CRITERION 2 – TEACHING – LEARNING AND EVALUATION

AQAR-2021-2022

2.6 - Student Performance and Learning Outcomes

2.6.1 - Programme and course outcomes for all Programmes offered by the institution are stated and displayed on website and communicated to teachers and students

CRITERION 2 – TEACHING – LEARNING AND EVALUATION

2.6 Student Performance and Learning Outcomes

2.6.1 Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution

B.A ENGLISH

COURSE OUTCOMES **(COs)**	COs	**ENGLISH-I** Course outcome This course helped the learner to; 1. Read and comprehend better 2. Communicate in English orally and in writing 3. Participate in role plays and mini- talks. 4. Refer to the dictionary for synonyms, expressions and grammar.
	COs	**POETRY** Course outcome This course helped the learner to; 1. Understand and appreciate a poem 2. Synthesize multi-fold elements of poetry for insightful reading having understood prosody 3. Understand the nuances of different genres and forms of poetry 4. Understand the different periods in English and American poetic tradition 5. Identify multiple perspectives in reading poetry 6. Compare great compositions in poetry Motivate himself/herself to attempt creative writing
	COs	**PROSE** Course outcome This course helped the learner to; 1. Understand and appreciate an excellent piece of prose 2. Develop insightful reading for understanding articles and classic literary prose 3. Understand the nuances of different types of prose writing 4. Understand the different periods in English literary tradition with respect to prose 5. Identify multiple perspectives in reading prose 6. Compare great compositions in journalistic styles Motivate him/her to attempt compositions in prose writing.
	COs	**SOCIAL HISTORY OF ENGLAND** Course outcome This course helped the learner to; 1. Understand and appreciate an excellent piece of prose 2. Develop insightful reading for understanding articles and classic literary prose 3. Understand the nuances of different types of prose writing

		4. Understand the different periods in English literary tradition with respect to prose 5. Identify multiple perspectives in reading prose 6. Compare great compositions in journalistic styles Motivate him/her to attempt compositions in prose writing.
	COs	**FOUNDATION ENGLISH-II** 1. Students will develop reading skills and reading speed 2. Students will read university texts and expand their vocabulary 3. Students will read for intensive information retrieval and interpretation required by university studies 4. Students will develop abilities as critical thinkers, readers and writers 5. Students will attain and enhance competence in the four modes of literacy: writing, speaking, reading & listening 6. Students will write 3 summaries in which they will communicate appropriately, accurately and effectively what has been read
	COs	**PROSE** Course outcome This course helped the learner to; 1. Understand and appreciate an excellent piece of prose 2. Develop insightful reading for understanding articles and classic literary prose 3. Understand the nuances of different types of prose writing. 4. Understand the different periods in English literary tradition with respect to prose. 5. Identify multiple perspectives in reading prose
	COs	**INDIAN WRITING IN ENGLISH** 1. Students would have learnt the values of spiritual refinement in human life. 2. Students would have understood the need of wiping out social evils to dream of a healthy society. 3. Students have understood how well the Indian culture is reflected in Literature. 4. An understanding of the socio-cultural aspect would have been reached.

	COs	**History Of English Literature** 1. The course offers extensive insight into the history of English literature, 2. While laying special emphasis on various literary movements, genres and writers that are held to be the representatives of their times. 3. It helps the students to evaluate the way socio-cultural and historical 4. Phenomena influence the literary production of a particular period.
	COs	**FOUNDATION ENGLISH-III** 1. Students will develop reading skills and reading speed 2. Students will read university texts and expand their vocabulary 3. Students will read for intensive information retrieval and interpretation required by university studies 4. Students will develop abilities as critical thinkers, readers and writers 5. Students will attain and enhance competence in the four modes of literacy: writing, speaking, reading & listening
	COs	**DRAMA** 1.This course traces the origin, growth of drama in England Specifically written during Elizabethan Age and Restoration Age. 2. It introduces drama as a literary genre as well as dramatic genre with Due emphasis on Shakespearean Age. 3. The course emphasises on the changing approaches to theatre and the change in dramatic works.
	COs	**LITERARY FORMS AND TERMS** 1. The paper provides an important study of literary theory as an Intellectual and critical activity. 2. To introduce the students to the nature, function and relevance of 3. Literary theory and criticism. 4. To help students judge literary works in an unbiased and Dispassionate manner as taught by the masters. 5. Strengthen and develop analytical and logical thinking.

	COs	**CREATIVE WRITING** 1. Understand and explain principles of creative writing, including form, technique, and style. 2. Deepen that understanding by interpreting and evaluating both published works and the works of peer writers. 3. Apply these principles to produce poems, stories, or essays. 4. Become familiar with the publishing process in the literary market and improve as a writer by submitting work to literary journals and participating in the writing community. 5. Apply principles of creative writing to improve communication in a variety of contexts, including personal, academic, and public life.
	COs	**SOFT SKILLS FOR CAREER COMMUNICATION** 1. Effectively communicate through verbal/oral communication and improve the listening Skills 2. Write precise briefs or reports and technical documents 3. Actively participate in group discussion / meetings / interviews and prepare & deliver presentations. 4. Become more effective individual through goal/target setting, self motivation and Practicing creative thinking.
	COs	**FOUNDATION ENGLISH-IV** 1. Students will develop reading skills and reading speed 2. Students will read university texts and expand their vocabulary 3. Students will read for intensive information retrieval and interpretation required by university studies 4. Students will develop abilities as critical thinkers, readers and writers 5. Students will attain and enhance competence in the four modes of literacy: writing, speaking, reading & listening
	COs	**FICTION** 1.Through the novels and short stories the students are introduced to The large-scale criticism and condemnation of contemporary values. 2. All forms of novel - psychological, biographical, war novels, and Novels of humour are included keeping the vast exposure in view.

	COs	**PHONETICS AND TRANSCRIPTION** 1. You will be familiar with the basic symbols of the International Phonetic Alphabet, including all those symbols needed to describe English 2. You will know the terminology appropriate to the description of consonants and vowels, including the parameters of description on the IPA chart. 3. You will understand something of the relationship between the sounds of speech and the abstract linguistic system that underlies them, as well as the relationship of phonetics and phonology to the wider linguistic system. 4. You will understand the basic structure of sound systems across languages, and the ways in which this is established analytically.
	COs	**PRESENTATION SKILLS** **1.** Create and present organized and focused messages in public speaking settings. **2.** Analyze audience demographic and psychographic information to create audience-centered messages. **3.** Employ verbal and nonverbal presentation skills for confidently and effectively delivering oral messages. **4.** Evaluate arguments and reasoning from an audience perspective. **5.** Employ strategies and skills to manage communication anxiety.
	COs	**PERSONALITY DEVELOPMENT** 1. Individual or in-group class presentations pertaining to the applications of concepts. 2. Theories or issues in human development Scores obtained from essay and or objective tests. 3. Attendance, classroom participation, small group interactions. 4. Research and write about relevant topics. 5. Design and complete a research project that can take the form of a developmental Interview, an observation or assessment through service learning.

	COs	**SHAKESPEARE** 1. Develop sufficient ability for reading and understanding Elizabethan English to allow for better comprehension of Shakespeare's plays, poems, and sonnets. 2. Analyze verbally and in writing Shakespeare's literary development. A. The structures and organizations of his dramatic works B. The development of his sonnets C. The development of his poems. 3. Analyze verbally and in writing Shakespeare as a product of his society. 4. Analyze verbally and in writing the relationship of Shakespearean literature to society. 5. Analyze verbally and in writing the relationship of the individual reader to Shakespearean literature.
	COs	**AMERICAN LITERATURE** 1. The course deals with the culture and literature of America from Colonial rule to the modern times. 2. It examines the changing American narrative and distinctly "American" in their texts. 3. It explores the various perspectives of race, gender, socioeconomic class and historical background which play a very important role in their works.
	COs	**FEMINIST WRITING** 1. Students would have understood gender equality and women's rights. 2. Students would have understood the revolutionary changes occurred due to women empowerment. 3. Students would have been aware of the negative impact of female feticide and woman exploitation in the society. 4. Students would have sharpened their knowledge

		comprehending the role of woman for the betterment of society
	COs	**LANGUAGE AND LINGUISTICS** **1.** Understand language structures and functioning of the language. **2.** Classify ancient and traditional perspectives of languag e use in the society. **3.** Analyse the Grammatical Theories of Western countrie s as well as India. **4.** Evaluate the relationship between language and society . **5.** Understand the application of linguistics on other relat ed disciplines
	COs	**ENGLISH FOR COMPETITIVE EXAM** 1. To make students aware of the interdisciplinary nature of the contemporary approaches in literature. 2. To develop an aptitude for research. 3. To develop an in-depth knowledge of different literary genres, writing styles, ages of literature. 4. To develop a critical perspective through the study of various schools of literary theory. 5. To train them to appear and qualify different competitive exams at state and national level.

	COs	**SOUTH ASIAN LITERATURE** 1. To achieve an excellent and broad-ranging foundational knowledge of the culture of South Asia, given by scholars at the forefront of their disciplines. 2. To grasp how each discipline approaches its object of study and organizes knowledge differently, by studying the same area from the standpoint of different intellectual traditions. 3. To prepare the student for either working in South Asian societies or in a context with South Asian Diaspora in the UK.
	COs	**ENGLISH LANGUAGE TEACHING** 1. At the end of the course the students will be able to Understand and do the contrastive analysis. 2. Acquire knowledge of various language skills. 3. Use various language teaching methods for teaching a language. 4. Understand the basic concept of language Testing and evaluation. 5. Identify the language errors and its classifications.

	COs	**GRAMMAR AND SEMANTICS** **1.** Have insight into basic issues of linguistic semantics, in cluding how linguistic expressions relate to entities in t he world, meaning relations between linguistic expressi ons, and the relation between meaning and truth. **2.** Have awareness into basic issues in pragmatics, including how context and pragmatic principles affect interpretation. **3.** Have vision into how semantic and pragmatics relate to neighboring fields such as lexical theory, morp hology and syntax. **4.** Understand how and why language differs from other communication systems, and how language is employed to communicate various types of meaning. **5.** Describe and analyze how people handle and exploit various semantic and pragmatic phenomena in everyday communication.
	COs	**ENGLISH LITERATURE FOR COMPETITIVE EXAMINATION** 1. To enable students to prepare for the competitive exams of various kinds especially meant for testing ability in English language. 2. To introduce students with the common question types asked in competitive examinations concerning English-grammar, vocabulary, comprehension, and other significant topics. 3. To encourage students to appear and prepare for the competitive exams. 4. To help the students to overcome the fear about English as a compulsory subject in various competitive exams.

	COs	**COMMUNICATION SKILLS – PRACTICAL** This project helped the learner to; 1. Implement the concepts acquired in Methodology / Criticism courses. 2. Understand library work and data collection. 3. Understand data analysis. 4. Understand presentation of facts methodically. 5. Understand the latest format of presentation such as MLA 8 Edition

COMMERCE

COURSE	**OUTCOMES** After completion of these courses students should be able to
SEMESTER I	
PRINCIPLES OF ACCOUNTANCY	CO-I Preparing financial statements in accordance with appropriate standards. CO-II Prepare ledger accounts using double entry bookkeeping and record journal entries accordingly CO-III Interpreting the business implications of financial statement information CO-IV Preparing accounting information for planning and control and for the evaluation of finance. CO-V Prepare Bank reconciliation statement from incomplete statement
BUSINESS COMMUNICATION	CO – I Develop communication skills and use of electronic media in business communication CO – II Learn the way to overcome communication barriers CO – III Practice modern forms of communication CO – IV Formulate job related communication and resume preparation CO - V Attend interview and participate in Group discussion with confidence
BUSINESS ECONOMICS	CO -I. Employ marginal analysis for decision making CO -II. Analyze operations of markets under varying competitive conditions

