# 2.6 STUDENT PERFORMANCE AND LEARNING OUTCOMES

## 2.6.1 PROGRAM OUTCOMES, PROGRAM SPECIFIC OUTCOMES AND COURSE OUTCOMES FOR ALL PROGRAMS OFFERED BY THE INSTITUTION.

# BA ENGLISH

## PROGRAMME SPECIFIC OUTCOMES

To enable the students to

**PSO 1:** Understand the imagination and creativity of different writers and enhance their writing skills.

**PSO 2:** Analyze literary texts and experience the merits of literary art.
**PSO 3:** Acquire knowledge through the study of fundamentals of language and literature.
**PSO 4:** Acquaint with Indian Literature in Translation and the process of Translation.
**PSO 5:** Get a sound knowledge in English Grammar and acquire skills in Creative Writing.
**PSO 6:** Pursue higher studies and research in English Language and Literature.
**PSO 7:** Appear confidently in various competitive and qualifying exams.
**PSO 8:** Inculcate values in their life through the study of Literature.

## COURSE OUTCOME

### ENGLISH FOR INFOTAINMENT – I ULEN11 CREDIT-3

CO1. Give an intellectual note on A.P.J.Abdul Kalam-Early Influences.
CO2. Write about the theme of the poem "Second Crucuifixion".
CO3. Examine the theme of the poem 'What I found in my Pocket
CO4. Discuss the first earnings of A.P.J.Abdul Kalam.
CO5. What thoughts came up in the mind of Chesterton when he picked his own pocket?
CO6. What is a synonym and how do synonyms help to the students?
CO7. Define eight Parts of Speech with examples.
CO8. Change the following as directed:
i) Arun said to Anu, "I am studying". [Change into indirect]
ii) Ravi said to Raj, "Please give me your pen". [Change into indirect]
iii) The tourist said, "How lovely the Tajmahal is!"[Change into indirect]
iv) Madhavan asked the stranger who he was. [Change into direct]
v) The boy told his friend that that book was interesting. [Change into direct]

CO9. Develop the following hints into a paragraph.

King Solomon well known for his wisdom - his fame reached the Queen of Sheba -Wanted to test his power of judgment - paid a visit - presented two identical garlands of roses - one was artificial while the other was real - asked him to identify the garland with real flowers- King Solomon ordered his attendants to open all the windows of the court room - bees swarmed in from the garden and sat on the real flowers - the Queen was impressed with this presence of mind.

CO10. Write a letter to the Principal of your college requesting him/her to issue your Transfer Certificate.

### ENGLISH FOR INFOTAINMENT – II ULEN22 CREDIT-3

CO1. What, according to Livingstone, are the essentials of education?
CO2. Trace the evolution of thought in O Captain! My Captain!
CO3. Give any fifteen agreements between the subject and the verb.
CO4. Discuss in Group: Job oriented education is a must in the present situation.

CO5. Rewrite the sentences using the correct form of the verb given in brackets.

i. Both the porters and the drivers (is/are) responsible.
ii. Either you or John (are/is) likely to be the captain.
iii. Neither my cow nor my goats (go/goes) on the road.
iv. A teacher along with forty students (has/have) come here.
v. A house consisting of forty rooms (are/is) to be painted.
vi. Billiards (is/are) an indoor game.
vii. Every man and woman (like/likes) to be praised.
viii. He is one of the teachers who (has been/have been) promoted.
ix. The whole class (wants/want) more library hours.
x. Every tree and every plant (need/needs) water.

CO6. 'King was a ray of hope in the world enveloped by the gloom of nuclear war' – justify.

CO7. What is the problem between the Hindus and Muslims?

CO8. Frame suitable sentences for the following patterns:

1. S+V+O
2. S+V+A
3. S+V+C
4. S+V+IO+DO
5. S+V

CO9. How will you introduce yourself in an interview?

CO10. Write a dialogue between two students about a tough question paper.

**ENGLISH FOR INFOTAINMENT – III ULEN33 CREDIT-3**

CO1. Justify the tittle of Tolstoy's short story 'Little Girls Wiser than Men'.

CO2. Write a critical appreciation of Wole Soyinka's poem, 'To My first White Hairs'.

CO3. Write a group discussion on 'Science is both Constructive and Destructive'

CO4. Give the central theme of the play 'The Post Office'.

CO5. List out Ten - point oath for the Youth as suggested by Dr.A.P.J.Abdul Kalam

CO6. How did the parents get back their son in 'At the Church Door'?

CO7. How does King Arthur console Sir Bedivere?

CO8. How does Emily Dinckinson depict the bird?

CO9. Rewrite the following sentences using Gerund form.

i) I am sorry to wake you up.
ii) It is difficult to read your writing.
iii) It is not wise to follow meaningless customs.
iv) Deepu is afraid to go near an elephant.

CO10. Describe the features of Newspaper Report.

**ENGLISH FOR INFOTAINMENT – IV ULEN44 CREDIT-3**

CO1 Comment on the views of Dr.A.P.J.Abdul Kalam on India as a land and Indians as people.

CO2 Write an essay on the bonds in the 'Fourth Act' of 'The Merchant of Venice'.

CO3 Explain with examples: i) Transformation of a Simple Sentence into a Complex Sentence.
ii) Transformation of a Simple Sentence into a Compound Sentence.
iii) Transformation of a Complex into a Compound Sentence.

CO4 Write a letter to your aunt, describing your favourite hobby.

CO5 Rewrite as **directed:**

i. *Inspite of* his poverty, he was happy.[into Complex and compound]
ii. *Unless* you work hard, you will fail.[into Compound and simple]
iii. Having posted the letter, I returned home.[into Compound and complex]
iv. It rained heavily *and so* the workshop was postponed.[into Simple and complex]
v. The tea was *too* hot for me *to* drink.[into Compound and complex]

CO6 Write the story of 'The Bats' in the 'Arranged Marriage' by Chitra Banerjee Divakaruni.
CO7 What happened to Eurydice and how the incident brought a change upon Orpheus?
CO8 How did Luz Long help Jesse Owens to win?
CO9 Write a note on the 'Venetian Laws'.
CO10 Write a Precis on the following passage:

**INDIAN WRITING IN ENGLISH UENT11-CREDIT -4**

CO1 Critically appreciate the poem 'The Casuarina Tree.'
CO2 Write an essay on the poem 'Migrations.'
CO3 Critically appreciate the poem 'The Snake Charmer'.
CO4 Write an essay on "A River".
CO5 Write an essay on 'Home Coming'
CO6 Discuss the concepts in the play – Malgudy Days
CO7 Write an essay on 'Glory of Twilight'.
CO8 Discuss the theme of the short story "The Wood Rose"
CO9 Write an essay on "Books that have influenced me".
CO10 Critically analyse the prose 'The First Case'.

**MODERN ENGLISH GRAMMAR AND USAGE UENT12-CREDIT -4**

CO1 Write an essay on the usage of Modal Auxiliary verbs in Imperative sentences.
CO2 Explain the 12 tenses with respective rules and proper examples.
CO3 Write down the rules to be followed in writing correct Tag Questions.
CO4 Explain the rules to be followed for correct Subject-Verb agreements in English Grammar.
CO5 Write an essay on the kinds of Noun.
CO6 Describe the kinds of Adjectives with atleast 2 suitable examples.
CO7 Write an essay on Prepositions.
CO8 Differentiate and Describe the Definite and Indefinite Articles.
CO9 Describe in detail about the transformation of Simple, Complex and Compound sentences.
CO10 Explain how the Active Voice sentence is changed into Passive Voice, and describe the rules to be followed.

**SOCIAL HISTORY OF ENGLAND UENA11-CREDIT -4**

CO1. Write an essay on Renaissance.
CO2. Describe about the Civil War and its significance.
CO3. Explain about the Age of Queen Anne.
CO4. Write about the consequences of Colonial Expansion. CO5. What are the causes and effects of Industrial Revolution?
CO6. Significance of the age of Victorian Age – Discuss.
CO7. Comment of the World War and Social Security. CO8. Write an essay on the effects of the French Revolution.
CO9. Importance of Agrarian Revolution – Comment on it.
CO10. Describe about the Restoration England.

**AGE OF SHAKESPEARE AND MILTON UENT21-CREDIT -4**

CO1. Pilgrim Progress as an Allegory- Discuss
CO2. In the pilgrim progress we find unity in diversity- Discuss
CO3. Write an essay on the conversation between Adam and Eve.
CO4. Write about Satan's Soliloquy.
CO5. Discuss Bacon as an Essayist.
CO6. Analyse any two Essays of Bacon.
CO7. Sketch the character of Duchess of Malfi.
CO8. Write about the minor characters in Duchess of Malfi.
CO9. Write an essay on the tragic element in Dr.Faustus.
CO10. Describe the character of Dr.Faustu

**LITERARY THEORY -UENT22 CREDIT -4**

CO1. Explain the form of ballad.
CO2. What is the subjective poetry?
CO3. What is the common theme of a sonnet?
CO4. Write two chief characteristics of autobiography.
CO5. What does the tragedy deal with?
CO6. Write a short note on pastoral elegy.
CO7. What is Spenserian stanza? Discuss its features.
CO8. Bring out the essentials of a tragedy.
CO9. Comment on the essentials of a good satire. CO10. Examine the types of comedy and their features.

**HISTORY OF ENGLISH LITERATURE – I UENA22-CREDIT -4**

CO1. Write an essay on Chaucer's language and style.
CO2. Write a detailed note on Dryden's contribution as a critic and poet.
CO3. Explain the characteristic features of Neo – Classical poetry.
CO4. Comment on Milton as a poet of Puritan Age.
CO5. Discuss Addison and Steele as writers of Periodicals.
CO6. Write a note on Sydney's poetry.
CO7. Discuss Pope as a great writer.
CO8. Explain Bacon as an essayist.
CO9. Define the term 'metaphysical poetry'. Discuss about the Metaphysical Poets.
CO10. Spenser as 'Poet's poet'- Discuss.

**AGE OF DRYDEN AND POPE UENT31-CREDIT -4**

CO11. Explain the structure of the poem "The Pulley"?
CO12. Explain the theme of the poem Alexander's Feast.
CO13. The use of metaphysical conceits in "A Valediction Forbidding Mourning"?
CO14. Write character sketches of Sir Roger at church?
CO15. Explain Goldsmith as an essayist?
CO16. Write the theme of Carpediem in the poem 'To his coy mistress'.
CO17. Discuss the theme in the drama 'Rivals'.
CO18. Write a character sketch of Robinson Crusoe.
CO19. Write your self-appreciation of the prose piece 'Beau Tibbs'
CO20. Describe Donne's metaphors used in his poems?

**HISTORY OF ENGLISH LITERATURE-II UENA33-CREDIT -4**

CO1 Write an essay on the salient features of Wordsworth's Poetry?
CO2 Write an essay on Shelley.
CO3 Write a Critique of Coleridge's "Christabel".
CO4 Discuss D.G.Rossetti as Pre-Raphaelites Poet.
CO5 Explain Virginia Woolf as a novelist.
CO6 Write a note on the Arnold.
CO7 What is the nature of the conflict of the hero in the heroic tragedy?
CO8 Hardy as a Wessex novelist-Discuss.
CO9 Write a note on the Austen's Pride and Prejudice.
CO10 Write a note on Pylon poets.

**SUBALTERN STUDIES UENE31 CREDIT -3**

CO1 The role of women in Mahasweta Devi's Draupadi-Discuss
CO2 Write an essay on the poem 'Purdha.'
CO3 Critically appreciate the poem 'Indian Reservation:Chaghnawaga'.

CO4 Write an essay on "The Old play house".
CO5 Write an essay on 'Can the Subaltern Speak"
CO6 Discuss the concepts in the play 'Strong Breed'
. CO7 Write an essay on 'Karukku'.
CO8 Discuss the theme of 'The Colour Purple'.
CO9 Write an essay on 'Seven steps around the fire'.
CO10 Critically analyse the prose 'I know why the caged birds sin

**AGE OF WORDSWORTH UENT41 CREDIT -4**

CO1 Write an essay on Keats's 'Ode to Nightingale'.
CO2 Write an essay on Walter Scott's Kenilworth.
CO3 How does the wind treat other natural elements?
CO4 What does the poet appeal to the West Wind? CO5
What did the poet say about creator to the lamb?
CO6 Where does Michael live and what does he for s living?
CO7 Prove-"In Praise of Chimney Sweepers" is highly imagination work with deep emotional appeal.
CO8 Where did the winged goddess lay in and what was she doing?
CO9 What does Wordsworth hear outside his window?
CO10 Write a short note on "Ode to Nightingale".

**AGE OF TENNYSON UENT42-CREDIT -4**

CO1 Write a critical note on Lotus Eaters.
CO2 Describe the salient features of Last ride together.
CO3 Write a critical note on Study of Poetry. CO4
Trace out Arnold's style of writing.
CO5 Write an essay on Blessed Damozel.
CO6 Sketch the character of Jane Eyre.
CO7 Explain the important characters of Silas Mariner.
CO8 Sketch trhe character of Earnest.
CO9 What does Ulysses address to his brave followers?
CO10 Rossetti's description of heaven in The Blessed Damozel – Discuss.

**LITERARY CRITICISM UENA44-CREDIT -4**

CO1 Write an essay on the five approaches of Literary Criticism.
CO2 Aristotle's views on Tragedy – Discuss.
CO3 Dryden as a Neo-classical critic – Discuss.
CO4 Write an essay – 'Arnold as a critic.'
CO5 Write an essay on 'Wordsworth as a critic.'
CO6 I A Richards' justification of poetry – discuss.
CO7 T S Eliot as a critic – discuss.
CO8 Give a brief note on Three Estimates of Arnold.
CO9 Explain Nature of poetry, according to Horace.
CO10 What is the value of poetry according to I A Richards?

**POST COLONIAL LITERATURE UENE42 CREDIT -3**

CO1 Describe about the similarities between physical and metaphysical journey in Atwood's 'Journey to the Interior'.
CO2 Comment at the concept of Female identity in Lawrence's The stone angel'.
CO3 Critically analyse the poem 'The Man with the wooden leg'.
CO4 Write an essay on "Australia".
CO5 Write an essay on 'A Far cry from Africa"
CO6 Discuss the concepts in the play 'Blood Relations'

CO7 Write an essay on 'Writing and Being'.
CO8 Discuss the theme of the story 'Silence'.
CO9 Write an essay on 'The story of a Non marrying Man'.
CO10 Critically analyse the prose 'The Aborgines of Canada'

**MODERN AGE UENT51 CREDIT -4**

CO1 Critically appreciate the poem 'The Soldier.'
CO2 Write an essay on the poem 'Strange Meeting.'
CO3 Critically appreciate the poem 'In memory of W.B.Yeats'.
CO4 Write an essay on "Easter 1916".
CO5 Write an essay on 'On keyhole morals'
CO6 Discuss the concepts in the play Pygmalion
CO7 Write an essay on 'The Lost Girl'.
CO8 Discuss the theme of martyrdom in 'Murder in the cathedral'.
CO9 Write an essay on Profession for women.
CO10 Critically analyse the prose 'Inside the whale'.

**AMERICAN LITERATURE UENT52 CREDIT -4**

CO1 Explain the images in the poem "When Lilacs Last in the Dooryard"
CO2 Define Poe's imaginative techniques in the poem "Annabel Lee".
CO3 When and where did the speech given by Emerson?
CO4 How does Huck mature?
CO5 How does Joe Killer introduced in "All My Sons"?
CO6 Write the critical analysis of the poem "After Apple picking".
CO7 What views of war of love does Hemingway Convey through "A Farewel to Arms"?
CO8 How does Emerson's "The American Scholar" relate to education today?
CO9 What is the form of the poem "After Apple Picking"?
CO10 Explain the character Chris Keller

**SHAKESPEARE I UENT53 CREDIT -4**

CO1 Salient features of Shakespeare's Tragedies.
CO2 Describe about the Elizabethan theatre and audience.
CO3 Briefly account about the Historical plays of Shakespeare.
CO4 Significance of Fools characters in Shakespeare's plays.
CO5 Discuss Macbeth as Tragedy.
CO6 The Merchant of Venice as Romantic Comedy-Discuss.
CO7 Discuss the Historical elements in the play 'Julius Caesar.
CO8 Which characters in the play 'The Merchant of Venice' spend time in disguise, and how is this thematically important?
CO9 Discuss some of the significant supernatural elements in William Shakespeare's plays.
CO10 Write an essay on Henry IV.

**FUNDAMENTALS OF LANGUAGE UENT54 CREDIT -4**

CO1 Define Phonology.
CO2 What are central vowels?
CO3 Give any two examples for Backformation.
CO4 Discuss briefly about Bow-Wow theory.
CO5 Give a note on pulmonic air stream mechanism.
CO6 Explain front vowels with examples.
CO7 Discuss the important of English as an international Language.
CO8 Explain the four theories in the 'Origin of Language'.
CO9 Transcribe the following words and mark stress:

a.Discount- b.Father- c.Defective-
d.Menace- e.Transcription

CO10 Briefly explain about Cardinal Vowels.

**POST COLONIAL LITERATURE II UENT55 CREDIT -4**

CO1 Critically appreciate the poem 'Telephonic Conversation.'
CO2 Write an essay on the poem 'Words.'
CO3 Critically appreciate the poem 'I am not that Women'.
CO4 Write an essay on "The Novelist as a Teacher".
CO5 Write an essay on 'Dance like a man '
CO6 Discuss the concepts in the play – The Lion and Jewel
CO7 Write an essay on 'Sister of my Heart'.
CO8 Discuss the theme of the short story "The Crow Eaters"
CO9 Write an essay on "The Sparrows".
CO10 Critically analyze the prose 'Decolonizing the Mind '.

**TRANSLATION THEORY AND PRACTICE-UENE53 CREDIT-3**

CO1 What is Translation?
CO2 What are the three modes of Translation according to Goethe?
CO3 What are the problems associated with prose Translation
CO4 Draw Eugene Nida's model of the Translation process.
CO5 What is cultural untranslatability?
CO6 What is borrowing?
CO7 What is modulation?
CO8 What are techniques used in Translation?
CO9 What are problems involved in translating a poem?
CO10 How does Susan Bassnett define translation?

**INTRODUCTION TO LITERARY THEORIES – UENT61 – CREDIT- 4**

CO1 Critically appreciate the Structuralism
CO2 Describe the structure of 'The Tales of Henry James.'
CO3 Define Reader Response Theory.
CO4 The Role of Reader in Fielding's Joseph Andrews and Tom Jones.
CO5 Write an essay on The Post Modernism.
CO6 Discuss the concepts of The Race for Theory.
CO7 Write an essay on Post-colonial Criticism.
CO8 Discuss the theme of Spivak's From a Critic of Post-Colonial Reason.
CO9 Write an essay on Spivak's – Chapter 3 History
CO10 Critically analyze on "Towards a Feminist Poetics.

**COMPARATIVE LITERATURE UENT62 CREDIT -4**

CO1 In Which century was comparative literature established in France?
CO2 Who neglects study according to Weisstein?
CO3 Analyse the origin of comparative studies in America.
CO4 What is Thematology? What are the thematological concerns in Comparative literature?
CO5 Discuss the contribution of sigmund freud to the study of literature.
CO6 Consider the french Pioneers in Comparative literature.
CO7 Write a short on American School.
CO8 Trace out the importance of Reception Study in Comparative Literature.
CO9 Write on a few important literary terms in connection with Influence Studies.
CO10 What are T.S Eliot's comments on Goethe?

**WOMEN'S WRITING – UENT63- CREDIT -4**

CO1 Critically appreciate the poem 'Introduction.'
CO2 Write an essay on the poem 'Tribute to Papa.'
CO3 Critically appreciate the poem 'Jyogadhya Uma'.
CO4 Write an essay on "Up Hill".
CO5 Write an essay on 'The Farewell Party'
CO6 Discuss the concepts in the play "Sulla"
CO7 Write an essay on 'The Mousetrap'.
CO8 Discuss the theme of "The Stranger".
CO9 Write an essay on Profession for women.
CO10 Critically analyse the prose 'Graduation'.

**ENGLISH LANGUAGE TEACHING UENT64 CREDIT -4**

CO1 Explain the focus in teaching Poetry.
CO2 Suggest way of doing correction work in composition classes.
CO3 Explain the processes called **scanning** and **skimming** in reading.
CO4 Briefly explain the importance of making notes.
CO5 How can blackboards be used effectively?
CO6 What are the simple teaching- learning aids that can be used in the class?
CO7 Write an essay on the Bilingual method.
CO8 Outline the various steps in teaching a prose lesson.
CO9 What is the importance of listening skills? How would you develop their skill among students?
CO10 What are the benefits of using activities in English classrooms?

**CONTEMPORARY LITERATURE UENT65 CREDIT -4**

CO1 Critically appreciate the poem 'Ambulance.'
CO2 Write an essay on the poem 'The Poet.'
CO3 Critically appreciate the poem 'Missing dates'.
CO4 Write an essay on "The double shame".
CO5 Write an essay on notes on English character.
CO6 Discuss the two primary concepts presented in the play *Look Back in Anger*.
CO7 Write an essay on the Possession.
CO8 Discuss the theme of martyrdom in 'The Power and the Glory'.
CO9 Write an essay on Care taker.
CO10 Critically analyse the drama 'Betrayal'.

**JOURNALISM AND MASS COMMUNICATION UENE64 CREDIT -3**

CO1 Trace the History of press.
CO2 Write an essay on the ethics of journalism.
CO3 Analyze the functions of the various departments of newspaper organization.
CO4 Describe the responsibility of editor and sub-editor.
CO5 Explain the different types of feature writing.
CO6 The characteristics of Good newspaper.
CO7 Write an essay on reporting.
CO8 Write an essay on Interview.
CO9 Write an essay on Press Laws.
CO10 What is Film reviewing and what are the existing methods of film reviewing.

## BBA

Upon completion of the program, the BBA graduate should be able to

**PSO 1**: Equip with advanced business acumen that helps them to understand the key business functions and organizational resources for efficient business management.
**PSO 2:** Acquire knowledge and skills in management, finance, accounting, marketing, human resource, technology, organizational behaviour, economics, operations and business law.
**PSO 3:** Demonstrate the ability to analyse complex, unstructured qualitative and quantitative problems by collecting, analysing data by using accounting, financial, mathematical, statistical tools, information and communication technologies to solve the complex business problems.
**PSO 4:** Apply technology to enhance organizational efficiency and create innovative business solutions.
**PSO 5:** Exhibit business-related behavioural skills including leadership, interpersonal, communication (written and oral), team, and lifelong learning skills.
**PSO 6:** Analyze global market opportunities and their influence on strategic marketing decisions.
**PSO 7:** Develop legal and ethical strategic plans that align with an organization's mission.
**PSO 8:** Demonstrate critical thinking skills in understanding managerial issues and problems related to the global economy and international business.
**PSO 9:** Familiarize with social responsibility issues that managers must address, including business ethics, cultural diversity, and environmental concerns.
**PSO 10:** Acquire entrepreneurial traits to start and manage their own innovative business successfully.

# COURSE OUTCOME

**UBAT11 - FUNDAMENTALS OF MANAGEMENT (4)**

CO1 Introduce the basics of management knowledge and to enable the student to correlate it with the practical aspect.
CO2 Build a base for learning management knowledge and to acquire prerequisite skills.
CO3 Provide a basis of understanding to the students with reference to working of business organization through the process of management.
CO4 Enable the student to understand the basic principles of management and functions.

**UBAT12 -FINANCIAL ACCOUNTING (4)**

CO1 Impart basic accounting knowledge
CO2 Inculcate basic accounting concepts and postulates
CO3 Provide wide knowledge about final accounts
CO4 Build a base for income and expenditure and receipts and payments accounts

**UBAA11 -MANAGERIAL ECONOMICS (4)**

CO1 Expose students to basic micro economic concepts.
CO2 Enable students to apply economic analysis in the formulation of business policies.
CO3 Enable students to use economic reasoning to problems of business.
CO4 Build a wide knowledge about basic Indian economic system.

**UBAT21 -ORGANISATIONAL BEHAVIOUR (4)**

CO1 Gain a solid understanding of human behaviour in the workplace from an individual, group, and organizational perspective and frameworks and tools to effectively analyse and approach various organizational situations.
CO2 Familiarize students with contemporary organizational behaviour theories and help them to understand predict and manage people better.
CO3 Acquaint the students with the fundamentals of managing business.
CO4 Understand individual and group behaviour at work place so as to improve the effectiveness of an organization.

**UBAT22 -BUSINESS ENVIRONMENT (4)**

CO1 Familiarize students with the nature of business environment and its components in business decision making.
CO2 Increase the awareness of the interconnected nature of today's world, and how economic, social, political and environmental issues can impact international integration and business.
CO3 Impart the environmental scanning skills to student to identify the business opportunity and challenges.
CO4 Enable students to analyse and interpret the current events relating to globalization and international business.

**UBAA22- COMPUTER APPLICATION (4)**

CO1 Held the students to know the Fundamentals of Computers.

CO2 Held them to understand how to use Computer applications in day to day Applications.

CO3 Introduce the students to the fundamentals of computers and familiarize them MS Office.

CO4 Introduce the students with some basic tools and applications on power point presentation.

**UBAT31 -COST ACCOUNTING (4)**

CO1 Impart the knowledge of basic cost concepts, element of cost & preparation of Cost Sheet.

CO2 Provide basic knowledge of important methods & techniques of costing.

CO3 Introduce the basics of cost accounting and enabling the student to correlate the two branches namely financial and cost accounting.

CO4 Build a base for learning management accounting.

**UBAA33 - COMPUTER APPLICATION -II TALLY (4)**

CO1 Introduce the students to the fundamentals of computers and familiarize them with the jargon commonly used by computer literates.

CO2 Introduce the students with some basic tools and applications in MS office.

CO3 Enable them in preparing report, presentation, and calculation effectively and analyse data for decision making using data of different kind.

CO4 Introduce the student to the Tally and its applications and thereby empowering them.

**UBAE31 -PERSONALITY DEVELOPMENT (3)**

CO1 Encourage students to develop balanced self-determined behaviour

CO2 Help students in enhancing self, increasing life satisfaction and improving the relationship with others.

CO3 Develop new ability to develop new problem solving skills in group and use these skills in personal life.

CO4 Encourage students to develop their personality by understanding the influence of environmental, educational and situational factors and how to modify the behaviour

**UBAT41 -BUSINESS COMMUNICATION (4)**

CO1 Teach the students to understand the concept, process and importance of communication.

CO2 Enable students to gain knowledge of media of communication.

CO3 Help the students to develop skills of effective communication - both written and oral.

CO4 Help students to acquaint with application of communication skills in the business world.

**UBAT42 - ENTREPRENEURSHIP DEVELOPMENT ()**

CO1 Provide knowledge of entrepreneurship and also provide necessary inputs for the creation of the new ventures.

CO2 Enable them to meet out challenges of starting new ventures and introducing new product and service ideas.

CO3 Familiarize the students with the different stages of project preparation.

CO4 Build entrepreneurship development activities undertaken by Indian government

**UBAA44 -BUSINESS STATISTICS (4)**

CO1 Understand the concept of population and sample.

CO2 Use frequency distribution to make decision.

CO3 Understand and to calculate various types of averages and variation.

CO4 Use regression analysis to estimate the relationship between two variables and to solve LPP to maximize the profit and to minimize the cost.

**UBAE42 -MERCHANT BANKING AND SERVICES (3)**

CO1 Give in-depth understanding of the concept and issues and various aspects of merchant banking and financial services.

CO2 Impart the skills in deciding leasing, hire purchase and bill discounting schemes offered by financial institution.

CO3 Familiarize the students with the corporate advisory services of financial institution and issue procedure involved in equity and debenture issue

**UBAT51 -MANAGEMENT ACCOUNTING (4)**

CO1 Familiarize the students with the accounting statement analysis.

CO2 Help the students acquire knowledge on ratio analysis by using accounting data and other related information for decision making, planning and control

CO3 Acquaint students with the budgetary preparation and cash flow and fund flow for business planning.

CO4 Develop the critical and analytical skills of students in analysing the product, project, divisional and organizational performance by using managerial accounting information.

**UBAT52 -MARKETING MANAGEMENT (4)**

CO1 Familiarize the student with the concept in marketing and make them to design and implement the best combination of marketing actions to carry out a firm's strategy in its target markets.

CO2 Develop the skills in market analysis and design customer driven strategies with regard to product, pricing, and promotion

CO3 Inculcate the students' skills in applying the analytic perspectives, decision tools, and concepts of marketing.

CO4 Enable to take decisions involving segmentation, targeting and positioning; product offering; pricing; distribution channels and marketing communications.

