in Section A will have 3 sub questions (a), (b) and (c), of which the candidate has to answer any two (2 marks each).
- ☐ Each question in Section B will have 2 sub questions (a) and (b), of which the candidate has to answer any one (5 marks each).
- ☐ Candidate should answer any three out of the five questions in Section C (10 marks each).
- ☐ Section A carries a total of 20 marks, Section B carries 25 marks, and Section C carries 30 marks.
- ☐ The maximum marks will be 75 and the duration of the exam will be 3 hrs.

Third Semester M.Sc. Degree Examination - Model question paper
Branch III - Chemistry/ Branch IV - Analytical Chemistry
CH/CL 231: INORGANIC CHEMISTRY - III
(2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among **(a)**, **(b)** and **(c)** from each. Each sub question carries 2 marks

1. (a) Represent diagrammatically the dative bonding seen in metal-cyano complexes.
(b) Give an example each for a hexahapto ligand and a heptahapto ligand.

- (c) Verify whether $[\text{IrBrCO}(\text{PPh}_3)_2]$ obeys 18 electron rule or not.
- List the factors that affect the stability of coordination compounds.
 - What is meant by trans effect?
 - What is the Kurnakovs test?
 - Give two examples for metallo-enzymes containing iron.
 - Briefly discuss the coordination environment of the metal ion in Vitamin B₁₂.
 - Explain the mechanism of oxygen binding in haemocyanin.
 - Explain doppler broadening with an example.
 - What is superhyperfine splitting in esr spectra?
 - How many signals are obtained in the ^{19}F nmr spectra of the following
 (i) SF_6 (ii) SF_4 (iii) XeOF_4 . Give reasons for your answer
 - List any two differences between GM counter and Proportional counter.
 - Distinguish between half life and average life. How are they related?
 - Summarise the liquid drop model of the nucleus.

[2 · 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

- IR spectroscopy provides vital information in during the study of metal carbonyls. Explain.
 - Discuss the characteristics of oxidative addition and reductive elimination reactions of organometallic compounds.
- Give an account of the photochemical reactions of complexes.
 - Using $[\text{PtCl}_4]^{2-}$ as the starting material, how can the cis and trans isomers of $[\text{PtCl}_2(\text{NH}_3)(\text{PPh}_3)]$ and $[\text{PtCl}_2(\text{NO}_2)(\text{NH}_3)]^-$ be prepared
- Explain the role played by calcium in blood clotting.
 - Briefly discuss nitrogen fixation.
- Discuss the application of ESR spectroscopy to Cu (II) complexes.
 - Discuss the utility of Mossbauer spectroscopy in the study of complexes of iron.
- Give a brief note on nuclear shell model
 - What is meant by radioactive equilibrium? The ratio between atoms of two radioactive elements A & B at equilibrium was found to be $3.1 \cdot 10^9:1$. If the half life period of A is $2 \cdot 10^{10}$ years what is the half life of B.

[5 · 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Construct the MO diagram of dibenzene chromium and explain the bonding using MOT.
12. What are inner sphere and outer sphere reactions? Explain the salient features.
13. Discuss in detail the function of PS-I and PS-II in photosynthetic activity.
14. How is CD and ORD employed in the structure determination of metal complexes?
15. Explain the principle involved in the working of the reactors in nuclear power plants

[10 · 3 = 30]

Third Semester M.Sc. Degree Examination - Model question paper
Branch III - Chemistry/ Branch IV - Analytical Chemistry
CH/CL 232: ORGANIC CHEMISTRY - III
 (2020 Admission Onwards)

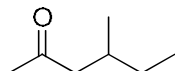
Time: 3 Hrs

Max. Marks: 75

SECTION A

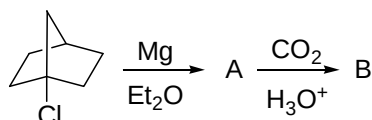
Answer **two** among **(a) (b)** and **(c)** from each. Each sub question carries 2 marks

1. (a) What is the effect of solvent polarity on $n-\pi^*$ transition?
 (b) How will you distinguish between Intramolecular hydrogen bonding and intermolecular hydrogen bonding using IR spectroscopy?
 (c) Predict the fragmentation pattern of the following molecule

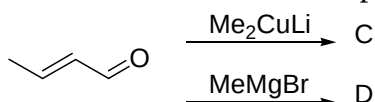


2. (a) How many peaks do you expect in the nmr spectrum of N,N-dimethyl formamide? Explain.
 (b) How does the coupling constant differ between a geminal and vicinal hydrogens?
 (c) What are shift reagents? Give an example

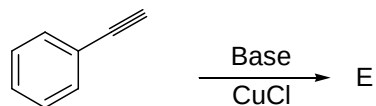
3. (a) Complete the reaction



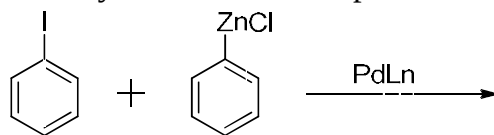
- (b) Predict the structure of the products C and D in the reaction given below



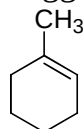
- (c) Write the structure of the compound E in the reaction given below



4. (a) Identify the reaction and predict the product

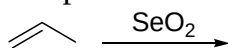


- (b) Suggest a retrosynthetic route for the following compound

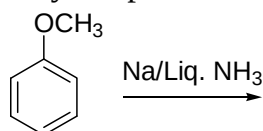


- (c) Give any two protecting groups for hydroxyl group.

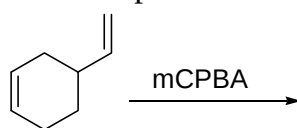
5. (a) Complete the reaction



- (b) Identify the product in the reaction given below



- (c) What is the product obtained in the following reaction?

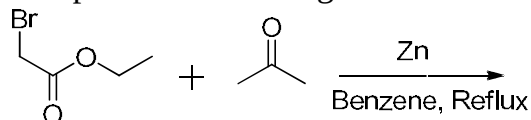


[2 · 10 = 20]

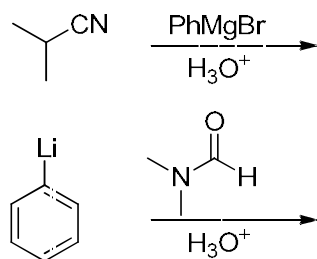
SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) Discuss the principle and applications of MALDI.
 (b) Give the mass fragmentation pattern of toluene and phenol.
7. (a) Explain the anomaly in the chemical shift value of acetylene and benzene.
 (b) Write on any two 2D NMR technique.
8. (a) Complete the following reaction and suggest a suitable mechanism



- (b) Predict the product (s) of the following reactions with mechanism



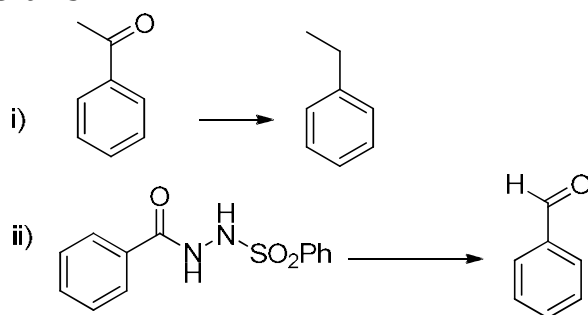
9. (a) Convert benzaldehyde to ethylbenzene using umpolung strategy.
 (b) Discuss the mechanism for Stille coupling with the help of an example.
10. (a) Illustrate Sharpless asymmetric epoxidation with the help of an example.
 (b) Give a brief outline of four Cr(VI) reagents used for oxidation reactions.

[5 · 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. a) Discuss the mass spectral fragmentation pattern of aromatic compounds, ketones and amides.
 b) Write on FAB.
12. a) ^1H NMR spectrum of a compound gives the following spectral data. δ 9.78(1H, s), 7.75(2H, d), 6.90(2H, d), 3.8(3H, s). Identify the compound
 b) Discuss DEPT nmr of
13. a) Discuss the preparation and reactivity of Tebbe's reagent.
 b) Illustrate the synthetic utility of silyl carbanions using examples
14. a) Discuss Suzuki and Heck coupling with the help of mechanism.
 b) Write in brief on olefin metathesis
15. a) Comment on the reactivity of various bulky metal hydrides using suitable examples.
 b) How will you bring about the following conversion? Suggest a suitable mechanism



[10 · 3 = 30]

Third Semester M.Sc. Degree Examination - Model question paper
Branch III - Chemistry/ Branch IV - Analytical Chemistry
CH/CL 233: PHYSICAL CHEMISTRY - III
(2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among **(a)**, **(b)** and **(c)** from each. Each sub question carries 2 marks

1. (a) Arrange O_2 , O_2^+ , O_2^- in the increasing order of stability. Justify your answer.
(b) Write briefly about 'Perturbation theory'.
(c) Write the Hamiltonian for He atom and suggest a suitable trial wave function for it.
2. (a) Predict and justify the condition at which a real gas obeys the following equation of state $PV = RT + Pb$.
(b) The van der Waals constant a for two gases are 4.17 and $0.024 \text{ dm}^6 \text{ atm mol}^{-2}$ respectively. Explain which is easily liquefiable and why?
(c) At what pressure does the mean free path of argon gas at 25°C become comparable to the diameter of the atoms themselves? Given $\sigma = 0.36 \text{ nm}^2$.
3. (a) The shift in frequency shown by a proton from TMS is 180 Hz, when measured on a 100 MHz instrument. Calculate the chemical shift in ppm.
(b) Calculate the ESR frequency of an unpaired electron in a magnetic field 0.33 Tesla. Given for free electron $g=2$, $\beta=9.273 \times 10^{-27} \text{ J/T}$.
(c) Explain the basic principle of X-ray photo electron spectroscopy.
4. (a) Apply phenomenological equation in thermal diffusion.
(b) How is temperature influence the miscibility curve of a three-component system forming one pair of partially miscible liquids?
(c) What are the conditions under which linear relations are valid to understand irreversible processes?
5. (a) How do parameterization techniques help to reduce the task of computation?
(b) Construct the z-matrix of CO_2 molecule.
(c) Differentiate STO and GTO.

[2 · 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) Calculate the first order correction to the energy levels for a one dimensional box with a slanted bottom whose potential energy varies as v_x/a where a is the length of the box.

- (b) Apply HMO theory to butadiene molecule and discuss the molecular orbitals and their corresponding energy levels.
7. (a) Calculate C_v for the following gases at room temperature.
 i) He ii) HCl iii) CO_2
 Discuss the principle of equipartition of energy.
 (b) Which among CO_2 and O_2 undergo effusion faster. Justify your answer.
8. (a) Write a brief account of NMR spectroscopy.
 (b) Discuss the application of Mossbauer spectroscopy.
9. (a) Derive expressions for entropy production in the case of system contains both the matter flow and current flow.
 (b) Verify the Onsager reciprocal relation in the case of simple chemical reaction $A \rightleftharpoons B$.
10. (a) Write a note on non-quantum mechanical method of energy calculation.
 (b) What is potential energy surface? Explain its significance.

[5 · 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Discuss the bonding in H_2 molecule by valence bond theory.
12. Discuss about the transport properties of gas. Show that the ratio of thermal conductivity to that of coefficient of viscosity = C_v/M
13. a) Explain the principle and applications of NQR spectroscopy.
 b) When N_2 gas is excited with radiation of energy 21.22 eV from a helium lamp, electrons are ejected with kinetic energies 5.63 eV and 4.53 eV. What are their binding energies?
 (7+3)
14. a) Draw the phase diagram of a three-component liquid system with three pairs of partially miscible liquids. Explain.
 b) How would you understand (i) thermo osmosis and (ii) thermal diffusion from irreversible thermo dynamics?
 (5+5)
15. a) Write briefly on ab-initio methods used in computational chemistry? What are the merits and demerits of the method?
 b) Explain the terms i) force field ii) contracted Gaussians.
 (7+3)

[10 · 3 = 30]

SEMESTER IV

CL 241 CHEMISTRY OF ADVANCED MATERIALS

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	understand dimensions, synthesis, physicochemical properties of nanomaterials and its applications.	U, Ap, An	1
2.	understand and apply characterization tools for analysing nano structures.	U, Ap, An	1
3.	outline and recognize the types of polymerization, kinetics and mechanisms.	U, Ap, An	1
4.	understand the stereochemical aspects and methods for the determination of molecular weights of polymers.	U, Ap, An	1
5.	discuss the synthesis and applications of selected classes of speciality polymers.	U, Ap, An	1, 5
6.	distinguish the types and important applications of smart materials.	U, Ap, An	1, 5

PSO–Programme Specific Outcome

Cognitive Level: R–Remember

An–Analyse

CO–Course Outcome

U–Understanding

E–Evaluate

Ap–Apply

C–Create

Module	Course Description	No. of Hrs	CO No.
1.0	Introduction to Nanomaterials and Nanotechnology		
1.1	Nanomaterials: 0D, 1D, 2D and 3D nanomaterials- fundamental physicochemical principles - size dependence of the properties of nanomaterials - quantum confinement. Nanocomposites.	3	1
1.2	Synthesis of nanomaterials: Sol-Gel, colloidal precipitation, co-precipitation, hydrothermal, vapour deposition, and sonochemical method.	3	1
1.3	Carbon nanostructures and clusters: Graphenes, carbon nanotubes and fullerenes (C ₆₀) - Synthesis, properties and applications.	4	1
1.4	Metal nanoparticles: Synthesis and properties (optical, electronic, magnetic), surface plasmon resonance.	3	1
1.5	Evolving interfaces of nanotechnology: Nanobiotechnology, nanoelectronics, nano sensors, nano-biosensors, nano tweezers, elementary ideas about nano catalysts, nano photocatalysts, nanofiltration.	3	1
1.6	Nanomedicines-nanoparticles for medical imaging and targeting cancer cells and nano encapsulation for drugdelivery to tumours. Nanotoxicology.	2	1

2.0	Characterization Tools in Nanotechnology	18	
2.1	Electron microscopies: Scanning electron microscopy (SEM), Transmission Electron Microscopy (TEM), High Resolution Transmission Electron Microscopy (HR-TEM).	4	2
2.2	Probe microscopies: Atomic Force Microscopy (AFM), Scanning tunnelling microscopy (STM), Scanning tunnelling electron microscopy (STEM).	4	2
2.3	X-ray methods: X-ray diffraction (XRD), X-ray Photoelectron spectroscopy (XPS), Energy Dispersive X-ray Spectroscopy(EDAX), X-ray Fluorescence (XRF)	4	2
2.4	Laser scattering method: Dynamic light scattering (DLS)	1	2
2.5	Spectroscopic techniques: IR spectroscopy for surface functionalization of nanoparticles, UV-visible - Diffused reflectance spectroscopy, photoluminescence, Raman spectroscopy. (Basic understanding of each technique with special emphasis on characterization at nano scale).	5	2
3.0	Polymerization processes	18	
3.1	Free radical addition polymerization-kinetics and mechanism. Chain transfer. Cationic and anionic polymerization: Kinetics and mechanism. Step growth polymerization - Polymer characterization – Molecular weights.	3	3
3.2	Linear vs cyclic polymerization. Other methods of polymerization - bulk, solution, melt, suspension, emulsion and Dispersion techniques.	3	3
3.3	Polymer stereochemistry: Configuration and conformation, Tacticity, Chiral polymers.	3	4
3.4	Molecular weight distribution and molecular weight control. Methods for determining molecular weights-static, dynamic, viscometry, light scattering and GPC.	4	4
3.5	Crystalline and amorphous states - Glassy and rubbery states. Glass transition temperature and crystalline melting of polymers. Degree of crystallinity - X-ray diffraction.	3	4
3.6	Thermal stability of polymers - Application of DSC.	2	3
4.0	Speciality Polymers	18	
4.1	Industrial Polymers: carbon chain and hetero chain polymers-synthesis and applications. Polymeric reagents, catalysts and substrates.	3	5
4.2	Conducting polymers: Synthesis & applications of polyacetylenes, polyanilines, polypyrroles & polythiophenes.	3	5

4.3	Photo responsive and photorefractive polymers. Polymers in optical lithography.	3	5
4.4	Drug delivery - Drug carriers - Polymer based nanoparticles.	3	5
4.5	Basic concepts about polymer based LEDs and lithium-polymer batteries.	3	5
4.6	Liquid crystalline polymers - Main chain and side chain liquid crystalline polymers. Phase morphology.	3	5
5.0	Smart materials	18	
5.1	Piezoelectric, magnetostrictive, halochromic, chromogenic, electrochromic, thermochromic, magnetocaloric and thermoelectric materials.	4	6
5.2	Chemistry behind photochromism in spiropyrans, spirooxazines, diarylethenes, azobenzenes, quinones. Examples for photochromic coordination compounds.	4	6
5.3	Shape-memory polymers, pH-sensitive polymers, Temperature-responsive polymers, dielectric elastomers.	4	6
5.4	Self-healing polymers and concept of mechanophores.	3	6
5.5	Introduction to ferrofluids, concept of pseudo elasticity.	3	6

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CL 242 APPLIED ANALYTICAL CHEMISTRY

Total 90 h

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	explain the thermal and radiochemical methods used in analytical chemistry.	U, An	1, 2
2.	explain the application of radio isotopes and the need for a safe disposal of nuclear waste.	U, An	1, 4
3.	explain the principle underlying the methods used in food analysis.	U, An	1, 10
4.	carryout the detection of food adulterants.	U, Ap, An	1, 7, 10
5.	explain the basic principles of forensic analysis.	U, An	1
6.	explain the nature of poisons and suggest possible antidotes.		1, 10
7.	explain the importance of DNA finger printing and ballistics in forensic analysis.	U, An	1, 10
8.	explain the methods of analysis and the principles involved in the analysis of biological fluids, enzymes, drugs and alcoholic beverages.	U, An	1, 10
9.	explain the instrumentation and working principle of Flame spectrometry, AAS, AES, XPS and X-ray fluorescence.	U, An	1, 2

PSO–Programme Specific Outcome

CO–Course Outcome

Cognitive Level: R–Remember

U–Understanding

Ap–Apply

An–Analyse

E–Evaluate

C–Create

Module	Course Description	No. of Hrs	CO No.
1.0	Thermal and Radiochemical methods of Analysis		
1.1	Principle, theory and instrumentation of Thermo mechanical analysis (TMA) and Dynamic mechanical analysis (DMA). Thermometric titrimetry – theory,	4	1

	applications.		
1.2	Radiochemical methods of analysis: radioactive tracer techniques and its applications, principle and applications of isotope dilution analysis, neutron activation analysis and its applications.	5	1
1.3	Radiometric titration: principle, techniques based on complex formation and precipitation, radiometric titration curves for estimation of ions from their mixture.	5	1
1.4	Applications of radio isotopes in industry, medicine, autoradiography, radio pharmacology, radiation safety precaution, nuclear waste disposal.	4	2
2.0	Food Analysis	18	
2.1	Food analysis: Determination of moisture (Oven drying Karl-Fischer Titration, Colorimetry), Ash (Dry and Wet ash method), crude protein (Kjeldahl's method, Dumas method and Biurett method), Fat (Soxhlet method; Mojonnier Method, Gerber method), Crude fibre, carbohydrate (Phenol-Sulfuric Acid method for determination of total carbohydrates; Nelson-Somogyi method for determination of reducing sugars; Enzymatic method), calcium, potassium, sodium, phosphates and vitamins (A, B ₁ , B ₂ , C, E) in food.	6	3
2.2	Food adulteration – common adulterants in food and their determination. Contamination of food stuffs. Analysis of milk for fat and added water.	4	4
2.3	Oils and fats and their analysis: iodine value, iodine bromine value, saponification value and acid value and their significances. Rancidity-detection and determination (peroxide number).	4	3, 4
2.4	Pesticide residues in foods determination of chlorinated organic pesticides.	4	3, 4
3.0	Forensic Analysis	18	
3.1	Forensic analysis: basic principles and significance, sampling, sample storage, sample dissolution.	3	5
3.2	Analysis of biological substances – blood, saliva and urine.	2	6
3.3	General discussion of poisons with special reference to mode of action of cyanide and organophosphates. Classification of poisons, Lethal dose, significance of LD ₅₀ and LC ₅₀ . Diagnosis of poisons in the living and the dead–clinical symptoms – postmortem appearances. Antidotes for common poisons. Estimation of poisonous materials such as lead, mercury, chromium and arsenic in biological materials.	5	6
3.4	Physiological effects of natural poisons such as	2	6

	morphine, hashish and nicotinoids. Health hazards and Remedial measures.		
3.5	DNA Finger printing, Steps involved, DNA Finger printing for tissue identification in dismembered bodies, Detecting steroid consumption in athletes.	3	7
3.6	Ballistics: internal and terminal ballistics – small arms. Bullets and bullet wounds, composition of bullets and detecting powder burn, detection of powder residue by chemical tests.	3	7
4.0	Analysis of selected materials	18	
4.1	Principles of estimation of biological fluids: Estimation and interpretation of data for blood sugar, haemoglobin, urea and cholesterol.	3	8
4.2	Biological significance, analysis and assay of enzymes: pepsin, monoaminoxidase, and tyrosinase.	3	8
4.3	Analysis of drugs and pharmaceuticals: quality control, official methods, classical and modern methods of drug analysis.	4	8
4.4	Analysis of common drugs: analgesics, antipyretics, antimalarial, antiallergic (anti-histamines) and antibiotics.	4	8
4.5	Analysis of alcoholic beverages: determination of quality parameters such as original extract, alcohol, extract, CO ₂ , O ₂ . Brix, degree of inversion, pH value, ethyl carbamate, carbohydrate, and dissolved oxygen	4	8
5.0	Instrumental Methods of Chemical Analysis	18	
5.1	Flame spectrometry: introduction, elementary theory, instrumentation, type of burners, type of interferences, background correction method and applications.	4	9
5.2	Atomic absorption spectroscopy: principle, instrumentation, production of atoms and ions, burners, detectors, HCL, TGL, EDL, advantage and disadvantage of AAS.	4	9
5.3	Atomic emission spectrometry: introduction, equipment, qualitative and quantitative analysis with AES, plasma emission spectrometry, ICP-AES, sample introduction and measurements.	4	9
5.4	X-ray Photoelectron spectroscopy (XPS): introduction and basic theory, instrumentation, XPS imaging.	3	9
5.5	Molecular fluorescence and X-ray fluorescence: introduction and basic theory, instrumentation and applications.	3	9

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CL 243 (a) Dissertation

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	demonstrate an advanced theoretical and technical knowledge of chemistry as a creative endeavour; analyse, interpret and critically evaluate scientific information.	Ap, An	1
2.	present information, articulate arguments and conclusions, in a variety of modes, to audiences in their field of research.	E, C	5, 8

3.	as part of a team or individually, design, conduct, analyse and interpret results of an experiment, and effectively communicate these in written reports and other formats.	Ap, An	3, 7
4.	develop an understanding of the requirements to undertake independent research in a chemistry field.	U	6, 9
5.	demonstrate an understanding of the relationship between scientific research and the progress of new knowledge in a global scenario.	An	5, 6, 9

CL 243 (b) Visit to R & D Centre

CO No.	Expected Course Outcomes <i>Upon completion of this course, the students will be able to</i>	Cognitive Level	PSO No.
1.	Understand the relevance of independent supervised research in a chemistry field and the need of well-developed judgement, adaptability and accountability as a practitioner or learner	U, An	2, 9

Model Question Papers

General Instruction to question paper setters

- ☐ There will be a 15 main questions in each question paper divided into 3 sections – A, B and C.
- ☐ Each of the sections A, B and C will have 5 questions each, **1 from each module**
- ☐ Each question in Section A will have 3 sub questions (a), (b) and (c), of which the candidate has to answer any two (2 marks each).
- ☐ Each question in Section B will have 2 sub questions (a) and (b), of which the candidate has to answer any one (5 marks each).
- ☐ Candidate should answer any three out of the five questions in Section C (10 marks each).
- ☐ Section A carries a total of 20 marks, Section B carries 25 marks, and Section 3 carries 30 marks.
- ☐ The maximum marks will be 75 and the duration of the exam will be 3 hrs.

Fourth Semester M.Sc. Degree Examination - Model question paper Branch III - Chemistry/ Branch IV - Analytical Chemistry CH/CL 241: CHEMISTRY OF ADVANCED MATERIALS (2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among **(a) (b) and (c)** from each. Each sub question carries 2 marks

1. (a) What is meant by quantum confinement?
(b) Explain the synthesis of metal nanoparticles with an example.
(c) Write a short note on nano toxicology?

2. (a) What is EDAX?
(b) How XPS is used in nano technology?
(c) How diffused reflectance spectroscopy is used in characterisation of nanoparticles?
3. (a) What do you mean by chain transfer in polymerization process?
(b) Mention two advantages and two disadvantages of solution polymerization over bulk polymerization.
(c) Explain briefly “auto acceleration” in radical polymerization? Why does it happen?
4. (a) What are conducting polymers?
(b) Name any two polymeric reagents.
(c) Which are the polymers used in optical lithography?
5. (a) What are halochromic materials?
(b) Write a note on pH-sensitive polymers.
(c) What are piezo electric materials?

[2 · 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) Explain the relation between size and properties of nano-materials.
(b) Explain the CVD method used in the preparation of nanoparticles.
7. (a) Explain the use of powder XRD in determination of particle size of nanomaterials.
(b) How is electron microscopy used as characterisation techniques?
8. (a) What are chain transfer agents? Describe their effect on rate expression and molecular weight obtained in the presence of chain transfer agent.
(b) Unlike radical polymerisation both cationic and anionic polymerization show a marked dependence on the type of solvent used. Discuss on this.
9. (a) Discuss the structure and working principle of lithium polymer batteries.
(b) Explain in detail the synthesis of polythiophenes.
10. (a) Explain the chemistry of photochromism in spirooxazines and quinones.
(b) Write short note on synthesis and application of ferrofluids.

[5 · 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Explain application and role of metal nano particles in catalysis with examples.
12. Discuss the applications of DLS and IR spectroscopy in the analysis of nanomaterials.

13. Elaborate any two methods to determine the molecular weight of polymers.
14. Explain the application of polymers in drug delivery and in catalysis.
15. Describe with proper examples:

(a) magnetostrictive materials	(b) thermoelectric materials
(c) self-healing polymers	(d) dielectric elastomers.

[10 · 3 = 30]

Fourth Semester M.Sc. Degree Examination - Model question paper
Branch IV - Analytical Chemistry
CL 242: APPLIED ANALYTICAL CHEMISTRY
 (2020 Admission Onwards)

Time: 3 Hrs

Max. Marks: 75

SECTION A

Answer **two** among **(a)**, **(b)** and **(c)** from each. Each sub question carries 2 marks

1. (a) Explain the principle behind thermo mechanical analysis?
 (b) What is meant by radiotracer technique? Give its applications
 (c) List out any two methods adopted for radiation safety.
2. (a) Differentiate food adulteration from contamination.
 (b) What is meant by rancidity?
 (c) How is fat content in milk determined?
3. (a) Distinguish LD₅₀ and LC₅₀.
 (b) What are antidotes? Which is the antidote used for treatment of pesticidal poisoning due to malathion?
 (c) What is meant by a false positive in forensic analysis? Give an example.
4. (a) Give the principle for the estimation of blood sugar.
 (b) Write a short note on Brix.
 (c) What are the modern methods of drug analysis?
5. (a) Flame emission spectroscopy is temperature dependent whereas AAS is not. Why?
 (b) List out two advantages and disadvantages of AAS.
 (c) What is the role of nebuliser in flame photometry?

[2 · 10 = 20]

SECTION B

Answer either **(a)** or **(b)** from each question. Each sub question carries 5 marks

6. (a) Examine briefly the methods and concerns of nuclear waste disposal
 (b) Discuss the principle behind Dynamic Mechanical Analysis.

[80]

7. (a) Explain the Phenol-Sulfuric Acid method for the determination of total concentration of carbohydrates present in food samples.
(b) How is the presence of chlorinated organic pesticides determined in food?
8. (a) What is a presumptive test in forensic analysis? Briefly explain the presumptive test used in the identification of saliva?
(b) What are suicidal and homicidal poisons? What are the characteristics of ideal suicidal and homicidal poisons? Give examples.
9. (a) Explain the determination of alcohol content and CO₂ in alcoholic beverages.
(b) Point out the biological significance of pepsin and monoaminoxidase.
10. (a) Give an account of the working of a hollow cathode lamp.
(b) Explain the interferences in AAS.

[5 · 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Discuss in detail the neutron activation analysis in radio chemistry citing its applications.
12. Explain the Kjeldahl's methods for the determination of proteins in food citing its advantages and disadvantages.
13. Discuss briefly on DNA finger printing as an analytical tool in forensic chemistry.
14. Give and principle and detail the method of estimation of cholesterol in biological samples.
15. Explain the theory and instrumentation of X-ray fluorescence.

[10 · 3 = 30]

UNIVERSITY OF KERALA

THIRUVANANTHAPURAM

M.Sc. Degree in Botany (Semester System)

Revised Course Structure & Syllabus

(w.e.f.2019 Admissions)

October 2018

PG BOARD OF STUDIES IN BOTANY

UNIVERSITY OF KERALA

M.Sc. Degree in Botany (Semester System)

Revised Course structure

Semes ter	Paper Code	Title of the Paper	Hours/ semester	Hours / week		ESA hours	Maximum Marks		
I				L	P	3	CA	ESA	Total
	BO 211	Phycology, Mycology, Microbiology &Plant Pathology	108	6	2	3	25	75	100
	BO212	Bryophyta, Pteridophyta & Gymnosperms	108	6	2	3	25	75	100
	BO213	Histology, Reproductive Biology, Microtechnique & Histochemistry	108	6	3	3	25	75	100
	BO214	Practical I	126		7	4	25*	75*	Δ
	Total for Semester I		450	18	7	13	75	225	300
II	BO 221	Taxonomy of Angiosperms, Economic Botany & Ethnobotany	108	6	2.5	3	25	75	100
	BO 222	Environmental Biology, Forest Botany, Phytogeography& Conservation Biology	108	6	2	3	25	75	100
	BO 223	Cell Biology, Genetics & Evolution	108	6	2.5	3	25	75	100
		Practical I							100*
	BO 224	Practical II	126		7	4	25	75	100
	BO 225	Submission I* (I A+1B)					25+25	50	
	Total for Semester II		450	18	7	13	100	350	550
III	BO 231	Plant Breeding, Horticulture & Biostatistics	108	6	1.5	3	25	75	100
	BO 232	Biochemistry, Plant Physiology & Research Methodology	108	6	3	3	25	75	100
	BO 233	Molecular Biology, Immunology & Plant Biotechnology	108	6	2.5	3	25	75	100
	BO 234	Practical III	126		7	4	25**	75**	Δ Δ
	Total for Semester III		450	18	7	13	75	225	300
IV	BO 241	Special Paper –I Bioinformatics & Biophysics	144	8	2	3	25	75	100
	BO 242	Special Paper –II Elective	144	8	5	3	25	75	100
		Practical III							100**
	BO 243	Practical IV	126		7	4	25	75	100
	BO 244	Dissertation	36	2				100	100
	BO 245	Submissions II**						50	50
	BO 246	Comprehensive Viva Voce					25	75	100
	Total for Semester IV		450	18	7	10	100	450	650
		Grand Total					400	1400	1800
L-Lecture, P-practical, ESA-End Semester Assessment, CA-Continuous Assessment (Internal)									

Δ The S1 practical examination marks (25*+75*=100*) will be awarded only during II semester practical Examinations.

Δ Δ The S3 practical examination mark (25**+75**=100**) will be awarded only during IV semester practical Examinations.

* Evaluation of the Submission 1(A) will be along with Practical I. Evaluation of the Submission 1(B) will be along with Practical II.

** The evaluation of the Submission II will be along with the Viva Voce at the end of 4th Semester.

SCHEDULE OF WORK LOAD

Semester	Paper code	Subject	Total hours		T Hours/week	P Hours/week
			T	P		
I	BO 211	Phycology	36	18	2	1
		Mycology	27	9	1.5	0.5
		Plant Pathology	18	0	1	0
		Microbiology	27	9	1.5	0.5
	BO 212	Bryophyta	27	9	1.5	0.5
		Pteridophyta	45	18	2.5	1
		Gymnosperms	36	9	2	0.5
	BO 213	Reproductive Biology	27	9	1.5	0.5
		Histology	36	9	2	0.5
		Microtechnique & Histochemistry	45	36	2.5	2
II	BO 221	Taxonomy of Angiosperms	90	36	5	2
		Economic botany	9	9	0.5	0.5
		Ethnobotany	9	0	0.5	0
	BO 222	Environmental Biology	54	36	3	2
		Forest Botany	9	0	0.5	0
		Phytogeography	18	0	1	0
		Conservation Biology	27	0	1.5	0
	BO 223	Cell Biology	36	18	2	1
		Genetics	54	27	3	1.5
		Evolution	18	0	1	0
III	BO 231	Plant Breeding	54	9	3	0.5
		Horticulture	18	9	1	0.5
		Biostatistics	36	9	2	0.5
	BO 232	Biochemistry	36	27	2	1.5
		Plant Physiology	54	27	3	1.5
		Research Methodology	18	0	1	0
	BO 233	Molecular Biology	36	9	2	0.5
		Immunology	18	0	1	0
		Plant Biotechnology	54	36	3	2
IV	BO 241	Special Paper – I Bioinformatics & Biophysics	90	18	5	1
			54	18	3	1
	BO 242	Special paper – II Elective	144	90	8	5
	BO 244	Dissertation	36	-	2	-

Elective II Special Papers

BO 242a : Biotechnology

BO 242b : Environmental Biology

BO 242c : Plant Biochemistry and Enzymology

BO 242d : Cytogenetics

The special paper comprises detailed studies in certain areas of a subject. Normally a department shall offer one of the above subjects as special paper. There shall be provision for change of subject for special paper, if necessary, in the ensuing years.

Study Tour

Study tour in the 2nd and 4th semesters of the PG programme is compulsory.

2nd Semester : minimum three one day field trips or 3 to 4 day study tour for flora awareness.

4th Semester : Visit to at least two regional and two national research institutions.

SUMBISSIONS

Submission I (Evaluation along with 2nd Semester Practical Examination)

Submission 1 (A)

1. Algae/Fungi/Pathology – Five species representing at least one member from each group

5x 2= 10 marks

2. Bryophytes/ Pteridophytes/ Gymnosperms- Three species from each group

5x3=15 marks

Total = 25 marks

Submissions can be either as herbarium or as preserved specimens.

Evaluation of the Submission 1(A) will be along with Practical I.

Submission I (B)

1. Herbarium of invasive species/Exotic species (5 numbers each)

10x1= 10 marks

2. Economic products/Ethnobotany (5 numbers- representation from both)

5x2= 10 marks

3. Tour Report

5 marks

Total =25 marks

Evaluation of the Submission 1(B) will be along with Practical II.

Submission II (Evaluation along with 4th Semester Practical Examination)

1. Detailed report on visit to any four National / Regional research institutions and the type of research works undertaken by these centers 10 marks

2. A model research proposal seeking fund to carry out research on a specific problem 20 marks

3. Power Point presentation of the dissertation carried out by the student before the examiner 20 marks

Total = 50 marks

The evaluation of the Submission II will be along with the Viva Voce at the end of 4th Semester.

Topic of the dissertation may be chosen from any area of botany and may be laboratory based, field based or both or computational, with emphasis on originality of approach. It may be started during 2nd/3rd semester and shall be completed by the end of the 4th semester. It should be duly signed by the research guide and the head of the Department and submitted for evaluation. The dissertation to be submitted should include:

- Introduction
- Objectives of the study
- Materials and methods
- Results and discussion
- Summary and conclusion
- References

Scheme for Practicals	Duration	CA	ESA	Total Marks
Practical I (BO 214) includes all the topics under papers BO 211, 212 & 213	4 hrs	25	75	100
Practical II (BO 224) includes all the topics under papers BO 221, 222 & 223	4 hrs	25	75	100
Practical III (BO 234) includes all the topics under papers BO 231, 232 & 233	4 hrs	25	75	100
Practical IV (BO 243) includes all the topics under papers BO 241 & 242	4 hrs	25	75	100

The practical examinations are conducted at the end of the semester II and Semester IV. Practical I and II examinations will be conducted at the end of the Semester II and Practical III and IV examinations will be conducted at the end of the Semester IV. Certified records of practical works done and submissions, if any, should be submitted at the time of each practical examinations.

Criteria for Continuous Assessment (CA)

Theory

Criteria	Marks
Attendance	>90- 5 marks
	>85%- 4 marks
	>80% - 3 marks
	>75% - 2 marks
	75% - 1 marks
Test Papers (2)	5x2= 10 marks
Seminar	5 marks
Assignment	5 marks
Total	25 marks

Practical

Criteria	Marks
Attendance	5 marks
Good Lab Practice	10 marks
Model Practical	10 marks
Total	25 marks

SCHEME OF EXAMINATION AND MARK DISTRIBUTION

Semester	Paper code	Paper	Hours/ Semester	ESA hours	Maximum marks		
					CA	ESA	Total
I	BO211	Paper 1	108	3	25	75	100
	BO212	Paper 2	108	3	25	75	100
	BO213	Paper 3	108	3	25	75	100
	BO214	* Practical I Score will be included in SemesterII	126	4	25	75	100
	Total for Semester I		450	13	100	300	400
II	BO221	Paper 1	108	3	25	75	100
	BO222	Paper 2	108	3	25	75	100
	BO223	Paper 3	108	3	25	75	100
	BO224	Practical II	126	4	25	75	100
	Submission I					50	50
	Total for Semester II		450	13	100	300	450
III	BO231	Paper 1	108	3	25	75	100
	BO232	Paper 2	108	3	25	75	100
	BO233	Paper 3	108	3	25	75	100
	BO234	**Practical III Score will be included in SemesterIV	126	4	25	75	100
	Total for Semester III		450	13	100	300	400
IV	BO241	Special Paper I	144	3	25	75	100
	BO242	Special Paper II	144	3	25	75	100
	BO243	Practical IV	126	4	25	75	100
	BO244	Dissertation	36			100	100
	BO245	Submission II				50	50
	BO246	Viva voce				100	100
	Total for Semester IV		450	10	100	500	550
Grand Total					400	1400	1800

Distribution of marks in each Semester Examination

Semester	Continuous Assessment		End Semester Assessment		Total marks
	Theory	Practical	Theory	Practical	
I	75	-	225	--	300
II	75	50(25+25)	225	150(75+75)	500
III	75	-	225	--	300
IV	50	50(25+25)	150	150(75+75)	400
	Dissertation				100
	Submissions				100
	Comprehensive Viva Voce				100
	Grand Total				1800

Distribution of Marks in Practical Examination

Practical Exam	Examination	Record/Submission	Total Marks
I	55	Record – 10 submission – 10	75
II	55	Record – 10 Herbarium/Field note-10	75
III	65	Record – 10	75
IV	65	Record -10	75

SEMESTER I

PAPER BO 211.PHYCOLOGY, MYCOLOGY,MICROBIOLOGY & PLANTPATHOLOGY

144 hrs (Theory: 108 hrs; Practical: 36 hrs)

Objectives:

- To familiarize the students the habitats ,classification, structure and life cycle of Algae, Fungi and lichen and the evolutionary trends in Algae and Fungi
- To get a basic idea about the ecological significance of Algae, Fungi and Lichen.
- To introduce the students about the aspects of Microbiology like classification, structure ,metabolism ,Bacterial culture and microbial diseases.
- To understand the role of microbes in Agricultural, Environmental and industrial applications
- To get the knowledge on various plant diseases caused by different types of pathogens and defence mechanism

Learning Outcomes:

The student will be able to

- Identify, collect and preserve different types of algae, fungi and lichens
- Develop a basic understanding about the structure and life cycle of algae, fungi and lichens
- Apply the knowledge on ecological and environmental significance of microbes for the benefit of the society
- Identify and suggest measures for the prevention and control of diseases in crop plants

A. PHYCOLOGY

36 hrs (2 hrs/wk)

1. Principles and modern trends in taxonomy of algae ; Contributions of Indian Algologists (2 hrs)
2. Classification of Algae (Fritsch F. E. 1935; Lee R. E. 2018). Characteristic features of major Divisions (4 hrs)
3. Thallus organization and its morphological variations; Evolutionary trends. (2 hrs)
4. Ecological role of algae. Fossil algae - Brief account only. (2 hrs)
5. Cell structure - Prokaryotic, mesokaryotic and eukaryotic organizations. (2 hrs)

6. Structure, reproduction and life cycle of the following types: (20hrs)
Hydrodictyon, Ulva, Pithophora, Draparnaldiopsis, Cephaleuros, Halimeda, Acetabularia, Nitella, Padina, Turbinaria, Amphiroa, Gracilaria, Ceramium, Spirulina, Scytonema
7. Economic Importance of Algae – Algae as biofuel. Algae as biofertilisers, as food, their uses in industry, water blooms and their ecological role. (4 hrs)

Practical

18 hrs (1hr/wk)

1. A record of algal types mentioned above – A study of their morphology and structure.
2. Field trips to be conducted for students to get familiarized with the local flora.

References

1. Lee, R. E. 2018. Phycology 5th Edition. Cambridge University Press, New Delhi.
2. Barsanti, L. & Gualtieri, P. 2014. Algae: Anatomy, Biochemistry, and Biotechnology, 2nd Edition. CRC Press.
3. Sharma, O. P. 2011. Text book of Algae. Tata McGraw Hill Publ. Comp. Ltd. New Delhi.
4. Bilgarmi, K. S & Saha, L. C. 2010. A Textbook of Algae. CBS Publishers, New Delhi.
5. Kumar, H. D. 1999. Introductory Phycology. East West Pvt. Ltd., New Delhi.
6. Vashishta, B. R. 1999. Algae. S. Chand & Company, New Delhi.
7. Bold, H. C. & Wynne, M. J. 1995. Introduction to Algae. Prentice Hall of India, New Delhi.
8. Kashyap, A. K. & Kumar, H. D. 1994. Recent advances in Phycology. Rastogy & Company.
9. Prescott, G. W. 1984. The Algae: A review. Lubrecht & Cramer Ltd.
10. Round, F. E. 1984. The Ecology of Algae. Cambridge University, Press, London.
11. Smith, G. M. 1976. Cryptogamic Botany Vol.1. Tata Mc Graw Hill Publ. Comp. Ltd. New Delhi.
12. Gangulee, H. C. & Kar, A. K. 1973. College Botany, Vol. I. New Central Book Agency Pvt. Ltd.
13. Fritsch F. E. 1935, 48. Structure and reproduction of algae. Cambridge University Press.

B. MYCOLOGY

27 hrs (1.5 hrs/wk)

1. Principles and modern trends of classification of Fungi-
- (Alexopoulos *et al.* 1996; Kirk *et al.* 2001, 2008); Contributions of Indian Mycologists. (2 hrs)
2. Structure, reproduction and phylogeny of: Phycomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes (6 hrs)
3. Thallus structure, reproduction and life cycle of the following types:
Phytophthora, Pilobolus, Aspergillus, Uromyces, Polyporus, Lycoperdon, Geaster, Ganoderma, Nidularia, Schizophyllum Colletotrichum, Fusarium and Helminthosporium. (14 hrs)

4. Economic importance of fungi with special reference to secondary metabolites; Fungi as biocontrol agent. (2hrs)
5. Classification, thallus structure, reproduction, ecological significance and Economic importance of Lichens. Thallus structure, reproduction and life cycle of the following types: *Parmelia*, *Graphis*. (3 hrs)

Practical

9hrs (1½hr/wk)

1. Study of the morphology and reproductive structures of the types mentioned in the syllabus.
2. Staining of fungal filaments by Cotton Blue, Methylene Blue.

References

1. Sharma , O. P. 2017. Fungi and Allied Microbes. McGraw Hill Education
2. Dube, H. C. 2013. An Introduction to Fungi. 4th Edition. Scientific Publishers, India.
3. Kirk, P., Cannon P.F., Minter D.W. & Stalpers J. A. 2008. Ainsworth & Bisby's Dictionary of Fungi. 10th Edition. CAB International, Oxon UK.
4. Alexopoulou, C. J., Mims, C.W. & Blackwell, M. 2007. Introductory Mycology. 4th Edn. John Wiley & Sons, New York.
5. Sharma, O. P. 2007. Text book of Fungi. Tata McGraw Hill, Publishing Co. Ltd. New Delhi.
6. Sumbali, G. 2005. The Fungi. Narosa Publishing House, New Delhi.
7. Sharma, P. D. 2004. The Fungi for University students. Rastogi Publications, Meerut.
8. Kirk, P. M., Cannon, P. F., David, J. C. & Stalpers, J. A. 2001. Ainsworth & Bisby's Dictionary of the Fungi, 9th Edition. CABI Publishing.
9. Chopra, G.L. 1998. A text book of Fungi. S. Nagin & Co. Meerut.
10. Srivastava, J. P. 1998. Introduction to Fungi. Central Book Depot, Allahabad.
11. Elizabeth Moore-Landeecker. 1996. Fundamentals of Fungi. Prentice Hall, New Jersey.
12. Mehrotra, R.S. & Aneja, K. R. 1990. An Introduction to Mycology. Wiley Eastern Ltd. New Delhi.
13. Hudson, H. J. 1986. Fungal Biology. Edward Arnold, London.
14. Moore, D., Casselton L.A. Wood D.A. & J. C. Frankland 1986. Developmental Biology of higher fungi. Cambridge University Press

15. Hale, M. E. 1983. Biology of Lichens. Edward Arnold, London.
16. Bessy, E. A. 1979. Morphology and Taxonomy of Fungi. Vikas Publishing House, New Delhi.
17. Ainsworth, G.C., Sparrow, K.E. & Sussman, A.S. 1973. The Fungi. Academic Press, New York.
18. Burnett, J. H. 1968. Fundamentals of Mycology. Edward Arnold Ltd. London.

C. MICROBIOLOGY

27 hrs (1.5 hrs/wk)

1. Brief history of microbiology. Experiments of Pasteur and Tyndall, Koch's postulates.
Methods of sterilization. (3 hrs)
2. Bacteria - Classification based on Bergey's Manual. Significance of 16 S RNA in Bacterial identification. (2 hrs)
3. Major groups of microorganisms and their characteristics -prions, viroids, viruses, bacteria, archaeobacteria, mollicutes, actinomycetes, cyanobacteria, viable but nonculturable (VBNC) bacteria
Morphology, and ultrastructure of typical bacterium. (6 hrs)
4. Growth and nutrition of microorganisms. Growth characteristics. Continuous culture devices - Chemostat. (3 hrs)
5. Extremophiles – Acidophilic, Alkalophilic, Thermophilic and halophilic bacteria.
Stress response in bacteria. (2 hrs)
6. Microbial diseases. Human diseases: Bacteria (Rickettsia), Virus (AIDS). Animal diseases: Anthrax (Bacteria). (3hrs)
7. Microbes in Agriculture: Rhizosphere, Nitrogen fixation, Mycorrhiza, Cyanobacteria (2 hrs)
8. Industrial Microbiology: Microbial fermentation-Major industrial products from microbes: Beverages, Antibiotics, Secondary metabolites, Recombinant products (3 hrs)
9. Applied Environmental Microbiology: Water Purification and Sanitary Analysis. Waste water Treatment (primary secondary and tertiary), Bioremediation and Metal Bioleaching (3 hrs)

Practical

9 hrs (1½ hr/ wk)

1. Practical involving preparation of media, principles of isolation, pure culturing aspects and

maintenance of culture.

2. Differential staining -Gram staining of pure cultures of *Bacillus/Lactobacillus/Rhizobium/Escherichia coli*.
3. Demonstration of bacterial motility by hanging drop method.
4. Isolation of *Rhizobium* from root nodule of legumes.
5. Test for coliforms in contaminated water.
6. Isolation of pure bacterial culture by streak plate method.

References

1. Tortora, G.J., Funke, B.R. & Case, C.L. 2019. Microbiology an Introduction. 13th Edition. Pearson Education, Inc.
2. Talaro, K. P. & Chess, B. 2018. Foundations in microbiology. 10th Edition. Pearson Education, Inc.
3. Cowan, M.K. & Smith H. 2018. Microbiology: A Systems Approach. 5th Edition. Mc Graw Hill Edn.
4. Pommerville, J. C. 2017. Alcamo's Fundamentals of Microbiology, 11th Edition. Jones & Bartlett Learning.
5. Iwasa, J. & Marshall, W. 2017. KARP'S Cell and Molecular Biology. John Wiley & Sons, Inc.
6. Madigan M. T., Bender K.S., Buckley D.H., Sattley W.M., & Stahl D.A. 2017 Brock Biology of Microorganisms. Pearson Education, Inc.
7. Bauman, R. W. 2015. Microbiology: with diseases by body system 4th Edn. Pearson Education, Inc.
8. Sharma, P. D. 2010. Microbiology. Narosa publishers, New Delhi.
9. Dubey, R. C. & Maheswari, D.K. 2010. A Text book of Microbiology, S. Chand & Company, New Delhi.
10. Rangaswami G and Bagyaraj D.J. 2004. Agricultural Microbiology. Prentice-Hall of India Pvt. Ltd.
11. Atlas, M. & Bartha, R. 2000. Microbial Ecology, Longmann, New York.
12. Black, J. G. 1999. Microbiology – Principles and Explorations, Prentice Hall, London.
13. Casida, L. E. 1997. Industrial microbiology. New Age Publishers, New Delhi.
14. Pelczar, M. J., Chan, E. C. S. & Kreig, N. R. 1993. Microbiology-concepts

and applications. McGraw Hill, Inc. New York.

15. Stainer, R.Y. *Stanier R.Y., Ingraham J.L., Wheelis M.L. and Painter P.R.* 1990. The microbial world. Prentice Hall of India, New Delhi.

C. PLANT PATHOLOGY

18 hrs (1 hr/wk)

1. History of Plant pathology, General principles and concepts of host-parasite interaction. (2 hrs)
2. Defence mechanisms - Systemic Acquired Resistance and Induced Systemic Resistance, major signaling pathways of plant defense mechanism. (4 hrs)
3. Epidemiology and quarantine. (1 hr)
4. Principles and methods of plant disease control: Fungicides and pesticides, natural pesticides, sanitation, disease resistance. Biological control: biocontrol agents, bio-inoculants, natural enemies, bio-traps. (2 hrs)
5. Study of the following plant diseases with reference to symptoms, causal organism, disease cycle and control measures. (9 hrs)

I	Paddy	-	Brown spot and Sheath Blight
ii.	Ginger		Soft rot
iii.	Rubber	-	Powdery mildew
Iv	Cardamom		Mosaic disease
v.	Tea	-	Red rust
Vi	Sugarcane	-	Red rot
Vii	Ladies finger	-	Yellow vein mosaic
Viii	Pepper	-	Quick wilt
Ix	Bacterial wilt	-	Tomato

Practical

A record of all diseases mentioned in the syllabus.

References

- 1 Singh R.S. 2017. Introduction to Principles of Plant Pathology. 5th Edition. Medtech Publisher.
- 2 Mehrotra R.S. 2017. Plant Pathology. 3rd Edition. McGraw Hill Education

- 3 Dube H.C.2014.Modern Plant Pathology.3rd Edition, Agribios, New Delhi.
- 4 Sharma,P.D, 2013.Plant Pathology.Rastogi Publishers NewDelhi.
5. Agrios, G.N. 2005. Plant Pathology 5th Edition. Academic Press, New Delhi.
6. Sharma, P. D 2005. Plant pathology. Narosa Publishing House, New Delhi.
7. Rangaswamy, G. & Mahadevan, A. 2002. Diseases of crop plants in India. Prentice Hall, New Delhi.
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9. Singh, R. S. 2000. Introduction to the principles of plant pathology. Oxford IBH, New Delhi.
10. Marshall, H. 1999. Diseases of plants. Anmol Publications Pvt. Ltd., New Delhi.
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12. Bilgrami, K. S. & H. C. Dube.1990. A Text Book of modern plant pathology. Vikas Publishers, New Delhi.
13. Butler, E. J. & Jones, S. G. 1949. Plant pathology. Macmillan & Co. Ltd. London.
14. Chatterjee, P. B. 1997. Plant protection techniques. Bharati Bhavan, Patna.
15. Chattopadhyay, S. B. 1991. Principles and procedures of plant protection Oxford & IBH, New Delhi.
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17. Mundkur, B. B.1982. Text book of Plant diseases. Macmillan India Ltd., New Delhi.
18. Pathak, V. N., Khatri, N. K. & Pathak, M. 1996. Fundamentals of Plant pathology. Agrobotanical publishers, India, Bikaner.

PAPER BO 212. BRYOPHYTA, PTERIDOPHYTA AND GYMNOSPERMS

144 hrs (Theory: 108 hrs; Practical: 36 hrs)

Objectives

- To impart basic knowledge about geographical distribution , classification ,structure ,life history and phylogeny of Bryophytes, Pteridophytes and gymnosperms.
- To give an idea about their ecological role and economically important products obtained from them and their uses.
- To familiarize the fossil members of these groups.

Learning Outcomes:

The student will be able to

- Collect and identify various types of Bryophytes, Pteridophytes and Gymnosperms
- Get the skill in identification of ecological niche and in conservation management of these plant groups
- Correlate evolution of these plant groups with respect to their changes in the environment, based on their structure and function

A. BRYOPHYTA

27 hrs (1.5 hrs/wk)

1. General characters and recent systems of classification (Shofield, 1985); Contributions of Indian Bryologists. (2 hrs)
2. A general account of morphological and anatomical features, reproduction, life history and phylogeny of: Sphaerocarpales, Marchantiales, Jungermanniales, Calobryales, Anthocerotales, Sphagnales, Andreales, Funariales, Polytrichales. (10 hrs)
3. Life cycle study of the following types: (12 hrs)
Lunularia, Targionia, Cyathodium, Reboulia, Pallavicinia, Porella, Anthoceros, Sphagnum, Polytrichum.
4. Origin and evolution of Bryophytes, Brief account on Fossil Bryophytes (2 hrs)
5. Economic importance of Bryophytes, Bryophytes as indicators of water and air pollution. (1hr)

Practical

9 hrs (1½ hr /wk)

Morphological and anatomical studies of the types mentioned in the syllabus.

References

1. Botanical Survey of India. 2016. Liverworts and Hornworts of India – An annotated check list.
2. Vanderpoorten A. & Goffinet B. 2009. Introduction to Bryophytes. Cambridge Publishers.
3. Shaw, J. & Goffinet, B. 2000. Bryophyte Biology, Cambridge University Press.
4. Rashid, A. 1998. An introduction to bryophyte. Vikas Publishing House, New Delhi.
5. Chopra, R.N. 1998. Topics in Bryology. Allied Printers, New Delhi.
6. Chopra, R.N. & Kumara, P. K. 1988. Biology of Bryophytes. Wiley East, New Delhi.
7. Prem Puri.1981. Bryophytes: Morphology, Growth and differentiation. Atma Ram and Sons, New Delhi.
8. Parihar, N.S. 1980. An introduction to Embryophyta. Vol. I. Bryophyta. Central Book Depot, Allahabad.
9. Smith, G. M. 1976. Cryptogamic Botany Vol. II. Tata McGraw Hill. Publishing Co. Ltd. New Delhi.
10. Cavers, F. 1976. The interrelationship of Bryophyta. S. R. Technic House, Asok Rajpath, Patna.
11. Watson, E.V. 1968. The structure and life of Bryophytes. Cambridge University, London.

B. PTERIDOPHYTA

45 hrs (2.5 hrs/wk)

1. General characters, classification (Bierhost, 1971) and life cycle of Pteridophytes; Contributions of Indian Pteridologists. (3hrs)
2. Comparative morphology, structure, ecology and phylogeny of the following groups: Psilopsida, Lycopside, Sphenopsida, Pteropsida. (8 hrs)
3. Structure, reproduction and life cycle of the following types: (24 hrs)
Isoetes, Ophioglossum, Angiopteris, Osmunda, Ceratopteris, Blechnum, Lygodium, Adiantum, Trichomanes, Acrostichum, Salvinia, Azolla.
4. Telome theory-basis, elementary proves- origin of sporophylls in Lycopside, Sphenopsida and Pteropsida- origin of root- merits and demerits of telome theory; Evolutionary trends in the gametophytes of Pteridophytes. (4 hrs)
5. Conservation of Pteridophytes: Pteridophytes as ecological indicators. (2 hrs)
6. Principles of Paleobotany, Fossil pteridophytes: (4 hrs)
Rhynia, Lepidocarpon, Sphenophyllum, Zygopteris

1. Structural details of the vegetative and reproductive parts of the types mentioned in the syllabus.
2. Identification of fossil types mentioned above.

References

1. Sharma, O. P. 2017. Text book of Pteridophyta. McGraw Hill Education.
2. Sundara Rajan, S. 1999. Introduction to Pteridophyta. New Age Publications, New Delhi.
3. Rashid, A. 1999. Pteridophyta. Vikas Publishing House, New Delhi.
4. Sporne, K. R. 1986. Morphology of Pteridophytes. Hutchinson University Library, London.
5. Stewart, W. N. 1983. Paleobotany and Evolution of Plants. Cambridge University Press, London.
6. Eames, E. J. 1983. Morphology of Vascular Plants. Standard University Press.
7. Parihar, N. S. 1980. An Introduction to Embryophyta Vol. II. Pteridophyta. Central Book Depot, Allahabad.
8. Smith, G. M. 1976. Cryptogamic Botany Vol. II. Tata McGraw Hill, Publishing Co. Ltd. New Delhi.
9. Shukla, A. C. & Misra, S. P. 1975. Essentials of Paleobotany. Vikas Publishing House, New Delhi.
10. Bierhost, D.W. 1971. Morphology of vascular plants. Macmillan, London.
11. Scott, D. H. 1962. Studies in Fossil Botany. Hafner Publishing Co. New York.
12. Arnold, C. A. 1947. An Introduction to Paleobotany. McGraw Hill, New York.

C. GYMNOSPERMS**36 hrs (2 hrs/wk)**

1. General characters, affinities, distribution and classification (Sporne, 1965; Christenhurz *et al.* 2011; Christenhurz & Bing, 2016); phylogeny and economic importance of Gymnosperms. (6 hrs)
2. Structural details of vegetative and reproductive parts, phylogeny and inter relationships of the following orders :
Cycadofilicales, Caytoniales, Bennettitales, Pentoxylales, Cycadales, Ginkgoales, Coniferales, Gnetales. (18 hrs)
3. Structure, reproduction and life cycle of the following types:
Zamia, *Araucaria*, *Cupressus*, *Podocarpus*, *Ephedra* (12 hrs)

Practical**9 hrs (½ hr/wk)**

1. Structural details of the following fossil types: *Heterangium*, *Medullosa*.
2. Anatomy of stem (TS, RLS, TLS), leaf and reproductive structures of the types mentioned in the syllabus.

References

1. James W.B. 2015 The Gymnosperms Handbook: A practical guide to extant families and genera of the world. Plant Gateway Ltd.
2. Christenhurz M. J. M. Reveal, J. L. Farjon, A. Gardner, M. F & Mill, R. R. M. and Chase M. W. (2011) A new classification and linear sequence of extant gymnosperms. Phytotaxa 19: 55-70. Magnolia Press
3. Vashishta, P.C. 2010. Gymnosperms, S. Chand & Company, New Delhi.
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5. Biswas, C. & Johri, B. M. 1999. The Gymnosperms. Narosa Publishing House, New Delhi.
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7. Sharma, O. P. 1997. Gymnosperms, Pragati Prakasan, Meerut.
8. Sporne, K. R. 1986. Morphology of Gymnosperms, Hutchinson University Library, London.
9. Ramanujan, C. G. K. 1976. Indian Gymnosperms in time and space. Today and Tomorrows printers and publishers, New Delhi.
10. Chamberlain, C. J. 1955. Gymnosperms-structure and evolution. Dover Publications, Inc. New York.
11. Coulter, J. M. & Chamberlain, C. J. 1964. Morphology of Gymnosperm. Central Book Depot, Allahabad.

**PAPER. BO 213. HISTOLOGY, REPRODUCTIVE BIOLOGY, MICROTECHNIQUE
AND HISTOCHEMISTRY**

162 hrs (Theory: 108 hrs; Practical: 54hrs)

Objectives:

- To understand the anatomical features of plant parts and to identify the anomalous growth
- To acquire knowledge on plant reproduction and development
- To correlate the anatomical and palynological features to taxonomy
- To familiarize the techniques for the preservation and processing of tissues
- To get practical experience in microtechnique and histochemistry

Learning Outcomes:

The student will be able to

- develop skill in using various laboratory techniques for the microscopic analysis of plant tissues
- get an in-depth knowledge on differentiation and development of plant tissue systems
- develop an understanding on the types of reproduction and the various processes involved in it
- to apply the anatomical and palynological data in basic research

A. HISTOLOGY

36 hrs (2 hrs/wk)

1. Origin, structure and function of cambium and their derivatives. (6 hrs)
2. Seasonal variation in cambial activity, role of cambium in wound healing and grafting (3 hrs)
3. Anomalous cambial activities in *Bignonia*, *Amaranthus*, *Mirabilis*, *Bougainvillea*, *Piper*, *Aristolochia*. (8 hrs)
Structure of wood TS, TLS and RLS - Soft wood, Hard wood, Sap wood, Heart wood. Role of extractives in wood quality. Wood anatomy of the following wood yielding plants of Kerala: *Artocarpus integrifolia*, *Tectona grandis*, *Dalbergia latifolia*, *Ailanthus malabarica*, *Alstonia scholaris*. (7 hrs)
4. Nodal anatomy, root –stem transition, transfer cells. (4 hrs)
5. Floral anatomy. (2 hrs)

6. Organization of shoot and root apex, shoot and root development, leaf development and phyllotaxy. (4 hrs)
7. Anatomy in relation to taxonomy (2 hrs)

Practical

9 hrs (½ hr/wk)

1. Anomalous structures of the types mentioned in the syllabus.
2. Leaf anatomy: epidermal peels, stomatal study, T.S. of lamina.
3. Nodal anatomy and root-stem transition.
4. Maceration of herbaceous and woody stems- separation of different cell types.

References

1. Cutler D.F., Ted Botha T. and Stevenson D.W. 2016. Plant Anatomy: An Applied Approach.
John Wiley & Sons.
2. Clive K. 2016. Plant Anatomy, Morphology and Physiology. Syrawood Publishing House
3. Esau, K. 2006. The Anatomy of Seed Plants. 2nd Edition. John Wiley & Sons, New York.
4. Fahn, A. 1989. Plant Anatomy, Pergamon Press, Oxford, New York.
5. Eames, A. J. & Mac Daniels, L. H. 1979. An Introduction to Plant Anatomy. McGraw Hill New York.
6. Cutler, E. G. 1978. Plant Anatomy (Vol. I, II.) Edward Arnold, London.
7. Chandurkar, P. J. 1966. Plant Anatomy. Oxford & IBH Publication Co. New Delhi.
8. Foster, A. S. 1960. Practical Plant Anatomy. Van Nostrand & East West, New Delhi.
9. Metcalfe, C.R. & Chalk, L. 1950. Anatomy of the Dicotyledons and Monocots (Vol. I, II), Oxford University Press, London.

B. REPRODUCTIVE BIOLOGY

27 hrs (1.5 hrs/wk)

1. Asexual reproduction: Vegetative apomixis. Adventive embryony. Non recurrent apomixis, diplospory, apospory, parthenogenesis, androgenesis, automixis, semigamy, agamic complex. (4 hrs)
2. Sexual reproduction: Microsporogenesis - male gametophyte - pollen fertility and sterility. Pollen storage. Pollen viability and germination. (3 hrs)
3. Megaspores - development and types. (3 hrs)

4. Pollination biology - primary and secondary attractants of pollination - ultra structural and histochemical details of style and stigma - significance of pollen-pistil interactions. (3 hrs)
5. Fertilization-barriers to fertilization- intra ovarian pollination and *in vitro* fertilization - embryo rescue. (4 hrs)
6. Embryo, endosperm and seed development. Polyembryony, Parthenocarpy. (4 hrs)
Androgenesis and gynogenesis. (2 hrs)
7. Application of Palynology in taxonomy (2 hrs)
8. Economic importance of pollen, Pollen allergy -
Pollen analysis of honey - role of apiaries in crop improvement. (2 hrs)

Practical

9 hrs (½hr/wk)

1. Pollen germination: *in vitro* and *in vivo* viability tests.
2. Study of pollen types using acetolysed and non-acetolysed pollen.
3. Developmental stages of anther, ovule, embryo and endosperm.