	CO -III. Evaluate the Demand and Supply, elasticity of demand and Law of returns CO -IV. Possess the knowledge about the perfect competition and price determination CO -V. Analyze causes and consequences of unemployment, inflation and economic growth
SEMESTER II	
FINANCIAL ACCOUNTING	CO-I To familiarize the concept of Branch account and its system CO- II To understand the Scope of departmental accounting CO– III To find out the technical expertise in maintaining the books of accounts. CO –IV Enable the students to understand partnership account from admission to dissolution CO-V To encourage the students about maintaining the books of accounts for further reference. 1.
BUSINESS MANAGEMENT	CO – I. To develop knowledge about evolution of management thoughts CO – II. To better understanding of planning and decision making CO – III. To give an idea about organization structure and different types of organization CO – IV. To make them familiarize with recruitment process and stages in selection CO – V. To provide idea about motivation, importance of communication and Principles of coordination.
INDIAN ECONOMY	Develop ideas of the basic characteristics of Indian economy, its potential on natural resources. CO -II. Understand the importance, causes and impact of population growth and its distribution, translate and relate them with economic development. CO –III. Grasp the importance of planning undertaken by the government of India, have knowledge on the various objectives, failures and achievements as the foundation of the ongoing planning and economic reforms taken by the government. CO -IV. Understand agriculture as the foundation of economic growth and development, analyse the progress and changing nature of agricultural sector and its contribution to the economy as a whole. CO - V. Not only be aware of the economy as a whole, they

	would understand the basic features of Mizoram's economy, sources of revenue, how the state government finance its programmes and projects.
ENVIRONMENTAL STUDIES	Understand key concepts from environment studies , political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions. CO-II To understand appreciate concepts and methods from renewable and nonrenewable sources and their application in environmental problem solving. CO-III Students can acquire knowledge on ecosystem , Food Chains, and historical context of environmental issues and the links between human and natural systems. CO-IV Students understand critically on Bio-diversity , threats for Bio-diversity and their roles and identities as citizens. CO-V Students understand consumers and environmental actors in a complex, interconnected world.
SEMESTER : III	
BUSINESS LAW	CO – I Understand the law and procedure of the contracts CO – II Analyse performance and the remedies CO – III Get clear idea about the guarantee of the parties under the contract CO – IV Get an idea about various kinds of agencies and bailment and pledge CO – V Summarize sale of goods and rights and duties of buyer and seller
CORPORATE ACCOUNTING – I	CO-I Enabling the students to understand the features of Shares and Debentures CO-II Develop an understanding about redemption of Shares and Debenture and its types CO-III To give an exposure to the company final accounts CO-IV To provide knowledge on Goodwill CO-V Students can get an idea about profit prior to incorporation.
BANKING THEROY LAW AND PRACTICE	CO – I To help to gather knowledge on banking and financial system in India CO – II To provide knowledge about commercial banks and its products CO - III To aim to familiarize banking system in India CO - IV To enable them to understand better customer relationship

	CO - V To create awareness about modern banking services like e-banking, m-banking and internet banking.
BUSINESS STATISTICAL METHODS	CO-I To familiarizes the concept of statistics CO-II To provide practical exposure on calculation of measures of average CO-III To provide practical exposure on calculation of measures of correlation and irrigation CO-IV To introduce the students about the concept of provability CO-V To provide practical exposure on calculation of trend analysis.
CAPITAL MARKET	CO – I Understand the structure and classification of capital market and analyse about Indian securities market. CO – II Analyse about the Intermediaries in the financial market, methods through which the capital fund has been raised. CO – III Understand the functions of stock exchange, listing of securities and major stock exchanges. CO – IV Analyse the commodity and financial derivatives and trading mechanisms. CO - V Discuss the functions of SEBI and measures taken by SEBI to Protect investors.
MS – OFFICE PRACTICAL - I	CO – 1 Recognize and use the Office Package software CO – 2 Identify and apply the menus in MS-Word CO – 3 Understand the menus in Excel CO – 4 Understand the components of Power point CO – 5 Surf details through Internet
SEMESTER : IV	
COMPANY LAW	CO - I. Different kind of corporate entities that are permitted to be set up CO - II. Company incorporation and rules and procedures for running a company CO - III. Manner of raising funds and roles and responsibilities of directors CO - IV. Rights and obligations of shareholders and other stakeholders including employees and creditors CO - V. Winding up of a company and its procedures

CORPORATING ACCOUNTING – II	CO –I Enable the students to understand about amalgamation , absorption and external reconstruction CO –II To make them aware about accounts of banking companies CO –III Keep them aware about accounts of insurance companies CO –IV Enable the students to gain an idea of liquidation of companies CO –V To introduce and develop knowledge of holding companies accounts
PRINCIPLES OF MARKETING	CO –I. Demonstrate understanding of marketing terminology and concepts. CO –II. Identify wants and environmental factors that shape marketing activities for certain target markets. CO – III. Demonstrate knowledge of the individual components of a marketing mix. CO –IV. Demonstrate knowledge of key business communication strategies within the marketing field. CO –V. Identify the organizational processes involved in the planning, implementation and control of marketing activities.
BUSINESS STATISTICAL DECISION TECHNIQUES	CO-I. Describe and discuss the key terminology, concepts tools and techniques used in business statistical analysis CO-II. Critically evaluate the underlying assumptions of analysis tools CO-III. Understand and critically discuss the issues surrounding sampling and significance CO-IV. Discuss critically the uses and limitations of statistical analysis CO-V. Solve a range of problems using the techniques covered
PROJECT METHODOLOGY	CO –I.Understand project characteristics and various stages of a project. CO –II. Understand the conceptual clarity about project organization and feasibility analyses – Market, Technical, Financial and Economic. CO –III. Analyze the learning and understand techniques for Project planning, scheduling and Execution Control. CO –IV. Apply the risk management plan and analyse the role of stakeholders. CO –V. Understand the contract management, Project Procurement, Service level Agreements and productivity

TALLY PRACTICAL - II	CO –I Enter the accounting transactions in computerized format and find the financial result concern. CO-2 Acquire the skill of financial decision making in a systemized manner. CO – 3 Interpret the financial statements as well as evaluation of stock at the end. CO – 4 After successfully qualifying practical examination, students will be awarded certificate to work with well-known accounting software i.e. Tally ERP.9 CO – 5 Students do possess required skill and can also be employed as Tally data entry operator.
SEMESTER : V	
COST ACCOUNTING	CO -I Aimed to familiarize the concept of cost accounting CO –II Helps to gather knowledge on preparation of cost sheet in its practical point of view CO –III To facilitate the idea and meaning of material control with pricing methods CO –IV Develop the knowledge about remuneration and incentives CO –V To introduce the concept of overhead cost
AUDITING	CO –I. The students should know the concepts of auditing, types and methods of auditing. CO –II. The Students acquired knowledge about vouching of cash & credit transaction, verification of assets & liabilities. CO –III. From this subject, the students learned about preparation of different methods & auditors' responsibility regarding depreciation & reserves. CO –IV. Comprehend the knowledge about appointment of different types of auditor, their rights and duties. The Students gain the knowledge about audit in EDP environment. CO –V.Students acquire knowledge about non trading concern auditing.
INCOME TAX LAW AND PRACTICE – I	CO – I To introduce the basic concept of Income Tax CO – II In order to familiarize the different know-how and heads of income with its components CO – III It helps to build an idea about income from house property as a concept CO – IV It give more idea about the income from business or profession

	CO – V Make the students familiarizes with the concept of depreciation and its provisions
INFORMATION TECHNOLOGY IN BUSINESS	CO – I Understand the components of computer CO – II Provide the knowledge about an overview of ECommerce and E-business CO – III Describe the consumer oriented E-commerce applications CO – IV Appraise the Electronic Data Interchange and its prerequisites CO - V Analyze the different types of E-marketing techniques
SEMESTER : VI	
MANAGEMENT ACCOUNTING	CO –I To enlighten the students thought and knowledge on management Accounting CO –II Helps to give proper idea on financial statement analysis in practical point of view CO –III To introduce the concept of fund flow and cash flow statement CO –IV To provide knowledge about budget control keeping in mind the scope of the concept CO –V To develop the know-how and concept of marginal costing with practical problems
ENTERPRENEURIAL DEVELOPMENT	CO –I. To aiming to develop students about Entrepreneurship development CO –II.To create an awareness on various Entrepreneurship Development Programme CO –III.To enable them to understand project formulation CO –IV.To familiarize the students with EDP schemes CO –V. To give an introduction about MSME, EDI and other training institutes in Entrepreneurship

FUNDAMENTALS OF INSURANCE	CO – 1 To understand the concept of insurance and its evolution CO – 2 To understand the business operations and market condition in Insurance Companies CO - 3 To understand the different needs of customers on insurance products CO – 4 To understand the insurance terminologies. CO – 5 Able to know the various insurance products.

DEPARTMENT OF BIOCHEMISTRY

SEMESTER I

BIOORGANIC CHEMISTRY

CO. NO	COURSE OUTCOME DETAILS
CO 1	To understand basic details of carbohydrate molecules and its classification
CO 2	Describe about the nature of amino acids and their interactions in the formation of proteins.
CO 3	Recall and understand the classification, chemistry and functions of lipids
CO 4	Characterize the structure and properties of lipids.
CO 5	To understand basic details of Nucleic Acid molecules and its classification

SEMESTER II

TOOLS OF BIOCHEMISTRY

CO. NO	COURSE OUTCOME DETAILS
CO 1	Describe the basics of measurements and various biological buffer systems of blood
CO 2	Demonstrate the principle, techniques and applications of chromatography
CO 3	Explain the various electrophoresis and centrifugation techniques and their applications in Biochemistry
CO 4	Categorize the colorimetry and Spectroscopic techniques for the assessment of biological Samples
CO 5	Classify the radioactive tracer techniques and applications of radioisotopes

SEMESTER III
ENZYMES

CO. NO	COURSE OUTCOME DETAILS
CO 1	Describe the various systems for classifying the enzymes
CO 2	Apply appropriate methods for determination of catalytic parameters and activity of enzymes and resolve problems considering kinetics and thermodynamics of enzymatic reactions
CO 3	Characterize the structure and functions of coenzymes, and the mechanism of enzyme catalysis
CO 4	Explain the regulatory mechanisms of enzyme activity which involve in the maintenance of body's homeostasis
CO 5	Use appropriate enzymes for use in industries for recognizing their potential

SEMESTER III

CELL BIOLOGY

After the successful course completion, learners will develop following attributes:

CO. NO	COURSE OUTCOME DETAILS
CO 1	Explain the purposes of basic components of prokaryotic and eukaryotic cells and their involvement in cell cycle
CO 2	Recognize the use of cellular components in generating and utilizing energy in cells
CO 3	Identify the cellular components that are involved in protein synthesis
CO 4	Describe the basic mechanisms involved in transport of biomolecules through biological membranes
CO 5	Apply their knowledge of cancer biology to selected examples of changes or losses in cell function especially during responses to environmental or physiological changes, or alterations of cell function

SEMESTER IV

INTERMEDIARY METABOLISM

After the successful course completion, learners will develop following attributes:

CO. NO	COURSE OUTCOME DETAILS
CO 1	Understand the basic principles of metabolic pathway
CO 2	Correlate the pathways of carbohydrate metabolism.
CO 3	Explain the synthesis and utilization of lipids in living organisms.
CO 4	Appraise the anabolic and catabolic reactions of amino acids.
CO 5	Discriminate the synthesis and degradation of the nucleic acids.