**UBAT53 -PRODUCTION MANAGEMENT (4)**

CO1 Make the students to understand the production function, process and plant design, planning functions, Material Planning and Layout and Scheduling.

CO2 Enable students to choose appropriate statistical techniques for improving processes and write reports to management describing processes and recommending ways to improve them.

CO3 Familiarize students with the design, planning and control of an organization's processes with the objective of creating and delivering products & services to customers and improving process & supply chain performance.

**UBAT54 - HUMAN RESOURCE MANAGEMENT (4)**

CO1 Equip students with knowledge, skill and competencies to manage people in the organization

CO2 Familiarize the students with the HRM practices, HR planning, Training Activities, Compensation and reward planning, Performance Appraisal system in an organization.

CO3 Provide an insight into the importance of motivation, counselling to create a stress free environment

**UBAT55 - OPERATIONS RESEARCH (4)**

CO1 Provide to the students a formal quantitative approach to problem solving and to introduce some widely-used mathematical models in solving business operations issues,

CO2 Provide an insight into basic linear programming, transportation and assignment technique, queuing model and replacement model to students to solve management problems.

CO3 Provide necessary inputs for optimum utilization of resources by employing operational research techniques

**UBAE53 - BUSINESS LAW (3)**

CO1 Impart in depth knowledge of the Law of contracts which forms, the foundation of all day to day obligations in the business world.

CO2 Instill in the students an awareness of legal framework in sale of goods, consumer protection to understand the applications of these laws to practical commercial situations.

CO3 Acquaint the students with the alternative forms of business organization available in the country as per partnership and new companies act.

**UBAT61– TOTAL QUALITY MANAGEMENT (4)**

CO1 Make them understand the philosophy and core values of Total Quality Management (TQM).

C02 Make them understand the voice of the customer and the impact of quality on economic performance and long-term business success of an organization;

CO3 Educate them about the best practices for the attainment of total quality

CO4 Help the students understand the relationship between business strategy, business performance and quality management.

**UBAT62 - MANAGEMENT INFORMATION SYSTEM (4)**

CO1 Enable the students to gain an understanding about how Information Systems are developed, implemented and assisted in decision making in an organizations.

C02 Familiarize the students with the four components of an MIS and understand how it add value to an organization.

CO3 Design system for an organization and identify privacy, security, and freedom of information issues in a business environment.

**UBAT63 -E-COMMERCE**

CO1 Familiarize the students with the technologies in e-commerce, e-business and its impact in business.

CO2 Enable the students to identify and implement the right e-commerce model and understand the ethical and legal issues associated with it.

C03 Give an insight about electronic payment system and its security

**UBAT64 - FINANCIAL MANAGEMENT (4)**

CO1 Help the students understand the foundations of finance and financing decisions, Working Capital and Long term sources of finance.

CO2 Acquaint the students with the theory and techniques of financial management, and developing their abilities in respect of investment and capital budgeting, financial planning, capital structure decisions, dividend policy and working capital management.

CO3 Develop the analytical skills for interpretation business information and application of financial theory in financing related decisions and situation

**UBAT65 -RESEARCH METHODS FOR MANAGEMENT (4)**

CO1 Educate the students about the basic research methodologies, design and applications.

CO2 Make them to identify and prepare a research proposal or problems through review of literature.

CO3 Familiarize students in the area of sampling, data collection and application of statistical tools in business research.

CO4 Cultivate the skills needed to prepare and present research reports.

**UBAE64 - SERVICES MARKETING (3)**

CO1 Enable the students to know about the various theories of service marketing.

CO2 Familiarize the students to gain insights on the issues in operational and administrative aspects of service marketing.

CO3 Help students to formulate strategies for identifying, organizing and establishing a retail format

CO4 Inculcate the skills of merchandising, segmentation, pricing and promotion strategies in service marketing.

## B.Sc. BIOCHEMISTRY

**PROGRAMME SPECIFIC OUTCOMES (PSOs):**

On completion of B.Sc Biochemistry programme

**PSO1:** Students will be able to accumulate knowledge in the basic concepts and principles of Biochemistry.

**PSO2:** Students will be able to enrich the theoretical and practical knowledge of that will pave way in achieving a successful career

**PSO3:** Students can develop the knowledge attained from the programme to work as biochemists in emerging modern clinical laboratories

**PSO4:** Students will interact appropriately and effectively with people in the field of Biochemistry and other allied backgrounds

**PSO5:** Students will get hands on experience and laboratory experiments will be beneficial to pursue higher studies and research

# COURSE OUTCOME

## CORE I – BIOMOLECULES-UBCT11 Credits-4

**CO 1**: Understand the basic fundamentals of biochemistry.

**CO 2**: Student can understand the chemistry of biomolecules and its significance

**CO 3**: Learn about the general properties of carbohydrates, proteins and lipids its role in the living beings.

**CO 4**: Understand the major role of nucleic acids in life processes.

**CO 5**: Learn about structure and functions of Vitamins in Living Beings.

## CORE II - NUTRITIONAL BIOCHEMISTRY-UBCT12 Credits-4

**CO 1**: Know the value and nutritional components of food.

**CO 2**: Understand the sources of nutrients such as carbohydrates, proteins, fibres and fats for good health.

**CO 3**: Enlighten the student about the healthy food- balanced diet

**CO 4**: Get aware about the disorders caused due to deficiency of protein, vitamin deficiency and minerals

**Co 5**: Future foods and its production, storage, applications and can able to identify the food adulterations.

## ALLIED CHEMISTRY-I
## ORGANIC, INORGANIC & PHYSICAL CHEMISTRY-UBCH11 Credits-4

**CO1**: Study the chemical kinetics, enzyme kinetics and the rate of reactions.

**CO2:** Understand the principles and application of electrochemistry and analytical chemistry.

**CO3**: Know the principles and methods of corrosion, electroplating process and the properties of carbohydrates

**CO4**: The students can learn the kinetics, bonding theory, atomic orbital and MO theory.

**CO 5**: Student can understand the chemistry of biomolecules and its significance

## CORE III - ENZYME AND ENZYME TECHNOLOGY-UBCT21 Credits-4

**CO 1**: Learn about enzymes and its classification and its role in Living beings.

**CO 2**: Study the enzyme reaction and enzyme kinetics through Michaelis-Menten equation and LB plot.

**CO 3**: Learn the methods of enzyme assay and the regulation mechanism of enzyme activity.

**CO 4**: Understand and know the mode of enzyme action and the industrial applications of enzymes.

**CO 5**: The students can gain the knowledge about the significance and industrial application of enzymes.

**CORE IV - INTERMEDIARY METABOLISM-UBCT31 Credits-4**

**CO1**: Learn the metabolic pathways involved in the physiological processes

**CO2**: Learn about High energy phosphates

**CO3**: Understand the concept of bioenergetics, carbohydrate and amino acid metabolism

**CO4**: Student acquire the knowledge about the bioenergetics and intermediate metabolism of biomolecules

**Co 5**: Study the lipid and nucleotide metabolism

**ALLIED - II - STATISTICS FOR BIOLOGY-UBCA32 Credits-4**

**CO1**: Understand the basics and purpose of statistics in organization and representation of collected data.

**CO2**: Learn the measure of central tendency and probability calculations.

**CO3**: The students can able to understand the correlation, regression and test of statistical significance to confirm the significance level

**CO4**: After this course student can able to use appropriate statistical tool for the validation, interpretation of biological data and present clearly

**CO5**: Student can acquire the knowledge about Tests of statistical significance

**ELECTIVE I - HUMAN PHYSIOLOGY –UBCE31 Credits-3**

**CO1**: Understand the composition and function of blood, ABO blood grouping and the students also can learn to about the properties of cardiac muscles, cardiac problems and how to measure the blood pressure.

**CO2**: Study the anatomy of human body and the function of organs in the growth and development of human.

**CO3**: Learn about the structure and function of respiratory system and endocrine system of human body.

**CO4**: Student can learn all body organ structure and its function

**CO5**: Student can acquire the knowledge about types and functions of Nervous system.

**CORE V – IMMUNOLOGY-UBCT41 Credits-4**

**CO1**: Study the basics of immunology and function of immune system against infections.

**CO2**: Learn the properties and functions of antigens and antibody types.

**CO3**: Acquire knowledge about hypersensitivity caused by immunological action and autoimmune disorders.

**CO4**: Students can understand the immunodeficiency disorders, vaccine production and the fundamentals of oncology.

**CO5**: Student can acquire the knowledge about types and significance of Vaccination.

**ALLIED – III - PHYSICS FOR BIOLOGY-UBCA42 Credits-4**

**CO1**: Obtain knowledge about the principles and types of spectroscopy and its application in the analysis of biological macromolecules.

**CO2**: Study the types of radioisotopes, techniques used for the measurement of radioactivity and it's used in biological studies.

**CO3**: Learn the role of isotopes in biological field, autoradiography techniques

**CO4**: The students can acquire skills on spectroscopy

**CO5**: Student can acquire the knowledge about radioactive substances and to know how to handle the radioisotopes.

**ELECTIVE II -GENERAL MICROBIOLOGY-UBCE42 Credits-3**

**CO1**: Understand the basics of microbiology, classification and general characteristics of microbes.

**CO2**: Study the structural organization and morphological features of microorganisms.

**CO3**: To know the growth, reproduction and metabolism of bacteria.

**CO4**: After this course student can get thorough knowledge of microbial classification, metabolism, and microbial production of medicine, fuel, food products and diseases caused by microbes.

**CO5**: Student can acquire the knowledge about Organic acid and antibiotic production.

**CORE VIII - CELL BIOLOGY AND VIROLOGY-BBO51 Credits-4**

**CO1**: Know the structure and function of membrane

**CO2**: Study the structure and functions of cell organelles and cell division

**CO3**: Understand the cell communication and cancer cells

**CO4**: Student can gain the knowledge about cell organelle, cell division, cell communication and mutational changes in gene function.

**CO5**: Student can acquire the knowledge about Plant and Animal Viruses.

**CORE IX - CLINICAL BIOCHEMISTRY-BBO53 Credits-4**

**CO1**: The students can understand about scope of clinical biochemistry to detect disorders.

**CO2**: Study the disorders caused due to the error in carbohydrate, lipid, protein metabolism and regulation of blood glucose level.

**CO3**: To learn the tissue function tests, biochemical tests and renal disorders.

**CO4**: Students can get the theoretical knowledge of clinical test.

**CO5**: Student can acquire the knowledge about Tissue function Test.

**CORE X- MOLECULAR BIOLOGY-BBO54 Credits-4**

**CO1**: The students can understand the genetic material

**CO2**: Understand the mechanism and types of DNA replication in prokaryote and eukaryote.

**CO3**: Understand the mechanism and types of DNA Transcription in prokaryote and eukaryote.

**CO4**: Obtain the knowledge of Protein Synthesis.

**CO5**: Student can acquire the knowledge about bacterial genetic exchange, genetic maps and linkage regulation of gene expression

**CORE XI- PLANT PHYSIOLOGY AND BIOCHEMISTRY-BBO52 Credits-4**

**CO1**: Understand the photosynthesis process occurs in plants.

**CO2**: Enlighten the students about plant nutrition, nitrogen fixation,

**CO3**: Understand the function of mineral, sulphur and nitrate metabolism in the plants.

**CO4**: The deep knowledge can use for the production of new crop variety and transgenic plants

**CO5**: Student can acquire the knowledge about Plant Tissue Culture and Secondary metabolites.

**CORE XII – PHARMACOLOGY-BBO55 Credits-4**

**CO1**: Understand the routes of drug administration and drug receptors,

**CO2**: Study the principles and methods of chemotherapy for cancer and mode of anticancer drugs.

**CO3**: Get knowledge about the adverse effect of drugs and metabolism of Xenobiotics.

**CO4**: The students can acquire profound knowledge regarding the drug metabolism

**CO5**: Student can acquire the knowledge about principles and phases of drug metabolism and pharmacological activity.

**ELECTIVE III – MICROBIAL BIOCHEMISTRY-BBO56 Credits-3**

**CO1**: Understand the Bacterial growth and metabolism.

**CO2**: Obtain knowledge about biosynthesis of amino acids and Lipids.

**CO3**: Learn the methods of fermentation.

**CO4**: Enlighten the students about the basic concepts of Organic acid Production.

**CO5**: Get trained on Downstream Processing.

**CORE XIII – PLANT BIOTECHNOLOGY-BBO61 Credits-4**

**CO1**: Understand the techniques Plant tissue culture.

**CO2**: Study about gene transfer mechanism in plants.

**CO3**: To enlighten the students to get deep knowledge about nitrogen fixation.

**CO4**: The students can understand about the plant vectors in gene transfer.

**CO5**: Students learn about antibody, antigen production in plants

**CORE XIV – GENETIC ENGINEERING-BBO62 Credits-4**

**CO1**: Get deep knowledge about the concepts of genetics, principles and mechanism of Mendelian inheritance, genes, chromosome and Mendel’s law.

**CO2**: Study the gene interaction, structure of chromosome, chromosomal aberration gene organization.

**CO3**: Study about the chromatin, metabolic pathways, mRNA molecules and nuclear transcription.

**CO4**: Student can able to get the thorough knowledge in genetics which can be used for advanced research

**CO5**: Students learn about Population genetics and pedigree analysis.

## CORE XV - HORMONES AND NEUROCHEMISTRY-BBO63 Credits-4

**CO1**: Get the deep knowledge about the classification, biosynthesis and degradation mechanism of hormones.

**CO2**: Learn about the biosynthesis and mode of action of thyroid hormone, pancreatic and adrenal hormones.

**CO3**: Gain the profound knowledge about the structure and function of brain, neurotransmitters with examples.

**CO4**: Students can get thorough knowledge in hormone chemistry and neurochemistry

**CO5**: Students learn about Structure of Brain and Neurotransmitters.

## ELECTIVE IV – BIOINFORMATICS-BBO64 Credits-3

**CO1**: Gain the knowledge about the history and development of different types of computers.

**CO2**: Learn the basic concepts of bioinformatics and its application in various field.

**CO3**: Understand the sequencing methods, database searching tools and Phylogenetic construction tools.

**CO4**: To obtain knowledge to take and submission process of protein and nucleotide sequence form the databases.

**CO5**: Student can learn the bioinformatics tool for the application of biological research

## B.SC. COMPUTER SCIENCE

## PROGRAMME SPECIFIC OUTCOMES FOR B.Sc. COMPUTER SCIENCE

**PSO1: Understanding of the basics of computer science.**

**PSO2: Apply fundamental principles and methods of Computer Science to a wide range of applications and mathematical and scientific reasoning to a variety of computational problems.**

**PSO3: Students have the opportunity to develop foundational skills to install and maintain computer networks, troubleshoot hardware and software problems.**

**PSO4: Design and implement software systems that meet specified design and performance requirements**

**PSO5: Apply advanced algorithmic and mathematical concepts to the design and analysis of software.**

**PSO6: Adhere to do higher studies or progress as an entrepreneur.**

**PSO7: Students gets the confidence to survive and get succeed in IT industry.**

**PSO8: Gets proficiency in the practice of computing, and to prepare them for continued professional development.**

**PSO9: Apply sound principles to the synthesis and analysis of computer systems**

**PSO10: Understands manage databases and develop web pages.**

## COURSE OUTCOME

### UCST11 - PROGRAMMING IN C (4)

CO1 Describes complete overview of structure, Data types, functions, control statements, pointers.
CO2 Handling 'Decision making & branching statements'
CO3 Allocation of array, structure & union
CO4 Work with pointers to identify the memory addresses
CO5 Able to implement function concept & storage classes

### UCST12 - DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION (4)

CO1 Impart the knowledge in the field of digital electronics
CO2 Design and realize the functionality of the computer hardware with basic gates and other components using combinational and sequential logic
CO3 Design digital circuits by simplifying the Boolean functions
CO4 Acquire knowledge about multiprocessor organization and parallel processing
CO5 Apply the association rules for mining the data
CO6 Able to trace the execution sequence of an instruction through the process
CO7 Understanding registers &BUS

### UCSA11 - DISCRETE MATHEMATICS (4)

CO1 Describes complete overview of set theory& relations equivalence
CO2 Handling 'truth table' and Logic Gates.
CO3 Working with Lagrange's theorem
CO4 Calculating matrices and linear equation
CO5 Working with partial ordering.

### UVAE11 - VALUE EDUCATION (3)

CO1 Describes value crisis & positive values & value erosion, Able to realize the family, material, human values.
CO2 Realize the value of cooperative living and social responsibility.
CO3 Aware of healthy behaviours.
CO4 Understand the rights and powers of women.

### UCST21 - PROGRAMMING IN C++ (4)

CO1 Describes complete overview of structure, Data types, functions, control statements, pointers.
CO2 Handling 'Decision making & branching statements'
CO3 Describes complete overview of Constructor and Destructor.
CO4 Work with pointers to identify the memory address.

### UEVS21 - ENVIRONMENTAL STUDIES (2)

CO1 Realize the Energy and environment
CO2 Using the resources of Environmental economics

CO3 How to manage Natural hazards and disaster management
CO4 Aware of Solid waste management
CO5 To impart knowledge of individual in conservation of natural resources

**UCST31 - FUNDAMENTALS OF DATA STRUCTURES (4)**

CO1 Upon completion of the course, the students are expected to:
CO2 Able to choose appropriate data structure as applied to specified problem definition.
CO3 To handle operations like Arrays, stack and queues etc. on various data structures.
CO4 How to apply concepts learned in various domains like linked list etc.
CO5 To use linear and non-linear data structures like Trees, Graphs

**UCSA32 - OPERATION RESEARCH (4)**

CO1 To Handle Mathematical Formation of Linear Programming.
CO2 To Understand Simplex Method & Artificial Variables for solving LPP.
CO3 To Cognize transportation Problem and Assignment Problem for optimization.
CO4 Making the students experts in finding the optimal solutions and networking problems through the Mathematical foundation techniques.

**UCSE31 - FUNDAMENTALS OF COMPUTER ALGORITHMS (3)**

CO1 Describes overview of computer algorithms to solve a problem
To Handling Dynamic programming
CO2 Understanding search& traversal techniques.
CO3 Understanding back tracking System.
CO4 Design & providing solution for Knapsack problem
CO5

**UCST41 - RELATIONAL DATABASE MANAGEMENT SYSTEMS (4)**

CO1 Describe about Database Language.
CO2 Understand the concepts of Database system Application.
CO3 Understand the concept of SQL.
CO4 Understand the concept of B Tree.
CO5 Working query evaluation and optimization.
CO6 Understand the concept of Transaction Management

**BCS32 - NUMERICAL METHODS (4)**

CO1 Describes overview of Algebraic equations
CO2 Handling direct and iterative method.
CO3 Working with Interpolation
CO4 Calculating Differentiation
CO5 Working with predictor corrector methods.

**UCST51 - SYSTEM SOFTWARE (4)**

CO1 To understand the execution process of HLL programs.

CO2 To understand the basic design of various system software
CO3 To implement various system software.

CO4 Aware of the evolution and fundamental principles of operating system, processes and their communication
CO5 know about file management and the distributed file system concepts in operating systems and understand the working principles of paging & segmentation
CO6 Working with Scheduling algorithms.

**UCST52- DATA MINING (4)**

CO1 Aware of the Functionalities, patterns, of operating system, processes and their communication
CO2 Design and deploy appropriate classification techniques
CO3 Use association rule mining for handling large data set.
CO4 Understand the concept of classification for the retrieval purposes
CO5 Know the clustering techniques in details for better organization and retrieval of data
CO6 Preprocess the data for mining applications

**UCST53 - SOFTWARE ENGINEERING (4)**

CO1 Describe the processes of software development
CO2 Understand and practice the various fields such as analysis, design, development, testing of Software Engineering
CO3 Develop software design and modules for real time system
CO4 Analyze verification & validation techniques
CO5 Enhancing the software maintenance from the plan to implementation
CO6 Describe configuration management & source code

**UCST54 - COMPUTER NETWORKS (4)**

CO1 Understand networking concepts and basic communication model.
CO2 Understand network architectures and components required for data communication
CO3 Analyze the function and design strategy of physical, data link, network layer and transport layer
CO4 Able to trace the flow of information from one node to
CO5 another node in the network
CO6 Identify the components required to build different types of networks

**UCST55 - MULTIMEDIA & ITS APPLICATION (4)**

CO1 Describe about Text and Graphics.
CO2 Understand the concepts of Digital Audio and Video
CO3 Understand the concept of Authoring Tools.
CO4 Understand the concept of multimedia and internet

**UCST61- JAVA & INTERNET PROGRAMMING (4)**

CO1 Describe java evolution-features-tokens & OOPS.
CO2 Understand the concepts and architecture of the World Wide Web
CO3 Understand the concept of Inheritance, Interface.
CO4 Creation of packages.

**UCST62 - WEB TECHNOLOGY (4)**

CO1 Create web pages using PHP
CO2 Identify the difference between the HTML PHP and XML documents.
CO3 Identify the engineering structural design of XML and parse tree
CO4 Analyze the difference between and PHP and XML.
**CO5** Understand the concept of JAVA SCRIPTS.

**UCST63 - COMPUTER GRAPHICS (4)**

CO1 Understand computational development of graphics
CO2 Provide in-depth knowledge of display systems, image synthesis shape modelling of 3D application.
CO3 Analyze the Line attribute & curve attribute
CO4 Design animation with rotation, translation and scaling
CO5 Working with CAD
CO6 Students are able to understand and develop own source code in the following concepts

## DEPARTMENT OF MATHEMATICS

## SEMESTER I

To enable the students to

**PSO 1:** Make use of linear equations for solving any differential equations.

**PSO 2:** Understand various problems related with planner graphs**.**

**PSO 3:** Understand the concepts of matrices and linear equations.

**PSO 4:** Learn properties of inverse Laplace transforms.

**PSO 5:** Correlate the linkage between technological development and basics sciences**.**

**PSO 6:** To Know a recent development in mathematical concepts and their applications.

**PSO 7:** Stimulate innate thinking ability of the students and thereby making them independent.

**PSO 8:** Correlate has a thirst for doing PG degree.

**COURSE OUTCOME (U.G)**

**UMTT11 – CALCULUS (4)**

**CO 1:**If a curve is define by parametric equation x =f( $\theta$ ) and y = $\phi(\theta)$ .prove that the curvature is $\frac{1}{\rho} = \frac{(x^1 y^{11} - y^1 x^{11})}{(x^{1^2} + y^{1^2})^{\frac{3}{2}}}$ .

**CO 2:**Evaluate $\int_0^1 \int_0^{\sqrt{1+x^2}} \frac{dydx}{\sqrt{1+x^2+y^2}}$

**CO 3:**Change the order of integration in the $\int_0^2 \int_{\frac{x^2}{a}}^{2a-x} xydxdy$ and evaluate it.

**CO 4:**Find the value of $\iint (x-y)^4 e^{x+y} dxdy$ where R is square with verties (0,1),(2,1),(1,2),(0,1) the sides of the square are x+y=1,x+y=3,x-y=1,x-y=-1, x+y=u, x-y=v

**CO 5:**If y = $\sin^{-1} x$ ,Prove that $(1-x^2)y_2 - xy_1 = 0 and (1-x^2)y_{n+2} - (2n+1)xy_{n+1} - n^2 y_n = 0$

**CO 6:**Show that in the parabola $y^2 = 4ax$ at the point (t)

$\rho = -2a(1+t^2)^{\frac{3}{2}}, x = 2a+3at^3, y = -2at^3$ deduce the equation of the evolute.

**CO 7:**Prove that $\int_0^{\pi} \theta \sin^3 \theta d\theta$

**CO 8:**Evaluate $\int_0^1 \int_0^{2y} (x+y)^2 dxdy$ over the area bounded by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

**CO 9:**Derive $I_{m,n} = \int x^m (\log x)^n dx$

**CO 10:**Given that x+y=u ,y=uv change the variable to u,v in the integral $\iint [xy(1-x-y)]^{\frac{1}{2}} dxdy$ taken over the area of triangle with the sides x=0,y=0,x+y=1 and evaluate it.

## UMTT12 - CLASSICAL ALGEBRA (4)

**CO 1:**Simplify or manipulate expressions involving polynomial, radical, rational, exponential, or logarithmic terms using appropriate properties and rules

**CO 2:**Use numeric or variable substitution while working with expressions

**CO 3:**Determine whether two expressions, functions, or equations involving polynomial, radical, rational, exponential, or logarithmic terms are equivalent and

a. Use appropriate strategies, properties, and rules to show they are the same, if equivalent
b. Find a counter example (i.e. an input where they differ in value or solution sets), if not equivalent

**CO 4:**Solve equations involving linear, polynomial, radical, rational, exponential, or logarithmic expressions

c. Utilize inverse functions or operators
d. Utilize factoring and the zero-product property

**CO 5:**State if a rule is a function and, if it is, determine if it has an inverse that is also a function and justify

**CO 6:**Determine if a function is linear, quadratic, exponential, or none of these and provide justification

e. Find a linear, polynomial, exponential, or logarithmic function with given graphical properties or a real-world situation (context)
f. Change the form of a linear, quadratic, or exponential function to one that more easily answers a given question

**CO 7:**Evaluate functions involving polynomial, radical, rational, exponential, or logarithmic expressions at given input values, or find input values that map to a given output value

**CO 8:** Learning the relation between roots and coefficients of equations symmetric roots

**CO 9:** Learning the reciprocal equation and solution of Numerical equation

## UMTT21 - ANALYTICAL GEOMETRY 2D & 3D (4)

**CO 1:** If the normal at L , one of the extremities of the latus rectum of the conic L/r =1+ecosθ Meets the curve again in Q. show that SQ=$l\frac{1+3e^2+e^4}{1+e^2-e^4}$

**CO 2:** If the normal at $\alpha, \beta, \gamma$ on L/r =1+cosθ meet in point $(\rho, \emptyset)$ show that

$$i) tan\frac{\alpha}{2} + tan\frac{\beta}{2} + tan\frac{\gamma}{2} = 0$$

$$ii) \alpha + \beta + \gamma = 2n\pi + 2\emptyset$$

**CO 3:** Given a plane $\pi$ , whose equation is ax+by+cz+d=0 to obtain the condition for the Line L. $\frac{X-X_1}{\lambda} = \frac{Y-Y_1}{\mu} = \frac{Z-Z_1}{V}$

(i)To be perpendicular the plane π

(ii)To be parallel to be π

(iii)To line in π

**CO 4:** If 'L' is the line $\frac{x}{-1} = \frac{y-1}{2} = \frac{z+2}{1}$ find the equation of the plane through 'L' which is parallel To the line of intersection of the planes 5x+2y+3z=4 and x-y+5z+6=0

**CO 5:** Find the equation of the sphere its has the centre on the plane 5x+y-4z+3=0 and passing Through circle$x^2 + y^2 + z^2 - 3x + 4y - 2z + 8 = 0, 4x - 5y + 3z - 3 = 0$

**CO 6:** Show that the plane 2x-y-2z=16 touches the sphere $x^2 + y^2 + z^2 - 4x + 2y + 2z - 3 = 0$ And find the point of contact.

**CO 7:** Find the equation of the right circular cylinder described on the circle through the points (a, 0, 0)(0, a, 0)(0, 0, a) as a guiding curve

**CO 8:** Find the equation of the cone whose vertex (1,1 ,1) and which passes through the Circle $x^2 + y^2 = 4\,, z = 2$

**CO 9:** Explain enveloping cone and to obtain the equation of the cone whose vertex is at $A_1(x, y, z)$ And which envelopes the sphere $s = x^2 + y^2 + z^2 - 9^2 = 0$

**CO 10:** To find the equation of the plane which touches the conicoids $s = ax^2 + by^2 + cz^2 - 1 = 0$ At $A_1(X_1, Y_1, Z_1)$

**UMTT22 - DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORM**

**(4)**

**CO 1:** Solve ( x2 + x ) p2 + ( x2 + x - 2xy ) p + y2 - xy = 0

**CO 2:** Solve ( yp2 + 2xp - y ) = 0

**CO 3:** Solve x2 ( ypx ) = yp2

**CO 4:** Solve e3x ( p - 1 ) + p3e2y = 0

**CO 5:** Solve for xp3 - 2x yp + 4y2 = 0

**CO 6:** Solve:Z = px + qy + $\sqrt{1 + p^2 + q^2}$

**CO 7:** Solve :$\frac{\partial^2 z}{\partial x^2}$ = a2 z given that when x=0 , $\frac{\partial z}{\partial x} = a \sin y$ and $\frac{\partial z}{\partial y} = 0$

**CO 8:** Form the p.d .eqestion by eliminating ∅ from

$i)\emptyset\ (x^2 + y^2 + z^2 , x + y + z) = 0$

$ii)\emptyset(x^2 + y^2 + z^2 , lx + my + nz) = 0$

**CO 9:**. By changing the independent variable by the relations r =x +at , s = x-at

show that the eqestion$\frac{\partial^2 y}{\partial t^2} = a^2 \frac{\partial^2 y}{\partial x^2}$ gets transform into the eqn

$\frac{\partial^2 y}{\partial r\, \partial s} = 0$ .Hence find a general soln of the P.D.E.