References

1. Johri B. M. , Srivastava P. S. 2015 Reproductive Biology of Plants Springer-Verlag Berlin and Heidelberg GmbH & Co.
2. Ramawat K.G. Mérillon J.M. and Shivanna K. R. 2014. Reproductive Biology of Plants. CRC Press.
3. Johri B. M. 2011. Embryology of Angiosperms. Springer.
4. Bhojwani, S.S & Bhatnagar, S.P. 2000. The Embryology of Angiosperms, Vikas Publishing House Pvt. Ltd. New Delhi.
5. Pandey, S.N. & Chadha, A. 2000. Embryology. Vikas Publishing House Pvt. Ltd. New Delhi.
6. Pandey, A.K. 1997. Introduction to Embryology of Angiosperms. CBS Publishers and Distributors, New Delhi.
7. Johri, B.M. 1984. Embryology of Angiosperms. Springer Verlag. Berlin.
8. Maheswari, P. 1980. Recent Advances in the Embryology of Angiosperms.

C. MICROTECHNIQUE AND HISTOCHEMISTRY

45 hrs (2.5 hrs/wk)

1. Scope of histochemistry and cytochemistry in Biology. (1hr)
2. Chemical fixation –reagents and fixatives, chemistry of fixation; Tissue dehydration – reagents, Infiltration and embedding; Sectioning and mounting (9 hrs)
3. Tissue processing technique for light microscope, hand and serial sections, squashes, smears and maceration (9 hrs)
4. Microtomy-Rotary, Sledge, Freezing, Cryostat and Ultratomes (5 hrs)
5. Classification and chemistry of biological stains. General and specific vital stains and flurochromes. (5 hrs)
6. Micrometry, camera lucida, photomicrography. (3 hrs)
7. Tissue processing techniques for electron microscopy. (2 hrs)
8. Detection and localization of primary metabolites- Carbohydrates (PARS reaction), Proteins (Coomassie brilliant blue staining), Lipids (Sudan Black method). Brief mention about other methods also. (5 hrs)
9. Detection and localization of secondary metabolites- alkaloids, terpenoids, phenolics. (3 hrs)
10. Enzyme histochemistry- General design and applications. (3 hrs)

Practical

36 hrs (2hrs/wk)

1. Preparation of double stained free hand sections and identification of the tissues with reasons (Normal or Anomalous secondary thickening).
2. Preparation of serial sections from the given block and identification of the tissues with histological reasoning.
3. Free hand sections showing localization of soluble components –Proteins, Sugars and Lipids.
4. Preparation of squashes and smears; Maceration of tissues for separating cell types
5. Measurement of microscopic objects (algal filaments, spore, pollen etc.)
6. Students are expected to get a thorough understanding on reagents and buffers for tissue processing.
7. Students should submit 10 permanent slides (2 serial, 4 hand sections, and 1 whole mount/sledge, 1squash, 1smear, 1 histochemical localization)

References

1. Yeung E.C.T., Stasolla C., Sumner M. J. & Huang B. Q. 2015. Plant Microtechniques and Protocols. Springer Nature
2. Prasad M. K. & Prasad M. K. 2000. Emkay Publications
3. Kierman, J.A. 1999. Histological and Histochemical Methods. Butterworth Publ. London.
4. Ruzin, Z. E. 1999. Plant Microtechnique and Microscopy. Oxford Press, New York.
5. Harris, J. R. 1991. Electron Microscopy in Biology. Oxford University Press, New York.
6. Gahan, P.B. 1984. Plant Histochemistry and Cytochemistry. Academic Press, London.
7. Johanson, W. A. 1984. Plant Microtechnique. McGraw Hill, New York.
8. Johanson, W. A. 1982. Botanical Histochemistry-Principles and Practice. Freeman Co.
9. John E. Sass. 1964. Botanical Microtechnique. Oxford & IBH Publishing Co. Calcutta.
10. Gary, P. 1964. Hand book of Basic Microtechnique. John Wiley & Sons, New York.
11. Pearse, A. G. E. 1960. Histochemistry. Vol. I & Vol. II, J&A. Churchill, London.
12. Johansen, D. A. 1940. Plant Microtechnique. Tata McGraw Hill Publishing Co. Ltd. New Delhi.

SEMESTER II

PAPER BO 221: TAXONOMY OF ANGIOSPERMS, ECONOMIC BOTANY AND ETHNOBOTANY

153 hrs (Theory 108 hrs; Practical 45 hrs)

Objectives:

- To understand the concepts and principles related to Plant taxonomy, Ethnobotany and Economic botany
- To acquire the skill in plant identification and herbaria preparation
- To create an attitude in conserving plants for sustainable development
- To understand the utility of different types of crops and their useful parts

Learning Outcomes:

The student will be able to

- identify, classify and prepare herbaria of flowering plants
- develop an attitude to document and conserve the local/ traditional plant wealth
- understand the significance of ethnic societies and their traditional knowledge for sustainable development
- suggest methods to explore the traditional knowledge from the ethnic societies

A. TAXONOMY OF ANGIOSPERMS

90 hrs (5 hrs/wk)

1. Scope and importance of taxonomy. (1 hr)
2. Taxonomic structure - Taxonomic hierarchy, Taxonomic categories – supra specific and infra specific categories; Concept of species, genus and family. (4 hrs)
3. Systems of classification: Brief study of Artificial (Linnaeus), Natural (Bentham and Hooker) and Phylogenetic (Bessey and Takhtajan) systems. Study of basic principles and recent Angiosperm Phylogeny Group (APG) system of classification. (6hrs)
4. Plant nomenclature: Brief history on the origin and development of nomenclature; Contents and major provisions of latest International Code of Nomenclature for algae, fungi, and plants (ICN) - Author citation, Typification and different kinds of types, Effective and valid publication of names, Principle of priority and its limitations, Conservation of names, Names of hybrids. Definition of nomenclature terms- autonym, homonym, basionym, tautonym and nomen nudum. A very brief account on International Code of Nomenclature of Cultivated Plants (ICNCP). (6 hrs)

5. History and development of taxonomy in India. Contributions of pioneers of Indian taxonomy - William Roxburgh, J. D. Hooker and J. S. Gamble. (1 hr)
6. Taxonomical literature: General indices, floras, revisions, manuals, icons, monographs, reviews and journals (1hr)
7. Construction of taxonomic keys (indented and bracketed) and its utilization. (2 hrs)
8. Herbarium: Definition, techniques involved in the preparation of herbarium, utility of herbarium and their maintenance. General account of national and regional herbaria - Central National Herbaria, Calcutta (CAL) and Madras Herbarium (MH), Botanical Survey of India (BSI). (3 hrs)
9. Botanical garden and its importance in taxonomic studies. Important National and International Botanical gardens - Royal Botanical Garden, Kew; Indian Botanical Garden, Calcutta; National Botanical Garden, Lucknow and Tropical Botanical Garden, Trivandrum. (2 hrs)
10. Role, organization and achievements of Botanical Survey of India. (1 hr)
11. Biosystematics – Turesson's concept and categories (2 hrs)
12. Trends in plant taxonomy – i. Cytotaxonomy ii. Chemotaxonomy iii. Numerical taxonomy iv. Molecular taxonomy v. Phylogenetic systematics - basic principles. (5 hrs)
13. Study of the current ideas on the origin of angiosperms - Bennettlean, Pteridospermean and Caytonialean ancestry. (1 hr)
14. Study of the following angiosperm families giving importance to morphological peculiarities, if any. Special emphasis should be given on morphological and phylogenetic interrelationships, recent revisions and rearrangements between and within the families and its critical analysis. (55 hrs)

Ranunculaceae	Magnoliaceae	Capparidaceae	Polygalaceae
Caryophyllaceae	Portulacaceae	Dipterocarpaceae	Malvaceae
Rhamnaceae	Vitaceae	Sapindaceae	Leguminosae
Combretaceae	Rhizophoraceae	Myrtaceae	Melastomataceae
Passifloraceae	Cucurbitaceae	Apiaceae	Rubiaceae
Asteraceae	Sapotaceae	Oleaceae	Asclepiadaceae
Boraginaceae	Solanaceae	Scrophulariaceae	Acanthaceae
Verbenaceae	Lamiaceae	Amaranthaceae	Aristolochiaceae
Piperaceae	Lauraceae	Loranthaceae	Euphorbiaceae
Urticaceae	Orchidaceae	Scitaminae	Amaryllidaceae
Liliaceae	Arecaceae	Araceae	Cyperaceae
Poaceae.			

Practical**36 hrs (2 hrs/wk)**

1. Study of representative members of all the prescribed families as evidenced by record of practical work (to be submitted during the practical examination).
2. Identification of fresh specimens using flora and other supportive documents like monographs.
3. Visit to a recognized herbaria (The report of the same should be submitted separately).
4. Field work for familiarizing the local flora under the supervision of teachers, and documentation of the proceedings.
5. Study tour of minimum three days should be conducted to biodiversity rich zones of Western Ghats, for familiarizing the floristic wealth (The report of the same should be submitted for evaluation).
6. Preparation of dichotomous key (minimum 5 keys).
7. A minimum of 10 abbreviations of authors' names to be presented in the record.
8. Expansion of 10 floral formulas.
9. Exercises in nomenclatural citations and solving nomenclatural problems (At least 10).
10. A minimum of 50 herbarium specimens giving representation of minimum of 40 families to be submitted for valuation.

B. ECONOMIC BOTANY**9 hrs (½ hr/wk)**

1. Detailed study of the occurrence, morphology of the useful part and uses of the following crop plants with their botanical details.
 - a) Cereals and Millets: Rice, Maize and Ragi.
 - b) Pulses: Soybean, Horse gram.
 - c) Sugar yielding plants: Sugarcane.
 - d) Plantation crops: Coconut, Cocoa, Coffee, Tea and Rubber.
 - e) Spices and condiments: Pepper, Ginger, Turmeric, Cardamom and Nutmeg.
 - e) Tuber crops-: Potato, Sweet potato, Taro and Tapioca.
 - f) Fruits: Mango, Banana, Citrus, Guava, Cashew nut and Jack fruit.
 - g) Vegetables: Brinjal, Cucumber, little gourd, Bitter gourd, Winged bean and Sword bean.
 - h) Medicinal plants: Sarpagandha, *Vinca*, *Glycirriza*, *Adhatoda* and *Andrographis*.
 - i) Narcotics: Cannabis, Opium.
 - j) Timber yielding plants: Rose wood, Teak Wood.

Practical**9 hrs (½ hr/wk)**

1. Identification of economically important plants and plant parts, and submission of five botanical specimens/ products of economic importance.

References

1. Judd, W.S., Campbell, C. S., Kellogg, E. A. & Stevens P. F. 2015. Plant Systematics. 4th Edn. Sinauer Associates, Inc., Massachusetts, USA.
2. Essig, F.E. 2015. Plant Life. A Brief History. Oxford University Press.
3. Takhtajan A. 2009. Flowering Plants. Springer.
4. Singh, G. 1999. Plant Systematics: Theory and Practice, Oxford IBH.
5. Sivarajan, V. V. 1999. Principles of Plant Taxonomy, Oxford and IBH Publishing Co.
6. Sen, S. 1992. Economic Botany, New Central Book Agency, Calcutta.
7. Sivarajan, V. V. 1991. An introduction to Principles of Taxonomy, London.
8. Sharma, O. P. 1990. Plant Taxonomy, Oxford Publishers, New Delhi.
9. Ambasta, S. P. 1986. The Useful Plants of India, Publication and Information Directorate, CSIR, New Delhi.
10. Stace, C. 1985. Plant Taxonomy and Biosystematics, London.
11. Arora, P.K. & Nayar, E.K. 1984. Wild relatives of Crops plants in India, NBPGRI Sci. Monograph No. 7.
12. Kochar, L. S. 1981. Economic Botany in the Tropics, Macmillan Co. New York.
13. Gibbs, R. D. 1975. Chemotaxonomy of Flowering Plants. In The quarterly review of Biology, 50: 3
14. Takhtajan, A. L. 1969. Flowering plants. Origin and Dispersal. Oliver and Boyd.
15. Rendle, A. B. 1967. Classification of Flowering Plants, Cambridge University Press.
16. Lawrence, G. H. M. 1964. Taxonomy of Vascular Plants, Macmillan Co. New York.
17. Davis, P. H. & Heywood. 1963. Principles of Angiosperm Taxonomy, Oliver-Boyd.
18. Hutchinson, J. 1959. Families of Flowering Plants, Cambridge University Press.
19. Lawrence, G. H. M. 1955. An Introduction to Plant Taxonomy, Central Book Depot.
20. Hill, A. F. 1952. Economic Botany, Tata McGraw Hill.
21. Gamble, J. S. 1935. Flora of Presidency of Madras, London.
22. Hooker, J. D. 1879. Flora of British India. Reeve & Co., London.

C. ETHNOBOTANY

9 hrs(½ hr/wk)

1. Plants and civilization.
2. Ethnobotany- relevance in Modern medicine.
3. Ethnic societies of Kerala and their traditional herbs.
4. Methodology and documentation of ethnobotanical research.
5. Medicines derived from herbal drugs.

6. Status of ethnobotanical studies in Kerala.
7. Contributions of S. K. Jain and E. K. Janaki Ammal.
8. Relevance of IPR in Ethnobotany.

References

1. Martin, G. J. 2004. Ethnobotany: A Methods Manual, Earthscan, UK.
2. Jain, S. K. 2001. Medicinal Plants, National Book Trust, India.
3. Cunningham, A. 2001. Applied Ethnobotany: People, wild plant use and conservation, Earthscan, UK.
4. Jain, S. K. & Mudgal, V. 1999. A Hand book of Ethnobotany. Bishen Singh Mahendrapal Singh, Dehradun.
5. Wood, M. 1997. The Book of Herbal Wisdom: using plants as medicines, North Atlantic Books, California.
6. Jain, S. K. 1987. A Manual of Ethnobotany, Indus Intl. Publishers, New Delhi.

PAPER BO222

ENVIRONMENTAL BIOLOGY, FOREST BOTANY, PHYTOGEOGRAPHY AND CONSERVATION BIOLOGY

144hrs (Theory 108 hrs; Practical 36 hrs)

Objectives:

- To learn the concepts on ecosystem and environment
- To impart knowledge on phytogeography and distribution
- To understand the concept, aim and principles of conservation
- To understand the causes and effects of pollution and climate change
- To create an awareness about the significance of forest and genetic resources
- To understand various rules and regulations for environment protection

Learning Outcomes:

The student will be able to

- understand the interactive phase of environment, biota and man
- understand the structural and functional dynamics of different ecosystems
- develop strategies for the effective utilization and management of natural resources
- adopt suitable steps for the protection and conservation of environment and natural resources

A. ENVIRONMENTAL BIOLOGY 54 hrs (3 hrs/wk)

1. Introduction to various approaches to the study of ecology based on levels of organization and habitat- interaction between environment and biota. Ecological niches, Concept of habitat and niche; niche width and overlap; fundamental and realized niche; resource partitioning; character displacement.
(5 hrs)
2. Physical environment; biotic environment; biotic and abiotic interactions. Concepts and dynamics of Ecosystems: Types – Freshwater, marine and terrestrial. Components of ecosystem, application of Law of thermodynamics, food chain, food web, trophic levels, ecological pyramids and recycling - energy flow and transaction. Productivity and Biogeochemical cycles. Development and evolution of ecosystems. Ecosystem management.
(8 hrs)
3. Characteristics of a population; population growth curves; population regulation; life

history strategies (r and K selection); concept of metapopulation – demes and dispersal, interdemec extinctions, age structured populations.

(4 hrs)

4. Nature of communities; community structure and attributes; levels of species

diversity and its measurement; edge effect and ecotone.

(4 hrs)

5. Ecosystem: Structure and function; energy flow and mineral cycling (CNP); primary production and decomposition; structure and function of some Indian ecosystems:

Grassland, terrestrial, forest, and aquatic (fresh water, marine, estuarine). Major terrestrial biomes; theory of island biogeography; biogeographical zones of India

(7 hrs)

6. Species interactions - types of interactions, interspecific competition, herbivory, carnivory, symbiosis.

(4 hrs)

7. Study of climate, their distribution and adaptation to the environment. Deserts (dry and cold) Tundra, Grassland, Savannah, Temperate forests, Tropical rain forests, Mangrove.

(3 hrs)

8. Ecological concepts of species: Autecological level (genecology), Synecological level (Ecosystem level). Ecads (Ecophenes), Ecotypes, Ecospecies.

(4 hrs)

9. Ecological succession: Types; mechanisms; changes involved in succession; concept of climax.

(4 hrs)

10. Disaster management, Global environmental problems- ozone depletion, greenhouse effect, global warming, acid rain, nuclear hazards – Climate change, Eutrophication.

(5 hrs)

11. Applied ecology: Environmental pollution; global environmental change; biodiversity-status, monitoring and documentation; major drivers of biodiversity change; biodiversity management approaches. Current environmental issues in India, Environmental education and awareness. Green Protocol.

(6 hrs)

Practical

36 hrs (2 hrs/wk)

1. Analysis of vegetation - Quadrat /line transects to find frequency and interpret the vegetation in terms of Raunkier's frequency formula.
2. To find out the dissolved oxygen content in the given water sample (pond, lake, well etc).
3. To find out the primary production in the given water sample using light and dark bottle method.
4. Estimation of carbonate and bicarbonate content in water samples.
5. Estimation of total organic carbon content in the given soil sample

6. Visit to a local area to document environmental assets river/ forest/grassland/hill/mountain
7. Visit to a local polluted site-Urban/Rural/Industrial/Agricultural.

Report of the items 6 and 7 should be included in the record.

References

1. Krohne D. T. 2017 Ecology: Evolution, Application, Integration. Oxford Univ. Press.
2. Poul V.I. 2013. Biodiversity: Issues, Impact, Remediations and Significance 1st Edition. V L Media Solutions
3. Stiling, P. 2012. Ecology: Global Insights and Investigations, McGraw- Hill Companies, NewYork.
4. Sharma, P. D. 2004. Environmental Biology, Himalaya Publications.
5. Kumar, H. D. 2000. Modern Concepts of Ecology. Vikas Publishing House, New Delhi.
6. Aradhana, P. S. (Ed). 1998. Environmental Management, Rajat Publications, Delhi.
7. Trivedi, R. K. & Goel, P.K. 2003. Introduction to Air pollution, Techno-Science Publication.
8. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001. Environmental Encyclopedia, Jaico Publ. House, Mumbai.
9. Chapman J. & Reiss M. 2000. Environmental Biology. Cambridge University Press.
10. Agarwal, K.C. 2001. Environmental Biology, Nidi Publ. Ltd. Bikaner.
11. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi.
12. Brunner, R.C. 1989. Hazardous Waste Incineration, McGraw Hill Inc.
13. Odum, F. E. 1971. Fundamentals of Ecology. W.B. Saunders and Company.

B. FOREST BOTANY

9 hrs (½ hr/wk)

1. Forests- definition, study of various forests of the world and India. (1 hr)
2. Forest products – Major and minor with reference to Kerala. (2 hrs)
3. Influence of forest on environment. (2 hrs)
4. Consequence of deforestation and industrialization. (2 hrs)
5. Sustainable use of bioresources. (2 hrs)

References

1. Shanmughavel, P. 2014. Forest Botany, Pointer Publishers.
2. Bor, N.L. 2008. A Manual of Indian Forest Botany International Book Distributors.
3. Singh M.P., Singh J. K., Mohanka N. & Sah R.B. 2007. Forest Environment and Biodiversity. 2nd Edition. Daya Publishing House.
4. Puri, G. S. 1989. Indian Forest Ecology, Vol. II, Oxford & IBH Co. Pvt. Ltd.
5. Agarwal, V. P. 1985. Forest in India, Oxford & IBH.

6. Champion, G. H. & Seth, K. A. 1968. A Revised Survey of Forest types of India.

C PHYTOGEOGRAPHY

18hrs (1 hr/wk)

1. Define – Phytogeography - static and dynamic phytogeography. (1 hr)
2. Geological history and evolution of plant life. (3 hrs)
3. Factors of plant distribution. Theories concerning present and past distributions-continental drift, glaciations, existence of land bridges and their effect on plant distribution. (4 hrs)
4. Phytogeographic regions of the world (Vegetational belts). (4 hrs)
5. Soil, climate, flora, and vegetation of India. (4 hrs)
6. Scope and relevance of GIS and Remote sensing (2 hrs)

References

1. Cox C.B. and Moore P.D. & Ladle R. 2016. Biogeography: An Ecological and Evolutionary Approach. Wiley-Blackwell.
2. Huismann, O. & de By R. A. (Editors) 2009. Principles of geographic system- An introductory text book. ITC, The Netherlands.
3. Schatz, G.E. 1996. Malagasy / Indo-Australo-Malesian Phytogeographic Connections. <http://www.mobot.org/MOBOT/Madagasc/biomad1.html>
4. Bharucha, F. R. 1984. A Text Book of Plant Geography of India. Oxford University Press.
5. Puri, G.S. 1983. Indian Forest Ecology, Vol. I, II. Oxford, New Delhi.
6. Ronald Good. 1964. The Geography of Flowering Plants. Longmans.
7. The International Biogeography Society <http://www.biogeography.org/>
8. Tree of Life. URL: <http://tolweb.org/tree/phylogeny.html>

D. CONSERVATION BIOLOGY

27 hrs (1.5 hrs/wk)

1. Concept, aim and principles of conservation. (1 hr)
2. Convention on Biological Diversity - Objectives – Definition of biodiversity – Roles of IUCN (IUCN), MAB - Red data book - Threatened categories of plants. Conservation strategies - *In-situ* and *Ex-situ* conservation - Sustainable development. Biosphere reserves, Wild life

sanctuaries and National parks in India with special reference to Kerala. (4 hrs)

3. Conservation biology: Principles of conservation, major approaches to management, Indian case studies on conservation/management strategy (Project Tiger, Biosphere reserves).

(3 hrs)

4. Agriculture and conservation of resources. Novel agricultural technologies – Nitrification inhibitors, Wind mills for irrigation, Solar energy for drawing ground water, Biogas for cooking and slurry left to be used as fertilizers.

(3 hrs)

5. Urbanization and Conservation – Planning for environmentally compatible human settlements and strategy for sustainable industrial development.

(2 hrs)

6. Conservation and energy – Causes of energy crisis, Conventional and Non-conventional energy sources.

(2 hrs)

7. Plant as a source of renewable energy. Development of non-polluting energy systems – Solar energy, Wind energy, energy recovery from solid wastes.

(2 hrs)

8. Conservation of Physical resources. (Mention all physical factors of environment).

(2 hrs)

9. Afforestation- social forestry, agroforestry, International Biological programme (IBP), Man and Biosphere (MAB), IUCN, world environment day, wild life preservation act (1972), Indian forest conservation act (1980), United Nations Environmental Programme, Environmentprotection Act.

(6 hrs)

10. Environmental awareness – role of Government and NGOs- Gaia hypothesis.

(2 hrs)

Practical

1. One day visit to ecologically significant location (National parks/ mangroves/estuaries).
2. Each student should plant and maintain at least two plants in the college botanic garden or premises, belonging to IUCN category, and document the same.

References

1. Shobh Nath Singh 2015. Non Conventional Energy Resources. 1st Edition. Pearson.
2. Tasneem Abbasi, S. A. Abbasi 2011. Renewable Energy Sources Their Impact on Global Warming and Pollution PHI Learning Pvt. Ltd
3. Mahendra Chaturvedi 2010. Biodiversity and Conservation 1st Edition D.P.S. Publishing

House

4. Van Dyke, F. 2008. Conservation Biology, foundation, concept, applications, Springer.
5. Hunter, M.L. Jr. and J.P. Gibbs. 2007. Fundamentals of conservation biology, 3rd edition. Blackwell Publishing, Oxford, United Kingdom, 497pp.
6. MacDonald & Katrina Service. 2007. Key Topics in Conservation Biology, Blackwell Publishing.
7. Bharucha & Jayalaxmi Rai (2002) The Biodiversity of India. Erach Grantha Corporation.
8. Andrew, S. Pullin. 2002. Conservation Biology, Cambridge University Press.
9. Fiedler, P.I. & Kareiva P.M. 1998. Conservation Biology for the coming decade. Chapman and Hall.
10. Dasman, R.F. 1976. Environmental Conservation, John Wiley and Sons, New York.

PAPER BO223: CELL BIOLOGY, GENETICS AND EVOLUTION

153 hrs (Theory 108 hrs; Practical 45 hrs)

Objectives:

- To learn the concepts on cell organelles, cell cycle, cell differentiation and interactions
- To acquire practical skill in cytological preparations
- To get knowledge about Mendel's Experimental approach
- To understand concepts on linkage, microbial genetics and biochemical genetics
- To impart knowledge on molecular genetics and protein synthesis
- To understand the concept on population and developmental genetics
- To understand mechanism of evolution

Learning Outcomes:

The student will be able to

- understand the concept on the cellular and molecular mechanisms involved in heredity and variation
- get the knowledge on population and developmental genetics
- learn the causes of genetic disorders at chromosomal level
- understand the origin and establishment of new life forms on earth

A. CELL BIOLOGY

36 hrs (2 hrs/week)

1. Introduction to cell biology – Cellular organization; Prokaryotic and Eukaryotic cells. Cytoskeleton; Its role in cell organization and mobility. (3 hrs)
2. Structure and organization of nucleus, nucleolus (NOR). Nuclear-Cytoplasmic transport (Nuclear localization signals, NPC Proteins, Nuclear import and export receptors). (3 hrs)
3. Chromosomes – Structure and organization of chromatin, packaging of DNA into chromosomes. Organization and role of centromere and telomere (centromeric and telomeric sequences). Mitochondrial and Chloroplast genome organization. (6 hrs)
4. Structural and Numerical variations in chromosomes –Structural: Deletions, Duplications, Inversions and translocations. Meiotic behavior of structural variants. Numerical: Euploids and aneuploids. Meiotic behavior of numerical variants. Evolutionary significance of chromosomal variations. (4 hrs)
5. Cell cycle and its regulation - Stages of cell cycle (Mitosis and Meiosis). Spindle formation and its disintegration, mechanism of chromosome movement and separation during anaphase, Role of cohesins and condensins, Role of motor proteins. Cell cycle and its control mechanisms (Check points); Role of cyclins and cyclin dependent kinases, cdk activating kinase (CAK), cdk inhibitory proteins (CKIs). (6 hrs)
6. Cell interactions – Extra cellular matrix, Cell adhesion molecules; cadherins, integrins, selectins, fibronectins, laminin and Immunoglobulin superfamily. Cell-cell adhesions (Junctional and non-junctional

adhesive mechanisms; occluding junctions, anchoring junctions, communicating junctions (Connexons) and plasmodesmata). (4 hrs)

7. Apoptosis – Mechanism of programmed cell death; Extrinsic and intrinsic pathways, Inhibitors of apoptosis. Mechanism of ageing. (4 hrs)
8. Cell differentiation – Stem cells, Cell potency, Molecular mechanism of cell differentiation (Brief account), Transcriptional control, Translational control, Gene amplification, Gene rearrangement and Transposition. (6 hrs)

Practical (18hrs; 1 hr/week)

1. Meiosis - *Rhoeo*, *Chlorophytum*, *Crotalaria*, *Datura* (at least one should be recorded).
2. Mitosis – Metaphase and Anaphase
3. Calculation of Mitotic index.

References

1. Becker, W. M. Hardin, J. & Bertoni G. 2018. Becker's World of the Cell. Pearson Education Ltd.
2. Janet, I. & Wallace, M. 2017. KARP'S Cell and Molecular Biology. John Wiley & Sons, Inc.
3. Sen, S., Kar, D. K. & Johri, B. M. 2005. Cytology & Genetics. Alpha Science International Ltd.
4. De Robertis & De Robertis. 1998. Cell and Molecular Biology. B.I. Waverly Pvt. Ltd. New Delhi.
5. Cooper, G. M. 1997. The Cell – A Molecular approach. ASM Press, Washington.
6. Strickberger, M. W. 1985. Genetics. Macmillan India, New Delhi.
7. Jurgen Schulz-Scaffer, 1985. Cytogenetics- Plants Animals and Humans. Springer Verlag, Berlin.

B. GENETICS 54 hrs (3 hrs/week)

I. Classical Genetics

1. Mendelian principles–Brief account and critical evaluation. (2hrs)
2. Sex determination- Mechanisms of sex determination- Brief account of genetically, hormonally, environmentally and chromosomally controlled mechanisms. A detailed account of the following chromosomal mechanisms- XX-XY, XX-XO, ZZ-ZW. Dosage compensation, Barr body, Lyon's hypothesis. (4 hrs)
3. Linkage, recombination and linkage maps – Bateson's concept of coupling and repulsion. Morgan's concept of linkage, linear arrangement of genes, linkage groups, complete and partial linkage, recombination linkage maps, three point test crosses, interference, coefficient of coincidence and negative interference. (3 hrs)
4. Microbial Genetics – Genetic recombination in viruses – lysogenic and lytic cycles in bacteriophages. Retro

viruses, reverse transcriptase, onco viruses, and oncogenes. Bacterial recombination - transformation experiment of Griffith, Avery *et al.* Conjugation – F+, F- and Hfr F- conjugations. Conjugation mapping – F – duction (sexduction). Transduction-generalized and specialized. Recombination in fungi (tetrad analysis in *Neurospora*), Complementation tests. (4 hrs)

5. Biochemical Genetics –Inborn errors of metabolism- Major types of metabolic errors in man:

Phenylketonuria, Alkaptonuria, Albinism, Tyrosinosis, Goitrous cretinism. (2 hrs)

6. Gene concept – Allele, Multiple alleles, pseudoallele, polygenes. Factor concept of Mendel, Presence absence theory of Bateson. Gene-Enzyme relationship, One gene - One enzyme hypothesis. Benzer's concepts of cistron, muton and recon. Brief description of the following types of genes- smart genes (luxury genes), housekeeping genes, Barbara Mc Clintock's transposons, overlapping genes, split genes, homeotic genes,

pseudogenes, orphan genes, selfish genes, gene cluster, gene families. (3 hrs)

II Molecular Genetics

1. DNA as the genetic material, DNA constancy, C - Value paradox, structure of B-DNA and Z-DNA. (2hrs)

2. DNA replication – Stage, unit and mode of replication. Semi conservative mode of replication. Messelson – Stahl experiment. System of replication – template, deoxy nucleotide triphosphate pool, enzymes and protein factors. Mechanism of replication, unidirectional and bidirectional replication. Molecular assembly at the replication fork, leading and lagging strands, Okazaki fragments. DNA polymerases of prokaryotes and eukaryotes, topoisomerases, gyrases, ligases and nucleases. DNA polymerase function, proof reading and repair. Comparison of eukaryotic and prokaryotic DNA replication. Replication of ØX174 DNA. (6 hrs)

3. DNA damage and repair- Photoreactivation repair, excision repair, recombinational repair, SOS repair. Genetic diseases caused by defects of DNA repair system – Blooms syndrome, Xeroderma pigmentosum, Retinoblastoma. (2 hrs)

4. Mutation – Types of mutations, methods of detection (CIB method, attached X method). Molecular mechanism of spontaneous and induced mutations, site directed mutagenesis. Environmental mutagenesis and toxicity testing, high radiation belts of Kerala. Mutagenic effects of food additives and drugs. Ames test. (3 hrs)

5. Genetic code –Features of the genetic code and its exceptions. (2 hrs)

6. Protein synthesis - Central dogma, Transcription, organization of transcriptional units. Prokaryotic and eukaryotic RNA polymerases and their function. RNA processing and translation. (2 hrs)

7. Gene Regulation – Gene Regulation in viruses - Cascade model of expression of early middle and late genes in

viruses. Gene Regulation in Prokaryotes – Operon concept, positive and negative control attenuation, anti termination. Gene Regulation in Eukaryotes – Heterochromatinisation and DNA methylation- DNA methylases, DNA rearrangements. Transcriptional regulation – signal transduction - upstream and downstream. Regulatory sequences and transacting factors, activators and enhancers. DNA binding by transcription factors. Britten and Davidson model for eukaryotic gene regulation. Post transcriptional regulation – RNA processing – split genes, hn RNA, introns and exons, capping, polyadenylation, splicing, snRNAs and spliceosomes. Post transcriptional silencing, MicroRNAs, RNA inhibition. Translational regulation and Post Translational regulation - Cleavage and processing of proteins. Genetic imprinting. Environmental regulation of gene expression. Epigenetics.

(8 hrs)

8. Gene synthesis – Khorana’s artificial synthesis of the gene for alanine transfer RNA and tyrosine transfer RNA of yeast. (2 hrs)

III. Population Genetics and Developmental Genetics

1. Population genetics – Systems of mating and their genetic effects. Hardy Weinberg law and its applications. Factors affecting gene frequencies – mutation, migration, selection, genetic drift, genetic polymorphism and selection, founder effect, genetic load. (3 hrs)
2. Consanguinity and its genetic effect. (1 hrs)
3. Human genetics: Pedigree analysis, Karyotypes, genetic disorders. (2 hrs)
4. Developmental genetics- Genetic control of development in plants and animals with stress to developmental genes in *Arabidopsis* and *Drosophila*. Role of cytoplasm in development. (3 hrs)

Practical

27 hrs (1.5 hrs/wk)

1. Work out problems in linkage, chromosome mapping, microbial genetics, molecular genetics and population genetics.

References

1. Krebs, J. E., Goldstein, E. S. & Kilpatrick, S. T. 2018. LEWIN’S GENES XII. Jones & Bartlett Learning.
2. Janet, I. & Wallace, M. 2017. KARP’S Cell and Molecular Biology. John Wiley & Sons, Inc.
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4. Snustad, P. D. & Simmons, M. J. 2012. Principles of genetics 6th Edition. John Wiley & Sons, Inc.
5. Benjamin A. Pierce. 2012. Genetics. A Conceptual Approach 4th Edition. W. H. Freeman and Company.
6. Klug, W. S., Cummings, M. R., Spencer, C. A. & Palladino. M. A. 2012. Concepts of genetics. Pearson Education, Inc.
7. Lodish, H., Berk, A., Kaiser, C. A. & Krieger, M. 2012 Molecular Cell Biology. 7th Edition, W. H.

Freeman, NY, USA.

8. Hartwell, L. H., Hood, L., Goldberg, M. L., Reynolds, A. E. & Silver, L. M. 2011. The McGraw Hill Companies, Inc.
9. Russell, P. J. 2010. Genetics: A molecular approach. 3rd Edition. Pearson Education, Inc.
10. Alberts, B., Bray, D., Hopkin, K. & Johnson, A. D. 2009. Essential Cell Biology. 3rd Edition, Garland Science, NY, USA.
11. Strickberger, M. W. 2008. Genetics 3rd Edition. Pearson Education India.
12. Weaver, R. F. 2008. Molecular Biology. 5th Edition. McGraw-Hill, New York.
13. Brown, T.A. 2006. Genomes. 3 Garland Science.
14. Tamarin, R. 2001. Principles of Genetics 7th Edition. McGraw Hill Education.
15. Goodenough, U. Genetics. 1984. Holt Saunders, New York.
16. Sinnot, E. W. Dunn, L. C. & Dobzhansky, T. 1958. Principles of Genetics. McGraw Hill, New Delhi.

C. EVOLUTION

18 hrs (1 hr / Wk)

1. Origin and evolution of life.	(2 hrs)
2. Concepts and theories of evolution. Classical and synthetic theories of evolution.	(4 hrs)
3. Forces and mechanism of evolution.	(3 hrs)
4. Speciation.	(3 hrs)
5. Isolation mechanism.	(2 hrs)
6. Evolution above species level.	(2 hrs)
7. Molecular evolution.	(2 hrs)

References

1. Charlesworth B. & Charlesworth D. 2017. Evolution: A Very Short Introduction, 2nd Edition Oxford University Press.
2. Willis K. & McElwain M. C. 2014. The Evolution of Plants. Oxford University Press.
3. Herron, J. C., Freeman, S. m Hodin, J., Miner, B. & Sidor, C. 2014. Evolutionary Analysis. 5th Edition. Pearson Education, Inc.
4. Futuyma D.J. 2013 Evolution. 3rd edition Sinauer Associates, Inc.
5. Shapiro, J. A. 2011. Evolution- A view from the 21st Century. Publishing as FT Press Science.
6. Barton N.H., Briggs E.G., Eisen J. A. Goldstein D. B. & Patel N.H. 2007 Evolution Cold Spring Harbor Laboratory Press; 1st edition (June 26,)
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13. Savage, J. M. 1969. Evolution, Oxford & IBH, New Delhi.

SEMESTER III

PAPER. BO 231. PLANT BREEDING, HORTICULTURE AND BIOSTATISTICS

135 hrs (Theory 108 hrs; Practical 27hrs)

Objectives:

- To provide basic knowledge in plant breeding, biostatistics and horticulture
- To understand different breeding methods used in crop improvement
- To develop practical skills in plant breeding
- To apply the statistical methods for data analysis
- To attain the skill and knowledge for the cultivation/ propagation and management of garden plants

Learning Outcomes:

The student will be able to

- acquire knowledge and skill for crop improvement programme
- undertake the cultivation and management of vegetable garden/ ornamental garden
- to analyse scientific data statistically

A. PLANT BREEDING

(54 hrs; 3 hrs/wk)

1. Definition, Objectives. Importance of floral biology in plant breeding. (2 hrs)
2. Methods of crop improvement
 - i. Plant Introduction: Definition, types and procedure. Sources of germplasm. Centres of genetic diversity. Concepts of de Candolle and Vavilov. Primary, secondary and microcenters. Genetic erosion. Preservation and utilization of germplasm. Gene banks. NBPGR. International exchange of germplasm. (4 hrs)
 - ii. Selection: Principles, genetic basis and methods: Mass selection, pure line selection, clonal selection. (5 hrs)
 - iii. Hybridization: Objectives. Procedure. Major achievements. Problems and causes of failure of hybridization. Handling of hybrids - Bulk method and pedigree method of selection. Distant hybridization - Role of interspecific and intergeneric hybridization in crop improvement. (6 hrs)
3. Genetics of incompatibility and sterility. Role in crop improvement Types of male sterility:
4. Gametic and zygotic sterility. Somatoplastic sterility. Cytoplasmic and genetic sterility. Methods to overcome incompatibility: (4 hrs)
5. Backcross breeding: Theory and procedure. (4 hrs)

6. Inbreeding: inbreeding consequences. Heterosis- Definition. Genetic and physiologic basis. Application in plant breeding. Steps in the production of single cross, double cross, three way cross, synthetic cross, multilines. Ideotype breeding: Concept, Achievements: (Wheat – Asana, Donald. Rice – Super Rice). (6 hrs)
7. Polyploidy breeding: induction of autopolyploidy and allopolyploidy. Role of chromosome manipulation. Chromosome addition and substitution lines. Achievements. (5 hrs)
8. Mutation breeding: Principles, objectives, procedure. Induction of mutations: Physical and chemical mutagens - Recurrent irradiation, Split dose irradiation, Combination treatment. Achievements. (5 hrs)
9. Resistance breeding: Principles. Methodology. Basis of resistance: Structural biochemical, physiological and genetic. Gene for gene systems of plants. Vertical and Horizontal resistance. Artificial production of epiphytotic conditions and screening procedures for resistance. (6 hrs)
10. Seed production and certification. (2 hrs)
11. Centres of crop breeding: International and National (with special reference to Kerala) (3 hrs)
12. Plant breeder's rights Act. National Biodiversity Policy. (2 hrs)

Practical

9 hrs (½ hr/Wk)

1. Emasculation; preparation of the inflorescence for crossing.
2. Estimation of pollen sterility and fertility percentage.
3. Pollen germination: *in vitro* and *in vivo* viability tests
4. Study of pollen types using acetolysed and non-acetolysed pollens
5. Developmental stages of anther, ovule, embryo and endosperm.

References

1. Chopra, V. L. 2012. Plant Breeding Theory & Practice Oxford & Ibh Publishing Co Pvt Ltd
2. Ghahal, G. S. & Gosal, S. S. 2002. Principles and Procedures of Plant Breeding. Narosa Publishing House.
3. Singh, B. D. 1996. Plant Breeding: Principles and Methods. Kalyani Publications.
4. Allard, R. W. 1995. Principles of Plant Breeding. John Wiley and Sons, Inc.
5. Sharma, J. R. 1994. Principles and Practices of Plant Breeding. Tata McGraw-Hill Publishers Company Ltd.
6. Hayward, M. D., Bosemark, N.O. & Romagosa, T. 1993 (Eds.) Plant Breeding. Principles and Prospects. Springer.

B. HORTICULTURE

18 hrs (1 hr/wk)

1. Concept and Scope – Familiarization of famous gardens in the world and in India. (1hr)
2. Tools and Implements. (1 hr)
3. Plant growing structures – Greenhouse, Glasshouse and Mist chamber. (1 hr)
4. Plant propagation: Seed propagation and vegetative propagation- natural and artificial.
Artificial methods of vegetative propagation: Cuttage, layerage, graftage, budding, micropropagation. (2 hrs)
5. Cultural practices – Thinning, training, trimming and pruning. (2 hrs)
6. Fertilizers: NPK, biofertilizers, green manure, compost, vermicompost. (2 hrs)
7. Outdoor horticulture: Components and designs of gardens. Types of gardens: (3hrs)
Vegetable/ medicinal/ floral. (2) Home gardens, public gardens, vertical gardens, roof gardens. Lawns and landscapes. (2 hrs)
8. Commercial horticulture: Nurseries, Orchards, Floriculture: Production of cut flowers.
Floral decorations (Brief account only). Indoor plants. (2 hrs)
9. Arboriculture: Pruning, bracing, feeding and transplanting. Bonsai: Principles and procedure. (2 hrs)

Practical

9 hrs (½ hr/wk)

1. Budding – ‘T’ Budding and Patch Budding.
2. Layering – Any two methods.
3. Grafting – Any two methods.
4. Designing of gardens and Methods of Landscaping
5. Familiarization of tools and implements used in Horticulture.

References

1. Gupta, S. N. 2018, Handbook of Horticulture, 1st Edition, Jain Brothers.
- Shry, C. & Reiley. 2016. Introductory Horticulture; 9th Edition. Cengage Learning.
3. Singh, J. 2014. Fundamentals of Horticulture, Kalyani Publishers.

C. BIOSTATISTICS

36 hrs (2 hrs/wk)

1. Sampling methods and errors (3 hrs)
2. Collection, classification and tabulation of data –Diagrammatic and graphic representation.

Line diagram, Bar diagram, Pie diagram, Histogram, Frequency curve, frequency polygon

Ogives. (3 hrs)

3. Measures of central tendency- mean, median and mode. (4 hrs)

4. Measures of dispersion – range, quartile deviation, mean deviation, standard deviation,
Coefficient of variation. (6 hrs)

5. Probability – basic concepts, theorems of probability. (2 hrs)

6. Experimental designs – randomized block designs, split plot design, Latin square. (4 hrs)

7. Test of significance – t- test, chi square test. (4 hrs)

8. Correlation and regression analysis. (5 hrs)

9. F-test, ANOVA, Least Significant Difference (LSD), Broad sense heritability. (5 hrs)

Practical

9 hrs (0.5 hrs/wk)

1. Using the given data from plant science, calculate dispersion.
2. Find out chi square value of the given data.
3. Find out broad sense heritability of data from plant science.
4. Preparation of graphs using EXCEL or similar packages

References

1. Veer Bala Rastogi, 2015. Biostatistics. 3rd edition. Medtech.
2. Norman Bailey, T. J. 2012. Statistical methods in Biology. Cambridge University Press.
3. Khan, I. A. and Khanum, A. 2008. Fundamentals of Biostatistics, 3rd edition.
4. Richards, J. & Sunder Rao, P. S. S. 2006. An introduction to Biostatistics and research methods.
5. Dutta, N. 2002. Fundamentals of Biostatistics: Practical approach.

**PAPER. BO 232. BIOCHEMISTRY, PLANT PHYSIOLOGY AND
RESEARCH METHODOLOGY
162 hrs (Theory 108 hrs; Practical 54 hrs)**

Objectives:

- To understand the different metabolism in plants
- To trace the relationship between biochemical pathways in plants and the physiological processes.
- To introduce the basic concepts in research methodology
- To prepare the students to draft a project proposal

Learning Outcomes:

The student will be able to

- understand the biochemical processes in plants
- conduct the qualitative and quantitative experiments in plants
- understand the mechanism of various physiological processes involved in the growth and development of plants
- set up plant experiments related to plant physiological

processes

- prepare a project proposal

A. BIOCHEMISTRY

36 hrs (2 hr/wk)

1. pH and buffers. Properties of water, acids bases and buffers. Henderson-Hasselbalch equation, pH, pKa. Common buffers (2 hrs)
2. Structure, function and metabolism of carbohydrates – Synthesis of starch, cellulose and sucrose. Interconversion of hexoses and pentoses. (7 hrs)
3. Structure, function and metabolism of lipids: Biosynthesis of fatty acids. Biosynthesis of Triacyl glycerol, diacyl glycerol, monoacyl glycerol. Gluconeogenesis. Membrane lipids. Lipid oxidation. (8 hrs)
4. Proteins and amino acids: Structure and classification of amino acids. Biosynthesis of amino acids. Classification of protein based on structure, function and localization sites. Primary, secondary, tertiary and quaternary structure. Protein domains. Ramachandran plot. Purification of proteins. (6 hrs)
5. Enzymes: IUB system of classification and nomenclature. Distribution of plant enzymes. Soluble and membrane bound enzymes. Co enzymes, substrate specificity, regulation of

enzyme activity, Inhibitors, allosteric enzymes. Isozymes. Ribozymes. Abzymes. Enzyme kinetics. the Michaelis–Menten equation, Lineweaver-Burk plot, K_m and V_{max} .

Multienzymes (7 hrs)

6. Secondary metabolites- Classification. Pathways of synthesis (3 hrs)

7. Biosynthesis of purines and pyrimidines. Metabolism of nucleotides. (3 hrs)

Practical 27 hrs (1.5 hrs/wk)

1. Preparation of buffers. Phosphate, carbonate, Tris HCl.
2. Preparation of standard solutions of BSA, Glucose, Catechol.
3. Extraction and estimation of soluble proteins by Bradford method.
4. Estimation of reducing sugars.
5. Isolation, assay and determination of specific activity of plant enzymes of germination, growth and fruit ripening, viz. amylase, protease, peroxidase and polyphenol oxidase.
6. Isolation and quantification of plant lipids by dry and wet methods.

References

1. Becker, W. M., Hardin & Bertoni G. 2018. Becker's World of the Cell. Pearson Education Ltd.
2. Nelson D. L. & Cox, M. M. 2017. Lehninger Principles of Biochemistry. 7th Edition. W H Freeman & Co.
3. Appling D. R., Anthony-Cahill S.J. & Mathews, C.K. 2016. Biochemistry. Concepts and Connections. Pearson Education Limited.
4. Berg, J. M., Tymozko. J. L. & Stryer, L. 2015. Biochemistry, 8th Edition. W. H. Freeman and Company.
5. Voet, D., Pratt C.W. & Voet, J. G. 2008. Principle of Biochemistry, 4rd Edition. John Wiley Sons Inc.
6. Jain, J.L. 2000. Fundamentals of Biochemistry. S. Chand & Co. New Delhi.
7. Hames, B.D., Hooper, N.M., & Houghton, J.D1999. Instant notes in Biochemistry. Viva books Pvt. Ltd. New Delhi.
8. Harborne, J.B. 1999. Plant Biochemistry. Chapman & Hall, New Delhi.
9. Campbell, M.K. 1999. Biochemistry. Saunders College Publishing, New York.
10. Fisher J. & Arnold J.1999. Instant Notes in Chemistry for Biologists. Viva Books Pvt. Ltd. New Delhi.
11. Goodwin, T. W. & Mercer, E. I. 1996. Introduction to plant Biochemistry. CBS Publishers and Distributors, New Delhi.

12. Satyanarayana, U. 1999. Biochemistry. Books and Allied (P) Ltd. Calcutta.
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14. Dennis, D. T. & Trurpin, D. H. (Eds.) 1993. Plant Physiology. Biochemistry and Molecular Biology. Longmann Scientific and Technical, Singapore.
15. Wilson, K. & Goulding, K. H. 1992. Biologists Guide to Principles and Techniques of Practical Biochemistry. Cambridge University Press.
16. Conn, E.E., Stumpf, P.K. Bruening G. & Doi R.Y.1987. Biochemistry. John Wiley and Sons. New Delhi.

B. PLANT PHYSIOLOGY

54 hrs (3 hrs/week)

1. Photosynthesis: Efficiency and turn over. Light harvesting complexes. Photosystem I and II - Structure and function. Mechanism of electron transport. Water oxidizing clock. Rubisco Structure and function. Photo inhibition. Phytochromes. CO₂ fixation: C₃, C₄ and CAM pathways. Energetics of CO₂ fixation. (10 hrs)
2. Photorespiration and glycolate metabolism. Mechanism of photorespiration in C₃ and C₄ plants. Factors regulating photorespiration. (6 hrs)
3. Respiration. Anaerobic, aerobic. Glycolysis, TCA cycle, ETS and ATP synthesis, transporters involved in exchange of substrate of products, Pentose phosphate pathway. (10 hrs)
4. Transport of metabolites – Xylem and Phloem sap translocation. (3 hrs)
5. Photoregulation and growth responses. Plant morphogenesis. Physiology of flowering, fruit ripening, senescence and abscission. (4 hrs)
6. Biological clock and circadian rhythm. (3 hrs)
7. Seed metabolism, glyoxylate cycle in fatty seeds during germination. (4 hrs)
8. Nitrogen metabolism. Nitrate and ammonium assimilation. Symbiotic and non symbiotic. Role of leg hemoglobin. (4 hrs)
9. Physiological response of plants to stresses like drought, heat and cold. Salt tolerance in plants. (5 hrs)
10. Role of phytoalexins. Defense mechanism. Phenyl propanoid pathway in plants. Allelopathy – Plant derived compounds. (3 hrs)
11. Plant hormones – Physiological effects and mechanism of action. (2 hrs)

Practical

27 hrs (1.5 hrs/wk)

1. Extraction and estimation of total proteins by TCA precipitation and Lowry's method.
2. Isolation of chloroplast from fresh leaves and estimation of chlorophyll proteins.
3. Chlorophyll survey of five plants. Quantification, absorption spectra of chlorophyll and carotenoids using different solvents.
4. Hill activity by DCPIP/ ferricyanide reduction.
5. Extraction and estimation of total phenols.
6. Physiological identification of CAM in plant species.
7. Setting up of Plant Physiology experiments.

References

1. Jain, J.L. 2017. Fundamentals of Plant Physiology 19th Edition. S Chand Publishing.
2. Sinha S.K. 2013. Modern Plant Physiology 2nd Edition. Narosa Publishers.
3. Taiz, L. & Zeiger, E. 2010. Plant Physiology. 5th Edition. Sinauer Associates Inc., Publishers.
4. Hopkins W.G. & Hüner N. P.A. 2008. Introduction to Plant Physiology. 4th Edition John Wiley & Sons
5. Öpik, H., Rolfe S.A. & Willis A. J. 2005. The Physiology of Flowering Plants. 4th Edition. Cambridge University Press.
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14. Conn, E.E., Stumpf, P.K. Bruening G. & Doi R.Y. 1987. Biochemistry. John Wiley and Sons. New Delhi.
15. Fitter, A.H. & Hay R.K.M. 1987. Environmental Physiology of Plants. Academic Press.
16. Wilkins, M.B. (Ed.) 1984. Advanced Plant Physiology, Pitman Publishing Co. New York.

17. Strafford, G.A. 1979. Essentials of Plant Physiology. Heinemann Publishing Co. New York.
18. Hess, D. 1975. Plant physiology. Narosa Publishing House, New Delhi.
19. Hatch, M.D. Osmond, C. B. & Slatyer, R. O. 1971. Photosynthesis and Photorespiration.

C. RESEARCH METHODOLOGY

18 hrs (1 hr/wk)

1. Introduction to Research methodology. (2 hrs)
2. Research design: objectives, defining a problem, derivation of hypothesis, review of literature, experimental design, data analysis, writing the thesis. (2 hrs)
3. Experimental design: methodology – analytical, biochemical, molecular. (2 hrs)
4. Data analysis- use of statistical tools, interpretation of results. (4 hrs)
5. Thesis preparation: title , abstract, materials and methods, results and discussion. (4 hrs)
6. Writing a research paper: using biological literature, deciding on a title, presenting the methodology, drafting and revising the content according to the journal requirements, citing sources in the text, preparing the reference section. Common tools for reference preparation. (4 hrs)

References:

1. Kothari, C.R. & Garg, G. 2018. Research Methodology. New Age International Publishers.
2. Gurumani, N. 2009. Research Methodology: for Biological Sciences. MJP Publishers, New Delhi.
3. Kumar, R. 2014. Research Methodology. Sage Publishing; 4th Edition.

**PAPER BO 233. MOLECULAR BIOLOGY, IMMUNOLOGY AND
PLANT BIOTECHNOLOGY**

153 hrs (Theory 108 hrs; Practical 45 hrs)

Objectives:

- To get an overview on Molecular Biology and Immunology
- To impart knowledge about various techniques in Molecular Biology
- To bestow practical skill in isolation of DNA, RNA and Protein
- To acquire an in depth knowledge on plant biotechnology and its application

Learning Outcomes:

The student will be able to

- get the knowledge on various techniques in molecular biology
- get the skill in isolation and quantification of DNA and proteins
- understand the knowledge on immunology, types of immune response and immunotechniques
- produce tissue cultured plants and artificial seeds

A. MOLECULAR BIOLOGY

36 hrs (2 hr/wk)

I. Basics in Molecular Biology

1. The RNA World. Molecular Clock. (1 hr)
2. DNA Topology- Twist and Writhe. Supercoiling. (1 hr)
3. Proteins involved in DNA Replication, Telomere and Telomerase. (1 hr)
4. Protein Folding. Role of Molecular Chaperones. (1 hr)
5. Isolation and purification of RNA, DNA (genomic and plasmid), different separation methods. (2 hrs)
6. Molecular cloning of DNA. Cutting and joining DNA Molecules, Restriction endonucleases.
Cloning vectors-features. Plasmids, Cosmids, Bacteriophage vectors, Phagemids, Yeast artificial chromosome (YAC), Bacterial artificial chromosome (BAC) and P1 phage vectors. Selection and analysis of cloned DNA sequences. (6 hrs)

II. Techniques in Molecular Biology

1. Polymerase chain reaction (PCR) Procedure and Components. Types of PCR i) inverse PCR. ii) Rapid amplification of cDNA ends (RACE) iii) Real-time quantitative PCR. PCR applications (6 hrs)
2. Generation of genomic and cDNA libraries. (2 hrs)

3. Restriction digestion and ligation; Restriction mapping. (2 hrs)
4. Sequencing genes and short stretches of DNA including Sanger dideoxy sequencing and Next Generation Sequencing (NGS brief account only). (3 hrs)
5. In vitro mutagenesis and deletion techniques, gene knock out in bacterial and eukaryotic organisms. (2 hrs)
6. Protein sequencing methods, detection of post translation modification of proteins. Foot Printing Assay. (1hr)
7. Methods for analysis of gene expression at RNA and protein level, large scale expression such as micro array based techniques. (2 hrs)
8. Molecular markers - RFLP, RAPD and AFLP techniques. (2 hrs)
9. Blotting techniques Sothern, Western, Northern and Dot Blot. Labeling of Nucleic acids. (2 hrs)
10. New Trends in Gene modification:- CRISPER/CAS System (2 hrs)

Practical

(9 hrs ½ hr/wk)

1. Isolation and purification of genomic DNA.
2. Demonstration of electrophoresis – Horizontal and Vertical.
3. Isolation of total RNA (Demonstration only).
4. Isolation and Partial purification of Proteins.

References

1. Krebs, J. E., Goldstein, E. S. & Kilpatrick, S. T. 2018. LEWIN'S GENES XII. Jones & Bartlett Learning.
2. Becker, W. M. Hardin, J. & Bertoni G. 2018. Becker's World of the Cell. Pearson Education Ltd.
3. Iwasa, J. & Marshall, W. 2017. KARP'S Cell And Molecular Biology John Wiley & Sons, Inc.
4. Lodish, H., Berk, A., Kaiser, C. A. & Krieger, M. 2012 Molecular Cell Biology. 7th Edition, W. H. Freeman, NY, USA.
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7. Cooper, G. M. & Hausman R. E. 2013. The Cell – A Molecular Approach. Sinauer Associates
8. Jones, R. L. 2012. The Molecular Life of Plants. Wiley-Blackwell.
9. Clark, D. P. 2010. Molecular Biology Elsevier Inc.

10. Weaver, R. F. 2008. Molecular Biology. 5th Edition. McGraw-Hill New York.
11. Primrose S. B. & Twyman, R.M. 2006. Principles of Gene Manipulation and Genomics. Blackwell Publishing.
12. De Robertis & De Robertis. 1998. Cell & Molecular Biology. B.I. Waverly Pvt. Ltd. Delhi.

B. IMMUNOLOGY

18 hrs (1hr/wk)

1. Immunity-mechanism; Innate and adaptive immune system: cells and molecules involved in innate and adaptive immunity. (2 hrs)
2. Antigens, antigenicity and immunogenicity. B and T cell epitopes. (2 hrs)
3. Structure and function of antibody molecules, generation of antibody molecules, generation of antibody diversity. (2 hrs)
4. Antigen antibody interactions, MHC molecules, antigen processing and presentation, activation and differentiation of B and T cell, B&T cell receptors. (3 hrs)
5. Humoral and cell mediated immune responses, primary and secondary immune modulation, the complement system, Toll like receptors cell mediated effector functions. (3 hrs)
6. Inflammation, hypersensitivity and auto immunity, immune response during bacterial (tuberculosis) parasitic (malaria) and viral (HIV) infections, congenital and acquired immune- deficiencies, Vaccines. (4 hrs)
7. Immunotechniques. Monoclonal antibodies, Antibody engineering Immuno Assays – RIA and ELISA (2 hrs)

References:

1. Abbas A.K., Lichtman A. H. H. & Pillai, S. 2018. Cellular and Molecular Immunology, Elsevier, Inc. USA.
2. Madigan M. T., Bender K.S., Buckley D.H., Sattley, W.M. & Stahl D.A. 2017 Brock Biology of Microorganisms. Pearson Education, Inc.
3. Gupta, S. K. 2014. Essentials of Immunology. Arya Publications.

4. Pommerville, J. C. 2011. Alcamo's fundamentals of microbiology, 9th Edition.
5. Male, D., Brostoff, J., Roth, D. B. and Roitt, I. 2006. Immunology, 7th Edition. Elsevier Limited.
6. Black, J. G. 1999. Microbiology –Principles and Explorations, Prentice Hall, London.

C. PLANT BIOTECHNOLOGY

54 hrs (3 hrs/wk)

1. Definition Scope and impact of biotechnology - an overview. (2 hrs)
2. Plant tissue culture techniques: Choice of explant, culture media and culture conditions, hormonal regulation of growth and differentiation, micropropagation; shoot tip, nodal segment, meristem cultures: callus culture, callus mediated organogenesis, cell suspension culture, cell line selection. (10 hrs)
3. Somaclonal and Gametoclonal variations. Genetic basis. Applications (3 hrs)
4. Somatic embryogenesis. Artificial seeds. Applications. Protoplast culture, Somatic hybridization and its impact on plant breeding. Use of protoplasts in genetic transformations. (5 hrs)
5. Haploid production: anther and ovule culture. Dihaploids and polyhaploids. Applications. (2hrs)
6. Production of secondary metabolites. Cell immobilization. Bioreactor technology. (3 hrs)
7. Cryopreservation Technology- In-vitro strategies for conservation of germplasm. (2 hrs)
8. Genetic engineering: Methods and applications. Applications of gene cloning techniques in plants. Gene targeting and sequence tags. (6 hrs)
9. Methods of gene transfer in plants. Agrobacterium and CaMV mediated gene transfer; direct gene transfer using PEG, microinjection, electroporation, microprojectile (biolistics) method, liposome mediated DNA delivery, Transposons as vectors. (8 hrs)
10. Application of Plant Biotechnology: - Transgenic plants -Traits for improved crop production- Field testing of transgenic plants. Herbicide Resistance, Vaccines for Plants, Genetic Pesticides, Pathogen resistance Molecular farming of antibodies in plants and Enhanced Nutrition . Technique and Controversy of Terminator Gene Technology. (10 hrs)
11. Genetically modified organisms and foods (GMO/GMF) - Social and ethical considerations. IPR issues. Patents. Biopiracy. (3 hrs)

Practical

36 hrs (2 hrs/wk)

1. Preparation of culture medium (MS, N&N, SH, B₅), sterilization and inoculation.
2. Shoot multiplication, Callus culture and organogenesis of important crops/medicinal plants/ornamentals.
3. Isolation and estimation of genomic DNA.

4. Demonstration of Agarose gel electrophoresis.
4. Encapsulation of seeds/embryos in calcium alginate.
5. Students have to submit a record of the above.

References:

1. Jaiswal S. Singh P. & Kumar K. 2017. Instant Biotechnology a competitive approach. New Vishal Publication.
2. Abdin M.K., Kiran U. Kamaluddin & Ali, A. 2017. Plant Biotechnology: Principles and Applications. Springer.
3. Thieman, W. J. & Palladino, M. A. 2013. Introduction to biotechnology. 3rd Edition Pearson Education, Inc.
4. Chawla, H.S. 2009. Introduction to Plant Biotechnology. 3rd Edition. Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.
5. Ratledge, C. & Kristiansen, B. 2006. Basic Biotechnology. 3rd Edition. Cambridge University Press. Crueger, W. & Crueger, A. 2000. Biotechnology - A Text book of Industrial Microbiology.
6. Trivedi, P.C. (Ed.) 2000. Plant Biotechnology - Recent Advances. Panima Publishing Co. New Delhi.
7. Brown, T.A. 1999. Genomes. John Wiley & Sons. New York.
8. Griffiths *et al.*, 1999. Modern Genetic Analysis. W.H. Freeman & Co. New York.
9. Gupta, P.K. 1999. Elements of Biotechnology. Rastogi Publications, Meerut.
10. Gamborg, O.L & Phillips, G.C. 1998. Plant Cell, Tissue Organ Culture. 1998. Narosa Publishing House, New Delhi.
11. Mertins, T. R. & Hammorsmith, R. L. 1998. Genetics a Laboratory Investigation.
12. Backer, J. M. Caldwell G.A. & Zachgo E.A. 1996. Biotechnology- A Laboratory Course. Academic Press, New York.
13. Dixon, R.A. & Gonzales, R. A. (Eds.) 1994. Plant Cell Culture - A Practical Approach. Oxford University Press, New York.
14. Pamela Peters. 1993. Biotechnology-A Guide to Genetic Engineering. Wim.C Brown Publishers, USA.
15. Old R.W. & Primrose. S.B. 1991. An Introduction to Genetic Engineering. Blackwell Scientific Publications, Oxford, London.
16. Brown, C.M., Campbell, I. & Priest, F.G. 1990. Introduction to Biotechnology. Blackwell Scientific Publications, Oxford, London.
17. Primrose, S.B. 1989. Modern Biotechnology. Blackwell Scientific Publications, Oxford, London.

18. Brown, C. M. 1987. Introduction to Biotechnology. Blackwell Scientific Publications, Oxford, London.
19. Thorpe, T.A. 1981. Plant Tissue Culture Academic Press, London.