SEMESTER IV

PLANT BIOCHEMISTRY

After the successful course completion, learners will develop following attributes:

CO. NO	COURSE OUTCOME DETAILS
CO 1	Understand the plant cell physiology
CO 2	Comprehend process of photosynthesis and photorespiration
CO 3	Demonstrate nitrogen fixation in plants
CO 4	Illustrate about the plant growth through seed germination and seed dormancy
CO 5	Explain hormones and secondary metabolites of plants

SEMESTER V

CLINICAL BIOCHEMISTRY

After the successful course completion, learners will develop following attributes:

CO. NO	COURSE OUTCOME DETAILS
CO 1	Understand clinical aspects of biochemistry
CO 2	Describe the composition and their functions, Anaemia:- classifications, erythrocyte indices. Blood coagulation system, Clotting time, Bleeding time, Prothrombin time, RBC count, WBC count,
CO 3	Set up a clinical laboratory and explain the disorders of carbohydrate metabolism
CO 4	Infer the inborn errors of amino acid and nucleic acid metabolism
CO 5	Elucidate the disorders of kidney and kidney function tests

SEMESTER V

MOLECULAR BIOLOGY

After the successful course completion, learners will develop following attributes:

CO. NO	COURSE OUTCOME DETAILS
CO 1	To describe and explain chemical and molecular processes of replication that occurs in cells
CO 2	Demonstrate the mechanism of replication process
CO 3	Describe the transcription process and their inhibitors
CO 4	Explain about the synthesis of proteins and regulatory mechanism
CO 5	Elucidate the molecular basis of mutation and repair mechanism

SEMESTER V
HUMAN PHYSIOLOGY

After the successful course completion, learners will develop following attributes:

CO. NO	COURSE OUTCOME DETAILS
CO 1	Seeks to understand the process of Digestion and absorption.
CO 2	Explain the physiology of respiratory system
CO 3	Understand muscle physiology and cardiovascular system
CO 4	Elucidate the Functional anatomy of the human reproductive and renal system system
CO 5	Infer organization of nervous system & the functioning of special senses

SEMESTER V

NUTRITIONAL BIOCHEMISTRY

After the successful course completion, learners will develop following attributes:

CO. NO	COURSE OUTCOME DETAILS
CO 1	Classification, composition, food sources, functions of carbohydrates, proteins, fats and oils
CO 2	Concept of nutrition, energy measurements, BMR, SDA, RNI and RDA
CO 3	Explain the effect of protein energy malnutrition
CO 4	Infer the classification, dietary sources and deficiencies of minerals
CO 5	Elaborate on the effects of drug on food and the role of diet in prevention and treatment of diseases

SEMESTER V

GENETIC ENGINEERING

After the successful course completion, learners will develop following attributes:

CO. NO	COURSE OUTCOME DETAILS
CO 1	Get proper knowledge about the DNA manipulative enzymes: Restriction enzymes and DNA ligases.
CO 2	Gain knowledge about In vitro construction of recombinant DNA molecules, passenger and vector DNA, and Transformation
CO 3	Learn about screening and selection of recombinant host cells, Gene Libraries, cloning techniques, Expression of cloned DNA
CO 4	Learn about the basics of Electrophoresis techniques, Polymerase chain reaction (PCR), Site directed mutagenesis (SDM), Nucleic acid sequencing:Blotting techniques.
CO 5	Have knowledge of Application of r-DNA technique in human health, Production of Insulin, Production of recombinant vaccines

SEMESTER VI

IMMUNOLOGY

After the successful course completion, learners will develop following attributes:

CO. NO	COURSE OUTCOME DETAILS
CO 1	Understand the types of Immunity.
CO 2	Illustrate the properties and types of antigen and antibodies
CO 3	Interpret the basics in antigen and antibody reaction
CO 4	Explain about the complement system and hypersensitivity reactions
CO 5	Clarify about the complement system and autoimmunity.

SEMESTER VI
ENDOCRINOLOGY

After the successful course completion, learners will develop following attributes:

CO. NO	COURSE OUTCOME DETAILS
CO 1	Illustrate the mechanism of action of hormones of hypothalamus and pituitary gland
CO 2	Understand hypothalamic and pituitary hormones.
CO 3	Elucidate the chemistry, secretion & biological function of thyroid and pancreatic hormones
CO 4	Enumerate the chemistry & synthesis of G.I.tract and adrenal gland hormones
CO 5	Detail the role of reproductive and local hormones

SEMESTER VI

PHARMACEUTICAL BIOCHEMISTRY

After the successful course completion, learners will develop following attributes:

O. NO	COURSE OUTCOME DETAILS
CO 1	Describe the pharmacokinetics and dynamics of drug molecule
CO 2	Understand about basic principles involved in pharmacokinetics.
CO 3	Understand about the drug receptor interactions and gain knowledge on metabolism .
CO 4	Describe the gender principles of adverse drug reactions and acute poisoning .
CO 5	Advance the knowledge on drug discovery process and ethical issues in drug discovery process and in preclinical toxicological studies .

SEMESTER VI

MICROBIAL AND INDUSTIAL BIOCHEMISTRY

After the successful course completion, learners will develop following attributes:

O. NO	COURSE OUTCOME DETAILS
CO 1	Describe the structural organization of microbes
CO 2	Explain the ways by which microbes involve in energy production
CO 3	Illustrate the mechanisms of microbial carbohydrate metabolism
CO 4	Demonstrate the methods involved in fermentation process
CO 5	Depict the process of industrial production of enzymes and antibiotics

COURSE	OUTCOMES After completion of these courses students should be able to
SEMESTER I	
CELL BIOLOGY	CO:1 Design the model of cell. CO:2 Differentiate the structure of prokaryotic and eukaryotic cell. CO:3 Explain the organization of Genes and chromosomes, chromosome morphology and its aberrations CO:4 Compare and contrast the events of cell cycle and its regulation CO:5Explain the communications of cells with other cells and to the environment.
SEMESTER II	
GENETICS	CO:1. Obtain acquaintance on historical overview of microbial genetics and genetic Materials CO:2Comprehend the concept of replication of genetic materials CO3. Understand about regulation of gene expression and mutation CO 4. Demonstrate the genetic exchange mechanism in microorganisms CO5:Grasp the Basic of genetics and their role

SEMESTER III	
GENERAL MICROBIOLOGY	CO:1Remember and recall the historical events which paved the development of different types of microscopes. CO:2Understand and differentiate the different types of microbes. **CO: 3** Analyze the media composition and grow the desired microbe. CO:4 Apply the knowledge to enumerate the microorganisms from natural environment. CO:5 Evaluate the success of understanding the viruses
SEMESTER - IV	
MOLECULAR BIOLOGY	CO: 1Learning structural levels of nucleic acids- DNA and RNA and genome organization in prokaryotes and eukaryotes CO: 2Understanding the concept of Gene and the gene architecture. ` CO: 3 Overview of the central dogma of life and various molecular events Learning molecular events in the DNA replication and role of different enzymes CO: 4 Molecular Events Translation leading to protein synthesis and Post translational modification. CO: 5 Understanding the regulation of gene expression in prokaryotes using operon concept and Eukaryotes.

SEMESTER V	
PLANT BIOTECHNOLOGY	CO: 1 Understand scientific and technical skills on plants study CO: 2 Acquire knowledge on limitations and challenges in plant cell tissue culture. CO: 3 Know the applications of Plant Biotechnology CO: 4 Learn the preservative methods of cells CO: 5 Evaluate and discuss public and ethical concerns over the use of plant Biotechnology
IMMUNOLOGY AND IMMUNOTECHNOLOGY	CO: 1 Design a model of Immunoglobulin/Antibodies CO: 2 Describe which cell M types and organs present in the immune response CO: 3 Illustrate various mechanisms that regulate immune responses and maintain Tolerance CO: 4 Exemplify the adverse effect of immune system including Allergy, hypersensitivity and autoimmunity CO:5 Apply basic techniques for identifying antigen antibody interactions

GENETIC ENGINEERING	CO: 1 Acquaint with the vocabulary involved in molecular cloning strategies and techniques used to probe DNA for specific genes of interest CO: 2 Apprehend with the tools and techniques in rDNA technology and types of Vectors CO: 3 Relate the role of restriction and modifying enzymes in recombinant DNA Technology CO: 4 Explore the techniques involved in construction of genomic DNA library and cDNA library CO: 5 Design the protocols for analyzing gene transfer methods and to explore knowledge on hybridization based markers

SEMESTER VI	
ANIMAL BIOTECHNOLOGY	CO:1.In the successful completion of the course, students will be able to: CO:2.To develop an understanding on basic pattern of animal cell culture and controlling characters CO:3.Acquire knowledge on handling animal cell culture and their applications CO:4. Understand the gene transfer technology , transgenic animal and stem cell technology CO:5. Emphasize techniques on fertilization in animals and its development
PROTEOMICS AND GENOMICS	**CO 1:** To familiarize the students with genome databases and metagenome database and analysis, markers for genetic analysis and gene expression profiling **CO 2**: To gain insight into different sequencing methods, comparative and functional genomic analysis which enables the students to understand about sequence and structure based approaches for gene prediction and function determination.

	CO 3: To have better understanding about proteomics and learn about protein profiling and analysis of data generated through mass spectrometry and to be aware of the bioinformatics tools available for analysis of proteomic data. **CO 4**: To have an enhanced theoretical knowledge on biological databases and sequence analsysis **CO 5**: To understand well about sequence alignment tools, gene prediction methods and homology modelling & drug targeting.
BIOPROCESS AND ENZYME TECHNOLOGY	CO:1 On successful completion of the course, student will be able to: CO:2 Narrate the scope and economics of 3.Microbial Biotechnology CO:3 Understand the need of microbial products for the mankind CO:4 Examine the learned techniques in production of industrially important products CO:5 Think about the innovativeness in the production of new beneficial metabolites

DEPARTMENT OF BOTANY

Course Outcomes

SEMESTER – I	
Course	**Outcomes** After completion of these courses students should be able to :
PLANT DIVERSITY-I (ALGAE AND BRYOPHYTES)	CO-1. Highlighting the occurrence, general characters and classification of Algae and Bryophytes. CO- 2 Explaining the structure, pigmentation, food reserves and methods of reproduction of Algae CO-3. Describing the structure, reproduction and

	life cycles of Algae (*Oscillatoria, Anabaena, chlamydomonas, Volvox, Oedogonium Caulerpa, Chara, Cyclotella, Sargassum* and *Polysiphonia)* CO-4. Describing the structure, reproduction and life cycles of Bryophytes (*Marchantia, Porella, Anthoceros and Polytrichum*). CO-5.Pointing out the economic importance of Algae and Bryophytes.
SEMESTER – II	
PLANT DIVERSITY-II (FUNGI, LICHENS, BACTREIA AND VIRUSES)	CO-1. Listing the general characteristics, mode of life, classification and economic importance of Fungi. CO-2. Explaining the occurrence, morphology, reproduction and life cycles of Fingi (*Albugo, Saccharomyces, Aspergillus, Neurospora, Peziza, Puccinia, Polyporus* and *Cercospora*). CO-3. Describing the General characteristics, Occurrence, Distribution, Classification and Reproduction and economic importance of Lichens. CO-4. Listing the general characters of Plant Virus and describing the reproduction of T4 phage. CO-5. Discussing the General characters, Occurrence, Distribution, Classification, Structure, Mode of nutrition, Reproduction and Economic importance of Bacteria.
SBEC-I-MUSHROOM CULTURE TECHNOLOGY	CO-1. Discussing the history, scope of edible mushroom cultivation and Types of edible mushrooms available in India. CO-2. Explaining the detail study of the mushrooms, *Pleurotus citrinopileatus, Agaricus bisporus*. CO-3. Determining the pure culture, nutritional value, cultivation unit, storage methods and preparation of mother spawn. CO-4. Understanding the importance and preparation of value added products
SEMESTER - III	
ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS ANATOMY	CO-1. Discussing the meristematic tissues (classification, distribution, structure, function and

	meristem theories). CO-2. Understanding the various tissue systems (simple, complex and vascular tissues). CO-3. Identifying the Primary and secondary structure of dicot, monocot stem, root, leaf and the normal and anomalous secondary growth in stem. CO-4. Explaining the structure and development of anther and types of ovule. CO-5. Describing the pollination, Fertilization, Double fertilization and Triple fusion, endosperm and development of dicot embryo.
SBEC - II - HORTICULTURE	CO-1. Outlining the Horticulture definition, branches, importance and scope. CO-2. Describing the Classification of Horticultural Crops (fruits and vegetables). CO-3. Examining the techniques of gardening - Types, Methods & Tools. CO-4. Determining the plant propagation techniques (Cutting, layering, Budding and grafting). CO-5.Demonstrating the Floriculture - Cultivation of commercial flower crops.
SEMESTER – IV	
PLANT DIVERSITY-III (PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY)	CO-1. Explaining the general characteristics, classification and sporangial organization of Pteridophytes. CO-2. Describing the morphology, anatomy, reproduction and life cycle of Pteridophytes (*Lycopodium, Selaginella, Equisetum, Gleichenia* , *Adiantum* and *Marsilea*). CO-3. Discussing the general characteristics and classification of Gymnosperms. CO-4. Describing the morphology, anatomy and reproduction of *Cycas, Pinus* and *Gnetum.* CO-5. Understanding the Paleobotany – geological time scale, radiocarbon dating, fossilization process and types of fossils.
SBEC-III - PLANT TISSUE CULTURE	CO-1. Discussing the Plant Tissue culture – Introduction, Historical background and Principle. CO-2. Explaining the laboratory organization, tools

	and techniques, methods of sterilization and media preparation. CO-3. Determining the types of culture - cell, tissue and organ culture, callus induction and suspension culture. CO-4. Describing the protoplast - isolation, culture and fusion, somatic hybridization and cybridization. Organogenesis – anther culture and Somatic embryogenesis. CO-5. Highlighting the application of tissues and cell culture, production of genetically variable plants and production of secondary metabolites.
SEMESTER – V	
MORPHOLOGY AND TAXONOMY OF ANGIOSPERMS	CO-1. Distinguishing the Plant body parts – Types and modification of Root, Stem and Leaf morphology, types, venation and phyllotaxy. CO-2. Illustrating the Inflorescence and their types and Flower morphology, floral types and their arrangements. CO-3. Understanding the types of classifications-artificial, natural and phylogenetic systems and plant nomenclature. CO-4. Identifying of genus and species of locally available wild plants. CO-5. Describing the morphological and floral characters of locally available families of flowering plants. CO-6. Highlighting the economic products with special reference to the Botanical name, family, morphology of useful part and their uses. CO-7. Demonstrating the herbarium technique.
CYTOLOGY AND GENETICS CYTOLOGY	CO-1. Explaining the History and Development of cell biology. CO-2. Illustrating the Ultra structure of a Plant cell and cell organelles. CO-3. Understanding the Mendelian genetics, principles and Mendel's laws. CO-4. Describing the gene interaction with suitable examples. CO-5. Discussing the Sex determination in plants, polyploidy and population genetics.