**CO 10:** 0. Solve:(x2-yz)P+(y2-zx)Q=z2-xy.

## UMTT31 - STATICS (4)

**CO 1:**. A uniform chain of length $l$ is to be suspended form tow point in the same horizontal line so that either terminal tension is $n$ times that at the lowest point. Show that the span must be $\frac{l}{\sqrt{n^2 - 1}} \log\left(n + \sqrt{n^2 - 1}\right)$

**CO 2:**

. Derive the equation of common catanery.

**CO 3:**

. .Explain the equilibrium of a body on a rough inclined plane under any force.

**CO 4:** .A uniform ladder is in equilibrium with one and resting on the ground and the other against a vertical wall; if the ground and wall be both rough, the coefficients of friction being $\mu$ and $\mu'$ respectively, and if the ladder be on the point of slipping at both ends, show that $\theta$, the inclination of the ladder to the horizon is given by $\tan\theta = \frac{1 - \mu\mu'}{2\mu}$ .

**CO 5:** Two beads of weights $w$ and $w'$ can slide on a smooth circular wire in a vertical plane. They are connected by a light string which subtends an angle $2\beta$ at the centre of the circle when the beads are in equilibrium on the upper half of the wire. Prove that the inclination of the string to the horizontal is given by $\tan\alpha = \frac{w - w'}{w + w'} \tan\beta$

**CO 6:** State and prove varigon's theorem.

**CO 7:**. Five equal forces acting along the sides AB, BC, CD, DE, EF of a regular hexagon. Find the sum of the moments of these forces about Q on AF at a distance x from A. Interpret the result and explain why it is so.

**CO 8:** Equals weights P and P are attached to two strings ACP and BCP passing over a smooth peg C. AB is a heavy beam of weight W, whose centre of gravity is 'a' ft, from A and 'b' ft. from B . Show that AB is inclined to the horizon at an angle

$$\tan^{-1}\left[\frac{a-b}{a+b}-\tan(\sin^{-1}\frac{W}{2p})\right]$$

**CO 9:**. A weight can be supported on a rough inclined plane by a force P acting along the plane or by a force Q acting horizontally. Show that the weight is $\frac{PQ}{\sqrt{(Q^2\sec^2\lambda - P^2)}}$ where $\lambda$ is the angle of friction.

**CO 10:**. Derive the equation of the common catenary

## UMTA32- ANCILARY MATHEMATICAL STATISTICS – I (4)

**CO 1:** Calculate karl person's coefficient of correlation between x and y for the following information N = 12 ; $\sum(x-8)^2 = 150$ $\sum X = 120$ $\sum(y-10)^2 = 200$

$\sum y = 130$ $\sum(x-8)(y-10) = 50$

**CO 2:** The first 4 moments of a distribution about the value 5 of a random variable are 2,20,40, and 50. Show that the mean is 7, variance is 16, $\mu_3$ is -64 and $\mu_4$ =162

**CO 3:** State and proof that tchebchevs inequality

**CO 4:** If $X_1, X_2, X_3 \ldots X_n$ are n independent random variables then,

var $(X_1 + X_2 + \ldots . X_n) = \text{var}(X_1) + \text{var}(X_2) + \ldots . \text{var}(X_n)$

**CO 5:** Find the expectation of the number of failures preceding the first success in a series of independent trials with constant probability of success p. Also find the standard deviation.

**CO 6:** Find the coefficient of correlation between x and y from the following data:

| x | 10 | 14 | 15 | 28 | 35 | 48 |
|---|---|---|---|---|---|---|
| y | 74 | 61 | 50 | 54 | 43 | 26 |

**CO 7:** The results of examination in 2 papers A and B for 20 candidates were as follows: candidates passed in paper A, 7 candidates passed paper B, 8 candidates failed in both paper A and B. If out of these candidates one is selected, what is the probability that he/she (1 )passed in both the papers,(2)failed only in A,(3)failed in A and B.

**CO 8:** A random variable x takes the value 1,2,3.....and p( x = n ) = $\frac{1}{2^n}$, n = 1,2,3..... Find (1) p( x is odd ) . (2) p( $x \leq 5$) (3) p( x is divisible by 5).

**CO 9:** A random variable x has the following probability function .

| X | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| P(x) | 0 | K | 2k | 2k | 3k | $k^2$ | $2k^2$ | $7k^2+k$ |

(i) Find K (ii) Evaluate (a) $p(x<6)$ (b) $p(x \geq 6)$ (c) $p(0<x<5)$

iii) If the minimum value of K (iv) Determine the distribution function of x

**CO 10:** The following table gives the age-distribution of the population and the number of unemployed in a town

| Age | No.of.persons in'000 | No.of unemployment |
|---|---|---|
| 20-30 | 40 | 400 |
| 30-40 | 55 | 1100 |
| 40-50 | 32 | 960 |
| 50-60 | 20 | 1600 |
| 60-70 | 8 | 1600 |

Find the coefficient of correlation r between the mid-values of the age groups and Percentages of unemployed in different age-constituents.

**UMTE31 VECTOR CALCULUS ,FOURIER SERIES AND FOURIER TRANSFORM (3)**

**CO 1:** Scalar and cross product of vectors in 2 and 3 dimensions represented as differential forms or tensors,

**CO 2:** The vector-valued functions of a real variable and their curves and in turn the geometry of such curves including curvature, torsion and the Frenet-Serre frame and intrinsic geometry,

**CO 3:** Scalar and vector valued functions of 2 and 3 variables and surfaces, and in turn the geometry of surfaces,

**CO 4:** Gradient vector fields and constructing potentials,

**CO 5:** Integral curves of vector fields and solving differential equations to find such curves,

**CO 6:** The differential ideas of divergence, curl, and the Laplacian along with their physical interpretations, using differential forms or tensors to represent derivative operations,

**CO 7:** The integral ideas of the functions defined including line, surface and volume integrals - both derivation and calculation in rectangular, cylindrical and spherical coordinate systems and understand the proofs of each instance of the fundamental theorem of calculus, and

**CO 8**:. Fourier series: Periodic, odd and even functions. Calculation of sine and cosine series. Simple applications concentrating on imparting familiarity with the calculation of Fourier coefficients and the use of Fourier series. The issue of convergence is discussed informally with examples.

## UMTT41 - DYNAMICS (4)

**CO 1:** A1 and A2 are tow fixed pulleys in the same horizontal line. A light string is placed over A2 and carries weighs W1 and W2 at its free. Another pulley B carrying a weight W3 is placed on the part of the string between A1 and A2. If A1 and A2 are so close together that all the portions of the string not in contact with the pulleys are vertical prove that when all the weights are in motion, the tension in the string is $4/w1^{-1}+w2^{-1}+4W3^{-1}$. Prove also that the condition that w3 shall remain at rest while ww1 and w2 are in motion is 4w1w2 = w3(w1+w2)

**CO 2:** Define Hooks law and work done in stretching an elastic string?

**CO 3:** Show that the path of a projection is a parabola.

**CO 4:** A Particle is thrown over a triangle from one end of a horizontal base and grazing vertex fall on the other end of the base. If A,B are the base angles and α the angle of projection show that the tanα= tanA+tanB.

**CO 5:** Show that for a given velocity of projection the maximum range down an inclined plane of inclination α bears to the maximum range up the inclined plane the ratio

$$\frac{1+\sin\alpha}{1-\sin\alpha}$$

**CO 6:** State and prove enveloping parabola.

A particle is projected so as to graze the tops of two parallel walls the first of height a at a distance b from the point of projection and second of height 'a' at a distance b from the point of projection. If the path of particle lines in the plane perpendicular to both the walls. Find the range on the horizontal plane and show that angle of projection exceeds $\tan^{-1}3$

**CO 7:** Find the loss of kinetic energy due to oblique impact of two smooth spheres?

**CO 8:** A particle is attached to the midpoint of an elastic string AB tightly stretched to tension T between two fixed points A and B. If the particle be pulled slightly in a direction perpendicular to AB and let go, Show that the period of vibration is $\pi\frac{\sqrt{m1}}{T}$ $where$ m = mass of the particle and l=AB.

**CO 9:** One end of and elastic string whose modulus of elasticity is λ and whose unstrected length is a fixed to a point on a smooth horizontal table and the other end is tied to a particle of mass m which is lying on the table. The particle is pulled to a distance where the extension of the string is b and the let go. Show that the time of completd oscillations is $2(\pi+2a/b)\sqrt{am}/\lambda$

**CO 10:** A particle is describing an ellipse of eccentricity e about a centre of force attracting as the inverse square of the distance and what at the apse further from the centre of force its speed is suddenly doubled with the direction of motion unchanged. Prove that if e<1/2, the new orbit will be a hyperbola of eccentricity 3-4e?

## UMTA42- ANCILARY MATHEMATICAL STATISTICS-II (4)

**CO 1:**Show that the following :

(a) If the probability distribution of a binomial random variable x with parameters (n,p) is denoted by $p[x=x]=B_i(x+1;n,p)$,prove p(x+1)=n-x/x+1.p/q.p(x).

(b) An unbiased coin is tossed eight times and the number of heads noted.The experiment is repeated 256 times and the following frequency distribution is obtained.

| No of heads | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | 2 | 6 | 30 | 52 | 67 | 56 | 32 | 10 | 1 |

Calculate the theoretical frequencies.

**CO 2:** If 10% of the screws produced by an automatic machine are defective find the probability that of 20 screws selected at random, there are

i) exactly two defectives,

ii) at the most three defectives

iii) atleast two defectives and

iv) between one and three defectives (inclusive).

Find also the mean, variance and skewness of the number of defective screws.

**CO 3:** Derive third ($\mu_3$),fourth ($\mu_4$) central moment in poission distribution.

**CO 4:** A manufacturer of pins knows that 2% of his products are defective. If he sells pins in boxes of 100 and guarantees that not more than 4 pins will be defective, what is the probability that a box will fail to meet the guaranteed quality?

($e^{-2}$=0.13534).

**CO 5:**. Let X be normally distributed with mean 8 and standard deviation 4.

Find i) $P(5 \leq X \leq 10)$

ii) $P(10 \leq X \leq 15)$

iii) $P(X \geq 15)$

iv) $P(X \leq 5)$

**CO 6:** The customer accounts of a certain department store an average balance of Rs. 120 and a standard deviation of Rs. 40. Assuming that the account balances are normally distributed , find

(i) What proportion of accounts is over Rs. 150?

(ii) What proportion of accounts is between RS.100 and Rs. 150?

(iii) What proportion of accounts is between Rs.60 and Rs. 90?

**CO 7:** Ten students are selected at random from a college and their heights are found to be 100,104,106,110,118,120,122,124,126and 128 cms. In the light of these data discuss the suggestion that the mean height of the students of the college is 110 cm.

The table value of t at 5% level for 8 df is 2.306 and for 9 df is 2.262 and 10 df is 2.228 for a two tail test

**CO 8:** A group of 5 patients treated with medicine A weight 42,39,48,60, and 41 kgs; A second group of 7 patients from the same hospital treated with medicine B weight 38,42, 56, 64,68 ,69 and 62 kgs. Do you agree with the claim that medicine B increases weight significantly. (The value of t at 5% level of significance for 10 df is 2.228)

**CO 9:** Time taken by workers in performing a job are given below

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Method I | : | 20 | 16 | 26 | 27 | 23 | 22 |
| Method II | : | 27 | 33 | 42 | 35 | 32 | 34 | 38 |

Test whether there is any significant difference between the variances of time distribution

**CO 10:**,Perform two way ANOVA for the data given numbers.

| | Treatment | | | |
|---|---|---|---|---|
| Plot of land | A | B | C | D |
| I | 38 | 40 | 41 | 39 |
| II | 45 | 42 | 49 | 36 |
| III | 40 | 38 | 42 | 42 |

Use coding method , subtracting 40 from the given numbers.

## UMTE42 - DISCREATE MATHEMATICS (3)

**CO 1:** .Briefly explains about conjunction and disjunction?

**CO 2:**. Explain tautologies.

**CO 3:** Briefly explain principal disjunctive normal forms?

**CO 4:** Write brief note on predicates?

**CO 5:** Explain the power set.

**CO 6:** Describe briefly about relation?

**CO 7:** Write the notes on types of grammar.

**CO 8:** Write the notes about the languages generated by a grammar.

**CO 9:** Write the notes on types of automata?

**CO 10:** Write the brief notes about finite automata?

## BMA51 - MODERN ALGEBRA - I (4)

**CO 1:** (i)For any three sets A,B,C prove that

(a) A$\cap (B \cup C) = (A \cap B) \cup (A \cap C)$

(b) $A \cup (B \cap C) = (A \cup B) \cap (A \cap C)$.

(ii) Write the De-Morgan's Law.

**CO 2:** State and prove Lagrange's theorem for finite group.

**CO 3:** State and prove sylow's theorem for abelian group.

**CO 4:** (i)If G is a group then A(G) is the set of automorphism of G is also a group.

(ii) State and prove cayley's theorem.

**CO 5:** Prove that a finite integral domain is a field.

**CO 6:** If R is a commutative ring with unit element and M is an ideal of R ,then M is a maximal ideal of R iff R/M is a field.

**CO 7:** If S has more than Two elements we can find two elements $\sigma, \tau$ in A(S) such that $\sigma \circ \tau \neq \tau \circ \sigma$

**CO 8:** If G is a group then

a) the Identity element of G is Unique

b) Every a ∈ G has a unique inverse in G.

c) For every a∈ G $(a^{-1})^{-1} = a$

d) For all a ,b ∈ G,$(a \cdot b)^{-1} = b^{-1} \cdot a^{-1}$

**CO 9:**. A non-empty subset H of the group G is a subgroup of G iff

(i) a, b ∈ H implies that $a \cdot b \in H$

(ii) a ∈ H implies that $a^{-1} \in H$

**CO 10:** State and prove Fundamental theorem of homomorphism.

## BMA52 - REAL ANALYSIS – I (4)

**CO 1:** If $x$ & $y$ denote points in $R^n$, then prove the following properties

(i) $\|x\| > 0$ & $\|x\| = 0$ *iff* $x = 0$.

(ii) $\|ax\| = |a|\|x\|$ for every real $a$.

(iii) $\|x - y\| = \|y - x\|$.

(iv) Cauchy- Schwarz inequality.

(v) Triangle inequality.

**CO 2:** Prove that (i) The union of any collection of open sets is an open set.

(ii) If $A$ is open & $B$ is closed then prove that $A - B$ is open & $B - A$ is closed.

**CO 3:** State and prove Lindelof Covering Theorem.

**CO 4:** If $S$ be a compact subset of a Metric space $M$ then Prove that (i) $S$ is closed & bounded.

(ii) Every infinite subset of $S$ has an accumulation point in $S$.

**CO 5:** Prove that in any Metric space $(S, d)$ every compact subset $T$ is complete.

**CO 6:** Prove that in Euclidean space $R^k$ every Cauchy sequence is convergent

**CO 7:** State and Prove Bolzano- Weierstrass theorem

**CO 8:** If $S$ be a subset of $R^n$, then prove that the following are equivalent

(i) $S$ is compact

(ii) $S$ is closed and bounded

(iii) Every infinite subset of $S$ has an accumulation point in $S$

(iv) State and Prove Cauchy- Schwarz inequality.

**CO 9:** i) Prove that every subset of a countable set is countable.

(ii) Prove that the set of all real numbers is uncountable.

**CO 10:** State and prove Heine Borel Theorem.

## BMA53 - COMPLEX ANALYSIS - I (4)

**CO 1:** State and prove C-R equation in polar co- ordinates

S.T In a compact set every continuous function is uniform continuous (i.e., In a bounded closed region a continuous function is uniformly continuous)

**CO 2:** State and prove that Cauchy's fundamental theorem

**CO 3:** Suppose f(z) is an analytic function in a simply connected region D and A(a) and B(b) are two points in D. Let C be any arbitrarily chosen simple rectifiable arc in D from A to B.

Then the integral $\int_C f(z)dz$ does not depend on C but depends on a and b

**CO 4:** State and prove Goursat's lemma

**CO 5:** State and prove cauchy's formula for first derivative

**CO 6:** Suppose $f(z) = u(x, y) + i\,v(x, y)$ is a single valued function defined in a neighbourhood of $z_0 = x_0 + i\,y_0$. Then the necessary condition for the differentiability of $f(z)$ at $z_0$ is the existence of the partial derivative $u_x, u_y, v_x, v_y$ at $(x_{0,}, y_0)$, which satisfy the relations .

$u_x = v_y; u_y = -v_x$

**CO 7:** Explain stereographic projection

**CO 8:** suppose i) D is a region, ii) $f_1(z) + f_2(z) + ...$ is a series univformly convergent in every compact region in D , whose sum is f(z)and iii) $f_n(z)$ is analytic in D (n=1,2,3,4…) then i) the sum function f(z) is analytic in D and ii) $f_1(z) + f_2(z) + ... = f(z)$ can be differentiated term by term any number of times

**CO 9:** If l(c is the length of the simple rectifiable arc C and if max $|f(z)|$ on C and if max $|f(z)|$ on C is M,then show that $\left|\int_C f(z)dz\right| \le M\ l(C)$

## BMA54 - OPERATION RESEARCH –I (4)

**CO 1:** Solve the following A.P

| | S1 | S2 | S3 | S4 |
|---|---|---|---|---|
| P1 | 2 | 10 | 9 | 7 |
| P2 | 15 | 4 | 14 | 8 |
| P3 | 13 | 14 | 16 | 11 |
| P4 | 4 | 15 | 13 | 9 |

**CO 2:** Formulate the travelling salesman problem as an assignment problem.

**CO 3:** Explain graphical method of solving $(2\times n)$ game.

**CO 4:** Solve the following game using dominance property.

| | | A | | |
|---|---|---|---|---|
| | | I | II | III |
| B | I | 1 | 7 | 2 |
| | II | 6 | 2 | 7 |
| | III | 6 | 1 | 6 |

**CO 5:** Use Big M Method to solve

$Maxz = 6x_1 + 4x_2\ s.t$

$2x_1 + 3x_2 \le 30,\ 3x_1 + 2x_2 \le 24,\ x_1 + x_2 \ge 3$

$x_1, x_2 \ge 0$

**CO 6:** Use two phase method to solve the L.P.P

$Maxz = 5x_1 + 3x_2\ s.t$

$2x_1 + x_2 \le 1, x_1 + 4x_2 \ge 6$

$x_1, x_2 \ge 0$

**CO 7:** Solve the T.P

| | To | | | $a_i$ |
|---|---|---|---|---|
| | W1 | W2 | W3 | |
| From F1 | 16 | 20 | 12 | 200 |
| F2 | 14 | 8 | 8 | 160 |
| F3 | 26 | 24 | 16 | 90 |

**CO 8:** Solve the following T.S.P

| $b_j$ | | To 180 | 120 | 150 | |
|---|---|---|---|---|---|
| | | A | B | C | D |
| From | A | - | 46 | 16 | 40 |
| | B | 41 | - | 50 | 40 |
| | C | 82 | 32 | - | 60 |
| | D | 40 | 40 | 36 | - |

**CO 9:** Solve the following L.P.P by Dual simplex method

$Maxz = -4x_1 - 6x_2 - 18x_3\ s.t$

$x_1 + 3x_3 \geq 3,\ x_2 + 2x_3 \geq 5,\ x_1, x_2, x_3 \geq 0$

**CO 10:** Solve the game graphically

$$\begin{array}{c} \\ A \end{array} \begin{array}{c} B \\ \begin{pmatrix} 3 & 3 & 4 & 0 \\ 5 & 4 & 3 & 7 \end{pmatrix} \end{array}$$

## BMA55 - NUMERICAL METHODS (4)

**CO 1:** Find the positive root of $e^x = 3x$ by bisection method.

**CO 2:** Solve the following system of equation by Gauss Elimination Method.

x + y +z= 6 ,3x + 3y + 4z = 20 , 2x + y +3z = 13.

**CO 3:** Using the method of False Position Method, Find the root between 1 and 2 correct to two decimal places for the equation $x^3 - x - 1 = 0$.

**CO 4:** Find the $7^{th}$ term of the sequence 2 ,9 , 28, 65, 126, 217 and also find the general term.

**CO 5:** Find the value of y at x =21 by using Gregory newton forward formula

X: 20 23 26 29

Y: 0.3420 0.3907 0.4384 0.4848

**CO 6:** Using stirling's formula , find y(1.22) from the following table

X : 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8

Y :0.8417 0.89121 0.93204 0.96356 0.98545 0.99749 0.99957 0.99385 0.97385

**CO 7:** Using Gauss backward interpolation formula find the population for the year 1936 given that

X : 1901 1911 1921 1931 1941 1951

Y: 12 15 20 27 39 52

**CO 8:** Using Lagrange 's interpolation formula, find y(10) from the following data

| | | | | |
|---|---|---|---|---|
| X : | 5 | 6 | 9 | 11 |
| Y : | 12 | 13 | 14 | 16 |

**CO 9:** Using newton's divided difference formula find the values of f(2),f(8),f(15) given the following table,

| **X** | **4** | **5** | **7** | **10** | **11** | **13** |
|---|---|---|---|---|---|---|
| **Y** | **48** | **100** | **294** | **900** | **1210** | **2028** |

**CO 10:** Find the values of y at x=21 and x=28 from the following data

| X | 20 | 23 | 26 | 29 |
|---|---|---|---|---|
| Y | 0.3420 | 0.3907 | 0.4384 | 0.4848 |

## BMA61 - MODERN ALGEBRA – II (4)

**CO 1:** Show that Let V be a vectors space of dimensions n,then any set of m vectors where $m > n$ is linearly independent ie) any set of m vectors where m < n cannot span V

**CO 2: If** $v_1, v_2, ..., v_m \in V$ are linearly independent and if $v \in V$ is not in their linear span , $v_1, v_2, ..., v_m, v$ are linearly independent

**CO 3:** Let V and W be a vector spaces over a field F: let $T : V \to W$ be an isomorphism then show that T maps a basis of V onto basis of W

**CO 4:** $F^n$ is isomorphic to $F^m$ if and only if $n = m$.

**CO 5:** If $v$ is a vector space over $F$ and if $w$ is a subspace of $v$ then $v/w$ is a vector space over $F$, where $v_1 + w, v_2 + w \in v/w$ and $\alpha \in F$ then prove the following

(i) $(v_1 + w) + (v_2 + w) = (v_1 + v_2) + w$

( ii) $\alpha(v_1 + w) = \alpha v_1 + w$.

**CO 6:** Prove that $(AB)^t = B^t A^t$

**CO 7:** Expand $(A+B)^2$ for $A = \begin{bmatrix} 1 & 2 \\ 2 & 0 \end{bmatrix}$; $B = \begin{bmatrix} 3 & -1 \\ 1 & 0 \end{bmatrix}$

**CO 8:** state and prove that schwartz inequality

**CO 9:** state and prove that Triangle inequality

**CO 10:** Show that hermitian $H$ is uniquely expressible as $A+iB$ where $A$ is real symmetric and $B$ is real skew symmetric.

## BMA62 - REAL ANALYSIS – II (4)

**CO 1:** If $f \in R(\alpha)$ on $[a,b]$ then $a \in R(f)$ on $[a,b]$ so prove that

$$\int_a^b f(x)d\alpha(x)+\int_a^b a(x)df(x)= f(b)\alpha(b)- f(a)\alpha(a).$$

**CO 2:** Prove that every open connected set in $R^n$ is arcwise connected.

**CO 3:** State and prove Heine theorem.

**CO 4:** Prove that $f$ is of bounded variation on $[a,b]$ if and only if $f$ can be expressed as the difference of two increasing function.

**CO 5:** State and prove Bolzano's theorem

**CO 6:** State and prove Fixed point theorem.

**CO 7:** **i)** Derive Rolle's theorem.

**(ii)** Obtain Mean Value theorem.

**CO 8:** State and prove Taylor's formula with remainder.

**CO 9:** Derive chain rule for derivatives.

**CO 10:** Write all the Linear properties of Riemann Stiltjes Integral.

## BMA63 - COMPLEX ANALYSIS – II (4)

**CO 1:** Find the taylor's series to represent $\dfrac{z^2-1}{(z+2)(z+3)}$ in $|z|<2$

**CO 2:** Find the poles of $f(z)=\dfrac{z^2+4}{z^3+2z^2+2z}$ and determine the residue at the poles

**CO 3:** Evaluate $\displaystyle\int_0^{2\pi}\frac{d\theta}{5+4\sin\theta}$

**CO 4:** State and prove that maximum module theorem

**CO 5:** State and prove that laurents series expansion

**CO 6:** State and prove that Cauchy's residues theorem

**CO 7:** Prove that $\displaystyle\int_0^{\infty}\frac{dx}{x^6+1}=\frac{\pi}{3}$ using the method of contours integrations evaluate

$$\int_{-\infty}^{\infty}\frac{x^2}{(x^2+1)(x^2+4)}dx$$

**CO 8:** Prove that $I = \int_0^{\pi} \frac{a\, d\theta}{a^2 + \sin^2\theta} = \frac{\pi}{\sqrt{a^2+1}} (a > 0)$

**CO 9:** State and prove that taylor's series

**CO 10:** State and prove that fundamental theorem of algebra

## BMA64 - OPERATIONS RESEARCH – II (4)

**CO 1:** Find the optimum order quantity for a product for which the price breaks are as Follows:

| Quantity | Unit Cost (Rs) |
|---|---|
| 0<Q <500 | 10.00 |
| 500<Q | 9.25 |

**CO 2:** The cost of a new machine is Rs.5,000 Maintenance cost of the year is Cn = 500(n-1), n=1,2,3.... Discount rate per year is 0.5. After how many years it Will be economical to replace the machine by a new one?

**CO 3:** Explain: PERT algorithm.

**CO 4:** Explain the procedure for the critical path method.

**CO 5:** Solve the following LPP:

$$Max\, z = 2x_1 + 3x_2$$
$$S\,t\,c\; -3x_1 + 7x_2 \le 14$$
$$7x_1 - 3x_2 \le 14$$
$$x_1, x_2 \ge 0$$

**CO 6:** For the mode, (M/M/1): (∞/FIFO) derive the steady-state difference equations and solve them.

**CO 7:** The annual demand of a product is 10,000 units, annual holding cost is 20% of the Average inventory value and the ordering cost is Rs.100 per order. The normal Price charged by the supplier is Rs.10 per unit. A discount of 2% is allowed On an order for atleast 1000 units. The discount rate will be raised to 5% if the Order is for 2500 units or more. Determine the most economical order quantity.

**CO 8:** As Pipeline is due for repairs. It will cost Rs.10,000 and last for 3 years. A new Pipe line laid at a cost of Rs.30.000 lasts for 10 years. Assuming cost of capital to be 10% which alternative should be chosen?

**CO 9:** Draw the network diagram. Calculate the variance to each activity, critical path and expected project length for the following information:

| Activity: | 1-2 | 2-3 | 2-4 | 3-5 | 4-6 | 5-6 | 5-7 | 6-7 |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Pessimistic time: | 3 | 9 | 6 | 8 | 8 | 0 | 5 | 8 |
| Most likely time: | 3 | 6 | 4 | 6 | 6 | 0 | 4 | 5 |
| Optimistic time: | 3 | 3 | 2 | 4 | 4 | 0 | 3 | 2 |

**CO 10:** Derive Wilson's formula for inventory problem with no shortages.

## BMA65 - GRAPH THEORY (4)

**CO 1:** A simple graph (i.e,a graph with out parallel edges or self loops )with n vertices and K components can have at most (n-k)(n-k+1)/2 edges.

**CO 2:** A given connected graphs G is an Euler graphs if and only if all vertices of G are even degree.

**CO 3:** Every connected graph has atleast one spanning tree.

**CO 4:** Explain circuit matrix of a digraph and incidence matriz of a digraph with example.

**CO 5:** Every circuit has an even number of edges in common with any cutest

**CO 6:** Define Euler digraphs and also show that a diagraph G is an Euler digraph if and only if G is connected and is balanced (i.e., $d^-(V)=d^+(V)$ for every vertex V in G).

**CO 7:** If a graph (connected or disconnected) has exactly two vertices of odd degree, there must be a path joining these two vertices.

**CO 8:** A graph G is disconnected if and only if its vertex set V can be partitioned into two non empty disjoint subset $V_1$ and $V_2$ such that there exists no edges in G whose one end vertex is in subset $V_1$and the other in subset $V_2$.