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SEMESTER IV
SPECIAL PAPER – I BO 241: BIOINFORMATICS
AND BIOPHYSICS

180 hrs (Theory 144 hrs; Practical 36 hrs)

Objectives:

- To provide the knowledge on Bioinformatics and its applications
- To familiarise the students on protein and nucleic acid data bases and genomics & proteomics.
- To get the skill in phylogenetic tree construction
- To impart information of computer aided drug designing and practice of molecular docking using suitable software.
- To learn the fundamentals of instruments and techniques used in Biology
- To familiarise the modern instruments of significance in analytic methods To understand the principles and applications of tracers techniques in biology

Learning Outcomes:

The student will be able to

- familiarise protein and nucleic acid data bases and genomics & proteomics.
- acquire the skill in phylogenetic tree construction
- understand basics of computer aided drug designing
- pursue research in Botany and advanced learning in Botany by knowing the principles of Bioinformatics.
- to explain key concepts in Biophysics
- to familiarise the modern instruments and techniques in Biology, their principles and applications
- to develop skill in handling various instruments related to Biophysics

A. BIOINFORMATICS

90 hrs (5 hrs/wk)

1. Introduction to Bioinformatics: Definition and History of Bioinformatics - Internet (3hrs)
Computational Biology and Bioinformatics.
2. Biological databases- Types of data and databases, Nucleotide sequence database (EMBL, GENBANK, DDBJ)- Protein sequence database (PIR, SWISS-PROT, TrEMBL), Secondary Databases (PROSITE, PRINTS, BLOCKS), Protein Structure Database (PDB) (9hrs)
3. Information retrieval from databases – search concepts, Tools for searching, homology searching, finding Domain and Functional site (6hrs)

homologies

4. Structural Bioinformatics – Molecular Structure viewing tool –Rasmol, Protein Structure Prediction – Secondary Structure prediction (Chou Fasman method and other Bioinformaticstools for secondary structure prediction) and Tertiary structure prediction (Comparativemodeling, Abinitio prediction, Homology modeling) (9hrs)
5. Genomics - Types (Structural and Functional), Genome Annotation, Gene Finding, Comparative genomics, Single nucleotide Polymorphism Gen-SNIP. (9hrs)
6. Proteomics – Protein expression analysis, Mass spectrometry in protein identification, Protein Sorting, Metabolomics, KEGG, Systems Biology-an introduction (9hrs)
7. Sequence Analysis – Global Alignment, pairwise analysis, Scoring Matrices (an introduction), Multiple Sequence Analysis (9hrs)
8. Molecular Phylogeny – Gene and Species tree. Molecular evolution and Kimuras theory, Phylogenetic Trees, Terminology in Phylogenetic tree. Cladogram and Phylogram, Significance of Molecular Phylogeny. (12hrs)
9. Computer Aided Drug Design and Molecular Docking, Breif study about Docking tools, AutoDock, molegro virtual docker, GOLD (9hrs)
- 10 Tools (Softwares) used in Bioinformatics - BLAST (including ALGORITHM of BLAST), Sequin, ClustalX, Clustal W, RasMol, Treeview, Phylip, GRAIL, GENSCAN, BIO-PERL. (9hrs)
- 11 Applications of Bioinformatics – Transcriptomics, Metabolomics, Pharmacogenomics, combinational synthesis (Brief Accounts). (6hrs)

Practical

18 hrs (1hr/wk)

1. Blast search with Protein Sequence (*Magnolia latahensis* sequence)
2. Blast search with Nucleic Acid Sequence (Neanderthal man's Paleo DNA)
3. Phylogenetic tree creation with CLUSTAL X, W and MUSCLE
4. Creation of phylogentic trees for selected families of Eudicots
5. Molecular docking (using either Free or commercial Software)

References

1. Rocha, M. & Ferreira, P.G. 2018. Bioinformatics Algorithms: 1st Edition. Academic Press.
2. Momand, J. & McCurdy, M. 2017. Concepts in Bioinformatics and Genomics. Oxford University Press.
3. Jeremy, R. 2015. Bioinformatics: An Introduction. Springer Publishing Co.
4. Choudhuri, S. 2014. Bioinformatics for Beginners. 1st Edition. Academic Press.
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7. Vyas, S.P. & Kohli, D.V. 2007. Methods in Biotechnology and Bioengineering. CBS Publishers and Distributors.
8. Evens, W.J. & Grant, G.R. 2005. Statistical Methods in Bioinformatics: An Introduction. Springer.
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11. Pierre Baldi & Soren Brunak. 2001. Bioinformatics: The Machine Learning Approach. 2nd Edition. The MIT Press
12. Lesk, A.M. 2002. Introduction to Bioinformatics, 1st Edn. Oxford University Press, Oxford, UK.
13. Patterson, B.K. 2000. Techniques in Quantification and Localization of Gene Expression.
14. Liu, B.H. 1998. Statistical Genomics: Linkage Mapping and QTL Analysis. CRC Press.

B. BIOPHYSICS

54 hrs(3 hrs/wk)

1. Chemical bonds: Ionic bond, Covalent bond, Vander Vaal's forces, hydrogen bonding and hydrophobic interactions. Bonding in organic molecules. Effect of bonding on reactivity. Polarity of bonds. Bond length. Bond angle. Dissociation and association constant. (6 hrs.)
2. Bioenergetics: Concepts of free energy, Thermodynamic principles in Biology. Energy rich bonds. Coupled reactions and group transfers. Biological energy transducers. (6 hrs)
3. Principles and applications of light and electron microscopy, resolving power, depth of field. bright field and dark field, phase contrast (negative and positive phase contrast), fluorescence, fluorescence resonance energy transfer (FRET), differential interference contrast (DIC) microscopy, scanning and transmission electron microscopy. different fixation and staining

techniques for EM, freeze-etch and freeze- fracture methods for EM, atomic force microscopy (AFM). Flow cytometry, confocal microscopy- different types, FISH, GISH.

(10 hrs)

4. Chromatography: Planar and column chromatography, Adsorption and partition chromatography, partition coefficient, Principle and applications of Gel filtration, Ion exchange and affinity chromatography, Thin layer chromatography, gas chromatography, HPLC, HPTLC, LCMS, GCMS.

(8 hrs)

5. Electrophoresis. Horizontal and vertical gel electrophoresis, PAGE, SDS- PAGE, DIGE (Differential gel electrophoresis), PFGE (Pulsed field gel electrophoresis), Immuno electrophoresis. Enzyme localization by electrophoresis. Zymogram and isozyme analysis. ELISA. Isoelectric focusing.

(8 hrs)

6. Centrifugation. Basic principles of centrifugation, RCF (relative centrifugal force), sedimentation coefficient, Ultra centrifugation - Differential centrifugation, density gradient centrifugation (zonal and isopycnic).

(4 hrs)

7. Principles of biophysical methods used for analysis of biopolymers: X-ray diffraction Bragg equation, fluorescence, UV, visible, IR, NMR, ESR Spectroscopy, ORD/CD, Fourier transform techniques, hydrodynamic methods, plasma emission spectroscopy. Atomic absorption spectroscopy, Mass spectroscopy

(8hrs)

8. Principles and applications of tracer techniques in biology. Radiation dosimetry. Radioactive isotopes. Autoradiography. Cerenkov radiation. Liquid scintillation.

(4 hrs)

Practical

18 hrs (1hr/wk)

Students are expected to get a good exposure on all the devices used in modern analytic methods by conducting study trips to two research institutions and to present a report.

1. Separation of pigments by column chromatography
2. Separation of amino acids by paper chromatography
3. Separation of alkaloids, phenols and pigments by TLC

References

1. Upadhyay, A., Upadhyay, K. & Nath, N. 2017. Biophysical Chemistry –Principles and techniques. Himalaya Publishing House.
2. Narayanan, P. 2000. Essentials of Biophysics. New Age International Publishers, New Delhi.
3. Daniel, M. 1999. Basic Biophysics for Biologists. Agro Botanica, Bikaner.
4. Roy, R.N.1999. A Text Book of Biophysics. New Central Book Agency(P) Ltd., Calcutta.
5. Hoppe, W. Lohmann, W. Markl, H. & Ziegler, H. Eds.1983. Biophysics. Springer Verlag, New York.
6. David Freifelder. 1982. Physical Biochemistry - Application to Biochemistry and Molecular Biology. W. H. Freeman.
7. Slayter, F.M. 1970. Optical Methods in Biology. Wiley Inter Science.
8. Casey, E.J. 1962. Biophysics: Concepts and Mechanics. Chapman & Hall, Ltd., London.

PAPER BO 242a: SPECIAL PAPER –II ELECTIVE
BIOTECHNOLOGY

234 hrs (Theory 144 hrs; Practical 90 hrs)

Objectives:

- To make awareness about the fundamentals of Biotechnology and
- To impart knowledge on Microbial genetics with respect to bacterial gene expression, regulation and gene manipulation.
- To familiarise the students with the tools and techniques of genetic engineering and gene transfer technologies
- To understand the techniques and applications of plant tissue culture
- To acquire basic practical skills in Biotechnology

Learning Outcomes:

The student will be able to

- understand the concept of biotechnology and microbial genetics
- get the knowledge on plant tissue culture and gene transfer technology
- acquire the skill in producing tissue cultured plants and artificial seeds
- get an understanding on the application of biotechnology in the production of secondary metabolites

144 (8hrs/wk)

Unit I: Basics of Biotechnology

(20hrs)

1. Genesis, projection of biotechnology as an interdisciplinary pursuit, prospects and bottlenecks.
2. Vectors, plasmids, bacteriophage and other viral vectors, cosmids, Ti plasmid, yeast artificial chromosome.
3. Enzymes used in genetic engineering, restriction enzymes- their types and target sites.
4. Impacts of biotechnology on agri-biodiversity, medicine, industry and environment.

Unit II: Microbial Genetics and technology(20 hrs)

1. Replication, regulation of bacterial gene expression.
2. Mutations, genetic transfer, manipulation of gene expression in prokaryotes.
3. Microbial production of
4. amino acids, antibiotics, microbial enzymes, organic acids.
5. Methods for laboratory fermentations, isolation of fermentation products, Elementary principles of microbial reaction engineering.
6. Microbial culture selection, fermented foods, probiotics.

Unit III: Genetic Engineering

(40 hrs)

1. Generation of Foreign DNA molecules, cutting and joining of DNA molecules – linkers, adapters, homopolymers.
2. Gene isolation, gene cloning, cDNA and genomic DNA library, expression of cloned genes.
3. Transposons and gene targeting
4. DNA labeling, DNA sequencing – Polymerase Chain Reactions (PCR), DNA finger printing,
5. Southern, Western and Northern blotting, Dot blots, in situ hybridization.
6. Molecular marker techniques – RFLP, RAPD, AFLP, SCAR, STR, SSR.
7. Site directed mutagenesis.
8. Gene transfer technologies – Agrobacterium and CaMV mediated gene transfer, direct gene transfer using PEG, Micro injection, electroporation, biolistic method, liposome mediated DNA delivery, gene therapy.
9. Transgenic organisms, Social and ethical issues , IPR, Patents and Biopiracy.

Unit IV: Plant Tissue Culture Techniques

(24 hrs)

1. Techniques and applications – callus culture and regeneration of plants, micropropagation for large scale production of crop plants, medicinal plants and ornamentals
2. Suspension culture and development – methodology, kinetics of growth and production formation, elicitation methods, hairy root culture
3. Protoplast culture – isolation, fusion, generation of hybrids, cybrids, preferential elimination of chromosomes, role in cytoplasmic male sterility and genetic transformation.
4. Exploitation of somaclonal and gametoclonal variations for plant improvement

Unit V: Transgenic organisms

(20 hrs)

1. Microbes – production of pharmaceuticals (somatostatin, humulin, interferons)
Genetically modified microbes – biodegradation, biopesticides, bioremediation, mineral leaching and biofertilizers.
2. Plants – insect resistance (Bt), virus resistance-coat protein, satellites, herbicide resistance. Increasing shelf life of foods – flavr savr tomatoes, control of seed germination, genetically modified foods.
3. Animals – production of vaccine and pharmaceuticals, hybridomas,

monoclonal antibodies.

Unit VI: Process Biotechnology

(20 hrs)

1. Bioprocess technology for the production of cell biomass and primary/secondary metabolites.
2. Microbial production, purification and bioprocess applications of industrial enzymes and organic compounds.
3. Bioreactor designs for exploitation of microbial products, scaling up and downstream processing.
4. Chromatic and membrane based bioseparation methods, immobilization of enzymes and cells and their application for bioconversion processes.

Practical

90 hrs (5 hrs/wk))

- a. Preparation of stock solutions for tissue culture.
- b. Preparation of solid and liquid media for test tube cultures and petri plate culture.
- c. Induction of callus culture and suspension culture.
- d. Encapsulation of embryos using sodium alginate.
- e. Isolation and quantification of genomic DNA.
- f. PAGE and AGE – demonstration.
- g. Restriction digestion and ligation using kits – demonstration.

References:

1. Krebs, J. E., Goldstein, E. S. & Kilpatrick, S. T. 2018. LEWIN'S GENES XII. Jones & Bartlett Learning.
2. Jaiswal S. Singh P. & Kumar K. 2017. Instant Biotechnology a competitive approach. New Vishal Publication.
3. Abdin M.K., Kiran U. Kamaluddin & Ali, A. 2017. Plant Biotechnology: Principles and Applications. Springer.
4. Watson, J.D., Baker T.A., Bell S.P., Gann A., Levine M. & Losick R. 2014. Molecular biology of the gene. 7th Edition. Cold Spring Harbor Laboratory, Tania, MIT
5. Thieman, W. J. & Palladino, M. A. 2013. Introduction to biotechnology. 3rd Edition Pearson Education, Inc..
6. Chawla H.S. 2009. Introduction To Plant Biotechnology Oxford & IBH Publishing Co Pvt.Ltd
7. Freifelder, D. 1993. Molecular Biology, Jones and Bartlett, Publishers, London.
8. Primrose, S.B. 1989. Animal Biotechnology Blackwell Scientific Publication, London.
9. Old, R. W. & Primrose, S.B. 1989. : Principles of Gene Manipulation, Blackwell scientific Publication, London.

PAPER BO 242b: SPECIAL PAPER –II ELECTIVE

ENVIRONMENTAL BIOLOGY

(Theory 144 hrs; Practical 90 hrs)

Objectives:

- To familiarise the fundamentals of the concept of ecosystem along with its structural and functional attributes.
- To understand the different aspects of environmental ecology with emphasis on pollution and waste management.
- To expose the students to the various areas of applied ecology such as physiological, industrial and molecular ecology.
- To acquire practical skills for water analysis to estimate phosphate and nitrate content planktons, major elements and to get experience in quadrant study

Learning Outcomes:

The student will be able to

- understand the concept on environmental ecology and waste management
- get the skill in water analysis
- identify the environmental problems at local level and suggest remedial measures

Unit I: Ecological Concepts

1. Concept of Biosphere (1hr)
2. Ecological processes: basic laws of energy flow, flow of energy, law of ten percent, Odum's Box pipe model of energy flow. (8 hrs)
- 3 Biogeochemical cycling: Major sedimentary and gaseous types, turnover rate and turn over time, residence time, nutrient budgeting and nutrient sink. (8 hrs)
- 4 Environmental factors: climatic, edaphic, topographic and biotic factors. (7 hrs)

Unit II: Population ecology

1. Quadrat sampling technique, line transect method, mark-recapture technique; Habitat destruction- fragmentation, perforation; Metapopulation- different types (10 hrs)
2. Population attributes – biotic potential, natality, mortality, demography- survivorship curves, life tables, age structure (9 hrs)

3. Population growth- Geometric, exponential and logistic, Time Lag, Grimes triangle, Carrying capacity, r and k selection (8 hrs)

Unit III: Community Ecology

1. Community structure: Species diversity – Berger Parker Index, Shannon index, Regional diversity – alpha, beta and gamma; Succession – Primary and Secondary, Facilitation, Inhibition, Tolerance. (10 hrs)
2. Species interactions – Competition, Predation, Herbivory, Parasitism, Commensalism, Ammensalism, Mutualism. (10 hrs)
3. Island biogeography (4hrs)

Unit IV: Ecosystem Ecology

1. Types of ecosystem – Major terrestrial and aquatic ecosystems. (8 hrs)
2. Components of ecosystem ; Functional attributes – Concept of productivity, trophic levels, trophic relations, food chain and food web, ecological pyramids; Keystone species, dominant species, ecosystem engineers, Indicator, Umbrella and flagship species (8 hrs)
3. Behavioural Ecology : Altruism, Kin Selection, Group selection, Individual selection, Foraging(5 hrs)

Unit V: Environmental Ecology

1. Pollution – major types of pollution, biological effects, environmental impacts at the local and global levels –
BOD, eutrophication, bioaccumulation, biomagnifications, ecological imbalance (4 hrs)
2. Land degradation – causes, effects of land degradation, remedial measures. (4 hrs)
3. Waste management – waste minimization, recycling of industrial wastes, solid waste management.
Waste disposal mechanisms. (4 hrs)
4. Environmental biotechnology – bioremediation, technology for biological waste disposal, biogas plants. (4 hrs)
5. Environmental issues – global warming, ozone layer depletion, deforestation and desertification, destruction of natural ecosystems. (4 hrs)
6. Environmental protection – environmental laws, conservation efforts, UNEP, IPCC, Kyoto protocol, Earth summits. (4 hrs)
7. Prospects of remote sensing in environmental studies. (3 hrs)

Unit VI: Applied Ecology

Microbial Ecology

1. Microbial ecology: Concepts, microbial behavior in ecosystems, microbial biodiversity, interaction among the microbial populations, development of microbial communities. Oxygenic photosynthetic microbes and anoxygenic photosynthetic microbes. Oxidative transformation of metals: sulfur

oxidation, iron oxidation, ammonia oxidation and hydrogen oxidation. Environmental stresses.

(5 hrs)

2. Wastewater treatment system (unit process): Physical screening, flow equalization, mixing, flocculation, flotation, sedimentation, granular medium filtration, adsorption, Bioremediation and phytoremediation.
(3 hrs)
3. Chemical precipitation, gas transfer, disinfection, dechlorination.
(2 hrs)
4. Effluent and sludge disposal, control and reuse. Water pollution control, Regulation and limit for disposals in the lakes, rivers, oceans, and land. Direct and indirect reuse of treated effluents and solid wastes.
(4 hrs)

Industrial Ecology

- 5 Current industrial wastewater treatment and disposal processes (Sugar and distillery, Textile, dyestuff, dairy, paper and pulp manufacturing industries)
(3 hrs)
6. Approaches to solid waste management using composting, vermiculture and biomethanation methods and their suitability to environment
(4 hrs)

Practical

90 hrs (5 hrs/wk)

1. find out the primary production in the given sample by using light and dark bottles.
2. Estimation of phosphate and nitrite in the water samples.
3. Estimation of hardness and salinity in the water samples.
4. Quantification of the planktons, present in the given two water samples.
5. Analysis of major elements (Na, K, Ca and Fe) of water samples.
6. Analysis of chlorophyll pigments in water.
7. Quadrat study of a given area to find out the Importance Value Index (IVI) of the community.
8. Analysis of water samples for coliform bacteria.
9. One day visit to any tribal locality / areas with relevant environmental issues
One day visit to an industry with relevance to wastewater treatment.

References:

1. Krohne D. T. 2017 Ecology: Evolution, Application, Integration. Oxford Univ. Press.
2. Poul V.I. 2013. Biodiversity: Issues, Impact, Remediations and Significance 1st Edition. V L Media Solutions
3. Stiling, P. 2012. Ecology: Global Insights and Investigations, McGraw- Hill Companies, NewYork.
4. Sharma, P. D. 2004. Environmental Biology, Himalaya Publications.
5. Sharma P D, 2003. Environmental Biology, Rastogi Publications, Meerut.
6. Kumar, H. D. 2000. Modern Concepts of Ecology. Vikas Publishing House, New Delhi.
7. Aradhana, P. S. (Ed). 1998. Environmental Management, Rajat Publications, Delhi.
8. Kumar, H. D. 1997. General Ecology. Vikas Publishing House, New Delhi.
9. Ambasht, R. S. & Ambasht, N. K. 1996. A Text book of Plant Ecology. Students' friends and Co, Varanasi.
10. Dash, M. C. 1996. Fundamentals of Ecology. TMH Publishing Company, New Delhi.
11. Tchobanoglous, G. & Burton, F. L. 1991. Waste water Engineering, Treatment, Disposal and Reuse. 3rd Ed., Metcalf and Eddy, Eds. Tata McGraw Hill Publishing Co. Ltd., New Delhi.
12. Richards, B. N. 1987. Microbiology of Terrestrial Ecosystems. Longman Scientific and Technical, New York.
13. Odum E. P. 1971. Fundamentals of Ecology. WB Saunders and Co.

**PAPER BO 242c: SPECIAL PAPER –II ELECTIVE
PLANT BIOCHEMISTRY AND ENZYMOLGY
(Theory 144 hrs; Practical 90 hrs)**

Objectives:

- To understand the basic organisation of cell and biochemical energetics.
- To know about the primary and secondary metabolites and their interrelationships.
- To learn about the details of protein structure and characterization
- To understand the fundamentals of enzyme kinetics in detail

Learning Outcomes:

The student will be able to

- learn the concept on metabolism, biochemical energetics and metabolic pathways
- understand the method of protein purification and characterization
- identify key enzymes of plant metabolism
- equip the students to follow the protocols for protein purification, isozyme analysis and enzyme separation

144hrs (8hrs/wk)

Plant Biochemistry

UNIT: Introduction

1. Biochemical organization of the cell.	(8 hrs)
2. Metabolism and biochemical energetics.	(8 hrs)
3. Intermediary metabolism. Major pathways and evolutionary significance.	(8 hrs)

UNIT:II Metabolic Pathways

4. Primary metabolic pathways and their inter relationships.	(8 hrs)
5. Enzyme mediated regulation of metabolism.	(8 hrs)
6. Secondary metabolism – main pathways and their inter relationships.	(8 hrs)

UNIT:III Protein

7. Protein structure, purification and characterization.	(8 hrs)
8. Biomolecular interactions – general account	(8 hrs)

Enzymology

UNIT IV: Classification and Characterization of Enzymes

- 9.Plant enzymes – general properties, classifications and nomenclature. (6 hrs)
10. Structural and functional organization of enzymes – primary, secondary and tertiary, structure, molecular characterization of functional organization. (10 hrs)
- 11.Sub cellular localization of enzymes by LM and TEM. Histochemistry of enzyme reaction. (8 hrs)
- 12.Enzyme purification and characterization – desalting methods, isolation and assay of plant enzymes and enzyme kinetics. (10 hrs)
- 13.Michaelis Menton equations and its significance, Lineweaver plots, enzyme inhibitions, activation.
- UNIT V:Enzyme Regulation, Localization and Applications** (6 hrs)
14. Allosteric enzymes, metabolic regulation – sigmoid, kinetic, steady state metabolic pathways by control of enzymatic pathways. (10 hrs)
- 15.Native PAGE in enzyme localization, principles and methodology, zymogram. (8 hrs)
- Iso Electric Focusing (IEF). (6 hrs)
- 16.Immobilization of enzymes, enzyme engineering – techniques and applications. (8 hrs)
- 17.Biotechnological applications of enzymes. (8 hrs)

Practical

90 hrs (5 hrs/wk)

1. Isolation, partial purification and estimation of specific activity of plant enzymes – poly phenol oxidase, malate dehydrogenase.
2. Isoenzyme analysis and preparation of Zymogram.
3. Separation of enzyme proteins by Native PAGE.

References:

1. Becker, W. M., Hardin & Bertoni G. 2018. Becker's World of the Cell. Pearson Education Ltd.
2. Nelson D. L. & Cox, M. M. 2017. Lehninger Principles of Biochemistry. 7th Edition. W H Freeman & Co.
3. Appling D. R., Anthony-Cahill S.J. & Mathews, C.K. 2016. Biochemistry. Concepts and Connections. Pearson Education Limited. Berg, J. M., Tymozko. J. L. & Stryer, L. 2015. Biochemistry, 8th Edition. W. H. Freeman and Company.
1. Voet, D. J. & Voet, J. G. 2008. Principle of Biochemistry, 3rd Edition. John Wiley Sons Inc.
2. Hames, B.D., Hooper, N.M., & Houghton, J.D. 1999. Instant notes in Biochemistry. Viva books Pvt. Ltd. New Delhi.
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13. Fersht, A. 1985. Enzyme Structure and Mechanism, 2nd Edition, Freeman.

BO 242 D: SPECIAL PAPER II CYTOGENETICS

(Theory 144 hrs; Practical 90 hrs)

Objectives:

- To understand the fundamentals of cytogenetics with emphasis on chromosome structure and meiotic behaviour
- To get the knowledge on chromosomal aberrations
- To learn the cytogenetics of polyploids and aneuploids.
- To get the skill in induction of polyploidy
- To study the sex determination mechanisms operating in different plants and animals
- To understand karyotype analysis and chromosome banding

Learning Outcomes:

The student will be able to

- learn the fundamentals of cytogenetics
- understand the concept on the structural and numerical variations in chromosome numbers and their applications and limitations
- understand the mechanism of sex determination
- analyse the banding pattern in human karyotype
- get the skill in doing cytology of plants and production of polyploids

144hrs(8hrs/wk)

Unit I - Introduction:

Basic trends in cytogenetics – genetic continuity and variation. Meiotic behavior & (16 hrs)

Chromosome abnormalities, Special types of chromosomes. (14 hrs)

B- chromosomes – origin, distribution, terminology, occurrence in different biological groups,

morphology, classification, preferential distribution, post meiotic preferential distribution, differential

fertilization, elimination, significance and adaptive value of B- chromosomes.

UNIT II - Chromosome Structural and Numerical Variations

Structural variations in chromosomes – origin and meiotic characters.

Aneuploids – trisomics, double trisomics, tetrasomics, double tetrasomics.

Types of trisomics – primary, secondary, tertiary, compensating fragment and

telocentric trisomics. Role of aneuploidy in producing variation and its significance in evolution. (20 hrs)

UNIT III Haploids and Polyploids

Haploidy – types of haploids, euhaploids, monohaploids, polyhaploids, Aneuhaploids; meiosis in haploids, induction of haploids.

- a. Morphology, anatomy and physiology of haploids.
- b. Genetic control of haploidy, genome analysis, inheritance in haploids- dosage effect.
- c. Significance of haploids in crop improvement (13 hrs)

Polyploidy – types of polyploids, numerical variation in chromosomes.

- d. Autopolyploids, allopolyploids, segmental allopolyploids, autoallopolyploids.
- e. Origin of polyploids, meiosis in polyploids, cytological and genetic effects of polyploids.
- f. Role of polyploids in plant diversity and evolution.
- g. Induction of polyploidy – methods of induction, morphological and cytological analysis of induced polyploids, significance of induced polyploidy in plant improvement.

(13 hrs)

UNIT IV - Genetics of Polyploids and Aneuploids

Theories of tetrasomic inheritance, Muller's hypothesis, Haldane's hypothesis, double reduction, techniques of nullisomic and monosomic analysis in polyploids trisomic analysis in diploids. Cytogenetic effects – effect on crossing over, position effect, translocation complex, Renner complex, Renner effect, Breakage, Fusion Bridge cycle. Cytogenetics of hybrids. (28hrs)

UNIT V- Sex Chromosome and Sex determination Mechanism

Sex chromosomes – undifferentiated, structural heteromorphic, multiple, protenor (XO), Neosex chromosomes, meiotic behavior of sex chromosomes in *Melandrium album* and *Rumex hastatus*. Evolution of sex chromosomes. Chromosomal mechanism of sex determination in *Melandrium* and *Drosophila* and the role of X and Y chromosomes and autosomes in them. Sexual dimorphism –

Genetic theory, cytological basis (22 hrs)

UNIT VI - Karyotype and Banding

Karyotype analysis and karyotype evolution. Chromosome banding – techniques and their applications,
Human cytogenetics. (18hrs)

Practical(90 hrs)

1. Somatic and meiotic chromosome study in selected polyploid and aneuploid. Eg. *Musa*,
Crinum.
2. Allopolyploid - polyploidy series in *Chlorophytum*
3. Induction of polyploidy using Colchicine in selected plants.
4. Cytological and morphological analysis of the colchipooids.
5. Meiotic study of *Rhoeo discolor*
6. Chromosome banding – G –banding.

References

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MSc. BOTANY II SEMESTER PRACTICAL EXAMINATION
(2019 admission onwards)

PAPER I- BO 214 –MODEL QUESTION

**PHYCOLOGY, MYCOLOGY, PLANT PATHOLOGY, MICROBIOLOGY,
BRYOPHYTA, PTERIDOPHYTA, GYMNOSPERMS, REPRODUCTIVE
BIOLOGY, HISTOLOGY, MICROTECHNIQUE AND HISTOCHEMISTRY**

Time:4hours

Max. marks:75

1. Prepare a double stained permanent free hand section of **A**. Draw labeled diagrams.
(Preparation-3 marks, diagram-1 mark, reasons-2 marks, identification-1 mark)

1x7=7 marks

2. Separate and identify any two algal filaments from **B**. Give reasons with
labelled diagrams

(Preparation ½ mark, reasons- ½ mark, diagram-½mark)

2x1 ½=3marks

Make suitable micro preparations of **C&D** , Identify giving reasons

2x4=8marks

(Preparation-1 mark, diagram-1 mark, reasons-1 mark, identification-1 mark)

3. Bring out the pathological interest of **E**.

1x4=4marks

(Name of disease-1mark; etiology-2 marks; name of pathogen-1mark)

4. Make suitable micro preparations of **F&G**, Identify giving reasons

2x4=8marks

(preparation-1 mark, diagram-1 mark, reasons-1 mark, identification-1 mark)

6. Make suitable micro preparations of **H**, showing T.S,. Identify giving
reasons

(T.S-1, diagram-1 mark, reasons-1 mark, identification-1mark)

1x4=4 marks

7. Identify and write critical notes on **I**. (Identification -1mark, critical note-1mark)

1x2=2 marks

8. Estimate the in-vitro viability of pollen through germination Or
Identify the ornamentation and sculpture patterns of pollen grains by a
suitable method Or Detect any one developmental stage of embryo in the
sample given. (Methodology-1. marks.Preparation-1mark).

1x2=2 marks

9.

- a. Identify the Bacteria in **J** by Gram's staining method

(Prep:-2 marks,procedure-2,identification-1)

1x5=5marks

- b. Macerate **K** and identify two xylem elements

(Prep:-1 mark, procedure-1mark, diag-1,identification-1)

1x4=4marks

- c. Prepare a serial sections of paraffin block **L** using Rotary microtome

(cutting & mounting the ribbon=2 mark)

1x2=2marks

- d. Spot at sight **M, N, O, PandQ**

(Genus -½ mark, Group- ½ marks)

1x5=5marks

- e. Write critical notes on **R**

1x1=1mark

Record =10 Marks

Submission of permanent slides =10marks

M. Sc. BOTANY II SEMESTER PRACTICAL EXAMINATION
(2019 admission onwards)
PAPER II BO 224 - MODEL QUESTION
TAXONOMY, ECONOMIC BOTANY, ETHNOBOTANY, ENVIRONMENTAL
BIOLOGY, CONSERVATION BIOLOGY, PHYTOGEOGRAPHY, CELL
BIOLOGY, GENETICS & EVOLUTION

Time:4hours

Max:marks-75

- i. Using The Flora of Presidency of Madras, identify the specimen **A** up to species (*Derivation-3marks, Family-1, Binomial with author citation-1 mark*). **1x5=5marks**)
- ii. Identify the specimen **B** to its family (*Derivation -3 marks, Identification-1mark*)
(1x4=4 marks)
- iii. Draw the L.S of the given flower **C**, construct the floral diagram and write the floral formula. (*L.S-1½ marks, Floral diagram-1 mark, Floral formula ½mark*).
(1x3=3marks)
- iv. Using vegetative and floral characters, prepare a dichotomous key for **D, E, F,G** (*Analysis of characters - 2marks, Preparation of key-2marks*) **(1x4=4marks)**
- v. Write binomial, family and morphology of the useful parts of **H &I**. (*Binomial-1mark, family-½ mark, usefulpart-½mark*) **(2x2=4marks)**
- vi. Make acetocarmine smear preparation of **J** to demonstrate any two stages of meiosis. (*Preparation 2marks, Diagrams 2x1=2 marks, identification ½x2 =1mark*) **(1x5=5marks)**
- vii. Work out the problems **K&L** **(6+3=9marks)**
- viii. Select an experiment from **M**, intend your requirements and conduct the experiment. (*Requirements 1mark, procedure 2 marks, conduct of experiment 2 marks, Result1mark*). **(1x6=6marks)**
- ix. Write critical notes on **N, O,P,Q** **(4x1.5= 6marks)**
- x. Nomenclatural problem **R** **(1x2=2marks)**
- xi. Write ethnobotanical significances of **S**. **(1x2=2marks)**
- xii. Expansion of floral formula **T** **(1x2=2marks)**
- xiii. Identify **U&V**
(Binomial 1mark,Family-½mark) **(1½ x 2=3marks)**
Record 10marks
Herbarium & field book (8+2) 10marks

**M. Sc. BOTANY IV SEMESTER PRACTICAL
EXAMINATION**

(2019 admission onwards)

PAPER III BO 234 - MODEL QUESTION

**PLANT BREEDING, HORTICULTURE, BIOSTATISTICS,
BIOCHEMISTRY, PLANT PHYSIOLOGY, MOLECULAR BIOLOGY
AND PLANT BIOTECHNOLOGY**

Time:4Hours

Maximum marks:75

1.Emasculate the flower in the inflorescence given

OR

Estimate the percentage of pollen fertility in the given plant by suitable staining.

(Methodology-2 marks. Preparation- 2 marks)

4marks

2. Demonstrate any one propagation method - Budding OR Grafting OR layering.

(Methodology- 2 marks. Preparation- 2marks)

4marks

3. Select an experiment from the lot and work out as per the objective.

(Procedure- 4 marks, Requirements- 2 marks, Result- 4 marks. Calculation- 4 marks)

14 marks

4. Isolate the genomic DNA from the given tissue and estimate the DNA content.

(Procedure- 4 marks, Requirements- 2 marks, Result- 4 marks.

Calculation- 4marks)

14 marks

5. Demonstrate the inoculation of explants to a suitable culture medium aseptically.

(Demonstration- 4Marks)

4 marks

6. Select an experiment from the lot and workout

(Procedure- 4 marks, Requirements- 2 marks, Result- 2 marks, Calculation- 2 marks)

10 marks

7. Setting up of plant physiology experiment

4marks

8. Work out the given problem

5 marks

9.Casting and loading of samples in Horizontal gel electrophoresis

(Methodology- 2 marks, gel casting- 2 marks, sample loading- 2 marks)

6 marks

Record

10marks

**M. Sc. BOTANY IV SEMESTER PRACTICAL
EXAMINATION
(2019 admission onwards)
PAPER IV BO 243 - MODEL QUESTION**

BIOINFORMATICS BIOPHYSICS AND BIOTECHNOLOGY.

Time: 4 Hours

Maximum marks: 75

BIOINFORMATICS & BIOPHYSICS:

35 Marks.

I. BIOINFORMATICS

- A) Construct a phylogenetic tree using CLUSTAL X/W (10 marks)
B) Search the protein sequence using BLAST. (5 marks)
C) Write critical notes on the given materials C1 and C2. (2 × 2.5 = 5 marks)

II. BIOPHYSICS:

- a. Select an experiment from the lot and work out as per the objective and submit the result for evaluation.
(Methodology- 7 marks, Result- 3 marks) (10 marks)
b. Critically explain the relevance/working of E1 and E2
(2 × 2.5 = 5 Marks)

III. BIOTECHNOLOGY (Elective):

30 Marks.

- c. Isolate the genomic DNA from the given tissue and estimate the DNA content. (Procedure: 5 marks, Result: 5 marks, Calculation 5 marks)
(1 × 15 = 15 marks)
d. Encapsulate the given embryos/explants using sodium alginate.
(Procedure: 3 marks, Result: 2 marks) (1 × 5 = 5 marks)
e. Critically explain the biotechnological relevance of H1 and H2.
(2 × 2.5 = 5 marks)
f. Submit two live tissue culture tubes for evaluation. (5 marks)

Record 10 marks

INSTRUCTIONS TO THE EXAMINERS

Paper I - BO214 : PHYCOLOGY, MYCOLOGY, PLANT PATHOLOGY, MICROBIOLOGY, BRYOPHYTA, PTERIDOPHYTA, GYMNOSPERMS, REPRODUCTIVE BIOLOGY, HISTOLOGY, MICROTÉCHNIQUE AND HISTOCHEMISTRY

- A. Histology : fresh angiosperm root/stem, (normal or anomalous, primary/secondary)
- B. Algal Mixture: give mixture of 3 algae & identification of any 2 members
- C. Algae with reproductive structure for sectioning
- D. Fungi/Lichen with reproductive structure for sectioning.
- E. Plant pathology- fresh or well preserved & diseased specimen.
- F. Bryophyte for sectioning (fresh or well preserved)
- G. Pteridophyte for sectioning (fresh or well preserved).
- H. Gymnosperms for sectioning (fresh or well preserved)
- I. Fossil specimens : Pteridophyte/ Gymnosperms
- J. Microbiology : Bacterial smear
- K. Maceration : show two xylem elements.
- L. Serial sectioning: Paraffin block embedded with good quality specimens fixed on a block holder should be supplied
- M, N, O, P & Q. Spot at sight (M-Algae, N-Fungi/Lichen, O-Bryophyta, P-Pteridophyta and Q- Gymnosperm)
- R. Stains/ Fixatives/Chemicals/Instruments.

Practical work

55marks

Valuation of Practical Record I

10marks

Valuation of permanent slides

10marks

[Free hand section	(4)	=4marks
Serial section	(2)	=2 marks
Smear	(1)	=1 mark
Squash	(1)	=1 mark
Whole	(1)	=1 mark
mount/sledge		
Histochemistry	(1)	=1mark]

TOTAL

75marks

**PAPER II BO 224: TAXONOMY, ECONOMIC BOTANY, ETHNOBOTANY,
ENVIRONMENTAL BIOLOGY, CONSERVATION BIOLOGY,
PHYTOGEOGRAPHY, CELL BIOLOGY, GENETICS & EVOLUTION**

- A. **Taxonomy- Identification up to species using the Flora of the Presidency of Madras:** Give fresh flowering twigs (select genera up to 20 species from the families of Dicotyledonae with bisexual flowers, centre should provide three volumes of Flora of the Presidency of Madras, and the binomial should be followed by author citation. Deduct ½ marks if author citation is not given by the candidate).
- B. **Taxonomy- Identification up to family:** Give fresh flowering twigs from the Class Dicotyledonae mentioned in the syllabus.
- C. **Taxonomy- Floral details, floral formula and floral diagram:** Give flowering twigs with buds from the families mentioned in the syllabus.
- D, E, F, G- **Taxonomic key:** Give 4 flowering twigs with clear vegetative and floral features.
- H& I. **Economic Botany:** any plant part /product of economic importance mentioned in the syllabus
- J. **Cell biology:** Show two meiotic stages
- K. **Genetics:** Problem related to linkage
- L. **Genetics:** Problem related to molecular or population genetics
- M. **Environmental biology:** Select experiment and estimate Dissolved oxygen/ organic carbon/carbonate/bicarbonate.
- N, O, P, Q. Critical notes from **Ecology, Phytogeography, Conservation biology and Evolution.**
- R. Nomenclatural problem.
- S. Ethnobotanical significance
- T. Expansion of floral formula
- U. & V. Herbarium sheets

Distribution of marks:

Practical work		55marks
Valuation of Practical record of SemesterII	10 marks	
Submission of 50herbarium sheets (Collected and identified by the candidate with field book and tour report)		10 marks
TOTAL		75marks

**Paper - III - BO 234: PLANT BREEDING, HORTICULTURE,
BIostatISTICS, BIOchemistry, PLANT Physiology,
MOLECULAR BIOLOGY AND PLANT BIOTECHNOLOGY**

Time:4Hours

Maximum Marks:75

1. Emasculation-Prepare the inflorescence for pollination.

or

Estimation of pollen fertility/sterility procedure.
2. Budding- T budding and patch budding.
 - a. Layering- any one method.
 - b. Grafting- Any one method.
3. The student has to perform any one of the experiment selected by lot method.
 - i) Extraction and estimation of soluble proteins by Bradford method.
 - ii) Estimation of reducing sugars by DNS method.
 - iii) Isolation assay and determination of specific activity of plant enzymes of germination, growth and fruit ripening viz. amylase, protease, peroxidase and poly phenoloxidase.
4. For isolation of DNA, the examiner should provide a standard value of DNA.
5. Demonstration of inoculation of any given plant material.
6. The student has to perform any one of the experiment selected by lot method. List of experiments
 - a. Evaluation and estimation of total protein by TCA method and Lowry method.
 - b. Isolation of chloroplast from fresh leaves and estimation of chlorophyll proteins.
 - c. Chlorophyll spectra of five plants - quantification, absorption spectra of chlorophyll and carotenoids using different wavelengths.
 - d. Hill activity by DCPIP/ Ferricyanide reduction.
 - e. Extraction and estimation of total phenols.
 - f. Physiological identification of CAM in plant species.
7. Setting up of plant physiology experiment. The requirements have to be provided by the center.
8. Work out problems related to mean, median, standard deviation and Chi square test.
9. The requirements have to be provided by the center.

Paper - IV BO 243: BIOINFORMATICS BIOPHYSICS AND BIOTECHNOLOGY.

Time: 4HoursMarks.

Maximum marks:75

BIOINFORMATICS & BIOPHYSICS: 35 Marks.

I. BIOINFORMATICS

A. Phylogenetic tree creation using CLUSTALX.

B. Blast search with protein sequence.

C1 and C2. Critical notes on any two items related to Bioinformatics.

II. BIOPHYSICS

c. Each student should carry out any one of the following experiment.

i. Separation of plant pigments by column chromatography.

ii. Separation of amino acids by paper chromatography.

iii. Separation of plant pigments by micro TLC.

d. Any chemical, equipment or photograph related to Biophysics.

III. BIOTECHNOLOGY

e. Isolate the genomic DNA and quantify the same.

f. Encapsulation of embryos using sodium alginate.

g. H1 and H2. Any chemical, equipment or photograph of related to Biotechnology.

h. Submission of live tissue culture tubes for evaluation.

M.Sc. Biotechnology

**Scheme & Syllabus
For Affiliated Colleges
(Revised)
2020**

**University of Kerala
Thiruvananthapuram**

M Sc Biotechnology

(Course Outcomes, Programme Outcomes and Programme Specific Outcomes)

Course Outcomes (CO):

After successfully completing this course, the student will be able to

- CO1:** Understand the basic knowledge and concepts of biotechnology and other related areas.
- CO2:** Understand the ability to apply their knowledge for practical which they can conduct independently.
- CO3:** Apply their knowledge in other advanced subject area like Nano-biotechnology, immuno-technology and animal and plant biotechnology for the betterment and advancement of their professional career.
- CO4:** Learn the theoretical and practical exposure to the basic and the advanced fields of biotechnology.

Programme Outcome (PO):

- PO1:** The major outcome of our MSc programme is to introduce competent biotechnologist's who can implement their knowledge base in advanced processes and applications in Biotechnology in the various fields of agriculture, industry, healthcare and environment.
- PO2:** An ability will be developed for the students to apply knowledge of Biotechnology (including other areas of life sciences like Biochemistry, Biophysics, Cell biology, Molecular Biology, rDNA technology, Immunology and Immuno-technology, Pharmaceutical Biotechnology, Nano-biotechnology etc.), for understanding its basic concepts.
- PO3:** Students also attain an ability to standardize and to conduct experiments, as well as to analyze and interpret data accordingly. They will gain an individual and team work ability to function on multi-disciplinary teams.

Programme Specific Outcomes (PSO):

- PSO1:** Design and execute industry oriented experiments in biotechnology using modern biotechnological tools and techniques.
 - PSO2:** Apply the knowledge of Biotechnology to demonstrate research skills and develop technology for industrial applications such as development of new biotech products, process and clinical practices and methodologies.
-

SUMMARY OF THE SYLLABUS AND SCHEME

Semester I

Course Code	Title of the Course	Teaching Hours/week			
		L	T	P	Total
BT 101	Cell Biology and Genetics	4	1	0	5
BT 102	Biochemistry	4	1	0	5
BT 103	Biophysics and Biostatistics	4	1	0	5
BT 104	Biochemistry Lab	0	1	4	5
BT 105	Cell Biology /Genetics lab	0	1	4	5
Total Hours /week		12	5	8	25

Semester II

Course Code	Title of the Course	Teaching Hours/week			
		L	T	P	Total
BT 201	Basic Microbiology	4	1	0	5
BT 202	Molecular Biology	4	1	0	5
BT 203	Mathematics, Computer Science, Bioinformatics & Research Methodology	4	1	0	5
BT 204	Microbiology Lab	0	1	4	5
BT 205	Molecular Biology Lab	0	1	4	5
Total Hours /week		12	5	8	25

Semester III

Course Code	Title of the Course	Teaching Hours/week			
		L	T	P	Total
BT 301	Plant Biotechnology	4	1	0	5
BT 302	Animal Biotechnology	4	1	0	5
BT 303	Genetic engineering	4	1	0	5
BT 304	Plant BT/ Animal BT Lab	0	1	4	5
BT 305	Genetic Engineering Lab	0	1	4	5
Total Hours /week		12	5	8	25

Semester IV

Course Code	Title of the Course	Teaching Hours/week			
		L	T	P	Total
BT 401	Immunology	4	1	0	5
BT 402	Environmental Biotechnology	4	1	0	5
BT 403	Food and dairy Biotechnology/Basics of Bioreactor	4	1	0	5
BT 404	Project	0	0	10	10
BT 405	General Viva -voce				
Total Hours /week		12	3	10	25

L –Lecture, T- Tutorial, P-Practical Total Number of Hours /week-25 hrs.
90 working days, 450 hours / semester. 5 months including exams. One seminar

II. MARK DISTRIBUTION

1. PAPER/SEMESTER

Semester	Papers	CA	ESA	Total Marks
I	BT-101-105	25 x 5	75 x 5	500
II	BT-201-205	25 x 5	75 x 5	500
III	BT-301-305	25 x 5	75 x 5	500
IV	BT-401-403	25 x 3	75 x 3	300
	BT-404	50 x 1	100 x 1	150
	BT-405	-	50	50
Grand Total (From S-1 to S-IV)				2000

CA- Continuous Assessment
ESA- End Semester Assessment

Total Marks for a semester **500**
Total Maximum marks at the end of IV semester **500 x 4=2000**

2. DISTRIBUTION OF MARKS FOR PROJECT EVALUATION

A. CA	
	Marks
Attendance	10
Work progress	20
Discussion	20
Total	50
B. ESA	
Project Content	50
Project presentation OR Viva Voce on Project	50
Total Marks for Project (CA + ESA)	150

III. SCHEME OF EXAMINATION PATTERN OF THE COURSE

Total Number of Hours /Week	25
One hour (period) for each subject and keep one hour for tutorial , seminar, discussions etc.	
Number of theory papers/semester and duration	3 (5 hrs each)
Number of Lab /Practicals	2 (5 hrs each)
Project	10 hours

EXAMINATION AND EVALUATION

Examination	CA	ESA	Total	Components of CA	
Theory	25	75	100	Attendance	5
				Seminar	5
				Assignments	5
				Test	10
Lab/ Practical	25	75	100	Attendance	5
				Record	5
				Test	10
				Viva	5
No. of seminars		One seminar/paper/student/semester			
No. of assignments		One assignment/paper/student/semester			
Tutorial hour		May be utilized for seminar and discussion			

PROJECT

Project work shall be assigned individually and must be carried out under the guidance of a faculty from the same college with or without an external guide OR in an external institution under the combined guidance of internal and external guides. The student has to submit the dissertation before the examiner for evaluation and may give a presentation on the project work, if asked for.

PROJECT EVALUATION

The evaluation of the project (Both CA and ESA) through oral presentation or Viva-voce as decided by the Chairman, Board of examinations..

	Marks
Project Content	50
Project presentation OR Viva Voce on Project	50
Maximum marks (including CA)	150

4. DETAILED SYLLABUS

SEMESTER I

BT 101 Cell Biology and Genetics

Aim

- To give a detailed and comprehensive knowledge on the various aspects of cell biology and genetics including cell structure and its functions, Mendelian genetics, and population genetics in detail.

Course Objectives

- The course gives the life activities at cellular and molecular level and basic functions of the various cellular compartments and organelles.
- It also gives the structural- functional and biochemical details of all cellular activities.
- This explains the basic principles of Mendelian, population genetics and heredity and gives an overview on the classical genetics- Linkage & Crossing over.

Course Outcome

On completion of the course, students shall be able to,

- Identify and present relevant information from research publications dealing with issues of cell biology and genetics.
- They will be able to assess and relate the information to the context of cell biology.
- Plan and carry out simple experiments on the basis of cell.
- The course enables students to analyse hereditary data and apply fundamental coupling analyses and genetic calculations.

Course Content

Cell Biology

Module 1

1. An overview of Cells and Cell Research- Microscopy – Light Microscopy, Electron Microscopy, Applications of electron microscopy in Cell biology, Confocal Microscopy, Fluorescence Microscopy and FRET. Cells - structure and size and shape, Prokaryotic and eukaryotic cells.
2. Cell membrane - structure and function, transport of nutrients and ions across the membranes, Mechanism of vesicle transport and vesicle fusion. Functional diversity of cellular membranes. Plasmodesmata, Tight junctions, Gap junctions – Structure and role in movement of molecules.

Module 2

3. Tissues- major types of plant tissues- simple tissue, complex tissues and tissue systems. Animal tissues- major types of tissues. Organs and organ systems
4. Cell organelles -structure and function. Plant and animal cells - similarities and differences.

Module 3

5. Cell cycle- Mitosis and meiosis, chromosomes- structure and organization,

nucleosomes organization karyotypes and ideograms. Cytological, genetical and evolutionary significance of Mitosis and Meiosis. Molecular events and regulation of cell cycle in eukaryotes. Check points, Cyclins and protein kinases, MPF (maturation promoting factor).

6. Cell-cell communication, cellular response to the environment, and mechanism of signal transduction.
7. Cancer Biology – cellular and genetic basis of cancer, apoptosis, carcinogens, environmental and diet factors in cancer.

Genetics

Module 4

8. Mendelian Genetics- Mendelian inheritance, Non-Mendelian inheritance

Module 5

9. Chromosome theory of inheritance- Linkage and crossing over. Recombination frequency. Extra-chromosomal inheritance
10. Chromosome aberrations- associated genetic diseases.

Module 6

11. Population genetics- genetic variation, polymorphism, gene pool, gene frequency, distribution pattern. Hardy-Weinberg equilibrium. Disequilibrium, factors affecting gene equilibrium

References

1. Genetics	AVSS Sambamoorthy	Narosa , New Delhi
2. Principles of genetics	DP Snustad, MJ Simmons JB Jenkins	John Wiley
3. Genetics	PK Gupta	Rastogi, Meerut
4. Cell & Molecular Biology	PK Gupta	Rastogi, Meerut
5. Genetics	PJ Russell	Benjamin Cummings
6. The science of genetics	AG Atherly, JR Girton, JF Mc Donald	Harcourt Brace College Publishers New York
7. Basic Human Genetics	EJ Mange, AP Mange	Sinauer Associates Inc, Massachusetts
8. The cell –A molecular approach	GM cooper	Sinauer Associates Inc, Massachusetts
9. Essential Cell Biology	Alberts, Bray, Johnson	Garland Pbl. NY
10. Concepts of genetics	Klug and Cummings	Person education N. Delhi

Online resources:

Authentic Web based resources like NCBI, PubMed, Science direct etc.

Semester I

BT 102 Biochemistry

Aim

- To give an introduction about the basic biochemistry related to the biological molecules, their diversity and biosynthesis, degradation and role in the biological systems.
- This also aims to develop a thorough knowledge among the students about the various biochemical reactions- metabolic pathways- responsible for the manifestation of life disease and metabolic errors.

Course Objectives

- The overall objective of the course is for the student to gain a basic working knowledge of biochemical concepts and techniques which will be necessary for future scientific endeavors.
- This course gives an idea on different biological molecules, their origin, biological role and its degradation according to the needs and demand of the system under various conditions.
- The interrelation of each of these metabolic pathways and their contribution in various metabolic disorders are also explained in detail.
- The application of the knowledge generated in the practical aspects of Biotechnology.

Course Outcome

On completion of the course, the student should achieve an understanding of the following:

- The structures of amino acids, their chemical properties and their organization into polypeptides and proteins.
- Methods for isolating and characterizing proteins the basic elements of protein structure key
- Principles of protein function.
- Enzymes and how they catalyze reactions as well as enzyme kinetics
- Structure of fundamental monosaccharides and polysaccharides structure
- Basic function of nucleotides structure of different classes of lipids and their roles in biological systems

Course Content

Module 1

1. Macromolecules - structure, classification and properties of Carbohydrates, Proteins and Lipids and Nucleic acids.

Carbohydrates- Monosaccharides-classification and structure, Isomerism in monosaccharides, Disaccharides- classification and types of disaccharides, its biological significance and functions, Oligosaccharides-hetero-oligosaccharides and homo-oligosaccharides, Polysaccharides- classification- hetero-polysaccharides, and homo-polysaccharides, storage polysaccharides and structural polysaccharides.

Module 2

Proteins- classification of proteins, building units of proteins- Amino acids- structure, properties and function, classification of Amino acids, peptide bonds, ramachandran plot, oligo peptides polypeptides, Structure of proteins- primary, secondary and tertiary

structures, quaternary structures, supra-secondary structures- motifs and domains,

Isolation and purification of proteins- different molecular and instrumental methods involved. Characterization of protein- structural and amino acid composition, Functions of proteins.

Module 3

Lipids- structure and classification, various types of lipids – Oils and fats, Triglycerides- structure and function, Phospholipids- structure, classification and functions, Biological significance of various types of Phospholipids, Glycolipids and lipoproteins, serum lipids and its significance, Cholesterol and its derivatives,

Nucleic acids- classification of Nucleic acids, Building blocks of Nucleic acids, structure of Nucleotides, classification of nucleotides, Purines, Pyrimidines, structure and function of DNA and RNA, Non-genetical function of Nucleic acids and its derivatives.

Module 4

2. Metabolism of carbohydrates - Glycolysis, TCA cycle, Gluconeogenesis, Pentose Phosphate pathway, Glycogen metabolism-Glycogenesis, glycogenolysis. Biosynthesis of starch, glycogen and glucose. Photosynthesis.
3. ETS and bioenergetics of cellular respiration. Redox reactions, standard oxidation reduction potential, mitochondrial electron transport chain, Oxidative phosphorylation, structure of ATP synthase, chemiosmotic hypothesis
4. Metabolism of Lipids- Oxidation of lipids. Beta-oxidation, Biosynthesis of lipids, Ketone bodies

Module 5

5. Metabolism of proteins and amino acids – Digestion and absorption, Biosynthesis and degradation of amino acid. Urea cycle, regulation.
6. Metabolism of Nucleotides –biosynthesis, degradation and regulation of nucleotides and related molecules. Energy compounds and its biosynthesis- ATP, NAD, NADP, FAD, Creatin phosphates
7. Secondary metabolism- classification and role of secondary metabolites of plants and microbes - Role of secondary metabolites
8. Metabolic network - Interrelationship of metabolisms Krebs cycle, amino acid synthesis,

Module 6

9. Enzymes -Enzyme classification and nomenclature. General properties of enzymes, factors affecting enzyme activity. Steady state kinetics. Michaelis – Menten equation and constants, maximum velocity, enzyme specificity, linear plot Lineweaver-Burke plot, Eadie-hofstee plot. Enzyme activation, inhibition-competitive and non competitive. Enzyme kinetics, mechanism of enzyme action, Allosteric interactions and product inhibition; Enzyme purification. Coenzyme; Clinical and Industrial applications of enzymes. Immobilization of enzymes and their application. Ribozymes and their applications. Enzyme engineering.

References

1. Harpers Biochemistry	RK Murray, DK Grammer, PA Mayes VW Rodwell	MC Graw Hill USA
2. Text Book of Biochemistry	DM Vasudebvan and Sreekumari	Jaypee Brothers Medical Publishers New Delhi
3. Biochemistry	U Satyanaryana	Becks & Allied Kolkotta
4. A text book of plant Physiology and Biochemistry	SK Verma	S Chand New Delhi
5. Instant notes Biochemistry	Hames, Hooper & Houghton	VIVA books Pvt ltd, N. Delhi
6. Biochemistry	Stryer, Jermy, Berg	Freeman Newyork
7. Biochemistry	Voet & Voet	Wiely & Sons
8. Principles of Biochemistry	GL Zubay, WW Parson & DE Vance	Wm C Brown Publishers Australia
9. Bioorganic chemistry	HR Hortan, LA Moran, RS Ochs	Prentice Hall USA
10. Environmental Biochemistry	CP Jrasa	Saup & Sons N Delhi
11. Biochemistry of Green plants	DW Krogman	Prentice Hall USA
12. Fundamentals of Enzymology	NC Price & L Stevens	Oxford science publications NY
13. Principles of Biochemistry	AL LEHINGER, DL NELSON & COX	Worth publishers NY

Online resources:

Authentic Web based resources like NCBI, PubMed, Science direct etc.

SEMESTER I**BT 103 BIOPHYSICS AND STATISTICS****Aim**

- To equip the students with knowledge of thermodynamics of biological system and bioenergetics. Also to give an introduction to the biophysical aspects of various biological physiological activities at cellular and molecular level.
- To get introduced to the fields of various instruments used in biotechnology- including the basic principle - application and working.
- To help students to have an idea on basic mathematical problems and calculations needed in Biotechnology aspects

Course Objective

- The course is designed to train the students in biophysics and bioinstrumentation techniques essential for the understanding of life sciences and biotechnology, for which basic knowledge in physics or Biophysics at graduate level is expected and is necessary for the proper understanding of this topic at postgraduate level.
- This course consists of basics of thermodynamics as applicable in the field of Biological systems- bio energetics- energy trapping and its transactions methods- biophysics of various biological activities.
- The course helps to attain knowledge on mathematical calculations and problems helping in competitive exams.

Course outcome

On completion of the course,

- The students will develop the capability to demonstrate a multiscale nature of biophysics by exploring macroscopic and microscopic applications.
- The students will learn to approach a research problem logically and will be able to do statistical analyses in research.

Course Content**BIOPHYSICS****Module 1**

1. Structure of atoms, molecule, Physico-chemical forces- ions, ionic bonds, covalent bonds, Hydrogen bonds, vander Wals forces, hydrophobic interactions, polar and non-polar molecules
2. Major Biological Macromolecules – role of various interatomic and molecular interactions in the formation and stability of macromolecules, supra-molecular assemblies and cellular components.

Module 2

3. Concept of Energy- matter and energy, thermodynamics- entropy, enthalpy

Bioenergetics- life as an energy system- major energy transformations mediated by life- Photochemical reaction of photosynthesis- Oxidative photophosphorylation, ATP, GTP, Creatin phosphate, muscle contraction, generation and transmission of nerve impulse.

4. Biophysics of Muscle movement , Impulse generation and impulse transmission

Module 3

5. Electromagnetic radiation- electromagnetic spectrum, photoreceptors- types of radiations-visible spectrum, absorption spectrum. Plant pigments and hormones as receptors of radiations- light receptors of animals. Biophysics of Vision.
6. Spectroscopy- various types of spectroscopic techniques, spectrophotometer- UV- Visible spectroscopy- Beer Lambert Law, IR spectroscopy, Raman Spectroscopy, X-ray diffraction technique-principle and application, NMR spectroscopy-principle and application, Fluorescent spectroscopy-principle and application.

Module 4

7. Microscopy- Light microscopy- Phase contrast Microscopy, Fluorescent microscopy, Modern Developments in Microscopy- FRET Microscopy, Confocal Microscopy, Electron Microscopy- Transmission and Scanning Electron Microscopy- Principle and applications, Resolution of a Microscope.
8. Centrifugation - Principle and application of various types of centrifugation- sedimentation coefficient, Svedberg unit.
9. Chromatography- Principle and application, Classification of Chromatography Adsorption and Partition chromatography, Paper Chromatography, TLC, Liquid Chromatography - ion exchange chromatography, Gel permeation chromatography, affinity chromatography, HPLC and GC.

Module 5

10. Electrochemical instruments - pH meter and Mass spectrometry.
11. Electrophoresis- principle and application, PAGE- Native and SDS-PAGE, Isoelectric focusing, 2D -gel Electrophoresis, immune electrophoresis.
12. Molecular hybridization Techniques- southern blotting. Northern blotting and Western blotting, Electro blotting
13. Principle and applications of tracer technique in biology: Radioactive Isotopes and half life of isotopes; Effect of radiation on biological system; autoradiography; radiation dosimetry; scintillation counting, safety aspects

BIOSTATISTICS

Module 6

1. General principles, sampling, sampling errors
2. Mean, Median, Mode, standard deviation and standard error
3. Probability- normal and binomial distribution, Poisson distribution- Frequency distribution - representation of frequencies.
4. Testing and Significance - Paired T- test. Unpaired T-test, Chi-square test Correlation and regression.
5. Graphs and diagrams - Bar diagrams, pie chart. Histograms and frequency curves

References

1. Principles of Biochemistry	AL LEHINGER, DL NELSON & COX	Worh publishers NY
2. A text book of Biophysics	RN Roy	New Central book Agency Kolkotta
3. Biophysics	Dr. S Thiravia Raj	Saras Publications Tamil Nadu
4. Principles of Biostatistics	M Paggana & Gaurveeu	Duxbery Australia
5. Essentials of Biophysics	P Naryananan	New age International PVt ltdN. Delhi
6. Biochemistry	Stryer, Jermy, Berg	Freeman Newyork
7. Principles of Biochemistry	GL Zubay, WW Parson & DE Vance	Wm C Brown Publishers Australia
8. Harpers Biochemistry	RK Murray, DK Grammer, PA Mayes VW Rodwell	MC Graw Hill USA
9. Basic Evaluation methods	Breakwell and L Millwart	Uty. Press Hyderabad
10. Biophysics An Introduction	RMJ Cotterill	John Wiely and Sons NYork
11. Basic Biophysics for Biotechnologist	M Daniel	Agrobios Jodhpur

Online resources:

Authentic Web based resources like NCBI, PubMed, Science direct etc.

SEMESTER I
PRACTICAL
BT 104 BIOCHEMISTRY LAB

Aim

- To train students on the basic techniques of biochemistry

Course Objectives

- The course gives an idea for the maintenance of laboratory and the practices that should be accomplished in a laboratory.
- The course explains how to prepare buffers and reagents, various methods of estimation of proteins, enzyme extraction and purification

Course Outcomes

At the end of this course,

- The students will equip themselves with the basic biochemistry techniques which can later applied for their laboratory research and also for many other industrial researches.
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Course Content**Laboratory techniques**

1. Titration curve of acetic acid and Glycine
2. Titration of acetic acid to determine the pKa value.
3. Preparation of buffer of a known pH (phosphate buffer, acetate buffer)
4. Determination of isoelectric pH of a given amino acid.
5. Methods of protein estimation- spectrophotometric determination of proteins by Lowry's method and Bradford method.
6. Enzyme extraction and purification - ammonium sulphate precipitation, protein purification by Gel permeation chromatography, ion exchange chromatography
7. Electrophoretic separation of proteins- SDS-PAGE Chromatography- column chromatography and Thin Layer Chromatography (TLC).

SEMESTER I

BT 105 CELL BIOLOGY, GENETICS AND BIOSTATISTICS LAB

Aim

- To train students on the basic techniques of cell biology and Genetics
- To make aware of the students a basic knowledges on computing biological problems statistically.

Course Objectives

- The course gives an idea for the maintenance of laboratory and the practices that should be accomplished in a laboratory.
- The course explains how to make slides for cytological examinations, other histochemical analysis, solving problems based on genetics and statistical analysis.