BIOINSTRUMENTATION AND BIOSTATICTIS	CO-1. Describing the basic principles of various microscopes (Light, Compound, Phase contrast, Scanning and Transmission Electron microscopes). CO-2Discussing the micro technique (microtomy, microtome's) and staining techniques. CO-3. Analyzing the basic principles of biostatistics. CO-4. Describing the principles, mechanisms and applications of basic bio-instruments. CO-5. Understanding the fundamental concepts of biostatistics.
ELECTIVE COURES- I - PLANT BIOTECHNOLOGY	CO-1. Discussing the history, definition, scope and significance plant biotechnology. CO-2. Explaining the Recombinant DNA technology, Enzymes, Cloning vectors, Transposons and Applications of Genetic Engineering. CO-3. Describing the Gene transfer in plants-Aims, strategies for development of transgenic plants. CO-4. Discussing the Environmental Biotechnology (Waste management, Solid waste and production of biogas, bioethanol) and food biotechnology.
SBEC -IV AGRICULTURAL MICROBIOLOGY	CO-1. Discussing the General characterization – Soil microflora (Bacteria, fungi, Actinomycetes, Algae, Phosphate solubilizing bacteria). CO-2. Describing the nitrogen cycle, biological N_2 fixation, symbiotic and non-symbiotic bacteria (*Rhizobium*, *Azospirillum* and *Azotobacter*). CO-3. Explaining the *Azolla* and *Anabaena azollae* association, nitrogen fixation, factors affecting growth. CO-4. Determining the Mycorrhizal association, types of mycorrhizal association, taxonomy, occurrence and distribution. CO-5. Formulating the Organic farm and organic fertilizers, recycling of biodegradable agricultural and industrial wastes and Biocompost making methods and field applications (Vermicomposting).
SBEC -V PLANT BREEDING AND PLANT UTILIZATION AS FOOD PLANT BREEDING	CO-1. Understanding the historical aspect, objectives of plant breeding. CO-2. Discussing the selection of breeding methods (pure line, clonal and mass). CO-3. Describing the types and procedure of hybridization and Somatic hybridization.

	CO-4. Explaining plant utilization as food, they are cereals, pulses, vegetables, sugar crop, oil crop and fruit crops.
SEMESTER – VI	
PLANT PHYSIOLOGY	CO-1. Understanding the plant and its water relations. CO-2. Describing the photosynthesis-photosynthetic pigments and light reactions. CO-3. Explaining the Respiration – Aerobic and Anaerobic respiration. Glycolysis, Krebs cycle, Electron transport System. CO-4. Discussing the Nitrogen Metabolism: nitrogen fixation- nitrification, denitrification and Nitrate assimilation. CO-5. Determining the Plant Growth regulators (Auxins, Gibberellins. Cytokinins Abscisic acid, Ethylene.
PLANT ECOLOGY AND PLANT GEOGRAPHY	CO-1. Discussing the Approaches to the study of ecology and plant environment. CO-2. Describing the ecosystems and ecosystem concepts. CO-3. Explaining the plant succession, types and ecological group of plants. CO-4. Classifying the environmental pollution, types and their control measures. CO-5. Defining the phytogeography Definition, concept, Scope and significance. Co-6. Illustrating the Phytogeographical zones of India and Vegetational types in Tamil Nadu.
PLANT PROTECTION	CO-1. Discussing the Damage to crops of India by Insects, Nematodes, Rodents, Fungi, Bacteria and viruses. CO-2. Describing the types of plant diseases, causative organisms and control measures. CO-3. Determining the symptoms, etiology and control measures of the various fungal diseases. CO-4. Determining the symptoms, etiology and control measures of the various bacterial diseases. CO-5. Explaining the nature of plant virus and Causal organism, symptoms, control measures of various viral diseases.
MAJOR ELECTIVE COURSE – II	CO-1. Explaining the atomic structure of elements

BIOCHEMISTRY	and structure and properties of water. CO-2. Describing the structure and properties of carbohydrates. CO-3. Illustrating the Amino acids (structure, properties (physical and chemical); function) and proteins (primary, secondary, tertiary, quaternary structure, function of protein). CO-4. Discussing the enzymes and lipids.
SBEC –VI **MEDICO- ETHNO BOTANY**	CO-1. Explaining the History, Scope and Importance of Medicinal Plants and Indigenous Medicinal Sciences (Ayurveda, Siddha. Unani). CO-2. Discussing the Ethnobotany (definition, scope and objectives) and Role of ethnic groups in conservation of plant genetic resources. CO-3. Describing the role of ethnobotany in modern medicine and significance of ethnobotanical medicinal plants. CO-4. Highlighting the medicinal plants for formulation of drugs.

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COURSE : B.SC CHEMISTRY

SEMESTER – I	
Course	**Outcomes** After completion of these courses students should be able to :
19UCH01 **General Chemistry - I**	CO-1. Know the method of handling of chemicals. CO- 2. Understand the different models of atoms. CO- 3. Study the periodic properties and its variation. CO-4. Learn the electron displacement effect. CO-5. Understand the behavior of ideal gases and real gases.
SEMESTER – II	
19UCH02 **General Chemistry - II**	CO-1. Understand the mode of formation of ionic bonds and covalent bonds. CO-2. Write the reactions of hydrides and carbides. CO-3. Compare the reaction, mechanism and stereochemistry of S_N1, S_N2 and S_Ni reactions. CO-4. Know the mechanism of aromatic electrophilic substitution reaction. CO-5. To study the chemical constitution.
19UCHS01 **Food and Nutrition**	CO-1. Know the source and constituents of food. CO-2. Define the terms like nutrition, nutrients etc. CO-3. Study the food adulteration. CO-4. Understand the method of preservation and processing of food. CO-5. Know the role of vitamins and minerals.
19UCHP01 **Volumetric estimation and Inorganic preparation.**	CO-1. To do the acid – base titration. CO-2. Calculate the strength of given solution. CO-3. Estimate the hardness of water. CO-4. To learn the technique of volumetric estimation. CO-5. Prepare the metal complexes and double salts.

SEMESTER – III	
17UCH03 **General** **Chemistry – III**	CO-1. Study the method of extraction of various metals like Ti, Zr etc. CO-2. Understand the mechanism of name reactions. CO-3. Write the reactions of carboxylic acids. CO-4. Define the symmetry in crystal system. CO-5. Understand the first law of thermodynamics.
SEMESTER – IV	
17UCH04 **General** **Chemistry - IV**	CO-1. Understand the nuclear reactions. CO-2. Write the reactions of heterocyclic compounds. CO-3. Study the chemistry of aniline and diazonium compounds. CO-4. Understand the second law of thermodynamics. CO-5. To evaluate absolute entropy.
17UCHS02 **Polymer** **Chemistry**	CO-1. Write the preparation of polymers. CO-2. Study the crystalline melting point and glass transition temperature. CO-3. Know the processing of polymers. CO-4. Learn the constitution of natural rubber. CO-5. Know the various constituents of plastics.
17UCHP02 **Inorganic qualitative analysis.**	CO-1. Analyse the acid radicals and basic radicals systematically. CO-2. Eliminate the interference acid radicals. CO-3. Do the group separation. CO-4. Prepare the sodium carbonate extract. CO-5. Carryout the confirmatory test for acid radicals and basic radicals.
SEMESTER – V	
17UCH05 **Inorganic Chemistry – I**	CO-1. Define acids and bases and its types. CO-2. Study the compounds of thorium and uranium. CO-3. Learn the Werner's theory and Sidgwick's theory. CO-4. Study the crystal field theory and its uses. CO-5. Write the reactions of metal complexes.
17UCH06	CO-1. To understand the optical isomers and optical

Organic Chemistry - I	isomerism. CO-2. To know the conformers and geometrical isomers. CO-3. Study the chemistry of amino acids and proteins. CO-4. Learn the function of nucleic acids. CO-5. To elucidate the structure of alkaloids and terpenes.
17UCH07 Physical Chemistry - I	CO-1. Study the adsorption and its types. CO-2. Derive the expression of rate constant of second order and third order reactions. CO-3. Study the Collision theory, Lindemann theory and ARRT. CO-4. Know the terminologies in electrochemistry and applications of conductance measurement. CO-5. Understand the DHO theory and hydrolysis of salts.
17UCHE01 Analytical Chemistry - I	CO-1. Study the separation techniques and purification techniques. CO-2. Understand the theories of precipitation. CO-3. Know the types of electronic transitions. CO-4. Study the types of vibrations. CO-5. Understand Raman scattering and Rayleigh scattering.
17UCHS03 Agricultural Chemistry	CO-1. Know the nutrients and its functions. CO-2. Study the manures and its types. CO-3. Understand the applications of pesticides and insecticides. CO-4. Learn the preservation of seeds. CO-5. Study the properties of soil.
17UCHS04 Dye stuffs and treatment of effluents.	CO-1. Define the terms chromophore and auxochrome. CO-2. Understand the various methods of dyeing. CO-3. Know the preparation of diphenylamine dyes and indigo dyes. CO-4. Write the preparation and applications of phthalein dyes and acridine dyes. CO-5. Study the treatment of effluents.
SEMESTER – VI	
17UCH08 Inorganic Chemistry - II	CO-1. Study the chemistry of metal carbonyls and silicates. CO-2. Know the chemistry of organometallic compounds.

	CO-3. Study the nanomaterials and its pplications. CO-4. Understand the chemistry of pseudohalogens and interhalogen compounds. CO-5. Study the magnetic properties of molecules.
17UCHE02 **Organic** **Chemistry - II**	CO-1. Elucidate the structure of disaccharides and polysaccharides. CO-2. Know the importance of vitamins. CO-3. Write the mechanism of rearrangements. CO-4. Study the important reagents and its uses. CO-5. Know the principle of green chemistry and green synthesis.
17UCH09 **Physical** **Chemistry - II**	CO-1. Study Nernst's distribution law and its applications. CO-2. Draw the phase diagram of various systems. CO-3. Understand the reactions involved in the galvanic cells. CO-4. Study the working of storage cells and fuel cells. CO-5. Learn the kinetics of photochemical reactions.
17UCHE03 **Analytical Chemistry - II**	CO-1. Study various chromatographic techniques. CO-2. Understand thermogravimetric analysis and differential thermal analysis. CO-3. Learn the technique of polarography. CO-4. To interpret the proton NMR spectrum of simple organic compounds. CO-5. To interpret the mass spectrum of simple organic compounds.
17UCHS05 **Pharmaceutical** **Chemistry**	CO-1. Define various terms in pharmaceutical chemistry. CO-2. Understand the action of sulpha drugs. CO-3. Study the action of analgesics. CO-4. Know the action of anti anaemic drugs. CO-5. Have a knowledge on important medicinal plants like tulasi, kilanelli, mango etc.

17UCHS06 Industrial Chemistry	CO-1. Know the preparation of chemical explosives. CO-2. Understand the manufacture of leather. CO-3. Study the production of chlorine and caustic soda. CO-4. Study the formulation of paints. CO-5. Have a knowledge on manufacture of cement and glass.
17UCHP03 Physical Chemistry Practical	CO-1. To determine the rate constant of acid catalysed hydrolysis of an ester. CO-2. To find out the molecular weight of solute by Rast method. CO-3. To study the simple eutectic system. CO-4. To determine the transition temperature of hydrated salts. CO-5. To find out the strength of an acid by conductivity method and potentiometric method.
17UCHP04 Gravimetric estimation and Organic practical	CO-1. To estimate the nickel by gravimetric analysis. CO-2. To estimate the lead by gravimetric estimation. CO-3. To learn the technique of gravimetric analysis. CO-4. To study the given organic compound qualitatively. CO-5. To determine the boiling point of liquids.