**CO 9:** A tree with n vertices has n-1 edges.

**CO 10:** Every tree has either one or two centres.

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**B.COM (COMPUTER APPLICATION)**

**PSO 1: Helps students in building a concrete footing for advanced studies in Commerce and to stand with the requirement of business sector, insurance, banking seeking youth fit for employment.**

**PSO 2: Students completing this programme will be able to develop managerial knowledge and tactical dexterity, with a broader skill set and encourages them to seek out audacious, innovative solutions for today's business.**

**PSO 3: Completion of this programme will also enable the students to formulate business problems and provide innovative solutions thus, molding them into future visionaries, management leaders that are compassionate yet efficient**

**PSO 4: Obtain the practical application exposure on MS-office and oracle software.**

**PSO 5: Students undergoing this programme will be equipped to the world of work, particularly, work of the future. The student will get a first-hand exposure of working in the real world**

**PSO 6: Take up professional examination/ Such as CAIIB, ACS, and ICWA, CA etc.**

**PSO 7: Prepare for pursuing PG Degree.**

## COURSE OUTCOME

### UCOC11 - FINANCIAL ACCOUNTING – I (4)

**CO 1:** What are the advantages of accounting?

**CO 2:** How is accounting information used by Internal & External users?

**CO 3:** Explain the Concepts and Conventions.

**CO 4**: Three column cash book (Problem)

**CO 5:** Trail Balance (Problem)

**CO 6**: Depreciation – Annuity (Problem)

**CO 7:** Sinking fund(problem)

**CO 8**: Insurance policy method (Problem)

**CO 9**: Final Accounts -5 or 6 Adjustment (Problem)

**CO 10**:Receipts & payment a/c (or) Income & Expenditure a/c with balance sheet. (Problems)

### UCOC12 - BUSINESS APPLICATION OF MS-OFFICE (PRACTICAL) (4)

**CO1** Bio –Data in MS Ward

**CO2** Text Formatting And Table in MS Ward

**CO3** .Minutes For MD Meeting in MS Ward

**CO4** Mail Merge in MS Ward.

**CO5** Calculate Student Mark Details in MS Excel

**CO6** Create Years Sales Of Two Company in MS Excel

**CO7** Create New Car Model in MS Power point

**CO8** Advertisement Of Our College in MS Power Point.

**CO9** Form Design in MS Access.

**CO10** Generate Report in MS Access.

### UCOA11 - INDIAN ECONOMY (4)

**CO1** What are the features of Indian economy?

**CO2** What measures the government is required to take to remove poverty in india?

**CO3** Describe briefly the impact of green revolution.

**CO4** Discuss the role of agriculture in India

**CO5** Explain and analyze the features on new industrial policy of 1991.

**CO6** Explain the various causes for industrial sickness in India.

**CO7** Explain the remedies of unemployment.

**CO8** Explain "employment generation programmes".

**CO9** Explain the term W T O.

**CO10** Explain the importance and the difficulties of measuring the national income.

**UCOC21- FINANCIAL ACCOUNTING – II (4)**

**CO1** Consignment (Problem)

**CO2** Joint Venture (Problem)

**CO3** What is 'Memorandum' Joint Venture Account"?

**CO4** Single Entry System (Problem)

**CO5** What is single entry? What are its salient features?

**CO6** Bill of Exchange (Problem)

**CO7** What is retiring a bill under rebate?

**CO8** Branch Account (Problem)

**CO9** Different types of Branches and its feathers.

**CO10** Department Accounts (Problem)

**UCOC22 - WEB DESIGNING USING HTML (PRACTICAL) (4)**

**CO1:** Simple webpage using heading tags.

**CO2:** Image with webpage.

**CO3:** Formatting text with physical syles.

**CO4:** Greeting card using marquee tags.

**CO5:** Hyper link using text.

**CO6**: Hyper link using image.

**CO7** Ordered list.

**CO8:** Unordered list.

**CO9:** Frames

**CO10:** Creating webpage for our college.

**UCOA22 - BUSINESS ETHICS (4)**

**CO1:** What are the needs of environmental ethics?

**CO2:** Elaborate the various types of values .what is the difference between moral and values?

**CO3:** Why we need Ethics in Marketing?

**CO4:** Recognise and resolve ethical issues in business;

**CO5**: Re-examine their knowledge of business and economic concepts from an ethical perspective;

**CO6:** Explain and illustrate the importance, for business and the community, of ethical conduct;

**CO7:** What is corporate governance? Write the need of corporate governance
**CO8**: Explain the work place environment.
**CO9**: What is Consumer Protection in marketing?
**CO10**: Examine the conceptual analysis of consumer production act 1986 in India.

## PROGRAMME SPECIFIC OUTCOMES FOR B.COM

**PSO 1: Study the general concepts, principles theories and arguments of selected areas and the core disciplines of economics, commerce and business.**

**PSO 2: Contribute positively to the development of organization and society, particularly in relation to business, economics and commercial problems.**

**PSO 3: To make the students as a specialists decision makers and social entrepreneurs in the field of commerce.**

**PSO 4: Understand and participate in the modern business and economic world.**

**PSO 5: Groom themselves so as to become potential employers/Executives.**

**PSO 6: Take up professional examination/ Such as CAIIB, ACS, and ICWA, CA etc.**

**PSO 7: Prepare for pursuing PG Degree.**

## COURSE OUTCOME

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**CO 10**:Receipts & payment a/c (or) Income & Expenditure a/c with balance sheet. (Problems)

### UCOC12 - BUSINESS ORGANISATION (4)

**CO1** Describe the qualities of a good business man.

**CO2** What are the various stages in the evolution of industry?

**CO3** What are the Characteristics of an ideal form of organization?

**CO4** Distinguish between a co-operative society and a joint stock company.

**CO5** Explain the term 'Optimum Firm'. Discuss the factors determining the optimum firm.

**CO6** Explain the large scale of firms.

**CO7** Describe the special problems of Public utilities.

**CO8** State the salient features of industrial policy in India.

**CO9** Describe the characteristics and management problems of NGO.

**CO10** What is organization in the public enterprises?

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**CO9** Different types of Branches and its feathers.

**CO10** Department Accounts (Problem)

**UCOC22 - BUSINESS ECONOMICS (4)**

**CO1:** Write the scope and objectives of business economics?

**CO2:** Explain the law of return to scale
**CO3:** Narrate the law of demand and demand curves

**CO4:** Short note on the elasticity of demand?

**CO5:** What are the factors determinants the demand?

**CO6**: Explain the relationship between the price and elasticity of demand

**CO7** Write the concepts of total product, average product and marginal product
**CO8:** Explain the differences between the fixed and variable factors
**CO9:** Explain the law of variable proportion

**CO10:** State the factors of production and their characteristics

**UCOA22 - BUSINESS ETHICS (4)**

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**CO8**: Explain the work place environment.
**CO9**: What is Consumer Protection in marketing?
**CO10**: Examine the conceptual analysis of consumer production act 1986 in India.

**UCOC31 – MARKETING (4)**

**CO1:** What is the importance of modern marketing?

**CO2:** What are the classifications of market?

**CO3:** What is the importance of production planning?

**CO4:** What are the advantages and disadvantages of the branding?

**CO5:** What are the factors influencing price decisions?

**CO6**: Explain "pricing policy".

**CO7:** What are the importance of physical distribution?

**CO8:** Discuss the recent trends in retailing.

**CO9:** What are the duties and responsibility of salesman?

**CO10:** What are the kinds of sales promotion?

**UCOA33 - BUSINESS STATISTICS (4)**

**CO1:** What is the scope or importance or uses of statistics?

**CO2:** Explain different methods of Sampling.

C**O3:** What are the various methods of collecting primary data?

**CO4;** What are the various types Diagram?

**CO5:** Problem from Mean.

**CO6:** Problem from Skewness.

**CO7:** Problem from Rank correlation.

**CO8:** Problem from Group data (Regression).

**CO9:** Explain the following: a) Laspeyer’s b) Paasche’s c) Fisher’s Ideal Index d) Marshall

Edge worth e) Bowley's and f) Kelly's methods

**CO10:** Problem from Indices

**UCOE31: COMPUTER APPLICATION IN BUSINESS (3)**

**CO1**: Enumerate the primary and secondary memory.

**CO2:** Explain output devices and input device.

**CO3:** write the various types of operating system.

**CO4:** Write the various function of operating system. Explain

**CO 5:** How do you work with table in word document.

**CO6:** How do you create table in MS ward ?

**CO7:** Explain the types of internet connections.

**CO8**: Explain the web protocol

**CO9:** Explain the E-Commerce - Payment Systems.

**CO10**: Explain the business model.

**UCOC41: BUSINESS FINANCE (4)**

**CO1:** Explain the objectives of financial management.

**CO2:** State the function of financial manager.

**CO3:** Narrate the steps involved in raising long term loans from financial institution.

**CO4:** Explain the factors that determine the working capital needs of a firm.

**CO5:** Problems from working capital.

**CO6:** Problem from cash budget.

**CO7:** Discuss the issues, challenges and function of modern financial management.

**CO8:** Explain the different sources of short term finance with example.

**CO9:** What are the procedure followed for finance of export trade by commercial bank?

**CO10:** Explain the difference source of long term finance in detail.

**UCOC42 – AUDITING (4)**

**CO1:** Explain the qualification and qualities of an audit?

**CO2:** Discuss the advantages of audit? The types of errors?

**CO3:** Explain the different types of Audit

**CO4:** State the merits and demerits of auditing.

**CO5:** What are the difference between Internal and statutory audit?

**CO6**: Narrate receipts side of cash book vouching?

**CO7:** Explain payment side of cash book vouching?

**CO8:** What are the powers and duties of an auditor?

**CO9:** Explain various liabilities of an auditor?

**CO10:** Discuss the various classification of investigation.

**UCOA44 - COMPANY SECRETARIAL PRACTICE (4)**

**CO1:** What are the character of a joint stock company?

**CO2**: Elaborate the qualities and position of the company secretary.

**CO3:** What are the duties and rights of the company secretary?

**CO4:** What are the difference between public company and private company?

**CO5:** What are the duties of secretary in connection with incorporation of a company?

**CO6**: Explain different kinds of company.

**CO7:** Enumerate the various function of company secretary.

**CO8:** Discuss the different stages involved in promotion of a company.

**CO9:** What are the types of mitting's of a company

**CO10:** Explain the duties of a company secretary with a regard to preparation of minutes.

**UCOE42- BUSINESS MATHEMATICS (3)**

**CO1:** What are the features of discounting bill?

**CO2:** Problems

**CO3:** Explain the various types of permutation

**CO4:** Problems

**CO5:** State Newton's formula for equal intervals and assumptions underlying it.

**CO6**: Problems

**CO7:** What is probability and its importance.

**CO8:** Problems

**CO9:** What is binomial distribution and its main characteristics?

**CO10:** Problems.

**BCO51 : PARTNERSHIP ACCOUNTING (4)**

**CO1:** Simple problem to calculate the interest on capital.

**CO2:** Sum to prepare the P/L appropriation account.
**CO3:** Sum A

**CO4:** What are the factors affecting the value of goodwill?

**CO5:** What are the various methods for valuation of goodwill?
**CO6:** Problem from joint life policy.
**CO7:** Sum from insolvency of a partner using Garner Vs Murray case.
**CO8:** Sum from Piecemeal distribution of cash.
**CO9:** Sum from a sale to a firm.
**CO10:** Comprehensive problem from amalgamation of firm and sale to a company.

**BCO52 : COST ACCOUNTING(4)**

**CO1:** Simple problem to calculate the interest on capital.
**CO2:** Sum to prepare the P/L appropriation account.
**CO3:** Sum from guarantee

**CO4:** What are the factors affecting the value of goodwill?
**CO5:** What are the various methods for valuation of goodwill?
**CO6:** Problem from joint life policy.
**CO7:** Sum from insolvency of a partner using Garner Vs Murray case.
**CO8:** Sum from Piecemeal distribution of cash.
**CO9:** Sum from a sale to a firm.
**CO10:** Comprehensive problem from amalgamation of firm and sale to a company.

**BCO53: INCOME TAX LAW AND PRACTICE (4)**

**CO1:** Briefly explain any ten incomes which are exempted from tax u/ s/ 10.

**CO2:** Problem – residential status.

**CO3:** Problem – Income from salary.

**CO4:** Problem – Income from house property

**CO5:** Problem – Income from business.

**CO6:** Problem – Income form profession.

**CO7:** Problem – Capital gain.

**CO8:** Problem – LTCG

**CO9:** Problem – Income from other sources.

**CO10:** Explain the deductions in respect of receipts and payments.

.

**BCO54 :AUDITING(4)**

**CO1:** Explain the qualification and qualities of an audit ?
**CO2:** Discuss the advantages of audit ?the types of errors ?
**CO3:** Explain the different types of Audit

**CO4:** state the merits and demerits of auditing.
**CO5:** What are the difference between Internal and statutory audit?
**CO6:** Narrate receipts side of cash book vouching ?
**CO7:** Explain payment side of cash book vouching ?
**CO8:** What are the powers and duties of an auditor ?
**CO9** Explain various liabilities of an auditor ?
**CO10:** Discuss the various classification of investigation.

**BCO55 : BUSINESS MANAGEMENT (4)**

**CO1:** Explain modern approaches to decision making under uncertainty
**CO2:** What do you mean by planning? Explain the various types of planning.
**CO3**: Explain in details the role and functions of human resource management.
**CO4**: Describe the various forms of organizational structure
**CO5**:Explain the principles of FW Taylor theory.
**CO6** Explain different styles of leadership based on authority.
**CO7:**Discuss the major tests that used in selection. What are the benefits and problems in using selection?
**CO8:** Discuss the importance of communication in a modern industrial organization
**CO9:** Explain in detail the maslow's needs hierarchy theory of motivation.
**CO10:** Explain the barriers of communication in on organization.

**BCO56 : RETAIL MANAGEMENT (4)**

**CO1:** Discuss the various types of retail location.

**CO2:** Explain the important elements of brand management

**CO3:** Explain the factors affecting consumer decision.

**CO4:** Discuss the channels of retailing.

**CO5:** Define the consumer behavior. List the characteristics of shopping behavior.

**CO6:** Explain the steps involved in developing retail strategy.

**CO7:** Explain various types of retail laden.

**CO8:** What are the factors which affect the behavior of retail shopper?

**CO9** Discuss the elements of stores design.

**CO10:** Explain stores layout planning.

**BCO61 : CORPORATE ACCOUNTING (4)**

**CO1:** Problem from issue of shares .

**CO2:** Simple problem from redemption of preference shares.

**CO3:** Problem from valuation of goodwill.

**CO4:** .Problem from valuation of shares.\

**CO5:**.Problem from company final accounts.

**CO6:**.Problem from profit prior to incorporation.

**CO7:** Problem from amalgamation.

**CO8:**Problem from internal reconstruction.

**CO9:**.Problem from underwriting of shares.

**CO10** Explain the various kinds of company

**BCO62 : MANAGEMENT ACCOUNTING (4)**

**CO1:** Problem from ratio analysis.
**CO2:** Problem from financial statement analysis.
**CO3:** Problem from fund flow. Cash flow statement.
**CO4:** Explain how funds from operation are calculated.
**CO5:** What do you mean by break even analysis? Enumerate the merits and demerits.
**CO6:** Problem from marginal costing.
**CO7:** Problem from Labour and overheads standard costing.
**CO8:** Problem from make or buy decision.
**CO9:** Distinguish between financial accounting and management accounting.
**CO10:** Problem from cash flow statement.

**BCO63: INCOME TAX LAW AND PRACTICE –II(4)**

**CO1:** Problem : Individual.

**CO2:** Problem : HUF.

**CO3:** What are the various types of authorities? Describe briefly their powers.

**CO4:** Problem: Deductions.

**CO5:** Problem: Firm.

**CO6:** Problem: Set-off &carried forward.

**CO7 :** Problem: Company.

**CO8:** What are the various types of assessment?

**CO9:** Problem: Total income.

**CO10:** Explain the procedure for assessment of firm.

**BCO64: COMPANY LAW(4)**

**CO1:** What is public company? Distinguish it from a private company.

**CO2:** Define a promoter . Explain his duties, functions and legal position.

**CO3:** Discuss the various stages in the formation a company.

**CO4:** Briefly describe the legal effects of memorandum and articles.

**CO5:** What is prospectus?. What are is requirements?

**CO6:** Explain the various kinds of shares along with merits and demerits.

**CO7 :** Enumerate the duties and liabilities of directors.

**CO8:** Write a essay on managerial remuneration.

**CO9:** Enumerate the duties and liabilities of a company secretary.

**CO10:**Discuss about the corporate governance.

**BCO65 INFORMATION TECHNOLOGY (4)**

**CO1:** Discuss about generation of computers.

**CO2:** Describe the classification of computer.

**CO3:** Narrate input devices.

**CO4:** Explain the classification of memory devices.

**CO5:** What is window and its features?

**CO6:** Describe the elements of multimedia.

**CO7 :** Narrate application areas of information technology.

**CO8:** What are the prerequisites for internet? Explain.

**CO9:** What are the services provided by internet?

**CO10:** What is network? Explain the types of networks.

**BCO66: ECOMMERCE (4)**

**CO1:** Explain the anatomy of E commerce application.

**CO2:** What are importance of e commerce?

**CO3:** Discuss the categories of E commerce.

**CO4:** Discuss the supply chain management.

**CO5:** Explain Chatting the online marketing?

**CO6:** Explain information based marketing advertisement.

**CO7 :** Elaborate the internet application in business.

**CO8:** What is the role of EDI in business?

**CO9:** Write an overview of the electronic payments systems?

**CO10:** Explain security issue on electronic payment system.

## B.SC-INFORMATION TECHNOLOGY

To enable the students to

**PSO 1:** Understanding of the basics of IT.

**PSO 2:** Apply fundamental principles and methods of Computer Technology to a wide range of applications and mathematical and scientific reasoning to a variety of computational problems.

**PSO 3:** Students have the opportunity to develop foundational skills to install and maintain computer networks, troubleshoot hardware and software problems
.

**PSO 4:** Design and implement software systems that meet specified design and performance requirements.

**PSO 5:** Apply advanced algorithmic and mathematical concepts to the design and analysis of software.

**PSO 6:** Adhere to do higher studies or progress as an entrepreneur.

**PSO 7:** Students gets the confidence to survive and get succeed in IT industry.

**PSO8:** Gets proficiency in the practice of computing, and to prepare them for continued professional development.

**PSO9:** Apply sound principles to the synthesis and analysis of computer systems

**PSO10:** Understands manage databases and develop web pages.

## COURSE OUTCOME

### UITT11 - PROGRAMMING IN C (4)

CO1: Describes the complete overview of C Structure.
CO2: Describe about Data types, functions and control statements.
CO3: Handling „Decision making, branching and looping statements.
CO4: Understanding the concept of array and its types.
CO5: Able to allocate the Memory for structure & union.
CO6: Understand the constant and variable with relevant example.
CO7: Impact the knowledge in the field of pointers in c language.
CO8: Able to write a program to calculate the roots of an equation in c.
CO9: To know a program to add two matrices in c language.
CO10: Understand the uses of user defined functions in detail.

### UITT12 - DIGITAL PRINCIPLES & COMPUTER ORGANIZATION (4)

CO1: Impart the knowledge in the field of digital electronics
CO2: Design and realize the functionality of the computer hardware with basic gates.
CO3: Design digital circuits by simplifying the Boolean functions
CO4: Acquire knowledge about multiprocessor organization and parallel processing
CO5: To know about Half Adder and Full Adder.
CO6: Able to trace the execution sequence of an instruction through the process
CO7: Floating point logical operation.
CO8: Describe With Neat Diagram The Working Of De-Multiplexer.
CO9: Define Instruction format with example.
CO10: Describe RAM and ROM address space with neat diagram.

### UITA11 - FUNDAMENTALS OF COMPUTER (4)

CO1: Understanding about the computers and its uses.
CO2: Describe about computer hardware.
CO3: To know the uses of key board.
CO4: Describe the uses of storage device.
CO5: Describe the modem.
CO6: Understanding the uses of internet
CO7: To know the various types of printers.
CO8: Describe about the different types of operating system
CO9: Describe about the different types of topologies.
CO10: Describe the factors of e-mail and connecting internet through wires and wirelessly.

### UITT21 – PROGRAMMING IN C++ (4)

CO1: Describes complete overview of Data types, functions, control statements, pointers.
CO2: Learning Object Oriented Programming Concepts.
CO3: Demonstrate the use of virtual functions to implement polymorphism.
CO4: Managing Console I/O Operations
CO5: Understanding Function Overloading & Operator Overloading
CO6: Understanding about Templates, Files and Exception Handling.
CO7: To know about Tokens, expressions and Control Structures.
CO8: Describe about the inheritance and its types in C++ with example programs.
CO9: Describe about the virtual base class.
CO10: Impact about the parameterized constructor.

## UITP21 - PROGRAMMING IN C and C++ LAB

CO1: Programs using I/O Statements in C.
CO2: Programs using Control Structure in C.
CO3: Programs using Arrays and Strings in C.
CO4: Program using Functions in C:
a) Call by value b) Call by Reference c) User Defined d) Built-in
CO5: Program using Pointers in C:
a) Operators & Expressions b) Pointers and Arrays c) Pointers & Strings d) Pointers & Structures e) Pointers & Functions.
CO6: Program using Structure & Unions in C.
CO7: Program using File Handling in C.
CO8: Program using Function Overloading, Operator Overloading in C++.
CO9: Program using Constructor, Friend Function
CO10: Program using Single Inheritance, Multiple Inheritance, Multilevel Inheritance, Hierarchical Inheritance in C++.

## UITA21 - WEB DESIGN LAB

CO1: Web page creation using ordered list and unordered list.
CO2: Marquee creation in Web page.
CO3: Web page creation using head, title, body, h1 – h6.
CO4: Web page creation using formatting tags (bold, italic, underline)
CO5: Web page with images
CO6: Web page creation with various font styles and body colors.
CO7: Web page creation using hyper link, tables, frames.
CO8: Web page creation using Forms in XML
CO9: Web page creation using CSS, XSLT, Parsing XML and the XML DOM.
CO10**:** XML Output from a Server

## UITT31 - FUNDAMENTALS OF DATA STRUCTURES (4)

CO1: Describes overview of array and its representations.
CO2: Understanding about Stack & Queue.
CO3: Understanding about Linked List and storage management.
CO4: Understanding about tree & its traversal techniques.
CO5: Understanding about Graphs and its components.
CO6: Describes about graph traversal.
CO7: Describe about garbage collection and compaction.
CO8: Able to know about the spanning tree.
CO9: Understanding about amazing problem with example
CO10: Describe about Doubly linked list.

## UITA32- OPERATIONAL RESEARCH (5)

CO1: Describes AND Development of OR
CO2: Handling Mathematical Formation of L.P.P.
CO3: Understanding Simplex Method & Artificial Variables.
CO4: Understanding transportation Problem.
CO5: Understanding Assignment Problem.
CO6: To know stack and surplus variables.
CO7: Understanding Vogel‟s Approximation Method.
CO8: To know the initial feasible solution using North West Corner Method.
CO9: Understanding degeneracy in transportation problem.
CO10: To know the steps in the “Hungarian Method” used for solving assignment problem.

## UITE31 - MANAGEMENT INFORMATION SYSTEM (3)

CO1: Describes overview Management Information System
CO2: Overview of Organization Structure.
CO3: Understanding Decision Making Concepts.
CO4: Describe the management control system and the management by exception.
CO5: Understanding Decision Support System.
CO6: Describe the Manager's Environment.
CO7: To know the operating elements of an information system.
CO8: Describe the strategies for determining information requirements.
CO9: Understanding Decision Support System.
CO10: Understanding the normalization in database design in DB requirements.

## UITS31 - OFFICE AUTOMATION

CO1: Able to understand and develop own source code in Mail Merge.
CO2: Able to understand and develop own source code in Power Point.
CO3: Able to create MS-WORD document using Formatting options.
CO4: Able to create Table preparation in MS-WORD.
CO5: Able to make Payroll calculation in MS-EXCEL.
CO6: Able to create mark sheet using mathematic function in MS-EXCEL.
CO7: To know Chart preparation in MS-EXCEL.
CO8: Able to create Table in MS –ACCESS.
CO9: Able to generate reports in MS –ACCESS.
CO10: To know Query processing in MS –ACCESS.

## UITT41 - RELATIONAL DATA BASE MANAGEMENT SYSTEM (4)

CO1: Describes overview of Data Base systems & Data Models.
CO2: Handling Relationship Model.
CO3: Understanding Algebra Operation.
CO4: Understanding back tracking System.
CO5: Design Relational Languages & Integrity Constraints
CO6: Understanding PLSQL / SQL.
CO7: To know about the overall system structure of database management system.
CO8: Understand about the relational algebra operators.
CO9: To know the domain constructer and referential integrity.
CO10: Understanding the functions and procedures in PL/SQL.

## UITP42 - RELATIONAL DATA BASE MANAGEMENT SYSTEMS LAB

CO1: Program using conditional control, interactive controls & sequential controls.
CO2: Program using excepting handling
CO3: Programs using explicit cursors & implicit cursors
CO4: Program using PL/SQL tables & records
CO5: Programs using database triggers
CO6: Program to design procedures using In, Out, Parameter
CO7: Program to design procedures using functions
CO8: Program to design procedures using packages
CO9: Program using ADO connectivity.
CO10: Program using DAO & RDO connectivity.

## UITA42 - DESK TOP PUBLISHING LAB (DTP)

CO1: Able to create Visiting Card in English using Page Maker.
CO2: Able to create Advertisement using Page Maker.
CO3: Able to create Certificate using Page Maker.
CO3: Able to create India Map using Coral Draw.
CO4: Able to create Cartoon using Coral Draw.
CO5: Able to create Rangoli using Coral Draw.

CO6: Able to create Logos in Tamil using Coral Draw.
CO7: Able to create Album in PhotoShop.
CO8: Able to create Flex Designing in PhotoShop.
CO9: Able to create Photo Editing in PhotoShop.
CO10: Able to create Fashion Designing using Coral Draw.

## UITE42 - NUMERICAL METHODS

CO1: Describes about Numerical Computations.
CO2: Describes comparison of direct and iterative method
CO3: Understanding about Newton‟s Formulae.
CO4: Understanding Gaussian Quadrature.
CO5: Understanding Euler‟s method.
CO6: Describe about Lagrange's method.
CO7: Understanding about predictor corrector method.
CO8: Understanding transcendental and algebraic equation.
CO9: Describe two dimensional laplace equation.
CO10: Understanding Taylor series

## UITS42 - LINUX / UNIX LAB

CO1: Able to understand and develop own source code in IPC using pipes.
CO2: Able to understand and develop own source code in Message Queues.
CO3: Deadlock avoidance using banker‟s algorithm.
CO4: Creation of a child, orphan and Zombie process.
CO5: Simulation of FCFS process scheduling
CO6: Simulation of ROUND ROBIN process scheduling.
CO7: Simulation of SJF process scheduling.
CO8: Demonstration of process synchronization using signals.
CO9: Demonstration of process synchronization using semaphores.
CO10: Able to understand and develop own source code to prevent from deadlock.

## BIT51 - INFORMATION SECURITY (4)

CO1: Describe the substitution ciphers.
CO2: Understanding the effects and causes of viruses.
CO3: Understanding in detail-plaintext system password list and encrypted password file.
CO4: Understanding security requirements of a database.
CO5: Describe peer reviews.
CO6: Describe the Hash function.
CO7: Understanding the DES.
CO8: Understanding about Firewall Design Principles.
CO9: To know the concept of malicious codes..
CO10: Understanding about database Security in detail.

## BDM52 - DATA MINING (4)

CO1: Understanding various data mining systems.
CO2: Describe data transformation.
CO3: To know the architecture of data mining system.
CO4: Describe mining multilevel association rules from relational databases. CO5: Understanding about data mining languages.
CO6: Understanding in detail about knowledge representation with various diagrams.
CO7: Describe about data mining and ethics.
CO8: Understanding the linear models to machine learning schemes of dataset. CO9: To know the attribute selection and discrediting numeric attributes.
CO10: Describe about ensemble learning of models.

## BSE53 - SOFTWARE ENGINEERING (4)

CO1: Describe the software cost estimation techniques.
CO2: To know the COCOMO-cost model in detail.
CO3: Understanding the relational notations and regular expressions with suitable examples.
CO4: Understanding the formats of an activity and data diagram components with a neat diagram.
CO5: Describe about relational notations.
CO6: Describe the importance of modularization and discuss about cohesion and coupling.
CO7: Understanding about system testing in detail.
CO8: Understanding the project size categories.
CO9: To know the factors that influence quality and productivity?
CO10: Understanding

a) Phased life cycle model with suitable figure.

b) Milestones, documents & reviews.