Course Outcomes

At the end of this course,

- The students will equip themselves with the basic cytology aspects to be performed in the laboratory.
- The students will be able to analyze genetic problems and will be able to approach a research problem statistically.

Course Content

Laboratory techniques

1. Cytological and Histological techniques- determination of number of viable cells in a cell population
2. Mitosis - Onion root tip squash preparation- Preparation of Karyotypes, Determination of Mitotic index.
3. Meiosis - squash preparation of immature anther- identification of different stages.
4. Microtomy and histochemical techniques - Preparation of thin sections of tissues and developing embryos and staining with tissue specific stains
5. Isolation and estimation of chloroplasts
6. Solving the problems of genetics
7. Calculation of mean, standard deviation, standard error and student's t-test Preparation of histograms, frequency polygon and pie diagram.

SEMESTER II

BT 201 BASIC MICROBIOLOGY

Aim

- To give an introduction about the microbial world- their distribution- morphology and reproduction and about the role of microorganism in various fields of human life and Industry.

Course Objectives

- Imparts advanced training in Microbiology for the students
- Makes the student aware the role of microbes in the daily life as well as in the various fields of science. How it can be controlled is also dealt with.

Course outcome

At the end of this course,

- The students get trained in all aspects of microbiology as it is required for Biotechnology.

Course Content

Module 1

1. Ultra structure of bacteria, fungi, algae, protozoa and viruses.
2. Classification of microbes, molecular taxonomy, Artificial and Natural systems of classification, Traditional characters used for the classification of Microorganisms.

Module 2

3. Current methods of identification, characterization, classification of Microorganisms. Microscopic examination of Microorganisms, Microscopes and Microscopy – Principle and applications for the study of Microorganisms.
4. Morphology and Fine structure of bacteria, cultivation of Bacteria, growth of bacteria – growth curve, Reproduction and growth, Pure culture and cultural characteristics. Microbial techniques, Staining techniques

Module 3

5. Characteristic features of eubacteria, archae, fungi- Molds and Yeasts, algae, protozoa and viruses- Viruses of bacteria, Viruses of plants and animals.
6. Biology of *Escherichia coli*, *Bacillus subtilis*, *Rhizobium sp.*, *Agrobacterium tumefaciens*, *Saccharomyces cerevisiae*, and phage lambda.

Module 4

7. Microbial nutrition. Growth, Microbial metabolism and energy production, bacterial photosynthesis and chemosynthesis
8. Microbial interaction (human microbe interaction, normal biota of the human body, plant microbe interaction).

Module 5

9. Control of Microorganisms- Physical chemical methods, Disinfectants, Antibiotics and mechanisms of antibiosis.
10. Microbial physiology and microbial genetics.

Module 6

11. Microbial ecology and Biogeochemical cycles
12. Environmental microbiology - Microbial deterioration of pesticides and organic compounds- cellulose- lignin- steroids- hydrocarbons; microbial deterioration of textiles- paper- wood- leather; microbial fouling and corrosion- Biodegradation of agricultural waste to biogas- Microbial leaching of ores.
13. Industrial microbiology- Microbes used in industrial processes- bioengineering of microbes for industrial purposes-

References

1. A text book of Microbiology	P Chakraborty	New central Book agency culcutta
2. Modern Concepts of Microbiology	H.D. Kumar, S. Kumar	Vikas Publishing House, Pvt. Ltd. New Delhi
3. Advances in Microbial Biotechnology	J.P. Tewari, T.N. Lakhanpal, J. Singh, R. Gupta, B.P. chamola	A.P.H. Publishing Corporation, New Delhi
4. Instant notes in Microbiology	J. Nicklin, K. Graeme- cook, T. Paget & R. Killington	Viva books Pvt. Ltd., New Delhi
5. Principles of Microbiology	R.M. Atlas	Mc Giraw Hill, NY
6. Introductory Microbiology	J. Heritage, E.G.V. Evans, R.A. Killington	Cambridge University Press
7. Human Parasitology	B.J. Bogitsh , T.C. Cheng	Academic Press, NY
8. Microbiology	Pelczar, Chan, Krieg, Tala Mc. GrawHill	Publishing Company, New Delhi
9. Microbiology- An Introduction	G.J. Tortora, B.R. Funke, C.L. Case	Wesley Longman, NY
10. Microbiology	L.M. Prescott, J.P. Harley, D.A. Klein.	Wm. C. Brown Publishers, Australia
11. Environmental Microbiology 3rd Edition	Academic Press	Ian Pepper Charles Gerba Terry Gentry

Online resources:

Authentic Web based resources like NCBI, PubMed, Science direct etc.

BT 202 MOLECULAR BIOLOGY

Aim

- To understand biological activities and metabolism at DNA and protein level

Course Objectives

- The course gives an in-depth insight into the molecular aspects of life - the central dogma.
- It explains molecular aspects of genes and its regulation- genome- gene expressions- heredity- recombination- protein synthesis- molecular basis of diseases- mutations- genetic analysis etc.

Course Outcome

At the end of the course,

- The student will get an idea about the principles behind molecular biology which makes students to understand the basic molecular tools and its application in basic research and applied research in various fields of life sciences.

Course Content

Module 1

1. **Nucleic acids** - DNA and RNA structure and functions, DNA as genetic material. Griffith, Avery- McCarty-MCLeod, Hershy- Chase, Franklin Conrat Experiments
2. **DNA Structure:** Chemistry of DNA, Forces stabilizing DNA structure, Helix parameters, Forms of DNA (A,B,C,D,T and Z), Watson – Crick and Hoogsteen base pairing , Physical Properties of ds DNA (UV absorption spectra Denaturation and renaturation), Chemical that react with DNA.

Module 2

3. **DNA topology:** DNA supercoiling, Supercoiled form of DNA, Superhelical density, Energetic of supercoiled DNA, Biology of supercoiled DNA (Topological domain of DNA,DNA topoisomerases, Mechanisms of supercoiling in cells, mechanisms of action of topoisomerase I and II, effect of supercoiling on structure of DNA and role of supercoiling in gene expression and DNA replication).
4. **Organization of DNA into chromosomes:** Packaging of DNA and organization of chromosome in bacteria and eukaryotic cells; packaging of DNA in eukaryotic nucleosome and chromatin condensation assembly of nucleosomes upon replication. Chromatin modification and genome expression.

Module 3

5. **Mutations-** molecular mechanism - types of DNA mutations and its significance. DNA repair - repair mechanisms - need of DNA repair, DNA recombination - molecular mechanism of recombination- relationship between repair and recombination, SOS mechanism. Proteins and enzymes involved DNA repair and recombination.
6. **DNA – Protein Interactions:** General features interaction of Helix- turn Helix motif, B sheet, Zn- DNA binding domain etc with DNA.

Module 4

7. **DNA Replication:** Mechanism of DNA polymerase catalyzed synthesis of DNA, types of DNA polymerases in bacteria and their role. Initiation of chromosomal DNA replication and its regulation in prokaryotes assembly of replisome and progress of replication fork, termination of replication. Types and function of eukaryotic DNA polymerases initiation of replication in eukaryotes, role of telomerases in replication of eukaryotic chromosomes. Inhibitor of DNA replication (Blocking precursor synthesis nucleotide polymerization, altering DNA structure).

Module 5

8. **Transcription:** RNA polymerases, features of prokaryotic and eukaryotic promoters. Strong and weak promoters. Assembly of transcription initiation complex in prokaryotes and eukaryotes and its regulation; synthesis and processing of prokaryotic and eukaryotic transcripts. Transport of RNA within eukaryotic cell. Regulatory elements of genes-promoters. Fate of mRNA.
9. **Translation- Synthesis and Processing of Proteome:** Structure and role of tRNA in protein synthesis, ribosome structure, basic feature of genetic code and its deciphering, translation (initiation, elongation and termination in detail in prokaryotes as well as eukaryotes), Post translational processing of protein (protein folding, processing by proteolytic cleavage, processing by chemical modification, inteins). Protein degradation.

Module 6

10. **Regulation of Gene expression in prokaryotes and eukaryotes:** Positive and negative regulation. lac-, ara-, his- and trp- operon regulation; antitermination, global regulatory responses; Regulation of gene expression in eukaryotes: Transcriptional, translational and processing level control mechanisms.
11. **DNA- transposable elements-** types of transposable elements, its importance in variation and evolution. Possible origin of virus, Oncogenes.

References

1. Advanced Molecular Biology	H.S. Bhamrah	Viva Books, Pvt. Ltd., New Delhi
2. Plant Biochemistry and Molecular Biology	Hans, Walter Held	Oxford, NY
3. Molecular Cell Biology	H.S. Bramrah	Anmol Publications Pvt. Ltd., New Delhi
4. Molecular Biology of the Gene	Watson, Baker, Bell, Gann, Levine, Losick	Pearson Education Pvt. Ltd., New Delhi
5. Apoptosis and Cancer chemotherapy	John A. Hickman & Caroline Dive	Humana Press, NJ
6. Molecular Modelling	Principles and Application, Andrew R. Leach	Longmann, England
7. PCR 3	Practical Approach, C. Simon Herrington & John O'Leary	Oxford, NY
8. Essential Molecular Biology	A Practical Approach, T.A. Brown	Oxford, NY
9. Cell & Molecular Biology	Concepts & Experiments Gerald Karp, John Wiley & Sons	NY
10. Gene VIII	Benjamin Lemin	Oxford University Press

Online resources:

Authentic Web based resources like NCBI, PubMed, Science direct etc.

BT 203 MATHEMATICS, COMPUTER SCIENCE, BIOINFORMATICS & RESEARCH METHODOLOGY

Aim

- To give an introduction to basic computational analysis and its applications
- To make the students understand what is Bioinformatics and Computational Biology- To make them aware the application of various computational tools in Bioinformatics and related subjects.
- To introduce to the world of various databases and its importance in biological research.
- Enable students to conduct scientific research. and also to analyze data and communicate the results in an appropriate fashion

Course Objectives

- The course explains the applications of computer in biotechnology and statistical analysis of experimental data and also basic research methodology adopted.
- The course gives an introduction on the origin and evolution of Bioinformatics and its importance in Biotechnology, Genomics and Proteomics.
- Various methods of genome analysis and proteome analysis is also described.
- It gives an outline on the various bioinformatics and computational tools used in analyzing protein, gene and genome data bases.
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Course outcome

At the end of the course,

- The student will be aware with a basic knowledge of modern molecular biology and genomics.
- The student will understand how theoretical approaches can be used to model and analyze complex biological systems.
- The students will also be able to understand the basics of how to perform scientific researches and also how to analyze and interpret a research problem

Course Content

MATHEMATICS

Module 1

1. Algebra

Complex numbers; algebra of complex numbers; geometrical representation; real and imaginary parts; modulus and arguments of a complex number; conjugate of a complex number- triangle inequality; club roots of unity.

2. Logarithms

Properties of logarithms- Common and Natural logarithms- Characteristics and Mantissa

3. Progression- arithmetic progression- Geometrical progression- harmonic progression.

4. Quadratic equations and Expressions

Theory of quadratic equations- relationship between their roots and coefficients; quadratic expressions; linear and quadratic inequations in one variable;

5. Binomial Theorem

Binomial expressions- Permutations and Combinations.

6. Calculus

Functions- into- onto and one-to-one functions; sum- difference- product and quotient of two functions; composite functions- inverse of a function- constant absolute value- greatest integer- polynomial - rational- trigonometric- exponential and logarithmic functions.

6. Analytical Solid Geometry

Analytical geometry of two dimensions and three dimensions, Central coincides, Paraboloids, Transformation of rectangular axes.

COMPUTER SCIENCE

Module 2

1. Computers- its application in biology- Basics
2. Basics of computer- Parts of a computer- hardware and software, operating systems- standard operating systems- MS DOS, Windows- Linux, Unix

Module 3

3. Programming - algorithms, binary language. Elements of programming languages- C++ and Perl
4. Standard software packages- Sigmaplot etc
5. Databases, Internet, Searching databases. Portals

BIOINFORMATICS

Module 4

1. **Information theory and biology:** Entropy, Shannon's formula, Divergence from equiprobability and independence, mark of chains, ergodic processes, redundancy.
2. **History and development of Bioinformatics, Database:** Various types of databases and its importance Use of databases in biology, - sequence databases, structural databases. Sequence Analysis- proteins and nucleic acids, structural comparisons, genome projects.

3. Sequence alignment-various methods, DNA sequence annotation and various programmes for sequence comparison and analysis.

Module 5

4. **Proteomics:** Sequence analysis of proteins, and nucleic acids, tools and techniques in proteomics, protein-protein interactions; post translational modification, methods of 2D structure predictions.
5. **Genomics:** Structural genomics- sequence analysis software like GCG etc, Functional genomics- Gene finder, genetic mapping, and linkage analysis, application of genetic maps, human genome project.

RESEARCH METHODOLOGY

Module 6

1. Introduction to research – The role of research, type of researches
2. Understanding research Concepts, Constructs, Variables, and Definitions
3. Problems and Hypotheses – Defining the research problem, Formulation of the research hypotheses, The importance of problems and hypotheses
4. Research design – Experimental and Non-experimental research design, Field research, and Survey research
5. Methods of data collection – Secondary data collection methods, qualitative methods of data collection, and Survey methods of data collection
6. Sampling techniques – The nature of sampling, Probability sampling design, Nonprobability, sampling design, Determination of sample size
7. Processing and analysis of data
8. Ethical issues in conducting research
9. Report generation, report writing

References

1. Bioinformatics- Concepts, skills and Application	S.C. Rastogi, N. Mendiratta, P. Rastogi ,	CBS Publishers and Distributors, New Delhi
2. Bioinformatics	M.M. Ranga,	Agrobios, Jodhpur
3. A Handbook of Bioinformatics	N. Yadav	Anmol Publication Pvt. Ltd, New Delhi
4. Fundamentals of Bioinformatics	I.A. Khan and A. Khanum	Ukaaz Publications, Andra Pradesh
5. Bioinformatics	The Machine Learning Approach	The MIT Press, USA
6. Proteomics	S.R. Pennington, M.J. Dunn	Viva Books Pvt. Ltd., New Delhi
7. Microarray Bioinformatics	Dov Stekel	Cambridge University Press
8. Algorithms on strings, trees, and sequences- Computer Science and Computational Biology	Dan Gusfield	Cambridge University Press
9. Analysis of DNA Microarray data	Steen Knudsen,	Wiley Liss NY
10. Mathematical models in	E.S. Allman, J.A. Rhodes	Cambridge University Press

Biology- An Introduction		
11. Bioinformatics- Sequence, structure and databanks	D. Higgins, W. Taylor	Oxford University Press
12. Bioinformatics for Geneticists	M.R. Barnes, I.C. Gray,	Wiley USA
13. Experimental Design and Data Analysis for Biologist	G.P. Quinn, M.J. Keough	Cambridge University Press
14. Research Methodology – Methods and Techniques”, 2nd Edition	C. R. Kothari	New Age International Publishers
15. Scientific Papers and Presentations-3rd Edition, Elsevier Inc	Davis, M., Davis K., and Dunagan M	Elsevier Inc
16. Research Methods for Science	Michael P. Marder	Cambridge University Press

BT 204 MICROBIOLOGY LAB

Aim

- To train students on the basic techniques of microbiology

Course Objectives

- The course gives an idea for the maintenance of laboratory and the practices that should be accomplished in a laboratory.
- The course explains the isolation and screening techniques of microbes and quality analysis of water.

Course outcome

On completion of the course candidates will achieve the following objectives,

- A detailed knowledge of structure, function and application of microorganisms.
- Skills in handling microorganisms in the laboratory.
- An understanding of applications of microorganisms in the industry, health-care, environmental protection, food agriculture and research.

Course Content

1. Isolation of bacteria from soil, water and air
2. Gram staining of bacteria
3. Methods of streaking of bacterial culture
4. Microbial analysis of drinking water by MPN
5. Microbial analysis of solid and liquid food items
6. Determination of dissolved oxygen of water
7. Estimation of Biological Oxygen demand (BOD) of wastewater or factory effluents, Determination of chemical oxygen demand (COD) of waste water
8. Estimation of nitrates in drinking water.
9. Study of bacterial flora of environment – Laboratories, soil, water, fermented foods and spoiled foods, commercial samples of water and drinks etc,
10. Bacterial growth - growth curve

BT 205 MOLECULAR BIOLOGY LAB

Aim

- To train students on the basic techniques of Molecular biology
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Course Objectives

- The course gives hands on training on the practical experiments and techniques in molecular biology

Course outcome

At the end of the course,

- The students will be made proficient in basic molecular biology skills and molecular biology laboratory techniques

Course Content

Laboratory techniques

1. Preparation of Buffers and solution for Molecular biology- TE buffer
2. Isolation of genomic DNA Preparation of Plasmid from known bacteria by alkaline lysis method- Preparation of solutions needed for the experiment
3. Estimation of DNA and purity checking by UV spectrophotometer
4. Agarose gel electrophoresis of plasmid and genomic DNA
5. Restriction analysis of plasmid DNA and evaluation of restriction sites
6. Construction of a recombinant plasmid Preparation of competent cells for transformation.

BT 301 PLANT BIOTECHNOLOGY

Aim

- To give an idea of plant tissue culture
- To introduce the various plant genetic engineering and transformations and its applications in various fields.

Course Objectives

- It gives introduction to the various transformation techniques employed in plant systems.
- It also describes the application of genetically modified plants in the various fields of science.

Course Outcome

At the end of the course,

- The students will gain an insight into the concepts and techniques of plant biotechnology and its application to crop plants
- They can also go for further research works during M.Phil and PhD courses

Course Content

Module 1

1. Plant cell -Plant cell and tissue and organ culture, principle - historical background
2. Plant tissue culture practical application and conventional plant breeding
3. Tissue culture media - composition and preparation- solid media and liquid media
4. Micro propagation of plants- initiation and maintenance of callus and suspension cultures- single cell clones.

Module 2

5. Organogenesis and somatic embryogenesis in plant tissue culture- development of whole -plants - Root formation, transfer of plant lets to the soil, hardening
6. Advantages of micropropagation in agriculture and horticulture
7. Shoot-tip meristem culture - raising virus free plants for rapid clonal multiplication of agricultural and horticultural plants

Module 3

8. Cell suspension cultures and its application in the production of secondary metabolites and single cell clones
9. Embryo culture and embryo rescue
10. Protoplast technology -protoplast isolation, fusion, protoplast culture, somatic hybridization, selection of somatic hybrid cells, culturing and development of somatic hybrid plants, symmetric and asymmetric hybrids, cybrids - Application of somatic hybridization plant improvement and breeding

Module 4

11. Somaclonal variation- significance in plant breeding
12. Production of haploid plants - anther and pollen culture, homozygous plants and its importance in genetics and plant breeding
13. Cryopreservation of plant cells, tissues and organs for germplasm conservation

Module 5

14. Plant genetic engineering - transgenic plants and its application in agriculture, different methods of plant genetic transformation
15. *Agrobacterium* mediated genetic engineering of plants, *Agrobacterium tumefaciens*, infection and molecular mechanism of tumor formation, Ti plasmids and RI plasmids, binary vectors, genetic markers, reporter genes and its application in genetic engineering,
16. Other methods of plant genetic transformation

Module 6

17. Metabolic engineering, Molecular plant breeding
18. Application of plant genetic engineering in agriculture, forestry and horticulture and industry, industrial application of transgenic plants, transgenic plants as bioreactors Chloroplast transformation.

References

1. Modern Concepts of Biotechnology	H.D. Kumar	Vikas Publishing House Pvt. Ltd., New Delhi
2. Role of Biotechnology in Medicinal and Aromatic Plants	Irfan A. Khan and Atiya Khanum	Ukaaz Publications, Hydreabad
3. Plant Tissue Culture	Kalyan Kumar D.	New Central Book Agency (P) Ltd, Calcutta
4. An introduction to Plant tissue Culture	M.K. Razdan	Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi
5. Biotechnology	B.D. Sigh	Kalyan Publishers New Delhi
6. Introduction to Plant Biotechnology	H.S. Chawla	Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi
7. Plant Biotechnology Recent Advances	P.C. Trivedi	Panima Publishing Corporation, New Delhi
8. Biotechnology	J.E. Smith	Cambridge University Press
9. Plant Biochemistry and Molecular Biology	Hans, Walter Held	Oxford, NY
10. Plant Cell, Tissue, and Organ Culture- Fundamental Methods	O.L. Gamborg, G.C. Philips	Narasa Publishing House, New Delhi

Online resources

Authentic Web based resources like NCBI, PubMed, Science direct etc.

BT 302 ANIMAL BIOTECHNOLOGY**Aim**

- To give an idea of animal tissue culture
- To introduce the various genetic and transformation techniques in animals and its applications in various fields.
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Course Objectives

- It gives introduction to the various transformation techniques employed in animal systems.
- It also describes the application of genetically modified animals in the various fields of science.
- The techniques of animal cell culture and its industrial and medical applications are described.

Course Outcome

At the end of the course,

- The students will gain an insight into the concepts and techniques of animal biotechnology and its wide industrial and medicinal applications.
- They can also go for further research works during M.Phil and PhD courses

Course Content**Module 1**

1. Animal cell - structure and organization, animal physiology.
2. Animal cell culture- Equipments and facilities for animal cell culture. Media and its preparation, pH and pH maintenance in culture media, role of carbon dioxide, serum and- serum free media, artificial media.

Module 2

3. Types of animal cell culture- primary and secondary cell culture, development cell lines or established cultures.
4. Biological characterization of cell cultures, contact inhibition, cell transformation, cancer cells, indefinite cell lines.
5. Measurement of cell viability, cytotoxicity.
6. Screening of cytotoxic compounds and its importance.

Module 3

7. Basic techniques of mammalian cell culture, methods of sub culturing.
8. Scaling up of cell cultures, bioreactors for animal cell cultures.

Module 4

9. Application of animal cell culture- industrial application, and clinical application- production. Stem cell research- types of stem cells, application of stem cells.
10. Somatic cell genetics, animal cloning and micromanipulation, apoptosis.

Module 5

11. Genetic engineering of farm animals - cloning vectors, viral vectors.
12. Methods of genetic transformations.
13. Transgenic animals and its uses.

Module 6

14. Gene therapy- methods of gene therapy
15. Ethical issues in animal biotechnology.

References

1. Modern Concepts of Biotechnology	H.D. Kumar	Vikas Publishing House Pvt. Ltd., New Delhi
2. Biotechnology- Fundamentals and Applications	S.S. Purohit & S.K Mathur	Agrobotanica , India
3. Agricultural Biotechnology	S.S Puroht	Agrobotanica , India
4. Fungi in Biotechnology	Anil Prakash	CBS Publishers, New Delhi
5. Biotechnology	B.D Singh	Kalyan Publishers, New Delhi
6. Biotechnology	J.E Smith	Cambridge University Press
7. Biotechnology	D. Balasubramanium, etal K.Dharmalingam, K.Jayaraman.	University Hyderabad
8. Animal Cell Culture	John R.W. Masters	Oxford University Press
9. Culture of Animal Cells	R.Ian Fresheny,	Wiley Liss Publication, New York

Online resources

Authentic Web based resources like NCBI, PubMed, Science direct etc.

BT 303 GENETIC ENGINEERING**Aim**

- To acquaint the students to the versatile tools and techniques employed in genetic engineering and recombinant DNA technology.

Course objectives

- To illustrate creative use of modern tools and techniques for manipulation and analysis of genomic sequences.
- To expose students to application of recombinant DNA technology in biotechnological research.
- To train students in strategizing research methodologies employing genetic engineering techniques.

Course outcome

At the end of the course,

- The student will achieve a sound knowledge on methodological repertoire which allows them to innovatively apply these techniques in in basic and applied fields of life science researches.

Course content**Module 1**

1. Genetic engineering as tool in biotechnology.
2. Milestones in the development of genetic engineering. Application of genetic engineering in biotechnology.
3. Molecular tools in genetic engineering - vectors, enzymes - restriction endonuclease.
4. DNA ligase, acid phosphatase and other DNA modifying enzymes.
5. Restriction enzymes - restriction analysis of genomes- restriction sites- cloning of blunt end DNA, adapters.

Module 2

6. DNA libraries- cDNA library. Genomic Library- Preparation of cDNA libraries and Genomic DNA libraries application of DNA libraries.
7. Gene cloning, gene expression.
8. DNA analysis: labeling of DNA and RNA probes. Southern and fluorescence *in situ* hybridization, DNA fingerprinting, chromosome walking.

Module 3

9. Techniques for gene expression: Northern and Western blotting, Gel retardation technique, DNA foot printing, Primer extension, S1 mapping, Reporter assays.
10. DNA sequencing and sequence assembly. Maxam-Gilbert's and Sanger's methods, techniques of in vitro mutagenesis, Site-directed mutagenesis, gene replacement and gene targeting, Shot gun sequencing, chemical synthesis of oligonucleotides; sequencing strategies for large genomes.

11. PCR- Principle and applications , Various types PCR.

Module 4

12. DNA mapping and DNA fingerprinting: Physical and molecular mapping, Hybridization and PCR based methods of fingerprinting.
 13. Vectors- and its uses in Genome sequencing.
 14. Cloning for gene expression- industrial production of animal and plant proteins in microbes - industrial application of genetic engineering- industrial production of recombinant proteins.

Module 5

15. Genetic engineering of eukaryotes- genetic engineering of plants and animals- vectors used for transformations - shuttle vectors.
 16. Protein engineering Metabolic Engineering, site directed mutagenesis.
 17. Application of genetic engineering in gene expression studies.
 18. Transgenic and gene knockout technologies to study molecular biology, chromosome engineering.

Module 6

19. Molecular markers. DNA based and **PCR - based markers** , RFLP, RAPD, RLGS, AFLP STS, EST, SSCP, VNTR, Multi locus probes, Microsatellites and minisatellites, STMS, DAF, AP-PCR .
 20. Gene therapy.

References

1. Biotechnology - Fundamentals and Applications	S.S. Purohit & S.K Mathur	Agrobotanica , India
2. Agricultural Biotechnology	S.S. Purohit	Agrobotanica , India
3. Biotechnology - Fundamentals and Applications	S.S. Purohit & S.K Mathur	S.S. Purohit & S.K Mathur
4. Molecular Biotechnology	S.B. Primrose	Panama Publishing Corporation, New Delhi
5. Text Book of Biotechnology	C.R. Chhatwal	Anmol Publications pvt Ltd, New Delhi
6. Applied Molecular Genetics	R .L. Miesfeld ,	Wiley Liss ,New York

Online resources

Authentic Web based resources like NCBI, PubMed, Science direct etc.

BT 304 PLANT BIOTECHNOLOGY/ ANIMAL BIOTECHNOLOGY LAB**Aim**

- To train students on basic and plant and animal cell and tissue culture techniques.

Course Objectives

- The course gives hands own experience in the tissue culture of plant and animal cells.

Course outcome

At the end of the course,

- The student will be well versed with the theoretical as well as practical background knowledge in plant and animal sciences need for understanding plant and animal biotechnology.
- The will gain working knowledge of laboratory techniques used in plant biotechnology.

Course Content**Laboratory techniques**

1. Preparation tissue culture Media, methods surface sterilization of explants
2. Stock preparation and calculations
3. Organ culture. Induction of callus, callus propagation, Organogenesis and transfer of plantlets to soil
4. Protoplast isolation, cell counting viability studies
5. Culturing of protoplast and regeneration of plants/ tissues from protoplasts
6. Production of haploids by anther culture, cytological examination of chromosomes in regenerated plants
7. Estimation of phenols from callus cultures
8. Preparation media for animal cell culture, sterilization by membrane filtration
9. Cell counting and viability checking by vital staining Sub culturing
10. Cytological examination of cultured cells

Practicals

BT 305 GENETIC ENGINEERING LAB**Aim**

To introduce the students to the concepts and practice of genetic engineering.

Course Objectives

- To understand the basics of genetic engineering.
- To learn different methodologies in genetic engineering.
- To enable students to design a cloning experiment.

Course Outcome

At the end of the course,

- Students obtain a thorough knowledge in basic Molecular biology and genetic engineering methods practiced in research.

Course content**Laboratory techniques**

1. Isolation of plasmids and purification
2. Electrophoretic separation of plasmid by agarose gel electrophoresis
3. Quantification and quality checking by UV spectrophotometry and electrophoresis
4. Restriction analysis and construction of restriction map of plasmid
5. Preparation of competent *E.coli* cells, Construction of recombinant plasmid
6. Genetic Transformation of *E.coli* with a recombinant plasmid
7. Screening transformed cells for the presence of recombinant plasmid and gene
8. Transformation frequency and cloning efficiency

BT 401 IMMUNOLOGY**Aim**

- To get introduced to the principles of immune systems of animals.
- To introduce to the world of molecular and diagnostic techniques of immunology, immunotechniques and its application.

Course Objectives

- This course is designed to impart the students the importance of immunology and its theoretical aspects and on the principles of immunology and immunotechnology
- The application of immunology in medicines is also dealt with.
- It also explains the various antigen-antibody reactions involved in diseases, stem cell technology and vaccine development.

Course Outcome

At the end of the course the students will,

- Get a deep foundation in the immunological processes.
- Students will gain knowledge on how the immune system works and also on the immune system network and interactions during a disease or pathogen invasion.

Course Content**Module 1**

1. History and scope of immunology. Types of immunity- innate, acquired, passive and active. Brief account on Immune system, Physiology of immune response- HI and CMI specificity and memory. Antigen-antibody reactions. Antigens- types- hapten.
2. Immunoglobulins- structure, distribution and function.

Module 2

3. Lymphoid tissues- ontogeny and physiology of immune system- origin and development, differentiation of lymphocytes.
4. Antigen distribution in population- HLA in human health and disease. Transplantation immunity- organ transplantation and HLA tissue typing.

Module 3

5. Effector mechanisms in immunity- macrophage activation. Cell mediated cytotoxicity.
6. Humoral and cell mediated immunity, Hypersensitivity reactions. Cellular interactions in human response.

Module 4

7. Antigen recognition. Lymphocyte activation, clonal proliferation, differentiation.

8. Cytokines in immunity, Interleukines and their role.

Module 5

9. Genetic Immuno regulations. Introduction to tumour immunology, autoimmune disorders.
10. Use of transgenic animals in mmunology, experimental immunology, vaccine, development, stem cell technology. Immunodiagnostics.

Module 6

11. Hybridoma technology and monoclonal antibody production, application and their uses. Cloning for vaccine development
12. Immunotechniques – ELISA, RIA, Immuno-electrophoresis, Immuno Diffusion, Western Blotting.

References

1. Immunology	Joshi. Osma	Agro Botanica N.Delhi
2. Instant notes in Immunology	Lydyard, helean, Fanger	Viva Books N.Delhi
3. An introduction to Immunology	CV Rao	Narosa N.Delhi
4. Immunology	Janus Kuby	Freeman NY
5. Principles of cellular and molecular Immunology	Jonathan Austin, Kathyryn Wood	Oxford NY
6. Immunology	Goldsby, Kindt, Osborne, Janus Kuby	Freeman NY
7. Medical Immunology	Parslow, Stites, Tera, Imboden	Mc Graw Hill NY
8. Cellular and molecular Immunology	Abbas, Lichman, Pobeas,	Harcourt & Brace Co.

Online resources

Authentic Web based resources like NCBI, PubMed, Science direct etc.

Aim

- To give an introduction to the various aspects of environmental biotechnology to students.

Course Objectives

- The course explains the application of biotechnology in environment.

Course outcome

At the end of the course the students will,

- Obtain knowledge on basic principles and technologies of decontamination of persistent organic pollutants (dangerous contaminants of the environment) mainly by means of the biological approaches i.e. using bioremediation etc.
- The students will know about the principles and techniques underpinning the application of biosciences to the environment

Course Content**Module 1**

1. Issues and scopes of environmental biotechnology.
2. Pollution- types of pollution, methods for measurement of pollution, Environmental management-problem solving approaches- its limitations.

Module 2

3. Biological wastewater treatment- Waste water characterization: COD, BOD,
4. Inorganic constituents, solids, biological components.
5. Principles and aims of biological wastewater treatment processes,
6. Biochemistry and microbiology of inorganic phosphorus and nitrogen removal.

Module 3

7. Suspended growth technologies: Activated sludge, oxidation ditches, waste stabilization ponds etc. Fixed film technologies: Trickling filters, rotating biological contactors, fluidized bed etc.
8. Anaerobic waste water treatment systems: RBC, UASB, Anaerobic filters.

Module 4

9. Environmental problems and treatment of industrial waste waters: Distillery, tannery, paper pulp etc.
10. Toxicity testing in waste water treatment plants.
11. Solid waste management: Anaerobic digestion, Composting.

Module 5

12. Biodegradation of organic pollutants:

Mechanisms and factors affecting biodegradation. Pollution problems and biodegradation of simple aliphatic, aromatic, polycyclic aromatic hydrocarbons, halogenated hydrocarbons, azo dyes, lignin and pesticides.

13. Bioremediation: Biostimulation and bioaugmentation , *In situ* and *ex situ* bioremediation technologies for various pollutants and sites. Bioremediation of oil spills and heavy metal pollution. Use of GMO in bioremediation. Biofiltration of polluted air.

Module 6

14. Biogeotechnology: Bioleaching of metals, biobeneficiation, microbially enhanced oil recovery, biodesulfurization of coal.
15. Microbes in the environment- Biofilms and its relevance in microbial survival, its effect in the environment.
16. Microbial Insecticides: Biopesticides. Bacterial, fungal and viral insecticides

References

1. Biotechnology – Fundamentals and application	SS Purohit SK Mathur	Agrobotanica, India
2. Agricultural Biotechnology	SS Purohit	Agrobotanica, India
3. Concepts in Biotechnology	Balasubraminan, Bryce, Dhramalingam, Jayraman	UTY Press. Hyderabad
4. Fungi In Biotechnology	Anil Praksah	CBS N. Delhi
5. Biotechnology	BD Singh	Kalyani Publishers
6. Environmental Biotechnology	Alan Scragg	Longman England
7. Biotechnology Unzipped	EricS grace	UTY Press. Hyderabad
8. Biotechnology	JE Smith	Cambridge UTY Press

Online resources

Authentic Web based resources like NCBI, PubMed, Science direct etc.

TECHNOLOGY

Aim

- To introduce Food and Dairy biotechnology to non-biotechnology students
- To introduce the subject of bioprocess technology in details
- To explain the industrial aspects of Biotechnology for the production of various of industrial products of biological origin.

Course Objectives

- The course explains the role of biotechnology in food and dairy technology.
- It gives details about the conversion of a small scale laboratory process in to a large scale industrial process.
- It also deals with the various important products produced by the bioprocess techniques.

Course Outcome

At the end of the course the students will,

- Get a detailed insight into the industrial processes carrying out in the food and dairy sector as well as how to transfer a small scale laboratory process to a large scale industrial process.

Basics of Bioprocess Technology

Module 1

1. Introduction to Bioprocess Technology – Scaling up of a Bioprocess , Upstream Processing , Downstream Processing,
2. Fermentation- Types of Fermentation, Its significance in Industry, Submerged Fermentation and Solid state fermentation, batch fermentation and continuous fermentation, Chemo stat Fermentation.

Module 2

3. Upstream Processing – Sterilization, Media Components, Cell cultures, its isolation and maintenance, strain improvements –methods of strain improvements, inoculation of microorganisms
4. Upstream Processing – Importance of downstream processing and methods of downstream processing , centrifugation, filtration, precipitation, dialysis,, Chromatographic techniques- gel filtration, ion exchange chromatography and affinity chromatography, electrophoresis, capillary electrophoresis, Quality assurance techniques and its importance in marketing.

Module 3

5. Bioreactors - types of bioreactors , factors affecting the design of bioreactors
6. Industrial microorganisms and cultivation of microorganisms in bioreactors, Kinetics of microbial growth.
7. Culture media sterilization for industrial application. Air in Bioreactors, pH maintenance in bioreactors

Module 4

8. Down stream processing and purification of products
9. Industrial bio-production of chemicals - and antibiotics

Module 5

Food and Dairy Biotechnology

10. Introduction to Food Technology - application of biotechnology in food processing use of food modifying enzymes - amylase, proteases, lipases etc.
11. Elementary idea of canning and packing - sterilization and pasteurization of food products

Module 6

12. Introduction to Food microbiology, Dairy microbiology, Microbial processing of milk and milk products. Sterilization and Pasteurization of milk and dairy products, Fermentation of milk, biochemical and physical changes associated with the process- Industrial processing of milk and production of food products - bread, cheese, butter, ghee and other value added products.

References

1. Modern Concepts in Biotechnology	HD Kumar	Vikas N. Delhi
2. Food Science	Potter & Hotchkiss	CBS N. Delhi
3. Food Microbiology	MR Adams and Moss	Panama N. Delhi
4. Food Processing- Biotechnological applications	Marwah & Arora	Asiatic Publ. N. Delhi
5. Biotechnology	JE Smith	Cambridge UTY Press
6. Perspectives in Nutrition	Gordon M Warlow	Mc Graw Hill NY

Online resources

Authentic Web based resources like NCBI, PubMed, and Science direct etc.

- Project work shall be assigned individually / a group of students not exceeding 4 nos.
- It must be carried out under the guidance of a faculty from the same college with or without an external guide OR in an external institution under the combined guidance of internal and external guides.
- The student has to submit the dissertation before the external examiner appointed by the University for Evaluation and may give a presentation on the project work, if asked for.

BT 405 GENERAL VIVA VICE EXAMINATION

General viva voce on theoretical and practical aspects based on the courses covered from semester I to IV.



UNIVERSITY OF KERALA
Thiruvananthapuram

DRAFT

M.Sc. Zoology - Semester System

Revised syllabus
(for 2020 admissions onwards)

March 2020

UNIVERSITY OF KERALA

M.Sc. Zoology - Semester System
Revised Syllabus, Course Structure & Mark Distribution

Semester	Paper Code	Title	Distribution of hours / semester			Duration of P (Hrs)	Maximum Marks		
			L	T	P		CA	ESA	Total
1	ZO 211	Systematics & Evolutionary Biology	100	5	-	3	25	75	100
	ZO 212	Biochemistry	100	5	-	3	25	75	100
	ZO 213	Biophysics, Instrumentation & Computer Science	100	5	-	3	25	75	100
	ZO 214	Practical	120	-	10	4	25	75	100
	Total for S 1		450*	15	10	-	100	300	400
2	ZO 221	Advanced Physiology & Functional Anatomy	100	5	-	3	25	75	100
	ZO 222	Genetics, Quantitative Analysis & Research Methodology	100	5	-	3	25	75	100
	ZO 223	Cell Biology, Molecular Biology & Bioinformatics	100	5	-	3	25	75	100
	ZO 224	Practical	120	-	10	4	25	75	100
	Total for S 2		450*	15	10	-	100	300	400
3	ZO 231	Microbiology & Biotechnology	100	5	-	3	25	75	100
	ZO 232	Ecology, Ethology & Biodiversity Conservation	100	5	-	3	25	75	100
	ZO 233	Immunology & Developmental Biology	100	5	-	3	25	75	100
	ZO 234	Practical	120	-	10	4	25	75	100
	Total for S 3		450*	15	10	-	100	300	400
4	ZO 241	Special Paper 1	100	8	-	3	25	75	100
	ZO 242	Special Paper 2	100	7	-	3	25	75	100
	ZO 243	Special Paper Practical 1	100	-	5	3	25	75	100
	ZO 244	Special Paper Practical 2	120	-	5	4	25	75	100
	Total for S 4		450*	15	10	-	100	300	400
	ZO 201	Project	-	-	-	-	25 marks	75 marks	100
	ZO 202	Comprehensive Viva Voce	-	-	-	-	-	100	100
Grand Total			-	-	-	-	400	1400	1800

L - Lecture, P - Practical; T - Tutorial; CA Continuous Assessment; ESA - End Semester Assessment;

*** Tutorial 30 hours per week**

UNIVERSITY OF KERALA
M.Sc. Zoology – Semester System
Revised syllabus (2019)

Semester I
ZO 211 Systematics and Evolutionary Biology

Total 100 hours (50+50 hrs)

AIM: To introduce the nature and scope of various aspects of Systematics, Animal taxonomy and Classification practiced in biological science with special reference to Animal Science.

COURSE OBJECTIVES: To impart knowledge on the basic aspects on Animal taxonomy and classification and demonstrate knowledge and understanding the naming of the species and get the idea about the phylogeny and evolutionary history.

Systematics (50hrs)

Module 1. Definition and basic concepts of systematics and taxonomy (5 hrs)

- 1.1. Historical resume of systematics
- 1.2. Importance and applications of systematics in biology
- 1.3. Material basis of systematics

Module 2. Taxonomic tools and techniques (15 hrs)

- 2.1. Taxonomic Procedures-collection, preservation, curation and process of identification.
- 2.2. Taxonomic characters of different kinds-quantitative and qualitative analysis of variation, Process of typification, different zoological types (holotype, paratype etc) and their significance.
- 2.3. Taxonomic keys-different kinds of taxonomic keys, their merits and demerits
- 2.4. Systematic publications- preparation of taxonomic publications
- 2.5. International code of zoological nomenclature, its operative principles, Implication and application of important rules
- 2.6. Zoological nomenclature – formation of scientific names of various taxa (Homonymy and Synonymy)

Module 3. Taxonomic characters and dimensions of speciation (15 hrs)

- 3.1. Taxonomic characters- different kinds, origin of reproductive isolation, biological mechanism genetic incompatibility
- 3.2. Dimensions of speciation-types of lineage changes. Production of additional lineage.
- 3.3. Species concept- species category, different species concepts, sub species, deme and other intra specific categories, hierarchy of categories

Module 4. Trends in systematic (15 hrs)

- 4.1. Chemotaxonomy
- 4.2. Cytotaxonomy
- 4.3. Molecular systematics
 - 4.3.1. Recent trends based on proteomics and genomics
 - 4.3.2. DNA bar coding and Barcoding of life

4.3.3. Phylogenetic trees

Evolutionary Biology (50 hrs)

Module. 5. Cosmic evolution and the Origin of life (5 hrs)

- 5.1. Cosmic evolution: Origin of the Universe, matter-time-space continuum. Theory of oscillating universe. Origin of galaxies, stellar systems, planets – earth
- 5.2. Origin of Life- Physical basis of life, extra terrestrial life.

Module. 6. Molecular Evolution (15 hrs)

- 6.1. Gene evolution
- 6.2. Evolution of gene families, molecular drive
- 6.3. Amino acid sequence divergence in proteins
- 6.4. Nucleotide sequence divergence in DNA
- 6.5. Molecular clocks
- 6.6. Ancient DNA

Module. 7. Biochemical and genomic evolution (15 hrs)

- 7.1. The evolutionary history of proteins and concept of molecular clock
- 7.2. Outline of origin of prokaryotic and eukaryotic genomes
- 7.3. The “C-Value paradox”.
- 7.4. Evolutionary history of neural integration
- 7.5. Evolution of the endocrine systems, Hormones and evolution.

Module. 8. Origin of Higher Categories (15 hrs)

- 8.1. Origin of Metazoa, theories of origin
- 8.2. Origin, Evolution and extinction of Trilobites
- 8.3. Origin and evolution of vertebrate groups- Pisces, Amphibia, Reptilia, Aves and mammals
- 8.4. Phylogenetic gradualism and punctuated equilibrium
- 8.5. Micro and Macro evolution
- 8.6. Stages in Primate Evolution- Prosimii, Anthroidea and Hominids. Factors in human origin-Hominid fossils.
- 8.7. Cytogenetic and Molecular basis of origin of man-African origin of modern man-Mitochondrial Eve, Y chromosomal Adam, - early migration, hunter-gatherer societies.
- 8.8. Evolution of human brain-communication, speech and language. Evolution of culture.

References

- 1. Alfred J.R.B and Ramakrishna.2004. Collection, Preservation and Identification of Animals. Zoological Survey of India Publications.
- 2. Benton,M.J.2005 93rdedn.). Vertebrate Paleontology, Blackwell Publishing Com. Oxford, Uk

3. Campbell, N.A and J.B.Reece.2009. Biology (8thedn). Benjamin Cummings Publ.NY,USA
4. David,M.H, Craig Moritz and K.M. Barbara. 1996. Molecular Systematics. Sinauer Associates, Inc.
5. Hick,amJr,Cleveland, Lary Roberts, Susan Keen, Allan Larson, David Eisenhour. 2011. Animal Diversity. McGraw-Hill Companies, Inc.NY
6. Kapoor, V.C. 1991. Theory and Practice of Animal Taxonomy. Oxford and IBH Publishing Co., Pvt Ktd. New Delhi.
7. Margulis, Lynn and M.J. Capman (4thedn.). Kingdoms and Domains: An Illustrated Guide to the Phyla of Life on Earth. W.H. Freeman & Company, USA
8. Mayr, E. 1969. Principles of Systematic Zoology. McGraw Hill Book Company, Inc., NY.
9. Mayr, E.1997. this is Biology: The Science of Living world. Universitites Press Ltd.
10. Narendran, T.C. 2008. An introduction to Taxonomy. Zoological survey of India.
11. Pat Willmer. 1996. Invertebrate Relationships-patterns in animal evolution. Cambridge University Press
12. Rupert E.Edward., R.S.Fox and R.D.Barnes. 2006. Invertebrate Zoology:
13. A Functional Evolutionary Approach. Thomson/Cole, Singapore Simpon:
14. Waterman, A.J.1971. Chordate Structure and Function. Macmillan Co. London
15. Winston, J.E.2000. Describing species: Practical taxonomic procedure for biologists. Columbia University Press, Columbia
16. Young, J.Z.1950. Life of Vertebrates. Clarendon Press, Oxford, UK
17. Arthur, W.2011. Evolution – A Developmental Approach, Wiley-Blackwell, Oxford, UK
18. Benton, M.J.2005(3rdedn). Vertebrate Paleontology. Blaxkwell Publishing Com. Oxford, Uk
19. Camilo J.Cela – Conde and Frannccisco J. Ayala. 2007. Human Evolution-Trails from the Past. Oxford University Press. Oxford, UK
20. Campbell.B.G.2009. Human Evolution. Transaction Publishers, NJ, USA
21. Charles W. Fox and Janson B.Wolf. 2006. Evolutionary Genetics-Concepts and Case Studies. Oxford University Press, NY. USA
22. Carroll, SB.2005. Endless Forms Most Beautiful: the New Science of Evo-Devo. WE Norton, New York
23. Cleveland P. Hickman, Jr., Larry S. Roberts and Allan Larson. 2001. Integrated Principles of Zoology. (11thedn). McGraw-Hill, NY, USA
24. Darwin, C.D.1859. On the Origin of Species by Means of Natural Selection. John Murray, London.
25. Dan, G. and Li,W.H.2000. Fundamentals of Molecular Evolution. (2ndedn). Sinauer Associates Inc. MA, USA
26. Elliott, Sober.2008. Evidences and Evolution. The logic behind the science. Cambridge University Press, UK
27. Futuyma, D.J. 1986. Evolutionary Biology)2nd edn0. Sinauer Associates Inc. MA, USA
28. Gould, S.J, 2002. The Structure of Evolutionary Theory. Harvard University Press, MA, USA
29. Hall, B.K and Hallgrimsson, B. 2008. Strickberger's Evolution (4thedn). Jones and Bartlett Pub.London, UK

30. Hall, B.K. and Olsen, W.M., (Ed). 2007. Keywords and Concepts in Evolutionary Developmental Biology. Discovery publishing House, New Delhi,
31. Hall, B.K., Pearson, R. and Mullae, G.B.2003. Environment, Evolution and Development: Toward a Synthesis. MIT Press, Cambridge MA, USA
32. Kimura, M. 1983. The neutral theory of molecular evolution. Cambridge University Press
33. Margulis, L and Michael J.C. 1998. Kingdoms&Domains: An Illustrated Guide to the Phyla of Life on Earth (4thedn). W.H. Freeman and Company, USA
34. Niles Eldredge. 2000. Life on earth: an encyclopedia of biodiversity, ecology and evolution (Vol.1 &11). ABC-CLIO, Inc. CA, USA
35. Rupert E. Edward., R.S. Fox and R.D. Barnes. 2006. Invertebrate Zoology:
36. A functional Evolutionary Approach. Thomson/Cole, Singapore
37. Stearns c.S. 1987. The evolution of sex and its consequences. Birakhauser, Basel, Switzerland
38. Strickberger, M.W. 2005. Evolution. Jones and Bartett Publishers, London.
39. West-Eberhard M.J. 2003. Developmental Plasticity and Evolution. Oxford University Press, oxford, UK
40. Web Resources
41. <http://www.talkorigins.org>
42. <http://www.ucmp.berkeley.edu>
43. <http://www.academicearth.org>

ZO 212 BIOCHEMISTRY

(100 hrs)

AIM: To introduce the nature and scope of various aspects of Biochemistry and Synthetic Biology.

COURSE OBJECTIVES: To impart knowledge on various biochemical molecules and path ways in life processes. Also demonstrate knowledge and understanding of the molecular machinery of living cells, the principles that govern the structures of macromolecules and their participation in molecular recognition, and understanding of the principles and basic mechanisms of metabolic control and molecular signaling.

Module I Introduction

(6hrs)

- 1.1. Atoms and molecules, intermolecular and intramolecular interactions Bonds-covalent and electrovalent bonds, ionic bond, hydrogen bond.
- 1.2. Water: Biological importance, pH and Acid – base balance. Buffers: Biological importance.
- 1.3. Unique solvent properties; electrolytic dissociation into cations and anions, Henderson – Hasselbalch equation.

Module 2 Carbohydrates

(12 hrs)

- 2.1. Classification and nomenclature
 - 2.1.1. Monosaccharides: Biological importance, Glucose, fructose, galactose, mannose and ribose. Isomerism – Structural isomerism and stereoisomerism, optical isomerism, Epimerism and Anomerism.

- 2.1.2. Reactions of monosaccharides: Oxidation, reduction ester formation, Osazone formation. Glycosidic bond.
- 2.1.3. Disaccharides: Sucrose, Lactose, Maltose, Isomaltose, Cellobiose and Trehalose.
- 2.1.4. Polysaccharides— Homopolysaccharides – Starch, glycogen, cellulose, Chitin, Dextran, Inulin, Pectin. Heteropolysaccharides- Hyaluronic acid, Heparin, Chondroitin sulphate, Keratan sulphate, Dermatan sulphate and Agar-agar. Glycoproteins and Mucoproteins.

Module 3 Proteins (10 hrs)

- 3.1.1. Amino acids: Structure, classification and properties of amino acids. pK value and iso-electric point of amino acids. Peptide and peptide synthesis. Reactions (due to carboxyl group, amino group and side chains). Colour reactions of amino acids and proteins.
- 3.2.1. Proteins—structure and classification—primary structure of protein (eg. Insulin).
- 3.2.2. Secondary structure- Alpha helix, Collagen helix, Beta pleated sheet, Ramachandran angles and Ramachandran map.
- 3.2.3. Fibrous proteins—examples (Keratin Collagen, Elastin, Resilin, Fibrous muscle proteins). Chaperons.
- 3.2.4. Tertiary structure—Globular protein- eg Myoglobin.
- 3.2.5. Quaternary structure- eg Haemoglobin
- 3.2.6. Tissue protein in health and diseases, -collagen, structure and synthesis, abnormal collagens, elastin, keratins, muscle proteins, lens proteins and cataract.

Module 4 Lipids (10 hrs)

- 4.1.1. Classification of lipids: Simple, compound and derived lipids. Biological importance of lipids.
- 4.1.2. Fatty acids: classification, nomenclature.
- 4.1.3. Simple fats: Triacylglycerol (Triglycerides) – Physical properties. Reactions – Hydrolysis, Saponification, Rancidity. Acid number, Saponification number, Iodine number oxidation, Ketosis, Reichert- Meissl-Wollny value
- 4.1.4. Compound lipids: Phospholipids- Lecithin, Phosphatidyl inositol, Cephalins, plasmalogens, Glycolipids, Sphingolipids
- 4.1.5. Steroids: Biologically important steroids-cholesterol, Vitamin D, Bile acids, Ergosterol, Terpenes. Prostaglandins- Structure, types, synthesis and functions.
- 4.1.6. Lipoproteins.

Module 5 Nucleic Acids (8hrs)

- 5.1.1. Structure of nucleic acids and nucleotides: Structural organization of DNA (Watson-Crick model) Characteristic features of A, B, C and Z DNA. Structural organization of tRNA and micro RNA stability of proteins and nucleic acids.
- 5.1.2. Protein-nucleic acid interactions. Electrostatic interaction, hydrogen bonding stacking interactions.

- 5.1.3. DNA binding proteins-DNA regulatory proteins, folding motifs, finger motifs, Zipper motifs, conformation flexibilities.
- 5.1.4. Biological roles of nucleotides and nucleic acids.

Module 6 Enzymes (10 hrs)

- 6.1.1. Classification- (I.U.B.system) co-enzymes, iso-enzymes, ribozyme.
- 6.1.2. Enzyme specificity.
- 6.1.3. Mechanism of action of enzymes. Formation of enzyme substrate complex. Various theories.
- 6.1.4. Enzyme kinetics: Michaelis-Menten equation. K_m value and its significance. Enzyme velocity and factors influencing enzyme velocity. Enzyme inhibition- suicide inhibition and feedback inhibition.
- 6.1.5. Enzyme regulation: Types of regulation, Allosteric regulations-Key enzymes, Covalent modification.

Module 7 Carbohydrate Metabolism (8hrs)

- 7.1.1. Major metabolic pathways: Glycolysis – Fate of pyruvate. Citric acid cycle and its significance; Oxidative & substrate level phosphorylation. Pentose phosphate pathway (self study).
- 7.1.2. Gluconeogenesis, Cori cycle
- 7.1.3. Glucogen metabolism: Glycogenesis, Glycogenolysis, adenylate cascade system Ca^{+2} Calmodulin-sensitive phosphorylase kinase. Regulation of glycogen synthesis
- 7.1.4. Inborn errors associated with carbohydrate metabolism. Glycogen storage disease, Lactose intolerance, Galactosuria
- 7.1.5. Factors maintaining blood glucose, Normal plasma glucose level, OGTT oral glucose tolerance test

Module 8 Metabolism of Proteins, Amino acids and nucleic acids (10 hrs)

- 8.1.1. Amino acid metabolism: Deamination, Transamination and Trans-deamination, decarboxylation
- 8.1.2. Formation and disposal of ammonia. Urea cycle.
- 8.1.3. Fate of carbon skeletons of amino acids: glucogenic, ketogenic, partly glucogenic and ketogenic with examples.
- 8.1.4. Synthesis of biologically significant compounds from different amino acids with special reference to glycine, glutamic acid, phenylalanine, tyrosine and tryptophan.
- 8.1.5. Catabolism of purines and pyrimidines
- 8.1.6. Heme synthesis and break down – Structure, biosynthesis, porphyrins, bilirubin metabolism, plasma bilirubin, jaundice

Module 9 Metabolism of Lipids (6 hrs)

- 9.1.1. Beta oxidation, alpha oxidation and omega oxidation of fatty acids.
- 9.1.2. Formation of ketone bodies, ketosis and keto acidosis
- 9.1.3. De novo synthesis of fatty acids and fatty acid metabolism
- 9.1.4. Biosynthesis and regulation of cholesterol, Metabolism of cholesterol.

9.1.5. Metabolism of Triglycerides.

Module 10 Energy Metabolism **(8hrs)**

- 10.1. Energy rich compounds and their biological significance
- 10.2. Biological oxidation- Mitochondrial electron transport, oxidative phosphorylation, ATP synthesis, Chemo-osmotic theory

Module 11 Detoxification **(3 hrs)**

- 11.1. Formation of toxic compounds in the body
- 11.2. Detoxification- oxidation, reduction, hydrolysis and conjugation

Module 12 Free radicals and anti oxidants **(3 hrs)**

- 12.1. Free radicals and antioxidants, Generation of free radicals. Reactive oxygen species. Damage produced by free radicals, Free radical scavenger systems.
- 12.2. Lipid peroxidation. Preventive antioxidants.

Module 13 Biochemistry of aging **(3 hrs)**

- 13.1. Cellular aging
- 13.2. Diseases associated with aging – e.g. Alzheimer's.
- 13.3. Prions, Apoptosis

Module 14 Clinical biochemistry (3 hrs)

- 14.1. Introduction to clinical biochemistry
14.2. Analysis of diseases (Diabetes etc)

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ZO 213 Biophysics, Instrumentation and Computer Science (100 hours)

Biophysics (25 hrs)

AIM: To introduce the principle behind the functioning of various instruments, their functioning and application of various computer programmes in biological laboratories.

COURSE OBJECTIVES: To get knowledge and understanding of the application of instruments in biological laboratory and the application of various computer programmes and packages in research.

Module 1 Thermodynamics (5 hrs)

- 1.1. Introduction-Concept of energy and laws of Thermodynamics
- 1.2. Matter and energy-Life as an energy system-order, disorder, Entropy, Enthalpy.
- 1.3. Photo bioenergetics: Photosynthesis – light and dark reactions, Redox couple and redox potential
- 1.4. Chemo-bioenergetics: electron transport and oxidative phosphorylation, Chemiosmotic theory and binding change mechanism of ATP synthesis.
- 1.5. Life as an autocatalytic system

Module 2 Electromagnetic spectrum (8 hrs)

- 2.1. Cosmic radiation – Gamma radiation, X-rays, UV – radiation, visible spectrum, infrared rays, microwaves and radiowaves.
- 2.2. Biological applications

Module 3 Radiation Biophysics (8 hrs)

- 3.1. Radioactivity; Detection and measurement of radiation
- 3.2. Radio-labelling methods,- detection and measurement of different types of radioisotopes and their applications I biology, incorporation of radioisotopes in biological tissues and cells, molecular imaging of radioactive material and safety guide lines
- 3.3. Ionizing radiation and induced mutations
- 3.4. Fluorescence.
- 3.5. Nuclear medicine-Internally administered radioisotopes. Radioiodine inthyroid function analysis. Renal, liver and lung function analysis.

Module 4	Nanotechnology	(4 hrs)
4.1.	Introduction to Nanobiology	
4.2.	Nanosensors and Nanomedicines	
Instrumentation		(50 hrs)
Module 5	Methodology and working of microscopes	(15 hrs)
5.1.	Phase contrast microscope	
5.2.	Fluorescent microscope	
5.3.	Electron microscopes – TEM and SEM, different fixation techniques for Em, Freeze etch and freeze fracture methods for EM,	
5.4.	Laser scan confocal microscope	
5.5.	Environmental scanning electron microscope	
Module 6	Centrifugation	(8hrs)
6.1.	Ordinary, high speed centrifuge	
6.2.	Density gradient centrifugation.	
6.3.	Ultracentrifugation	
Module 7	Electrophoresis	(7 hrs)
7.1.	Principle	
7.2.	Gel electrophoresis – SDS PAGE, Agarose Gel Electrophoresis	
7.3.	High voltage electrophoresis	
7.4.	Immuno electrophoresis- principle and application	
Module 8	Chromatography	(5 hrs)
8.1.	Principle	
8.2.	Column chromatography, Ion exchange chromatography, HPLC, Gas chromatography	
Module 9	Biophysical methods	(15 hrs)
9.1.	Colorimeter, spectrophotometer, flame photometer	
9.2.	Atomic absorption spectrophotometer, florescent spectrometer	
9.3.	Infrared spectrophotometry, NMR and EMR spectrophotometry, Different types of Mass spectrometry and surface plasma resonance methods.	
9.4.	Molecular snalysis using UV/ visible light, fluorescence, circular dichroism	
9.5.	Molecular structure determination using X ray diffraction	
9.6.	Electrophysiological methods-simple neuron recording, patch clamp recording, ECG, Brain activity recording, Lesions and stikulation of brain, pharmacological testing, PET (Positron emission tomography), MRI,FMRI, CAT scanning methods	
Computer Science		(25 hrs)
Module 10	Introduction to computers	(self study)
10.1.	Characteristics of computers	

- 10.2. Hardware –input out put devises, processor Modules, storing, controlling
- 10.3. Characteristics of computers

Module 11 Computer generations (8 hrs)

- 11.1. Classification- first to 5th generation
- 11.2. Notebook, laptops, PCs, workstations, mainframe system, supercomputers, client and server computers, hand held computers, - tablet pc, PDA, pocket PC, smart phone.
 - 11.2.1. Artificial intelligence
- 11.3. Number systems binary, octan, hexadecimal

Module 12 Soft ware (4 hrs)

- 12.1. Relationship between hard ware&soft ware, system soft ware& application soft ware
- 12.2. Acquiring soft ware – buying pre written soft ware, ordering customized soft ware, developing customized software, down loading public domain soft ware, software development steps- firmware, and middle ware

Module 13 Operating systems (4 hrs)

- 13.1. Windows, DOS, Linux (self study)
- 13.2. Concept of free software

Module 14 Computer Programming (4 hrs)

- 14.1. Low level languages
- 14.2. High level languages
 - 14.2.1. Programming language C++

Module 15 Computer and Communications (5hrs)

- 15.1. Introduction to Cyber security/Information security (brief mention only). LAN (local area net work) WAN (wide area network, MAN (Metropolitan area network)
- 15.2. Internet, email, www, social network groups etc.

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Semester II

ZO221ADVANCED PHYSIOLOGY and FUNCTIONAL ANATOMY(100 hrs)

AIM: To introduce the nature and scope of various aspects of Anatomy and physiology in general and human Anatomy and physiology in particular.

COURSE OBJECTIVES

To impart deep knowledge on the structure and functioning of different systems in organisms from molecular level to organ systems and to the physiological attributes of whole organism.

Module 1	Introduction	(self study)
1.1.	Introduction to Physiology and Anatomy	
1.2.	A brief history of Physiology and Anatomy	
1.3.	Cell as a living Module of the body	
1.4.	Fluids in the cell environment	
1.5.	Resistance of the cell to acidity and alkalinity.	
Module 2	Support and Movement	(10 hrs)
2.1.	Cellular movements, Cytoskeleton, Hydrostatic skeleton	
2.2.	Terrestrial, aquatic and aerial locomotion	
2.3.	Musculo skeletal system – Bones and muscles – structure and its role in locomotion with reference to humans	
2.4.	Theories of molecular basis of muscle contraction	
2.5.	Catch muscle and Fibrillar muscle	
2.6.	Clinical implications	
Module 3	Nutrition	(10 hrs)
3.1.	Feeding mechanism in animals (self study)	
3.2.	General principles of Gastro-intestinal function	

- 3.3. Factors that regulate quantity of food
 - 3.4. Secretory function of the alimentary canal-hormones and enzymes
 - 3.5. Absorption mechanism of digested nutrients
 - 3.6. Obesity-causes and consequences
 - 3.7. Gastro- intestinal disorders
- Module 4 Circulation (12 hrs)**
- 4.1. Body fluids in invertebrates and vertebrates
 - 4.2. types of heart, anatomy of heart (human) and Haemopoiesis
 - 4.3. Coronary circulation, Heart valves and Heart sounds
 - 4.4. Circulatory Shock, Cardiac failure
 - 4.5. Control of blood pressure and blood flow
- Module 5 Respiration (10 hrs)**
- 5.1. Respiratory organs of invertebrates and vertebrates and its functions
 - 5.2. Mechanism of Pulmonary ventilation
 - 5.3. Respiration of unusual environment – Aviation, High altitude, Deep sea diving, Foetal respiration
 - 5.4. Regulation of respiration
 - 5.5. Respiratory disturbance: Oxygen therapy, Artificial respiration
- Module 6 Excretion and Osmoregulation (10 hrs)**
- 6.1. Types of Excretion, Structure of kidney, Basic renal process (self study)
 - 6.2. Osmo regulation in fresh water, marine and terrestrial animals
 - 6.3. Regulation of sodium and water balance, Primary sodium re absorption, Urine concentration
 - 6.4. Diuretics and kidney diseases. Creatine clearance – Plasma creatine
 - 6.5. Haemodialysis, Peritoneal dialysis and transplantation
 - 6.6. Regulation of acid-base balance, blood volume and extra cellular volume
 - 6.7. Respiratory regulation of acid base balance
- Module 7 Nervous Co ordination (10 hrs)
(self study)**
- 7.1. Neurons, Types of Neurons, transmission of Nerve impulse
 - 7.2. Giant nerve fibres in invertebrates
 - 7.3. Development of neurons and neuronal functionality
 - 7.4. Factors leading to neuronal death
 - 7.5. Neuro transmitters, neuro modulators and mechanism of neuro transmitter release
 - 7.6. Neuronal disorders-strokes, excitotoxicity and NMDA receptors
- Module 8 Endocrinology (10 hrs)**
- 8.1. Invertebrate and Vertebrate endocrine system (self study)
 - 8.2. Classification of Hormones and nature of hormonal action
 - 8.3. Structure and function of different hormones
 - 8.4. Neuro-endocrine feedback and response to various stimuli
 - 8.5. Measurement of Hormone concentration in blood

Module 9 Somatic and Special senses (10 hrs)

- 9.1. Structure of Invertebrate and Vertebrate eye
- 9.2. Tactile, Position, Pain, Thermal and taste Senses
- 9.3. Visual pathways organization of visual cortex. Analysis of visual information, detection of colour
- 9.4. Auditory pathways – Functions of cerebral cortex in hearing
- 9.5. Neuronal mechanism of sound detection and direction

Module 10 Reproduction (10 hrs)

- 10.1. Male reproductive system- Anatomy Spermatogenesis and transport of sperm (self study)
- 10.2. Hormonal control of male reproductive function
- 10.3. Female reproductive system – Anatomy, Ovarian function (self study)
- 10.4. Control of ovarian function. Uterine changes in menstrual cycle, effects of estrogen and progesterone. Androgen in women
- 10.5. Pregnancy – Ovum transport, sperm activation, implantation and placentation
- 10.6. Hormonal and other changes during pregnancy – Parturition, Lactation
- 10.7. Birth control measures Pre-natal diagnostic tests.
- 10.8. Adjustments of the infants to extra uterine life

Module 11 Physiological adaptation and Stress (5hrs)

- 11.1. Physiological adaptation, acclimation, acclimatization.
- 11.2. Concept of stress- definition, stressor, stress response, eustress, distress, acute and chronic stress, stress acclimation.
- 11.3. Concept of ease, recovery response, stress hormones, neuroendocrine control of stress response, role of hypothalamo-pituitary-adrenal axis.