B.Sc. Mathematics-Course Outcomes

SEMESTER I

CLASSICAL ALGEBRA	CO-1. Understand the concepts of Binomial series and theorem for a rational index, standard results for the Exponential and Logarithmic series. CO 2Test for consistency of linear equations and Cayley-Hamilton theorem. CO-3Examine the relation between roots and coefficients of an equation and to understand the theory of equations. CO-4Learning of reciprocal equations, diminishing roots and removal of term of an equation. CO-5Understand the Descarte's rule of sign, Horner's method of approximation and Newton's method of evaluating a real root
DIFFERENTIAL CALCULUS	CO-1. Learn Partial and higher derivatives, total differential coefficient and implicit functions. CO-2.Understand the concepts of Jacobians, necessary and sufficient condition and the Legrange's multipliers. CO-3.Know the polar coordinates, length of perpendicular and the concepts of Asymptotes CO-4.Learn curvature and radius of curvature of pedal curves, polar tangential curves. CO-5.Study the Envelopes of one and two parameters, chord of curvature, Evolute and their properties.

SEMESTER II

INTEGRAL CALCULUS	CO-1. Calculate the length of an arc of a curve when whose equations are given in parametric and polar forms. CO-2.Evaluate the area of surfaces of revolution. CO-3.Determine the area and volume by applying the techniques of double and triple integrals. CO-4.Obtain equations for surfaces and curves in three dimensions. CO-5.Identify different types of differential equations and solve them.

VECTOR ANALYSIS	CO-1. Define vector equations for lines and planes. CO-2.Analyze vector functions to find limits, derivatives, tangent lines, integrals, arc length, curvature. CO-3.Compute limits and derivatives of functions of two and three variables. CO-4.Differentiate vector fields. CO-5.Determine gradient vector fields and potential functions.
SEMESTER III	
STATICS	• CO-1. Gain knowledge about the types of forces • CO-2Gain knowledge about the couples. • CO-3.Understand the concepts of friction and equilibrium of a particle. • CO-4.Develop the concept of centre of gravity. • CO-5.Gain the knowledge about virtual work.

DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	CO-1.Compute all the solutions of second and higher order linear differential equations with constant coefficients, linear equations with variable coefficients CO-2.Compute all the solutions of second and higher order linear differential equations with Variables coefficients, linear equations with variable coefficients. CO-3.Find the solution of First order partial differential equations for some standard types. CO-4.Understand the Laplace transforms of standard functions CO-5.Apply Laplace transform to solve second order linear differential equation and simultaneous linear differential equations.
SEMESTER IV	
DYNAMICS	CO-1.To gain knowledge about velocity. CO-2.Understand the concepts of two fundamental principles. CO-3.To develop the concept of Impulsive forces.

	CO-4.Gain knowledge about simple harmonic motion. CO-5.To develop the concept of central forces.
TRIGONOMETRY AND ANALYTICAL GEOMETRY OF 3D	CO-1.Understand the Expansions of trigonometric ratios. CO-2.Understand the concept of Inverse hyperbolic functions. CO-3.To gain knowledge about the symmetrical form and coplanar lines. CO-4.Enhance the fundamental concepts of sphere and equation of circle on a sphere. CO-5.To develop the concepts of cone and general quadric cone.
SEMESTER V	
MODERN ALGEBRA I	CO-1.Understand the concepts of Group and Subgroup and its applications. CO-2.Acquire Knowledge about the concepts of homomorphisms, isomorphisms. CO-3.Gain knowledge about the concepts of Automorphism. CO-4.Analyse the concept of Ring.Field and Euclidean Ring. CO-5.Analyse and demonstrate theEuclidean ring and properties of Polynomial Rings.
REAL ANALYSIS I	CO-1.Understand basic concepts of Sequence and Series CO-2To gain knowledge about the bounded sequence. CO-3.Analyse the concept of Convergent and divergent series CO-4.Understand the concept of Metric Space. CO-5.To develop the concept of Open and Closed set.
COMPLEX ANALYSIS I	CO-1.Know the concept of Limits,Continuity and Analytic function. CO-2.Solve Complex integrals CO-3.Gain knowledge about Cauchy integral formula and

	Liouville's theorem. CO-4.Analyse the concept of Linear transformation CO-5.Understand various linear transformation and Conformal mappings.

OPERATIONS RESEARCH	CO-1.Formulate simple reasonind and learning optimization problem. CO-2.Analyse a problem and can select a suitable strategy. CO-3Apply an appropriate method to obtain the solution to a problem. CO-4.Understand the concept of Inventory model problem. CO-5.Understand the concept of network and critical path
DISCRETE MATHEMATICS	CO-1.Recall the various concepts of Mathematical Logic CO-2.Understand the concepts of different types of normal forms CO-3.Classify the various types of functions and make them to use in practical applications related to computer science CO-4.Gain knowledge about the Algebraic systems CO-5.Understand the concepts of Boolean Algebra and its applications.

MODERN ALGEBRA II	CO-1.Find the Linear dependent and independent, bases and dimensions of spaces. CO-2.Understand about Inner product space and Modules. CO-3.Know about the concept of linear transformation, Characteristics roots and Matrices. CO-4.To gain knowledge about canonical form and nilpotent transformations. CO-5.Compute the Trace and Transpose and Determinants.
REAL ANALYSIS II	CO-1.Understand the Connected set and bounded sets. CO-2.Gain knowledge about the Compact metric space CO-3.,Understand basic concepts of Riemann integration and solving simple problem. CO-4.Solving problems by using theorems on derivatives CO-5.To develop the concept of convergence and uniform convergence.
COMPLEX ANALYSIS II	CO-1.Understand the concept of various types of Series CO-2.Gain knowledge about Uniform convergence of power series. CO-3Find different Singularities and Residues. CO-4.Evaluate the improper integrals and concept of Jordan's Lemma CO-5.Concept of Rouche's theorem.

GRAPH THEORY	CO-1.Basic concept of graph theory, degree,vertex and Subgraph. CO-2.Understand the connectedness and components. CO-3.Understand the concept of Euler graph and Hamilton graph CO-4.Gain knowledge about trees and matrices in graph

	CO-5.Know about the Diagraph and Matrices
NUMERICAL ANALYSIS	CO-1.Solving problem by Newton's method and Muller's method CO-2.Gain knowledge about Newton's forward and backward difference CO-3.Study the concept of Numerical Differentiation and integration CO-4.Solving by solution of linear system CO-5.Solving by solution of ordinary differential equations

B.SC.MICROBIOLOGY

COURSE	**OUTCOMES** After completion of these courses students should be able to
	SEMESTER I
FUNDAMENTALS OF MICROBIOLOGY	1. Learning the scientific methods and the history of science is the embodiment of scientific knowledge 2. As an introductory part of Microbiology, students will get the basic ideas and practices from the contribution of several Microbiologists in the field of microbiology. 3. They will have to know the diversity of microbial world like algae, fungi, protozoa and their general characteristics and importances. 4. They will be understood various laboratory practices, biosafety and also know the applications of important instruments like biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter. 5. Critique the recent developments in Microbiology.
	SEMESTER II
MICROBIAL PHYSIOLOGY AND METABOLISM	2. Understand Nutrients uptaking and environmental condition of Microorganisms. 3. Metabolic mechanism of microorganisms. 4. Essential growth factors and nutrient supplements of their growth of microbial population. 5. Classified the microbes based on that surviving environment and Overall physiology and anatomy of microorganisms to be learned

	6. Explain the physiological changes in microbes during growth
MICROBIAL DIVERSITY	1. Understand different types Microorganisms and Diversity of microorganisms. 2. Well-known about the General Characteristics and Classification of Microorganisms 3. Identify the morphological characteristics, importance and classification of algae and protozoa. 4. Classified the microbes based on that surviving environment and Economic importance of Microorganisms. 5. Overall microorganisms diversity to be learned

SEMESTER III	
MICROBIAL GENETICS	1. Through the course students will be acquainted with genome organization and mutations, different plasmids, mechanisms of genetic exchange, phage genetics and transposable elements 2. Microbial Genetics will allow students to know the genetic material , structures of DNA and RNA, central dogma of life which includes replication of DNA (prokaryotes and eukaryotes), translation (prokaryotes and eukaryotes, transcription in prokaryotes and eukaryotes, posttranscriptional processing. 3. Assess the competency of microbes to uptake DNA 4. Compare different mechanisms of gene transfer. 5. Outline the biology of phages and their role in gene transfer.
CONCEPTS OF BIOTECHNOLOGY	1. Understand the tools and techniques of genetic engineering 2. Understand and describe DNA, fingerprinting and its application in forensic science 3. Understand the methods of production of health related compounds by biotechnology 4. Explain and describe the advantages/disadvantages of genetic engineering for humans 5. Understand the production and importance of genetically modified food
PRINCIPLES OF BIOINSTRUMENTATION	1. Discuss the applications of biophysics and principle involved in bioinstruments 2. Describe the methodology involved in

	biotechniques 3. Describe the applications of bioinstruments 4. Demonstrate knowledge and practical skills of using instruments in biology and medical field 5. Perform techniques involved in molecular biology and diagnosis of diseases
	SEMESTER IV
IMMUNOLOGY	1. Demonstrable detailed knowledge and understanding of immunology and the way it is applied in diagnostic and therapeutic techniques and research. 2. Demonstrate knowledge and practical skills in undertaking simple immunological experiments that mimic those under taken in diagnostic laboratories and research laboratories. 3. Demonstrate literature review skills in undertaking a large survey of a complex field with in immunology, synthesis the information from primary medical literature. 4. Adhere to safe working practice in a mixed microbiology/immunology laboratory 5. Explain the concepts and trends in dimensions of health
BIOTECHNOLOGY FOR SOCIETY	1. Known that different types of cultivation techniques of Insects, Microrganisms. Such as Sericulture, Aquaculture and Vermiculture techniques. 2. Convert waste material to beneficial one, likewise biofertilizer, biogas. 3. learned the techniques of vaccine production and gene therapy 4. The using of biological techniques to modify the product nature for increase the market value of product. 5. The mechanism and methods of genetically modified plants and animals. Characteristic features of those things.

SEMESTER V	
MEDICAL BACTERIOLOGY	1. This course provides learning opportunities in the basic principles of medical microbiology and infectious disease. 2. It covers mechanisms of infectious disease transmission, principles of aseptic practice, and the role of the human body's normal microflora. 3. The course provides the conceptual basis for understanding pathogenic microorganisms and the mechanisms by which they cause disease in the human body. 4. It also provides opportunities to develop informatics and diagnostic skills, including the use and interpretation of laboratory tests in the diagnosis of infectious diseases. 5. To understand the importance of pathogenic bacteria in human disease with respect to infections of the respiratory tract, gastrointestinal tract, urinary tract, skin and soft tissue.
FOOD AND DAIRY MICROBIOLOGY	1. By the study of food & diary microbiology the students are able to know the principles and methods of food preservation, production of different fermented foods, different food borne diseases: 2. Their causative agents, foods involved, symptoms and preventive measures. They will have the know food sanitation and control. 3. The students will know about the cultural and rapid detection methods of food borne pathogens in foods and introduction to predictive microbiology 4. Design appropriate techniques for the recovery of fermented products 5. Compare the production processes of various fermented foods.
MEDICAL PARASITOLOGY AND ENTOMOLOGY	1. Identify the different types of parasites 2. Classify each parasite 3. Describe the structure of each parasite 4. Explain the parasites' life cycles 5. Discuss the relationship between each parasite and its host
MEDICAL MYCOLOGY	1. Student can classify the medically important fungal organisms on the basis of reproduction, taxonomy, macroscopic and microscopic morphology and

	mycoses 2. Explain mechanisms of pathogenesis (Fungi) with clinical importance 3. Student can define how antifungal agents can be used in treatment 4. Evaluate modern laboratory diagnostic methods. 5. Outline the significance of prophylaxis and therapeutic management
RECOMBINANT DNA TECHNOLOGY	1. Through completion the course the students will capable the acquire the knowledge about the genetic engineering, different methods in molecular cloning, DNA amplification, DNA sequencing, 2. Discuss the structure, properties and functions of nucleic acids 3. Assess the concept of gene regulation in prokaryotes and eukaryotes 4. Explain the process of transcription in prokaryotes and eukaryotes 5. Construction and Screening of Genomic and cDNA libraries and its applications
SEMESTER VI	
SOIL AND AGRICULTURAL MICROBIOLOGY	1. Gained knowledge of Agricultural Microbiology 2. An understanding of plant microbe-interactions. 3. A critical understanding about major plant diseases caused by fungi, bacteria and viruses, their control measures. 4. An clear view about production of biopesticides & biofertilizers 5. Compare the soil profiles and their perspectives of ecological zonation
ENVIRONMENTAL AND PHARMACEUTICAL MICROBIOLOGY	1. Know General bacteriology and microbial techniques for isolation of pure cultures of microbes from different environmental sources. 2. Acquire knowledge on air soil and water microbiology 3. Students acquire the information about microbes 4. Know about microbes and its role in air borne diseases. 5. Able to know about principles and techniques in waste treatment.