## BCN54 - COMPUTER NETWORK (4)

CO1: Able to know the OSI reference model with neat diagram.
CO2: Describe the guided transmission media.
CO3: Understanding briefly about a simplex protocol for a noisy channel with algorithm.
CO4: Understanding about distance vector routing in detail.
CO5: Describe about electronic mail.
CO6: Able to know the TCP/IP reference model in detail.
CO7: Understanding Ethernet cabling.
CO8: Understanding Manchester encoding.
CO9: Understanding hierarchical routing.
CO10: Understanding the ALOHA.

## BCG55 - COMPUTER GRAPHICS (4)

CO1: Describe the refresh cathode ray tubes.
CO2: Understanding character attributes with suitable example.
CO3: Understanding translation and rotation in 2D basic transformation with example.
CO4: Able to know the Cohen Sutherland line clipping.
CO5: Able to know the logical classification of input devices.
CO6: Understanding the interactive picture construction techniques.
CO7: Understanding raster scan system.
CO8: Able to know the midpoint circle generating algorithm.
CO9: Able to know the Matrix representation for composite transformation.
CO10: Understanding Sutherland - Hodgeman polygon clipping algorithm.

## BIT56 – VISUAL PROGRAMMING LAB

CO1: Program for simple arithmetic operators using text command boxes.
CO2: Program to manipulation of string and data functions.
CO3: Program to design the calculator.
CO4: Program to perform magic square.
CO5: Program using number puzzle, picture puzzle.
CO6: Program using file, directory and drive list boxes.
CO7: Program using command dialog box.
CO8: Program using to design a text editor using rich text box.
CO9: Program to access Database Access using DAO, RDO and ODBC.
CO10: Program using graphical function to draw a picture and save it.

## SBEGR – COMPUTER GRAPHICS LAB

CO1: Program using line drawing algorithm.
CO2: Program using circle drawing algorithm.
CO3: Program using transformation – rotation – arbitrary point.
CO4: Program using transformation – rotation – origin.
CO5: Program using transformation – rotation – fixed point.
CO6: Program using transformation – Translation – arbitrary point.
CO7: Program using transformation – scaling – origin.
CO8: Program using transformation – scaling – fixed point.
CO9: Program using windowing.
CO10: Program using clipping.

## BIT61 - JAVA AND INTERNET PROGRAMMING (4)

CO1: Describe the basic concepts of object oriented program
CO2: Understanding the concept job method overloading with an Example.
CO3: Describe synchronization.
CO4: Understanding applet life cycle in detail.
CO5: Understanding the controlling of windows in java script. CO6:
Describe java operators.
CO7: Understanding how exception-handling mechanism can be used for debugging a program.
CO8: Able to develop an applet that receive three numeric values as input from the user and then displays the largest of the three on the screen.
CO9: Describe the three ways of drawing polygons.
CO10: Understanding the statements used in java script.

## BIT62 - WEB TECHNOLOGY (4)

CO1: Describe Build- in Objects in JavaScript.
CO2: Understanding the following,
a. (i)Window object (ii) Document object
b. (iii)Form object (iv) Browser object
CO3: Understanding HTML server controls with examples.
CO4: Describe about various basic web server controls.
CO5: To know about the various advanced issues with example.
CO6: Understanding the operators and expressions in javascript.
CO7: Understanding the following: (i) Text element (ii) Button element
CO8: To know the HTML form control in asp.net.
CO9: Understanding the following data list web server control
(i) CheckBoxList Control (ii) ListBox control
CO10: Understanding the following in request object:
(i) Form collection (ii) Browser object

## BIT63 - MULTIMEDIA TECHNOLOGY (4)

CO1: Describe the various resources for multimedia developers.
CO2: Understanding the following:
(i) Raster/ Bitmap images Vector images.
CO3: Understanding the video capture and playback system in detail.
CO4: Understanding the two basic strategies for creating multimedia products.
CO5: Understanding the following authoring tools.
Simple authoring and delivery tools. - Complex interactive authoring tools.
CO6: Understanding the following
(ii) Client/server technology- Communication protocol-Internet addressing.
CO7: Understanding the products and its types.
CO8: Understanding the characteristics of digital audio and its system.
CO9: To know a detail account on text in multimedia.
CO10: To know a detail account on background and data size of digital video.

## BIT64 – JAVA AND INTERNET PROGRAMMING LAB

CO1: Program using arrays and flow control statements.
CO2: Program using run time exception and I/O exception.
CO3: Program using multi-threading.
CO4: Program using Layout management.
CO5: Program using GUI components.
CO6: Program using event handling.
CO7: Program using animation and images.
CO8: Program using Java Applet.
CO9: Program using Java files management methods.
CO10: Program using JDBC.

## BIT65 – WEB TECHNOLOGY LAB

CO1: Program using VB.NET to find biggest of three numbers.
CO2: Program using VB.NET to enumeration.
CO3: Program using VB.NET to structure exception handling.
CO4: Program using VB.NET to constructor and destructor.
CO5: Program using VB.NET to perform inheritance and polymorphism.
CO6: Program using ASP.NET to designing login form.
CO7: Program using ASP.NET to show the data in data grid.
CO8: Program using ASP.NET to create an advertisement using Ad rotator control.
CO9: Program to perform payroll detail in ASP.NET using Access as background.
CO10: Program using ASP.NET to generate the Hotspots in the image.

## BIT66 – OPERATING SYSTEM LAB

CO1: Able to understand and develop own source code in IPC using pipes.
CO2: Able to understand and develop own source code in Message Queues.
CO3: Deadlock avoidance using banker‟s algorithm.
CO4: Creation of a child, orphan and Zombie process.
CO5: Simulation of FCFS process scheduling
CO6: Simulation of ROUND ROBIN process scheduling.
CO7: Simulation of SJF process scheduling.
CO8: Demonstration of process synchronization using signals.
CO9: Demonstration of process synchronization using semaphores.
CO10: Able to understand and develop own source code to prevent from deadlock.

## SBEMM – MULTIMEDIA LAB

CO1: Program using Flash to animate any object.
CO2: Program using Flash to morphing using shape tweening.
CO3: Program using Flash to add motion guide layer.
CO4: Program using Flash to apply color to cradle.
CO5: Program using Flash create a jumping ball.
CO6: Program using Flash to experiment masking.
CO7: Program using Flash to create a button to draw traffic symbol.
CO8: Program using Flash to motion tweening.
CO9: Program using Flash to scale technique change color and size.
CO10: Program using Flash to animation of moving object.

# B.SC BIOTECHNOLOGY

To enable the students to

**PSO 1:** Acquire knowledge on the fundamentals of Biotechnology for sound and solid base which enables them to understand the emerging and advance concepts in life science.

**PSO 2:** Contribute to the field of Biotechnology and allied industries designing, developing and providing solutions for product/ processes/ Technology/ Development

**PSO 3:** Acquire experimental skills relevant to biotechnology industries.

**PSO 4:** Apply the principles of modern biotechnology to problems related to plant, animal, industrial and human life.

**PSO 5:** Enable the students to become an excellent researcher in Biotechnology research field to discover unique products for societal need.

**PSO 6:** Acquire knowledge in domain of Biotechnology enabling their applications in Industry and Research

**PSO 7:** Become entrepreneurs and techno managers which strong ethics and communication skills.

**PSO 8:** Make them to explore the scope of avenues of biotechnology by pursuing higher studies.

# COURSE OUTCOME

## MICROBIOLOGY – UBTT11 CDT: 4

**CO1:** The objectives of this course are to introduce the students to the field of microbiology with special emphasis on microbial diversity, morphology, physiology and nutrition; methods for control of microbes and host-microbe interactions.

**CO2:** Students should be able to identify the major categories of microorganisms and analyse their classification, diversity, and ubiquity.

**CO3:** Students should gain knowledge to Identify and demonstrate the structural, physiological, and genetic similarities and differences of the major categories of microorganisms.

**CO4:** Students learn about the growth requirements and pattern of growth of microorganisms.

**CO5:** Students should know about to demonstrate and evaluate the interactions between microbes, hosts and environment.

## GENETICS – UBTT12 CDT: 4

**CO1:** To know about the basics of genetics and classical genetics encompassing prokaryotic/phage genetics to yeast and higher eukaryotic domains.

**CO2:** To acquire knowledge about the classical concepts of Mendelian genetics across these life-forms.

**CO3:** The students will be exposed to the concepts of population genetics, quantitative genetics encompassing complex traits, clinical genetics and genetics of evolution.

**CO4:** Student will be able to know the fundamental molecular principles of genetics and to understand the relationship between phenotype and genotype in human genetic traits.

**CO5**: Students acquire Knowledge on genetic recombination in Bacteria.

## ANCILLARY CHEMISTRY – UACH11 CDT: 3

**CO1:** The course aims at elucidating principles of applied chemistry in industrial systems, water treatment, engineering materials and analytical techniques.

**CO2:** The Students will be able to analyse trends in periodic table with electronic and atomic structure.

**CO3:** The Students will be able to interpret phase diagrams of pure and binary substances and demonstrate the working of electrodes and their applications.

**CO4:** The Students will be able to calculate various parameters defining water and fuel quality and also to carry out basic experimental procedure.

**CO5**: The Students will be emphasized on need for safety and safety procedure in laboratory

## CELL AND MOLECULAR BIOLOGY- UBTT21 CDT: 4

**CO1:** To understand the various biological processes and molecular structure and functions of cells and molecules such as DNA, RNA and proteins.

**CO2:** To understand storage of genetic information and its translation at molecular level in prokaryotic and eukaryotic systems.

**CO3:** Student should be equipped to understand the fundamental aspects in biological phenomenon.

**CO4:** Students will be able to know the properties of genetic materials and storage and processing of genetic information.

**CO5**: Students will know the difference between mitochondrial and chloroplast genome.

## IMMUNOLOGY AND IMMUNOTECHNOLOGY – UBTT31 CDT: 4

**CO1:** To get knowledge on the basic principles and definitions of immunology, its modern achievements and practical ways of implementation

**CO2:** Students will acquire skills and competence in specialized immunological techniques in the diagnosis and management of health related disorders.

**CO3:** Acquire knowledge and understanding of research methods employing immunological techniques for application in biomedical and clinical research.

**CO4:** Students should know the skills to analytically, critically and systemically analyse and evaluate information related to Immunotechnology.

**CO5**: Students also gain knowledge on immunological disorders.

## BIOMOLECULES- UBTA32 CDT: 4

**CO1:** Students should learn the elements present in biomolecules and the different monomers and polymers.

**CO2:** Students will able to identify their chemical elements and the difference between simple sugars and complex carbohydrates.

**CO3:** To acquire knowledge to identify the chemical elements and functional groups and to recognize the structure of an amino acids.

**CO4:** Students should able to identify the chemical elements and components of a nucleotide and also able to describe the function of DNA.

**CO5**: Students acquire knowledge on the role of vitamins and its deficiencies.

## TAXONOMY AND PLANT PHYSIOLOGY – UBTE31 CDT: 3

**CO1:** To acquire the basic knowledge needed for proper understanding of plant functioning. .

**CO2:** Students should gain the knowledge of Plant Kingdom and understanding of the taxonomic hierarchy.

**CO3:** Students should identify and describe the different types of plant cells and tissues, their structure and function.

**CO4:** Students should able to determine the role and function of specific vegetative parts of the plant and the role and function of the reproductive parts of the plant.

**CO5**: Students learn about the growth regulatory substances.

## PRINCIPLES OF GENETIC ENGINEERING- UBTT41 CDT: 4

**CO1:** To understand the basic theoretical concepts and techniques of genetic engineering.

**CO2:** Students should know about the different types of vectors of genetic engineering.

**CO3:** Students will gain knowledge about the applications of recombinant DNA technology

**CO4:** Student will acquire knowledge about the DNA sequencing and amplification and its importance in the Genetic engineering

**CO5:** Students learn about various applications of genetic engineering**.**

## BIOPHYSICS – UBTE42 CDT: 3

**CO1:** Students should know about the physical laws (laws of Physics) are valid in biological systems.

**CO2:** Students should able to explore the biophysics of signalling and movement at the cellular level.

**CO3:** To learn the relationship between structure and function at the molecular level.

**CO4**: To learn about the methods of cell study.

**CO5:** To prepare students for higher courses in environmental and medical biophysics, genomics and proteomics

## DEVELOPMENTAL BIOLOGY- BBT51 CDT: 4

**CO1:** Students should able to understand the different phases of the embryo development and associated medical implications.

**CO2:** Students will acquire knowledge to analyse and interpret the principles of early and late embryonic development.

**CO3:** To compare and comprehend the development of model organisms like *C. elegans*, amphibians, Aves.

**CO4:** To demonstrate the medical implications of developmental biology.

**CO5**: Students learn the process of organogenesis and regeneration.

## ANIMAL BIOTECHNOLOGY- BBT52 CDT: 4

**CO1:** The objectives of this course is to introduce students to the principles, practices and application of animal biotechnology

**CO2:** Students to develop basic skills for vertebrate cell culture, maintenance of cell lines and in vitro application of cell and molecular techniques.

**CO3:** Students should understand the principles of animal cloning and its applications.

**CO4:** Students will be able to acquire knowledge in animal cloning and its applications

**CO5**: Students gain knowledge about transgenic animals, merits and demerits.

## BIOPROCESS TECHNOLOGY-BBT53 CDT: 4

**CO1:** This course will provide a comprehensive understanding of media formulations, microbial growth kinetics, bioreactor selection, upstream & fermentation processes, and its role in manufacturing bio-products.

**CO2:** To learn about how microorganisms and biochemical processes can be applied in engineered systems.

**CO3:** Students should gain knowledge about microbial growth & cultivation, various bioreactor components, and types of bioreactor used in biotechnology industries.

**CO4:** To learn important microbial/enzymatic industrial processes in food and fuel industry.

**CO5**: To learn the important aspects on food technology.

## BIOPHYSICS AND BIOSTATISTICS-BBT54 CDT: 4

**CO1:** The course will provide the fundamentals of statistics and biophysics.

**CO2:** Students will able to know the theory of statistics and their application for solving the problems in the field of life sciences.

**CO3:** Students should classify the various types of data and apply basic statistical concepts

**CO4:** Students should learn the use of concepts of probability, probability laws, and probability distributions and apply them in solving biological problems and statistical analysis.

**CO5**: Students gain knowledge on correlation and regression analysis.

## ENVIRONMENTAL BIOTECHNOLOGY-BBT55 CDT: 4

**CO1:** Students should understand how biotechnology can help in monitoring or removing the pollutants and developing an understanding of new trends such as biofuels, renewable energy sources, or microbial technologies which can minimize the harmful impact of pollutants in the environment.

**CO2**: To learn the Importance of Biofertilizers in increasing crop productivity.

**CO3:** To learn comprehend fundamentals of biodegradation, biotransformation and bioremediation of organic contaminants and toxic metals.

**CO4:** To acquire knowledge and apply biotechnological processes in waste water and solid waste management.

**CO5:** Students will able to demonstrate innovative biotechnological interventions to combat environmental challenges

## BIOTECHNOLOGY AND HEALTH-BBT56 CDT: 3

**CO1:** To learn about the classical genetics and transmission of characters from one generation to the next which will make foundation for the advanced genetics.

**CO2:** To learn about the advanced genetic technology and therapy related to the human diseases.

**CO3:** Students should able to develop innovative research ideas for curing genetic disorders in humans

**CO4**: Students gain knowledge on transplantation and use of embryonic stem cells in medical field.

**CO5:** Students should know about the Social, Ethical and Legal Issues in Medical Biotechnology

## PLANT BIOTECHNOLOGY-BBT61 CDT: 4

**CO1:** The Students will learn the fundamentals of culturing plant cells and tissues, culture environment, cell proliferation, differentiation, and media formulation.

**CO2:** The Students will acquire knowledge on various recombinant DNA techniques to produce genetically modified organisms with novel traits.

**CO3:** To acquire the knowledge about the techniques of Plant Tissue Culture, Lab. organization & measures adopted for aseptic manipulation and nutritional requirements of cultured tissues.

**CO4:** To learn the techniques of culturing tissues, single cells, protoplasts & anther culture, germplasm conservation and cryobiology.

**CO5**: Students gain knowledge on use of plant growth hormones and their role in plant tissue culture.

## BIOINFORMATICS-BBT62 CDT: 4

**CO1:** The objectives of this course are to provide students with the theory and practical experience of the use of common computational tools and databases which facilitate investigation of molecular biology and evolution-related concepts.

**CO2:** Develop an understanding of the basic theory of these computational tools.

**CO3:** Students should gain working knowledge of these computational tools and methods.

**CO4:** Students gain knowledge to relevance for investigating specific contemporary biological questions and critically analyse and interpret the results of their study.

**CO5:** Students acquire knowledge on Evolutionary analysis, rooted and unrooted tree representation, bootstrapping strategies.

## BIOINSTRUMENTATION-BBT63 CDT: 4

**CO1:** Students should know the basics and advanced principles, concepts, and operations of medical devices.

**CO2:** Students should learn the parts, function, and resolving power of various microscopes**.**

**CO3:** Students should learn brief study of different medical instrument and their use in physiological measurements

**CO4:** This course is to familiarize the students with the analysis and design of different instrument like HPLC and GC.

**CO5:** this course familiarise the students with electrophoretic techniques, electrophoresis of proteins and nucleic acids**.**

## BIOSAFETY AND IPR-BBT64 CDT: 3

**CO1:** Students will gain awareness about Intellectual Property Rights (IPRs) to take measure for the protecting their ideas.

**CO2:** They will able to devise business strategies by taking account of IPRs.

**CO3:** Students will acquire adequate knowledge in the use of genetically modified organisms and its effect on human health.

**CO4:** Students will gain more insights into the regulatory affairs.

**CO5**: Students acquire knowledge on patent filing procedures.

# B.Sc FOODS & NUTRITION

To enable the students to

**PSO 1:** To know human physiology and nutritional needs of persons associated with physiological and metabolic anomalies.

**PSO 2:** Apply food science knowledge to describe functions of ingredients food.

**PSO 3:** Understand and apply nutritional assessment techniques.

**PSO 4:** Provides self -reliance through balance of freedom and discipline wit in the body, mind and spirit.

**PSO 5:** Educate the community on dietary modification based on the severity of illness and complication of the disease.

**PSO 6:** To understand the prevalence of malnutrition in Indian scenario and gain knowledge of effective methods to combat malnutrition.

**PSO 7:** Acquire professional, vocational and entrepreneurial skills for career design and development.

**PSO 8:** Gain insight in public health nutrition for employment in State and Central government

## FOOD SCIENCE –I (UFNT11) Credit - 4

CO 1: The student will gain knowledge about energy requirements and the Recommended Dietary Allowances

CO 2: Understand the nutritive value, identify cooking quality, develop skills in the preparation and storage of milk and egg products.

CO 3: Gain the knowledge about processing and preservation of fruits and vegetables

CO 4: Determine the smoking point of any cooking oils and the stages of sugar cookery

CO 5: Assess the effect of addition of acid, fat, salt, water and sugar on the texture of flesh foods quality.

## HUMAN PHYSIOLOGY (UFNT12) Credit - 4

CO 1: Understand the Structure and Functions of the various organ systems of the body.

CO 2: Compare the digestive and excretory system and infer the mechanisms of digestion and excretion in human beings.

CO 3: Relate the Structure with Functions of the tissues and organs

CO 4: Comprehend the Mechanism of Action of Organs.

CO 5: Discuss the role of hormones and functions of human reproductive system.

## FOOD SCIENCE –II (UFNT21) Credit - 4

CO 1: Gain knowledge on different nutrients in foods.

CO 2: Understand the scientific principles governing the acceptability of food and preparation.

CO 3: Role of different antioxidant to boost.

CO 4: Use various sensory methods for evaluating variety of foods.

CO 5: Determine the smoking point of cooking oils and the stages of sugar cookery.

## NUTRITION THROUGH LIFE CYCLE -(UFNT31) Credit - 4

CO 1: Apply knowledge of the science of nutrition to human health.

CO 2: Understand the Physiological changes and hormones involved during pregnancy and lactation.

CO 3: Plan a healthy food choice for physical, physiological psychological aspects in infancy and children.

CO 4: Impact of growth and development in arriving at the nutritional needs of adolescents.

CO 5: Determine nutrient requirements during old age.

**NUTRITIONAL BIOCHEMISTRY-(UFNA32) Credit - 4**

CO 1: Students will understand the principles of biochemistry and also chemistry of major nutrients.

CO 2: The knowledge about the major metabolic pathways in human metabolism.

CO 3: The synthesis of nucleic acids and proteins.

CO 4: Obtain complete knowledge on Enzyme and its application

CO 5: Gain the knowledge about importance of vitamins and minerals in human development.

**ENTEREPRENEURSHIP DEVELOPMENT-(UFNE31) Credit - 3**

CO 1: Analyze the environment related to small scale industry.

CO 2: Understand systematic process to select and screen a business idea.

CO 3: To assess opportunities and constraints for new business ideas

CO 4: Design strategies for successful entrepreneur.

CO 5: Develop managerial skills for entrepreneurship development.

**THERAPEUTIC NUTRITION-(UFNT41) Credit - 4**

CO 1: Plan and prepare standardized hospital diet for the needed patients.

CO 2: Counsel patients effectively

CO 3: Delineate various deficiency disorders with respect to their prevalence, causes, symptoms and preventive measures.

CO 4: Converse the kinds of commercial formulas available for oral and enteral feedings.

CO 5: Apply Nutrition care process for various Diseases and disorders

**HEALTH AND HYGIENE – (UFNE42) Credit - 3**

CO 1: Classify the common kinds of physical/chemical contamination and simple measures to prevent food poisoning.

CO 2: Explain how high standards of personal hygiene for food handlers can be achieved.

CO 3: Define integrates practices for economic control of pests

CO 4: Design food hygiene and sanitation measures to control the spread of microorganism.

CO 5: Criteria to fulfill water safety and environmental requirements.

**FOOD MICROBIOLOGY – (UFNT51) Credit - 4**

CO 1: Understand the interaction between microorganisms and food.

CO 2: Describe the characteristics of food borne and water borne microorganisms

CO 3: Understand the role of microorganisms in health maintenance.

CO 4: Compare food borne infection and food intoxication

CO 5: Able to preserve the perishable foods from different types of microbial spoilage.

**COMMUNITY NUTRITION – (UFNT53) Credit - 4**

CO 1: Identify suitable methods for resolve nutrition related problems in community.

CO 2: Educate the community.

CO 3: Analyze maternal and child health care programs.

CO 4: Assess immunization and its effective actions.

CO 5: Alleviate the nutrition problems at national level.

**HUMAN DEVELOPMENT-(UFNT54) Credit - 4**

CO 1: Outline the principles of development from conception to birth.

CO 2: Compare the development pattern of infancy and early childhood during life cycle.

CO 3: Critique the growth and development changes between childhood and adolescence.

CO 4: Explain the importance of childhood care, guidance and counseling.

CO 5: Discuss the methods of disciplining children and their effects.

**FUNDAMENTALS OF NUTRITION-(UFNT55) Credit - 4**

CO 1: Understand the role of food and nutrients in health and disease prevention.

CO 2: Analyze the different Quality aspects of carbohydrate.

CO 3: Understand the mechanisms of regulation of metabolic pathways in human body.

CO 4: Evaluate nutrition information based on scientific reasoning for clinical and community application.

CO 5: To gain knowledge about different micro nutrient deficiencies.

**FOOD PACKAGING-(UFNE53) Credit - 3**

CO 1: discuss the characteristics and functions of materials used in food packaging.

CO 2: identify the types of packaging material for suitable product.

CO 3: The standard method used for marketing of developed products.

CO 4: Various methods of food packaging to increase the shelf lives.

CO 5: Understand the importance of food labeling.

**FOOD AND BEVERAGE SERVICE-(UFNT61) Credit - 4**

CO 1: Understand the various processes of preparing, presenting and serving of food and beverages to the customer.

CO 2: Identify the process of personal cheques, travelers' cheques, and creditcard

CO 3: Identify, suggest and serve different kinds of wine in a professional manner.

CO 4: Identify the equipment necessary for table side cooking.

CO 5: Identify items suited for table side preparation.

**FOOD SERVICE MANAGEMENT-(UFNT62) Credit - 4**

CO 1: Discuss about the scope of food service management principles and functions.

CO 2: Principles of menu planning, purchasing, receiving, storage, inventory, production and cooking procedures of food service operation.

CO 3: Compare the electrical and non-electrical equipment's in food service establishment.

CO 4: Make use of costing principles.

CO 5: Understand the quality management in food service institution.

**NUTRITION AND FITNESS-(UFNT63) Credit - 4**

CO 1: Describe the principles of science of sports, exercise and fitness.

CO2: Identify the special nutritional requirements of athletes.

CO 3: Explain energy balance, weight management and eating disorders in athletes.

CO 4: Discuss the use of specific nutritional supplements in sports.

CO 5: Plan modified diets for special group of athletes- children, teenage, pregnant woman and athletes with diabetes.

**INTERIOR DECORATION AND HOUSEKEEPING – (UFNE64) Credit - 3**

CO 1: Understand the basic concept of interior decoration.

Co 2: Gain knowledge about soft furnishing.

Co 3: Discuss the cleaning equipments.

Co 4: Analyze the interior environment design and style.

Co 5: Outline the principles of safety and security measures.

## B.SC.PHYSICS

**PSO 1:** To enable the students to gain knowledge in core areas of Physics in Electricity, Magnetism, Optics and Spectroscopy.

**PSO 2:** To understand Mathematical Physics, Energy Physics, Nuclear Physics, Atomic Physics, Laser Physics and Thermal Physics.

**PSO 3:** To update their knowledge in Electronics, Digital Electronics, Optics and Spectroscopy, and Astro Physics.

**PSO 4:** To understand physical principles in Physics like Laser, Medical,Fiber optics, Energy Physics, Atomic and Nuclear physics.

**PSO 5:** To develop their knowledge and skills in both Tamil and English.

**PSO 6:** To study important chemical principles, reaction and their significance.

**PSO 7:** To involve in co-curricular and Extra-curricular activities.

**PSO 8:** To progress academically and career wise.

## COURSE OUTCOME

### UPHT11 - PROPERTIES OF MATTER (4)

**CO 1:** Write about Simple pendulum.

**CO 2:** Describe the interchangeability of centre of suspension and oscillation.

**CO 3:** Determine the variation of 'g' with depth.

**CO 4:** Define Escape velocity. Derive an expression for Escape velocity.

**CO 5:** Derive Newton's law of gravitation.

**CO 6:** Discuss the equivalence of a shearing stress with equal linear tensile stress and an equal linear compressive stress.

**CO 7:** Explain Bernoulli's theorem with proof.

**CO 8:** Explain the Rankine's method of determining viscosity of gases.

**CO 9:** Discuss Osmosis and Vapour pressure of a solution.

**CO 10:** Discuss the Kinetic theory of solutions like boiling point and freezing point of solutions.

### UPHT12 - THERMAL PHYSICS (4)

**CO1** Derive Mayer's relation between $C_p$ and $C_v$ of a gas.

**CO2** Describe the Regnault's method to find $C_p$.

**CO3** Describe Joly's method for determination of $C_v$.

**CO4** How is the thermal conductivity of a bad conductor measured by Lee's disc method?

**CO5** Give the thermodynamical proof for Stefan Boltzmann law.

**CO6** Derive an expression for the Viscosity of the gas in terms of mean free path of its molecules.

**CO7** Describe the Porous plug experiment and discuss the results.

**CO8** Explain adiabatic demagnetization in detail.

**CO9** Derive Maxwel's thermodynamical relation.

**CO10** Explain Clement and Desorme's method of determining the ratio of the two specific heat capacities of a gas.

## UPHT21 - ELECTRICITY AND MAGNETISM (4)

**CO1** State and prove coulomb's theorem.

**CO2** Derive the relation between electric field and electric potential.

**CO3** Derive an expression for the energy stored by a charged capacitor.

**CO4** State and prove kirchoff's laws.

**CO5** Explain the principle of potentiometer. How will you use it to calibrate an ammeter?

**CO6** Apply Gauss's law to calculate the electric field intensity due to the uniformly charged sphere at points. a) Outside the sphere b) At the sphere c) Inside the sphere

**CO7** Discuss with necessary theory about moving coil ballistic galvanometer and also correction for damping in ballistic galvanometer.

**CO8** Derive an expression for ac circuit containing resistance, inductance and capacitance in series.

**CO9** Explain the Dia, para and ferro magnetism.

**CO10** Explain Carrey Fosters bridge with necessary theory. How would you determine the resistivity and temperature coefficient of resistance using it?