Module 12 Sports Physiology (4 hrs)

- 12.1. Muscles in exercise, cardiac reserve, cardiovascular fitness, fascia training, neurobiological effects of physical exercise, physical fitness and its components.
- 12.2. Dope test, drugs and athletes
- 12.3. Fitness test. Bio energetic fuel for muscle work

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Zo222 Genetics, Quantitative Analysis and Research Methodology

(100 Hrs)

AIM: To introduce the nature and scope of various aspects of Genetics, Biotechnology and signal transduction processes related with zoological science.

COURSE OBJECTIVE: To introduce students to the science of heredity, from its basic principles to the most recent advances in the field. To impart knowledge of classical and molecular genetics.

Genetics

(70hrs)

Module 1 Introduction

(5 hrs)

- 1.1. Genetics and modern agriculture
- 1.2. Genetics and medicine
- 1.3. Legal and ethical issues in genetics

Module 2 Mendelian Genetics and its Application

(15 hrs)

- 2.1. Gene mapping
- 2.2. Recombination frequency
- 2.3. Chromosome banding
- 2.4. Genetics in animal breeding
- 2.5. General effects of inbreeding and out breeding; hybrid vigour.
- 2.6. Expressivity, penetrance
- 2.7. Modern concept of Mendelism

Module 3 Population Genetics

(15 hrs)

- 3.1. Genetic variations
- 3.2. Polymorphism

- 3.3. Gene pool
- 3.4. Gene frequency
- 3.5. Distribution patterns
- 3.6. Hardy Weinberg equilibrium
- 3.7. Disequilibrium
- 3.8. Factors disrupting gene equilibrium

Module 4 Human Genetics (15 hrs)

- 4.1. Pedigree analysis – Karyotype analysis
- 4.2. X-Chromosome dosage
- 4.3. Lyon hypothesis and mosaicism
- 4.4. Genetics of ABO system
- 4.5. Rh disease and its inheritance
- 4.6. Sickle haemoglobin and inheritance; thalassemias
- 4.7. Genetic disorders – Patau, Edwards, Cri-du-chat syndromes, Philadelphia chromosome.

Module 5 Microbial Genetics (12hrs)

- 5.1. Retrovirus
- 5.2. Viral genome and multiplication – HIV genome and multiplication
- 5.3. Reproductive cycle of RNA viruses
- 5.4. Plasmids – Vector DNA – Insert DNA
- 5.5. Lambda Phages
- 5.6. Microbes in genetic engineering

Module 6 Genetics in Medicine and Forensics (8hrs)

- 6.1. Human Genome Project:
- 6.2. Human gene therapy
- 6.3. DNA fingerprinting:
 - 6.3.1 Applications in forensic science
 - 6.3.2. Applications in paternity testing

Quantitative Analysis (15 hrs)

Module 1 Introduction (2hrs)

- 1.1. Definition, history, scope of biostatistics and application of statistics in biology (self study)
- 1.2. Descriptive and inferential statistics
- 1.3. Preliminary concepts – population and sample, statistic and parameter, variables, sampling (self study)
- 1.4. Collection of data – primary and secondary data, methods. Use of software in statistics.

Module 11 Descriptive Statistics (2 hrs)

- 2.1 Processing and classification of data, presentation of data-tabulation and graphical and diagrammatic representation (self study)

2.2.	Measures of Central Tendency, problems (self study)	
2.3.	Measures of Dispersion-problems, Skewness and Kurtosis	
2.4.	Correlation and Regression, problems (self study)	
Module 111	Probability Distribution	(3 hrs)
3.1.	Definition, important terms and concepts	
3.2.	Theorems in probability	
3.3.	Important theoretical distributions- Binomial, Poisson, and Normal probability distributions.	
Module 1V	Parametric test	(4 hrs)
4.1.	Basic idea – Hypothesis testing, types of errors	
4.2.	Tests of significance for large and small samples- Z-test, Chi-Square Test, Student's 't' test, F-test – problems – and ANOVA	
Module V	Non-parametric test	(2 hrs)
5.1.	Characteristics, advantages and disadvantages	
5.2.	Types (Brief account only)	
Module V1	Vital statistics	(2 hrs)
6.1.	Introduction, uses, methods of collections	
6.2.	Measures of vital Statistics, life tables	
Research Methodology		(15 Hrs)
Module 1	Introduction	(2 hrs)
1.1.	Definition, meaning, objectives, and significance of research, research methods vs Methodology	
1.2.	Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs Qualitative, Conceptual vs Empirical.	
1.3.	Characteristics of good research, steps of working of research	
Module 11	Research Formulation	(2 hrs)
2.1.	Formulation and defining a research problem, techniques involved	
2.2.	Literature survey-Journals, conference proceedings, books, government reports, etc,	
2.3.	Problem selection, formulation of working hypothesis	
Module 111	Research design	(2 hrs)
3.1.	Meaning, need and features a good research design	
3.2.	Different types of research design (exploratory, descriptive, diagnostic and hypothesis-testing research studies)	
3.3.	Developing a research plan.	
Module 1V	Execution of research plan	(2 hrs)

- 4.1. Data collection methods-primary and secondary, sampling design (self study), measurements etc. LC 50 & Dose Response.
- 4.2. Analysis of data (self study)
- 4.3. Interpretations-advantages and techniques-and generalizations of the findings

Module V Scientific documentation (3 hrs)

- 5.1. Significance of report writing, types of reports
- 5.2. Research report writing (thesis, dissertations, research articles, etc) – characteristics and format
- 5.3. Writing and preparation of articles for publication and for oral and poster presentation
- 5.4. Project proposal and report writing.

Module V1 Research, extension and ethics (4 hrs)

- 6.1. Publications-abstracting and indexing journals, books, conference/seminar proceedings, periodicals, reference sources, reviews, monographs. Extension tools, impact factor, citation.
- 6.2. Online libraries, e-journals, e-books, e-encyclopedia, institutional websites, TED Talk.
- 6.3. Intellectual property Rights-copy right, patents, trademarks, geographical indications, industrial design.
- 6.4. Research misconduct: fabrication, falsification and plagiarism
- 6.5. Precaution – ESO standards for safety, lab protocols, lab animal uses, IACUC, control of hazards
- 6.6. Ethical norms, codes and policies for research ethic, laws in India

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Quantitative Analysis

1. Fisher.R.A., Statistical Methods for Research
2. Biometrical Genetics – Dover Publication, New York
3. Ostle B, Statistics in Research.
4. Agarwal, B.L. (1996) Basis Statistics. New Age International (P) Ltd. Publishers, New Delhi.
5. Bailey, N.T.J (1981). Statistical Methods in Biology. Hodder and Stongtton, London.
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8. Gupta, S.P. (1996). Statistical Methods. Sultan Chand & Sons Publishers, New Delhi.
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10. Bailey, N.T.J.1994. Statistical Methods in Biology (3rdedn).Cambridge University Press, London
11. Danial, W. 2006. Biostatistics: A foundation for Analysis in Health Sciences, John Wiley and Sons Inc., New York.
12. Dharmapalan, B. 2012.. Scientific Research Methodoly. Narosa Publishing House, New Delhi.
13. Finney, D.J. 1980. Statistics for Biologists. Chamman and Hall, London
14. Kothari C.R., 2009. Research Methodology: Methods and Techniwues. New Age Interntional Publishers, New Delhi.
15. Oliver, P.2005. Writing Your thesis. Vistar Publications. New Delhi.

Zo223 Cell Biology, Molecular Biology and Bioinformatics

(100 hrs)

AIM: To introduce the nature and scope of various aspects of Cell structure and molecular biological aspects in cell biology.

COURSE OBJECTIVES: The students will be introduced on the various aspects of Cell structure, function, cell replication, cell communication, protein synthesis, cell dynamics etc.

Module 1	Membrane structure, models and membrane transport	(10 hrs)
1.1.	Diffusion of small molecules across phospholipids bilayer	
1.2.	Uniporter – catalysed transport	
1.3.	Membrane potential	
1.4.	Active transport by ATP powered pumps	
1.5.	Co-transport by symporters and antiporters	
Module 2	Cell-cell signalling	(5hrs)
2.1.	Cell surface receptors	
2.2.	Signal transduction pathways (cyclic AMP, cyclic GMP, Ras, Raf and MAP kinase pathways)	
2.3.	Second messenger system	
Module 3	Cell cycle	(6 hrs)
3.1.	Cyclin and cyclin – dependent kinases	
3.2.	Regulation of CDK – cyclin activity	
3.3.	Check points in the cell cycle	
3.4.	Regulation of cell cycle in malignant cells	
Module 4	Chromatin structure	(6 hrs)
4.1.	Types of Chromatin	
4.2.	Detailed structure of nucleosome; higher order structure of chromatin and the role of histones H1, scaffold proteins, and radial loop model	
Module 5	Topology of Nucleic Acids	(5 hrs)
5.1.	Linking number and writhing number	
5.2.	DNA Super coiling	
5.2.1	Super coiling in prokaryotes	
5.2.2	Super coiling in eukaryotes	
5.2.3	Role of topoisomerases	
Module 6	Organization of the eukaryotic genome	(12 hrs)
6.1.	Genomic size and genetic content	
6.2.	Complexity of eukaryotic genome:	
6.2.1	Intragenic sequences -exons, introns; split gene organization; regulatory sequences	
6.2.2	Intergenic sequences	
6.2.2.1	Unique sequences	
6.2.2.2	Repetitive sequences: Highly repeated sequences – satellite, minisatellite and microsatellite DNAs Moderately repeated sequences (e.g. SINEs and LINEs).	
6.3.	DNA denaturation-renaturation kinetics and genome complexity; in situ hybridization.	
6.4.	Organelle genomes-mitochondrial and plastid DNAs	
Module 7	DNA Replication, repair and recombination	(14 hrs)

- 7.1. Prokaryotic and Eukaryotic DNA replication
 - 7.2. DNA replication machinery.
 - 7.3. Enzymes and accessory proteins involved in replication
 - 7.4. DNA damage and repair
 - Direct reversal: photo reactivation, adaptive response
 - Excision repair
 - Mismatch repair
 - SOS repair and mutagenesis
 - ERecombination repair; Rec A and other recombinases
 - 7.5. Damage signaling and checkpoints
 - 7.6. DNA repair-associated disorders
- Module 8 Transcription and RNA processing (8 hrs)**
- 8.1. Prokaryotic and eukaryotic transcription
 - 8.2. Binding the transcription complex-promoters, factors and RNA polymerases.
 - 8.3. Regulation of transcription
 - 8.4. Sigma factor and its role in prokaryotic transcription.
 - 8.5. Post-transcriptional processing of RNA precursors, spliceosomes.
- Module 9 Translation-gene expression (15 hrs)**
- 9.1. Prokaryotic and Eukaryotic translation
 - 9.2. The translation machinery
 - 9.3. Mechanism of initiation, elongation and termination
 - 9.4. Co-and post translational modifications of proteins.
 - 9.5. Hormonal regulation of protein synthesis.
- Module 10 Gene Regulation Mechanisms (7 hrs)**
- 10.1. Gene regulation in eukaryotes at various levels.
 - 10.2. Transcription factors and DNA-binding domains (Zinc-finger motif and Helix-loop-helix motif)
 - 10.3. Transcription signals – TATA Box, CAAT BOX., Enhancers.
- Module 11 Bioinformatics (12 hrs)**
- 11.1. Introduction to bioinformatics, brief history and its role and importance in modern biology, internet, internet, portals, servers and search engines.
 - 11.2. Biological databases, their purpose, primary, secondary, curated and ncurated databases types of databases (DNA, protein, RNA, functional and structural databases),
 - 11.3. Uploading and downloading of data, FASTA format, data retrieval from databases, analyses tools and soft wares and their applications, pair wise and multiple sequence analyses.
 - 11.4. Construction of rooted and un-rooted phylogenetic trees, their interpretation and use in analyzing evolutionary trends, steps in phylogenetic analyses

- 11.5. Brief overview of computational biology, computation, prediction and modulation of biological pathways, (ex. Kegg pathways) e-cell, computational analyses of genomes and proteomes

References

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3. Richard Lodivk, (2004) Molecular Biology & Genes, Pearson Education.
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8. Herbert Taylor, Molecular Genetics, Part 1 & II.
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11. Elliot, H.E. and Elliott, D.C. (2001). Biochemistry and Molecular Biology, Oxford University Press.
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16. A Gib De Busk (2000) Molecular Genetics, Mac Millan Co. New York.
17. Gunther S. Stnet and Richard Calender (2000) Molecular Genetics, CMS Publishers, 485 Jain Bhawan, Bholanath Nagar, Shahdara, Newdeli.
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24. Wilson K and Walker J (2006) Principles and Techniques of Biochemistry and Molecular Biology, Cambridge University Press, N.Y
25. Andrew Read and Dian Donnai. (2007) New Clinical Genetics. Scion Publishing Ltd.,

Zo214 Practical 1

A Systematics and Evolutionary Biology

1. Collection and identification of the following using standard keys:

- A. Insects (5 nos)
 - B. Prawn (2 nos)
 - C. Crab (2 nos)
 - D. Fishes (5 nos)
2. Study of preservation media and tools and materials for taxidermy
 3. Comparative study of prokaryotic and eukaryotic cells by staining and mounting (evolutionary significance).
- B. Biochemistry**
1. Titration curve of acetic acid. Titration of a measured volume of acetic acid with sodium hydroxide (NaOH) to determine the amount of acid in the given solution and pKa of acetic acid.
 2. Determination of the isoelectric pH of the given amino acid by titration method.
 3. Estimation of DNA/RNA
 4. Quantitative estimation of glycogen of a tissue.
 5. Quantitative estimation of blood glucose.
 6. Quantitative estimation of serum protein.
 7. Determination of acid value of the given fat.
 8. Determination of saponification value of the given fat.
 9. Estimation of serum cholesterol using a standard protocol
 10. Determination of the Michaelis constant (K_m value) for the digestion of casein by trypsin.
 11. Estimation of serum cholesterol using a standard protocol.
 12. Estimation of acetylcholine content in tissue sample.
- C. Biophysics, Instrumentation and Computer Science**
1. Micrometry: Measurement of microscopic objects using micrometer.
 2. Separation of haemolymph of serum protein by gel electrophoresis.
 3. Sketching of biological specimens using a camera Lucia.
 4. Quantification estimation of Na, K, Ca of the given sample with the help of flame photometer/ spectrophotometer preparing standard curve.
 5. Preparation of tables and bar diagrams using suitable softwares, from the data provided.
 6. Statistical Analysis (Chi-square, t-test, correlation, regression, standard deviation and standard error) of the given data using suitable software. E.g. PH Stat.

References

1. Hardd Varley- Practical clinical Biochemistry
2. Ranjana Chawla – Practical Clinical Biochemistry – Methods and interpretations.
3. Hawk's Practical Physiological Chemistry
4. Jayaraman, Practical Biochemistry.

Practical 11

Zo 224 Advanced Physiology and Functional Anatomy

Please use software such as **Physio Ex.9.0** where ever applicable

1. Effect of salivary amylase on starch (colorimetric)
 - a) Influence of temperature and calculation of Q_{10}

- b) Influence of pH
2. Transport of glucose through intestinal wall (everted gut sac) of a suitable animal
3. Recording of heart beat and the effect of drugs (acetylcholine and adrenaline) in fowl.
4. Effect pH different concentrations of NaCl (0.1% to 2%) on the diameter of RBCs using micrometry.
5. Estimation of RBCs and WBCs in vertebrate blood
6. Blood histology of earthworm/cockroach/fish and chick.
7. Studies on feeding-Mounting of mouth parts of housefly, honey bee and mosquito in relation to food and feeding.
8. Observation of mitochondria in yeast cells.
9. Observation on ciliary movement in bivalve gills in relation to temperature and pH.
- Genetics and Quantitative analysis
10. Chromosome study – Squash preparation of *Drosophila*/Chironomous larvae
11. Calculation of Mean, Standard deviation, Standard Error, and Students' t-test.
12. Calculation of correlation coefficient & Test of significance.
13. Preparation of histogram, frequency polygon and pie diagram using appropriate software.
- Cell and molecular biology
14. Study of meiosis- Squash preparation of grasshopper testis.
15. Histological localization of protein and glycogen in paraffin sections.
16. Estimation of DNA from tissue extract.

Semester III

Paper 1- Zo231 Microbiology and Biotechnology

(100 Hours)

AIM: To introduce the nature and scope of various aspects of Developmental Biology and stem cell biology in general and human development and applications of stem cell biology in particular.

COURSE OBJECTIVE: The students will be introduced on the various aspects of developmental biology such as animal development, cellular differentiation, stem cell biology etc.

PART.A.Microbiology

(50 hours)

Module 1 Introduction to Microbiology

(7 hrs)

- 1.1 Scope and history of microbiology – mention the contributions of important Scientists who developed Microbiology as a major discipline (e.g. Pasteur, Koch etc).
- 1.2 Microbial diversity including Extremophiles – brief account.
- 1.3 Characteristic features of microorganisms –Bacteria, Virus, Fungi & Protozoa. Mention Microalgae. Classification of Bacteria, Virus, Fungi & Protozoa.
- 1.4 Classification of bacteria, Bergey's Manual, (self study)

Module 2	Bacterial Cell structure and function	(8hrs)
2.1	Ultrastructure of bacteria – cell membrane, cytoplasmic inclusions, nucleoid etc	
2.2	Bacterial Cell Wall- structure; differences between gram positive and negative cell wall, gram staining	
2.3.	External components & their functions – pili, flagella, fimbriae, capsules, slime layers etc.	
Module 3	Microbial Nutrition and Growth	(10 hrs)
3.1	Common nutritional requirements of microorganisms- auto trophy and heterotrophy.	
3.2	Types of culture media	
3.3	Microbial growth – overview of cell growth, generation time, measurement of growth.	
3.4	Typical growth curve, continuous culture, effect of environmental factors on growth. Stress response.	
Module 4	Industrial & Environmental Microbiology	(10hrs)
4.1.	Industrial Microbiology	
4.1.1.	Concept of fermentation. Types of fermentation – submerged, solid state – mention briefly.	
4.1.2.	Basis design and types of fermenters.	
4.1.3.	Products of Industrial Microbiology such as Alcohol, Antibiotics (e.g. Penicillin), Organic acids (e.g. Acetic acid, Lactic acid).	
4.1.4.	Microbiology of milk & foods. Preservation of milk – Pasteurization techniques. Probiotics.	
4.1.5.	Microbial spoilage of different types of foods & Food borne diseases (self study)	
4.1.6.	Beneficial activities of microbes in food (self study)	
4.1.7.	Microbial quality control and safety of food (self study)	
4.2.	Environmental Microbiology	
4.2.1	Introduction to terrestrial and aquatic microbiology. Principles of Microbial Ecology.	
4.2.2.	Biogeochemical cycles – nitrogen cycle, sulphur cycle & carbon cycle. Role of microorganisms in the biogeochemical cycles.	
4.2.3.	Microbiology of waste treatment. Brief account of microbial treatment of waste water and solid wastes	
4.2.4.	Bioremediation – microbial treatment of radioactive wastes and xenobiotics.	
4.2.5.	Microbes in decomposition and recycling process (self study)	
4.2.6.	Symbiotic and asymbiotic N ₂ –fixation (self study)	
Module 5	Medical Microbiology	(15 hrs)

- 5.1. Host-microbe interaction-process of infection, pathogenecity, virulence & infection, microbial adherence, penetration of epithelial cell layers and events in infection following penetration, Infection of blood, lymphatic system.
- 5.2. Exotoxins – classification, mechanism of action of exotoxins e.g. Diphtheria, Botulinum, Tetanus, and Cholera toxins.
- 5.3. Control of Microorganisms – various physical & chemical methods.
- 5.4. Use of antibiotics and other antimicrobial drugs.
- 5.5. Drug resistance and emergence of multiple drug resistance – recent cases of TB (XDR, TDR); NDM etc.
- 5.6. A survey of harmful and beneficial microbes (self study)

Topics for Self Study (not for evaluative purposes)

- Classification of Bacteria, Bergy's manual
- Microbes in decomposition and recycling process
- Symbiotic and asymbiotic N₂- fixation
- Microorganisms and food
- Microbial spoilage of different types of foods & Food borne diseases
- Beneficial activities of microbes in food
- Microbial quality control and safety of food

PART.B.Biotechnology

(50 hrs)

Module 6 Introduction to Biotechnology

(10 hrs)

- 6.1. History of Biotechnology (self study). Board areas of BT – traditional and modern; types – plant biotechnology, animal biotechnology and microbial biotechnology.
- 6.2. Techniques in Biotechnology – brief description of common techniques such as tissue culture, genetic engineering, cloning etc.

Module 7 Molecular Cloning

(15 hrs)

- 7.1. Gene cloning – basic steps in gene cloning. Isolation of donor DNA.
- 7.2. Vectors – types and characteristics e.g. plasmids, phages, hybrid vectors, artificial chromosomes.
- 7.3. Enzymes used in gene cloning – exonuclease, endonuclease, ligase, reverse transcriptase, polymerase, terminal transferase etc.
- 7.4. Techniques of gene transfer – calcium chloride transformation, microinjection, electroporation, shotgun cloning, Agrobacterium mediated transfer etc.
- 7.5. Practical application of genetic engineering – useful products. Application in Medicine, Agriculture, Agriculture and Animal Husbandry, Environment etc. Biotechnology Industry.

Module 8 Recent Trends in Biotechnology (15 hrs)

- 8.1. Synthetic Biology – description and developments in the area.
- 8.2. Artificial life – concept and achievement
- 8.3. DNA Barcoding – concept and experimental details with examples.
- 8.4. GMOs and GM Foods – pros and cons.
- 8.5. Microbial warfare – bio-weapons and bioterrorism

Module 9 Bioethics (5 hrs)

- 9.1. Ethical, legal and social issues of Biotechnology.

Module 10. Biotechnology in India (5 hrs)

- 10.1. History of biotechnology research in India.
- 10.2. India's Biotechnology Policy
- 10.3. Biotechnology Regulatory Agencies in India.
- 10.4. Comparison with developed countries

References

Microbiology

1. Microbiology – Prescott, Harley and Klein, 6th Edition.
2. Microbiology: An Introduction. Tortora, Funke & Chase. 10th edition (2009). Benjamin Cummings. ISBN: 0321550072.
3. Bacteria: The Benign, the Bad, and the Beautiful. Trudy M. Wassenaar. ISBN: 978-1-1181-0766-9. 2011, Wiley-Blackwell
4. Microbiology. Pelczar, Reid and Chan. Tata-McGrawHill. Reprint 2008. ISBN 0074623206, 9780074623206.
5. Introductory Food Microbiology. H. A. Modi 2007. ISBN 8179102213.
6. Food Microbiology An Introduction by Thomas J Montville, Karl R. Mathews
7. Microbiology by Edward Alcamo Wiley publishing inc ISBN 0-8220-5333-0
8. Alamo, E.I. (2001). *Fundamentals of Microbiology* (6th Ed.). Jones & Bartlett Publishers, Inc., Massachusetts, USA. ISBN: 0 7637 1067 9
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Biotechnology

1. Benjamin Lewin – Genes X (2011).
2. James D Watson - Molecular Biology of the Gene (6th Edition)
3. George W Burns, the Science of Genetics, Mae Millan CO New York.
4. A Gib De Busk, Molecular Genetics, Mae Millan CO New York.
5. Edgar Altenberg, Genetics, Oxford and IBH Publisher, New Delhi.
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7. Gunther S. Stent & Richard Calender Molecular Genetics, CMS Publishers, 485 Jain Bhawan, Bholanath Nagar, Shahdra, Newdeli

8. Richard Losick, (2004) Molecular Biology & Genes, Pearson Education.
9. Strickberger, M.W. Genetics, Macmillan Publishing Co., Inc., New York.
10. J.M. Walker and R. Rapley, (2002), Molecular Biology and Biotechnology, Purnima Publishing Corporation, New Delhi.

Semester III

Zo232 Ecology, Ethology and Biodiversity Conservation

AIM: To introduce the nature and scope of various aspects of Ecology and Environmental Biology in general and human environment in particular.

COURSE OBJECTIVES

Imparting basic knowledge about the environment and its allied problems. Developing an attitude of concern for the environment. Make one striving to attain harmony with Nature, Acquiring skills to help the concerned individuals in identifying and solving environmental problems.

Part 1: Ecology

(30 hrs)

Topics for self study

Biotic and abiotic factors and their interactions.

Structure, basic components, their interactions and inter-relations. Fundamental concepts relating to energy – first and second laws of thermodynamics, entropy.

Gaseous and sedimentary cycles.

Characteristics of population: density, natality, mortality, biotic potential, environmental resistance, growth forms, immigration, emigration and migration.

Characteristic: Species diversity, stratification, dominance, boundaries, ecotone and edge effect, ecological indicators.

Module 1 Ecological Energetics

(8 hrs)

- 1.1. Solar energy and photosynthetic production, efficiency of energy capturing, chemosynthesis
- 1.2. Energy flow – features of energy flow (unidirectional flow and loss of energy as heat) and pathways of energy flow.
- 1.3. Productivity – primary production and production efficiency, secondary production, standing crop
- 1.4. Food chain (grazing, detritus and auxiliary food chains), food, webs, trophic levels and ecological pyramids (pyramid of numbers, pyramid of biomass and pyramid of energy (self study))
- 1.5. Classification of ecosystems based on energy input (natural unsubsidized and subsidized solar powered ecosystems, human subsidized solar powered ecosystem and fuel powered urban and industrial systems).

Module 2 Transition and Stability in Communities

(7 hrs)

- 2.1 Succession- Basic types (Primary succession, Secondary succession, Autogenic succession, Allogenic succession, Autotrophic succession, Heterotrophic succession).
- 2.2 Trends in succession

- 2.3. Stages of succession – (Nudation, Invasion, Competition and co-action, Reaction, Climax), pulse stability
- 2.4. Examples of succession – (Succession in aquatic and terrestrial ecosystems)
- 2.5. Relevance of ecosystem development theory to human ecology, prospects for detritus agriculture, the compartment model.

Module 3 Concepts of Habitant, Niche and Guild (6 hrs)

- 3.1. Habitat, microhabitat and niche. different types of niches: spatial niche, trophic niche, species niche, multidimensional niche, fundamental and realized niche.
- 3.2. Niche overlap, Gause's principle, resource partitioning, competition hypothesis, concept of Guild, character displacement, ecological equivalents.

Module 4 Species Interactions (9 hrs)

- 4.1. Intra and interspecific interactions, Types of Interspecific interactions – (Positive, Negative and Neutral)
- 4.2. Positive interactions (commensalism, proto-cooperation, mutualism and pollination).
- 4.3. Negative interactions (competition, parasitism, amensalism, predation, herbivory and carnivory)
- 4.4. Co-evolution

Part 11: Ethology (30 hrs)

Topics for self study

History, development and applications; motivation and models of motivation; reflexes imprinting, habituation; neural mechanisms in behavior, hormones and behavior; Sociobiology social groups – merits and demerits, features of organized groups; social groups in mammals, social stress; pheromones and chemical communication.

Module 5 Learning (6 hrs)

- 5.1. Classification of learning: Imprinting, habituation, imitation (self study), classical conditioning, instrumental/operant conditioning, cognitive learning, latent learning, insightful learning.

Module 6 Nervous System and Behaviour (8 hrs)

- 6.1. Stimulus filtering, sign stimulus, innate release mechanism and fixed action plans (FAPs).
- 6.2. Brain centres and learning, neural mechanism of learning and memory.

Module 7 Complex Behaviour patterns (8 hrs)

- 7.1. Orientation, Navigation and homing.
- 7.2. Migration (Fishes and birds)

- 7.3. Biological rhythms – biological clock, circadian, circannual, lunar, tidal and seasonal periodicities, sleep and arousal, genetics of biological rhythms.
- Module 8 Environment, genetics and Evolution of behaviour (8 hrs)**
- 8.1. Habitat selection and territoriality.
- 8.2. The Evolution of communication; Development of bird song.
- 8.3. The evolution of reproductive behavior and mating systems.
- Module 9 Biodiversity (15hrs)**
- 9.1. Introduction: Definition, levels of biodiversity (genetic diversity, species diversity and ecosystem diversity), values of biodiversity (self study)
- 9.2. Diversity indices: Alpha diversity, Beta diversity and Gamma diversity; the species diversity and ecosystem stability.
- 9.3. Biodiversity in India: Major biogeographic zones of India; India as a mega diversity nation; hot spots biodiversity – characteristics; an outline of the features and biodiversity of hot spots in India (Western Ghats and Eastern Himalaya).
- 9.4. Features, structure and biodiversity of some of the Indian ecosystems: Terrestrial ecosystems (forest, grassland, desert), Aquatic ecosystems freshwater, marine, estuarine).
- Module 10 Conservation Biology (13 hrs)**
- 10.1. Depletion of biodiversity: Current estimates of species loss, causes of biodiversity loss, impacts of biodiversity loss, Strategic species concepts: keystone species, indicator species and umbrella/glagship species.
- 10.2. Strategies of conservation: in situ and ex situ conservation, Gene Banks, establishment of protected areas, habitat conservation captive public awareness and other relevant measures.
- 10.3. An evaluation of the “Project Tiger” and “ Project Elephant” programmes.
- 10.4. World conservation strategy (1980)
- 10.5. National Biodiversity Action Plan 2008: a brief outline of objectives & plans
- Module 11 International Conventions & Treaties for conservation of Biodiversity (12hrs)**
- 11.1. Stockholm declaration on human Environment (1972), Convention on Regulation of Antarctic Marine Resources Activities (RAMRA, 1986), Moduleed Nations World Charter for Nature (1982), Kyoto Protocol and Brundtland Framework Convention on Cllimate Change (UNFCCC), Report (1987).
- 11.2. Earth summit (1992) – detailed study – Ratio Declaration on Environment and Development, Agends21, Forest Principles, Convention on Biological diversity.

- 11.3. Species based treaties: Migratory Bird Treaty Act (MBTA) of 1918,
International Convention for the Regulation of Whaling (ICRW),
Washington, 1946, Convention for the Conservation of Antarctic
Seals, 1972, Convention on International Trade on Endangered Species
(CITES, 1975),
- 11.4. Ecosystem based treaty: Ramsar Convention (1981) – Ramsar sites in
India and Kerala.

References

Ecology & Biodiversity

1. Beck, W.S., Liem, K.F. & Simpson, G.G. (1991). *Life: An Introduction to Biology* (3rd Ed.). Harper Collins Publishers, New York, pp 1361. ISBN: 0 06 500009 9.
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6. Donald Van DeVeer & Christine Pierce (). *The Environmental Ethics & Policy Book* (3rd Ed.). Wadsworth-Thomson Learning, Canada. ISBN: 0 534 56188 8.
7. Emmel, T.C. (1976). *Population Biology*. Harper & Row Publishers, New York. ISBN 0 06 041904 0.
8. Gaston, K.J. & Spicer, J.I. (1998). *Biodiversity: An Introduction*. Blackwell Science Ltd., London. ISBN 0 632 04953 7.
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14. Richard Brewer (). *The science of Ecology* (2nd Ed.). Saunders College Publishing, USA. ISBN: 0 03 096575 6.
15. Russell, P.J., Starr, C., Wolfe, S.L., Hertz, P.E. & Mcmillan, B. (2009). *Ecology*. Cengage Learning Private Limited, pp 532. ISBN-13: 9788131508503.
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Zo233 Immunology and Developmental Biology

Immunology

(100 Hrs)

(40 hrs)

AIM: To introduce the nature and scope of various aspects of Immunology and Developmental biology.

COURSE OBJECTIVES: Integration and consolidation of knowledge in immunology such as nature of resistance, mode of development and growth, various aspects of development.

Module 1	Introduction to Immune System	(4 hrs)
1.1	Types of immunity, innate and acquired immunity; passive and active immunity; humoral and cell-mediated immunity.	
1.2	Organs of immune system: Primary and Secondary lymphoid organs.	
1.3	Brief account on immune cells: types and production.	
Module 2	Immunogens (Antigens)	(7 hrs)
2.1	General properties, Structure and function, variability and diversity.	
2.2	Factors affecting antigenicity.	
2.3	Epitopes and Haptens.	
2.4	Adjuvants and their role in enhancing immunogenicity.	
Module 3	Immunoglobulins (antibodies)	(8 hrs)
3.1	General Properties-Structure and functions	
3.2	Different classes of immunoglobulins (IgA, IgD, IgE, IgG and IgM)	
3.3	Genetic basis of antibody diversity: Immunoglobulin gene organization; Gene rearrangement and expression.	
3.3.1	Somatic recombination: V (D) J recombination and functional diversity	
3.3.2	Somatic hyper mutation	
3.3.3	Class switching	
3.4	Polyclonal and Monoclonal antibodies	
3.5	Hybridoma technology –technique and applications	
Module 4	Antigen-antibody interactions	(6 hrs)
4.1	Primary and secondary immune responses	
4.2	Theories of antibody formation (Directive theory, clonal selection theory etc.)	
Module 5	Complement System	(4hrs)
5.1	Complement systems-General features	
5.2	Classical pathway and alternate pathway complement receptors, biological effect of complements.	
Module 6	Transplantation	(7 hrs)
6.1	Classification of grafts	
6.2	Major Histocompatibility Complex (MHC) and MHC proteins; role in tissue transplantation; Mechanism of graft retention and rejection.	
6.3	General immunosuppressive therapy.	
Module 7	Defects in Immune Mechanisms	(4 hrs)
7.1	Defective innate immune mechanisms	
7.2	Auto immune diseases	
Developmental Biology		(60 Hrs)
Module 1	Introduction	(4 hrs)

1.1	Definition, history, Scope of embryology and Practical applications (self study)	
1.2	The evolution of developmental patterns in unicellular organism; origin of sexual reproduction. Developmental patterns among animals-brief survey (asexual means; parthenogenesis; sexual means; gonochorism, hermaphroditism, metamorphosis, uterine development in mammals)	
Module 2	Fertilization	(8 hrs)
2.1	Events in fertilization	
2.1.1	Cytoplasmic changes	
2.1.2	Nuclear changes	
2.2	Prevention of polyspermy	
2.3	Significance of fertilization	
Module 3	Developmental Model Systems	(16 hrs)
3.1	Early development of <i>Drosophila</i> -Egg, cleavage, mid-blastula transition, gastrulation	
3.2	Early development of <i>Caenorhabditis elegans</i> -Egg, cleavage and gastrulation.	
3.3	Genetic control of development and embryonic axis formation.	
3.3.1	Gene action in development of <i>Drosophila</i> :- Maternal effect genes; Segmental genes (gap genes, pair-rule gene and segment polarity gene) and Homeotic genes (homeobox and homeodomains)	
3.3.2	Hox cluster genes in vertebrates	
Module 4	Embryonic Induction	(10 hrs)
4.1	Types of embryonic induction – Primary, Secondary and Tertiary Induction (Experiments of Spemann and Mangold)	
4.2	Mechanism of axis formation in amphibians; Nieuwkoop centre.	
4.3	The functions of organizer; the diffusible proteins of the organizer 1; the BMP inhibitors.	
4.4	Stem cells, totipotency, pluripotency	
Module 5	Medically assisted human reproductive technologies	(12 hrs)
5.1	Conventional in vitro fertilization and embryo transfer (IVF-ET) – general protocol (Patient selection, manipulation of menstrual cycle, superovulation, oocyte retrieval, preparation of semen sample, IVF treatment, embryo transfer.	
5.2	Gametic Intrafallopian Transfer (GIFT)	
5.3	Zygotic Intrafallopian Transfer (ZIFT)	
5.4	Tubal Embryo stage Transfer (TET)	
5.5	Intra-cytoplasmic sperm injection (ICSI)	
5.6	Intra Uterine Insemination (IUI)	
Module 6	Cloning experiments in animals	(10 hrs)
6.1	Genomic equivalence; multiple potencies; differential gene expression.	
6.2	Amphibian cloning, cloning mammals, human cloning-prospects and demerits.	

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Developmental Biology

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7. D.J.Bejley, J.A. Firth, J.R.F.Houtt, Human Reproduction and Developmental Biology

Immunology

1. Roitt, L, Brostoff, J and Male, D., Immunology
2. Ashim K Chakravarthy, Immunology
3. M.K. Majumdar, Microbiology and immunology
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PRACTICALS

Zo234 Microbiology, Biotechnology, Ecology, Immunology and Developmental Biology

Microbiology and Biotechnology

1. Techniques for Isolation of bacteria-serial dilution, pour plate, spread plate techniques.
2. Enumeration of bacteria from water and soil
3. Motility Testing – hanging drop method.
4. Gram staining of bacteria
5. Determination of quality of milk-methylene blue reductase test.
6. Biochemical tests – catalase test, kovac's oxidase test, gas production etc.
7. Isolation of DNA from plant/animal tissue.
8. Plasmid isolation
9. Detection of coliform bacteria by H₂S paper strip method for monitoring water quality.
10. Culturing of paramecium to observe ciliary movement.

Immunology

1. Antigen-antibody interaction in vitro and identification of blood groups.
2. Blood film preparation and identification of cells.
3. Detection of pregnancy using kits.
4. Immunodiffusion and Immunoelectrophoresis

5. Demonstration of phagocytes in insect hemocytes.

Developmental Biology

1. Induced ovulation and artificial fertilization
2. Preparation of temporary whole mounts of chick blastoderm
3. Vital staining of chick blastoderm and tracing the development of stained parts (window method)
4. Effect of drugs on heart beat of chick embryo.
5. Study of different types of eggs: insect egg, frog's egg, hen's egg, mammalian egg-models/charts
6. Morphological and histological studies of different placental types of mammals (3 numbers)
7. Identification of cross sections of chick embryo through heart, eye and ear.

Ecology

1. Estimation of pyramid of numbers and biomass in a small ecosystem.
2. Estimation of Primary productivity using dark and light bottles.
3. Description of ecological adaptations of any 10 organisms.
4. Habituation in pila/ Alarm response in fishes / Maize learning in rats.
5. Study of Biodiversity indices:
 - (a) Population
 - (b) Density and relative density,
 - (c) Frequency and relative frequency,
 - (d) Abundance and distribution,
 - (e) Modified similarity index
 - (f) Shannon-Wiener Index
6. Composition assessment of the taxonomic diversity/biodiversity in a habitat (eg. Grass land, arid land, wet land)
7. Assessment of Invertebrate and Vertebrate diversity in Your locality (e.g. campus).
8. Quantitative estimation of planktons.
9. Poster Presentation on a relevant topic (e.g. International conventions and treaties, species interactions, biodiversity loss, etc.).
10. Mounting cercaria of flukes in aquatic birds.

Semester IV

Special Subject: Endocrinology

Zo241 Vertebrate Endocrinology

(100hrs)

AIM: To introduce the nature and scope of various aspects of vertebrate and invertebrate endocrinology and Human Reproductive Physiology.

COURSE OBJECTIVES: To impart knowledge on the human endocrinology and understand the principles and mechanisms involved in endocrinology.

Module 1 Introduction

(5 hrs)

1. Historical perspective
2. General Classes of chemical messengers
Peptide hormones, steroid hormones, bioamines, eicosanoids, chalcones, neurotransmitters, neuropeptides, neurosteroids, neurohormones, lumones, phytohormones, synthetic hormones.

Module 2 Vertebrate endocrine glands (30 hrs)

1. Morphology and anatomy of endocrine glands
2. Biosynthesis of hormones (Mention key enzymes)
3. Functions of hormones
4. Disorders of hormonal imbalance
5. Hypothalamus and its secretions
6. Hypothalamohypophyseal interaction
7. Eicosanoids-Biochemistry and biological action. Prostaglandins, prostacyclins, thromboxanes, leukotrienes.
8. Evolution of endocrine glands-a brief account.

Module 3 Mechanism of hormone action (30 hrs)

1. General and Molecular mechanism of action of amines, polypeptide and steroid Hormones
2. Hormone receptors
Receptors as mediators of endocrine signals
Classification of endocrine receptors
Measurement of receptor ligand interaction
1. Cell surface receptors (Mode of action of peptide hormones)
Receptor structure
Regulation of receptor number
2. Second messengers of hormonal action
Cyclic nucleotides; Inositol triphosphate; Diacyl glycerol; Genomic action of cAMP
3. Signal transduction
G proteins and dual control of adenylate cyclase; Receptor crosstalk
6. Receptor with tyrosine kinase activity, serine and threonine kinase activity
7. Receptors that are protein phosphatases
8. Receptors coupled with ligand gated ion channels
9. Direct membrane action of steroid hormones-non genomic action

Module 4 Cell growth factors (5 hrs)

1. Types of growth factors-mechanism and its functional role in cellular activities:
Somatomedins-IGF; Epidermal Growth factor (EGF) family; Transforming Growth factor β family (TGF β); Platelet derived growth factor (PDGF); Fibroblast growth factor (FGF).
2. Nerve Growth factor (NGF); Hepatocyte Growth factor (HGF)

Module 5 Hormones and Cancer (10 hrs)

1. Relationship of hormones to carcinogens and development of cancers from inappropriate hormonal treatment.

2. Hormone related treatment of cancer
3. Oncogenes and hormonal function
4. Hormone receptor status of Breast Cancer
5. Ectopic production of hormones by tumour cells

Module 6 Functional Endocrinology (10 hrs)

1. Role of hormones in behaviour of animals
2. Hormonal control of reproduction
3. Hormonal involvement in evolution
4. Influence of hormones in developmental process

Module 7 Endocrine methodology (10 hrs)

1. Methods and techniques in endocrine research
2. Histological and cytological methods; Surgical methods; Bioassays
3. Radio isotopic studies-RIA, ELISA, EIA
4. Nucleic acid approaches in endocrinology
5. Recombinant DNA techniques and genetic engineering

References

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1. Williams Text Book of Endocrinology edited by Jean D. Wilson and Daniel W. Foster, Saunders Company 8thEdn. 1992.
2. Hormones from Molecular to disease Elby-Elienne-ErulieBautieu and Paul A. Kelly 1990.
3. Endocrinology-Basic and Clinical Principle-P. Michael Corn and Shlomo Mel Med. Humana Press The Totowa. 1997
4. Vertebrate Endocrinology-Daniel O.Norris Academic Press. 3r edn. 1997.
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8. Hormones-Anthony-W.Norman and Gerald Litwark-Academic Press. 1997.

Special Subject: Endocrinology

ZO242 Physiology of Reproduction(With special reference to mammals) (100hrs)

AIM: To introduce the nature and scope of various aspects of vertebrates especially mammals.

COURSE OBJECTIVES: To impart knowledge on mammalian reproduction and understand the principles and mechanisms involved in reproduction.

Module 1. Foetal and Embryonic Gonads and Genital Ducts (20 hrs)

1. 1. Comparative anatomy of genital system in vertebrates
1. 2. Origin of primordial germ cells

- 1.3. Differentiation of the testis: Germinal epithelium, interstitial tissue, Foetal androgens and role
- 1.4. Differentiation of ovary: Foetal estrogens and role
- 1.5. Origin and differentiation of the genital ducts: Wolffian duct, mullerian duct
- 1.6. Hormonal basis of sex differentiation
- 1.7. Histology, cytology and endocrinology of the foetal gonads
- 1.8. Disorders of sexual differentiation development: True hermaphroditism, Pseudohermaphroditism, Chromosomal errors and sex determination – Penile agenesis, Double Penis, Bifid Penis, Micropenis, Acruate Uterus, Double uterus.

Module 2. Physiology of Female Reproduction–I. Ovary & Reproductive cycles (12 hrs)

- 2.1. Anatomy of female reproductive system- Gross anatomy and histology of ovary
- 2.2. Ovarian hormones
- 2.3. Folliculogenesis and oogenesis and their hormonal control
- 2.4. Ovulation- Luteinization, Atresia
- 2.5. Reproductive cycles- Estrus and menstrual cycles- structural changes and hormonal control

Module 3. Physiolog of female reproduction– II. Implantation, Pregnancy and Parturition (12 hrs)

- 3.1. Nidation, Desidualization
- 3.2. Placentation- Types, Placental hormones and their regulation
- 3.3. Physiology of pregnancy - Endocrine basis
- 3.4. Development of foetal membranes- Amnion, chorion, allantois and yolk sac
- 3.5. Physiology of parturition and endocrine control

Module 4. Physiology of female reproduction–III Mammary gland & Lactation (6 hrs)

- 4.1. Infantile mammary gland, Pubertal changes in mammary gland, Structure of adult mammary gland
- 4.2. Synthesis, composition and secretion of milk- galactopoesis- Milk let down
- 4.3. Hormonal regulation of lactation

Module 5. Physiology of Male reproduction: I. Testis, Reproductive tract and Accessory Reproductive Glands (15 hrs)

- 5.1. Anatomy of male reproductive system- Testis, Vasa efferentia, Epididymis, Vas Deferns, Ejaculatory ducts, Urethra, Penis
- 5.2. Accessory sex glands- Seminal vesicles, Prostate gland and Cowper's glands- Structure, cytology and functions
- 5.3. Histology of testis- Sertoli cells, Leydig cells and rete testis – structure and functions
- 5.4. Male sex act
- 5.5. Temperature regulation of testicular function
- 5.6. Testicular hormones- Androgens

Module 6. Physiology of Male Reproduction - Spermatology (10 hrs)

- 6.1. Spermatogenesis and its hormonal control

- 6.2. Structure of a typical mammalian sperm, Comparative morphology of sperms of mammals.
- 6.3. Physiological maturation of sperm – initiation of motility and capacitation
- 6.4. Sperm motility and energetic- Factors affecting sperm motility
- 6.5. Biochemistry of semen

Module 7. Reproductive Behaviour (7hrs)

- 6.1. Concept of puberty
- 6.2. Adolescence- Somatic changes , psychological changes and hormonal changes
- 6.3. Senescence
- 6.4. Menopause

Module 8. Fertility regulation and Reproductive toxicology (8 hrs)

- 8.1. Disorders of male and female reproductive systems- Sexual dysfunction
- 8.2. Infertility in males and females – causes and curative measures
- 8.3. Birth control devices
- 8.4. Reproductive toxicology – effects of chemicals, drugs and alcohol on reproduction
- 8.5. Fertility regulation in farm animals

Module 9. Reproductive Health (10 hrs)

- 9.1. Sex Education and its importance
- 9.2. Adolescent sexual activity and adolescent stress management
- 9.3. Sexual harassment and its impacts
- 9.4. Sexually transmitted diseases

References:

1. Essentials of Medical Physiology, Leonard R. Johnson (Ed.), Academic Press.
2. Physiology of reproduction – Vol.I& II. Edited by E. Knobi& J.D. Neill. Raven Press, New York. 1994.
3. Human Reproductive Biology – R.E. Jones, Academic Press, London . 1997.
4. Comparative Endocrinology and Reproduction – Joy KP. Krishna A, Haldar L, Narosa Publishing HJouse, New Delhi. 1999.
5. Male infertility and Sexual Dysfunction – W.J.G. Hellstrom, Springer-Verlag, New York. 1997.
6. Reproduction in Mammals. Vol.I and II. Edited by C.R. Austine& R.V. Short Cambrige University Press, London. 1986.
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8. Current Concepts in Fertility Regulation. Edited by C.P. Puri and P.F. A. Van Look. Wiley Eastern Ltd. 1994.
9. Principles of Anatomy and Physiology , Vol II; G.I. Tortora and B.H. Derrickson , John Wiley& Sons Inc.

Semester IV
Special Subject: Endocrinology
Practical I

Zo243 Physiology of Reproduction with special reference to Mammals

1. Histology of testes of fish, Calotes. Frog, chick and rat (any two animals)
2. Histology of ovary of fish, calotes, frog, chick and rat (any two animals)
3. Dissection of male and female reproductive system of frog, calotes, chick and rat.
4. Vaginal smear of rat
5. Sperm smear of any one vertebrate
6. Demonstration of induced ovulation in any one vertebrate

Zo244 Endocrinology

Vertebrate Endocrinology

- 7 Dissection of endocrine glands in fish, frog, calotes, chick and rat (any two animals)
8. Demonstration of glandectomy experiments in any two vertebrates
9. Simple experiment to study the effect of thyroxine, insulin and cortisol on blood glucose/total protein in fish/frog
10. Preparation of single cell suspension of any one tissue for in vitro study
11. Histological study of endocrine gland using haematoxylin eosin stain in any two vertebrates.
12. Disorders of endocrine glands (5 numbers for short notes)

Special Subject: Fish Biology and Fishery Science

Zo 241: Ichthyology

Aim: To introduce the various methods of Ichthyology. Morphology, food and feeding.

Aim: To impart knowledge on diversity, adaptation, and other physiological aspects related to fish, to enhance the students knowledge and application in fishery and Aquaculture.

Module 1. Classification and distribution of fishes (10hrs)

- 1.1 Scope and history of Ichthyology (self study)
- 1.2 Geographical distribution of fishes in marine and freshwater habitats
- 1.3 Distribution of fishes in marine and freshwater habitats in India and Kerala
- 1.4 Classification of fishes upto family – distinguishing characters with examples
- 1.5 Barcoding in fish taxonomy

Module 2. Adaptation of fishes to special conditions (10hrs)

- 1.2 Deep sea fishes
- 1.3 Cave dwelling fishes
- 1.4 Hill stream fishes

- 1.5 Air-breathing fishes
- 1.6 Venomous fishes
- 1.7 Larvicidal fishes and biological control
- 1.8 School in gin fishes

Module 3. Functional morphology and bionomics of fishes (15hrs)

- 3.1 Gross external anatomy of fishes
- 3.2 Body form diversity
- 3.3 Fins- type, structure, function and modifications
- 3.4 Skin- Structure and function
 - 3.4.1. Scalation – types of scale, structure, development and modifications
 - 3.4.2. Colouration – types of chromatophores, biological significance

Module 4. Food, feeding, digestion and growth in fishes (10hrs)

- 1.1 Basic anatomy of digestive system of a cartilaginous and a bony fish
- 1.2 Food and feeding habits- natural food, feeding habits and adaptations; feeding in relation to season, growth, sex and breeding; gastro-somatic index
- 1.3 Digestion, absorption and utilization of food
- 1.4 Growth in fishes- length and growth relationship, growth curve and growth studies using scales and condition factor.

Module 5. Excretion and osmoregulation (5hrs)

- 1.1 Brief account of structure and function of kidney
- 1.2 Hormonal control of excretion and osmoregulation

Module 6. Locomotion (10hrs)

- 6.1 Types of locomotion – swimming and non-swimming
- 6.2 Body form and locomotion
- 6.3 Fins and locomotion
- 6.4 Swim bladder and buoyancy- origin and function
- 6.5 Weberian ossicles and its significance

Module 7. Sense organs in fishes (10hrs)

- 7.1 Later all in essence organs, Ampullae of Lorenzini
- 7.2 Chemo, mechano, thermo and electro receptors
- 7.3 Structure of eye and visual pigments

Module 8. Endocrine glands in fishes (10hrs)

- 8.1 Structure and function of - Pituitary gland, ultimobranchial gland, caudal neuro secretory cells, urophysis, corpuscles of stannous, inter renal tissue and chromaffin tissue, islets of Langerhans, thyroid gland, gonad and pineal organ

Module 9. Reproduction in fishes (10hrs)

- 9.1 Sexuality – hermaphroditism, unisexuality and bisexuality
- 9.2 Gonads- phases of maturity, length at first maturity, gonado-somatic index, fecundity
- 9.3 Reproductive behavior- sexual dimorphism, courtship, parental care, nest building

Module 10. Fish genetics**(10hrs)**

- 10.1 Sex determination in fishes
- 10.2 Recent trends and techniques in hybridization
- 10.3 Chromosome manipulation in fishes
- 10.4 Transgenesis in fishes

**Special Subject: Fish Biology and Fishery Science
Zo 242: Fisheries and Aquaculture****Fisheries****Module 1. Fishery Science****(15hrs)**

- 1. Importance of Fishery Science- Inland fisheries, Marine fisheries, capture fisheries and culture fisheries
- 2. Inland capture fisheries- Riverine fisheries, reservoir fisheries, cold water fisheries and estuarine fisheries
- 3. Marine capture fisheries in India- Offshore and deep sea fisheries- fin fish fishery, shell fish fishery (crustacean and molluscan)

Module 2. Methods of fishing**(10hrs)**

- 2.1 Indigenous fishing crafts of India- sea fishing crafts- Catamaran, Musula boat, caravel boats, Dinghi, Dug out canoes, plank built canoes, out trigger canoes
- 2.2 Inland fishing crafts: Dug out and plank built boats
- 2.3 Mechanised Indian fishing crafts- fishing vessel characteristics
- 2.4 Indigenous fishing gears in India: Traditional and conventional; sea fishing gears and inland fishing gears

Module 3. Harvest and post-harvest Technology**(20hrs)**

- 3.1 Harvesting- precautions observed during harvesting, sorting, grading the catch
- 3.2 Nutritive value of fish and biochemical composition of fish flesh
- 3.3 Fish spoilage and preservation
- 3.4 Fish preservation and processing – Icing and freezing, canning, salting, drying, curing, smoking etc
- 3.5 Fish products and byproducts- Liver oil, meal, manure, glue, isinglass, leather, chitosan, fish maws, fish protein concentrate, fish fins
- 3.6 Fish food poisoning

Module 4. Fish export and Extension**(5hrs)**

- 4.1 Transportation and marketing: Overseas market for diversified products and principal world market for diversified sea food products
- 4.2 Fisheries Extension: extension philosophy and extension methodology
- 4.3 The status of Indian fishery co-operative movement and fish farmers development agencies

Aquaculture

Module 5. Aquaculture**(10hrs)**

5.1 Scope and objectives of aquaculture; status in India

5.2 Culture systems-

5.2.1 Criteria for space and site selection

5.2.2. Culture systems- pond, bheries, salt pans, tanks, race way, cage, pens etc.

5.3 Hatcheries- different types

5.4 Design and construction of aquafarms

Module 6. Breeding and seed production**(10hrs)**

6.1 Bionomics of cultivable species of fish and shell fish (Mulletts, milk fish, pearl spot, carps, *Penaeus* spp., *Macrobrachium* spp.)

6.2 Breeding of fishes with special reference to Indian major carps- wet and dry bundh technique for breeding.

6.3 Induced breeding

6.3.1. Induced breeding in Fish- Principle, techniques and advantages of hypophysation, selective breeding and seed production.

6.3.2. Induced breeding in Shrimp- Techniques involved in shrimp breeding and seed production- eye stalk ablation etc.

6.4 Transport of live fishes- fingerlings and breeders

6.5 Cryopreservation of gametes and embryos

6.6 Common fish diseases – viral, fungal, bacterial and parasitic infections.

Module 7. Nutrition in culture fishes**(3hrs)**

7.1 Nutritional requirement of a culture fish

7.2 Feed-Live and formulated

7.3 Procedure of feed formulation

Module 8. Methods of freshwater and brackish water fish culture**(15hrs)**

8.1 Monoculture – Indian major carps (Catla, Rohu, Mrigal), exotic species, Tilapia

8.2 Composite culture

8.3 Culture of air-breathing fishes- ecology of swamps and use in culturing air-breathing fishes

8.4 Shrimp culture: traditional and scientific brackish water culture practices in India with special reference to Kerala.

8.5 Ornamental fish culture- exotic and indigenous species

8.6 Aquarium set up and maintenance; Aquarium plants and aquarium accessories

8.7 Frog culture

Module 9. Mari culture in India**(7 hrs)**

9.1 Sea farming and sea ranching

9.2 Prawn culture

9.3 Pearl culture and culture of edible mollusks

9.4 Turtle farming

9.5 Sea weed cultivation

Module 10. Integrated fish culture**(5 hrs)**

10.1 Paddy cum fish culture

10.2 Fish-livestock farming- manorial value of livestock wastes and their role in recycling for raising fish production

10.3 Sewage fed fish culture

Field Work

1. Visit to freshwater and brackish water fish farms

2. Collection of water and soil samples of fish ponds for analyzing hydrographical parameters

Study tour

Visit to fisheries institute and fishing harbours to study the following:

1. Freshwater and brackish water aquaculture

2. Fishing operations

3. Fish preservation and processing

4. Boat building and net making

5. Fisheries research, survey, education and examination

Special Subject: Fish Biology and Fishery Science

Practical I

Zo 243-Ichthyology

Taxonomy

1. Identification and classification of 10 local fishes (Marine/freshwater) upto species level.

2. Identification and classification of 5 prawns upto species level.

Dissection and Mounting

3. Membranous labyrinth

4. Ampullae of Lorenzini

5. Brain

6. Scales- Placoid, cycloid, ctenoid

7. Digestive system of a fish (cartilaginous or bony fish)

8. Urinogenital system of a teleostean fish

9. Pituitary gland

Fish Physiology

10. Effect of NaCl/KCL on fish chromatophores.

11. Determination of the rate of oxygen consumption of a fish at room temperature.

12. Determination of gonado somatic index.

13. Measurement of fecundity rate in a fish.

14. Qualitative and quantitative analysis of gut content in a herbivorous and carnivorous fish.

15. Determination of gastro somatic index.

16. Smear preparation of fish blood to study the morphology of different cellular elements .

17. Differential count of fish WBC.

Fish Genetics

18. Sex determination in fishes.
19. Hybridization techniques in fishes.
20. Karyotyping in fishes.

Special Subject: Fish Biology and Fishery Science

Practical II

ZO 244- Fisheries and aquaculture

Fish pond ecology

1. Determination of nutrients in the water samples from freshwater and brackish water ponds (Phosphate/sulphate/nitrate).
2. Determination of free calcium carbonate in the soil sample from freshwater and brackish water ponds.
3. Determination of LC_{50} for fish exposed to a given pollutant.

Fish Pathology

4. Identification of common external fish parasites (at least 5 numbers).
5. Estimation of spoilage in fish by pH method.
6. Determination of bacterial plate count for fish skin, flesh and gut.

Breeding Techniques

7. Mounting of pituitary gland.
8. Preparation of pituitary gland extract.
9. Demonstration of hypophysation technique.
10. Demonstration of artificial insemination.
11. Demonstration of sperm motility in a fish.
12. Preparation of a formulated fish feed.

Fish byproducts

13. Identification and study of fish byproducts
13. Preparation of any one fish by product
13. Estimation of muscle protein
13. Estimation of muscle glycogen

Fishing crafts and gear

17. Identification and study of different types of fishing crafts (Minimum 5 numbers)
17. Identification and study of different types of fishing gears (Minimum 5 numbers)
17. Setting up of an aquarium
17. Study of aquarium accessories
17. Study of common aquarium plants (Minimum 5 numbers)

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Semester IV

Special Subject- Insect Science

ZO 241 General Entomology

(100hrs)

Aim: To introduce students to the importance of entomology, classification of insects, their anatomy, embryology, classification, toxicology management etc.,

Objective: To acquaint the students with external morphology of the insect's body, Pest management etc.,

Unit 1 Introduction

(5hrs)

- 1.1. Origin and evolution of insect.
- 1.2. Fossil Insects.
- 1.3. Insect-plant interdependence (Co-evolution).

Unit 2 Anatomy

(20hrs)

- 2.1. Integument : Histology of the basic components, Chemical composition of cuticle, sclerotization, physical properties of cuticle, coloration, permeability, characteristics, molting and external integumentary processes.
- 2.2. Head- General morphology of head (Opisthognathus, Prognathus, Hypognathus). Head segmentation, Head skeleton, Tentorium, Modifications in head capsule, Mouth parts- modifications based on feeding mechanisms. Antennae- Structure, functions and types.
- 2.3. Thorax- Segmentation- Structure and modifications.
- 2.4. Abdomen- Segmentation- Structure and characteristics.
- 2.5. Wings- Origin and evolution of wings, venation- structure, wing modifications.
- 2.6. Appendages- Segmentation- structure- Adaptive radiation of legs.

Unit 3. Embryogenesis

(20hrs)

- 3.1. Types of eggs, Formation of blastoderm and germ layers, formation of germ band and extra embryonic membranes.
- 3.2. Differentiation of germ layers.

- 3.3. Segmentation, Appendage formation and blastokinesis, organogenesis, polyembryony, control of embryogenesis, Oviparity, Viviparity, Oviposition, eclosion, post embryonic morphogenesis.
- 3.4. Growth, metamorphosis, endocrine mechanism in metamorphosis.

Unit 4. Insect Classification

(15hrs)

- 4.1. Biology and habits of the different orders of the insects- classification upto families.
- 4.2. Biology and habits gall forming and leaf mining insects.
- 4.3. Aquatic insects- Aquatic adaptations including respiratory adaptations.
- 4.4. Adaptation of parasitic and predatory insects.
- 4.5. Seasonal adaptations- Dormancy- Diapause.

Unit 5. Insect Physiology

(30hrs)

1. Insect nutrition: Anatomy and histology of foregut, mid and hind gut, Modification of gut (filter chamber) processes of secretion of enzymes, microbiota, and digestion of wood, keratin, wax and silk.
2. Respiratory system: Trachea, Tracheoles, Air sacs, spiracles. Types of ventilator process- passive ventilation bulk flow and active ventilation.
Passive suction ventilation and elimination of CO₂. Ventilation in aquatic insects and endoparasitic insects during molting.
Central nervous control of ventilation.
3. Circulatory system: the dorsal vessel and accessory pumping sinuses.
Cardiac regulation and circulation- general characteristics and chemical composition of hemolymph, hemocytes, origin number and function. Other tissue associated with circulatory system.
4. Excretory system: Malpighian tubules- anatomy and histology. Orthopteran, Hemipteran, Coleopteran and Lepidopteran types. Salt and water balance, control of diuresis and gut mobility, nitrogenous excretion, insect urine.
5. Nervous system, Glandular and Muscular systems.
Structure and function of nervous system, nervous integration.
Exocrine and endocrine glands and their functions.
Skeletal muscle, visceral muscle, muscle development and maintenance.
6. Sense organs: Morphology of sense organs, sensory mechanisms, light and sound production.
 - 5.6.1 Mechanoreception- the tactile sense, proprioceptive sense, sound perception.
 - .2 Chemoreception- sensory coding phagostimulants and phagodeterrents.
 - .3 Thermoreceptors- Hygroreceptors.
 - .4 Photoreception- Compound eyes, dorsal ocelli etc.
 - .5 Light production and sound production- different types of sound producing organs.
7. Reproduction and morphogenesis.
 - .1 Reproductive system and gametogenesis in male and female
 - .2 Fertilization, Sex determination, parthenogenesis.
 - .3 Different types of insect larvae and pupae.