MEDICAL VIROLOGY	1. Students will be able to learn the nature, structure, general properties and their importance of different animal and plant viruses. 2. They will also know about Viral Transmission, Salient features of viral nucleic acids, Replication and also several disease caused by viruses and the way of preventation 3. Outline the general characteristics and pathogenesis of viruses 4. Discuss the various replication strategies of viruses and the human diseases they cause. 5. Compile the different diagnostic procedures, and treatment strategies for viral infections
INDUSTRIAL MICROBIOLOGY	1. Students will be able to define fermentation. 2. They will be able to describe process of industrial fermentation. 3. They will be able to understand the role of bioreactor in fermentation. 4. They will be able to explain industrial processes for various products by flow sheet diagram. 5. Discuss the steps in downstream processing and assess the nature and utility of various fermented products

CLINICAL LAB TECHNOLOGY	1. Competency to perform a full range of testing in the contemporary medical laboratory encompassing pre-analytical and post-analytical components of laboratory services , including hematology , chemistry, microbiology, urinalysis, body fluids, molecular diagnostic, phlebotomy, and immune heamotology. 2. Professional conduct, respecting the feeling and needs of others, protecting the confidence of patient information, and not allowing personal concerns and biases to interfere with the welfare of patients. 3. Exhibits a sense of commitment to the ethical and human aspects of patients care. 4. Administrative skills consist with philosophies of quality assurance, continuous quality improvement, laboratory education and appropriate composure under stressful conditions. 5. Recognize the role of the clinical laboratory scientists in the assurance of quality health care.

Course : B.Sc Chemistry

SEMESTER – I	
Course	**Outcomes** After completion of these courses students should be able to :
17UCH01 **General Chemistry - I**	CO-1. Know the method of handling of chemicals. CO- 2. Understand the different models of atoms. CO- 3. Study the periodic properties and its variation. CO-4. Learn the electron displacement effect. CO-5. Understand the behavior of ideal gases and real gases.

SEMESTER – II	
17UCH02 **General Chemistry - II**	CO-1. Understand the mode of formation of ionic bonds and covalent bonds. CO-2. Write the reactions of hydrides and carbides. CO-3. Compare the reaction, mechanism and stereochemistry of S_N^1, S_N^2 and S_N^i reactions. CO-4. Know the mechanism of aromatic electrophilic substitution reaction. CO-5. To study the chemical constitution.
17UCHS01 **Food and Nutrition**	CO-1. Know the source and constituents of food. CO-2. Define the terms like nutrition, nutrients etc. CO-3. Study the food adulteration. CO-4. Understand the method of preservation and processing of food. CO-5. Know the role of vitamins and minerals.
17UCHP01 **Volumetric estimation and Inorganic preparation.**	CO-1. To do the acid – base titration. CO-2. Calculate the strength of given solution. CO-3. Estimate the hardness of water. CO-4. To learn the technique of volumetric estimation. CO-5. Prepare the metal complexes and double salts.

SEMESTER – III	
17UCH03 **General Chemistry – III**	CO-1. Study the method of extraction of various metals like Ti, Zr etc. CO-2. Understand the mechanism of name reactions. CO-3. Write the reactions of carboxylic acids. CO-4. Define the symmetry in crystal system. CO-5. Understand the first law of thermodynamics.
SEMESTER – IV	
17UCH04 **General Chemistry - IV**	CO-1. Understand the nuclear reactions. CO-2. Write the reactions of heterocyclic compounds. CO-3. Study the chemistry of aniline and diazonium compounds.

	CO-4. Understand the second law of thermodynamics. CO-5. To evaluate absolute entropy.
17UCHS02 **Polymer Chemistry**	CO-1. Write the preparation of polymers. CO-2. Study the crystalline melting point and glass transition temperature. CO-3. Know the processing of polymers. CO-4. Learn the constitution of natural rubber. CO-5. Know the various constituents of plastics.
17UCHP02 **Inorganic qualitative analysis.**	CO-1. Analyse the acid radicals and basic radicals systematically. CO-2. Eliminate the interference acid radicals. CO-3. Do the group separation. CO-4. Prepare the sodium carbonate extract. CO-5. Carryout the confirmatory test for acid radicals and basic radicals.
SEMESTER – V	
12UCH05 **Inorganic Chemistry – I**	CO-1. Define acids and bases and its types. CO-2. Study the compounds of thorium and uranium. CO-3. Learn the Werner's theory and Sidgwick's theory. CO-4. Study the crystal field theory and its uses. CO-5. Write the reactions of metal complexes.
12UCH06 **Organic Chemistry - I**	CO-1. To understand the optical isomers and optical isomerism. CO-2. To know the conformers and geometrical isomers. CO-3. Study the chemistry of amino acids and proteins. CO-4. Learn the chemistry of heterocyclic compounds. CO-5. To elucidate the structure of alkaloids and terpenes.
12UCHE01 **Physical Chemistry - I**	CO-1. Study the Nernst's distribution law. CO-2. Understand the adsorption and its types. CO-3. Derive the expression of rate constant of second order and third order reactions. CO-4. To study the theories in chemical kinetics. CO-5. To know the kinetics of photochemical reactions.

12UCHE02 **Spectroscopy**	CO-1. To know the types of electronic transitions. CO-2. Understand the types of vibrations. CO-3. Study the Raman scattering and Rayleigh scattering. CO-4. To interpret the proton NMR spectrum of simple organic compounds. CO-5. To interpret the mass spectrum of simple organic compounds.
12UCHS03 **Agricultural Chemistry**	CO-1. Know the nutrients and its functions. CO-2. Study the manures and its types. CO-3. Understand the applications of pesticides and insecticides. CO-4. Learn the preservation of seeds. CO-5. Study the properties of soil.
12UCHS04 **Dye stuffs and treatment of effluents.**	CO-1. Study the synthesis and applications of quinonid dyes. CO-2. Know the synthesis and uses of indigo dyes and diphenyl methane dyes. CO-3. Understand the preparation and uses of phthalein dyes and xanthein dyes. CO-4. Study the preparation of acridine dyes. CO-5. Study the treatment of effluents.
SEMESTER – VI	
12UCH07 **Inorganic Chemistry - II**	CO-1. Study the chemistry of metal carbonyls and silicates. CO-2. Know the chemistry of organometallic compounds. CO-3. Learn the imperfections in the crystal system. CO-4. Understand the chemistry of pseudo halogens and inter halogen compounds. CO-5. Study the magnetic properties of molecules.
12UCH08 **Organic Chemistry - II**	CO-1. Elucidate the structure of mono saccharides. CO-2. To elucidate the structure of disaccharides. CO-3. Find out the structure of antibiotics. CO-4. To study the various rearrangements. CO-5. To study the role of various reagents and its applications.

12UCHE03 Analytical Chemistry	CO-1. Have a knowledge on data analysis. CO-2. To understand the theories of precipitations. CO-3. To study various chromatographic techniques. CO-4. Familiar with TGA and DTA techniques. CO-5. Learn the techniques of polarography.
12UCHE04 Physical Chemistry	CO-1. Study the phase diagram of various systems. CO-2. To know the terminologies in electrochemistry and applications of conductance measurement. CO-3. To study the DHO theory and hydrolysis of salts. CO-4. Understand the reactions involved in the galvanic cell. CO-5. To know the working of storage cells and fuel cells.
12UCHS05 Pharmaceutical Chemistry	CO-1. Define various terms in pharmaceutical chemistry. CO-2. Understand the action of sulpha drugs. CO-3. Study the action of analgesics. CO-4. Know the action of anti anaemic drugs. CO-5. Have a knowledge on important medicinal plants like tulasi, kilanelli, mango etc.
12UCHS06 Industrial Chemistry	CO-1. Know the preparation of chemical explosives. CO-2. Understand the manufacture of leather. CO-3. Study the production of chlorine and caustic soda. CO-4. Study the formulation of paints. CO-5. Have a knowledge on manufacture of cement and glass.
12UCHP03 Physical Chemistry Practical	CO-1. To determine the rate constant of acid catalysed hydrolysis of an ester. CO-2. To find out the molecular weight of a solute by Rast method. CO-3. To determine the transition temperature of hydrated salts. CO-4. To find out the strength of an acid by conductivity method and potentiometric method.

12UCHP04 **Gravimetric estimation and Organic practical**	CO-1. To estimate the lead by gravimetric estimation. CO-2. To learn the technique of gravimetric analysis. CO-3. To study the given organic compound qualitatively. CO-4. To determine the boiling point of liquids.

Course Outcomes BSc. Computer Science **SEMESTER I**	
MICROPROCESSOR	CO1: recall and apply a basic concept of digital fundamentals to Microprocessor based personal computer system. CO2: identify a detailed s/w & h/w structure of the Microprocessor. CO3: illustrate how the different peripherals (8255, 8253 etc.) are interfaced with Microprocessor. CO4: distinguish and analyze the properties of Microprocessors & Microcontrollers. CO5: analyze the data transfer information through serial & parallel ports. CO6: train their practical knowledge through laboratory experiments.
ASSEMBLY LANGUAGE PROGRAMMING	CO1: Demonstrate ability to handle arithmetic operations using assembly language programming in TASM and training boards CO2: Demonstrate ability to handle logical operations using assembly language programming in TASM CO3: Demonstrate ability to handle string instructions using assembly

	language programming in TASM CO4: Demonstrate ability to handle sorting operations and using assembly language programming in TASM
SEMESTER II	
C-PROGRAMMING	CO1 Explain about the basic concepts of program development statements and its syntax. CO2. Explain the various types of arrays and its structure. CO3Discuss about the various types of Functions and String handling mechanisms. CO4.Explain the Concepts of structures and Unions. CO5.Illustrates the various operations performed on different types of files.
PROGRAMMING IN C LAB	CO1 Explanation of design and algorithmic solution for a given problem. CO2. Construction of flowchart for the computer programs. CO3 Explains the program using Control Statements CO4. Explains the program using Arrays and Functions. CO5. Explain the program using file handling with structure.
SEMESTER III	
OBJECT ORIENTED PROGRAMMING WITH C++	CO1 Explain the top-down and bottom-up programming approach and apply bottom up approach to solve real world problems. CO2. Explain the difference between static and dynamic binding. Apply both techniques to solve problems. CO3 Describe the concept of inheritance and apply real world problems. CO4. Discuss the generic data type for the data type independent programming which relate it to reusability. CO5. Explain to design of handling large data set using File I/O.

PROGRAMMING IN C++ LAB	CO1 Explain the features of C++ using object oriented programming. CO2. Describe the relative merits of C++ as an object oriented programming language. CO3 Describe the major object-oriented concepts to implement object oriented programs in C++ Using encapsulation and inheritance. CO4. Describe the major object-oriented concepts to implement object oriented programs in C++ Using polymorphism. CO5.Explain the advanced features of C++ specifically stream I/O, templates and operator overloading.
DATASTRUCTURES AND ALGORITHMS	Co1 : Remember the concept of algorithms. Co2 : Understanding the concept of arrays and stacks. Co3 : Apply Queue and linked list for other data structures. Co4 : Evaluate the tree and graphs. Co5 : Analyze the searching and sorting methods.
SEMESTER-IV	
RELATIONAL DATABASE MANAGEMENT SYSTEM	Co1 : Recognize the concept of database. Co2 : Apply SQL Commands. Co3 : Understanding the Advance SQL Concept. Co4 : Understanding the concept of Normalization. Co5 : Analyze the transaction management.

RDBMS LAB	CO1:Design and implement a database schema for a given problem domain CO2:Understand the use of query language (SQL) and its syntax. CO3:Populate and query a database using SQL DML/DDL commands. CO4:Perform programming in PL/SQL including stored procedures,functions and triggers.

SEMESTER V	
GUI PROGRAMMING	Co1 : Understanding the basic concepts of visual basic . Co2 : Implement the concept of variables , constants and branching statements. Co 3 : Use menus and sub functions to solve the given program. Co4 : Understanding the concept of arrays. Co5 : Access data using the concept of files.
OPERATING SYSTEM	CO1Describe the basic components of an operating system and their role in implementations for general purpose, real-time and embedded applications. CO2. Define the concepts of processes, threads, asynchronous signals and competitive system resource allocation. CO3 Explain what multi-tasking is and outline standard scheduling algorithms for Multi-tasking. CO4. Discuss mutual exclusion principles and their use in concurrent programming including semaphore construction and resource allocation. CO5. Expose the details of major operating system concepts, overview of system memory management and the implementation of file systems.
COMPUTER NETWORK	CO1 Explain the local, metropolitan and wide area networks using the Standard OSI reference model. CO2. Discussion of various networking technologies. CO3 Explain the concepts of protocols, network interfaces and design of performance issues in local area networks and wide area networks. CO4. Describeabout wireless networking concepts,contemporary issues in networking technologies, network tools and network programming. CO5. Explain the analysis of different types of protocol and the comparison of number of data link, network and transport layer protocols.