## UPHT31 - MATHEMATICAL PHYSICS (4)

**CO1** Find the angle between the surfaces $x2+y2+z2=9$ and $x2+y2-z=3$ at the point (2,-1,2)

**CO2** Mention the physical significance of Gauss divergence theorem. State and prove it.

**CO3** Distinguish between singular and non-singular Matrix.

**CO4** Explain in detail, the symmetric and anti-symmetric matrix with an example.

**CO5** Relation between Beta Gamma function.

**CO6** Physical examples of Fourier series.

**CO7** Solution of Laplace's equation in two dimensional cylindrical coordinates.

**CO8** Evaluation and transformation of Gamma function

## UPHE31 - FIBRE OPTICS (3)

**CO1** Explain the advantages of fiber optic communication.

**CO2** What are characteristic features of optical fiber?

**CO3** Give an account of linear scattering losses and Non – Linear Scattering losses.

**CO4** Explain the working of optical fiber communication system with a neat sketch.

**CO5** Write short notes an absorption loss in fibers.

**CO6** Explain vapour phase deposition techniques.

**CO7** Explain briefly about cable design.

**CO8** Describe the principle and working of He – Ne laser with necessary diagrams.

**CO9** Describe the principle, construction and working of ruby laser.

**CO10** Explain the structure and function of LED and state the characteristics.

## UPHT41 - SOLID STATE PHYSICS (4)

**CO1** Give an outline of Umklapp processes.

**CO2** Explain lattice thermal resistivity.

**CO3** Write a note on imperfections.

**CO4** Deduce clausius – Mossotti relation.

**CO5** Write a note on electronic Polarizability.

**CO6** Describe the structure of HCP crystal. Deduce the C/a ratio and packing factor for HCP structure.

**CO7** Describe Nacl structure and diamond structure. Calculate the packing factor of Diamond Crystal.

**CO8** Explain the induced dipole – dipole interaction and repulsive interaction.

**CO9** Explain the classical and quantum of the free electron theories.

**CO10** Derive and discuss Richardson. Dushman equation.

## UPHE42 –SOLAR THERMAL AND RENEWABLE ENERGY SYSTEMS (3)

**CO1** Explain elastic potential energy.

**CO2** Explain internal work and internal energy.

**CO3** Explain Transmission of energy.

**CO4** Explain Conservation of energy.

**CO5** Write about Energy changes and Energy Conservation.

**CO6** Explain enthalpies of physical and chemical changes.

**CO7** Explain four factor formula.

**CO8** Brief note on reactors.

**CO9** Describe Neutron cycle in a thermal reactor.

**CO10** Write about Solar energy Collectors.

## UPHT51- ELECTRONICS-I (4)

**CO1** Explain tunnel diode. Describe it I-V characteristics

**CO2** Describe the band structures of semiconductrs.

**CO3** Explain the voltage divider bias

**CO4** Explain Z- parameter.

**CO5** Explain cascade amplifier.

**CO6** What is the Push pull amplifier? Explain its working.

**CO7** Explain the working of Phase shift oscillator. Obtain an expression for frequency of oscillation and deduce the value of minimum gain required for the working of circuit.

**CO8** Describe the working of Bistable multivibrator. Derive an expression for frequency of output and duty cycle.

**CO9** Derive the expression of gain for inverting operational amplifier.

**CO10** Explain OP-AMP as integrator and differentiator with neat diagram.

## UPHT52 - CLASSICAL MECHANICS (4)

**CO1** Derive Lagrange's equations for systems containing dissipative forces.

**CO2** Describe the principle of virtual work.

**CO3** Write short notes on D'Alembert's principle.

**CO4** Discuss generalized force in dynamic system.

**CO5** Describe Hamilton's principle for non conservative and non holonomic system.

**CO6** Deduce reduction of two body central force problem to one body problem.

**CO7** Deduce Kepler's first law from first integral.

**CO8** Explain Bose-Einstein statistics.

**CO9** Describe Maxwell Boltzmann distribution law.

**CO10** Explain Molecular energies in an ideal gas.

## UPHT53 - QUANTUM MECHANICS (4)

**CO1** Explain the Einstein's theory of photoelectric effect.

**CO2** What are stationary states? In stationary states, show that the probability current density is constant in time.

**CO3** Define a Hermitian operator. Show that the eigenvalues of a Hermitian operator are real.

**CO4** Distinguish between coordinate and momentum representations. What are the operators for coordinate and momentum in the two representations?

**CO5** Explain Quantum mechanical tunneling?

**CO6** Explain about the elliptical orbits of Hydrogen atom by Sommerfeld.

**CO7** Explain the significance of Stern-Gerlach experiment.

**CO8** Illustrate the uncertainty principle on the basis of single-slit experiment. Explain its Applications also.

**CO9** Explain the significance of Ehrenfest's Theorem.

**CO10** In a one dimensional crystal, the periodicity of the potential led to the concept of energy bands. Explain.

## UPHT54 - LASER PHYSICS (4)

**CO1** Explain briefly about Intensity.

**CO2** Derive An Expression For Life Time.

**CO3** Discuss About Possibility Of Amplification.

**CO4** Time dependent perturbation theory creation and annihilation operators

**CO5** Discuss About Zero Point Energy.

**CO6** Describe the Solid state Laser Nd:YAG lasers and its applications

**CO7** Explain Line broadening mechanisms

**CO8** Explain semiconductor Lasers

**CO9** Explain collision broadening and Doppler broadening.

**CO10** Describe The Electric Dipole Interaction Of Radiation With Matter.

**CO11** Discuss About Three Level Laser System.

## UPHT55 - OPTICS AND SPECTROSCOPY (4)

**CO1** Describe the Young's double slit experiment in detail.

**CO2** Explain Lloyd's single mirror and Fresnel's double mirror.

**CO3** Determine the wavelength of sodium light using Newton's rings.

**CO4** Describe the working and construction of Michelson's interferometer.

**CO5** Describe the Fresnel's explanation for the rectilinear propagation of light

**CO6** What is zone plate? Describe the action of a zone plate for an incident spherical wave front.

**CO7** Describe the construction and working of Laurent's half shade polarimeter.

**CO8** Describe the production, detection and analysis of elliptically polarized light.

**CO9** Explain infrared spectroscopy in detail.

**CO10** Explain in brief Nuclear Magnetic resonance. Describe an experimental setup to study Nuclear Magnetic resonance.

## UPHE53- MEDICAL PHYSICS (3)

**CO1** Describe resting and action potential

**CO2** Explain different systems of human body in detail.

**CO3** Discuss the instrumentation for diagnostic X-ray.

**CO4** Write about the special features of medical on radio isotopes.

**CO5** Explain about ventilators with neat diagram.

**CO6** Write a short note on "Conventional or bouncing ba**l** display" and "Non Fade Display".

**CO7** Explain the instrument for measuring the mechanics of breathing.

**CO8** Write about the diagnosis, calibration and reparability of patient monitoring equipment.

**CO9** Explain the different systems of human physiology with their uses.

**CO10** Write notes on four types of diathermy and tunnel diode FM transmitter

## UPHT61 - DIGITAL ELECTRONICS (4)

**CO1** What is meant by binary number?

**CO2** Convert decimal number 23 into equivalent binary number.

**CO3** Give the ASCII code for each of these:

(a) 7 (b) W ( c) f (d) Y

**CO4** Convert the following binary numbers into decimal numbers. (a) 1101 1001 (b)1001 1000 (c) 1100 1010 (d) 0010 1010

**CO5** Find the 2's complement of (a) 0000 1111 (b) 0101 1010 (c) 1011 1110 (d) 1111 0000.

**CO6** Explain half adder and full adder.

**CO7** What is EX-OR gate? Draw the truth table. Explain its working.

**CO8** With a neat circuit diagram write about the working of TTL NAND gate.

**CO9** Explain the characteristics of logic gates.

**CO10** Describe the details of R-2R ladder networks and successive approximation types.

## UPHT62 - NUCLEAR PHYSICS (4)

**CO1** What is mass spectrum?

**CO2** Define binding energy.

**CO3** Define isotopes and isobars. Give an example.

**CO4** Explain Bain bridge mass spectrometer with diagram.

**CO5** How to calculate age of the earth? Give its physical significance.

**CO6** Explain cloud chamber.

**CO7** Write about thermo nuclear reaction principle and its working process.

**CO8** Describe the GM counter and explain its working as particle detector.

**CO9** Explain the Bethe's theory of fusion energy.

**CO10** With a neat sketch explain the working of nuclear reactors and discuss about its safety measures.

## UPHT63 - ATOMIC PHYSICS (4)

**CO1** Write a Brief notes on types of potentials.

**CO2** Explain the Laws of photoelectric emission.

**CO3** Explain photovoltaic cell.

**CO4** Explain Bragg's law.

**CO5** Write a Brief notes on X-ray spectra.

**CO6** Write Brief notes on Compton Scattering.

**CO7** Explain Sommerfield relativistic atom model.

**CO8** Write brief notes on stern Gerlach experiment.

**CO9** Derive on expression for Michelson – Morley experiment.

**CO10** Explain Lorentz transformation equation.

**UPHE64- ASTROPHYSICS (3)**

**CO1** Mention the different types of spectrum.

**CO2** What is the continuous spectrum?

**CO3** State Kirchhoff's law of thermal radiation.

**CO4** Discuss the chemical composition of star.

**CO5** With a neat sketch explain the determination of rotation curve and average gas distribution.

**CO6** Describe our mother galaxy Milky Way with diagram.

**CO7** Give a detailed account on cosmological models.

**CO8** What is the spectral class of a star having prominent hydrogen?

**CO9** Discuss in detail about the black hole.

**CO10** Discuss in detail about the steady state model and Big Bang theory.

# ஸ்ரீ ஆதி சுஞ்சனகிரி மகளிர் கல்லூரி, கம்பம்

## தமிழ்த்துறை – பருவம் 1

### ULTA11 - இக்கால இலக்கியம் (Part 1 – Tamil)

1. மரபுக் கவிதை மற்றும் புதுக்கவிதைகளைப் பற்றி அறிந்து கொள்ளல்.
2. இராணி மங்கம்மாள் நாவல் மற்றும் சாகுந்தலை நாடகத்தின் கட்டமைப்பு குறித்து அறிந்து கொள்ளல்.
3. சிறுகதைகள் மற்றும் உரைநடைக் கட்டுரைகள் குறித்து அறிந்து கொள்ளல்.
4. கவிதை, சிறுகதை, நாவல், உரைநடை, நாடகம் ஆகியவற்றின் தோற்றம் மற்றும் வளர்ச்சி பற்றி அறிந்து கொள்ளுதல்.
5. இலக்கணங்களைக் கற்றறிந்து கொண்டு இலக்கியங்களை உருவாக்குதல் பற்றி அறிந்து கொள்ளல்.

### UTAT11 - இக்கால இலக்கியம்

1. மரபுக் கவிதை – பாரதியின் சுயசரிதை மற்றும் புதுக்கவிதை - அப்துல் ரகுமானின் ஆலாபனை பற்றி அறிந்து கொள்ளல்.
2. 'வேருக்கு நீர்' புதினத்தில் சமூக பின்புலத்தைப் பற்றி அறிந்து கொள்ளல்.
3. இரவு சிறுகதைத் தொகுப்பின் கட்டமைப்பினை அறிந்து கொள்ளல்.
4. செண்பகம் ராமசாமியின் சாபம் விமோசனம் நாடகத்தின் வழி சமூகம சார்ந்த கருத்துக்களை பற்றி அறிந்து கொள்ளல்.
5. மகாவித்துவான் ரா.ராகவ அய்யங்கார் நல்லிசைப் புலமை மெல்லியலாளர்கள் உரைநடையில் சங்ககால நல்லிசைப் புலவர்கள் பற்றி அறிந்து கொள்ளல்.

### UTAT12 – நன்னூல் எழுத்ததிகாரம்

1. எழுத்துக்களின் வகைகள் மற்றும் பிறப்பு பற்றி அறிந்து கொள்ளுதல்.
2. சொற்களின் வகைகள் மற்றும் உறுப்புகள் குறித்து அறிந்து கொள்ளுதல்.
3. புணர்ச்சி மற்றும் உயிரீற்றுப் புணரியல் பற்றி அறிந்து கொள்ளுதல்.
4. மெய்யீற்றுப் புணரியல் குறித்து அறிந்து கொள்ளுதல்.
5. வேற்றுமை உருபுகள் குறித்து அறிந்து கொள்ளுதல்.

**UTAA11 – தமிழ் இலக்கிய வரலாறு**

1. தமிழ் மொழியின் தொன்மையையும், தொல்காப்பியம் மற்றும் சங்க இலக்கியங்களின் சிறப்புகளையும் அறிந்து கொள்ளுதல்.
2. சங்க மருவிய கால இலக்கியங்கள் மற்றும் தமிழ்க் காப்பியங்கள் குறித்து அறிந்து கொள்ளுதல்.
3. சைவ, வைணவ பக்தி இலக்கியங்களின் தோற்றம், வளர்ச்சி குறித்து அறிந்து கொள்ளுதல்.
4. சிற்றிலக்கியங்கள், புராணங்கள், மற்றும் கிறித்தவ, இஸ்லாமியர்களின் தமிழ்த் தொண்டு குறித்து அறிந்து கொள்ளுதல்.
5. கவிதை, சிறுகதை, நாவல், உரைநடை, நாடகம் ஆகியவற்றின் தோற்றம், வளர்ச்சி மற்றும் பெண்ணிய, தலித்திய இலக்கியங்களின் இன்றைய நிலை பற்றி அறிந்து கொள்ளுதல்.

**UVAE11 – விழுமியக் கல்வி**

1. தொல்காப்பிய, சங்க இலக்கிய விழுமியங்களைப் பற்றி அறிந்து கொள்ளல்.
2. திருக்குறள் போன்ற தமிழ் நீதிநூல்கள் உணர்த்தும் விழுமியங்கள் குறித்து அறிந்து கொள்ளல்.
3. தமிழ்க் காப்பியங்கள் கூறும் விழுமியங்கள் குறித்து அறிந்து கொள்ளல்.
4. தமிழ்ச் சமய இலக்கியங்கள் உரைக்கும் விழுமியங்கள் குறித்து அறிந்து கொள்ளல்.
5. பெண் வாழ்வியல் நன்னெறி மற்றும் ஆடவருக்குரிய தமிழ் இலக்கிய விழுமிய நன்னெறிகள் குறித்து அறிந்து கொள்ளல்.

**ULTA22 - இடைக்கால இலக்கியம் (Part 1 – Tamil)**

1. சைவ இலக்கியங்கள் பற்றி அறிந்து கொள்ளல்.
2. வைணவ இலக்கியங்கள் பற்றி அறிந்து கொள்ளல்.
3. பிள்ளைத்தமிழ், நந்திக் கலம்பகம், கலங்கத்துப்பரணி குறித்து அறிந்து கொள்ளல்.
4. பக்தி இலக்கியம் மற்றும் சிற்றிலக்கியம் குறித்த இலக்கிய வரலாற்றை அறிந்து கொள்ளல்.
5. மொழிப் பயன்பாடு பெறுதல்.

**UTAT21- நன்னூல் சொல்லதிகாரம்**

1. பெயர்ச்சொற்களின் இலக்கணங்கள் மற்றும் வேற்றுமை வகைகளை அறிந்து
   கொள்ளல்.
2. வினைச்சொற்களின் பாகுபாடு மற்றும் வினைமுற்றின் வகைகள் குறித்து அறிந்து கொள்ளல்.

3. பெயர், வினைச்சொற்களுக்கும் - இடை, உரிச்சொற்களுக்கும் பொதுவான
   இலக்கணங்களை அறிந்து கொள்ளல்.
4. இடைச்சொல்லின் பொதுவிலக்கணம் மற்றும் வகைகளை அறிந்து கொள்ளல்.
5. உரிச் சொல்லின் பொதுவிலக்கணம் மற்றும் வகைகளை அறிந்து கொள்ளல்.

## UEVS21- சுற்றுச் சூழல் கல்வி

1. ஐவகை நிலப்பாகுபாடு, தமிழர் வகுத்த பொழுதுகள்,உயிரினப் பகுப்பு மற்றும் ஐம்பூதக் கட்டமைப்பு குறித்து அறிதல்.
2. சுற்றுச் சூழல் மாசுபாடு, உலக வெப்பமாதலைத் தடுக்கும் முறைகள், ஓசோன் மண்டிலம் காத்தல் ஆகியவற்றை அறிதல்.
3. மரங்களின் நன்மைகள், வனப் பாதுகாப்புச் சட்டவிதி முறைகள் பற்றி அறிதல்.
4. இயற்கை வள ஆதாரங்கள் மற்றும் நீர்நிலைகள் பராமரிப்பு பற்றி அறிந்து கொள்ளல்
5. கழிவுப் பொருட்கள் மற்றும் தடைசெய்யப்பட்ட பொருட்களை அகற்றுதல், சுற்றுச் சூழலை நேசிக்கும் முழக்கங்கள் பற்றி அறிதல்.

## ULTA33 – காப்பிய இலக்கியம் (Part 1 – Tamil)

1. இரட்டைக் காப்பியங்கள் குறித்து அறிந்து கொள்ளல்
2. காப்பிய இலக்கிய வகைகளை உணர்தல்.
3. சீறாப்புராணம் - தேம்பாவணி ஆகிய இஸ்லாமிய, கிறித்தவக் காப்பியம் பற்றி அறிதல்.
4. ஐம்பெருங் காப்பியம், ஐஞ்சிறு காப்பியம் குறித்த வரையறை மற்றும் தமிழில் காப்பியங்கள் குறித்த வரலாறு பற்றி அறிதல்.
5. செய்தி அறிக்கை எழுதுதல், நேர்காணல் செய்தல் மற்றும் சொற்றொடர்களை மொழிபெயர்த்தல் பற்றி அறிதல்.

## ULTA44 – பழந்தமிழ் இலக்கியம் (Part 1 – Tamil)

1. நற்றிணை மற்றும் குறுந்தொகை பாடல் கருத்துக்களை அறிந்து கொள்ளல்.
2. சங்க இலக்கியங்களான முல்லைப்பாட்டு மற்றும் புறநானூறு பாடல் கருத்துக்களை அறிந்து கொள்ளல்.
3. சங்க மருவிய கால இலக்கியங்களான திருக்குறள், நாலடியார் மற்றும் பழமொழி ஆகியவற்றின் பாடல் கருத்துக்களை அறிந்து கொள்ளல்.
4. பழந்தமிழ் இலக்கியங்களின் அகம், புறம் பற்றிய இலக்கிய வகைமைகள் பற்றி அறிந்து கொள்ளல்.
5. வணிகக் கடிதம், சிறுகதை, புதுக்கவிதை மற்றும் இலக்கியக் கட்டுரை போன்றவற்றை எழுதுவதற்கு அறிந்து கொள்ளல்.

## PGDCA

PSO1 Understand Basic concept, and Programming language like procedure oriented language, Object oriented programming, event driven programming.

PSO2 Different Hardware and software specification.

PSO3 Understanding application of different software. Needed for area development like online treading institute.

### COURSE OUTCOME

### PGDC11 – PROGRAMMING IN C (5)

CO1 Understanding the basic structure of C program using an example program.
CO2 Describe the various types of operator in C.
CO3 Discuss on the syntax WHILE WHILE-DO and FOR loop statements using examples.
CO4 Describe the category of function and the concept of recursion.
CO5 Describe the method of initializing and using to and multidimensional arrays.
CO6 Program to find the minimum and maximum from the given set of numbers.
CO7 Discuss on the concept of strings and the various types of strings functions.
CO8 Describe the various types of storage classes and its importance with example.
CO9 Able to write a detailed note on operations on pointers and working pointer expressions.
CO10 Describe the input-output operations with files.

### PGDC12 - PC SOFTWARE FOR WINDOWS (5)

CO1 Discuss about the formatting paragraphs and text in MS Word.
CO2 Elucidate copying, moving, deleting and renaming the files using the mouse.
CO3 Able to creating and formatting a table in MS Word.
CO4 Describe about viewing and printing merge letters in MS Word.
CO5 Narrate the appearance of chart in excel.
CO6 Understanding the statistical function in excel.
CO7 Elucidate about the common features of DTP.
CO8 Able to creating and printing a presentation.
CO9 Illustrate creating and editing a table in MS-Access.
CO10 Able to creating and printing report in MS-Access.

### PGDC13 - FUNDAMENTALS OF COMPUTERS (5)

CO1 Describe the characteristics of computers.
CO2 Describe about the computer components with block diagram.
CO3 Understanding about the system software.
CO4 Understanding the Spread sheet. Programming languages. DBMS.
CO5 Describe the evolution of operating systems
CO6 To know about Multiprocessing. Time sharing. Real Time Processing.
CO7 Understanding the transmission media.
CO8 To know about Digital and analog transmission.
CO9 Describe the use of sound and animation in multimedia.
CO10 Impact the use of images and video in multimedia.

## PGDC21 - OPERATING SYSTEM BASICS (5)

CO1 Describe about the distributed system.
CO2 To know about network structure in detail.
CO3 Describe about inter-process communication.
CO4 Describe about multithreading models in detail.
CO5 To know aboout:

i. Banker's Algorithm

ii. Safety Algorithm

iii. Resource Request Algorithm

CO6 Understand about segmentation with paging.
CO8 Impact about various disk scheduling in detail.
CO9 To know about the recovery from deadlock.
CO10 To know about the disk management.

## PGDC22 - DATABASE MANAGEMENT SYSTEM (5)

CO1 Discuss about the transaction concept and transaction state.
CO2 Impact about centralized and client-server architecture.
CO3 Understand about set operations.
CO4 Describe about nested queries in detail.
CO5 Illustrate about Entity relationship diagram.
CO6 Elucidate briefly about E-R design issues.
CO7 Elucidate about the decomposition using functional dependencies.
CO8 Understand about decomposition using multi-valued dependencies.
CO9 To know about magnetic disk in detail.
CO10 Impact about the RAID.

## PGDC23 - INTERNET (5)

CO1 To know about the Internet Works.
CO2 Impact in Dial up scripting.
CO3 Understand about E-mail ID.
CO4 Describe about telnet and newsgroup.
CO5 Impact in detail about WWW.
CO6 List types Web browsers and Explain.
CO7 Discuss about Utilities.
CO8 To know about (i) Software types. (ii) File types.
CO9 Discuss about Trouble shooting problems.
CO10 To know about the free web presence providers.

## M.Sc. BIOCHEMISTRY

## PROGRAMME SPECIFIC OUTCOMES

**On completion of M.Sc. Biochemistry programme,**

**PSO1: Students will be able to enrich the knowledge in the advanced concepts and principles of Biochemistry.**

**PSO2: Students will be able to strengthen the theoretical knowledge in biochemistry to secure a successful career**

**PSO3: Students will be able to utilize the knowledge attained from the programme to work as biochemists in emerging modern clinical laboratories and scientific government organizations**

**PSO4: Students will be able to communicate appropriately and effectively with people in the field of Biochemistry and other allied backgrounds**

**PSO5: Students will be able to develop hands on experience and laboratory experiments perceived will be constructive to pursue research.**

# COURSE OUTCOME

## CORE I - CHEMISTRY OF BIOPOLYMERS-PBCT11 Credits-5

**CO1**: Gain the knowledge about the chemical structure of biopolymers, and their classification

**CO2**: Learn the techniques for isolation and purification of polysaccharides and can understand its biological function.

**CO3**: Study the primary, secondary, tertiary protein structure, metalloprotein, nucleic acid and their functions.

**CO4**: Students can learn the basic concept, structure and function of biopolymer.

**CO5**: Students can learn the basic concept, structure and function of Nucleic acid.

## CORE II - ENZYMES AND ENZYME TECHNOLOGY-PBCT12 Credits-5

**CO1**: Learn the classification and properties of enzymes and its application in various field.

**CO2**: Study the enzyme kinetics and mechanisms of enzyme action.

**CO3**: Learn the enzyme activity and immobilization methods and the application of immobilized enzymes

**CO4**: Student can able to understand the nomenclature of enzyme, enzyme action, role of enzymes in biosensor, and their advantages.

**CO5**: Student learn about the methods of Biosensor and their applications.

## CORE III - CELLULAR BIOCHEMISTRY-PBCT13 Credits-5

**CO1**: Know the structure and function of membrane

**CO2**: Study the structure and functions of cell organelles and cell division

**CO3**: Understand the cell communication and cancer cells

**CO4**: Student can gain the knowledge about cell organelle, cell division, cell communication and mutational changes in gene function.

**CO5**: Student Learn about Cancer and its types and treatment methods.

**ELECTIVE 1 - BIOPHYSICAL METHODOLOGY-PBCE11 Credits-5**

**CO1**: Study the properties of electromagnetic radiation

**CO2**: Learn the principle and applications of UV, NMR, and ESR spectroscopy.

**CO3**: Know about radioactive isotopes and its biological application.

**CO4**: Students can understand the instrumentation, principle, types and uses of spectroscopy, microscopy, radioisotopes techniques and centrifugation

**CO5**: Students can Learn the instrumentation, principle, types and uses of centrifugation

**CORE V - ENDOCRINOLOGY AND METABOLIC REGULATION-PBCT21 Credits-5**

**CO1**: Study the hormone classification and biosynthesis

**CO2**: Learn the synthesis and biological functions of pituitary hormones, growth hormones and thyroid hormones.

**CO3**: Study about function of pancreas, adrenal hormones, mechanism and role of pathophysiology.

**CO4**: Student can acquire the knowledge about hormone secretion, function and metabolic regulations

**CO 5**: Student can update the knowledge about Adrenal hormone secretion, function and metabolic regulations

**CORE VI - CLINICAL BIOCHEMISTRY-PBCT22 Credits-5**

**CO1**: Study the disorders caused due to the error in carbohydrate metabolism and regulation of blood glucose level.

**CO2**: Know the disorders caused due to the defects in lipid, protein and nucleic acid metabolism.

**CO3**: Train the clinical test such as tissue function tests, biochemical tests and renal disorders.

**CO4**: Student can understand the clinical significance of diagnostic biochemistry.

**CO5**: Student can acquire the knowledge about Enzyme assay and its Clinical significance

**CORE VII – IMMUNOBIOLOGY-PBCT23 Credits-5**

**CO1**: Get the knowledge about basic immune cells and organs of the immune system and function.

**CO2**: Learn about the structure and function of immunoglobulin and immunogenicity.

**CO3**: Gain the knowledge regarding the transplantation, auto immunity disorders, vaccination and immunotechniques

**CO4**: Student can able to understand the principles of immune system for the preparation of new vaccine

**CO5**: Student can acquire the knowledge about Transplantation and auto immunity.

**ELECTIVE II – BIOSTATISTICS-PBCE22 Credits-5**

**CO1**: Understand the common statistical techniques and terminology used in this study and can applied for research purpose.

**CO2**: Know the concepts and solve relevant problems pertaining to each topic

**CO3**: Learn numeric and graphical techniques to display and summarize medical and health related data

**CO4**: Students can get knowledge to present the biological data accurately and effectively.

**CO5**: Student can acquire the knowledge about Tests of statistical significance.

**CORE IX - MICROBIOLOGY & ITS APPLICATIONS-PBCT31 Credits-5**

**CO1**: Understand the basics of microbiology, classification and general characteristics of microbes.

**CO2**: Study the structural organization, growth, reproduction and morphological features of microorganisms.

**CO3**: Students get knowledge about spoilage and food poisoning by microorganisms, food borne diseases and production of various commercial products

**CO4**: Student can acquire the skill to isolate and identify the microbes from any sample and can effectively use the microbes for the society needs

**CO5**: Student can acquire the knowledge about types of fermentation and downstream processing.

**CORE X- MOLECULAR BIOLOGY-PBCT32 Credits-5**

**CO1**: Study about the genetic material, mutation and genetic codon.

**CO2**: Understand the bacterial genetic exchange, genetic maps, linkage and types of DNA replication in prokaryote and eukaryote.

**CO3**: The students can understand the regulation of gene expression and mutation**.**

**CO4**: Student can get the thorough knowledge which is essential for recombinant DNA technology.

**CO5**: Student can acquire the knowledge about Gene mutations and Bacterial Transposons.

**CORE XI - PLANT BIOCHEMISTRY-PBCT33 Credits-5**

**CO1**: Understand the photosynthesis process occurs in plants.

**CO2**: Study the functions of natural and artificial plant growth regulators and hormones.

**CO3**: To enlighten the students to get deep knowledge about plant nutrition, nitrogen fixation, the function of mineral, and sulphur and nitrate metabolism in the plants.