Unit 6. Insect communication

(10hrs)

- 6.1. Acoustic, visual, tactile and chemical methods.
- 6.2. Role of hormone in communication.
 - .1 Pheromones
 - .2 Kairomones
 - .3 Allomones
- 6.3. Social organization, communication and behavior with reference to Termites, Ants and Honey bees.
- 6.4. Insect Immunity

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ZO 242 Applied Insect Science

(100hrs)

Aim: To introduce various aspects of pest control, Industrial application of entomology, pest control and management.

Objective: To familiarize various aspects of entomology like pest infestation, pest control, pest outbreak, Industrial entomology etc.,

Unit 1 Introduction Insect Pests

(5hrs)

- 1.1 Kinds of insect pests. Major pests, minor pests, sporadic pests, endemic pests, exotic pests, seasonal pests, occasional pests, regular pests, persistent pests.

Unit 2 Causes of Pest Outbreak

(8hrs)

- 2.1 Deforestation, Destruction of natural enemies pest resurgence.

- 2.2 Secondary pest outbreak, Intensive and extensive cultivation, Introduction of new crops, new varieties, hybrid varieties, cultural practices, change in agricultural practices- introduction of new pests.
- 2.3 Forecasting pest outbreaks and surveillance, short term and long term forecasting- Forecasting based on observations- Climatic and empirical factors.

Unit 3 Biology of pests and control

(20hrs)

- 3.1 Biology, nature of damage and control of major pests of major crops: Paddy, coconut, cotton, mango, vegetables, pulses, coffee, tea, sugarcane, banana, cashew, pepper, turmeric, ginger, cardamom, and stored products.
- 3.2 Insect pest of domestic animals, biology and control.
- 3.3 Biology of major arthropod vectors of human diseases belonging to diptera, anoplura, siphonoptera, - control of vectors.
- 3.4 House hold pest insects - biology and control

Unit 4 Industrial Entomology

(12hrs)

- 4.1 Silkworm technology – Sericulture
- 4.2 Honeybee- Apiculture
- 4.3 Lac-Insect-Lac culture
- 4.4 Insects as human food and as scavengers

Unit 5 Principles and Insect Control

(20hrs)

- 5.1 Basic principles of insect control, prophylactic methods, cultural methods, mechanical methods, physical methods and legal methods.
- 5.2 Biological control- Brief history, theory behind classical biological control. Agents of Biological control- Parasite and parasitoids, predators and pathogenic microorganisms (bacteria, fungi and virus).
- 5.3 The practice of biological control- phases conservation, importation and colonization- mass culture and release of natural enemies.
- 5.4 Important biological control products undertaken in India against insect pest.
- 5.5 Economic dimensions of biological control- merits and demerits.
- 5.6 Significance and relevance of biological control in the present regime.

Unit 6 Insect Toxicology

(15hrs)

- 6.1 Chemical control- Insecticide formulations, inorganic and organic pesticides, Classification of insecticides- based on mode of entry, mode of action.
- 6.2 Synthetic organic insecticides. Organochlorine compounds (DDT, BHC, Endosulfan- heptachlor, dieldrin).
- 6.3 Organophosphorous insecticides- monochrotophos, tetra ethyl pyrophosphate, parathion.
- 6.4 Carbamates- Carbaryl, carbofuran
- 6.5 Botanical insecticides- chemical properties, mode of action and toxicity. (nicotine, rotenone, pyrethrum and neem, insect growth regulators).
- 6.6 Synthetic pyrethroids- definition, uses as insecticides, mode of action (pyrethrin, allethrin).
- 6.7 Fumigation and fumigants
- 6.8 Insecticide residues

6.9 Pesticide appliances

Unit 7 Pest Management

(15hrs)

- 7.1 Concepts of pest management, definition, characteristics of pest management, pest management strategies and techniques.
- 7.2 Integrated pest management (IPM)- definition, IPM in agro ecosystem, preventive practices, Therapeutic practices, selection of tactics
- 7.3 Principles of behavioural control- pheromonal considerations- communication pheromones, sex pheromones, aggregation, pheromones, orientation theories, use of other chemicals- repellants- plants allomones- Antifeedants, integration of behaviours modification with other tactics.
- 7.4 Autocidal control- (Chemosterilants, sterile male technique and other genetic tactics)
- 7.5 Pest management tactics
 - 7.5.1 Ecological management of crop environment
 - 7.5.2 Reducing average favourability of ecosystem
 - 7.5.3 Disrupting continuity of pest requisites
 - 7.5.4 Diverting pest population away from crop
 - 7.5.5 Reducing the impact of insect injury
- 7.6 Ecological back lash and its management- resistance of population of pest management-tactics, pest population resurgences and replacement- enhanced microbial degradation, upset in community balance.

Unit 8. Insecticide Resistance

(5hrs)

- 8.1 Genetic, physiological and biochemical mechanisms.
- 8.2 Insecticide metabolism- microsomal and extra microsomal
- 8.3 Dynamics of environmental pollution by insecticides, its impact in biosphere.
- 8.4 Pest residues, insecticide poisoning, biological magnification, health hazards, silent spring (Racheal Carson).

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Semester IV

Special Subject : Insect Science

Practical I

Zoo 243 (Taxonomy, Anatomy, Histology and Physiology)

Taxonomy

1. Identification and preparation of taxonomic key of 10 insects belonging to 10 families and 4 orders
2. Collection, preservation and presentation of insects belonging to 30 families.
3. Mounting, sketching and labeling of taxonomic features of the following.
 - a) Wings in insect of 5 orders.
 - b) Antennae in insects of 5 orders.
 - c) Mouth parts in insects- 4 types
 - d) Leg-4 types.
 - e) Whole mount of 5 insects/ life stages of taxonomic importance.

Anatomy and Histology

1. Dissection
 - 1.1 Alimentary canal and associated glands of 4 groups of insects with different feeding habits.
 - 1.2 Reproductive system of any 2 female insects.
 - 1.3 Nervous system in any two groups.
 - 1.4 Stomatogastric nervous system (Oesophageal, sympathetic, single recurrent nerve and paired recurrent nervous).
 - 1.5 Endocrine system

1.6 Identification of sensilla employing a suitable technique.

2. Histology

2.1 Preparation of paraffin sections of insect midgut epithelium and ovary using Haematoxylin-eosin staining technique to demonstrate histological details.

2.2 Whole mount staining preparation of insect brain to demonstrate neurosecretory cells by PAVB technique.

3. Physiology

1. Quantification of proteins in fat/haemolymph

2. Quantification of glycogen in fat body.

3. Estimation of any one transaminase in insect fat body/ haemolymph.

4. Identification of at least two free amino acids in haemolymph by paper chromatography.

5. Quantitative estimation of any two digestive enzymes (protease, amylase/ invertase).

6. Haemolymph protein profile employing PAGE (Demonstration).

7. Identification of haemocytes using Giemsa/Wright's/ BPS stain.

NOTE: Candidates shall submit a collection consisting of 30 families of insect from different orders (It shall include dry collection, wet collection and slides including life stages). The collection shall be submitted at the time of practical examination along with practical record.

Practical II

Zo244 (Ecology, Economic Entomology and Experimental Entomology)

Ecology

1. Methods of collection and identification of soil insects (any 10 numbers)

2. Field work: A field study shall be conducted to observe the insects in their natural habitat. A detailed field report shall be submitted by each student which includes observation of insects in area such as forests, grass land, aquatic insects, sandy areas etc. the field report duly certified shall be submitted at the time of practical exam along with practical record.

3. Estimation of LC₅₀ value and LD₅₀ value of any two brands of insecticides for some aquatic/terrestrial organisms.

Economic Entomology

1. Collection, preservation, identification and presentation of following categories of pests.

1.1. Agricultural pests of different crops 10 numbers.

1.2. Stored- product pests- 3 numbers.

1.3. Vectors and veterinary pests-4 numbers.

1.4. House-hold pests- 5 numbers.

1.5. Beneficial insects – 6 numbers.

2. Collected and identified insect specimens and pests of crops shall be submitted at the time of practical examination. Candidates shall submit a minimum of 15 wet collections.

3. Field study to collect/observe insect species of pollinators, parasitoids, predators, scavengers and weed killers.

4. Field study of various methods of pest management.
Pesticide formulation.
Pesticide application.
Safety, hazards and first aid.

Experimental Entomology

1. Malpighian tubule activity using suitable dyes.
2. Rearing of any two insects in the laboratory.
3. Identification of larval instars using Dyar's rule.
4. Sexing of insects- larva pupa and adult.
5. Effect of starvation on glycogen/ protein on insect fat body/haemolymph.
6. Effect of starvation on transaminase activity in insects.

NOTE: Candidates shall submit a minimum of 15 numbers of different categories of pests at the time of practical examination along with the practical record. A duly certified field report also shall be submitted at the time of practical examination.

Semester IV

Special Subject: Environmental Physiology

AIM: To introduce the nature and scope of various aspects of Environmental pollution and its management in micro and macro levels.

OBJECTIVES: Imparting basic knowledge about the environmental pollution, toxicology and its allied problems. Make one striving to attain knowledge on the pollution problems and toxicological effects and toxicological procedures in experiments and analysis.

Zo241 : Pollution Biology & Environmental Physiology

(100hrs)

Unit 1 Introduction

(12hrs)

1.1	Environmental pollution – Concepts and definitions
1.2	1.2 Environmental pollutants
	1.2.1 Organic pollutants
	1.2.2 Heavy metals, industrial effluents
	1.2.3 Pesticides
	1.2.4 Radioactive pollutants
	1.2.5 Oil, food additives and contaminants

Unit 2 Air Pollution

(15hrs)

- 2.1 Chief air pollutants, occurrence, sources and effects
- 2.2 Interaction of air pollutants in the atmosphere – Photochemical reactions- Formation and effects of secondary pollutants and photochemical smog.
- 2.3 Effects of air pollutants on materials, building metals, vegetation and human health; a brief survey of air pollution episodes.
- 2.4 Air pollution abatement technologies- Design and working of bag filters, electrostatic.

Unit 3. Noise pollution

(5hrs)

- 3.1 Sources
- 3.2 Effect of noise pollution on materials, animals and humans.
- 3.3 Sonic boom
- 3.4 Abatement strategies

Unit 4 Water pollution

(6hrs)

4.1 Organic pollution

- 4.1.1. Organic and sources of organic pollutants- Biodegradable and non-biodegradable; Domestic, agricultural and industrial sources.
- 4.1.2. Biochemical Oxygen Demand (BOD)
- 4.1.3. Chemical Oxygen Demand (COD)- Importance and method of estimation.
- 4.1.4. Effects of organic pollution on aquatic systems
- 4.1.5. Eutrophication- Sources and effects
- 4.1.6. Biocides, fungicides and herbicides- Sources and effects
- 4.1.7. Biomagnification: Toxic effects on non-target organisms and hazards to man.

4.2. Industrial pollution

- 4.2.1. Heavy metals- Effects of various heavy metals (such as Hg, Pb, Cd, As Cr).
- 4.2.2. Fluoride pollution on human life
- 4.2.3. Thermal pollution – sources, effects and control.
- 4.2.4. Oil spills- sources, effects and control.

4.3. Water pollution abatement technology

(10hrs)

- 4.3.1. Primary, secondary and tertiary treatment systems
- 4.3.2. Design and operations of screens, grit chambers, sedimentation tanks and oxidation ponds.
- 4.3.2. Design and operations of biological treatment systems like aerated lagoons, activated sludge process, trickling filters and sludge digestion.

Unit 5. Radioactive Pollution

(10hrs)

- 5.1. Sources of nuclear radiation.
- 5.2. Biological effects of ionizing radiations and non-ionizing radiations.
- 5.3. Nuclear waste disposal

Unit 6. Terrestrial pollution

(12hrs)

- 6.1 Solid wastes and disposal (garbage, ashes, rubbish, street litter, agricultural waste, mining wastes and industrial wastes.)
- 6.2 Strategies of control of solid waste pollution.

Unit 7 Environmental Physiology

(30hrs)

7.1 Temperature adaptation

- 7.1.1. Morphological and physiological adaptations: Relation between body size and metabolic rate. Temperature and metabolic rate: Thermal acclimation; Enzymatic acclimation;
- 7.1.2. Temperature classification of animals – Homoiotherms and Poikilotherms.

- 7.1.3. Thermal migration.
- 7.1.4. Implications of global warming on animals.

7.2 Pressure adaptations

- 7.2.1. Adaptations to hyperbaric stress with particular reference to deep sea organisms.
- 7.2.2. Biochemical mechanisms of animals to high altitudes (hypoxia and hypoxia).

7.3. Osmoregulation and ionic regulation

- 7.3.1. Osmoregulation in fresh water, marine, estuarine and terrestrial animals.
- 7.3.2. Sodium pump Na^+ and H^+ -ATPase in relation to salinity adaptations.

7.4. Eco-physiological adaptations.

- 7.4.1. Mimicry and coloration
- 7.4.2. Echolocation
- 7.4.3. Bio-luminescence
- 7.4.4. Electric organs

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27. Yogendra,N. and Srivasantha (1995). Environmental Pollution. Ashish Publishing House, New Delhi.
28. S.CharlesKendeigh (1980). Ecology with special reference to animals and man, Prentice Hall of India Pvt. Ltd.
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ZO 242 Environmental Management

(100hrs)

AIM: To introduce the nature and scope of various aspects of Environment management and its conservation.

COURSE OBJECTIVES: To acquire knowledge and understanding of the Environment and its management including the conservation practices, laws and regulations.

Unit 1 Resources of Earth

(15hrs)

- 1.1 Renewable and non-renewable resources
 - 1.1.1. Forests, wild life, endangered species fisheries.
 - 1.1.2. Fossil fuels, minerals- their over exploitation for domestic, agricultural and industrial purposes.
 - 1.1.3. Water resources- protection of water shed reclamation of sewage and waste and water amangement in India.
- 1.2 Conservation of natural resources
- 1.3 Remote sensing of resource management.

Unit 2 Human exploitation of earth's resources

(15hrs)

- 2.1 Human interferences in ecosystems- consequences of over-exploitation
- 2.2. Brief account of weather modifications, desalination, artificial rain aking, acid rain, green house effects and its consequences and destruction of ozone umbrella.

Unit 3. Biological conservation and management

(20hrs)

- 3.1 Principles of conservation
- 3.2 Conservation and economic use of energy and energy audit.
- 3.3 Ecological problems due to intensive aquaculture- importance of trawling ban
- 3.4 Conservation of wild life- present status and strategies of conservation.
- 3.5 Deforestation and its consequences- need for scientific management and conservation of forests.
- 3.6 Biodiversity in India- Biodiversity conservation – *in situ* and *ex- situ* methods.
- 3.7 Biodiversity registering and patenting of biodiversity.

Unit 4. Environmental policy and Education

(15hrs)

- 4.1 Environmental policy- social, economic and legal aspects.
- 4.2 Environmental laws and their enforcement.
- 4.3 Environmental awareness- role of Government, media and voluntary organizations.

Unit 5. Environmental Impact Assessment and Sustainable Development (15hrs)

- 5.1 Environmental Impact Assessment (EIA)
 - 5.1.1. Definition, aim, principles and concepts of EIA.
 - 5.1.2. Elements of environmental impacts.
 - 5.1.3. Methods for preparing EIA- Check list method, Werner- Prestroit study.
 - 5.1.4. EIA Process making inventories, sampling and data processing, impact prediction and stimulation.
- 5.2 Sustainable Development
 - 5.2.1. Concepts and dimensions.

- 5.2.2. Basic needs
- 5.2.3. Unavoidable impacts and imperatives relating to sustainable development.
- 5.2.4. Alternative strategies.

Unit 6. Environmental Biotechnology

(20hrs)

6.1 Pollution abatement using microbes.

- 6.1.1. Sewage treatment.
- 6.1.2. Solid waste disposal.

6.2 Soil enrichment by using microbes.

6.3 Genetic engineering of nitrogenous gene ('nif' genes) and nodulation genes.

6.4 Microbial insecticides

- 6.4.1. Insecticidal toxin of *Bacillus thuringiensis* and genes and nodulation genes.
- 6.4.2. Baculoviruses as biocontrol agents and their genetic engineering for improved biocontrol.

References.

1. J.L.Chapman and M.J. Resis (1999), Ecology- Principles and Applications. Cambridge University Press.
2. Abbasi, S.A. and Ramaswamy, E.V. (1999). Biotechnological methods of pollution control. Oxford University Press, Hyderabad.
3. Atchia, M. and Tropp.S. (1995). Environmental Management, John Wiley and Sons.
4. Barthlott, W and Winiger, M. 1998), Biodiversity. Springer Verlag, Berlin.
5. Bishop, P.L. (2000). Pollution Prevention: Fundamentals and Practice, Mc Graw Hill Pub.
6. Aneja K.R. (2000). Experiments in microbiology, plant pathology, tissue culture, and mushroom cultivation. WishwaPrakashan, New Delhi.
7. Cutter, S.L. (1999). Environmentla risks and hazards. Prentice Hall of India Pvt. Ltd., New Delhi.
8. Hary, M.F. (1990). Standard hand book of hazardous waste treatment and disposal. McGraw Hill.
9. Houghton, J.(1999). Global Warming. Cambridge University Press.
10. Kamboj, N.S. (1999). Control of noise pollution. Deep and Deep Publishers.
11. Kluge, H. Bittner, A and Hohnholz. J.H. (1995). Environment management, Institute of scientific Co-operation, Tubinlen, Germany.
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15. Rao, M.N. and Rao, N.V.N. (1997). Air Pollution. Tata Mc Graw Hill Pub. Co. Ltd.
16. Schwab, G.O. Gangmeirr, D.D. and Elliot, W.J. (1996). Soil and water amanagement systems. John Wiley and sons.
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18. Sellers, B.H. (1984). Population of our Atmosphere, Adam Hilger Ltd., Bristol.
19. Seragelglin (1999). Biotechnology and Biosafety. World Bank, Washington D.C.
20. Sharma, B.K and Kaur, H. (1996). Water pollution, GOEL Publishing house, Meerut.

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22. Singh B.P. et al., (1988). Environment and Biotechnology. Todayand tomorrow Printers. New Delhi.
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24. Trivedi, P.R. (2000). Global Biodiversity, Authors Press.
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28. Glick B.R. and Pasternak, J.J. (2000). Molecular Biotechnology ASM Press, Washington, DC.
29. S.CharlesKendeigh (1980). Ecology with special reference to animals and man, Prentice Hall of India Pvt. Ltd.
30. N.K.Uberoi, (1999). Environmentla Management., Excel Books.
31. Biswarup Mukherjee, 1997. Environmentla Biology, Tata Mc Graw Hill.
32. Abbasi, S.A. (1998). Environmental Pollution and its control. Cognent International, Pondicherry.

Semester IV
Special Subject: Environmental Biology

Practical 1. Zo 243 Pollution Biology & Environmental Physiology

(10 practicals to be carried out)

1. Analysis of soil texture using micrometry.
2. Determination of moisture content of soil.
3. Determination of soil pH (different soil samples)
4. Determination of organic carbon.
5. Determination of porosity/water retaining capacity of soil.
6. Determination of chlorine in water.
7. Determination of H₂S in water.
8. Determination of Ammonia in water.
9. Short term bioassays and determination of LC50 of fish exposed to a given pollutant.
10. Effect of soil pollution on the population on earth works.
11. Study of indicator organisms.
12. Effect of pollution on the oxygen consumption of fishes.
13. Temperature/pH preferences of fishes.
14. Field work- Students are expected to make a field study on the problem of environmental pollution in their area.

Note: the students should submit the field study report at the time of examination.

Practical II Zo 244 Environmental Management

(10 practicals to be carried out)

1. Determination of pH of water.
2. Determination of electrical conductivity of water.
3. Determination of turbidity of water.
4. Determination of salinity of water.
5. Determination of hardness of water.
6. Determination of BOD and COD of polluted water.
7. Estimation of BOD and COD of polluted water.
8. Instrumentation: Principles, use and working of the following instruments.
 - 8.1 pH meter
 - 8.2 Electrical conductivity meter.
 - 8.3 Flame photometer
 - 8.4 Hygroscopic soil thermometer
9. Estimation of primary productivity (chlorophyll method).
10. Estimation of secondary productivity
11. Construction of pyramids of numbers and biomass from a pond collection.
12. Species diversity estimation with reference to a fresh water pond/soil.

University of Kerala

M.Com Degree Programme

(under Semester Pattern in the Affiliated Colleges)

w.e.f 2018 onwards

Scheme and Syllabus (from 2018 Admission onwards)

SEMESTER I				Marks	
Code	Paper	Subject	CA	ESA	Total
CO 211	Paper1	Business Ethics and Corporate Governance	25	75	100
CO 212	Paper2	Legal Framework for Business	25	75	100
CO 213	Paper3	Research Methodology	25	75	100
CO 214	Paper4	Planning and Development Administration	25	75	100
CO 215	Paper5	Advanced Corporate Accounting and Reporting	25	75	100
Total			125	375	500

SEMESTER II				Marks	
Code	Paper	Subject	CA	ESA	Total
C0 221	Paper 1	E-Business and Cyber Laws	25	75	100
C0 222	Paper 2	Strategic Management	25	75	100
C0 223	Paper 3	Quantitative Techniques and Financial Econometrics	25	75	100
C0 224	Paper 4	International Business	25	75	100
C0 225	Paper 5	Investment Management	25	75	100
Total			125	375	500

Summer Internship

Elective - FINANCE

SEMESTER III				Marks	
Code	Paper	Subject	CA	ESA	Total
CO 231U	Paper1	Income tax Planning and Management	25	75	100
CO 232F	Paper2	Security Analysis and Portfolio Management	25	75	100
CO 233F	Paper3	International Financial Management	25	75	100
CO 234F	Paper4	Strategic Cost and Management Accounting	25	75	100
Total			100	300	400

SEMESTER IV			Marks		
Code	Paper	Subject	CA	ESA	Total
CO 241W	Paper1	Goods and Service tax & Customs Duty-Law and Practice	25	75	100
CO 242F	Paper 2	Risk Management and Derivatives	25	75	100
CO 243F	Paper 3	Accounting Standards	25	75	100
CO 244S	Paper 4	Management Optimization Techniques	25	75	100
		Total	100	300	400
		Project Report			100
		Comprehensive Viva			100
		Grand Total			2000

Elective - INFORMATION TECHNOLOGY & E-BUSINESS

SEMESTER III			Marks			
Code	Paper	Subject	CA	ESA		Total
				Written	Practical	
CO 231 E	Paper 1	Office Automation	25	50	25	100
CO 232 E	Paper 2	Internet and Web Designing	25	50	25	100
CO 233 R	Paper 3	Management of Intellectual Property Rights	25	75	-	100
CO 234 E	Paper 4	Legal Frame work for Information Technology Based Business	25	75	-	100
		Total	100	300		400

SEMESTER IV

Code	Paper	Subject	CA	Marks		Total
				Written	Practical	
CO 241 E	Paper1	Database Management and Information Technology	25	50	25	100
CO 242 E	Paper 2	E -Banking and Business Models	25	75	-	100
CO 243 E	Paper 3	E- Commerce and Global Marketing	25	75	-	100
CO 244 S	Paper 4	Management Optimization Techniques	25	75	-	100
		Total	100	300		400
		Project Report				100
		Comprehensive Viva				100
		Grand Total				2000

Elective - INTERNATIONAL TRADE**SEMESTER III**

Code	Paper	Subject	CA	Marks		Total
				ESA		
CO 231 T	Paper1	Foreign Language (Any one paper) CO 231.1 T Foreign Language: Arabic				
		CO 231.2 T Foreign Language: French	25	75		100
		CO 231.3 T Foreign Language : German				
CO 232 T	Paper 2	International Trade and Documentation Management of Intellectual Property	25	75		100
CO 233 R	Paper 3	Rights	25	75		100
CO 234 Y	Paper 4	FOREX Management	25	75		100
		Total	100	300		400

SEMESTER IV

			Marks		
Code	Paper	Subject	CA	ESA	Total
CO 241 Z	Paper1	Logistics and Supply Chain Management	25	75	100
CO 242 T	Paper2	Strategic Management for MNCs	25	75	100
CO 243 T	Paper3	Legal Framework for International Trade	25	75	100
CO 244 S	Paper4	Management Optimization Techniques	25	75	100
Total			100	300	400
Project Report					100
Comprehensive Viva					100
Grand Total					2000
Elective - MARKETING					

SEMESTER III

			Marks		
Code	Paper	Subject	CA	ESA	Total
CO 231M	Paper 1	Agricultural and Rural Marketing	25	75	100
CO 232M	Paper 2	International Marketing	25	75	100
CO 233M	Paper 3	Marketing Research	25	75	100
CO 234M	Paper 4	Marketing Communication	25	75	100
Total			100	300	400

SEMESTER IV

			Marks		
Code	Paper	Subject	CA	ESA	Total
CO 241Z	Paper1	Logistics and Supply Chain Management	25	75	100
CO 242M	Paper2	Industrial Marketing	25	75	100
CO 243M	Paper3	Services Marketing	25	75	100
CO 244S	Paper4	Management Optimization Techniques	25	75	100
Total			100	300	400
Project Report					100
Comprehensive Viva					100
Grand Total					2000

Elective- BANKING AND INSURANCE

SEMESTER III

			Marks		
Code	Paper	Subject	CA	ESA	Total
CO 231 U	Paper 1	Income Tax Planning and Management	25	75	100
CO 232 B	Paper 2	Modern Banking	25	75	100
CO 233 B	Paper 3	Insurance Law and Practice	25	75	100
CO 234 Y	Paper 4	FOREX Management	25	75	100
Total			100	300	400

SEMESTER IV

			Marks		
Code	Paper	Subject	CA	ESA	Total
CO 241W	Paper1	Goods and Service tax & Customs Duty - Law and Practice	25	75	100
CO 242 B	Paper2	Investment Banking and Financial Services	25	75	100
CO 243 B	Paper3	Principles and Practices of Actuarial Science	25	75	100
CO 244 S	Paper4	Management Optimization Techniques	25	75	100
Total			100	300	400
Project Report					100
Comprehensive Viva					100
Grand Total					2000

Subjects common for more than One Elective

SEMESTER NO	CODE	PAPER	SUBJECT	COMMONFOR THE FOLLOWING ELECTIVES
III	CO 231U	1	Income Tax Planning and Management	1. Finance 2. Banking &Insurance
III	CO 234Y	4	FOREX Management	1. International Trade 2. Banking & Insurance
III	CO 233R	3	Management of Intellectual Property Rights	1. International Trade 2. Information Technology and E Business
IV	CO 244S	4	Management Optimisation Techniques	1. Finance 2. Marketing 3. Banking and Insurance 4. Information Technology & E-Business 5. International Trade
IV	CO 241W	1	Goods and Service tax & Customs Duty- Law and Practice	1. Finance 2. Banking &Insurance
IV	CO 241Z	1	Logistics and Supply Chain Management	1. International Trade 2. Marketing

SEMESTER I

Paper 1: CO 211- BUSINESS ETHICS AND CORPORATE GOVERNANCE

Objectives:

1. To convey basic understandings on the theories of Business Ethics
2. To provide a understanding on Corporate Governance practices and the provisions of the Companies Act relating to corporate governance

Module 1: Business Ethics and Ethical Practices: Ethics – Sources- Importance - factors influencing Business Ethics – Benchmarks on code of Ethics – Ethics Committees – Training Programmes – Ethical Decision Making – Ethics in Finance - Marketing and HR
(15Hrs)

Module 2: Organization Culture: Features – Building and Maintaining Organization Culture – Organizational Socialization – Managing cultural Diversity – Work Ethics – Work Culture – Quality of Work Life – Work Life Balance – areas Improving Work Life Balance – Strategies of Work Life Balance
(20Hrs)

Module 3: Corporate Governance: Importance – Objectives – Basic Ingredients of Corporate Governance – Principles - Theories – Phases of development of Corporate Governance in Global and Indian Perspectives – Code of Corporate Governance – Committees on Corporate Governance (Global and Indian)
(15Hrs)

Module 4: Corporate Social Responsibility : CSR under Companies Act 2013 – Scope – Relevance – Importance – Areas of CSR – Arguments for and against CSR – Ackerman’s model of CSR – SEBI – Clause 49 of listing agreement – Evaluation of Corporate Governance of a Company – Methods – Shareholder Value – EOCE, PAT, EPS, TSR, MVA, EVA and HVA - Corporate Philanthropy – Corporate Citizenship – Social Audit
(25 Hrs)

Module 5: Corporate Image and Excellence : Corporate image – building corporate image – Importance – Corporate Excellence – importance – Measures to achieve corporate excellence – New initiatives on corporate excellence - Role of Chairman – Qualifications – Power – Duties and Responsibilities – Board Committees – New Directions **(15Hrs)**

References:

1. Laura P Hartman, Perspectives in Business Ethics, Mc Graw Hill International
2. George A Steiner and John F Steiner, Business , Government and Society, Mc Graw Hill International
3. SK Chakraborty, Ethics in Management Vedantic Perspectives, Oxford University Press
4. Subhash Sharma, Management in New Age: Western Windows – Eastern Doors, New Age International Publishing , New Delhi
5. Prof (Col.) PS Bajaj, Dr. Raj Agarwal – Business Ethics an Indian Perspectives, Biztantra2006.

SEMESTER I

Paper 2: CO 212- LEGAL FRAMEWORK FOR BUSINESS

Objectives:

1. To enable student acquire updated knowledge and develop understanding of the regulatory framework for business
2. To make students aware of opportunities available in various legal compliances so as to enable them employable.
3. To expose students in emerging trends in good governance practices including governance.

Module 1: Advanced Company Law: The Companies Act 2013: Formation and related procedures of various types of companies Procedure for inter-corporate loans, investments- guarantee and security – Registration modification and satisfaction of charge Declaration and payment of dividend Maintenance of Books of Accounts - statutory financial audit, cost audit and secretarial audit – Board meetings and procedures-
(15 Hrs)

Module 2: Other Corporate Laws: Limited Liability Partnership Act, 2008: Concept, formation, membership, functioning and Dissolution - Conversion of LLPs into Private Limited Companies and vice versa. The insolvency and bankruptcy code,2016 - Insolvency Professionals - Liquidation Process – Insolvency and Bankruptcy Board of India.
(15Hrs)

Module 3: Economic Laws: **a.** FDI Policy – Foreign Direct Investment in India and abroad – External Commercial Borrowing (ECB) Formalities – Establishment of Branch Office of a foreign entity in India. **b.** Foreign Trade Policy – Opportunities of commerce/finance professional in foreign trade – Procedure of import and export – Export promotion schemes and initiatives. **c.** Competition Commission of India – Compliance of competition law.
(20Hrs)

Module 4 : Industrial and Labour laws: Overview of Industrial Policy of Govt of India and Govt of Kerala – Regulatory Mechanism under IDRA – MSME Development Act – Advantages of MSMEs and their role and significance in economic development – Central and State Schemes for MSME Promotion –Udyog Aadhar. **(20 Hrs)**

Module 5: Foreign Exchange Management Act - Features and Application- Opportunities for Indian Business -Challenges-Foreign Contribution (Regulation) Act 2010 **(20Hrs)**

References

1. Kapoor. N .D, *Business law*, Sulthan Chand andSons
2. Chandha P.R, *Business law*gajgotia, NewDelhi
3. Garg K.C, V.K Surendran, Mahesh Sharma and Chawla R.C, *Busiess regulatory frame work*, Kalyani Publishers, NewDelhi
4. Tulsian P.C, *Business Laws*, Tata Macgraw-Hill publishing Co.Ltd, NewDelhi
5. B S Moshal, *Modern Business law*,Ane books, New Delhi
Awathar Singh, *Company Law*, Eastern LawBooks
- 6 Corporate Laws – Taxmann
- 7 Lectures on Company Law –K.S.Anantharaman
- 8 A Textbook of Company Law – PPSGogna
- 9 Limited Liability Partnerships – HitenterMehta
- 10 Beginner’s Guide to Capital Market – SEBI’s Investor Awareness Website
www.investor.sebi.gov.in
- 11 Guide to Insolvency and Bankruptcy Code 2006 –Taxmann
- 12 The Indian Partnership Act – Pollock andMulla
- 13 Economic, Labour and Industrial Laws – Sultan Chand andSons
- 14 FEMA and FDI Ready Reckoner –V.S.Datey
- 15 Export and Import Documentation and Procedures – J.Senthil Velmurugan and S.Mahalakshmi
- 16 Competition Law in India – AbirRoy
- 17 Law of Consumer Protection –Dr.V.K.Agarwal

- 18 Anti-Money Laundering and Know Your Customer – Indian Institute of Banking and Finance(IIBF)
- 19 Intellectual Property Laws –P.Narayanan
- 20 Micro, Small and Medium Enterprises in India – IIBF
- 21 Labour and Industrial Laws –P.K.Padhi
- 22 Labour Laws –Taxmann
- 23 Compliances under Labour Laws – H.L.Kumar
- 24 Text Book on Arbitration and Conciliation with Alternate Dispute Resolution – SaharayMadhusudan
- 25 Law of Corporate Governance : Principles and Perspective –K.R.Samphath
- 26 Listing Agreement bySEBI
- 27 Journals – Chartered Secretary, Management Accountant, TheChartered Accountant, FIEO News andVyavasayakeralam
- 28 Websites -www.india.gov.in,www.mca.gov.in,www.commerce.gov.in,
www.dgft.gov.in,www.cci.gov.in,udyogaadhaar.gov.in,
www.egroups.kerala.gov.inandwww.cca.gov.in,

SEMESTER I

Paper 3: CO 213- RESEARCH METHODOLOGY

Objectives:

1. To provide an insight into the fundamentals of social science research.
2. To understand the need, significance and relevance of research and research design.
3. To acquire practical knowledge and required skills in carrying out research.

Module 1: Fundamentals of Research: Research-meaning-nature-significance-objectives-utilities-Principles of scientific research-Scientific Methods-Induction, Deduction-Qualities of a good researcher-Research Ethics. Research Methods-Types of Research-Fundamental, Applied, Policy, Exploratory, Descriptive, Predictive, Analytical, Historical; Methods of Investigation-Library, Case study, survey, Field study, Experimental, Evaluation, Action, Diagnostic, Ex-post Facto Research; Quantitative and Qualitative research. (15Hrs)

Module 2: Research Process: Research problem Identification-Identifying research gap-setting of objectives and hypotheses-identifying the variables-dependent, independent and intervening variables-Research design-steps in developing a research design-research design for descriptive, analytical, empirical and experimental research-qualities of a good research design. (15 Hrs)

Module 3: Sampling Techniques and Data Collection Methods: Probability and non-probability sampling techniques-sample size-sampling errors-sources of collection of data-Techniques and tools for data collection-Pre-testing and Pilot study (Review only). (5 Hrs)

Module 4: Statistical Estimation and Hypothesis Testing: Estimation-Qualities of a good estimation, Criteria for selecting estimation, Methods of estimation, point and interval estimation, confidence interval, determination of sample size in estimation. Testing of Hypothesis-Need and Significance of hypotheses-Formulation, Types of hypotheses-errors in testing hypotheses-type-I and Type-II errors-one tailed and Two

tailed tests-level of significance-Parametric tests-large sample and small sample tests-Z test, t-test, F-test-application of parametric tests. Non-parametric tests-Chi-square test, Sign test, Fisher-Irwin test, rank sum test, Run test, Mann-Whitney U test, Kruskal Wallis H test, Wilcoxon test, Mc Nemer test. Analysis of Variance-Meaning-Assumptions of ANOVA, Techniques of ANOVA-One way classification-Two-way classification-Setting up ANOVA table, Conditions for application and uses of ANOVA-Interpretation of analysed data. **(40 Hrs)**

Module 5 : Report writing and presentation: Research report- Types of reports- Content of report-Style of reporting-Steps in drafting reports-Qualities of a good report- Documentation-Citation-Footnotes-References-Bibliography-APA and MLA Format in writing references and Bibliography. **(15Hrs)**

References:

- 1.Krishnaswamy O.R, Research Methodology in Social Sciences
- 2.Kothari C. R, Research Methodology: Methods and Techniques
- 3.Sharma R,N & Sharma R.K ,Research Methods in Social Science
- 4.John W.Best and James V. Khan, Research in Education
- 5.Singh A.K., Tests, Measurements and Research Methods in Behavioural Sciences.

SEMESTER I

Paper 4: CO 214- PLANNING AND DEVELOPMENT ADMINISTRATION

Objectives:

1. To generate an overall insight on planning process in Indian Economy
2. To make the students aware about new planning initiatives in India

Module 1 - Structure of Indian Economy- Relevance of sectors in Indian Economy; Primary, Secondary and Tertiary Sectors-National Income-Methods of Computation-Inflation effects on Indian Economy- India's current National Income in comparison with leading economies of the world-Challenges. **(15Hrs)**

Module 2: Planning mechanism in India—Economic planning-features, types-Phases of Economic Planning-Growth and Planning Models-(Briefly mention) -State Planning Board-District Planning Board **(20Hrs)**

Module 3: Fiscal Policy-Centre-State financial relationship-Resource Allocation-Finance Commission-Development and Non Development expenditure-Preparation of budgets: Centre, State and Local Self Government-Deficit financing-Plan and Non-Plan Expenditure (Case Study: Evaluation of current Budget) **(20Hrs)**

Module 4 : Policy Initiatives in the Planning Process –Niti Aayog –Structure— Objectives –Functions-Guiding Principles -Vision Statement-Recent Policy initiatives: Make in India, Jan DhanYojana, Startup India, Swatch Bharath Abhiyan, Mudra Bank, Digital India – Future development initiatives **(20Hrs)**

Module 5: Role of State and Local Self Government-Planning initiatives in Kerala-Kerala Perspective Plan –Mission-Vision-Scope-Local Self Government –Role, Functions and Programmes **(15Hrs)**

References:

1. Agarwal A.N. and Kundanlal (1999), Economics of Development and Planning, Vikas Publishing House, NewDelhi
2. Seth.M.L. and S.P. Singh (1998), Economic Planning: Theory andPractice, S.Chand and Company Ltd., Ram Nagar, NewDelhi
3. Dhingra.I.C. and V.K.Garg (2000), Economic Development and Planning in India, Sulthan Chand Publications, NewDelhi
4. Mishra S.K. and Puri V.K (2008), 26th Edition, Indian Economy,Himalaya Publishing House Pvt. Ltd.,Mumbai-
5. Desai and Bhale Rao (1986), Economic Planning and Policy,Himalaya Publishing House,Mumbai
6. Madan Mohan Batra (1987), Planning in India: development perspective towards the 21st century, V.K. Publishing House,Mysore
7. Misra and Puri (1999), Development and Planning Theory andPractice, Himalaya Publishing House,Mumbai
8. Gerald. M. Meier, and Robert E. Baldwin,(1957) (Reprint in 1975), Economic Development- Theory, History ,Policy, Asia Publishing House,Mumbai
9. Gerald. M. Meier, James E. Rauch,(2005), Leading Issues inEconomic Development, (8th Edition) Oxford University Press,Oxford,
10. Meier .G.M. (1995), Leading Issues in Economic Development (6thedition) Oxford University Press, NewDelhi.
11. Higgins Benjamin (1963), Economic Development, Principals, Problems and Policies, Central Book Depot,Allahabad
12. Kindleberger C.P. (1977), Economic Development (III edition) McGraw Hill NewYork.
13. Adelman. I (1961), Theories of Economic Growth and Development, Stanford Universities Press,Standford.
14. Bose. A, (1975), Marxian and Post Marxian Political Economy, PenuinLondon
15. Chakrvarthy S (1982), Alternative Approaches to the Theory of Economic Growth, Oxford University Press, NewDelhi.
16. Growth. S, (1986), An Introduction to Development Economics, Allen and Unwin
17. Little IMD (1982), Economic Development : Theory Policy and International Relations, Basic Books, NewYork
18. Schumpeter J.A., (1949), The Theory of Economic Development,Harvard University Press,Cambridige.
19. Bhagavathi J and Desai, (1970), India: Planning for Industrialization,Oxford University Press,Oxford
20. Jolly. R., (1973), Third World Employment, Penguin,Oxford
21. Sen.A.K. (1962), Choice of Techniques, Basil Backwall,Oxford

SEMESTER I

Paper 5: CO 215- ADVANCED CORPORATE ACCOUNTING AND REPORTING

Objectives:

1. To acquaint the students about important accounting standards
2. To gain ability to prepare financial statements including consolidated financial statements of group companies and financial reports of various types of entities by applying relevant accounting standards.
3. To expose the students to advanced accounting issues and practices such as insurance claims, investment accounting and liquidation of companies.

Module 1: International Financial Reporting Standards (IFRS)-Introduction –Scope- An Overview of IFRS – Applicability of Accounting Standards in the preparation and presentation of Final accounts **(15 Hrs)**

Module 2: Insurance Claims and Investment Accounts--Loss of stock,--Consequential Loss—Average Clause- Investment Accounts— Cum interest—Ex-interest—Ex dividend and cum dividend—Columnar investment accounts.

(20 Hrs)

Module 3: Consolidated Financial Statement (AS 21) – Holding Companies – Definition – Preparation of Consolidated Balance Sheet – Minority Interest – Pre-acquisition or Capital Profits – Cost of Control or Goodwill – Inter- company Balance – Unrealised Inter-company profits – Revaluation of assets and liabilities – Bonus Shares – Treatment of Dividend-CrossHolding. **(20 Hrs)**

Module 4: Amalgamation - Types of Amalgamation – Calculation of Purchase-consideration- Methods of accounting for amalgamation- Inter-company investments

(20Hrs)

Module 5: Accounting for Liquidation of Companies – Preparation of Statement of Affairs – Deficiency/Surplus Account - Liquidator's Final Statement of Account – Receiver's Statement of Accounts. **(15Hrs)**

Theory and practical problems shall be in the ratio of 30 : 70. Practical problems shall be included for application of accounting standards also.

References:

1. Accounting Standards—Prof. IsrarShaikh and Rajesh Makkar, LexisNexis.
2. Accounting Standards—M.P. Vijayakumar, Snow White,Chennai.
3. Indian Accounting Standards—Rajkumar S Adukia, LexiNexis.
4. Indian Accounting Standards—Asish K Bhattacharjee, Tata McGrawHill.
5. Advanced Corporate Accounting—PCThulsian
6. Advanced Corporate Accounting—MC Shukla, T.S. Grewal and SCGupta
7. Advanced Financial Accounting—Dr. B.D.Agarwal
8. Advanced Accountancy—RL Gupta andRadhaswami

SEMESTER II

Paper 1: CO 221- E-BUSINESS & CYBER LAWS

Objectives:

1. To equip the students with the emerging trends in business
2. To equip the students to introduce and explore the use of information technology in all aspects of business.
3. To familiarise with the students cyber world and cyber regulations

Module - 1: E-business- Concepts – Definition – e-business vs. e-commerce - Technology – Sustainable and disruptive , - E-Business Models – Revenue model, Architectural model and Market opportunity models - E-business Design: steps, Knowledge building, capacity evaluation. **(10 Hrs)**

Module-2 : E-Marketing – Traditional Marketing – Web presence Goals – Browsing Behaviour – online Marketing – E-advertising – Internet Marketing Trends – E branding– E- marketing strategies .- modes of e-marketing - Concept and Definition of E-Retailing; Different Models of E Retailing; Model for Web based Information System in E-retailing; -EPOS System. Functions of an EPOS System, e-payment mechanism. **(20 Hrs)**

Module - 3 : E- Business Technologies-Customer relationship management (CRM) - Organizing around the customer - CRM design and infrastructure - CRM Trends; Selling-chain management - Need for selling-chain management - Order acquisition process – Enterprise resource planning (ERP) – Forces influencing ERP – Implementation strategies - ERP trends; Supply chain Management - Supply-chain planning and execution - SCM issues and trends; E-procurement – Knowledge repository- Data mining – Social media platform. **(30 Hrs)**

Module – 4: Cyber Law- Introduction – Need – Evolution of Cyber Laws - Scope– Jurisdiction in cyber space – jurisdiction with respect to E-Commerce and E-governance –Indian law relating to IPR (Copy right, Trademark, Patents etc.) **(15 Hrs)**

Module – 5: Cyber Regulations- -Cybercrime investigation and surveillance – internet surveillance and privacy - issues relating to investigation, cyber forensic, relevant provisions under IT Act 2000, IPC and Evidence Act etc. Adjudication under the IT Act

– Cyber Appellate Tribunal – punishments for various cybercrimes (an overview)

(15 Hrs)

References:

1. E-business, Dr. Ravi Kalakota, Pearson Education Asia
2. E-Business (R)evolution, Daniel Amor, Pearson Education Asia
3. E-Business-2, Dr. Ravi Kalakota & Macia Robinson, Pearson Education Asia
4. E-Business and Commerce, Brahm Canzer, Dreamtech press, New Delhi
5. The E-Business book, Dayle M Smith, Viva books, New Delhi
6. E-Business essentials, Rajat Chatterjee, Global India Publication, New Delhi
7. E-Business essentials, Matt Haig, Kogan Page India Ltd
8. IT Act 2000, IT Amendment Bill 2006, IT Amendment Bill 2008

SEMESTER II

Paper 2: CO 222- STRATEGIC MANAGEMENT

Objectives:

1. To create a conceptual awareness on various strategies.
2. To familiarise students with the formulation, implementation and evaluation of strategies

Module 1: Concept of strategy- Meaning- Definition– Features of strategic management- process of strategic management- Levels of strategy –Corporate and SBU- Strategic decision making- Approaches to and process of strategic decision making- Mintzberg's modes of strategic decision making, Strategic Intent-Developing vision and mission- setting of objectives and goals - Strategic management in international context- strategies of multinational companies with respect to case studies. **(20 Hrs)**

Module 2: Environment analysis- components of environment -environmental scanning- PESTEL analysis- Environmental Threat and Opportunity Profile (ETOP)- organisational appraisal-SWOT analysis- Industry and Competitive Analysis- competitive intelligence - Michael Porters' industry analysis-competitive analysis- Strategic Advantage Profile--Comparative advantage and Core competence- - TOWS matrix. **(20Hrs)**

Module 3: Strategic Alternatives- Criteria and process, Corporate level strategies-Grand strategies-Generic Strategies- integration, intensive, Stability, Defensive, and Expansion- Diversification - Retrenchment strategies: sub-classification of strategies. **(15Hrs)**

Module 4: Formulation of strategies–Approaches to strategy formulation-GAP analysis- BCG matrix- Synergy-Functional strategies- Production, Marketing, Finance and HR Strategies, - Strategic choice- process and policies. **(15Hrs)**

Module 5: Implementation, Evaluation and Control- Implementation process and issues –Structural, functional and behavioural Aspects of implementation- Mc Kinsey Seven S Model – concept of blue ocean strategy,- Evaluation and control of strategies- Techniques. –Strategic audit. **(20Hrs)**

References:

1. Arthur A Thompson and AJ Stickland III, Strategic Management, New Delhi Tata McGrawHill
2. Sharma R.A, Strategic Management in Indian Companies, Deep and Deep Publications, NewDelhi.
3. Thomas L Wheelen and J. David Hunger, Concepts in Strategic Management and Business Policy, New Delhi,Pearson.
4. Subha Rao, Business Policy and Strategic Management, Himalaya Publishing House,Mumbai
5. Budhiraja, S.B. and M.B. Athreya: Cases in Strategic Management, Tata McGraw Hill, NewDelhi.
6. Michal, E Porter: The Competitive Advantage of Nations, Macmillan, NewDelhi.
7. David Fred R, Strategic Management, Prentice Hall, NewJersey

SEMESTER II

Paper 3: CO 223- QUANTITATIVE TECHNIQUES AND FINANCIAL ECONOMETRICS

Objectives:

1. To impart expert knowledge in the application of Quantitative Techniques and Business Econometrics in research.
2. To impart knowledge in the use of SPSS in processing and analysis of data.

Module 1 : Probability Theories: Introduction to probability-Certain and Impossible events-sample space-The complement of an event-Mutually exclusive events-Addition and Multiplication Rules for Probability- Independent and dependent events-Combinatorial probability-Conditional probability-Bayes Theorem/Law of total probability-Central Limit Theorem **(15 Hrs)**

Module 2: Probability Distribution: Binomial distribution-Bernoulli process, properties of binomial distribution, mean and standard deviation of binomial distribution-utility of binomial distribution-fitting of binomial distribution. Poisson distribution- meaning and properties of Poisson distribution, utility of Poisson distribution, fitting of Poisson distribution. Normal distribution-normal curve-properties of normal distribution, utility of normal distribution,- normal approximation to binomial distribution-normal approximation to Poisson distribution. Other probability distribution- beta distribution-exponential distribution. **(15Hrs)**

Module 3: Introduction to Financial Econometrics: Econometrics-Meaning, Methodology, Types; Econometric Models – Steps in modeling -Specification – Estimation and Validation Types of Economic Data – Time Series, Cross Sectional and Panel - Model Specification test – Ramsey Reset Test – Basic Understanding of Breakpoint- Least Square Estimates – Assumptions – Best Linear Unbiased Estimate (BLUE)– Spherical Errors–White Noise **(15Hrs)**

Module 4: Univariate and Multivariate Analysis(Basic concepts and simple problems only) Ordinary Least Squares (OLS) – Simple and Multiple Regression – Predictors and Predict and Normality of Distributions – Normality Test using descriptive statistics – Jarque- Bera statistic Stationary series- Level- First and second order differencing – Unit Root test – Augmented Dickey Fuller test -Linear Relationship of Variables – Correlation- Regression Results analysis – Individual Coefficient tests – t statistics and p values, Joint test – fit of goodness of model tests -R-squared, Adjusted R-squared, F statistics and p value, Serial correlation- Durbin Watson statistics-Basic difference between Multi-variate and Multiple regression. Multi collinearity - Coefficient Diagnostics – Variance Inflation Factor- Residual diagnostics – Correlogram Q Statistics, Correlogram of square Residuals, Histogram Normality, Heteroskedasticity.

(25 Hrs)

Module 5: Processing and Analysis of Data using SPSS: Introduction to SPSS- Features, Creating files and data entry, Preparation of frequency tables and graphs. Steps in data processing-checking, editing, coding, classification. Analysis of data-statistical tools, univariate, bivariate and multivariate-Measures of central tendency, dispersion, correlation, regression, t-test, Chi-square test, factor analysis and ANOVA.**(20 Hrs)**

References:

1. Fundamentals of Statistics for Business and Economics-V.K.Kapoor, Sultan Chand and Sons, New Delhi.
2. Statistics for Management-Levine, Pearson Education Asia.
3. Basic Econometrics (5th Ed), Damodar N Gujarati, Dawn C Porter and Sangeetha Gunasekhar, Nc Graw Hill Education (India) Edition 2012, ISBN: 978-0-07-133345-0 (13 digits) or 0-07-133345-2 (10 digits)
4. Analysis of Financial Time series (3rd Ed), Ruey S. Tsay, Wiley India Pvt Ltd, 4435-36/7, Ansari Road, Dharyaganj, New Delhi 110002, ISBN: 978-81-265-4893-4
5. Using Econometrics (6th Ed), A. H . Studenmund, Pearson, Education Limited, Indian edition published by Dorling Kindersley India Pvt Ltd, copyright © 2014 ISBN: 978-93-325-3648-7 First Impression 2015

6. Applied Econometrics (3rd Ed), Dimitrios Asteriou and Stephen G. Hall, Palgrave 2016, ISBN:978-1-137-41546-2
7. Mutivariate Data Analysis (7th Ed), Joseph F. Hair (jr), William C. Black, Barry J. Babin and Rolph E. Anderson, Pearson, Education Limited, Indian edition published by Dorling Kindersley India Pvt Ltd, copyright © 2015 ISBN: 978-93-325-3650-0 Fourth Impression2016.
8. SPSS in simple steps-Kiran Pandya Smruti Bulsari Sanjay Sinha Dream techPress.
9. A Handbook of Statistical Analyses Using SPSS-Sabine Landau, Brain. S. Everitt-Chapman andHall/CRC.

SEMESTER II

Paper 4: CO 224 - INTERNATIONAL BUSINESS

Objective:

- To introduce the concept of international business and to create awareness on the changes in the international business arena

Module 1: International Business -Meaning, Nature, scope and importance- Stages of internationalization of business-Methods of entry into foreign markets: Licensing- Franchising- Joint Ventures-Strategic Alliances- Subsidiaries and Acquisitions (Discuss case studies relating to subsidiaries and acquisitions)-Framework for analyzing international business environment- Domestic -Foreign and Global Environment-Recent Developments in International Business. **(20Hrs)**

Module 2: Theoretical Foundations of IB: Theory of Mercantilism- Theory of Absolute and Comparative Cost Advantage-Haberler's Theory of Opportunity Cost- Heckscher-Ohlin Theory- Market Imperfections Approach-Product Life Cycle Approach(Discuss case studies)- Transaction Cost approach-Dunning's Eclectic Theory of International Production **(20 Hrs)**

Module 3: Legal framework of International Business: Nature and complexities: Code and common laws and their implications to business-International Business contract- legal provisions, Payment terms. **(10Hrs)**

Module 4: Multi-Lateral Agreements & Institutions: Economic Integration – Forms: Free Trade Area, Customs Union, Common Market and Economic Union-Regional Blocks: Developed and Developing Countries- NAFTA- EU-SAARC, ASEAN-BRICS- OPEC-Promotional role played by IMF-World Bank & its affiliates- IFC, MIGA and ICSID-ADB-Regulatory role played by WTO&UNCTAD. **(25Hrs)**

Module 5: Multinational Companies (MNCs) and Host Countries: MNCs – Nature and characteristics- Decision Making-Intra Firm Trade and Transfer Pricing – Technology Transfer- Employment and labour relations- Management Practices- Host Country Government Policies-International Business and Developing countries: Motives of MNC operations in Developing Countries (Discuss case studies)-Challenges posed by MNCs

(15 Hrs)

References:

1. Charles W.L. Hill, Global Business Today- University of Washington.
2. Charles W.L. Hill, International Business: Competing in the Global Market Place- Mc Graw Hill, New York.
3. Charles W. L. Hill, Chow How Wee & Krishna Udayasankar, International Business: An Asian Perspective- Mc Graw Hill, New York.
4. Donald Ball, Michael Geringer, Michael Minor & Jeanne McNett, International Business: The Challenge of Global Competition- Mc Graw Hill, New York.
5. Alan M Rugman & Simon Collinson, International Business: Pearson Education, Singapore.
6. Paul R. Krugman & Maurice International Economics: Theory and Policy - Obstfeld Pearson Education Singapore
7. John Daniels, Lee Radebaugh, Daniel Sullivan, International Business: Environments & Operations- Prentice Hall, New Delhi.
8. Sumati Varma, International Business. Ane Books Pvt Ltd, New Delhi, 2011.
9. P. Subba Rao, International Business: Text and Cases- Himalaya Publishing House Pvt. Ltd. Mumbai.
10. Francis Cherunilam, International Business: Text and Cases- PHI Learning Pvt. Ltd. New Delhi.
11. V.K. Bhalla, - S. Chand & Company Pvt. Ltd. New Delhi. International Business
12. K. Aswathappa, International Business Tata McGraw Hill Publishing Company Limited. New Delhi.

SEMESTER II

Paper 5: CO 225- INVESTMENT MANAGEMENT

Objectives:

1. To provide a general understanding about investment avenues and personal finance.
2. To give a broader understanding about behavioural finance and how it equip to decide personal investment.

Module1: Investment

- a. **Conceptual Background To Investment:** Meaning & Definition Of Investment – Dimensions Of Investment – Economic, Physical & Financial Investment – Corporate Vs Personal Investment – Investment Objectives – Process Of Investment – Factors Affecting Investment - Investment, Speculation & Gambling.
- b. **Investment Avenues:** Security & Non-Security Form – Fixed Income Investment – Variable Income Investment – Direct & Indirect Investment – Mortgage – Reverse Mortgage – Securitisation Of Assets/Debts – Real Estate Investment – REI Valuation – Real Estate Investment Regulatory Authorities – SEBI Guidelines on REIT – Money Market Instruments (Repos & Tbs) – Capital Market Instruments (Equity, Debts & Hybrid) – Investment In Banks, Insurance Companies, Post Offices, Etc - Investment in Gold : Physical gold - Gold ETFs - Sovereign Gold Bond - Relative advantages and limitations.

(20 Hrs)

Module 2 : Principles of Financial Markets and Interest Rates: Principles of Financial Market – Online Trading – Depository System – Interest Rates – Nominal and Real Rates – Base Rate – LIBOR/LIBID etc – Term Structure Theories – Interdependence of Markets and Interest Rates.

(16 Hrs)

Module 3: Personal Finance: Meaning – Components of Personal Finance – Levels

of Personal Finance (Basic, Advanced, & Application) – Financial Literacy –Personal Finance Principles – Personal FinancePlanning– Essentials of Asset Planning – Insurance Planning – Investment Planning – Retirement Planning– Estate Planning –Tax Planning. **(20Hrs)**

Module 4: Behavioural Finance : Investment Deciding Cycle – Judgment Under Uncertainty – Utility Preference – Expected Utility Theory – Information Screening – Biases – Information Processing –Baysian Decision Making– Heuristic And Cognitive Biases – Forecasting Biases – Group Behaviour – Conformism – Hedging – Cornering – Investment Styles And Behavioural Pricing – Insider Trading – Circular Trading – Price Rigging. **(18Hrs)**

Module 5: Financial Modeling Using Spreadsheet: Introduction To Modeling – Introduction To Spread Sheet – Database Framing – Creating Charts -Understanding Finance Function In Spread Sheet – Creating Model – Valuation – DCF Techniques.(Practicals) **(16Hrs)**

References:

1. Bhalla VK, Investment Management, S Chand &Co.
2. Bodie, Kane, Marcus, and Mohanty, Investment, TMH
3. Prasanna Chandra, Investment Analysis and Portfolio Management,TMH
4. Punithavathy Pandian, Security Analysis and Portfolio Management, Vikas Publications
5. Reghunathan, Investment Analysis and Portfolio Management, PearsonEducation
6. Dhanesh Kumar Khatri, Security Analysis and Portfolio Management, Trinity Press
7. Sidney Cottle, Roger F Murray & Frank E Block, Security Analysis,TMH
8. Stephen H Penman, Financial Statement Analysis and Security Valuation,TMH
9. Preeti Singh, Investment Management: Security Analysis & Portfolio Management,HPH

Elective: FINANCE

SEMESTER III

Paper 1: CO 231U -INCOME TAX PLANNING AND MANAGEMENT

Objectives:

1. To impart deep knowledge about the latest provisions of Income Tax Act
2. To develop application and analytical skill of the provisions of Income Tax Law for Income Tax planning and Management.

Expected input

Basic knowledge and understanding about the fundamental concepts and computation of tax and Assessment procedure from B.Com.

Expected outcome

Students will get expert knowledge regarding the legitimate way of Tax Planning and Management under different Financial and managerial decisions after considering the impact of Direct Tax Laws.

Teaching Hours:108

No. of Modules: 6

Module 1: Overview of Income Tax law-Computation of Tax an Overview -Individual, Company ,Firm –Accounting Standards relating to Tax-Tax Information **(10 Hrs)**

Module 2: Tax planning and Management:- Meaning - Tax planning, Tax Evasion, Tax avoidance, Tax management – Differences- Nature and Scope of Tax Planning- Precautions in Tax Planning- Need for Tax Planning-Limitations- Tax Audit- Tax Planning in relation to Heads of Income -Concept of TDS/TCS -Advance payment- Computation- -Rebate 87A,88 – Relief u/s 89 , 90,91.Black Money Act 2005- Introduction-Features- Highlights-Importance. **(15Hrs)**

Module 3: Tax Planning And Management For Individuals:- Tax Incidence on Individuals- Significance-Taxable Income- hints for Tax Planning and Management- Impact of Tax on Financial Decisions-Alternative Minimum Tax (AMT)- Tax Planning For Employer and Employee-Documentation and Filing of Return- E-Filing- Tax Credit- TRACES- Refund-Appeal-Tax Return Preparators (TRP)- Procedures and rules- Settlement commission-Advance Ruling
(16 Hrs)

Module 4:Tax Planning For Firm, Association of Person and Body of Individuals:- Tax incidence on Firm/AOP/BOI- Impact of Tax liability on Firm –Significance of Tax Planning- LLP-Sec: 184 & 185- Inter-transaction between partners and Firm – impact of Tax on Change in Constitution of Firm- Conversion Of Firm in to Company – Conditions Of 40(b) – Carry forward and Set off in case of Change in Constitution of Firm – Filing of Return-Appeal- Refund- Hints for Tax planning for Firm, AOP and BOI. (22Hrs)

Module 5: Tax Planning and Management for Company:- Types of Companies- Domestic and Foreign- Tax incidence on Companies- Impact of Income Tax on Corporate Decisions – Tax Planning and Management in Corporate Decisions – MAT Provisions- Computation-Application of IT in Tax Planning –Tax Planning For New Business- Tax Planning on Venture capital Companies – Tax Planning on Financial and Investment decisions – Capital structure-Dividend and Deemed Dividend- Dividend Distribution Tax-Bonus Shares- Make or buy – own or Lease – Repair or Replace- Employee Remuneration – Setting up of new business – Location Aspects – Amalgamation or Demerger – Filing of Return – E-Filing- Refund- Appeal- Methods and procedures – Annual Return for TDS and TCS – Hints for Tax Planning and Management.
(25Hrs)

Module 6: International Taxation- Basic Concepts – Double Taxation Relief – Computation – DTAA – GAAR – Advance Ruling- Transfer pricing – transfer Pricing Law in India- Concepts of Arms length price – advance Pricing Agreement- Taxation of E-Commerce Transaction –Filing of Return- International Settlement Commission – Methods and Procedures.
(20Hrs)

NB: i) Some case studies involving the learning

ii) Necessary inputs from B.Com Programme

References:

Books

1. Singhanian. V.K: Direct Tax planning and Management, Taxman,N.Delhi.
2. Singhanian.V.K: Direct Taxes Laws and Practices,Taxman, N.Delhi
3. E.A.Srinivas: Corporate Tax Planning;Tata Mc-GrawHill
4. Mehrithra HC: Direct Tax Planning
5. Kushal Kumar Agrawal: Direct Tax Planning and Management; Atlantic Publishers
6. Bhagavath Prasad: Direct Tax Law andPractice
7. LakhotiaR.N: Corporate TaxPlanning
8. CA G.Sekar: professional guide to TaxAudit

Journals and Circulars

1. Chartered Accountant Today- Tax man for CurrentReading
2. Circulars issued byCBDT
3. Journal CharteredAccountant
4. Black Money Act 2005 (Bare Act-mainprovisions)

SEMESTER III

Paper 2: CO 232F- SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Objectives:

1. To provide a comprehensive understanding on the principles of security analysis and develop the skill in portfolio management.
2. Equip the students to value the real worth of securities.