PROBLEM SOLVING TECHNIQUES	CO1:Understand the fundamental concepts of algorithm,flowchart&problem solving techniques. CO2: To analysis the given problems,use appropriate techniques and write efficient algorithm. CO3: Apply the basic knowledge of mathematical factoring methods to model an algorithm for given problem. CO4:Implement the concept of array to solve a given problem. CO5:design an algorithm for merging,sorting and searching.
PROGRAMMING IN VB LAB	CO1 Explain the simple programs using basic control statement. CO2. Explain the GUI based program using Basic ActiveX Control. CO3 Explain the different advanced ActiveX control with example application programs.

	CO4. Explain the various types of data base handling with MS-Access and Oracle CO5. Describe the concepts of data report for an organization.
SHELL PROGRAMMING LAB	CO1:Write a shell script to implement the file commands using shell. CO2:Describe the concept of memory information. And CPU information. CO3:Design script for displaying date and time,list of file. CO4:Describe calcommand and palindrome checking. CO5:To develop the script for compare to files and to given set of numbers using linux commands.
SEMESTER VI	
JAVA PROGRAMMING	Co1: Remember the concepts of oops. Co2:Understand the basic terminologies of language and statements. Co3: Evaluate the arrays strings,victor and package. Co4: Unterstanding the concept of 4ultithread and applet programming. Co5:Analyze the I/o streams and graphics classes.

SOFTWARE ENGINEERING	CO1 Explain the local, metropolitan and wide area networks using the Standard OSI reference model. CO2. Discussion of various networking technologies. CO3 Explain the concepts of protocols, network interfaces and design of performance issues in local area networks and wide area networks. CO4. Describe about wireless networking concepts, contemporary issues in networking technologies, network tools and network programming. CO5. Explain the analysis of different types of protocol and the comparison of number of data link, network and transport layer protocols.
DATAMINING AND WAREHOUSING	CO1 The fundamental concepts of data warehouse, delivery process, system process and process architecture. CO2. Explain the the system and data warehouse, process managers, capacity planning, tuning and testing. CO3 Describe the the basics of data mining, data mining metrics and social implications of data mining CO4. Discuss about the implementation of data ware housing techniques CO5. Explain the association rules, basic algorithms, advanced association rules techniques and measuring the quality of rules.
COMPUTER GRAPHICS	Co1 : Remember the basic concepts of graphic system. Co2 : Understanding scan systems and I/O devices. Co3 : Apply 2D Transformation. Co4 : Evaluate 3D Transformation. Co5 : Implement visible surface and detection methods.

PROGRAMMING IN JAVA LAB	CO1 Explain the programming language design, syntax and semantics. CO2. Describe the critical thinking skills through solving programming problems. CO3 Explain the standard syntax for java programs and other programming Tools. CO4. Describe the animation and events based advanced java program concepts (Applet) CO5. Explain the java programs using object oriented class with parameters, constructors, utility, calculations, methods including inheritance, test classes and exception handling.
PRACTICAL IMAGE EDITING TOOL	CO1: Todesign greeting card and web page layout using photoshop. CO2:Apply various filter effect and stamp tool. CO3: Design Bunch of flower front page of college calendar. CO4: To perform plastic surgery and to create see through to text. CO5: To convert balck and white image and describe fill a text.

PG DEPARTMENT OF COMMERCE WITH CORPORATE SECRETARYSHIP

Program Outcomes	PO-I The students will be ready for employment in functional areas like accounting, taxation, banking, insurance and corporate law, economics, finance, auditing and marketing. PO-II After completing two years for Master in Commerce (M.Com) program, students would gain a thorough grounding in the fundamentals of Commerce and Finance. PO –III The commerce and finance focused curriculum offers a number of specializations and practical exposures which would equip the student to face the modern-day challenges in commerce and business. PO -IV The all-inclusive outlook of the course offer a number of values based and job oriented courses ensures that students are trained into up-to-date. In advanced accounting courses beyond the introductory level, affective development will also progress to the valuing and organization levels. PO-V After completing post graduation, students can get

	skills regarding various aspects like Marketing Manager, Selling Manager, over all Administration abilities of the Company. Capability of the students to make decisions at personal & professional level will increase after completion of this course.
Program Specific Outcome	PSO-I Students also acquire skills to work as tax consultant, audit assistant and other financial supporting services. Students have choices to pursue professional courses such as CA, M.COM, MBA, CMA, ICWA, CS, etc. PSO-II Students are able to play roles of businessmen, entrepreneur, managers, consultant, which will help learners to possess knowledge and other soft skills and to react aptly when confronted with critical decision making.
Semester –I **Course Outcomes** **CORE-I General and Commercial Law**	CO-I Make the students understand about business and corporate law CO-II Develop knowledge on contract and various types of contracts CO-III To help the students to understand the concept of sale of goods CO-IV Make the students understand about companies and its types CO-V To equip the students with proper knowledge about Foreign exchange
CORE-II&VICompanyLaw & Secretarial Practice I&II	CO-I To impart students with the knowledge of fundamentals of Company Law and provisions of the Companies Act of 2013. CO-II To apprise the students of new concepts involving in company law regime. Define memorandum of association and articles of association. CO-III Determine private placement and prospectus and misrepresentation in prospectus. CO-IV Write the meaning and nature of capital share and capital. CO-V Identify the difference between share and debenture and owned capital and debt capital.
CORE-III Financial Market and Services	CO-I Student will able to understand the Australian banking system and describe the role of regulatory bodies in regulating how banks manage their capital. CO-II Student will able to describe the types of equity securities that companies can use to raise equity capital and

	how these securities can be listed and traded on the Australian Stock Exchange. CO-III Student will able to apply different company valuation techniques to determine share prices. CO -VI Student will able to describe the characteristics of different types of debt securities and be able to price them. CO-V Student will able to describe different theories of how interest rates are determined and explain the relationship between the term to maturity, risk, and interest rates.
CORE-IVAdvancedCorporate Accounting	CO-I Learn about the journal entries of issue of shares and issue of debentures. CO-II To know about the meaning of companies and working style of companies. CO-III Know about the final accounts of the companies. CO-IV Learn about the valuation method of shares and goodwill and measurement of performance of companies. Work with profit prior to incorporation and post incorporation profits in companies accounts. CO-V Learn about the concept of sources of redemption of debentures and redemption of preference shares.
ELECTIVE-I Economic Legislations	CO-I Apply intellectual property law principles (including copyright, patents, designs and trademarks) to real problems and analyse the social impact of intellectual property law and policy. Work in teams, solve problems and manage time CO-II Analyse ethical and professional issues which arise in the intellectual property law context. Write reports on project work and critical reflect on your own learning.
Semester-II **CORE-V Income Tax**	CO-I Define the procedure of direct tax assessment. CO-II Able to file IT returns on individual basis. CO-III Able to compute total income and define tax complicacies and structure. CO-IV Able to understand amendments made from time to time in Finance Act. CO-V Differentiate between direct and indirect tax assessment.
ELECTIVE-II Applied Costing	CO-I Define the various components of total cost of a product i.e. direct & indirect cost and fixed & flexible cost. CO-II Determine various levels of material i.e. reorder level, minimum level, maximum level & EOQ for managing working capital. CO-III Use methods of time-keeping & time-booking and

	manage idle & overtime. CO-IV Define the features of overhead or indirect cost of production and basis of allocation and apportionment. CO-V Use cost-sheet to compute unit cost of product. Determine basis for computing tender price of a product.
CORE-VIICorporate Social Responsibility	CO-I Acquaint with the various concepts and aspects of corporate social responsibility. CO-II Understand about the concept of business ethics. CO-III Acquired knowledge about corporate social responsiveness and corporate citizenship. CO-IV Describe about different concepts in understanding corporate governance.
CORE-VIII Labour and Industrial Laws	CO-I Students should able to elaborate the concept of Industrial Relations. CO-II The students should able to illustrate the role of trade union in the industrial setup. CO-III Students should able to outline the important causes & impact of industrial disputes. CO-IV Students should able to elaborate Industrial Dispute settlement procedures. CO-V Student should be able to summarize the important provisions of Wage Legislations, in reference to Payment of Wages Act 1936, Minimum Wages Act 1948 & Payment of Bonus Act 1965
EDC-I Entrepreneurship Development	CO-I Student will able to understand the basic development of entrepreneurship as a profession. CO-II Student will have a basic knowledge of human resource management for small business. CO-III Student will able to identify and implement systems for collecting and analyzing information to monitor the performance of a new firm. CO-IV Student will able to understand the differences between an entrepreneurial venture and an ongoing business operation. CO-V Student will able to understand the critical roles of marketing research, competitive analysis, consumer-value proposition, and market-entry strategy in the development of a business plan.
EDC-II Marketing	CO-I Students can identify how consumer behaves differently. CO-II Able to understand how a product possessed from different stages. CO-III Able to understand the difference between trademark

	and branding. CO-VI Able to describe the customer segmentation, target marketing and positioning. CO-V Understand different methods of sale promotion.
NMEC- Human Rights	CO-I Identify and evaluate the historical, philosophical, political and cultural developments establishing human rights as a set of global norms, agreements, and procedures. CO-II Explore global human rights institutions, law, and processes, and assess the impact of their interaction with national and local cultural practices and norms. CO-III Critically examine the impact of diverse geographic, cultural and theoretical contexts on the social acceptance and practical application of human rights norms. CO-IV Synthesize interdisciplinary approaches and contributions to topics such as gender, race, poverty, violence and post-colonialism within a human rights framework. CO-V Reflectively evaluate the effectiveness of human rights practice on local, national or international humanitarian efforts.
Semester –III **CORE-IX Indirect Taxes**	CO-I Student will able to Compute the assessable value of transactions related to goods and services for levy and determination of duty liability. CO-II Student will able to Identify and analyze the procedural aspects under different applicable statutes related to indirect taxation. CO-III Student will able to Understand the basic principles underlying the Indirect Taxation Statutes (with reference to Central Excise Act, Customs Act, Service Tax, Value Added Tax, and Central Sales Tax). CO-IV Student will able to understand Tax liability and taxable entities. Accounting treatment (simple and trilateral transactions) . CO-V Student will able to examine The method of tax credit. Inflows and outflows. Outflows: tax imposition, tax exemption, tax deduction. Student will able to understand Inflows and outflows related to VAT. Imposition of tax and tax base. Delivery of goods and services. Tax rates. Periodic tax returns. Place of delivery of goods and services and its impact on VAT.
CORE-X Corporate Laws	CO-I The student will well verse in basic provisions regarding legal frame work governing the business world. CO-II To know the students with the basic concepts, terms

	& provisions of Mercantile and Business Laws. CO-III To develop the awareness among the students regarding these laws affecting trade business, and commerce.
CORE-XII Management Accounting	CO-I Use business finance terms and concepts when communicating. CO-II Explain the financial concepts used in making accounting management decision. CO-III Use effective communication skills to promote respect and relationship for financial deals. CO-IV Utilize information by applying a variety of business and industry software and hardware to major financial function. CO-V Demonstrate a basic understanding of accounting management.
CORE-XI Research Methodology	CO-I Acquired knowledge of research methodology for decision making in business. CO-II Understanding the process of research through questionnaire. CO-III Describe about sampling and data collection. CO-IV Development in skills of hypothesis testing and interpretation of data.
ELECTIVE-III Computer Application in Business	CO-I Understand the concept of input and output devices of Computers and how it works. CO-II Understand the concepts, structure, types and design of operating Systems. CO-III Understand the concept of Data Communication, its Modes, its Forms and Data Communication Channels. CO-IV Understand evolution of internet, its application and its basic services. Understand model, components of computer and how it works. CO-V Understand the concept of input and output devices of Computers in detail. Understand RAM, ROM and their types in detail.
Semester-IV **CORE-XIII Secretarial and Management Audit**	CO-I Student will understand the audit process from the engagement planning stage through completion of the audit, as well as the rendering of an audit opinion via the various report options. CO-II Student will understand auditors‟ legal liabilities, and be able to apply case law in making a judgment whether auditors might be liable to certain parties. CO-III Student will understand to describe the various levels of persuasiveness of different types of audit evidence and

	explain the broad principles of audit sampling techniques. CO-IV Student will understand to discuss the need for an independent or external audit and describe briefly the development of the role of the assurance provider in modern business society. CO-V Student will able describe the quality control procedures necessary to ensure that a competent assurance engagement is performed, and apply professional ethics including Code of Conduct to specific scenarios. Student will Explain the internal audit process including the professional standards applicable to the internal audit profession.
CORE-XIV Corporate Financial Management	CO-I Use business finance terms and concepts when communicating. CO-II Explain the financial concepts used in making financial management decision. CO-III Use effective communication skills to promote respect and relationship for financial deals. CO-IV Utilize information by applying a variety of business and industry software and hardware to major financial function. CO-V Demonstrate a basic understanding of financial management.
ELECTIVE-IVSecurities Market Analysis	CO-I To create an interest in investment habit keeping its wide scope. CO –II To introduce the concept of Capital Market. CO –III To familiarize the concept of lease financing venture Capital and Mutual Fund To help them to understand security analysis CO-IV To create an awareness about risk and return of different investments CO-V To enlighten the evolution of securities and derivatives. To make them understand the investment decisions and portfolio performance.