**CO4**: The students can understand about the plant physiology and reproduction

**CO5**: Student can acquire the knowledge about Gene transfer mechanism in plant.

**ELECTIVE V -BASIC BIOINFORMATICS-PBCE33 Credits-5**

**CO1**: Understand the sequencing methods, database searching tools and Phylogenetic construction tools.

**CO2**: Obtain knowledge to submission process of protein and nucleotide sequence data to the databases.

**CO3**: Learn the methods to found the structure of specific compounds, visualization tools and evolutionary tools.

**CO4**: Enlighten the students about the basic concepts of bioinformatics and its application in various field.

**CO4**: Student can acquire the knowledge about Micro array and 3D structural analysis of biomolecules.

**CORE XIII – BIOTECHNOLOGY-PBCT41 Credits-5**

**CO1**: Study the DNA isolation methods, cloning vectors and restriction enzymes.

**CO2**: Learn about southern, northern and western hybridization and gene transfer methods.

**CO3**: Study about the application of transgenic plants and monoclonal antibodies

**CO4**: Student can learn advance biotechniques and its application.

**CO5**: Student can acquire the knowledge about IVF and Gene Therapy.

**CORE XIV - ENVIRONMENTAL TOXICOLOGY-PBCT42 Credits-5**

**CO1**: Understand the harmful effect of pesticide and merits of bio pesticides

**CO2**: Student will be able to know about rDNA technology and food toxicology.

**CO3**: To learn the industrial effluent toxicology and metal toxicity and factors influencing metal toxicity.

**CO4**: Students can obtain basic knowledge about xenobiotics in environmental segments (air, water, soil, and biota), its metabolism and effects

**CO5**: Student can acquire the knowledge about Food Toxicology and metal toxicity

## M.SC.COMPUTER SCIENCE

PS01: Able to handle any kind of software development

PS02: Able to maintain the software network to handle the technological challenges.

PS03: Able to develop strong analytical skills, critical thinking and experimental skills.

PS04: Able to solving on Computational problems, system networking knowledge, use of technology with innovative ideas

## COURSE OUTCOME

### PCST11 Advanced Java Programming (5)

**CO1:** Design and Create Java Applications using OOPs concept

**CO2:** Utilise the features of exception handling, threads & util package in Java.

**CO3:** Simplify the communication between client & server using database connectivity.

**CO4:** Build Java applications that include GUIs and event driven programming

### PCST12 Data Structures And Algorithms (5)

**CO1:** Analyse the space and time complexities for an algorithm

**CO2:** Identify and use appropriate data structure to solve problems

**CO3:** Use Hashing Techniques to solve real time Problems

**CO4:** Implement and Handle various searching and sorting algorithms

### PCST13 Mathematical Foundations Of Computer Science (5)

**CO1:** Construct simple mathematical proofs and possess the ability to verify them.

**CO2:** Utilise Algebraic Structures and Recurrence Function

**CO3:** Know various graphs and its algorithms in computer programs.

**CO4**: Describe computer programs in a formal mathematical manner

### PCST21 Advanced Operating System (5)

**CO1:** Knowledge about advanced concepts in OS

**CO2:** Able to rectify the designing concepts of OS

**CO3:** Ability to develop OS for distributed systems

**CO4**: Understand the Mutual exclusion, Deadlock detection and file sharing in Distributed operating system

## PCST22 Relational Database Management System (5)

**CO1:** Create E/R models from application descriptions.

**CO2:** Improve the database design by normalization.

**CO3:** Students can create database structure

**CO4:** Create databases in an RDBMS and enforce data integrity constraints and queries using SQL

## PCST23 Computer Networks (5)

**CO1:** Have a good understanding of the OSI Reference Model

**CO2**. Students can understand TCP/IP Model and in particular have a good knowledge of Layers.

**CO3:** Identify the different types of network devices and their functions within a network

**CO4:** Students will Analysis the requirements for a given organizational structure.

## PCST31 Compiler Design (5)

**CO1**: Learn the various parsing techniques and different levels of translation.

**CO2**: Have a good understanding of specific object code from source language.

**CO3**: Learn to optimize the code and schedule for optimal performance.

## PCST32 Software Engineering (5)

After successful completion of the course, Student shall be able to:

**CO1:** Understands the process to be followed in the software development life cycle

**CO2:** Understand fundamental concepts of requirements engineering.

**CO3**: Find the practical solutions to the problems.

**CO4:** Student can work as an individual and as part of a multidisciplinary team to develop and deliver quality software

## PCST33 Web Programming (5)

**CO1** Students will learn to design web pages using HTML.

**CO2** Able to gain knowledge on creating interactive web pages using JavaScript, Query.

**CO3** Able to write a program and to use Cascading Style Sheets (CSS) and DOM.

**CO4** Able to develop server side scripting using PHP

## PCST41 Digital Image Processing (5)

After completion of the course, Student shall be able to

**CO1.** Understand how digital images are represented and manipulated in computer

**CO2**. Develop a broad range of image processing techniques and their applications.

**CO3:** Understand the different types of image transformations and image features.

CO4: Understand the advancements in Computer Vision of Images.

## PCST42 Mobile Computing (5)

After successful completion of the course, Student shall be able to:

**CO1:** Understand the characteristics and limitations of mobile hardware devices including their user-interface modalities

**CO2**. Design and develop context-aware solutions for mobile devices.

**CO3.** Have to clear idea about Satellite Systems

**CO4**: develop their knowledge in mobile computing system and how to interact with servers and database systems.

## PCSE11 Computer Graphics (5)

After successful completion of the course, Student shall be able to:

**CO1:** Explain Graphic primitives and the working of I/O devices

**CO2:** Apply geometric transformations in objects

**CO3:** Implement Graphic modeling process
**CO4**: Create interactive graphics applications in C++ using graphics application programming interfaces.

## PCSE22 Data Warehousing and Data Mining (5)

After successful completion of this course, the students shall be able to

**CO1:** Identify the characteristics of data warehousing.

**CO2:** Identify the association rules for mining applications.

**CO3:** Design appropriate classification/clustering techniques for data mining problems

CO4: Select appropriate tools for various data mining applications.

## PCSE22 Cryptography And Network Security (5)

After completion of the Course, students shall be able to

**CO1:** Learn and operate secure programming techniques

**CO2:** Understand the design issues in Network Security

**CO3:** Identify security threats, security services and mechanisms to counter them.

**CO4:** Be familiar with security applications in wireless environment

## PCSE33 Software Project Management (5)

After completion of the Course, Students shall be able to

**CO1**: Learn how to estimate the cost associated with a project

**CO2**: Plan and monitor projects for the risk management

**CO3**: Learn the process of monitoring and controlling

**CO4**: Gain the in-depth knowledge about software development standards and to know how to manage people and organization of teams with their own.

## PCSE33 Big Data Analytics (5)

After completion of the Course, students shall be able to

**CO1**: Know the fundamental concepts of big data and analytics.

**CO2**: Utilize the tools and practices for working with big data

**CO3**: understand about the research that requires the integration of large amounts of data.

**CO4:** Gain the In depth knowledge in stream computing

# MA ENGLISH

| PROGRAMME SPECIFIC OUTCOMES | |
|---|---|
| At the end of the programme, the student will be able to | |
| **PSO1:** | Read, understand, analyze, interpret, and extrapolate from the complex texts that are at the heart of the diverse traditions of the English language. |
| **PSO2:** | Identify, analyze, interpret and describe the critical ideas, values, and themes that appear in literary and cultural texts and understand the way these ideas, values, and themes inform and impact culture and society, both now and in the past. |
| **PSO3:** | Demonstrate a command of written academic English, including the abilities to a) organize and present material in a cogent fashion, b) formulate and defend original arguments, c) employ effectively the language of their discipline, and d) write under time constraints. |
| **PSO4:** | Analyse, interpret, and understand the complex interrelationships between authors, texts, and specific social, political, and historical contexts and apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres. |
| **PSO5:** | Write well in a variety of formats, including essays, research papers, reflective writing, and critical reviews of secondary sources and to cogently convey their own interpretations and perspectives, or produce new creative and artistic works themselves |

| | | |
|---|---|---|
| **PENT11** | **British Literature I** | **CO1:**know the poetic tactics of the classical writers**(K1,K2)**<br><br>**CO2:**understand the difference between Old English and Middle English**(K1,K2)**<br><br>**CO3:**be aware of the salient features of aphoristic style **(K2,K4)**<br><br>**CO4:**Discover and to apply the creative power behind art and literature **(K2,K3,K6)**<br>**CO5:**Critically analyze the life and works of great writers and will be able to create literary pieces on their own **(K4,K6)** |
| **PENT12** | **British Literature II** | **CO1:**understand the sense of rationalism and sensibility of the writers<br><br>**CO2:**recognize and understand the figurative language<br><br>**CO3:**apply the technical nuances of Neo-Classical dramas<br><br>**CO4:**comprehend the artistic style of the writers and to adopt the style in writing<br>**CO5:**appreciate the intense zeal of the writers and to stimulate the creativity of the students |
| **PENT13** | **Indian Writing in English** | **CO1:**Understand the social, and political controversies in India during the colonial and post- colonial periods<br>**CO2:**Acquire knowledge about Indian cultural ethos and its uniqueness<br><br>**CO3:**Evaluate the unique characteristics of Indian writing in English<br>**CO4:**Appreciate the spirit of the Indian writers to preserve the noble values of Indian society<br>**CO5:**Acquire literary acumen for facing the SET/ NET/TET and other competitive examinations with confidence |
| **PENT14** | **Diasporic Fiction** | **CO1:**introduce the emerging body of literature<br><br>**CO2:**intimate the process of cross cultural studies and comparative literary studies<br><br>**CO3:**display an understanding of both literal and metaphorical meaning of literary texts<br><br>**CO4:**negotiate the complexities and ambiguities<br><br>**CO5:**incorporate the literary products with different cultural and geographical specificity |

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|---|---|---|
| **PENE11** | **Creative Writing** | **CO1:**Construct a variety of flawless sentences in English using appropriate grammatical structures<br>**CO2:**Earn their skills in Technical Writing to be a reporter, Content Writer<br>**CO3:**Draft effective research proposals/reports<br>**CO4:**Exploit the resources of English language for professional enrichment<br>**CO5:**Master the mechanics of writing and to be a writer/a teacher |
| **PENT21** | **British Literature-III** | **CO1:**know the revolutionary ideologies of the romantic writers<br>**CO2:**identify the lyrical qualities in romantic poetry<br>**CO3:**discover the creative power behind art and literature and to imitate and to recreate<br>**CO4:**appreciate the style of the essayists<br>**CO5:**relish the aesthetic beauty, wonder in the realm of nature and reflect in Writing |
| **PENT22** | **British Literature – IV** | **CO1:**know the religious and philosophical insight through dramatic monologues<br>**CO2:**understand the writers' vision for the betterment of mankind<br>**CO3:**ponder the values and ideas propagated by the Victorian writers<br>**CO4:**explore the several social problems in Victorian England<br>**CO5:**analyze the life of the Victorians to apply human values and ethics in real life |
| **PENT23** | **Shakespeare-V** | **CO1:**understand the magnitude of the Shakespearean world<br>**CO2:**introspect the complexities of Shakespeare's plays<br>**CO3:**attain a comprehensive knowledge of the plays of Shakespeare<br>**CO4:**analyze the stylistic features of Shakespeare<br>**CO5:** relish the sublimity of Shakespearean language and express through creative writing |

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|---|---|---|
| **PENT24** | **Language and Linguistics** | **CO1:**know the concepts of linguistics<br>**CO2:**familiarize with the basic symbols of the International Phonetic Alphabet and to familiarize with pronunciation<br>**CO3:**enhance intrinsic values of language usage<br>**CO4:**analyze the various aspects of articulation effects<br>**CO5:**practice the intricacies of various structures of modern English and to practice transcription |
| **PENE22** | **TRANSLATION THEORY AND PRACTICE** | **CO1:**understand the history of translation<br>**CO2:**develop the transactional skills **CO3:**refine<br>their standard in translation **CO4:** appreciate the<br>intercultural concepts<br>**CO5:**apply the intrinsic skills of translation |
| **PENT31** | **American Literature** | **CO1:**learn the literary works & culture of the Americans<br>**CO2:**understand the literary activities of the writers of American descent<br>**CO3:**gain a perception of literary trends set by the American writers<br>**CO4:** understand the character, flavor and ethos of the American literature<br>**CO5:**Appreciate the positive approaches of the American writers towards equality and emancipation and enable them to practice and to be an instructor. |
| **PENT32** | **World Classics In Translation** | **CO1:**Acquire perception of the classical texts amidst the whole gamut of world literatures.<br>**CO2:**Discover the richness of the cultures and their writings<br>**CO3:**Possess the capacity to identify, expound on and compare literary genres and periods.<br>**CO4:**Relish the essence of knowing the works of people from other cultures and background.<br>**CO5:**Exposed to analyze and demonstrate the knowledge of the major literary movements of the period and to apply in translation oriented works. |

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|---|---|---|
| **PENT33** | **Literary Theory And Criticism** | **CO1:**The course intends to provide a critical understanding of the developments in literary criticism from the beginning to the end of 19th century<br>**CO2:**Moreover some selected texts/critics are prescribed for detailed study whose contribution to this area constitutes a significant benchmark in each era.<br>**CO3:**It also provides a conceptual framework for developing an understanding of the function and practice of traditional modes of literary criticism<br><br>**CO4:**Learn the history of literary criticism and various literary theories. Apply critical and technical theory and vocabulary to describe and analyze, and formulate an argument about literary and other texts.<br><br>**CO5:**Think about the non-fixity of meaning of literacy texts.<br><br>Develop a skill in applying various literary theories in interpreting a specific text. |
| **PENE33** | **Writing For The Media** | **CO1:**Demonstrate their ability to observe events, gather information, write news reports and news releases and report on events<br>**CO2:**Gain first-hand experience in the designing the News Letters.<br><br>**CO3:**Understand the difference between communication and media theories and would have gained expertise to handle this area in their profession<br>**CO4:**grasp the complex relationship between communication/media theories and a diverse set of individual, social, and professional practices<br><br>**CO5:**Know the processes and practice of writing for the media and to have placement in Media |
| **PENT34** | **Research Methodology** | **CO1:**Comprehend Literary Research against other types of researches and will have learnt to identify and describe the Research Question<br>**CO2:**Imbibe the rhetoric styles, language appropriate for research and the knowledge on the mechanics and methodology of writing a literary project<br>**CO3:**Acquire training in selecting and defining the appropriate research problem and parameters.<br><br>**CO4:**Understand how to organize ideas and format a dissertation.<br>**CO5:**develop data analytics skills and meaningful interpretation to the data sets so as to solve the Research problem |

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|---|---|---|
| **PENT41** | **Post Colonial Literature** | **CO1:**Familiarized with some of the seminal works on colonialism<br><br>**CO2:**Acquainted with the key concepts of postcolonial literary theory through the study of postcolonial texts<br>**CO3:**Introduced to aspects of subjectivity, race, class and feminism as they inhere in the postcolonial space<br>**CO4:**Known how a literary text, explicitly or allegorically; represents various aspects of colonial oppression<br><br>**CO5:**Learnt how a text reveals about the politics and/or psychology of anti-colonialist resistance and trace the history of post-colonial movements in India and its textual representations and trained them to teach and to be sensitized towards cross cutting issues. |
| **PENT42** | **Women's Writing** | **CO1:**Learn how and on what grounds women's writings can be considered as a separate genre.<br>**CO2:** Read and understand canonical texts written by Women writers across different ages.<br>**CO3:**Differentiate between sex and gender and how the latter is a social construction.<br><br>**CO4:**Be aware about the issues and concerns of the women writers of the developed, developing and under-developed countries<br>**CO5:**Demonstrate awareness of cultural and intercultural concerns relating to women's writing |

**PROGRAMME SPECIFIC OUTCOMES FOR**

**M.Com**

**PSO 1: To apply the critical and analytical skills and methods to the identification, evaluation**

**and resolution of complex problems**

**PSO 2: To train the students for up-to-date carrier skills.**

**PSO 3: To apply both quantities and qualitative knowledge to the future careers in business.**

**PSO 4: To ability in competitive exams like,CA,CS,ICWA,CMA,BAT etc.**

**PSO 5: To acquire the skills like effective communication, decision making problem solving in day- to-day business affairs.**

## COURSE OUTCOME

**PCOT11– Marketing Management (5)**

**CO1:** Explain the marketing concepts

**CO2:** Identify the strategies adopted for buyer's behaviour.

**CO3:** Analyse the tools for promotion, sales promotion and Advertising.

**CO4:** Assess the marketing organization and control.

**CO5**: Assess Customer Satisfaction, Benchmarking and Quality Management

**CO6**: Discuss about the steps in consumer research.

**CO7:** Explain the public relations

**CO8:** Discuss about the green Marketing.

**CO9:** Discuss the consumerism.

**CO10:** Explain the total quality management.

**PCOT12- INTERNATIONAL TRADE AND PRACTICES (5)**

CO1: Why the reason for firms going to international business?

CO2: What are the components of BOP? Explain.

**CO3:** Understand the concepts of international marketing and environment

**CO4:** Evaluate the various determinants of international marketing channels

**CO5:** Analyse the determinants of market selection and market entry methods

**CO6**: Explain the TRIM.

**CO7:** What are the function of IMF and World Bank.

**CO8:** Explain major export and imports in Indian scenario.

**CO9:** What are the factors determine the exchange rate?

**CO10:** Discuss about FEMA.

**PCOT13– ADVANCED FINANCIAL MANAGEMENT (5)**

**CO1**: Explain the various techniques of financial management and financial planning

**CO2**: Make use of the relevance of capital structure, cost of capital and dividend policy with the value of the firm

**CO3:** Analyse the financial plan, leverages, capital structure and cost of capital of a company

**CO4:** Determine the optimal capital structure and value of a firm

**CO5**: Estimate the cost of capital, optimum dividend and working capital requirements of business firms.

**CO6**: Explain the components of working capital

**CO7:** Explain concept, needs and types of working capital.

**CO8:** Problems from capital budgeting

**CO9:** Problems from working capital.

**CO10:** Problems from cost of capital

**PCOP11- COMPUTERIZED ACCOUNTING WITH TALLY(PRACTICAL) (5)**

**CO1:** Possess skills to create a company with accounting and inventory features.

**CO2:** Work with the well-known procedure for recording the transactions in accounting and inventory vouchers.

**CO3:** Create company, ledger and groups

**CO4:** Entre vouchers.

**CO5:** Create Inventory groups, items ,unit of measures and entre the vouchers,

**CO6**: Analyze the reports like Day Book, Trial Balance, Profit & Loss A/c, Income and Expenditure Account, Balance Sheet & Printing option **CO7:** b

**CO8:** Prepare Bank reconciliation statement and debtors, creditors management

**CO9:** Create stock summary

**CO10:** Back up and restore data.

**PCOC11 - MANAGERIAL ECONOMICS (5)**

**CO1:** Explain the managerial economics in relation with other discipline.

**CO2:** Explain the Goals of corporate enterprises.

**CO3** What are the factors affecting elasticity of demanding.

**CO4:** Explain the various methods of demand determinants.

**CO5:** Explain the various cost concepts.

**CO6**: Explain the cost output relationship (short run and long run)

**CO7:** Explain the various methods of pricing.

**CO8:** What are the factors affecting pricing policy?

**CO9:** What are the causes of industrial sickness?

**CO10:** Explain the various function of public finance.

**PCOT21–MODERN BANKING AND INSURANCE (5)**

**CO1:** Briefly explain the various credit control measures of Central Bank.

**CO2:** Examine the various methods of credit control measures.

**CO3:** What is internet banking? Explain the drawbacks of internet banking

**CO4:** Describe about the services of E-Banking.

**CO5:** What do you mean by mobile banking? Explain the features and security issues of mobile banking.

**CO6**: Describe the accounting and taxation aspects of Insurance.

**CO7:** Discuss about Insurance business environment in India.

**CO8:** Describe the drawbacks of internet banking.

**CO9:** Explain the significance of telephone banking system

**CO10:** Describe the principles of life insurance.

**PCOT22– ADVANCED COST ACCOUTING (5)**

**CO1:** Briefly explain the cost accounting and financial accounting.

**CO2:** Problem cost sheet**.**

**CO3:** problems from materials.

**CO4:** Problems from labour.

**CO5:** Problems from over heads.

**CO6**: Problems from contract account

**CO7:** Apply the various cost management techniques

**CO8:** Explain the concepts of activity based costing, target costing, life cycle costing, standard costing, value chain and value added

**CO9:** Problems from job costing

**CO10:** Problems from process costing.

**PCOT24- QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS (5)**

**CO1:** problems from Correlations

**CO2:** problems from regression.

**CO3:** Explain probability and be able to use a range of techniques to calculate probabilities

**CO4:** problems from probability

**CO5:** What is the test statistics used to test the significance of the difference between sample mean and population mean?

**CO6**: How do you find the analysis of variance?

**CO7:** Problems from transportation.

**CO8:** Problems from assignment.

**CO9:** Problems from binomial expansion.

**CO10:** Problems from nuwton's methods.

**PCOT23- BUSINESS RESEARCH METHODS (5)**

**CO1:** Describe the steps included in research process.

**CO2:** Explain the conceptual framework of research design

**CO3:** Explain the qualities of a good researcher.

**CO4:** What is mean by sampling? What are its types?

**CO5:** Briefly explain the types of research.

**CO6**: Explain the methods of collecting the data.

**CO7:** Explain the important scaling techniques used in business research.

**CO8:** What are the statistical tools used in the research?

**CO9:** WHAT is editing in data processing?

**CO10:** Explain the contents of research report in detail.

**PCOE22– BUSINESS ENVIRONMENT (5)**

**CO1:** Enumerate the functions of consumer protection act 1986
**CO2:** What are the critical elements of socio-cultural environment?
**CO3:** Explain consumerism in India

**CO4:** Explain social institution and systems

**CO5:** Explain the social responsibility of business?
**CO6**: Explain the importance of international economic\ institutions WTO World bank and IMF
**CO7:** Write the critical elements of political environment?

**CO8:** Explain the economic system and business environment

**CO9:** State the industrial policy, fiscal policy, monetary policy?
**CO10:** .Enumerate the EXIM policy

**PCOT34-MANAGEMENT ACCOUNTING (5)**

**CO1:** Define financial statement, cash flow statement, marginal costing, budgetary control and capital budgeting.

**CO2:** Explain the scope and functions of management.
**CO3:** Distinguish between management accounting and financial accounting.
**CO4:** problems from fund flow and cash flow.

**CO5:** problems from materials.

**CO6**: problems from labour.

**CO7:** problems from BEP.

**CO8:** What are the role and limitations of CVP analysis?

**CO9:** Explain the importance of capital budgeting and its difficulties.

**CO10:** Problems from ARR,PBM,DCF<NPV AND IRR.

**PCOT32- FINANCIAL MARKETS AND SERVICES (5)**

**CO1:** Draw a structure of Indian Financial Institution and explain.

**CO2:** State the role of financial system in the economic development of a company?

**CO3:** Give the structure of the Indian Money Market and Point out its deficiencies.

**CO4:** What are the characteristics of a well-developed Money Market?

**CO5:** Write on the functions of New Issue Market.

**CO6**: Describe detail Method of Trading in a Stock Exchange.

**CO7:** What is the various function of a Merchant Bankers?

**CO8:** The scope for Merchant banking is great in India – Discuss.

**CO9:** Explain the role of factoring in India and mention the guidelines laid down by SEBI

**CO10:** Explain the different types of factoring and their significance.

**PCOT33– ADVANCED CORPORATE ACCOUNTING (5)**

**CO1:** Outline the basic concepts of corporate accounting

**CO2:** Sum from ascertain the value of Inventories as per AS-2.

**CO3:** Sum from AS-14 (Accounting Standard 14) for Amalgamations

**CO4:** Analyse the internal and external reconstruction, performing asset and non-

Performing asset

**CO5:** Determine the purchase consideration, capital and revenue profits and profit / loss

of bank, insurance and electricity companies

**CO6**: Problems from banking company.

**CO7:** problems from holding company

**CO8:** problems from electricity and railway.

**CO9:** Explain the schedule and preparation of final accounts.

**CO10:** Explain briefly any 5 Indian Accounting Standards.

**PCOT31– INDIRECT TAXATION (5)**

**CO1:** Explain the concepts of Goods and Services Tax Act and Customs Act

**CO2:** Explain the various types of central excise duty.

**CO3:** Apply the GSTN Portal in business

**CO4:** Explain the classes of officers central and state goods and services tax act.

**CO5:** Categorize the transactions under CGST, SGST, IGST and UTGST

**CO6**: Enumerate the procedure for registration under schedule 3

**CO7:** Appraise the mechanism of Goods and Services Tax System

**CO8:** Explain sale or purchase of goods in the course of Import (or) export.

**CO9:** Prepare the tax planning and tax management for payment of tax and filling of tax returns.

**CO10:** Explain prohibition of importation and exportation of goods.

**MCOC25 - HUMAN RESOURCES MANAGEMENT (5)**

**CO1:** Describe the functions of HRM?

**CO2:** HRM has evolved along the years – Comment

**CO3:** What are various sources of recruitment? Discuss their relative merits and demerits

**CO4:** Enumerate the steps involved in the process of HR planning

**CO5:** Explain any two theories of learning?

**CO6**: Discuss the Meslow's theory of motivation

**CO7:** Briefly explain the methods of job evaluation

**CO8:** Explain theories of personality?

**CO9:** Bring out the causes off inter group conflict?

**CO10:** How do you manage the conflict in the organisation? Explain

**PCOT41– INCOME TAX & TAX PLANNING (5)**

**CO1:** What is TDS and its provisions.

**CO2:** Explain the power CBDT.

**CO3:** Problems from income from other sources.

**CO4:** Write a notes on a)PAN b) E Filling of income tax return.

**CO5:** Understand the basic concepts of Income Tax Act

**CO6**: Identify the exempted incomes from all heads of incomes

**CO7:** Analyse the procedures for computing taxable incomes from five heads.

**CO8:** Determine the taxable income of different heads of income

**CO9:** Explain power of principle commissioner.

**CO10:** Prepare the statement of tax liability of an individual

**PCOT42-STRATEGIC MANAGEMENT (5)**

**CO1:** The students will, by means of a large project report written in groups, obtain training in analysing the strategic situation of a real technology based company, and in developing suggestions for change and development of the company's strategy. Thereby, the students will also acquire experience with working in groups as well as with writing reports for a company.

**CO2:** The students will, by means of lectures and a written exam, be encouraged to reflect on and combine key perspectives and frameworks within the field of strategic management.

**CO3:** The student will analyse a company strategic situation, with particular emphasis on strategic analyses on the business level, the corporate level, and the network level **CO4:** The student will develop suggestions for change and development of a company's strategy.

**CO5:** The student will understand specific knowledge of perspectives, frameworks and concepts within strategy formation, strategic change, and strategic innovation.

**CO6**: Explain in detail about the major objective of NPO.

**CO7:** Write discuss about the corporate strategies

**CO8:** Discuss the importance of GE matrix and balance score card.

**CO9:** Write a note on a) Recovery b) recession c) management buyout.

**CO10:** Discuss the types of non profit organisation.

**M.Sc. MATHS**

**COURSE OUTCOME**

**SEMESTER I**

**PMTT11 - LINEAR ALGEBRA (5)**

**CO 1:**If F is a field, a non-scalar monic polynomial in $F[x]$ can be factored as a product of monic primes in $F[x]$ in one and, except for order, only one way.

**CO 2:** Let f be a polynomial over the field F with derivative f'. Then f is a product of distinct irreducible polynomial over F if and only if f and f' are relatively prime.

**CO 3:**Every n dimension vector space over the field F. If isomorphism to the space $F^n$

**CO 4:**If $V = W_1 \oplus ..... \oplus W_K$, then there exist k linear operators $E_1 ..... E_K$ on V such that

(a)each $E_i$ is a projection ($E_1^2 = E_i$); (b)$E_i E_j = 0$, if $i \pm j$; (c)$I = E_1 + .....+E_k$;

(d)the range of $E_i$ is $W_i$. Conversely if $E_1, ..... E_k$ are k linear operators on V which satisfy conditions (1), (2), and (3), and if we let $W_i$ be the range of $E_i$, then

$V = W_i \oplus ..... \oplus W_k$

**CO 5:**Let T be a linear operator on the space V, and let $W_1, ....w_k$ and $E_1 .....E_k$ be as in Theorem 9.

Then a necessary and sufficient that each subspace $W_i$ be invariant under T is that T commute

with each of the projections $E_i$ ..... $T E_i = E_i T$, $i = 1 ..... k$.

**CO 6:**Every MXN matrix A is row equivaient to a row – reduced echelon matrix.

**CO 7:** Let V and W be finite dim vector spaces over the field F such that dimV=dim W if T is linear transformation from V into W then the following equivalent

(i) T is intertible (ii)T is non- singular (iii) T is onto the range of T is W.