Module 1: Fundamental Analysis: Sources of Investment Information - Intrinsic Value – Dimensions of Fundamental Analysis – Analysis of Economy-wide Factors (Study of Economic Aggregates, Classification of Factors into indicators, Forecasting about the Economy & Conclusion of Economic Analysis) – Analysis of Industry-wide Factors (Study of Industry Life Cycle, Study of Qualitative & Quantitative Factors & Conclusion) – Analysis of Company-wide Factors (Financial Performance Analysis, Analysis of Qualitative Parameters, & Conclusion) – Estimation of Intrinsic Value – End Result of Fundamental Analysis. **(10Hrs)**

Module 2: Technical Analysis: Premises of Technical Analysis – Type of Charts – Tools of Technical Analysis – Prediction of Overall Market Trends (Dow Jones Theory, Elliot Wave Theory, Advance Decline Index, & Client Account Position) – Prediction of Individual Share Trends (Moving Average Analysis, Oscillators-MACD, ROC & RSI-Chart Patterns) – Confirmation through Traded Volume – Efficient Market – Efficiency of Indian Stock Market – Efficient Market Hypothesis Basics of EMH – Forms of Market Efficiency (Weak Form, Semi-Strong Form, & Strong Form)– Test of Market Efficiency –RUN Test. **(20Hrs)**

Module 3: Valuation of Securities: Concept and Factors Affecting Valuation - Yield-Holding Period Return (HPR) – Yield Till Maturity (YTM) - Return & Risk – Risk-free Return & Risk Premium – Valuation of Fixed Income Securities – Valuation of Debenture/Bond – Valuation Mechanism (Valuation of Redeemable Debenture,

Valuation of Deep Discount Debenture/Bond, Valuation of Non-redeemable Debenture, & Valuation of Convertible Debenture) – Valuation of Preference Shares – Valuation of Equity Shares (Dividend Capitalisation/Constant Growth Model, Multi-Stage Growth/Super Normal Growth in Dividend, & Price-Earnings Ratio Model) – (Illustrations) **(20Hrs)**

Module 4: Portfolio Management: Meaning of Portfolio – Notions/Principles (Notion of Diversification & Notion of Negative Correlation) – Measurement of Return of Individual Securities & Portfolio (Historical Return/Ex-Post Returns and Expected Return/Ex-Ante Returns)– Measurement of Risk (Systematic & Non-Systematic) of Individual Securities & Portfolio- Concept of Beta–Portfolio Theories/Approaches (Traditional Portfolio Theory & Modern Portfolio Theory)–Portfolio Construction under Traditional Approach – Features of Traditional Approach & Portfolio Management Process.(Illustrations) **(18Hrs)**

Module 5: Modern Portfolio Theory: Principles of MPT – Concept of Efficient Portfolio, Efficient Frontier, Market Portfolio, & Managed Portfolio – Characteristics Line – Markowitz Portfolio Theory/Mean – Variance Criterion of Markowitz – Assumptions – Markowitz Portfolio Construction Process – Markowitz Portfolio Selection using Utility Curve – Sharpe’s Single Index Model – Construction of Efficient Portfolio – Capital Assets Pricing Model (CAPM) – Concept of Risk-free Assets and Risky Assets – Assumptions of CAPM – Concepts of Lending & Borrowing in Construction of Portfolio – Application of CAPM (CML & SML) – Factor Model – Fama French Three Factor Model - Arbitrage Pricing Theory (APT)–(Illustrations) **(20 Hrs)**

Module 6: Portfolio Revision and Evaluation: Portfolio Revision – Need – Factors Affecting Portfolio Revision – Revision Strategy (Active Revision Strategy & Passive Revision Strategy) – Index Portfolio – Tracking – Formula Plans – Constant Rupee Value Plan – Constant Ratio Plan – Variable Ratio Plan – Rupee Cost Averaging – Merits & Demerits of Portfolio Revision–Portfolio Performance Evaluation – Need– Benchmarks, Sharpe Reward to Variability Ratio–Treynor Reward to Volatility

Ratio – Jensen’s Performance Index – Fama’s Decomposition Model. (Illustrations)
(20 Hrs)

References:

1. Bhalla V K, Fundamentals of Investment Management, S Chand &Co.
2. Donald E Fisher and Ronald E Jordan, Security Analysis and Portfolio Management, PearsonEdn.
3. Kevin S, Security Analysis and Portfolio Management, PHI
4. Prasanna Chandra, Investment Analysis and Portfolio Management, TMH
5. Punithavathy Pandian, Security Analysis and Portfolio Management, Vikas Publications
6. Reghunathan, Investment Analysis and Portfolio Management, Pearson Education
7. Dhanesh Kumar Khatri, Security Analysis and Portfolio Management, Trinity Press
8. Sidney Cottle, Roger F Murray & Frank E Block, Security Analysis, TMH
9. Stephen H Penman, Financial Statement Analysis and Security Valuation, TMH
10. Preeti Singh, Investment Management: Security Analysis & Portfolio Management, HPH

SEMESTER III
Paper 3: CO 233 F- INTERNATIONAL FINANCIAL
MANAGEMENT

Objectives:

- To familiarise the students with the international financial markets and instruments.
- To convey an understanding about foreign exchange risk management

Module 1: International Financial Management- Meaning and Scope of international financial management- Financial Management of MNCs-Components of global financial markets -Recent trends in global financial markets. **(13Hrs)**

Module 2 : Foreign Exchange Market- Exchange Rate Mechanism-Exchange Rate theories -Gold Standard-Bretton Woods System -Fixed Parity System-Floating Rate System- Independent Float and Managed Float-Currency Pegging: Pegging to single Currency -Pegging to basket of Currencies - Pegging to SDRs (Special Drawing Rights) convertibility of Indian rupee-Balance of Payment and Exchange rate. **(25 Hrs)**

Module 3: Foreign Exchange Risk Management-Markets for Foreign Exchange and Derivatives, Market for Currency Futures, Currency Options and SWAPS –Risk management computation--Challenges **(15 Hrs)**

Module 4: International Financial Instruments- Equity instruments -ADR-GDR-IDR- Debt instruments -Foreign Bonds, Euro Bonds, Global Bonds, Convertible Bonds- Floating Rate Notes - Quasi instruments –Euro Notes- - Financial Swaps-Parallel loans and Back to back loans **(20Hrs)**

Module 5: Foreign Direct Investment-Meaning-Types-Theories of Foreign Direct Investment--Current issues in Foreign Direct Investment –FDI in India- Opening up of

various sectors-Foreign Institutional Investors(FIIs) –Role of FIIs (20Hrs)

Module 6: International Investment Decisions -- Appraisal of Foreign and Domestic Projects -Risks involved in International Investment Decisions-currency risk-political risk-inflation risk-country risk (15 Hrs)

References:

1. Ian H. Giddy, 'Global Financial Markets' AITBS
2. Kirt C. Butler, 'Multinational Finance' Thomson southwestern
3. Thummuluri Siddaiah, 'International Financial Management', Pearson Education, New Delhi, 2010
4. S. Kevin, Fundamentals of International Financial Management, Prentice Hall of India, New Delhi., 2016
5. Gurusamy S, 'Global Financial Institutions', Vijay Nicole and Tata McGrawHill
6. Reid W. Click and Coval, 'International Financial Management' Prentice Hall India
7. Rite M Rodriguez, "International Financial Management", E Eugene Carter Prentice Hall, New Delhi
8. Alan C Shapiro, "Multinational Financial Management", Allyn and PaconIoc, Boston
9. Adrin. Buckley, "Multinational Finance", Hcrit, New Delhi
10. Madura, Jeff, "International Financial Management, West Publishing Company.
11. Apte P.G. International Financial Management, Tata McGraw Hill, New Delhi
12. Machiraju H R, International Financial Markets in India, New age international Publishers, New Delhi

SEMESTER III
Paper 4: CO 234F- STRATEGIC COST AND MANAGEMENT
ACCOUNTING

Objectives:

- (i) To comprehend and familiarize the established techniques, methods and practices in Strategic Cost and Management Accounting to the students.
- (ii) To introduce the evolving Strategic approaches and techniques in Cost and Management field and to developed industrial behaviour among the students in the emerging business areas.

Module 1: Marginal Costing Techniques for Decision Making – Meaning of marginal cost and marginal costing. Role of Marginal costing in decision making-fixation of selling price, Accepting additional orders, Quotations, Make or buy decisions, Key Factor Analysis, Own or Lease, Sell or further process, Closing down or suspending activities.

(15Hrs)

Module 2 : Process Costing Application - Features of Process Costing and its applications in different situations- Inter process profits, Work-in-Progress, Accounting for Equivalent Production and its procedure under different cases namely- (a)When there is only closing work-in-progress with no process losses. (b)When there is only closing work-in-progress with process losses (c) When there is opening as well as closing Work in Progress with no process loss.

(20Hrs)

Module 3 : Standard Costing and Variance Analysis- (a)Material Variance, Material cost variance, Material price variance, Material usage variance, Material Mix Variance, Material Yield Variance, (b) Labour Variance-Labour cost variance, Labour Efficiency variance, Labour Idle time variance, Labour Mix Variance, Labour Yield Variance,(c) Overhead Variance- Fixed overhead variance, Variable overhead variance, Volume Variance, Expenditure variance, Capacity variance, Calendar Variance, Efficiency Variance (d)Sales Value Variance-Total Sales Variance, Sales price variance, Sales Volume Variance, Sales Mix Variance, Sales Quantity Variance. Sales-Margin

variance. (e) Reconciliation of Budgeted Cost and Revenue with the help of Variances.

(25Hrs)

Module 4 : Transfer Pricing Applications- Concept, Measurement of Divisional performance, Alternative Transfer pricing methods-Market based Transfer pricing, Marginal cost Transfer pricing, Full cost Transfer pricing, Cost plus mark up Transfer pricing, Negotiable Transfer Pricing, Marginal cost and Opportunity cost Transfer pricing, International Transfer pricing.

(10Hrs)

Module 5 : Strategic cost & Management Accounting- Cost Accounting Standards, Importance of Cost Accounting Standards, Revenue Management Concept- (Importance to Production Channel and Customer Profitability Analysis). Enterprise Performance Management (EPM) - Concept, meaning and importance, Application of EPM in Cost and Management Accounting. Strategic Concepts and Applications in Cost and Management Accounting (a) Concept of Better Decision, (b) Business Intelligence, (c) Strategic map, (d) Driver Caused Budgeting. : Customer Relationship Management (CRM) - Concept, Meaning Importance. CRM Practices in Cost and Management Accounting (a) Predictive Accounting (Importance to Decision Making), (b) Trend Analysis, (c) Decision Support System, (d) Cost Planning, (e) Economic Analysis (Concepts, Tools and Applications), (f) Sunk Cost, (g) Life cycle Cost, (Theory only)

(28 Hrs)

Module 6 : Business Analysis Embedded in Enterprise Performance Management- (a) Optimisation Techniques, (b) Predictive Methods, (c) Statistical and Operational Analysis. (Basic Practical Problems only). Behavioral Cost management- (a) Skill Development, (b) Tech-production, (c) Bench marking, (d) Enterprise resource Planning (ERP), (Advanced Concepts Only).

(10Hrs)

References :

1. Advanced Cost and Management Accounting SP Jain, KL Narang, Simmi Agrawal, Kalyani Publishers, NewDelhi.
2. Prasad.N.K. Advanced Cost Accounting, Book syndicate Pvt. Ltd,Kolkata
3. Khan.M.Y. and Jain P.K. Advanced Cost Accounting, Tata McGraw Hill Publishing Co.Ltd.NewDelhi.
4. Arora M.N. Principles and Practices of Cost Accounting-Vikas Publishing House New Delhi
5. Maheswari SN. Cost and Management Accounting, Sultan Chand and Sons,NewDelhi.
6. Thulsian.PC. Practical Costing, Vikas Publishing House NewDelhi
7. Colin Drury, Management and Cost Accounting, Cengage Learning India Pvt .Ltd, New Delhi.
8. Horngren, Foster and Datar, Cost Accounting A Managerial Emphasis, Prentice Hall of India Pvt.Ltd, NewDelhi

SEMESTER IV

Paper 1: CO 241W- GOODS AND SERVICE TAX & CUSTOMS DUTY- LAW AND PRACTICE

Objectives:

1. To gain expert knowledge of the principles and law relating to Goods and Service Tax and Customs Act.
2. To impart skill in applying and analysing the provisions of Goods and Service Tax Act and Customs Act in handling practical situations.

Module 1: Introduction: Meaning and Definition of Indirect Taxes-Nature-Scope-Constitutional provisions-Advantages-Disadvantages-Difference between Direct and Indirect Taxes- Types-Milestones in the history of Indirect Taxation in India. **(10 Hrs)**

Module 2: Basic Provisions of GST: Introduction-Meaning-Features-Historical backdrop of Goods and Service Tax-Major Indirect Taxes merged in to Goods and Service Tax-Benefits of GST-Economy, Industry and trade, tax payers-Types of GST-CGST-IGST-SGST- UTGST Schedules-Rate of GST- Kerala GST Provisions. **(20 Hrs)**

Module 3: Main Provisions of GST - Main Provisions: Provisions r- Compensation(GST)Law-Definitions of important terms-Levy of Tax-Collection-relating to Place, Time and Value of Supply-Different meaning of supply- Composite Supply-Mixed supply- Scope of Supply- Taxable Supply- E-Commerce-Supply Chain –GST Exemption limit- Tax Invoice-Credit and Debit Notes-Valuation Rules-Computation Tax- Input tax Credit(ITC)-Registration-procedures-Deemed Registration-Cancellation of Registration- Accounts and Records- Period of Retention of Records- Presumption as to Documents>Returns- Annual-Final-Payment of Tax-Information Technology in GST-Audit- Special Audit-Assessment-Refund-Consumer welfare Fund-GST Practioners-TDS/TCS. **(23Hrs)**

Module 4: Administration of GST:- GST- Council-Authorities-Inspection-search seizure-Arrest-Demand-Recovery—Liability to pay tax in certain cases- -Advance Ruling- Authority and Appellate Authority-GSTN-Information infrastructure for GST.

(15 Hrs)

Module 5: Appeals And Revisions under GST.: Appeals-Appeal to High Court- Appeal to Supreme Court- Revisions-Offences- Compounding of Offences-Penalty- Transitional provisions-IGST Provisions- Inter-state Supply- Intra-state supply- Zero rated Supply- Imported Supply- Transfer of ITC-Compensation Rules- Base year Revenue-Projected Revenue-Miscellaneous provisions-Interest-Job Work Procedure- Deemed Export.

(20Hrs)

Module 6: Customs Duty: Definition of Customs Duty- Objectives Role of customs duty in International trade--Importance-Demerits-Important definitions-Basis of determining customs Duty- Types of Duties-Anti-dumping Duties-Import and Export manifest—Specified Goods- Stores-Warehouses-Export Policy-Customs Duty Authorities and Powers Assessment Procedures--Penalties and Prosecutions-Appeals and Revisions-Tax liability and Valuation of Goods-Baggage Rules-Import Procedure and Documents-Export Procedure and Documents.

(20 Hrs)

Input—Basic Awareness from B.Com and First Semester M.Com

References:

1. Hand Book of GST in India Concepts and Procedures(2017Edition) -Rakesh Garg &Sandeep Garg - Bloomsbury IndiaPublications
2. GST in India-Rakesh Garg &Sandeep Garg, Bloomsbury IndiaPublications
3. All About GST-V.S Datey-Taxman Publications.
4. GST Law, Concept & Impact Analysis-Dr. SanjivAgarwal
5. GST Law & Analysis with Conceptual Procedure-Bimal Jain & Isha Bensal- YoungGlobal
6. An Insight of GST in India-ICWAI, Vol:1&2

7. Indirect Taxes-Dr.H.C Mehrotra & Prof. Agarwal, Sahitya Bhavan Publishers, Agra.
8. Indirect Taxes-V.S Datey, Taxman Publications NewDelhi.
9. Indirect Taxes –Dr.V.Balachandran, Sultan Chand and Sons,NewDelhi.
10. GST Bare Acts, Rules, Notifications &Circulars

SEMESTER IV

Paper 2: CO 242F- RISK MANAGEMENT AND DERIVATIVES

Objectives:

1. To understand the risk management process and its application
2. To give a broader awareness on derivatives and its applications

Module 1: Basic Concepts in Risk : Meaning of Risk And Uncertainty – Chance of Loss And Loss Forecasting - Pure And Speculative Risk – Objective And Subjective Risk – Fundamental And Particular Risk – Enterprise Risk (Pure, Speculative, Strategic, Operational, & Financial Risks) – Financial Risk (Price, Credit, Interest Rate, Foreign Exchange & Value of Money) – Difficulties in Categorization of Risk – Method of Handling Risk – Financial Analysis In Risk Management Decision - Link Between Cause, Event And Effects – Burden of Risk on Society. **(12 Hrs)**

Module 2: Introduction to Risk Management: Meaning And Definition of Risk Management – Objectives of Risk Management –Steps in Risk Management Process (Identify And Analyse Loss Exposures, Select The Appropriate Techniques, Implement And Monitor RM Programme) – Benefits of Risk Management – Personal Risk Management – The Changing Scope of Risk Management – Enterprise Risk Management(ERM) – Risk Management Tools And Techniques – Relation Between Risk Management, Compliance, and Audit – Governance, Risk And Compliance (GRC) – Insurance As a Risk Transfer Mechanism – Insurance Market Dynamics. **(20 Hrs)**

Module 3: Introduction to Derivatives: Concept, History, And Economic Benefits of Derivatives – Underlying Asset, Margin Requirements, Settlement of Transactions, Lot Size – Classification of Derivatives (Exchange Traded Vs. OTC Derivatives Market, Commodity And Financial) –Derivatives Market In India-Traders In Derivative Markets – Derivatives Trading At NSE – Currency Derivatives Market–Commodity Derivatives Trading In India – Commodity Exchanges - **Forward Contracts** (Features, Payoff From Forward Contracts, Forward Price) – **Future Contracts**(Features,

Difference Between Forward And Futures) – **Option Contracts** (Features, Payoff From Option Contract, Factors Affecting Price of Option Contract, Call Vs. Put Options, American Vs. European Options) – **Index Futures** – **Swaps** (Features & Types).

(20 Hrs)

Module4: Hedging/Risk Management through Derivatives: Meaning – Types – Short Hedge Through Option, Futures, & Index Futures –Long Hedge Through Option, Futures, Index Futures – Credit Derivatives (Credit Default Swap & Total Return Swap) - Special Issues In Derivates (Synthetics, Multi-Period Option, & Compound Option) – Combination And Spread – Exotic Options (Asian Option, Barrier Option & As You LikeIt)–Hedging Strategies With Index Futures, Options, & Swap – Speculative Trading Strategies – Arbitrage Strategies With Options.

(20Hrs)

Module 5: Pricing/Valuation of Derivatives: Option Pricing – Binomial Model (One-Step Binomial Process & Two-Step Binomial Method) – Continuous Time Model – Volatility – Estimated And Implied Options And Dividend Paying Assets Warrants And Convertibles - Black & Scholes Model – Options Delta, Gamma, Vega, Theta, Rho – Future Pricing –Spot And Forward Contract - The Cost of Carry Model - Reverse Cost of Carry – Pricing By Arbitrage Process.

(18Hrs)

Module 6: Accounting for Derivatives: Accounting treatment in case of Cash Settled Equity Index/Stock Option – Accounting treatment in respect of equity stock option in case of delivery settled options – Accounting for Open Option at the end of an accounting period – Accounting for Equity Stock Options –Accounting for daily receipt/payment of margin - Disclosure to be made in Financial Statement – Guideline of ICAI

(18Hrs)

References:

1. Kumar S S S, Financial Derivatives, PHI
2. Michel Crouhy, Dan Galai and Robert Mark, The Essential of Risk Management, The McGraw Hill Companies
3. John C Hull, Risk Management in Financial Institutions, John Wiley and Sons Inc
4. Rangarajan K Sundaram, & Sanjiv R Das, Derivatives: Principles and Practice, McGraw Hill Edu (India) Pvt. Ltd.
5. Bharati V. Pathak, The Indian Financial System – Markets, Institutions, & Services, Pearson
6. Dhanesh Kumar khatri, Security Analysis and Portfolio Management, Trinity Press
7. George E. Rejda, Principles of Risk Management and Insurance, Pearson
8. Ravi. M Kishore, Advanced Accounting with Accounting Standards, Taxmann.
9. Ravi. M Kishore, Strategic Financial management, Taxman

SEMESTER IV

Paper 3: CO 243F- ACCOUNTING STANDARDS

Objective

To acquaint the students to understand the structure, process and organizational set up involved in evolving accounting standards in India. To enable the students to apply some key standards while preparing and presenting the financial statements Course.

Module 1: Accounting Bodies—International Accounting Standards Board—Institute of Chartered Accountants of India—Accounting Standards Boards—Procedure adopted by ASB in formulating Accounting Standards—Companies Act 2013 and Accounting Standards—Need for accounting standards—International Accounting Standards and IFRS—Convergence with IFRS. (15 Hrs)

Module 2 :Disclosure of Accounting Policies (AS 1)—Accounting Policies Valuation of Inventories (AS 2)—Measurement-- Cost of purchase—Cost of conversion—Joint costs—Treatment of borrowing cost—Cost formulae—Specific identification method—FIFO, Weighted Average Cost—Standard Cost—Retail Inventory Method—NRV—Valuation of inventory below cost. Revenue Recognition (AS 9)—Sale of goods—Rendering of service—Completed service contracts—Proportional completion method. (20Hrs)

Module 3 : Accounting for fixed assets (AS 10) —Gross and Net Book Value—Composition of Cost—Self Constructed Assets—Exchanged Assets—Improvement and repairs to fixed asset—Retirement and Disposal—Revaluation of Fixed Assets Depreciation Accounting (AS 6)—Historical Cost—Estimated Residual Value—Depreciation Policy—Change in method of depreciation—Change in measures of depreciation amount (Estimated life, Estimated resale value and historical cost)—Additions and Extensions—Assets involving liabilities in foreign currency. Intangible Assets (AS 26)—Monetary Assets—Non-Monetary Assets—Acquired intangible assets—Exchange for another assets—IA arising from amalgamation—IA out of Govt. grants—Internally generated goodwill—Amortisation of IA. Service contracts—Proportional completion method. (20Hrs)

Module 4: Accounting for Leases (AS 19)—Finance Lease—Operating Lease—Minimum Lease Payments—Gross investment in leases—Interest rate implicit in leases—Accounting treatment in the books of lessee and lessor—Sub leases by lessee
Segment Reporting (AS 17)—Business Segment—Geographical Segments—Reportable Segments—Identification Tests—Primary and Secondary Segments.

(20 Hrs)

Module 5: Earning Per Share- AS 20- Financial Instruments- Financial Liability- Potential Equity Shares- Dilutive Non- Dilutive Potential Equity Share- Profit Available to Equity Shares- Weighted Average Number of Equity shares. Basic EPS- Restatement of EPS-Diluted EPS

(15Hrs)

Module 6: Impairment of Assets (AS 28)—Net Selling Price—Value-in-Use—Recoverable Amount—Carrying Amount—Impairment Loss—Cash Generating Units—Goodwill—Top Down and Bottom up tests—Corporate Assets—Reversal of Impairment Loss Accounting for Taxes on Income (AS 22)—Deferred Tax—Current Tax—Impact of Timing Difference—Measurement of Tax Expenses—Reasonable certainty and Virtual certainty—Criteria offsetting off.

(18Hrs)

References

- Asish K Bhattacharjee, Tata Mc Graw Hill, . Indian Accounting Standards
- Israr Shaikh and Rajesh Makkar, Lexis Nexis. Accounting Standards
- Rajkumar S Adukia, Lexi Nexis, Indian AccountingStandards
- Rawat D S—Taxman AccountingStandards
- Vijayakumar M.P, Snow White, Chennai - AccountingStandards

SEMESTER IV

Paper 4: CO 244S- MANAGEMENT OPTIMIZATION TECHNIQUES

Objectives:

1. To convey basic principles and application of optimization tools of resource utilization.
2. To provide an insight into optimal project implementation Techniques under deterministic and probabilistic conditions.

Module1: Optimization Techniques: Introduction-Definition-Nature and Importance-Steps in Intelligent decision making- Modelling Techniques **(8 Hrs)**

Module 2: Linear Programming: Introduction-Formulation of LPP-Maximize, Minimize, objective function-Constraints and non-negativity conditions-Graphical solution-Optimal solution-Infeasible and unbounded solutions-degeneracy-Simplex method-slack, surplus and artificial variables-Duality-Primal and dual problems

(22Hrs)

Module 3: Transportation and Assignment Problems: Transportation Problems- Initial basic feasible solution using North West Corner Rule, Lowest Cost Entry Method and Vogel Approximation Method-Optimal solution-MODI method- Degeneracy, Unbalanced and Maximization in Transportation Problems. Assignment Problems- Hungarian Method-Maximization, Unbalanced and Restricted Assignment Problems- Travelling Salesman Problems. **(23 Hrs)**

Module 4: Game Theory: Game Theory- Pay off matrix- Maxim in and Minimax – Saddle point-Solution of pure and Mixed strategy games- Graphic Method-Principle of dominance-Arithmetic Method. **(15 Hrs)**

Module 5: Optimization Techniques: Replacement Theory- Replacement of Capital Items and items that fail completely- Individual and Group replacement policy. Queuing Theory-Models (simple problems); Inventory models-computation ; Simulation-MONTE CARLO Method and Random Numbers. **(15Hrs)**

Module 6: Project Scheduling and Monitoring: Network Analysis-Critical Path Method-Scheduling and Control of Projects-Free, Independent and Total Float(slack)-PERT-time estimates and Probability of completion-cost/time trade off analysis-Crashing of projects and resource considerations **(25 Hrs)**

References:

1. J K Sharma – operation Research – Theory and Practice – MacMillian.
2. John M. Nicholas, Project Management for business and Technology – Problems andpractice.
3. Harvey M Wagner - “Principle of Operation Research, PH Learning Pvt.Ltd.
4. Management operations Research – Satya Narayanan, LalithaRaman.
5. Operations Research Hamdy ATaha
6. Operation Research – V.K.Kapoor.
7. Operation Research – S.D.Sharma.

Elective: INFORMATION TECHNOLOGY & E- BUSINESS

SEMESTER III

Paper1: CO 231E- OFFICE AUTOMATION

No. of instructional hours per week: 6 (2 Hrs theory and 4 Hrs practical)

Aim of the study: To update and expand skills in Office Automation softwares.

Course objectives:

1. To equip the students to meet the demands of the industry.
2. To develop practical skills in document preparation, spread sheet application, data management and business presentation.

Module 1: Office Automation – Softwares used for office automation – free and paid, different file types to be managed in an office – documents, spreadsheets, presentation, publishing and databa sefiles. **(10 Hrs)**

Module 2: Word processing - Opening Microsoft Word, Word Adjusting, adding or deleting text, selecting blocks of text, copying text, moving text, search and replace, Saving, editing and designing a document, character formatting and style, page formatting – headers, footers, page numbers, bullets, margin settings and column, justifying of text, line spacing, tab settings, automating tasks, creating tables – entering text into tables, inserting rows and columns in the table, deleting a row and column from the table formatting the text in the table. **Advanced uses of Word Processor** - Mail Merge Creating documents using templates - Adding and removing digital signatures in documents **(22Hrs)**

Module 3: Microsoft Excel - Excel user interface, starting with excel, working with cell and cell addresses, entering and editing data, finding and replacing data, selecting a range, moving, cutting, copying with paste, inserting and deleting cells, freezing cells, cell formatting options, adding, deleting and copying worksheet with in a workbook, renaming a worksheet, Cell reference – relative, absolute - Elements of excel charts – categories, create a chart, choosing chart type, edit chart axis, titles, labels, data series and

legend, adding a text box, rotate text in a chart, converting a chart on a web page, saving a chart. **Advanced uses** - functions: – logical – AND, IF, NOT, OR, TRUE; Financial – DB, FV, IPMT, IRR, NPV, PMT, and PV; statistical –AVERAGE, COUNT,COUNTIF, MAX, MIN; mathematical – PRODUCT, SQRT, SUM, SUMIF - Pivot tables - Macros in excel creating, adding and editing of macros VBA programming in Excel forms in excel. **(26Hrs.)**

Module 4: Microsoft Access - Databases - creating a new database, creating tables, editing tables, entering data into a table, editing data in a table, relationship between tables - Creating a query; types of queries - Creating a report; types of reports, printing reports - Creating a simple form; modifying a form, adding control to a form, searching, sorting, Introduction to Software development in Access using VBA Code **(20Hrs)**

Module 5: Microsoft PowerPoint - Introduction, creating presentations – using auto content wizard, using templates, using blank presentation, formatting background, adding sounds, slide show, slide sorter, setting animation, slide transaction, setting intervals, saving and printing, presentations, adding and playing audio clips in presentations, creating hyperlinks in presentations, converting the presentations into a video clip (an overview only) **(20Hrs.)**

Module 6: Adobe in Design – creation and opening, working, setting defaults and preferences, viewing pages, using toolbox, working with text and graphics, moving between pages, adding and deleting pages, naming and saving a file. **(10 Hrs)**

Recommended Books

1. Cox et.al, 2007. *MS Office step by step*, PHI, NewDelhi.
2. Michael, *Adobe In Design Styles: How to create better, faster, Text andLayouts*
3. Pariah S Burke, *Mastering In Design CS5 for Print Design andProduction*

SEMESTER III
Paper 2: CO 232E- INTERNET AND WEB DESIGNING

No. of instructional hours per week: 6 (2 hour theory and 4 hrs practical)

Aim of the study: To update and expand skills in web designing for business operations.

Course objectives:

1. To give advanced knowledge in the field of web designing.
2. To equip the students to meet the demands of the industry.
3. To expand the practical skills in web designing and publishing for business.

Module 1-Computer networks and its need-Networks topology-Types of networks-History of Internet-Concept of Internet and www- Working of Internet–Protocols-Web publications-Cyberspace –Organisations of Internet management-.Application of Internet- World Wide Web, Search Engines, Newsgroups, Electronic Mail, Web Portal, Chat, Video Conferencing, FTP, Remote Login, E-Commerce, E-Learning, E-Governance, E- Banking. Internet Security concept-Firewalls and types-Security products–Biometrics– Cryptography-Digital signatures and electronic signatures

(12 Hrs)

Module 2- Static Web Page Development: - Basics of HTML -Understanding HTML, Create a Web page, Linking to other Web pages, Publishing HTML Pages, Text Alignment and Lists, Text Formatting Fonts Control, Email Links and link within a Page, Creating a Table, Creating HTML Forms, Creating Web Page Graphics, Putting Graphics on a Web Page, Custom Backgrounds and Colors, Creating Animated Graphics.

(22Hrs)

Module 3–DynamicWeb page Development:-CSS –creating and editing cascading style sheets, Defining Style with HTML Tags, Features of Style Sheet, Style Properties, Style Classes, and External Style Sheet. **Multimedia-** Sound-types of sound files, linking of sound files, embedding sound files -Video–Analog video, Digital video, webcams, Animation–Downloading animations, flash Publishing –Testing, Transferring to the web.

Publishing –registering a site, marketing a site, maintaining a site, Domain names, web hosting. (24Hrs)

Module 4–JavaScript:- Introduction to Java Script: Writing First Java Script, External Java Script, Variables: Rules for variable names, declaring the variable, assign value to a variable, Scope of variable, Using Operators, Control Statements, Java Script loops, Java Script Functions: Defining a Function, Returning value from function, User defines function. (15Hrs)

Module 5-XML an Overview –XML –XMLDTD–Physical structures in XML –XML data–creating and validating a book description document in XML–placing XSL in perspective–XSL concepts– code walk through XSL –creating XSL stylesheet– creating and using COMobjects in XML-Creating blogs. (15Hrs)

Module 6 – Advance Web Technologies - Angular (JavaScript open-source framework using MVC architectural pattern). Laravel (open-source PHP web framework). React JS (opensource,JavaScriptlibrarymaintainedbyFacebook).Node.js(notjustaframework, a complete environment). Ruby on Rails (RoR) (favourite frameworks for web developers). ASP.NET (Microsoft built web development framework)(20Hrs)

References

1. HTML, XHTML & CSS (Visual Quick Start Guide Series) Sixth Edition by Elizabeth Castro ISBN-10:0321430840 ISBN-13:978-0321430847
2. Dreamweaver CS5 for Windows and Macintosh: Visual Quick Start Guide by Tom Negrino, Dori Smith ISBN-10:032170357X ISBN-13:978-0321703576
3. Flash CS5 Professional for Windows and Macintosh: Visual Quick Start Guide by Katherine Ulrich ISBN-10:0321704460 ISBN-13:978-0321704467
4. Styling WebPages with CSS: Visual Quick Project Guide By Tom Negrino, Dori Smith ISBN-10:0-321-55557-0 ISBN-13:978-0-321-55557-1
5. Mary Millhollon, et al. *Easy Web Design*, PHI, New Delhi.
6. Nick Vandome. *Creating WebPages*, Dream tech Publishers, New Delhi.
7. Mike McGrath. *HTML in Easy Steps*, Dream tech Publishers, New Delhi.,
8. *Webdesigning and Production for Business*, Green Tech Books, Thiruvananthapuram
9. NIIT. *Basics of Website Design*
10. Millhollon & Castrina. *Faster Smarter Web Page Creation*, PHI, New Delhi.

SEMESTER III
Paper 3: CO 233R- MANAGEMENT OF INTELLECTUAL
PROPERTY RIGHTS

Objective: This course aims at familiarising the students with the historical perspectives of IPR, key forms, IPR legislations, impacts of IPR in the development of India and the process of registering IPRs.

Module 1: Historical perspective- WIPO- international treaties- Paris and Berne conventions- WTO- multilateral agreements- TRIPS- India and TRIPS- Issues and Challenges-benefits-criticism (15Hrs)

Module 2: Key forms of IPR- patents- copyrights- trademarks- industrial designs- layout designs of ICs- geographical indications- trade secrets- plant varieties (15Hrs)

Module 3: IPR and legislations- Indian Trademarks Act 1999- The Copy rights (Amendment) Act 1999- Geographical Indications of Goods (Registration and protection) Act 1999- Semiconductor Integrated Circuit Layout Design Act 2000- The Industrial Designs Act 2000- Protection of Plant Varieties and Farmer's Rights Act 2001- Biological Diversity Act 2002- The Patents (Amendment)Act2005. (20Hrs)

Module 4: Impact of IPRs on developing countries in general and India in particular- impact on agriculture- bio piracy- impact on pharmaceutical companies- public health programmes-SMEs. (15Hrs)

Module 5: Procedure for registering IPRs- role of government- Department of Industrial Policy and Promotion, Major agencies for administering IPRs- enforcement mechanism- Intellectual Property Appellate Board. (20 Hrs)

Module 6: Cyber law: Emergence of Cyberspace, Cyber Jurisprudence, Cyber Ethics, Overview of IT Act, 2000, Amendments and Limitations of IT Act, Legal Recognition of Electronic Records, Legal Recognition of Digital Signature, Certifying authorities, Cyber Crime and Offences (23Hrs)

References:

1. W.R Cornish, Intellectual Property Patent, Copyrights, Trademarks & Allied Rights, Sweet & Maxwell, London
2. Bibek Debroy, Intellectual Property rights, Rajiv Gandhi Institute for Contemporary Studies, Delhi, B.R. Pub. Corp.
3. Wadhera B.L., 2011, Law Relating to Intellectual Property -Patents, Trade Marks, Copyrights, Designs, Geographical Indications, Universal Law Publishing, New Delhi
4. P Narayana, Intellectual property law
5. Rajeev Jain, Intellectual property law by Patents ,copyrights, trademarks and design
6. Journal of Intellectual Property Rights- various issues

Websites:

www.dipp.nic.in/iprwww.i

prlawindia.orgwww.wipo.i

nt/ipdl/en

SEMESTER III
Paper 4: CO 234E- LEGAL FRAME WORK FOR INFORMATION
TECHNOLOGY BASED BUSINESS

No. of instructional hours per week: 6

Objectives:

1. To give advanced knowledge in the field of cyber law.
2. To equip the students to meet the demands of the industry.
3. To develop practical skills in handling cyber issues in business.

Module 1–Introduction- Cyberspace vs. Physical space; Scope of Cyber Laws. Components of Cyber Laws in India-Information Technology Act, 2000; Relevant provisions from Indian Penal Code, Indian Evidence Act, Bankers Book Evidence Act, Reserve Bank of India Act, etc. **(12Hrs)**

Module 2- Concept of Cyber Crimes – ‘Cyber Contraventions’ & ‘Cyber Offences’ Cyber Crimes and legal issues involved - Unauthorised Access, Cyber Hacking, Denial of Access To Authorised Person, E mail bombing, Web jacking, Web Defacement & Salami Attacks, Cyber Defamation– meaning; applicability of provisions of IPC; penal liabilities, Phishing, Cyber Stalking, Cyber pornography, Cyber Terrorism. **(30Hrs)**

Module 3 -E-Contract–legal provisions regulating the– contract with special reference to the provisions of IT Act, 2000. **Copyright issues in Cyber space**–relevant provisions under Copyright Act, 1957 regulating copyright issues in Cyber space; Online Software Piracy–legal issues involved; Analysis of sufficiency of provisions of Copyright Act to deal with Online Software Piracy. **Trademark issues in Cyberspace**–Domain Name; Cyber squatting as a form of Domain Name dispute; Case law. **(24Hrs)**

Module 4 - Information Technology Act – a brief overview; Documents or transactions to which IT Act shall not be applicable; meaning of Computer, Computer system and

Computer network; E – commerce; E – governance; Concept of Electronic Signature; Concept of Cyber contraventions and Cyber Offences. **(18Hrs)**

Module 5: Introduction to Information Security, Network Security, Cyber Security, SQL injection, socialsite security. **(12Hrs)**

Module 6: Application and Business Security Developments, Policy Standards and Laws, BCP, DR Plannin gand Audit. **(12Hrs)**

References

1. Pavan Duggal–Cyber crime and Jurisdiction inIndia
2. RohasNagpal “Cyber Terrorism in the Context of Globalisation”, *The IT and Law Initiative* (SymbiosisPublication)
3. Rohas Nagpal ,IPR &Cyberspace–IndianPerspective
4. INDIAN PENALCODE1860
5. INDIAN EVIDENCE ACT 1972
6. BANKERS BOOK EVIDENCE ACT1891
7. RBI OF INDIA ACT1934
8. INFORMATION TECHNOLOGY ACT 2000, IT Amendment Bill 2006, IT Amendment bill2008.
9. COPYRIGHTSACTANDTRADEMARKACT
- 10.E-CONTRACT

SEMESTER IV
Paper 1: CO 241E- DATABASE MANAGEMENT AND
INFORMATION TECHNOLOGY

No. of instructional hours per week: 6 (2 hour theory and 4 hrs practical)

Aim of the study: To update and expand skills in database management and Information technology

Course objectives:

1. To give advanced knowledge in the field of Database Management.
2. To equip the students to meet the demands of the industry.
3. To expand the practical skills in Database Management.

Module 1: Database system Design: overview of Database Management ‘ Storage and file organization’ Index structure entity- relationship model; An architecture of database system; relational model; Relational operators; Functional dependencies & normalization; SQL: A relational database language transaction processing concepts; Concurrency control **(15Hrs)**

Module 2: Security and Data Warehousing: Recovery system; Database Security/ authorization; Distributed database; object-oriented database; Network model; Hierarchical model; Data warehouse; Environment & Design, Data warehousing & technology, Web-enabled dataware house. **(15Hrs)**

Module 3: Application of Database Management: Data mining process, Management applications of data mining, Spatial, geographic & multimedia database, New applications; Distributed IS& World Wide Web linkages. **(18Hrs)**

Module 4: Advanced database concepts: Cloud database, centralized database, introduction to Big Data, Block Chain Data, crypto currency etc. **(18Hrs)**

Module 5: Introduction to Apache Hadoop (Apache Hadoop is an open-source software framework used for distributed storage and processing of datasets of big data using the Map Reduce programming model. It consists of computer clusters built from commodity hardware), Apache Spark. **(22Hrs)**

Module 6: Management and Organization: Relating IT to organizational leadership, culture, structure, policy and strategy; programmer productivity. Managing legacy systems; Evaluation centralization- decentralization issues; IT forecasting. **(20 Hrs)**

References:

Date C.J; An introduction to Database Concepts, Addison Wesley, Massachusetts

Desai Bipin; An Introduction to Database System, Galgottia Publications, New Delhi

Elmasri and Nawathe; Fundamentals of Database System, Pearson Education, Asia

Imran Bashir: Mastering Block chain,

SEMESTER IV

Paper 2: CO 242E- E-BANKING AND BUSINESS MODELS

Objectives:

1. To understand the relevance of E- banking in the present scenario
2. To impart knowledge about technology application in banking

Module 1: Introduction to present day banking system- Concepts- New Trends in banking- Core Banking- Internet Banking – Mobile Banking – Criteria for licensing – Financial Inclusion — new reforms in banking sector **(13Hrs)**

Module 2: E-banking- meaning, definition, features, advantages and limitations- core banking, the evolution of e-banking in India, Legal framework for e-banking. **(15Hrs)**

Module 3: Electronic delivery channels and products- Teller machine at bank counters, cash dispensers, ATM, Telephony, Internet, mobile phone,- Banking products- Traditional products, the new banking products, segmentation , electronic money, electronic cash, electronic payment system. **(20Hrs)**

Module 4: Banking system for electronic delivery, online enquiry and updates facility, PIN and their use, signature storage and display, cheque truncation, security measures- encryption, firewalls, authentication, banking organization for electronic delivery. **(20 Hrs)**

Module 5: Banking on Technology: RTGS information technology, bank net, RBI net, Data net, virtual banks, Data mining, intelligent agents, biometrics, mobile wireless access devices, CRM, risk management for e-banking, impact of technology on banks. **(20Hrs)**

Module 6: E-banking business models- various models- home banking, office banking, online banking, internet banking, mobile banking, SMS banking,- models of electronic payments, other business models. **(20Hrs)**

References:

1. Sanjay Soni and Vinayak Aggarwal, Computers and Banking, M/s Sultan Chand & Sons, New Delhi,1993.
2. Uppal, R.K. “E-Banking in India (Challenges & Opportunities)”, New Century Publications, New Delhi,2007.
3. Joseph, P.T., E-Commerce: An Indian Perspective, Prentice Hall of India,New Delhi,2009.

SEMESTER IV

Paper 3: CO 243E- E-COMMERCE AND GLOBAL MARKETING

Objectives:

1. To understand the relevance of E- Commerce in the present scenario
2. To familiarize the students with the concept and issues of global marketing environment

Module 1: Introduction to E-Commerce: Meaning, definition, features, advantages, disadvantages,- E-market- a paradigm shift, technological convergence, - Transition to e-commerce in India and its challenges, IT act. (20 Hrs)

Module 2: Business Models of E-Commerce, key elements of business models, B2C, B2B, C2C, C2B, B2G.... Models based on relationship of transaction types- brokerage model, aggregator model, info- intermediary model, community model, value chain model, affiliate model etc. (20Hrs)

Module 3: E-payment systems and E-security- EDI, Digital payment, E-cheque, e-cash, debit card, credit card, smart card, digital signature, operation of e-payment system. –Risk in e-payment, security measures, supply chain Management. (20Hrs)

Module 4: E-marketing- the scope and challenges of global marketing, opportunities, advantages and limitations, the dynamic environment of global trade, business customs in global marketing, multi-national market regions and market groups. (20 Hrs)

Module 5: Global Marketing Environment: Economic Environment, Socio-cultural Environment, Legal and statutory framework, Need for Environmental analysis, Country Risk Analysis, Global Marketing Research and information System, Research Process of International Marketing. (15Hrs)

Module 6: Global marketing management: products and services for customers and businesses, global marketing channels and marketing mix, pricing for global market. (13 Hrs)

References

1. Kenneth C Laudon “ E-Commerce” Pearson Education,2013.
2. Murthy C.S.V “ E-Commerce- concepts, models, strategies”,Himalaya Publishing House, New Delhi,2013.
3. Joseph P.T, “ E-Commerce- An Indian Perspective”, PHI Learning Pvt. Ltd,New Delhi,2012.
4. Addison Wesley, “Frontiers of E-Commerce “, Pearson Publication,2012.
5. David Whitley, “E-Commerce Strategy, Technology and Application”,Tata McGraw Hill Publication, New Delhi,2012.
6. Philip R. Cateora and John L. Graham, “International Marketing “, , McGraw-Hill,2011

SEMESTER IV

Paper 4: CO 244S- MANAGEMENT OPTIMIZATION TECHNIQUES

Objectives:

1. To convey basic principles and application of optimization tools of resource utilization.
2. To provide an insight into optimal project implementation Techniques under deterministic and probabilistic conditions.

Module 1: Optimization Techniques: Introduction-Definition-Nature and Importance-Steps in Intelligent decision making-Modelling Techniques **(8 Hrs)**

Module 2: Linear Programming: Introduction-Formulation of LPP-Maximize, Minimize, objective function-Constraints and non-negativity conditions-Graphical solution-Optimal solution-Infeasible and unbounded solutions-degeneracy-Simplex method-slack, surplus and artificial variables-Duality-Primal and dual problems

(22Hrs)

Module 3: Transportation and Assignment Problems: Transportation Problems-Initial basic feasible solution using North West Corner Rule, Lowest Cost Entry Method and Vogel Approximation Method-Optimal solution-MODI method- Degeneracy, Unbalanced and Maximization in Transportation Problems. Assignment Problems-Hungarian Method-Maximization, Unbalanced and Restricted Assignment Problems-Travelling Salesman Problems. **(23 Hrs)**

Module 4: Game Theory: Game Theory- Pay off matrix- Maxim in and Minimax – Saddle point-Solution of pure and Mixed strategy games- Graphic Method-Principle of dominance-Arithmetic Method. **(15 Hrs)**

Module 5: Optimization Techniques: Replacement Theory- Replacement of Capital Items and items that fail completely- Individual and Group replacement policy. Queuing Theory-Models (simple problems); Inventory models-computation ; Simulation-MONTE CARLO Method and Random Numbers. **(15 Hrs)**

Module 6: Project Scheduling and Monitoring: Network Analysis-Critical Path Method-Scheduling and Control of Projects-Free, Independent and Total Float(slack)-PERT-time estimates and Probability of completion-cost/time trade off analysis-Crashing of projects and resource considerations **(25 Hrs)**

References:

1. J K Sharma – operation Research – Theory and Practice – MacMillian.
2. John M. Nicholas, Project Management for business and Technology – Problems andpractice.
3. Harvey M Wagner - “Principle of Operation Research, PH Learning Pvt.Ltd.
4. Management operations Research – Satya Narayanan, LalithaRaman.
5. Operations Research Hamdy ATaha
6. Operation Research – V.K.Kapoor.
7. Operation Research – S.D.Sharma.

Elective : INTERNATIONAL TRADE

SEMESTER III

Paper 1: CO 231.1 T - FOREIGN LANGUAGE – ARABIC

Aim of the Course:

- To impart the basics of Arabic Language
- To acquaint the words and phrases related to Commerce, Industry and Travel sector
- To introduce the culture of Arabs

Course Description

Under this course it is envisaged to enable the learner to understand, read Arabic and to react in the various situations of life. This course helps to understand in short the Arab civilization, culture and the trade relations of Arabs with India.

Module – 1: Alphabets, Parts of Speech, Structure of Arabic Sentences, Sentence making, deferent sentences, Vocabulary, Sentences and its types, Gender, Singular, Dual, Plural, Definite and Indefinite, (15Hrs)

Module 2: Nominal Sentences and Verbal Sentences, Object of Genitive case or Prepositions, The Genitive, Adjective (15Hrs)

Module –3: Travel& Tourism situations: Railway station, bus service, bus station, train fare, airport, air travel, tourism, travel business, receptionist, reception of the guests, being host ,seeing off (25Hrs)

Module 4: Work situations: Different work situations: In the office, interviews, factory, in the shop, business, market etc (25Hrs)

Module –5: Lifestyle and customs of Arabs, Arab civilization, culture (13 Hrs)

Module –6: Trade relations, Trade relations of Arabs with India. (15 Hrs)

Text Books:

- a) **Arabic for Your Trip** -Berlitz, U.K.
- b) **Durusun Fil-Arabiyya** by Linguaphone Institute, London

Books for Reference:

- a) A Course in Spoken Arabic, Shafi Shaikh (OUP)
- b) An Easy way to Commercial and Journalistic Arabic, Muhammad Ismail al Mujaddidi, Sahara Publications, Calicut, 2003
- c) Arabic Self Taught (Syrian), A. Hassam
- d) Arabic Today, John Mace, Edinburgh University Press, London
- e) Business Arabic, Dr. A.I. Rahmathullah, al Huda Books, Calicut
- f) Easy Steps to Functional Arabic, Dr. S.K. Bahmani
- g) Introduction to Arabic, a BBC radio Course for beginners.
- h) Spoken Arabic, Said Salah
- i) Technical, Business, Legal and Journal Arabic: an academic book in translation, Abdul Rasheed, T.P. Mohammad, al Huda Books, Calicut, 2007
- j) The Commercial Arabic, V.P. Abdul Hamid and N.K. Abdul Halim, Al Huda Books, Calicut, 2003

SEMESTER IV

Paper 1: CO 231.2T – Foreign Language -FRENCH

Objective: To develop basic communicative ability in French language especially with business situations

LANGUAGE FUNCTIONS AND TOPIC AREAS

Module1	-Greetings and exchanging personal information -Countries and nationalities-Numbers , Days and months -Alphabet, Spell names and other words- Professions -Telling time
Module2	-Talk about Leisure activities and your likes and dislikes-Describing people -Ask questions to gather information- Telephoning -Giving and asking for directions – Travelling at the airport, catching a train - Food and drinks
Module3	-Shops and shopping [How to ask for price] -French meals, understand a menu and order [restaurant bill, taxi fare, hotel bill etc] - French etiquette
Module4	-Making suggestions and polite requests- Writing an informal not a postcard

Language structures	Module5	-Verbs-Articles - Adjectives -Present tense and Present Continuous- Past tense -Immediate future-Prepositions
	Module6	-Partitive articles to express quantity- Imperative –for order and to advice

SEMESTER III

Paper 1: CO 231. 3T – FOREIGN LANGUAGE- GERMAN

Aim of the syllabus is to develop skills in listening comprehension, writing and speaking German Language using basic German Grammatical Structures.

Theme	Grammar for the development of skills
1. Name, Country, Residence	Personal pronouns, word order, Position
2. Studies and Profession	Possessive pronouns, verb "sein"
3. Family, siblings, Age	Verb "haben", indefinite article Negation: "nicht" and "Kein"
4. Time, Appointments	Definite articles, strong verbs
5. Invitation	Separable verbs, imperative
6. Job Search, Job selection	Model verbs
7. Shopping	Accusative case
8. GIFTS, At the postoffice	Dative case
9. Information	Place and Direction

Parallel to the grammar mentioned above, a short introduction to themes in German Culture will also be included in the course

References : Lernsile Deutsch Teil I (Max Hueber Verlag)

Lesson 1 to 9

SEMESTER III
Paper 2: CO 232T- INTERNATIONAL TRADE AND
DOCUMENTATION

Objective: The objective of this course is to acquaint the students with the basic concepts of International trade, India's foreign trade policies, export assistance and promotion measures and various aspects of importing.

Module 1: Theories of International Trade- Absolute and comparative Advantage theories- Heckscher- Ohlin theory- terms of trade- theory of international trade in services.

(15 Hrs)

Module 2: Tariffs- Quotas- dumping- Antidumping/ countervailing- duties- technical standards- exchange control and other non tariff measures

(15 Hrs)

Module 3: Composition and direction of India's foreign trade- India's foreign trade policy- export promotion infrastructure and institutional set up – deemed exports- rupee convertibility- policy on foreign collaborations and counter trade arrangements- India's joint ventures abroad- project and consulting exports.

(25Hrs)

Module 4: Export assistance and promotion measures- ECGC- import facility- duty drawback- duty exemption schemes- tax concessions- MAI-MDA-100 percent EOUs- SEZs.

(20Hrs)

Module 5: Processing of an export order – methods of payment- negotiations of export bills- pre and post shipment export credit – Bank guarantees- types and characteristics of export documents

(23Hrs)

Module 6: Procedure for procurement through imports- Import financing-customs clearance of imports- managing risks involve dinimporting. **(10 Hrs)**

References:

1. M B Rao, Manjula Guru, WTO and International Trade, Vikas Publishing house, New Delhi
2. Francis Cherunilam, International Trade and Export Management, Himalaya Publishing House,Mumbai
3. Mahajan V.S, India's foreign and balance of payments, Deep & Deep Publications, New Delhi

SEMESTER III
Paper 3: CO 233R- MANAGEMENT OF INTELLECTUAL
PROPERTY RIGHTS

Objective: This course aims at familiarising the students with the historical perspectives of IPR, key forms, IPR legislations, impacts of IPR in the development of India and the process of registering IPRs.

Module 1: Historical perspective- WIPO- international treaties- Paris and Berne conventions- WTO- multilateral agreements- TRIPS- India and TRIPS- Issues and Challenges-benefits-criticism **(15 Hrs)**

Module 2: Key forms of IPR- patents- copyrights- trademarks- industrial designs- layout designs of ICs- geographical indications- trade secrets- plant varieties **(15Hrs)**

Module 3: IPR and legislations- Indian Trademarks Act 1999- The Copy rights (Amendment) Act 1999- Geographical Indications of Goods (Registration and protection) Act 1999- Semiconductor Integrated Circuit Layout Design Act 2000- The Industrial Designs Act 2000- Protection of Plant Varieties and Farmer's Rights Act 2001- Biological Diversity Act 2002- The Patents (Amendment)Act2005. **(20Hrs)**

Module 4: Impact of IPRs on developing countries in general and India in particular- impact on agriculture- bio piracy- impact on pharmaceutical companies- public health programmes-SMEs. **(15Hrs)**

Module 5: Procedure for registering IPRs- role of government- Department of Industrial Policy and Promotion, Major agencies for administering IPRs- enforcement mechanism- Intellectual Property Appellate Board. **(20Hrs)**

Module 6: Cyber law: Emergence of Cyberspace, Cyber Jurisprudence, Cyber Ethics, Overview of IT Act, 2000, Amendments and Limitations of IT Act, Legal Recognition of Electronic Records, Legal Recognition of Digital Signature, Certifying authorities, Cyber CrimeandOffences **(23Hrs)**

References:

1. W.R Cornish, Intellectual Property Patent, Copyrights, Trademarks & Allied Rights, Sweet & Maxwell,London
2. Bibek Debroy, Intellectual Property rights, Rajiv Gandhi Institute for Contemporary Studies, Delhi, B.R. Pub.Corp.
3. Wadhera B.L., 2011, Law Relating to Intellectual Property -Patents, Trade Marks, Copyrights, Designs, Geographical Indications, Universal Law Publishing, NewDelhi
4. P Narayana, Intellectual propertylaw
5. Rajeev Jain, Intellectual property law by Patents ,copyrights, trademarks anddesign
6. Journal of Intellectual Property Rights- variousissues

Websites:

www.dipp.nic.in/iprwww.i

prlawindia.orgwww.wipo.i

nt/ipdl/en

SEMESTER III

Paper 4: CO 234Y- FOREX MANAGEMENT

Objective: The purpose of this course is to give the students an exposure to the way foreign Exchange Market operates, to understand the principles of Currency valuation, techniques that can be used to hedge foreign exchange risk and to create an understanding on foreign exchange Management in India.

Module 1: Foreign Exchange, concepts, significance of foreign exchange- Forex Reserves - Exchange rates- inter banks and Merchant rates- spot and forward rates-TT rates-computations-Forex Markets—derivates in the Forex markets- Futures, Swaps, Options and Arbitrage- Forex dealers and Speculators Organisations of the Forex market.

(15 Hrs)

Module 2: Exchange rate fixation- Purchasing Power Parity Theory- Interest Rate Parity Theory- Flow Model- Asset market models-forecasting of exchange rates- Nominal Effective Exchange Rates and real Effective Exchange rates- Hedging against Exchange rate fluctuations.

(15Hrs)

Module 3: Forward Exchange Contracts-relevance-types- forward exchange rate computation – factors influencing Forward Rates- extension and cancellation of forward contracts-Futures-features vs Forward contracts-Options- types and Mechanisms-risk Management through forward contracts.

(20 Hrs)

Module 4: Forex Risk management – transaction risk exposure risks- internal strategies- shifting of risk- sharing of risk- exposure netting and offsetting- External strategies – money market Hedge- currency swaps- interest rate swaps- Economic consequences of exchange rate changes- Managing Risk .

(20 Hrs)

Module 5: Forex Management in India- Fixed and fluctuating rates-rupee convertibility- Nostro-Vostro-Loro Accounts- Exchange control Measures- relevance. Foreign Exchange

reserves of India- composition and Management- monetary and Fiscal policy and its impact on foreign exchange reserves in India. (20Hrs)

Module 6: Foreign investment Management: FDI - National FDI policy - Liberalization. Economic determination - impact of globalization. Foreign portfolio investments with special reference to developing countries. (18 Hrs)

References

1. Alan C Shapiro, Multi National Financial Management,
2. Clare C Gump, ABC of Foreign Exchange
3. Krishnamoorthy S, Guide to Foreign Exchange Regulations
4. Chatterjee A K, Principles of Foreign Exchange
5. Rajwadi, Foreign Exchange Management
6. Keith Red Head, Financial Derivatives
7. V V Keshkamat , Foreign Exchange Arithmetic, – Vivek Publications ,Mumbai
8. C Jeevandam, Foreign Exchange Arithmetic and Risk Management, – Sulthanchand & Sons
9. B K Chaudhuri, Finance of Foreign Trade and Foreign Exchange– Himalaya Publishing House

SEMESTER IV

Paper 1: CO 241Z- LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Objective: The objective of this course is to enable students to understand the importance and dynamics of a firm's physical distribution functions and management of its supply chain.

Module 1: Introduction to distribution logistics: Nature, importance and scope of logistic decisions; Systems approach to logistics; integrates logistics; Total cost concept; supply chain management- nature, importance and interface with logistics; Concept of customer service.

(18 Hrs)

Module 2: Transportation and physical Distribution: Importance and modes of transportation Selection of transportation modes; Multi modal transportation; Documentation and carrier liabilities. Inter – state good movement and problems; Transportation management.

(15Hrs)

Module 3: Inventory control: Economic order quantity under conditions of certainty and uncertainty; Inventory requirements as function of number of stock locations; techniques of inventory control.

(15 Hrs)

Module 4: Warehousing: Role and modern concept of warehousing; private vs public warehousing; Planning warehousing operations; Site selection, warehouse layout.

(20Hrs)

Module 5: Material handling: Management of receipts and issues; Computers and warehousemanagement.

(20 Hrs)

Module 6: Order Processing: Importance to customer service; Model of Performance measurement; Packagingandutilization.

(20 Hrs)

References:

- 1.Bowersox and others, Physical Distribution Management, Tata McGraw Hill, New Delhi
- 2.Dobler D.W, Purchasing and Supply Management, Tata McGraw Hill, New Delhi
- 3.Glaskowsky N.A, Business Logistics, Dryden Press, Ohio

4. Khanna K.K, Physical Management, Himalaya Publishing House, New Delhi

SEMESTER IV

Paper 2: CO 242T- STRATEGIC MANAGEMENT FOR MNCs

Objective: The objective of this course is to give students acquaintance with the growth and development of MNCs, strategic management of MNCs, organizational design of MNCs, integration of subsidiaries, business ethics and social responsibility.

Module1: Concepts of MNCs- Emergence and growth of MNCs- Process of internationalization- Types of MNCs- Factors behind growth of MNCs- Problems and benefits from MNCs- Special problems of MNCs. (15Hrs)

Module 2: Strategic Management of MNCs- SWOT Analysis- Components of strategies- Levels of Strategies- Corporate level, Business level and functional level strategies- Strategy formulation and implementation-Case studies. (15Hrs)

Module 3: Ownership strategy of MNCs- International Joint Ventures- International Strategic Alliances- Business Process Outsourcing- Foreign subsidiary- Mergers and acquisition, Problems, Prospects and patterns of each form- case studies. (20Hrs)

Module 4: Strategic planning in MNCs- concept of strategic planning- need- focus modes- Planning for expansion- Planning of competitive advantage and market leadership- Planning for core- competence- Environmental scanning and planning – case studies. (20Hrs)

Module 5: Organizational strategies of MNCs – Organizational theories applicable to MNCs- Structure of MNCs- American, European and Japanese organizational designs of MNC (20Hrs)

Module 6: Designing appropriate strategy- Organizational Integration of subsidiaries- Strategic adaptation to local conditions- MNC culture- Business Ethics- Social responsibility. (18Hrs)

References

- 1.International Business: S. Shiva Ramu
- 2.Management: Griffin
- 3.International Business: James H Taggart
- 4.Essentials of international Marketing: Michael C McDermott
- 5.Strategic Management- Strategy Formulation and Implementation: John A Pearce II & Richard B Robinson
- 6.Strategic Planning for Corporate Success: V.S. Ramassamy & S.Namakumari
7. Cases in Strategic Management: S.B Budhiraja & M.B Athreya

SEMESTER IV

Paper 3: CO 234T- LEGAL FRAMEWORK FOR INTERNATIONAL TRADE

Objective: This course aims at familiarizing students with the legal framework of International trade. It covers various aspects such as law on International sale of goods, patent regulations, trademarks, arbitration and conciliation regulations, FEMA AND Cyberlaws.

Module 1: Uniform Law on International Sale of goods- obligations of the seller – obligations of the buyer, common provisions- rules concerning damages-provisions of passing of risk in international sale contracts. Foreign Trade (Development and Regulations) Act 1992- objectives- Powers of Central Govt. Import/ Export License- Application Procedure- Refusal, Suspension of License; Role of DGFT- Exemptions from FTDRAct.

(20Hrs)

Module 2: Patents regulations: Patents- Meaning- varieties- provisions of patent applications procedure- procedures after filling applications – patenting- patents of plant and seeds, Drugs- Life of patents and Rights of patentee. Working of patent- Infringement of patent- surrender and revocation of patent. Provisions related to secrecy direction for patent out of India- Protection for security of India- patent regime under WTO.

(20Hrs)

Module 3: Trade and merchandise marks regulations: registration- procedure- opposing registration- effect of registration- prohibition of registration. Foreign Trade Mark- Privileges to nationals and non- nationals- Licensing of trademark- registered user provisions- violation of trade mark rights-remedies.

(15 Hrs)

Module 4: Arbitration and conciliation regulations- purpose of Arbitration- difficulties in India. Domestic Arbitration- agreement- Tribunal- Arbitral proceedings- Arbitral

award- Intervention by Court. Conciliation – enforcement if foreign awards- International Arbitration.
(15Hrs)

Module 5: FEMA Regulations- objectives- Need. Functions of RBI under FEMA, regulations over transactions in foreign exchange and securities – Restriction on capital account and current account transactions- control over realization of Foreign Exchange; Regulations of receipts and payments to resident outside India; Rule of Foreign Exchange possession and retention, realization, repatriation and surrender; provisions regulating export of goods and services- borrowing and lending in Foreign Exchange

(20 Hrs)

Module 6: Acquisition and transfer of property in and outside India- establishment of branch in India; Enforcement/ penalties under the Act; Cyber Laws- need and significance.

(18 Hrs)

References:

1. Datey, Economic Laws
2. Bare Acts: Govt. of India

SEMESTER IV

Paper 4: CO 244S- MANAGEMENT OPTIMIZATION TECHNIQUES

Objectives:

1. To convey basic principles and application of optimization tools of resource utilization.
2. To provide an insight into optimal project implementation Techniques under deterministic and probabilistic conditions.