**CO 8:**a) Prove that a linear combination of n - linear functions is n-linear.

b)Derive Lagrange's interpolation formula

**CO 9:**a) Let D be a 2-linear function with the property that D (A) = 0 for all $2 \times 2$ matrices A over K having equal rows. Then D is alternating.

b)Let n > 1 and let D be an alternating (n-1)-linear function on (n-1) × (n-1) matrices over K. For each j, $1 \leq j \leq n$, the function $E_j$ defined by $E_j (A) = \sum_{i=1}^{n} (-1)^{i+j} A_{ij} D_{ij} (A)$

**CO 10:** Let T be a linear operator on a finite-dimensional space V. If T is diagonalizable and if $c_1$ ….. $c_k$ are the distinct characteristic values of T, then there exist linear operator $E_1$…..$E_k$ on V such

that (a)$T = c_1 E_1 + \ldots. + c_k E_k$ ;(b)$I = `E_1 + \ldots\ldots + E_k$ ;(c)$E_i E_j = 0, i \pm j$;(d)$E_1^2 = E_i$ ($E_i$ is

projection)(e)the range of $E_1$ is the characteristic space for T associated with $c_i$ .

## PMTT12 - REAL ANALYSIS –I (5)

**CO 1:**state and prove the root test.

**CO 2:** A mapping of a metric space X into metric space Y is

continuous on X iff $f^{-1}$ (v)is open in X.for every open set V in y.

**CO 3:** State and prove generalised mean value theorem.

**CO 3:** If f is continuous on [a,b],then f $\in$ R($\alpha$) on [a,b].

**CO 4:**If f $\in$ R($\alpha$),g $\in$ R ($\alpha$) on [a,b] then

(a) fg $\in$ R($\alpha$)

(b) $|f| \in R(\alpha) and \left|\int_a^b f d\alpha\right| \le \int_a^b |f| d\alpha$

**CO 5:**State and Prove Every K-cell is compact ..

**CO 6:** (a) If p>0 then $\lim_{n\to\infty} \frac{1}{n^p} = 0$

(b)If p>0, then $\lim_{n\to\infty} \sqrt[n]{p} = 1$

(c) $\lim_{n\to\infty} \sqrt[n]{1} = 1$

(d)If p>0 and $\alpha$ is real ,then $\lim_{n\to\infty} \frac{n^\alpha}{(1+p)^n} = 0$

**CO 7:** Let f be a continuous mapping of a compact metric space

$x \to R^k$ then f(x) is closed & bounded .then f is bounded.

**CO 8:**Assume $\alpha$ increases monotonically $\alpha$',R on [a,b]. Let f be

bounded real function on [a,b], then f $\in$ R($\alpha$) in this case

$$\int_a^b f d\alpha = \int_a^b f(\alpha)\alpha'(x)dx.$$

**CO 9:**State and prove L Hospital Rule.

## PMTT14 - GRAPH THEORY (5)

**CO 1:**If G1 and G 2 are two 1-isomorphic graphs the rank of G2 and the nullity of G1 equals the nullity of G2

**CO 2:** Every cut set in a connected graph G must contain at least one branch of every spanning tree of G.

**CO 3:**A graph of n vertices is a complete graph iff its chromatic polynomial is

$P_n(\lambda) = \lambda(\lambda-1)(\lambda-2).\ldots\ldots(\lambda-n+1)$

**CO 4:**A covering g of a graph is minimal iff g containing no paths of length three or more.

**CO 5:** Every tree with two or more vertices is 2-chromatic.

**CO 6:** A simple graph (i.e;a graph without parallel edges or self – loops ) with n vertices and k components can have at most (n-k)(n-k+1)/2 edges.

**CO 7:**P.T.a tree with n vertices has n-1 edges.

**CO 8:** The maximum vertex connectivity one can acheive with a graph G on a n vertices and e edges ( e > n-1 ) is the integral part of the number 2e/n that is $\lfloor 2e/n \rfloor$ . Prove that the relationships among $A_f, B_f$ and $C_f$.

**CO 9:** (a) Explain adjacency matrix with examples .

(b)Prove that the relationships among $A_f, B_f$ and $C_f$.

**CO 10:** (a) Let a and b be two nonadjacent vertices in a graph G be a graph G. Let G' be a graph obtained by adding an edge between a and b. Let G'' be a simple graph S Obtained from G by fusing the vertices a and b together and replacing sets of parallal edges with single edges. Then,

$$P_n(\lambda) \text{ of } G = P_n(\lambda) \text{ of } G' + P_{n-1}(\lambda) \text{ of } G''$$

(b) A complete matching of $v_1$ into $v_2$ in a bipartite graph exists iff every subset of r vertices in $v_1$ is collectively adjacent to r or more vertices in $v_2$ for all values of r.

## PMTE11 - PROBABILITY THEORY AND STATICS (5)

**CO 1:**State and Prove, Tchebchev's Inequality.

**CO 2:**. Find the distribution of the quotient of two independent $\chi^2$ Variables is a beta distribution of

Same kind.

**CO 3:**Show that for 2 degrees of freedom , the probability p of a value of $\chi^2$ greater than $\chi_0^2$ is

$e(^{-\chi_0^2}/2)$ and hence show that $\chi_0^2 = 2 \log_e(1/p)$

**CO 4:**If X and Y are two independent normal random variables each with the distribution N (0,1).

Show that Z=X/Y is a beta distribution.

**CO 5:**A random variable x has the following probability function

| x | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| P(x) | 0 | k | 2k | 2k | 3k | $k^2$ | $2k^2$ | $7k^2+k$ |

a) Find k b) evaluate i) p(x<6) ii) p (x≥6) iii) p(0<X<5)

c) If P (X≤K)>1/2, find the minimum value of k

**CO 6:**Find the equation regression lines for the following table.

| X | 25 | 28 | 35 | 32 | 36 | 36 | 29 | 38 | 34 | 32 |
|---|---|---|---|---|---|---|---|---|---|---|
| Y | 43 | 46 | 49 | 41 | 36 | 32 | 31 | 30 | 33 | 39 |

**CO 7** (i) Find the coefficient of correlation between x and y

| X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| y | 12 | 11 | 13 | 15 | 14 | 17 | 16 | 19 | 18 |

(ii) Show that $1-R^2_{1(23)}=\frac{(1-P)(1+2P)}{(1+P)}$ given that all the coefficients of zero order are equal to p.

(iii)Given a normal curve with $\mu = 25.3$ and $\sigma = 8.1$ .Find the area under the curve between 20.6 and 29.1

**CO 8** (i)State &Prove Gramer-Rao Inequality

(ii)State &Prove Rao-Blackwell Inequality

**CO 9**The following is a latin sqaure of a design when 4 varieties of seeds are being tested. Set up the analysis of varience table and state your conclusion. You may carry out suitable change of orign and scale.

A 105 B95 C125 D115

C115 D125 A105 B105

D 115 C95 B105 A115

B 95 A135 D95 C115.

**CO 10** (a) ($x_1$,$x_2$,$x_3$ )are independent random variable having poisson distribution with parameter

λ. Show that $x_1+x_2+x_3/3$ and $5x_1+3x_2+x_3/9$ are also unbiased estimator of λ

(b) Let $X_1, X_2, \ldots\ldots X_n$ be a simple random sample from a population.Then the sample mean is an unbiased estimator of the population mean .

## PMTT13 - DIFFERENTIAL EQUATIONS (5)

**CO 1:**P.T. there are three linearly independent solution of the third order equation

$$x'''+b_1(t)x'' + b_2(t)x' + b_3(t)x = 0, t\epsilon I.$$

Where$b,, b_2$ $and$ $b_3$ are function defined and continuous on an interval I.

**CO 2:**Solve the Hermite in power series method.

**CO 2:**Solve $x'' - 2tx' + 2nx = 0$ $in$ Power series method.

**CO 3:**P.T Legendre polynomial $P_n(t)$ is given by

$$P_n(t) = \frac{1}{2^n.n!}\frac{d^n}{dt^2}(t^2-1)^n.$$

**CO 4:**Let all the assumptions of three real numbers m is hold . For the parameters λ ,μ ( $\lambda \neq \mu$ ) . Let x and y be the corresponding solutions of (p$x$ ) + qx +λ r x = 0 , A≤ t ≤ B such that [ pw ( x , y )]$_A^B$ = 0 Where w ( x , y ) is the wronskian of x and y and [z]$_A^B$ means z (B )- z (A). Then $\int_A^B r\ (s)x\ (s)y(s)ds = 0.$

**CO 5:**Find the integral surface of the PDE $x(y^2+z)p - y(x^2+z)q = (x^2-y^2)z$ which contain the straight line x+y=0, z=1

**CO 6:**Prove that the general solution of the linear partial differential equation $P_p + Q_q = R$ is F(u,v)=0 where F is an arbitrary function and u(x,y,z)= $c_1$ and v(x,y,z)= $c_2$ form a solution of the equations $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$. Hence find the general solution of z(xp-yp)= $y^2 - x^2$

**CO 7:**G (t ,s ) be given by the relation , G(t , s ) = { -y (t)z(s)/ A If t ≤ s , -y(s)z(t)/A if t≥ s .Then , x is a solution of L (x(t)) + f(t) =0 , a ≤t≤ Let b,$m_1x(a) + m_2x\ (a) = 0\ and\ m_3x(b) + m_4x\ (b) = 0$ if and only if x(t)=$\int_a^b G(t,s)\,f(s)ds.$

**CO 8:**State and prove picard's theorem

**CO 9:** (a)P.T Properties of Bessel equation:

$(i)\frac{d}{dt}\left[t^p J_p(t)\right] = t^p J_{p-1}(t),\ (ii)\frac{d}{dt}\left[t^{-p} J_p(t)\right] = t^p J_{p+1}(t).$

(b)Let $a_,, a_2, \ldots \ldots$ be the zero 's of the Bessel function $J_p(t)$ then,

$$\int_0^1 t\, J_p(a_m t)\, .J_p(a_n t)dt = \begin{cases} 0 & m \neq n \\ \frac{1}{2}J_{p+1}^2 & (a_n) = n \end{cases}.$$

## SEMESTER II

## PMTT23 - TOPOLOGY (5)

**CO 1:** (i). The continuous image of the connected set is connected.

(ii) State and Prove: Intermediate value theorem.

**CO 2:** (i) prove that every closed subset of a compact set is compact .

(ii)prove that continuous image of compact set is compact .

**CO 3:** (i) State and prove by by Lebsgue number lemma

(ii) Every regular space with countable basis is normal.

**CO 4:** (i)Every mertizable space is normal.

(ii) Every compact hausdroff space is normal

**CO 5:** State and prove Rules for constructing continuous) Let X and Y be the topological space and

let f : X →Y then the following are equivalent

(i) f is continuous

(ii) for every closed subset A of X one has f (Ã ) C f (A)

(iii) for every closed set U of Y, $f^{-1}$ (B) is closed in X.

(iv) for each X ∈ C and each neighbourhood V of f(x) there enist a neighbourhood U of x such that f(v) c V

(v) Every simply ordered set is an hausdroof space in the order Topology. The product of two hausdroff space is a hausdroff space. A subspace of a hausdroff space is a hausdroff space.

**CO 6:** (a) prove that . Let X be a topological space then the following are equivalent

i) X is point .

ii) X is a limit point compact.

iii) X is a sequentially compat .

(b) 23. State and prove Tychenoff theroem.

**CO 7:**. (i).State and prove Uryshon metrization theorem.

(ii)State and prove Tietze extension theorem.

**CO 8:**. i) A subspace of the first countable space is first countable.

(ii )Countable product of the first countable space is first countable.

(iii) Subspace of the second countable space is second countable.

(iv)Countable product of the second countable space is second countable.

**CO 9:** i)A subspace of the regular space is regular.

(ii) Product of the regular space is regular.

**CO 10:**. (i) state and prove by Tube lemma. (ii) State and prove pasting lemma.

## PMTT21- ALGEBRA (5)

**CO 1:** Students will have a working knowledge of important mathematical concepts in abstract algebra such as definition of a group, order of a finite group and order of an element.

**CO 2:** Students will be introduced to and have knowledge of many mathematical concepts studied in abstract mathematics such as permutation groups, factor groups and Abelian groups.

**CO 3:** Students will actively participate in the transition of important concepts such homomorphisms & isomorphisms from discrete mathematics to advanced abstract mathematics.

**CO 4:** Students will gain experience and confidence in proving theorems. A blended teaching method will be used requiring the students to prove theorems give the student the experience, knowledge, and confidence to move forward in the study of mathematics.

## PMTT22 - REAL ANALYSIS – II(5)

**CO 1:** Investigate the ideas of continuity and inverse images of open and closed sets, functions continuous on compact sets

**CO 2:** Differentiate the concepts of connectedness and implement them on various sets.

**CO 3:**. Examine the derivatives of functions and apply few theorems based on it.

**CO 4:**. Investigate properties of monotonic functions.

**CO 5:** Learn the properties of Riemann- Stieltjes integral

## PMTT24-OPTIMIZATION TECHINIQUE (5)

**CO 1:** The students will be able to analyze the real life systems with limited constraints

**CO 2:** Identify the mathematical nature of a given optimization problem

**CO 3:** Analyze a range of classes of optimization problems

**CO 4:** Identify solution methods for the optimization problems studied

**CO 5:** The students will be able to depict the systems in a mathematical model form

## PMTE22-AUTOMATA THEORY(5)

**CO 1:** Acquire a fundamental understanding of the core concepts in automata theory and formal languages.

**CO 2:** An ability to design grammars and automata (recognizers) for different language classes.

**CO 3:** An ability to identify formal language classes and prove language membership properties.

**CO 4:** . An ability to prove and disprove theorems establishing key properties of formal languages and automata.

**CO 5:** To solve the sums based on automata and grammar.

## SEMESTER III

## PMTT31 - COMPLEX ANALYSIS (5)

**CO 1:** The linear fractional transformation is carries circle into a circle. The linear fractional transformation is carries circle $C$ into a circle $C$. Then the transform a pair of points symmetric with respect to $C$ onto a pair of points symmetric with respect to $C$.

**CO 2:** State and prove Weierstras's theorem.

**CO 3:** State and prove the Maximum modulus theorem.

**CO 4:** State and prove Laurent's theorems.

**CO 5:** Define singularities with example.

**CO 6:** State and prove "Luca's theorem".

**CO 7:** State and prove Abel's theorem of radius of convergent of a power series.

**CO 8:** Find the linear fractional transformation which carry's the circle $|z|=2$ into $|z+1|=1$ the point $-2$ into origin and the origin into $i$.

**CO 9:** State and prove Cauchy theorem for a rectangle.

**CO 10:** State and prove Hurwitz theorem.

## PMTT32 - MEASURE & INTEGRATION (5)

**CO 1:** The outer measure of an interval equal its length .

**CO 2:** The ciass of lebesgue measurable set M is a $\sigma-$Algebra.

**CO 3:** Let C be any real number and let f and g be real valued measurable functions defined on the same measurable set E f+c, cf, f+g, fg, f-g are measurable.

**CO 4:** If $\mu$ is a measure on a $\sigma-$ ring s, then the class s of sets of the from E$\Delta N$ for any sets E,Nsuch that E$\in$S while Nis contained in some set in s of zero measure, is a $\sigma$- ring, and the set function $\mu(\mathrm{E}\Delta N)=\mu(E)$ is a complete measure on s.

**CO5:** state and prove lebesgue's dominated convergence theorem.

**CO 6:**.A differentiable function $\psi$ is a convex on (a,b) iff, $\psi'$ is a monotonic increasing function. If $\psi''$exists on (a,b), then , $\psi$ is a convex iff $\psi''\geq 0$ .

**CO 7:** State & prove Hahn Decomposition.

**CO 8:** If A is an algebra S(A) = $M_O$(A)

(i,e) the $\sigma$ – algebra generated by A is the smallest monotone class containing A.

**CO 9:** State & prove Fubini's Theorem.

**CO 10:** show that Uniqueness of the Extension

## PMTT33-CLASSICAL DYNAMICS (5)

**CO 1:**. Be able to solve the Lagrange's equations for simple configurations using various methods.

**CO 2:** Understand the concept of Hamilton Jacobi Theory.

**CO 3:** Be able to understand the concept canonical Transformations

**CO 4:** To develop skills in formulating and solving physics problems

**CO 5:**. Able to get idea of dynamical systems are of relatively recent origin, the concept of

motion in phasespace and its geometrical depiction is simple.

## PMTT34 -CALCULUS OF VARIATIONS AND INTEGRAL EQUATIONS (5)

**CO 1:** Determine asymptotes for rational expressions (we will not go into these graphs in much detail)

**CO 2:** Apply the techniques from the previous section to graph a fourth degree polynomial or higher

**CO 3:** On successful completion of the course students will be able to recognize difference between

Volterra and Fredholm Integral Equations, First kind and Second kind, homogeneous and inhomogeneous etc.

**CO 4:** They apply different methods to solve Integral Equation

## SEMESTER IV

## PMTT41 - FUNCTIONAL ANALYSIS (5)

**CO 1:** State and prove Bessels inequality.

**CO 2:** If ***P*** is the projection on a closed linear subspace of ***H***, then ***M*** reduces an operator ***T*** $\Leftrightarrow$ ***TP=PT***.

**CO 3:** To Prove that $\sigma(x)$is non-empty.

**CO 4:** Show thatIf I is a proper closed two - sided ideal in A, then the quotient algebra $\frac{A}{I}$ is a semi simple banach algebra

**CO 5:** State and prove open mapping theorem.

**CO 6:** State and prove orthogonal Decomposition theorem.

**CO 7:** If ***A*** is a positive operator on ***H***,then ***1+A*** is non- singular.In particular ***1+T*T*** and ***1+TT**** are non-singular for an arbitrary operator on ***H***.

**CO 8:** To prove that the $r(x) = \lim \|x^n\|^{\frac{1}{n}}$

**CO 9:** Show that the radical R of A is a proper closed – two sided ideal

**CO 10:** If ***T*** is non-singular operator on ***H.*** Then $T^*$ is also non-singular

And $(T^*)^{-1}=(T^{-1})^*$.

## PMTT42 - DIFFERENTIAL GEOMETRY (5)

**CO 1:** Find the equation of evolute and involute.

**CO 2:** State and Prove Four Vertex and Barbier theorem.

**CO 3:** Find the curvature and Torison of the involutes.

**CO 4:** State and Prove Euler's Theorem

**CO 5:** State and prove the theorem of Gauss and the equations of codazzi .

**CO 5:** a)State and prove that the formulas of Serret frenet.

b)Show that the necessary and Sufficient condition that the curve to be a plane is $[r',r'',r'''] = 0$

**CO 6:** a)Derive the formula for curvature and Torison

b)Calculate the curvature and Torison of the cubic curve given by $r=(u,u^2,u^3)$

**CO 7:** Obtain curvature and Torison of the curve of intersection of the two quadratic surfaces.$ax^2+by^2+cz^2=1,a'x^2+b'y^2+c'z^2=1$

**CO 8:** a)Find the radius and centre of a spherical curvature.

b)Derive equations of Gauss –Weingardan .

**CO 9:** State and prove the existence theorem for surfaces

**M.Phil (Commerce)**

**Programme Specific Outcomes**

**On successful completion of M.Phil., Commerce Programme, the scholars would be able to**

**PSO 1: demonstrate an extensive and in-depth knowledge on research methodology and in the area of specialization.**

**PSO 2: communicate the research ideas proficiently, write analytically and clearly present complex information to different groups**

**PSO 3: identify the research problems, formulate and test hypotheses, analyse, interpret and draw conclusion on the basis of empirical and analytical data**

**PSO 4: engage research independently through lifelong learning in contemporary areas of commerce**

**RESEARCH METHODOLOGY (4)**

**CO 1:** Define research and discuss the need for the business research.

**CO 2:** What is research design? How is a research design prepared?

**CO 3:** Explain the classification of the sampling method.

**CO 4**: What are the various methods of primary and secondary data? Explain its merits and demerits

**CO 5:** Explain 'pilot study' and 'pretest'.

**CO 6**: How to process Data? Explain.

**CO 7:** What is chi-square test? Explain its significance.

**CO 8**: What are the general rules relations to graphic representation? Explain

**CO 9**: What are the types in their research report?

**CO 10:** Explain the essentials of good report writing in research

.

**RESEARCHNFOR BUSINESS DECISIONS (4)**

**CO 1:** What are the factors influencing research in the field on business environment?

**CO 2:** Explain liberalization, Privatization and Globalization

**CO 3:** Enumerate the research on 'pricing strategy' for introducing a new product?

**CO 4**: Explain the research on distribution channels.

**CO 5:** Explain the research on leadership traits and style.

**CO 6**: Highlight the various aspects of research on increasing motivation.

**CO 7:** How does corporate governance help on social responsibilities of business?

**CO 8**: Explain Business Ethics.

**CO 9**: . Explain "Mutual Funds"

.**CO 10:** Discuss the need for protecting the interest of investors.

## M.Phil. – BIOCHEMISTRY

**On completion of M.Phil Biochemistry programme,**

**PSO 1: Update students knowledge on environment biochemistry and solid waste Management**

**PSO 2: Train the students in various advanced biochemical techniques**

**PSO 3: Enable the students to know research methodology and how to write a good thesis**

**PSO 4: Get professional skills in teaching, evaluation, and students counselling.**

**PSO 5: Get trained in presenting research papers in seminars and writing a good research paper for publications.**

## COURSE OUTCOME

### CORE I - RESEARCH METHODOLOGY-MBCT11 Credits-4

**CO 1**: Students get knowledge about Research and methods used in validation of scientific truth.

**CO 2**: Get trained on advantages of using Statistics in research.

**CO 3**: Students gain knowledge about bio-ethics and bio-safety with reference to experimental animals.

**CO 4**: Learn the structure and components of scientific paper and the essential features of a thesis.

**CO 5**: Get knowledge about patent and IPR.

### CORE-II- INSTRUMENTAL METHODS AND ANALYSIS-MBCT12 Credits-4

**CO 1**: Students gain Knowledge about the Various Chromatographic techniques.

**CO 2**: Enable the students to know the basic component, instrumentation of spectrophotometer.

**CO 3**: Update student Knowledge on the role of radioactivity in biochemistry and its applications in various fields.

**CO 4**: Students get trained in the separation, isolation of genomic DNA from

Mammalian tissue and the significance of A260/280 ratio.

**CO 5**: Students learn about autoradiography and peptide mass analysis by MOLDI-TOF.

### CORE-III – TEACHING AND LEARNING SKILLS Credits-4

**CO 1**: Students get trained on the steps and planning of lecture and its various types.

**CO 2**: Learn about methods of developing fluency in oral and written communication

**CO 3**: Update the Knowledge about ICT.

**CO 4**: Get trained on internet in education and EDUSAT and ETV channels.

**CO 5**: Students learn about the preparation of E-Content.

## CORE-IV – ENVIRONMENTAL BIOCHEMISTRY Credits-4

**CO 1**: Students understand the types and components of environment, Natural resource and to know the harmful effect of environmental pollutions caused by industries.

**CO 2**: Learn about the soil and liquid waste management system and the toxicity of heavy metals.

**CO 3**: Know the characteristics of soil and to understand the importance of Carbon, Nitrogen and sulphur cycle.

**CO 4**: Students can identify the environmental problem and they can apply this knowledge to solve such environmental problems i.e. conserve the earth.

**CO 5**: Students learn about the Bioreactors and its applications.

# M.PHIL (COMPUTER SCIENCE)

## PROGRAMME SPECIFIC OUTCOMES

On successful completion of M.Phil., COMPUTER SCIENCE Programme, the scholars would be able to

| | |
|---|---|
| **PSO1** | **After successful completion of Master of Philosophy in Computer Science, the students will be able to demonstrate basic knowledge in Computer Science.** |
| **PSO2** | **The scholars will be able to use research tools used by researchers in their chosen area of specialization.** |
| **PSO3** | **Scholars pursuing this course will show ability in the critical evaluation of research techniques and methodologies.** |
| **PSO4** | **The scholars will acquire basic knowledge of research and skills to solve problems, analyze data and interpret the results.** |
| **PSO5** | **The students will be able to communicate effectively and demonstrate professional and ethical responsibilities.** |

### ACS11 - RESEARCH METHODOLOGY (4)

| | |
|---|---|
| CO1 | To understand the types of research and thesis writing. |
| CO2 | To learn to use tools related to research in Computer Science. |
| CO3 | To learn to calculate the computing time of algorithms |
| CO4 | To learn Formal Language of Computer Science, its grammar and its applications |
| CO5 | To learn and use probability and applications of probability in areas such as System Reliability. |

### ACS12- FOUNDATION IN COMPUTER SCIENCE

| | |
|---|---|
| CO1 | To learn the importance of optimization methods |
| CO2 | To understand the basic ideas of Data Mining and to analyze data sets. |
| CO3 | To learn to apply Cloud Computing in the current social and research contexts. |
| CO4 | To appreciate IoT as a fast growing paradigm on Research in Computer Science and to use the same for research. |
| CO5 | To understand the use of Cryptography as a tool of security in the areas of Database, Program and Computer Networks. |

## ACS14 - NETWORK SECURITY & CRYPTOGRAPHY

| | |
|---|---|
| CO1 | Understand cryptography and network security concepts and application |
| CO2 | Apply security principles to system design |
| CO3 | Identify and investigate network security threat |
| CO4 | Analyze and design network security protocols |
| CO5 | Conduct research in network security |

## ACS14 - NEURAL NETWORKS AND MINING TECHNOLOGIES

| | |
|---|---|
| CO1 | Understand the learning and generalization issue in neural computation. |
| CO2 | Apply neural networks to classification and recognition problems. |
| CO3 | Understand the basic concepts of the information retrieval. |
| CO4 | Analyze the involvement of the information retrieval in modern life style & social media. |
| CO5 | Apply data pre-processing, indexing, retrieval method And concepts |

## ACS14 - DIGITAL IMAGE PROCESSING (4)

| | |
|---|---|
| CO1 | Develop an overview of the field of image processing. |
| CO2 | Understand the fundamental algorithms and how to implement them. |
| CO3 | Prepare to read the current image processing research literature. |
| CO4 | Gain experience in applying image processing algorithms to real problems. |

## M.Phil ENGLISH

## PROGRAMME SPECIFIC OUTCOMES

**To enable the students to**

**PSO 1: Get knowledge about various literary genres**

**PSO 2: Develop the originality and creativity in English PSO 3: Experience the aesthetics of literary art**

**PSO 4: Be well versed in effective communication**

**PSO 5: Tap their critical faculty to develop deep into literature for research**

**PSO 6: Excel in various competitive/qualifying examination for their academic and career progression**

**PSO 7: Ignite the research potential by involving them in project work**

## COURSE OUTCOME

**MENT12 - LITERARY CRITICISM: CONTEMPORARY CRITICAL THEORIES (4)**

CO1 Discuss about Dryden's views on other writers in 'Essay on Dramatic Poesy'.

CO2 How does Coleridge divide imagination? Explain it.

CO3 Impersonality Theory of TS Eliot – Discuss.

CO4 What is the relation between Tradition and Individual Talent, according to TS Eliot?

CO5 Define 'Tension'. Explain the term with reference to Al en Tate's 'Tension in Poetry'.

CO6 Distinguish Feminism and Womanism with reference to Showalter's Towards Feminist

Poets.

CO7 What kind of connection does exist between the wish and three periods of time,

according to Freud?

CO8 The various approaches expected by Allen Tate from the critics to study the work -

Analyse with reference to his "Tension in Poetry".

CO9 How does Freud come to the conclusion that Creative writers' source is from myths,

legends, fairytales, etc? Justify his analysis.

CO10 Write an essay IA Richards's 'Four Kinds of Meaning'.

**MENT11 - RHETORIC AND RESEARCH METHODOLOGY – (4)**

CO1 Mention a few common scholarly abbreviations.

CO2 How would you select a topic of your research?

CO3 Define the format of the research paper.

CO4 How would you compile a working bibliography?

CO5 Enumerate the various systems of Documentation in Research.

CO6 Describe about the significance of Plagiarism.

CO7 Write an essay on organizing the materials for your dissertation.

CO8 Describe about your understanding of using quotations in the dissertation.

CO9 Discuss about the importance of Punctuation, Margin and Spacing.

CO10 What is the importance of Proof Reading and Bibiliography?

**AREA PAPER– AEN14**

CO1. Explain the aim and scope of research topic.

CO2. Write an essay on chapterization.

CO3. How to prepare a draft in research methodology.

CO4. Explain the purpose of research.

CO5. Explain the various forms of discourse.

CO6. Write an essay on comprehension.

CO7. Explain the techniques of writing.

CO8. Write an essay on bibliography.

CO9. Write an essay on the issues concerned in the field of research

CO10. Discuss the scope of research.