Module 1: Optimization Techniques: Introduction-Definition-Nature and Importance-Steps in Intelligent decision making- Modelling Techniques **(8 Hrs)**

Module 2: Linear Programming: Introduction-Formulation of LPP-Maximize, Minimize, objective function-Constraints and non-negativity conditions-Graphical solution-Optimal solution-Infeasible and unbounded solutions-degeneracy-Simplex method-slack, surplus and artificial variables-Duality-Primal and dual problems **(22 Hrs)**

Module 3: Transportation and Assignment Problems: Transportation Problems-Initial basic feasible solution using North West Corner Rule, Lowest Cost Entry Method and Vogel Approximation Method-Optimal solution-MODI method- Degeneracy, Unbalanced and Maximization in Transportation Problems. Assignment Problems-Hungarian Method-Maximization, Unbalanced and Restricted Assignment Problems-Travelling Salesman Problems. **(23Hrs)**

Module 4: Game Theory: Game Theory- Pay off matrix- Maxim in and Minimax – Saddle point-Solution of pure and Mixed strategy games- Graphic Method-Principle of dominance-Arithmetic Method. **(15 Hrs)**

Module 5: Optimization Techniques: Replacement Theory- Replacement of Capital Items and items that fail completely- Individual and Group replacement policy. Queuing Theory-Models (simple problems); Inventory models-computation; Simulation-MONTE CARLO Method and Random Numbers. **(15 Hrs)**

Module 6: Project Scheduling and Monitoring: Network Analysis-Critical Path Method-Scheduling and Control of Projects-Free, Independent and Total Float(slack)-PERT-time estimates and Probability of completion-cost/time trade off analysis-Crashing of projects and resource considerations **(25 Hrs)**

References:

1. J K Sharma – operation Research – Theory and Practice – MacMillian.
2. John M. Nicholas, Project Management for business and Technology – Problems and practice.
3. Harvey M Wagner - “Principle of Operation Research, PH Learning Pvt.Ltd.
4. Management operations Research – Satya Narayanan, LalithaRaman.
5. Operations Research Hamdy ATaha
6. Operation Research – V.K.Kapoor.
7. Operation Research – S.D.Sharma.

Elective : MARKETING

SEMESTER III

Paper 1 : CO 231M- AGRICULTURAL AND RURAL MARKETING

Course Objectives

1. To learn how general marketing concepts apply to agricultural and rural marketing
2. To impart knowledge in enabling the taught to critically analyze the methods of agricultural and rural marketing

Module 1 Agriculture Marketing- Definition, Scope, Concepts and Objectives, Differences in Agricultural and Consumer Marketing, Constraints in Agricultural Marketing. **(15Hrs)**

Module 2. Role of Agriculture in Economic Development of India - Role of Government in Agricultural Development. **(13Hrs)**

Module 3. Agribusiness-Emerging Branches-Non Conventional Form of Agribusiness-Export Potential for Farm Products –Supporting Services **(20Hrs)**

Module 4. Advantages& Limitations of Organized Retailing in Agri Inputs and Outputs-Recruitment of Human Resources in Agri Marketing and New Trends in Agricultural Marketing **(25Hrs)**

Module 5. Rural Marketing- Features, Significance, Scope and Limitations- Segmentation in Rural Marketing-Classification of Products and Services in Rural Marketing- Marketing Mix for Rural Products- Innovative Distribution Channels **(25Hrs)**

Module 6. Cooperative Marketing- Concepts, History, Functions-Reasons for Slow Progress of Cooperative Sector **(10Hrs)**

Reference Books

Rural Marketing- Challenges and Opportunities H C Purohit

Rural Marketing In India-Strategies and Challenges Ruchika Ramakrishnan

Rural Market and Agricultural Marketing Kiran Sankar Chakraborty

The Rural Marketing Book Pradeep Kashyap& SiddharthRaut

Agricultural Marketing in India S S Acharya and N L Agarwal Oxford & IBH Publishing
Co Pvt Ltd, Culcutta

Agribusiness Management In India- Text & Cases- Dr. Subhash Bhawe

SEMESTER III

Paper 2: CO 232M- INTERNATIONAL MARKETING

Objectives:

- To familiarize the students with the concept and issues of international marketing and enable them to analyze the foreign market environment and develop international marketing strategies for a business firm.

Module 1:Introduction: Introduction to marketing (Basic concepts only), International Marketing- an overview; International marketing management process, International marketing information system. International Market Segmentation, Targeting and Positioning; International market entry strategies – Exporting, licensing, contract manufacturing, joint venture, setting –up of wholly owned subsidiaries abroad.

(22 Hrs)

Module 2: Global Marketing Environment: Economic Environment, Socio-cultural Environment, Legal and statutory framework, Need for Environmental analysis, Country Risk Analysis, Global Marketing Research and information System, Research Process of International Marketing.

(16 Hrs)

Module 3: International Product Planning and Pricing decisions: International marketing mix International product policy ; Product positioning in foreign market; Product standardization and Adoption ; Brands, Trademarks, Packaging and Labeling ; International marketing of services ; International product pricing policy ; Factors affecting international price determination ; methods of Pricing for international markets.

(25 Hrs)

Module 4: International Distribution Decisions: Distribution channel- from traditional to modern channel structures, Intermediaries for international markets-their roles and functions; Factors affecting choice of channels; Locating, selecting and motivating channel members; International logistics and supply chain management; Planning and Issues.

(20 Hrs)

Module 5: International promotional policy: Concept; International advertising; Developing International advertising strategy ; International sales promotion strategies ; Other forms of promotion for global markets.

(15Hrs)

Module 6: Emerging trends in International Marketing: International Marketing through Internet; Ecological concerns and international marketing ethics. **(10Hrs)**

References:

1. Dr.K. Karunakaran, 'Marketing Management(Text and cases in Indian Context)'. Himalaya PublishingHouse.
2. Philip Kotler and Kevin Lane Keller,' Marketing Management',Prentice Hall.
- 3.Dana – Nicoleta, Laseu, 'International Marketing',Biztantra.
4. Warren J. Keagan, Mark Green, 'Global Marketing 3/e, PrenticeHall.
5. Cateora, Phillip R. ;Grahm, John L. And PrashantSalwan ,International Marketing, TataMcGrawHill.
6. Philip R. Cateora, John Graham, 'International Marketing', Irvine – SagePublications.
7. Michal R. Czinkota, Illkka A. Ronkainen, 'Best Practices in InternationalMarketing', Harcourt collegePublishers.
8. P.K. Vasudeva, 'International Marketing' Excel books.
9. R. Srinivasan, 'International Marketing' Prentice HallIndia.
10. Rajagopal, International Marketing, Vikas PublishingHouse.
11. Francis Cherunilam, 'International Business', PHI Learning PrivateLimited

SEMESTER III

Paper 3: CO 233M- MARKETING RESEARCH

Objectives:

1. To understand the relevance of Marketing research
2. To learn the applications of research in a marketing context

Module 1: Introduction -Introduction to Market Research- Types of Research – Basic &Applied, Nature, Scope, Objectives, Importance & Limitations of Market Research. Marketing Research activities – Steps involved in Research process - Problem identification and definition; Determination of information needs; Developing research proposal-Market research v/s Marketing research-Research Design – types of Research Design. (20Hrs)

Module 2: Method of data collection- Sources and collection of Marketing Data. Secondary data – Advantages & Limitations, Sources –Govt. & Non Govt. Primary Data – Advantages &Limitations, Sources, Methods of Collection Primary Data – Observation, Mail, Personal Interview, Telephonic Interview, Internet Interviewing- survey errors. (15 Hrs)

Module 3: Sampling -Sampling, Questionnaire & Scaling Techniques. Probability and Non Probability Sampling, Sampling methods, Sample Design. Questionnaire design and drafting. Scaling techniques like Nominal, Ordinal, Interval, Ratio, Perceptual Map, Semantic Differential, Likert, Rating& Ranking Scales. Hypothesis testing-Introduction-Types of tests and test selection- One sample test-Two-Independent Sample tests-Two-related sample tests- Chi-square test-Tests for large and small samples-ANOVA. (25 Hrs)

Module 4: Data processing and analysis of data - Data Processing and Tabulation-Editing coding, problems in editing, tabulation. Data Analysis- Measurement of central tendency, dispersion, univariate analysis, bivariate analysis, multidimensional analysis-

Multivariate analysis, (Factor analysis, cluster analysis, multidimensional analysis, conjoint analysis).-Market and Sales Analysis-Sales forecasting – objective and subjective methods-Test marketing positioning research. (28Hrs)

Module 5: Emerging trends in Marketing Research-Marketing research in the social media (facebook, my space, blogs)-Marketing research in the motion picture industry-Marketing research in the TV industry-In-store shopper marketing-Online brand perception research-Online targeted advertising - Applications of Marketing Research - Product research; Advertising research; Market and sales analysis; Marketing research in India; Ethical issues related to marketing research. (10Hrs)

Module 6: Marketing research writing -Interpretation and Report Writing: Interpretation, types of research reports, guidelines for writing a report-Purpose of Report-Classification of Report-Functions of Research Report- Principles of report writing-Fundamentals of good reports-writing a report format, evaluation of research report. (10Hrs)

References Books:

1. Marketing Research by RamanujMajumdar
2. Marketing Research byMishra
3. Marketing Research by MVKulkarni
4. Marketing Research by DMSarawte.
5. Research for Marketing Decisions by Paul Green, DonaldTull.
6. Marketing Research-RajendraNargundkar(TataMc)
7. Business research Methods-DonaldR.Cooper.
8. Marketresearch-G.C.Beri
9. Marketing Research-Aaker
10. Marketing Research -Tull& Hawkins
- 11.Marketing Research S L Gupta, ExcelBooks

SEMESTER III

Paper 4: CO 234M- MARKETING COMMUNICATION

Objective:

To familiarise the students with the basic concepts of Marketing communication, Advertising and Brand Management.

Module 1: Role of IMC in marketing process, IMC planning model, Marketing and promotion process model. Communication process, steps involved in developing IMC programme, Advertising Vs Marketing mix, Advertising appeal in various stages of PLC, Advertising Agency: Type of agencies, Services offered by various agencies, Criteria for selecting the agencies and evaluation (20Hrs)

Module 2: Media planning: Developing Media plan, Problems encountered, Media Evaluation-Print, Broadcast media, Support media in advertising, Media strategy: Creativity, Elements of creative strategies and its implementation, Importance of Headline and body copy. (20Hrs)

Module 3: Advertising objectives and Budgeting: Goal setting – DAGMAR approach, various budgeting methods, Monitoring, Evaluation and control: Measurement in advertising, various methods used for evaluation, Pre-testing, Post testing. (20 Hrs)

Module 4: Direct Marketing: Features, Functions, Growth, Advantages/Disadvantages, Direct Marketing Strategies. Promotion: Meaning, Importance, tools used, drawbacks, push pull strategies, Co-operative advertising, Integration with advertising and publicity Public relation/ Publicity:- Meaning, Objectives, tools of public relations, Public relation strategies, Goals of publicity, Corporate Advertising – Role, Types, Limitations, PR Vs Publicity. (20Hrs)

Module 5: Basics Understanding of Brands – Definitions - Branding Concepts – Functions of Brand - Significance of Brands – Different Types of Brands – Co branding –

Store brands. Brand image Building – Brand Loyalty programmes – Brand Promotion Methods – Role of Brand ambassadors, celebrities – On line Brand Promotions. (15Hrs)

Module 6: Measuring Brand Performance – Brand Equity Management - Global Branding strategies - Brand Audit – Brand Equity Measurement – Brand Leverage -Role of Brand Managers– Branding challenges & opportunities. (13 Hrs)

Reference:

1. Semenik Richard J, *Promotion & Integrated Marketing Communications*, Thomson
2. Kumar, S. Ramesh; *Marketing and Branding* –The Indian Scenario; Pearson Education; New Delhi.
3. Moorthy, Y.L.R.: *Brand Management*, Vikas Publication House, New Delhi. 2012
4. Aaker, David A: *Managing Brand Equity*, Free Press, New York
5. Kumar, S. Ramesh; *Marketing and Branding* –The Indian Scenario; Pearson Education; New Delhi.
6. S.A. Chunawalla, *Foundation of Advertisement Theory and Practices*, Himalaya Publishing House, Mumbai.
7. Belch, George E. and Belch, Michael A.; *Advertising and promotion*, Tata McGraw Hill, New Delhi

SEMESTER IV

Paper 1: CO 241Z- LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Objective: The objective of this course is to enable students to understand the importance and dynamics of a firm's physical distribution functions and management of its supply chain.

Module 1: Introduction to distribution logistics: Nature, importance and scope of logistic decisions; Systems approach to logistics; integrates logistics; Total cost concept; supply chain management- nature, importance and interface with logistics; Concept of customer service. (18Hrs)

Module 2: Transportation and physical Distribution: Importance and modes of transportation Selection of transportation modes; Multi modal transportation; Documentation and carrier liabilities. Inter – state good movement and problems; Transportation management. (15Hrs)

Module 3: Inventory control: Economic order quantity under conditions of certainty and uncertainty; Inventory requirements as function of number of stock locations; techniques of inventory control. (15Hrs)

Module 4: Warehousing: Role and modern concept of warehousing; private vs public warehousing; Planning warehousing operations; Site selection, warehouse layout. (20Hrs)

Module 5: Material handling: Management of receipts and issues; Computers and warehouse management. (20Hrs)

Module 6: Order Processing: Importance to customer service; Model of Performance measurement; Packaging and utilization. (20 Hrs)

References:

- 1.Bowersox and others, Physical Distribution Management, Tata McGraw Hill, New Delhi
- 2.Dobler D.W, Purchasing and Supply Management, Tata McGraw Hill, New Delhi

3. Glaskowsky N.A, Business Logistics, Dryden Press, Ohio
4. Khanna K.K, Physical Management, Himalaya Publishing House, New Delhi

SEMESTER IV

Paper 2: CO 242M- INDUSTRIAL MARKETING

Objectives:

1. To learn how general marketing concepts apply to industrial business contexts.
2. To impart knowledge in enabling the taught to critically analyze firm- specific industrial marketing issues.

Module 1. Nature of Industrial Marketing: Industrial marketing vs. consumer marketing- Relational approach to industrial marketing – The nature of industrial demand &Industrial customer (18Hrs)

Module 2. Type of Industrial Products: Major equipment, Accessory equipment, Raw and processed materials, Components parts and sub -assemblies, Operating supplies, Standardized and non- standardized parts, Industrial services (20Hrs)

Module 3. Organizational influences on buying behavior: Buying roles, The buy grid model, The organization buying decision process- Purchasing systems- Auctions- Documentation- Bids- Order – Placement- Follow up- Receipt and inspection (20 Hrs)

Module 4. Industrial Product Decisions: Industrial product life cycle – Industrial product mix determinants viz. Technology- Competition- Operating capacity- Shift in location of customers- Government controls – Changes in level of business activity (20 Hrs)

Module 5. Pricing of Industrial Products: Pricing objectives- Price decision analysis- Break Even Analysis- Net pricing- Discount pricing – Trade discount – Geographic pricing- Factory pricing- Freight allowance pricing- Terms of sale – Outright purchase- Hire purchase–Leasing (15Hrs)

Module 6. Promotion of Industrial Products- Supporting salesman- Motivating distributors – Stimulating primary demand- Sales appeal – Publicity & sponsorships –

Trade shows – Exhibits – Catalogs – Samples- Promotional letters – Promotional novelties
(15 Hrs)

Book recommended:

1. Anderson, Customer Relationship Management, Tata MaGrawHill.
2. Daragh O Reilly and Julian J Gibas, Bulding Buyer Relationships, Macmillian India Ltd.
3. Michael D Hutt and Speech T.V, Industrial Marketing Management, The DrydenPress.
4. Robert Dwyer F., Business Marketing, MaGrawHill.
5. Robert & Reeder, Edward G. Briety and Betty H. Reeder, Industrial Marketing: Analysis Planning and Control. Prentice Hall of IndiaLtd
6. Industrial Marketing – P KGhosh

SEMESTER IV

Paper 3: CO 243M- SERVICES MARKETING

Objectives

1. To understand the differences between services and physical goods and to understand how these differences translate into marketing.
2. To prepare students to be successful managers in this increasingly service-oriented economy.

Module 1: Marketing Services -Concept of services – importance - Goods & Services marketing - Growth of the service sector - Emergence & Reasons for the growth of service sector in India, - Product to Services, the Challenges - The Service Sector - Meaning and Types of Service - Why Services Marketing? - Classifying Services - Service economy and the nature of services – Service Marketing Implications - Service and Technology - Designing of the service, blueprinting, using technology developing, human resources, building service aspirations.

(10 Hrs)

Module 2 :The Services Marketing Mix- 7 P's of service marketing - *Product* - Product differentiation, product levels - *Pricing* of services- pricing concepts, pricing strategies for services - *Place*-Service distribution, components of service delivery system, potential management, problems associated with services delivery - *Promotion*- Challenge of Service communication - Service Advertising Strategies - *People*- Importance of people in service marketing, Role of various people involved - *Physical Evidence* -concept of Physical Evidence, types of Physical Evidence in various services - *Process*-concept, types of process.

(25 Hrs)

Module 3: Consumer Behaviour in Services - Customer Behavior in Service Settings – Consumer Choice - Consumer Experience – Post Experience Evaluation - Customer Expectations of Service - Importance of Customer Expectations - Factors that Influence Customer Expectations of Service – Issues Involving Customer Service Expectations - Ensuring high Customer Satisfaction – Understanding differences among Consumers - Internal marketing of Services – Customer Experience Management (CEM) - Customer

Satisfaction Measures - Demand Management in Services - Supply and Demand considerations in Services – Eservices Marketing. **(20Hrs)**

Module 4: Dimensions of Service Quality -Delivering Quality Service - Challenges of Measuring Service Quality - Employees role in Service Delivery - Service quality research and measurement- SERVQUAL - Quality standards, factors and solutions - Developing appropriate and effective communication about service quality - Service Product - Service Processes - Service Recovery – How Customers Respond to Service Failures - Recovery Expectations - Service Recovery Strategies – Service Recovery Process - Service Guarantees - The Customer Gap - The customer expectations versus perceived service gap - Closing the Gaps - Key factors and strategies for closing the gap - GAPS Model of Service Quality. **(25 Hrs)**

Module 5: Building Customer Relationships in Services- CRM issues in services – Relationship Marketing - Strategizing on HRM - Employee Role in Service Delivery - Service Culture - The Critical Importance of Service Employees - Boundary-Spanning Roles - Service delivery and Organization Culture and Climate - Focusing on the Customer - Relationship Development Strategies – Relationship Challenges.

(13 Hrs)

Module 6: Modern Trends in Services Marketing- *Live Project* based on marketing of services in Financial Services/Health Services/Hospitality Services including travel and tourism/Professional Services/Public Utility Services - Developing Sustainable Service Models. **(15Hrs)**

References Books:

1. Zeithaml V, Bitner M.J. & Gremler D.D. and Ajay Pandit (2012), *Services Marketing: Integrating customer focus across the firm*. Special Indian Edition, McGraw-Hill Education Pvt. Ltd., New Delhi.
2. Christopher Lovelock and Jochen Wirtz (2011) *Services Marketing: People, Technology, Strategy*, Seventh Edition, Pearson Publishing.

3. Schmitt, Bernd H. (2003) *Customer Experience Management: A Revolutionary Approach to Connecting with Your Customers*, Wiley, ISBN0471237744.
4. Ramneek Kapoor, Justin Paul and Biplab Halder (2011) *Service Marketing: Concepts & Practices*, Tata McGraw-Hill Education Private Ltd., New Delhi.
5. Philip Kotler and Paul N Bloom (1984) *Marketing Professional Services*, Prentice Hall, New Delhi.
6. Lovelock and Wright (2002) *Principles of Service Marketing and Management*, 2nd edition, Prentice Hall.
7. S.M. Jha (2003) *Services Marketing*, Himalaya Publishing House, New Delhi. ISBN. 9788170408307
8. Natarajan, L (2013) *Services Marketing*, Margham Publications, Chennai.
9. R. Srinivasan (2014) *Services Marketing: The Indian Context*, Prentice Hall India Learning Private Limited; Fourth edition, ISBN-10:8120350340.
10. Harsh V. Verma (2011) *Service Marketing: Text and Cases*, Second Edition, Pearson Education; ISBN-10:8131754472.
11. Rajendra Nargundkar (2010) *Services Marketing*, McGraw Hill Education (India) Private Limited; 3 edition, ISBN-10:0070682127.
12. Ravi Shankar (2002) *Services Marketing*, Excel Books, ISBN-10:8174462678.
13. K. Rama Mohana Rao (2011) *Services Marketing Paperback*, Pearson Education; Second edition, ISBN-10:8131732258.
14. Adhrian Payne (2009) *The Essence of Marketing*, Prentice Hall of India Pvt. Ltd., New Delhi. Further Reading
15. Grönroos, C. (2006) Adopting a service logic for marketing. *Marketing Theory*, Vol. 6, No. 4, 317-333.
16. Grönroos, C. (1984) A service quality model and its marketing implications. *European Journal of Marketing*, Vol. 18, No. 4, 36-44.
17. Parasuraman A., Zeithaml, V. A. & A. Malhotra (2005) E-S-QUAL a multiple scale for assessing electronic service quality, *Journal of Service Research*, Vol. 7, No. 3, 213-233.

SEMESTER IV

Paper 4: CO 244S- MANAGEMENT OPTIMIZATION TECHNIQUES

Objectives:

1. To convey basic principles and application of optimization tools of resource utilization.
2. To provide an insight into optimal project implementation Techniques under deterministic and probabilistic conditions.

Module1: Optimization Techniques: Introduction-Definition-Nature and Importance-Steps in Intelligent decisionmaking- Modelling Techniques **(8 Hrs)**

Module 2: Linear Programming: Introduction-Formulation of LPP-Maximize, Minimize, objective function-Constraints and non-negativity conditions-Graphical solution-Optimal solution-Infeasible and unbounded solutions-degeneracy-Simplex method-slack, surplus and artificial variables-Duality-Primal and dual problems **(22 Hrs)**

Module 3: Transportation and Assignment Problems: Transportation Problems-Initial basic feasible solution using North West Corner Rule, Lowest Cost Entry Method and Vogel Approximation Method-Optimal solution-MODI method- Degeneracy, Unbalanced and Maximization in Transportation Problems. Assignment Problems-Hungarian Method-Maximization, Unbalanced and Restricted Assignment Problems-Travelling Salesman Problems. **(23Hrs)**

Module 4: Game Theory: Game Theory- Pay off matrix- Maxim in and Minimax – Saddle point-Solution of pure and Mixed strategy games- Graphic Method-Principle of dominance-Arithmetic Method. **(15 Hrs)**

Module 5: Optimization Techniques: Replacement Theory- Replacement of Capital Items and items that fail completely- Individual and Group replacement policy. Queuing Theory-Models (simple problems); Inventory models-computation ; Simulation-MONTE CARLO Method and Random Numbers. **(15 Hrs)**

Module 6: Project Scheduling and Monitoring: Network Analysis-Critical Path Method-Scheduling and Control of Projects-Free, Independent and Total Float(slack)-PERT-time estimates and Probability of completion-cost/time trade off analysis-Crashing of projects and resource considerations **(25 Hrs)**

References:

1. J K Sharma – operation Research – Theory and Practice –McMillian.
2. John M. Nicholas, Project Management for business and Technology – Problems andpractice.
3. Harvey M Wagner - “Principle of Operation Research, PH Learning Pvt.Ltd.
4. Management operations Research – Satya Narayanan, LalithaRaman.
5. Operations Research Hamdy ATaha
6. Operation Research – V.K.Kapoor.
7. Operation Research – S.D.Sharma.

Elective – BANKING & INSURANCE

SEMESTER III

Paper 1: CO 231U -INCOME TAX PLANNING AND MANAGEMENT

Objectives:

1. To impart deep knowledge about the latest provisions of Income Tax Act
2. To develop application and analytical skill of the provisions of Income Tax Law for Income Tax planning and Management.

Module 1: Overview of Income Tax law-Computation of Tax an Overview -Individual, Company ,Firm –Accounting Standards relating to Tax- Tax Information Services

(10 Hrs)

Module 2: Tax planning and Management:- Meaning - Tax planning, Tax Evasion, Tax avoidance, Tax management – Differences- Nature and Scope of Tax Planning- Precautions in Tax Planning- Need for Tax Planning-Limitations- Tax Audit- Tax Planning in relation to Heads of Income -Concept of TDS/TCS -Advance payment- Computation- -Rebate 87A,88 – Relief u/s 89 , 90,91.Black Money Act 2005- Introduction-Features- Highlights-Importance.

(15Hrs)

Module 3: Tax Planning And Management For Individuals:- Tax Incidence on Individuals- Significance-Taxable Income- hints for Tax Planning and Management- Impact of Tax on Financial Decisions-Alternative Minimum Tax (AMT)- Tax Planning For Employer and Employee-Documentation and Filing of Return- E-Filing- Tax Credit- TRACES- Refund-Appeal-Tax Return Preparators (TRP)- Procedures and rules- Settlement commission-Advance Ruling

(16Hrs)

Module 4:Tax Planning For Firm, Association of Person and Body of Individuals:-

Tax incidence on Firm/AOP/BOI- Impact of Tax liability on Firm –Significance of Tax

Planning- LLP-Sec: 184 & 185- Inter-transaction between partners and Firm – impact of Tax on Change in Constitution of Firm- Conversion Of Firm in to Company – Conditions Of 40(b) – Carry forward and Set off in case of Change in Constitution of Firm – Filing of Return-Appeal- Refund- Hints for Tax planning for Firm, AOP and BOI. (22 Hrs)

Module 5: Tax Planning and Management for Company:- Types of Companies- Domestic and Foreign- Tax incidence on Companies- Impact of Income Tax on Corporate Decisions – Tax Planning and Management in Corporate Decisions – MAT Provisions- Computation-Application of IT in Tax Planning –Tax Planning For New Business- Tax Planning on Venture capital Companies – Tax Planning on Financial and Investment decisions – Capital structure-Dividend and Deemed Dividend- Dividend Distribution Tax- Bonus Shares- Make or buy – own or Lease – Repair or Replace- Employee Remuneration – Setting up of new business – Location Aspects – Amalgamation or Demerger – Filing of Return – E-Filing- Refund- Appeal- Methods and procedures – Annual Return for TDS and TCS – Hints for Tax Planning and Management.

(25 Hrs)

Module 6: International Taxation- Basic Concepts – Double Taxation Relief – Computation – DTAA – GAAR – Advance Ruling- Transfer pricing – transfer Pricing Law in India- Concepts of Arms length price – advance Pricing Agreement- Taxation of E-Commerce Transaction –Filing of Return- International Settlement Commission – Methods and Procedures.

(20Hrs)

NB: i) Some case studies involving the learning

ii) Necessary inputs from B.Com Programme

References:

Books

1. Singhanian. V.K: Direct Tax planning and Management, Taxman,N.Delhi.
2. Singhanian.V.K: Direct Taxes Laws and Practices,Taxman, N.Delhi
3. E.A.Srinivas: Corporate Tax Planning;Tata Mc-GrawHill
4. Mehrithra HC: Direct Tax Planning
5. Kushal Kumar Agrawal: Direct Tax Planning and Management; Atlantic Publishers
6. Bhagavath Prasad: Direct Tax Law andPractice
7. LakhotiaR.N: Corporate TaxPlanning
8. CA G.Sekar: professional guide to TaxAudit

Journals and Circulars

1. Chartered Accountant Today- Tax man for CurrentReading
2. Circulars issued byCBDT
3. Journal CharteredAccountant
4. Black Money Act 2005 (Bare Act-mainprovisions)

SEMESTER III

Paper 2: CO 232B- MODERN BANKING

Objectives

1. To understand the relevance of banking in the present scenario
2. To impart practical knowledge about modern banking

Module 1: Modern Banking- Concepts- New Trends in banking- cashless economy – Small banks and payment banks – Mudra banks --Criteria for licensing --Outsourcing of Non-core Services– Financial Inclusion –Bank Mergers and Acquisitions – new reforms in banking sector

(15 Hrs)

Module 2: Corporate Banking : Meaning and importance-various services provided-Cash Management- Debt Management, Factoring and Forfeiting- Trusteeship-Custodial services--Business advisory, Off shore services---Trade services - Corporate Deposits - Importance of Institutional deposits and retail deposits.

(20Hrs)

Module 3: Retail Banking- Introduction - Applicability of retailing concepts - Distinction between Retail Banking and Corporate / Wholesale Banking -Retail Products—Overview- Customer requirements- Products development process - Approval process for retail loans-Credit scoring--Important Asset Products – innovative banking product sand services.

(15Hrs)

Module 4:Credit Management in Banks –Loan Policy – Compliance with RBI guidelines – Credit Appraisal and Credit Decision Making – Monitoring and Review of Loan Portfolio –NPAs – Dealing with credit defaults, Stressed assets, Debt Restructuring– SARFAESI Act, 2002--Appraisal methodology for different type of clients/products

(18Hrs)

Module 5: Risk Management in Banks - Credit Risk Management - Introduction – Basel norms(I,II and III) - Frame work for risk management - RBI guidelines on risk management - Risk rating and risk pricing - Methods for estimating capital requirements

- Credit risk - standardized approach & advanced approach - Credit rating / credit scoring and rating system design - Credit Bureaus - Stress test and sensitivity analysis - Internal Capital Adequacy Assessment Process (ICAAP) **(25 Hrs)**

Module 6: Bank Marketing Management – Marketing of Banking Services – Marketing Mix for Banking Services – Developing Marketing Strategies and plans – Marketing Budget – Organisation of Marketing Functions in Banks. **(15Hrs)**

References

1. Gerald Hatler, Bank Investments and Funds Management, Macmillan
2. Stigum, Managing Bank Assets and Liabilities, Dow-Jones Irwin.
3. Dudley Lockett, Money and Banking, McGrawHill.
4. Vasant Joshi, Vinay Joshi, Managing Indian Banks- Challenges Ahead”, Response Books.
5. Vasant Desai, Banks and institutional management, Himalaya Publishing House.
6. Principles of Banking, Indian Institute of Banking and Finance, Macmillan.

Journals

- 1) The Indian Banker, Published by: Indian Banks Association
- 2) Bank Quest, Published by: Indian Institute of Banking and Finance

SEMESTER III

Paper 3: CO 233B- INSURANCE LAW AND PRACTICE

Objectives:

1. To give a comprehensive understanding on the general principles and concepts of insurance, insurance practices and procedures
2. To create awareness among students on the legal framework of insurance

Module 1: Introduction-Insurance – Meaning, definition, nature, need and significance of insurance, history and evolution of Insurance –Mechanism of Insurance - Principles of Insurance- Insurance as a social security tool, investment avenue, risk management technique – Insurance and tax planning- Role of insurance in business and economic development – Re insurance-Double Insurance. (15 Hrs)

Module 2: Legal Principles in Insurance-Insurance contract – meaning, features, factors affecting the contract, essentials of valid insurance contract, types of insurance contract, defective contracts. Fundamentals of agency laws – definition of an agent, agents regulation, Insurance and intermediaries, agents compensation, procedure of becoming an agent. Agency licenses – pre-requisites for obtaining license, license duration, cancellation, termination. - Code of conduct, unfair practices. - Functions of an agent- Agent as a practitioner- Policy valuation and claim settlement (Case Studies) (22 Hrs)

Module 3: Classification of insurance policies-Meaning, features, significance, elements of protection and investment, service providers for various policies - General Insurance - Personal Insurance (Medical, Accidental, Property, Vehicle), Rural Insurance, Farm Insurance, Industrial Insurance, Commercial Insurance - Life Insurance Whole Life Plan, Endowment, Money Back, Term plan, ULIP- Others insurance policies -Home insurance, Travel insurance, Health Insurance etc (20 Hrs)

Module 4: Insurance Companies in India-Life Insurance Corporation of India – Capital structure, organization, performance and progress – Growth and development of General Insurance Corporation of India - Privatization of Insurance in India – participants, their progress and implications on Indian economy, Impact of globalisation on Insurance sector - Recent trends - FDI in insurance sector- Foreign Participants in India and their current status in Indian Insurance Industry **(16Hrs)**

Module 5: Development of Insurance products- Core functions of an insurance company - Product Development- Customer Servicing- Marketing and Promotion - Insurance Sales – Underwriting- Policy Administration- Claims- Reinsurance-Actuarial Support- Accounting and Investment- Training and Development.- Changing face of Indian Insurance Industry – Bancassurance, technology enabled insurance, micro insurance, social insurance, etc - Challenges faced by the insurance industry in this globalised era **(15Hrs)**

Module 6: Insurance legislative framework in India- History of legislations in India- Major acts and amendments - main features of Insurance Act 1938, L.I.C. Act 1956 - General Insurance Business (Nationalisation) Act, 1972 (amended in 2002), - Insurance Regulatory and Development Authority Act 1999- Duties, Powers and functions of IRDA, Micro insurance Regulations’ Act,2005 - The Insurance Laws (Amendment) Act, 2015 - Other legislations governing insurance business in India **(20Hrs)**

References

1. Das, Subhash Chandra , “The Financial System in India: Markets, Instruments, Institutions, Services And Regulations”, PHI Learning Pvt. Ltd.,2015
2. Sukhvinder Singh Dari, “Impact of Privatization Policy and FDI on Life Insurance Corporation Vis-à-vis Insurance Regulatory Authority of India”, Track2Publications,2014
3. Uma Narang,”Insurance Industry in India: Features, Reforms and Outlook”, New CenturyPublications,2013

4. L. M. Bhole and Jitendra Mahakud, "Financial Institutions & Markets" 5th Edition, Tata McGraw-Hill Education, New Delhi, 2009
5. Neelam C. Gulati, "Principles Of Insurance Management: A Special Focus On Developments In Indian Insurance Sector Pre And Post Liberalisation" Excel Books India, 2009
6. Karam Pal, B.S. Bodla and M.C. Garg, "Insurance Management : Principles and Practices" Deep and Deep Publications, 2007
7. Tyagi C.L and Madhu Tyagi, "Insurance- Law and Practice", Atlantic Publishers & Distributors, New Delhi, 2007
8. Nalini Prava Tripathy, Prabir Pal, "Insurance: Theory And Practice", PHI Learning Pvt. Ltd., 2005
9. B. S. Bodla, M.C. Garg and K.P. Singh, "Insurance : Fundamentals, Environment and Procedures" Deep and Deep Publications, 2004
10. Dr. P S Palande, R S Shah, M L Lunawat, "Insurance in India: Changing Policies and Emerging Opportunities", SAGE Publications India, 2003
11. Ms. M. V. Bakshi & Dr. K. C. Mishra, "Insurance Business Environment and Insurance Company Operations"
12. Ms. M. V. Bakshi & Dr. K. C. Mishra, "Legal & Regulatory Aspects of Insurance".
13. [Peter Zweifel](#) (Author), [Roland Eisen](#) "Insurance Economics"
14. <https://www.irda.gov.in>,
<http://www.policyholder.gov.in/>, <http://www.newindia.co.in/>

Journals –

15. IRDA Journal, "The Journal" by Insurance Institute of India
16. Journal of Insurance and Risk Management by Birla Institute of Management and Technology
17. The [Journal of Risk and Insurance](#), edited by [Keith J. Crocker](#), served online at Wiley Online Library

SEMESTER III

Paper 4: CO 234Y- FOREX MANAGEMENT

Objective: The purpose of this course is to give the students an exposure to the way foreign Exchange Market operates, to understand the principles of Currency valuation, techniques that can be used to hedge foreign exchange risk and to create an understanding on foreign exchange Management in India.

Module 1: Foreign Exchange, concepts, significance of foreign exchange- Forex Reserves - Exchange rates- inter banks and Merchant rates- spot and forward rates-TT rates-computations-Forex Markets—derivates in the Forex markets- Futures, Swaps, Options and Arbitrage- Forex dealers and Speculators Organisations of the Forex market.

(15 Hrs)

Module 2: Exchange rate fixation- Purchasing Power Parity Theory- Interest Rate Parity Theory- Flow Model- Asset market models-forecasting of exchange rates- Nominal Effective Exchange Rates and real Effective Exchange rates- Hedging against Exchange rate fluctuations.

(15Hrs)

Module 3: Forward Exchange Contracts-relevance-types- forward exchange rate computation – factors influencing Forward Rates- extension and cancellation of forward contracts-Futures-features vs Forward contracts-Options- types and Mechanisms-risk Management through forward contracts.

(20 Hrs)

Module 4: Forex Risk management – transaction risk exposure risks- internal strategies- shifting of risk- sharing of risk- exposure netting and offsetting- External strategies – money market Hedge- currency swaps- interest rate swaps- Economic consequences of exchange rate changes- Managing Risk .

(20 Hrs)

Module 5: Forex Management in India- Fixed and fluctuating rates-rupee convertibility- Nostro- Vostro- Loro Accounts- Exchange control Measures- relevance. Foreign Exchange reserves of India- composition and Management- monetary and Fiscal policy and its impact on foreign exchange reserves in India. (20Hrs)

Module 6: Foreign investment Management: FDI - National FDI policy - Liberalization. Economic determination - impact of globalization. Foreign portfolio investments with special reference to developing countries. (18 Hrs)

References

1. Alan C Shapiro, Multi National Financial Management,
2. Clare C Gump, ABC of Foreign Exchange
3. Krishnamoorthy S, Guide to Foreign Exchange Regulations
4. Chatterjee A K, Principles of Foreign Exchange
5. Rajwadi, Foreign Exchange Management
6. Keith Red Head, Financial Derivatives
7. V V Keshkamat , Foreign Exchange Arithmetic, – Vivek Publications ,Mumbai
8. C Jeevandam, Foreign Exchange Arithmetic and Risk Management, – Sulthanchand & Sons.
9. B K Chaudhuri, Finance of Foreign Trade and Foreign Exchange– Himalaya Publishing House

SEMESTER IV

Paper 1: CO 241W- GOODS AND SERVICE TAX & CUSTOMS

DUTY- LAW AND PRACTICE

Objectives:

1. To gain expert knowledge of the principles and law relating to Goods and Service Tax and Customs Act.
2. To impart skill in applying and analysing the provisions of Goods and Service Tax Act and Customs Act in handling practical situations.

Module 1: Introduction: Meaning and Definition of Indirect Taxes-Nature-Scope-Constitutional provisions-Advantages-Disadvantages-Difference between Direct and Indirect Taxes- Types-Milestones in the history of Indirect Taxation in India. **(10 Hrs)**

Module 2: Basic Provisions of GST: Introduction-Meaning-Features-Historical backdrop of Goods and Service Tax-Major Indirect Taxes merged in to Goods and Service Tax-Benefits of GST-Economy, Industry and trade, tax payers-Types of GST-CGST-IGST-SGST- UTGST Schedules-Rate of GST- Kerala GST Provisions. **(20 Hrs)**

Module 3: Main Provisions of GST - Main Provisions: Provisions r- Compensation(GST)Law-Definitions of important terms-Levy of Tax-Collection-elating to Place, Time and Value of Supply-Different meaning of supply- Composite Supply- Mixed supply- Scope of Supply- Taxable Supply- E-Commerce-Supply Chain –GST Exemption limit- Tax Invoice-Credit and Debit Notes-Valuation Rules-Computation Tax- Input tax Credit(ITC)-Registration-procedures-Deemed Registration-Cancellation of Registration- Accounts and Records- Period of Retention of Records- Presumption as to Documents>Returns- Annual-Final-Payment of Tax-Information Technology in GST- Audit- Special Audit-Assessment-Refund-Consumer welfare Fund-GST Practioners-TDS/TCS. **(23Hrs)**

Module 4: Administration of GST:- GST- Council-Authorities-Inspection-search seizure-Arrest-Demand-Recovery—Liability to pay tax in certain cases- -Advance Ruling-Authority and Appellate Authority-GSTN-Information infrastructure for GST. (15 Hrs)

Module 5: Appeals And Revisions under GST.: Appeals-Appeal to High Court-Appeal to Supreme Court- Revisions-Offences- Compounding of Offences-Penalty-Transitional provisions-IGST Provisions- Inter-state Supply- Intra-state supply- Zero rated Supply- Imported Supply- Transfer of ITC-Compensation Rules- Base year Revenue-Projected Revenue-Miscellaneous provisions-Interest-Job Work Procedure-Deemed Export.(20 Hrs)

Module 6: Customs Duty: Definition of Customs Duty- Objectives Role of customs duty in International trade--Importance-Demerits-Important definitions-Basis of determining customs Duty- Types of Duties-Anti-dumping Duties-Import and Export manifest—Specified Goods- Stores-Warehouses-Export Policy-Customs Duty Authorities and Powers Assessment Procedures--Penalties and Prosecutions-Appeals and Revisions-Tax liability and Valuation of Goods-Baggage Rules-Import Procedure and Documents-Export Procedure and Documents. (20 Hrs)

Input—Basic Awareness from B.Com and First Semester M.Com

References:

1. Hand Book of GST in India Concepts and Procedures(2017Edition) -Rakesh Garg &Sandeep Garg - Bloomsbury IndiaPublications
2. GST in India-Rakesh Garg &Sandeep Garg, Bloomsbury IndiaPublications
3. All About GST-V.S Datey-Taxman Publications.
4. GST Law, Concept & Impact Analysis-Dr. SanjivAgarwal
5. GST Law & Analysis with Conceptual Procedure-Bimal Jain & Isha Bensal-YoungGlobal
6. An Insight of GST in India-ICWAI, Vol:1&2
7. Indirect Taxes-Dr.H.CMehrotra & Prof. Agarwal, Sahitya Bhavan Publishers, Agra.
8. Indirect Taxes-V.S Datey, Taxman Publications NewDelhi.
9. Indirect Taxes –Dr.V.Balachandran, Sultan Chand and Sons,NewDelhi.
10. GST Bare Acts, Rules, Notifications &Circulars

SEMESTER IV

Paper 2: CO 242B- INVESTMENT BANKING AND FINANCIAL SERVICES

Objectives:

1. To expose students to the world of investment banking.
2. To provide an introduction and general understanding to students about some of the other financial services

Module 1: Fundamentals of Investment Banking- Concept of Financial Services- Importance-Fund and Fee based services. **Investment Banking**-Concept - History and emergence of Investment Banking-Functions performed by Investment banks-Types of players in Investment banking-Difference between commercial banking, merchant banking and investment banking-Investment Banking in India.

(15 Hrs)

Module 2: Business of Investment Bankers-Business of raising funds through issue of equity and debt/Fixed income instruments including international funding and rating. Business of trading. Business of mergers and acquisitions-the buy and the sell side-conflicts of interest-the trusted advisors role. Business of creating value through corporate restructuring-Wealth management business.

(25Hrs)

Module 3: Ethics and Regulation - Need for ethics in the investment industry- Association of Investment Bankers of India (AIBI)- AIBI's Code of Conduct for Merchant Bankers. **Regulations**- Objectives of regulations- Potential consequences of regulatory failure-Regulatory framework for investment banking in India-SEBI (Investment Advisors) Regulations 2013.

(14Hrs)

Module 4 :Venture capital, Housing Finance and Securitisation of debt-Venture capital-Theoretical framework-Indian Venture Capital Scenario. SEBI Regulations. **Housing Finance**-Concept-Role of housing and housing finance in the economy-Evolution of housing and housing finance in India. **Securitisation of debt**-Concept-Players-Operational mechanism-Securitisation in India. (25Hrs)

Module 5:Other fund based financial services-Leasing-Concept and classification-Financial evaluation of leasing from lessee's and lessor's perspective-Leasing in India-Mortgage, hypothecation, pledge, lien – Difference between pledge and lien, pledge and bailment, pledge and hypothecation, mortgage and hypothecation, mortgage and pledge.

(15 Hrs)

Module 6: Fee Based Financial Services-Depository Services-Concept-Depository System in India. **Stock Broking**- Concept-Stock brokers, Sub brokers & foreign brokers in India -Stock market trading in India - Derivatives trading in India. **Credit Rating**-Concept-Rating process and methodology-Credit rating in India-SEBI Regulations-Credit Rating Agenciesin India. (14Hrs)

Practical: Students should at least study 4 to 5 cases in the above mentioned areas and make a presentation in class

References

1. AIBI's Due Diligence Handbook
2. AIBI's Code of Conduct for Merchant Bankers
3. Alex K Mathews & K Sasidharan, Financial Services and Systems, McGraw Hill Education.
4. Barathi V Pathak, Indian Financial System, Pearson Education India.
5. Castillo, Jerilyn J and McAniff, Peter J, Practitioners Guide to Investment banking, Circinus Business Press.
6. I.M. Pandey, Financial Management, Vikas Publishing House Ltd.
7. James C Van Horne & John Martin Wachowicz, Fundamentals of Financial Management, Financial Times prentice Hall.
8. M Y Khan, Financial Services, Tata McGraw Hill Education
9. Prathap Giri S, Investment Banking-Concept, Analysis and Cases, Tata McGraw Hill.
10. Punithavathy Pandiyan, Financial Services and Markets, Vikas Publishing House Ltd.
11. Rakesh Ranjan, Investment Banking, Wiley Publication.
12. S Guruswamy, Merchant Banking and Financial Services, McGraw Hill Education (India) Private Limited.
13. SEBI guidelines and latest amendments in the above segments
14. V.A. Avadhani, Marketing of Financial Services, Himalaya Publishing House

SEMESTER IV

Paper 3: CO 243B- PRINCIPLES AND PRACTICES OF ACTUARIAL SCIENCE

Objectives:

1. To familiarise students with actuarial valuation and its principles.
2. To familiarise the students with the practical side of actuarial valuation

Module 1: Introduction: The Actuarial Science – Theory And Application – Credibility

–Characteristics of Actuarial Science–Actuarial Education –Actuarial Research –
Emerging Risk – Insurance Risk – Rate Making – Pricing – Credibility – Reserving
(15 Hrs)

Module 2: Risk Theory: Meaning of Risk –Different Types of Risk – Risk Theory –
Risk Management – Risk Control – Risk Financing – Risk Financing Option for An
Insurer – Risk Retention –Computation of Risk value (15Hrs)

Module 3: Mortality tables - Probabilities of Survival and Death - Computation of
mortality rates - Preparation of mortality tables - Mortality tables for insurance and for
annuities - Valuation of Life Insurance Risks and Principles underlying - Determination
of Life Reserves: Meaning, Methods of calculation of Life Reserve: Terminal, initial and
mean reserves - Actuarial Analysis of pension plans. (25Hrs)

Module 4: Reinsurance: Basis of reinsurance – forms of reinsurance – the cost of
reinsurance to the cedant – the reinsurer's margin – reinsurance pricing method –
formula- process of reinsurance pricing – facultative certificates – property certificates–
casualty certificates – the role of actuary (25Hrs)

Module 5: Valuation of Insurance companies- Valuing an insurance company –
operating an insurance company – regulating an insurance company. (15Hrs)

Module 6: Cases on insurance company valuation. (13Hrs)

References:

1. Hossack, LB: J.H. Pollard and B. Zehnawirth, Introductory Statistics with Applications in General Insurance, Cambridge University Press; Cambridge, England.
2. Babbel, David F. and Graig B. Merrill, Valuation of Interest, Sensitive Financial Instruments, Society of Actuaries, Maringale.
3. Whatsham: Futures & Options in Risk Management, Thomson
4. Morgan, J.P.: Introduction to Credit Metrics, J.P. Morgan, New York.
5. Bell, David E. and Authur Shleifer Jr.: Risk Management.
6. Course material and books published by "Insurance Institute of India", Mumbai.

SEMESTER IV

Paper 4: CO 244S- MANAGEMENT OPTIMIZATION TECHNIQUES

Objectives:

1. To convey basic principles and application of optimization tools of resource utilization.
2. To provide an insight into optimal project implementation Techniques under deterministic and probabilistic conditions.

Module1: Optimization Techniques: Introduction-Definition-Nature and Importance-Steps in Intelligent decision making- Modelling Techniques **(8Hrs)**

Module 2: Linear Programming: Introduction-Formulation of LPP-Maximize, Minimize, objective function-Constraints and non-negativity conditions-Graphical solution-Optimal solution-Infeasible and unbounded solutions-degeneracy-Simplex method-slack, surplus and artificial variables-Duality-Primal and dual problems (**22 Hrs**)

Module 3: Transportation and Assignment Problems: Transportation Problems-Initial basic feasible solution using North West Corner Rule, Lowest Cost Entry Method and Vogel Approximation Method-Optimal solution-MODI method- Degeneracy, Unbalanced and Maximization in Transportation Problems. Assignment Problems-Hungarian Method-Maximization, Unbalanced and Restricted Assignment Problems-Travelling Salesman Problems. **(23 Hrs)**

Module 4: Game Theory: Game Theory- Pay off matrix- Maxim in and Minimax – Saddle point-Solution of pure and Mixed strategy games- Graphic Method-Principle of dominance-Arithmetic Method. **(15 Hrs)**

Module 5: Optimization Techniques: Replacement Theory- Replacement of Capital Items and items that fail completely- Individual and Group replacement policy. Queuing Theory-Models (simple problems); Inventory models-computation; Simulation-MONTE CARLO Method and Random Numbers. **(15 Hrs)**

Module 6: Project Scheduling and Monitoring: Network Analysis-Critical Path Method-Scheduling and Control of Projects-Free, Independent and Total Float(slack)-PERT-time estimates and Probability of completion-cost/time trade off analysis-Crashing of projects and resource considerations **(25 Hrs)**

References:

1. J K Sharma – operation Research – Theory and Practice – MacMillian.
2. John M. Nicholas, Project Management for business and Technology – Problems and practice.
3. Harvey M Wagner - “Principle of Operation Research, PH Learning Pvt.Ltd.
4. Management operations Research – Satya Narayanan, LalithaRaman.
5. Operations Research Hamdy ATaha
6. Operation Research – V.K.Kapoor.
7. Operation Research – S.D.Sharma.

GUIDELINES FOR PROJECT FOR M.COM

Project work to commence at the beginning of the third semester

Every student shall work on a project related to Commerce and more closely associated to the area of specialization.

Project Report to be submitted at the end of the last semester. There could be linkage between the summer internship and the topic of the project.

Project work should be done under the supervision and guidance of regular faculty.

Students who submit a project shall justify the following:

- ☐ Relevance of the study
- ☐ Problem identified
- ☐ Objectives and the Methodology
- ☐ Outcome envisaged and the possible application of the same.

Identifying a topic which is live from the environment/industry is possible through establishing linkages with industry/ policy making bodies.

Two copies of the project report in English (Printed or typed in A4 size paper) should be submitted by the student at the end of the last semester

Structure of the Report

Title Page

- ☐ Certificate from the guide
- ☐ Name of the Student, Name and Designation of the supervisingTeacher
- ☐ Acknowledgements
- ☐ Contents
- ☐ Executive Summary
- ☐ Chapter I:Introduction

1. Research problem
 2. Objectives of the study,(ONE primary objective associated with the statement of the problem and other secondary objectives)
 3. Methodology (stating the variables associated with the objectives) and the hypotheses emerging from research problem and objectives framed , sample design and technique
- ☐ Chapter II Review of Literature
 - ☐ Chapter III and IV: Data Analysis and interpretation
 - ☐ Chapter V: Summary findings Recommendations
 - ☐ Appendix (Questionnaire, Specimen copies of forms, other exhibits etc;)
 - ☐ Bibliography

Project Evaluation

Dissertation /Project Report to be submitted at the end of the last semester. The project report shall be subject to internal and external evaluation followed by a Viva-voce.

Internal Evaluation is to be done by the supervising teacher and external evaluation is to be done by an examiner appointed by the University along with the Head of the Department or his nominee.

The maximum marks shall be 100 -project assessment 75% viva voce 25% . Viva Voce shall be conducted along with the comprehensive viva-voce.

A viva voce related to the project work will be conducted by the external evaluation Board and students have to attend the viva voce.

Project assessment marks are to be awarded to the students combining the internal and external evaluation, taking the average.

Total Marks for the Project is 100 in two components A - Project assessment -75 and B Viva Voce- 25

Project assessment valuation would have the e following break up :

Relevance of the study-10

Problem identification -10

Methodology- sampling data analysis tools variables and hypotheses-30

Findings-10

Reporting-5

Linkage in the study-5

Outcome achieved -5

The student should get a minimum of 30 in project report.

If the student fails to get a minimum in project report, he or she shall submit the project report after modifying it on the basis of the recommendations of the examiners.

Industrial Visit cum Study Tour

Study tour to be mandatory for the M.Com Programme. It should cover an organization where functional applications of concepts/ theories covered in the Programme are being practised. The visit should be pre- planned with an objective to learn identified applications. The learning could be in

- ☐ Accounting processes (Computerized, Digitalize operations)
- ☐ Capital Market Operations
- ☐ Auditing Practices
- ☐ Integrated Financial Services
- ☐ Payroll Management
- ☐ Production/ Marketing/ Distribution/ Logistic Management

The total time to be devoted in the organization is one day out of five days set aside for the tour.

The outcome of the visit to be documented in a report with the following format

Student Tour Dairy

1. Name of the College
2. Name of the Student
3. M.Com Programme.....Semester
4. Name of the Oragnisation
5. Date of Visit
6. Learning Objectives
 - To Observe applications of
.....
.....
 - To Understand processes
.....
.....
7. Interaction sheld
.....
.....
8. Outcome in the form of learnings
.....
.....
9. Observations (along with pictures, citations, illustrations)

Counter Signed by HoD

UNIVERSITY OF KERALA

Scheme and Regulations for M. Com under Semester pattern in Affiliated Colleges

1. Scope

1.1 These regulations shall come into effect from 2018 admissions onwards

2. Eligibility for admission

2.1 Eligibility for admission and reservation of seats for various Post Graduate programmes shall be according to the rules framed by the University from time to time

3. Duration

3.1 The normal duration of a P.G Degree Programme shall be four semesters. No student shall be permitted to complete the programme by attending more than 8 continuous semesters.

3.2 The duration of each semester shall be five months inclusive of examinations. There shall be at least 90 instructional days in a semester and a minimum of 450 hours of instructions in a semester.

4. M .Com Scheme and Syllabus (to be implemented from 2018-19)

SEMESTER I				Marks	
Code	Paper	Subject	CA	ESA	Total
CO211	Paper1	Business Ethics and Corporate Governance	25	75	100
CO212	Paper2	Legal Framework for Business	25	75	100
CO213	Paper3	Research Methodology	25	75	100
CO214	Paper4	Planning and Development Administration	25	75	100
CO215	Paper5	Advanced Corporate Accounting and Reporting	25	75	100
Total			125	375	500

SEMESTER II			Marks		
Code	Paper	Subject	CA	ESA	Total
CO221	Paper1	E -Business and Cyber Laws	25	75	100
CO222	Paper2	Strategic Management	25	75	100
		Quantitative Techniques			
CO223	Paper3	and Financial Econometrics	25	75	100
CO224	Paper4	International Business	25	75	100
CO225	Paper5	Investment Management	25	75	100
Total			125	375	500
Summer Internship					

Elective - FINANCE

SEMESTER III			Marks		
Code	Paper	Subject	CA	ESA	Total
CO231U	Paper1	Income tax Planning and Management	25	75	100
CO232F	Paper2	Security Analysis and Portfolio Management	25	75	100
CO233F	Paper3	International Financial Management	25	75	100
CO234F	Paper4	Strategic Cost and Management Accounting	25	75	100
Total			100	300	400

SEMESTERIV**Marks**

Code	Paper	Subject	CA	ESA	Total
CO241W	Paper1	Goods and Service tax & Customs Duty-Law and Practice	25	75	100
CO 242F	Paper 2	Risk Management and Derivatives	25	75	100
CO 243F	Paper 3	Accounting Standards	25	75	100
CO244S	Paper4	Management Optimization Techniques	25	75	100
Total			100	300	400
Project Report					100
Comprehensive Viva					100
Grand Total					2000

Elective - INFORMATION TECHNOLOGY & E-BUSINESS**SEMESTERIII****Marks**

Code	Paper	Subject	CA	ESA		Total
				Written	Practical	
CO 231 E	Paper 1	Office Automation	25	50	25	100
CO 232 E	Paper 2	Internet and Web Designing	25	50	25	100
CO 233 R	Paper 3	Management of Intellectual Property Rights	25	75	-	100
CO 234 E	Paper 4	Legal Frame work for Information Technology Based Business	25	75	-	100
Total			100	300		400

SEMESTER IV

Code	Paper	Subject	CA	Marks		Total
				ESA		
				Written	Practical	
CO241 E	Paper1	Database Management and Information Technology	25	50	25	100
CO 242 E	Paper 2	E -Banking and Business Models	25	75	-	100
CO 243 E	Paper 3	E- Commerce and Global Marketing	25	75	-	100
CO 244 S	Paper 4	Management Optimization Techniques	25	75	-	100
		Total	100	300		400
		Project Report				100
		Comprehensive Viva				100
		Grand Total				2000

Elective - INTERNATIONAL TRADE**SEMESTER III**

Code	Paper	Subject	CA	Marks		Total
				ESA		
CO 231 T	Paper1	Foreign Language (Any one paper) CO 231.1 T Foreign Language : Arabic				
		CO 231.2 T Foreign Language: French	25	75		100
		CO231.3 T Foreign Language : German				
CO 232 T	Paper 2	International Trade and Documentation	25	75		100
		Management of Intellectual Property				
CO 233 R	Paper 3	Rights	25	75		100
CO 234 Y	Paper 4	FOREX Management	25	75		100

SEMESTER IV

Code	Paper	Subject	CA	Marks	
				ESA	Total
CO 241 Z	Paper1	Logistics and Supply Chain Management	25	75	100
CO 242 T	Paper2	Strategic Management for MNCs	25	75	100
CO 243 T	Paper3	Legal Framework for International Trade	25	75	100
CO 244 S	Paper4	Management Optimization Techniques	25	75	100
Total			100	300	400
Project Report					100
Comprehensive Viva					100
Grand Total					2000
Elective - MARKETING					

SEMESTER III

Code	Paper	Subject	CA	Marks	
				ESA	Total
CO 231M	Paper 1	Agricultural and Rural Marketing	25	75	100
CO 232M	Paper 2	International Marketing	25	75	100
CO 233M	Paper 3	Marketing Research	25	75	100
CO 234M	Paper 4	Marketing Communication	25	75	100
Total			100	300	400

SEMESTER IV

Code	Paper	Subject	CA	Marks	
				ESA	Total
CO 241Z	Paper1	Logistics and Supply Chain Management	25	75	100
CO 242M	Paper2	Industrial Marketing	25	75	100
CO 243M	Paper3	Services Marketing	25	75	100
CO 244S	Paper4	Management Optimization Techniques	25	75	100
Total			100	300	400
Project Report					100
Comprehensive Viva					100
Grand Total					2000

Elective- BANKING AND INSURANCE

SEMESTER III

Marks

Code	Paper	Subject	CA	ESA	Total
CO 231 U	Paper 1	Income Tax Planning and Management	25	75	100
CO 232 B	Paper 2	Modern Banking	25	75	100
CO 233 B	Paper 3	Insurance Law and Practice	25	75	100
CO 234 Y	Paper 4	FOREX Management	25	75	100
Total			100	300	400

SEMESTER IV

Marks

Code	Paper	Subject	CA	ESA	Total
CO 241W	Paper1	Goods and Service tax & Customs Duty - Law and Practice	25	75	100
CO 242 B	Paper2	Investment Banking and Financial Services	25	75	100
CO 243 B	Paper3	Principles and Practices of Actuarial Science	25	75	100
CO 244 S	Paper4	Management Optimization Techniques	25	75	100
Total			100	300	400
Project Report					100
Comprehensive Viva					100
Grand Total					2000

5. Evaluation

5.1 Evaluation of each paper shall be done in two parts (1) Continuous Assessment (CA) and (2) End Semester Assessment(ESA)

5.2 The distribution of marks shall be 25% for CA and 75% for ESA

6. Continuous assessment

6.1 The allocation of marks for each component under continuous assessment shall be in the following proportions.

Theory paper

a. Attendance	5
b. Assignment	5
c. Tests	10
d. Seminar	5

Total	25

6.2 There shall be no continuous assessment for project work

6.3 The allotment of marks for attendance shall be as follows:

Attendance less than 75%	0mark
75%	1mark
76to 80%	2marks
81to 86%	3marks
86to 90%	4marks
Attendance more than 90%	5marks

Those who secure a minimum of 75% attendance in the aggregate for all the papers of a semester taken together alone will be allowed to register for the end semester assessment of the semester.

Condo nation of attendance to a maximum of 10 days in a semester subject to a maximum of two times during the whole period of the PG Programme may be granted by the University .Benefit of attendance may be granted to students who attended to University Union activities, meetings of the University bodies and for participation in extracurricular activities by treating them as present for the days of the their absence for the above purpose on production of participation/attendance certificate in such activities, subject to a maximum of 10 days in a semester.

6.4 Each student shall be required to submit not more than 2 assignments for each paper. Valued assignments must be returned to the students.

- 6.5 For each paper there shall be at least two class tests during a semester. The probable dates of tests shall be announced at the beginning of each semester. Marks for tests shall be awarded on the basis of the marks secured for the better of the two sets. Valued answer scripts must be made available to the students for perusal within 10 days from the date of test.
- 6.6 Students shall be required to present a seminar on a selected topic in each paper. A maximum of 5 marks shall be awarded for the seminar. The evaluation of the seminar will be done by the concerned teacher/(s) handling the paper based on the presentation, seminar paper and participation in discussion.
- 6.7 All the records of the continuous assessment must be kept in the Department and must be made available for verification by the University if necessary. Separate orders incorporating the details for the award of marks under CA will be issued by the university.
- 6.8 In 3rd and 4th semester, one hour per week shall be allotted for project work.
- 6.9 Under Information Technology and E business elective, there shall be practical examination with a weightage of 25 marks for three papers namely Office Automation, Internet & Web designing and Data Base Management & Information Technology.

7. Summer Internship

Summer internship shall be done at the end of the second semester subject to the following modified guidelines for summer internship as per U. O No. Ac.AIV/1/M.Com Summer Internship /2015 dated 06.05.2016.

1. There shall be summer internship by way of an organizational study (OS) for two weeks to facilitate the students to get familiarized with procedures and practice adopted in functional areas such as production/ operations, Marketing, Human Resource, Management Information system, Research and Development and Finance by reputed firms approved by the Teaching Department at the end of the M Com second semester programme.
2. Organizational Study (OS) for two weeks shall be arranged immediately after the University examination, but prior to the commencement of third semester classes.

3. Organizational Study (OS) shall be monitored by the supervising teachers concerned insisting the submission of Work Diary in the format prescribed by the University.
4. Each student shall have to submit a written account of experiences gained during the Organizational Study (OS). However, the summer internship carries Zero credit.
5. The students shall be permitted to appear for the end semester examination only after furnishing a certificate by the Head of the Department of the Teaching Department concerned to the effect that the written account of experiences gained during Organizational Study (OS) was submitted on time.

8. Project evaluation

Project to be submitted at the end of the last semester will be valued by a Board of 2 examiners appointed by the university. The maximum marks shall be 100 of which 75 marks is for Project Report and 25 marks is for Project Viva (as per U.O.No.Ac.A IV/3/M.Com/2016 dated 03.11.2016). The project viva shall be conducted along with the comprehensive Viva Voce.

9. End Semester Assessment

- 9.1 End semester assessment of all the semesters shall be conducted by the university. There shall be double valuation system of answer books. The average of 2 valuations shall be taken into account. If there is a variation of more than 15% the answer books shall be valued by a third examiner.
- 9.2 The results of the CA shall be displayed within 5 working days from the last day of a semester. The complaints regarding award of marks of various components of CA , if any, have to be submitted to the department within 3 working days from the display of CA marks. These complaints shall be examined by the Departmental Committee to arrive at a decision regarding the awarding of marks. The decision shall be communicated to the student.
- 9.3 The marks awarded for various components of the CA shall not be rounded off, if it has a decimal part. The total marks of CA shall be rounded off to the nearest

whole number. The statement of marks of the CA of all the students in a semester shall be approved by the departmental Committee, countersigned by the Principal and forwarded to the Controller of Examinations within 15 working days from the last day of the semester. The University has the right to normalize the CA for which; separate rules shall framed by the syndicate.

- 9.4 The results of ESA shall be arranged to be published within 30 to 45 days from the date of the last examination.

10. Pass Requirement

Those who secure not less than 40% marks for ESA for each theory paper and aggregate minimum of 50% marks for theory, project, project based viva and comprehensive viva of PG degree courses under semester pattern shall be declared to have successfully completed the semester. However, practical and theory can be treated as separate units. The marks for project and viva will be carried over.

Those who have successfully completed all the semesters of a programme shall be declared to have successfully completed the PG programme.