M.Sc., BIOTECHNOLOGY

COURSE	OUTCOMES After completion of these courses students should be able to
SEMESTER I	
CELL AND MOLECULAR BIOLOGY	CO 1: Understanding the prokaryotic and Eukaryotic cell. CO 2: Discussing in detail the cell membrane and function. CO 3: Understanding the structural and functional organization of cell organelles. CO 4: Gaining knowledge for cell to cell signaling. CO 5: Examining the cellular basis of differentiation.
BIOLOGICAL CHEMISTRY	CO1: To make students have a strong foundation in chemical biology. CO2: To introduce them to metabolic pathways of the major bio molecules and relevance to clinical conditions CO3: To correlate Biochemical process with biotechnology applications. CO4**:** To discuss the significance of various metabolic processes occurring in biological system. CO5: To evaluate of both Hormones and Enzymology and also its medical importance in the human life.
MICROBIOLOGY	CO1: To understand the landmarks of microbiology, sterilization and principle and working of microscopes. CO2: To get in depth knowledge of microbial diversity and growth curve of microbes.

	CO3: To know microbial diseases and host pathogens interaction by microbes. CO4: To examine on epidemic and pandemic diseases. CO5: To learn agricultural and environmental microbiology.

SEMESTER II	
IMMUNOLOGY AND IMMUNOTECHNOLOGY	**CO 1:** To present an overview on types of immunity & immunological responses and to illustrate about different cells and organs involved in immune system, properties and role of antigens and antibodies in immune system. **CO 2**: To demonstrate the principle of antigen and antibody interactions and its diagnostic applications **CO 3** : To display the role of MHC in antigen processing and presentation and the elaborate the process of T cell and B cell activation during the course of Cell mediated and Humoral immune responses respectively **CO 4**: To elucidate on the properties and functions of cytokines and complement components in immune response, hypersensitivity reactions and different types of vaccines **CO 5**: To interpret the mechanism of immune response against the Infectious diseases, Immunodeficiency and Autoimmune diseases, Transplantations and Cancers.
GENETIC ENGINEERING	**CO 1:** To learn the theoretical knowledge in the genetic engineering enzymes and application. **CO 2:** Understanding the basic concept of gene cloning and the role of enzymes and vectors responsible for gene manipulation, transformation and genetic engineering. **CO 3:** Students expanded their knowledge about gene transfer methods and identifying suitable hosts for cloning and sequencing.

	CO 4: To learn the genomic library construction, hybridization and labeling techniques. **CO 5:** Describe the Transgenic methods, chromosome jumping and PCR and methods for gene therapy.

SEMESTER III	
PLANT BIOTECHNOLOGY	CO 1: Acquire the knowledge about the techniques of Plant Tissue Culture, Lab. organization & measures adopted for aseptic manipulation and nutritional requirements of cultured tissues. CO 2: Learn the techniques of culturing tissues, single cells, protoplasts & anther culture, germplasm conservation and cryobiology CO 3: Learn the large scale clonal propagation of plants through various micropropagation techniques, Production of secondary metabolites under in vitro conditions CO 4: A good understanding of r-DNA technology, methods of gene transfer, molecular markers and marker assisted selection C0 5: Develop transgenics resistant to biotic & abiotic stresses & quality characteristics and their role in crop improvement
ANIMAL BIOTECHNOLOGY	**CO 1:** To know and be familiar with the organization of animal cells, scope & limitations of animal cell culture, types and characteristics of cell culture. **CO2**:To gain knowledge on the infrastructure requirements for animal cell culture like laboratory layout & design, equipments, substrates and media requirements for animal cell culture, properties of animal cell culture medium and maintenance of aseptic condition. **CO 3**: To become aware of the basic techniques involved in animal cell culture for establishment of cell line, cloning & selection, cell line characterization, quantification and scale up techniques. **CO 4**: To understand about the applications of animal

	cell culture in drug testing like viability and cytotoxicity assay, cryopreservation of cell lines and establishment of cell banks, bio- safety regulations and Bioethics in animal cell culture and specialized techniques preferred in animal cell culture. **CO 5**: To interpret about culture of specific cell types like hematopoietic cells and tumor cells, tissue engineering and stem cell technology and its applications, role of animal cell culture in IVF & test tube babies and gene therapy using embryonic stem cells.
BIOPROCESS TECHNOLOGY	**CO 1**: Designing of bioreactors and control necessary for maximizing production. **CO 2**: Select and optimize media for maximum production of microbial metabolites. **CO 3**: Designing of protocols for strain improvement and separation of molecules after separation process **CO 4**: Describe and analyze the control of *invitro* cellular growth process within the industrial –scale bioreactor environment **CO 5:** To understand the various techniques for isolation, recovery and purification of a protein and evaluate the outcome.

SEMESTER IV

RESEARCH METHODOLOGY AND BIOSTATISTICS	**CO1:** Learn about Introduction, types and methods of research **CO2:** Acquiring the skills of scientific reading, writing and presentations of research **CO3:**Describe various application area of biostatistics **CO4:** Distinguish different types of data and sampling techniques. **CO5:** Learn the statistical analysis of biological data

M. Sc. (Computer Science)

PG Department of Computer Science	After successful completion of two year degree program in M.Sc. Computer Science a student should be able to
Course Outcomes M.Sc. (Computer Science) I – Semester	
Course	**Outcomes**
17PCS01 Design and Analysis of Algorithms	1. To design efficient algorithms using various algorithm designing strategies 2. To analyze the problem and develop the algorithms related to these problems 3. To classify the problem and apply the appropriate design strategy to develop algorithm 4. To design algorithm in context of space 5. To maintain time complexity and apply asymptotic notation
17PCS02 Advanced Computer Architecture	1. Describe basic organization of computer and the architecture of 8086 microprocessor 2. Implement assembly language program for given task for 8086 microprocessor 3. Demonstrate control unit operations and conceptualize instruction level parallelism 4. Categorize memory organization and explain the function of each element of a memory hierarchy

	5. Identify and compare different methods for computer I/O mechanisms
17PCS03 Advanced Java Programming	1. To learn the graphics and animation on the web pages, using Java Applets 2. To learn Java Data Base Connectivity (JDBC) so as to retrieve and manipulate the information on any relational database through Java programs 3. To learn the server side programming using Servlets and JSP and To learn Java Bean so as to make the reusable software components 4. To learn the invocation of the remote methods in an application using RMI 5. To learn the development of Enterprise based applications, using EJB based Stateful, Stateless and Entity Beans
17PCS04 Principles of Programming Languages	1. To learn major programming paradigms and techniques involved in design and implementation of modern programming languages 2. To learn the structure of a compiler and interpretation 3. To different programming paradigm to improving the clarity, quality, and development time of a program (structured programming) 4. To learn Haskell (an advanced purely-functional programming style and lambda calculus (for variable binding and substitution) 5. To learn To understand basic logic programming through Prolog
17PCS05 Advanced Operating Systems	1. To design and understand the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems. 2. To evaluate, and compare OS components through instrumentation for performance analysis. 3. To analyze the various device and resource management techniques for timesharing and distributed systems 4. To develop and analyze simple concurrent programs using transactional memory and message passing 5. To understand the trade-offs and implementation decisions
17PCSP01 Advanced Java Programming Lab	1. To learn the Internet Programming, using Java Applets 2. To create a full set of UI widgets and other components, including windows, menus, buttons, checkboxes, text fields, scrollbars and scrolling lists, using Abstract Windowing Toolkit (AWT) & Swings 3. To learn to access database through Java programs, using Java Data Base Connectivity (JDBC)

	4. To create dynamic web pages, using Servlets and JSP and to invoke the remote methods in an application using Remote Method Invocation (RMI) 5. To understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB)
17PCSP02 Algorithms using C++ Lab	1. Identify the problem given and design the algorithm using various algorithm design techniques 2. Implement various algorithms in a high level language 3. Analyze the performance of various algorithms 4. Compare the performance of different algorithms for same problem 5. To implement more concept of designing algorithms

Course Outcomes M.Sc. (Computer Science)
II – Semester

Course	Outcomes
17PCS06 .Net Programming	1. Understand the development and deployment cycles of enterprise applications 2. Utilize the .NET framework to build distributed enterprise applications 3. Develop ASP.NET Web Services, secure web services, and .NET remoting applications 4. To develop web applications using a combination of client-side and server-side technologies 5. To understand and experiment with the deployment of enterprise applications
17PCS07 Discrete Structures	1. Write an argument using logical notation and determine if the argument is or is not valid 2. Demonstrate the ability to write and evaluate a proof or outline the basic structure of and give examples of each proof technique described 3. Understand the basic principles of sets and operations in set and to prove basic set equalities 4. Apply counting principles to determine probabilities 5. Demonstrate an understanding of relations and functions and be able to determine their properties
17PCS08 Data Mining Techniques	1. To introduce the fundamental concepts of data mining and Recognize various types of data mining tasks 2. To introduce mathematical and statistical models used in data Classification 3. To define, understand and interpret association rules

	4. Discuss the clustering algorithms to solve real-world problems 5. To create sample data of iris using preprocessing concept using case study
17PCSE04 (Elective – I) E – Technologies	1. Understand the basic concepts and technologies used in the field of management information systems 2. Have the knowledge of the different types of management information systems 3. Understand the processes of developing and implementing information systems 4. Be aware of the ethical and social 5. To security issues of information systems
17PBAED2 (EDC – I) Stress Management	1. This course provides understanding stress such as work related stress and individual stress 2. This course serves time management such as importance of planning the day and developing concentration 3. This course serves career plateau such as Identifying Career plateaus and Structural and Content Plateauing and Making a fresh start 4. This course provides controlling crisis management 5. This course provides self development
17PCSP03 .Net Programming Lab	1. To utilize the .NET framework to build distributed enterprise applications 2. To develop web applications using a combination of client-side and server-side technologies 3. To understand and experiment with the deployment of enterprise applications 4. To develop client and server side programming using database connectives 5. To connect SQL based on .Net programming
17PCSP04 Data Mining Lab	1. The data mining process and important issues around data cleaning, pre-processing and integration 2. The principle algorithms and techniques used in data mining, such as clustering, association mining, classification and prediction 3. Synthesize the data mining fundamental concepts and techniques from multiple perspectives 4. Advance relevant programming skills 5. Gain experience and develop research skills by reading the data mining literature
17PHR01 Human Rights	1. Apply effective written and oral communication skills to business and legal situations 2. Analyze the global legal environment

	3. Students will graduate with the ability to analyze complex problems, find and deploy a variety of legal authorities, and communicate effectively in a variety of settings 4. Use critical thinking skills in business situations 5. Apply an ethical understanding and perspective to business situations
Course Outcomes M.Sc. (Computer Science) III – Semester	
17PCS09 Open Source Computing	1. Describe the core syntax and semantics of Python programming language. 2. Discover the need for working with the strings and functions. 3. Illustrate the process of structuring the data using lists, dictionaries, tuples and sets. 4. Indicate the use of regular expressions and built-in functions to navigate the file system. 5. Infer the Object-oriented Programming concepts in Python.
17PCS10 Network Security and Cryptography	1. Identify information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of finite fields and number theory. 2. Understand, compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication. 3. Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes. 4. Apply network security basics, analyze different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPSec, and PGP. 5. Apply the knowledge of cryptographic utilities and authentication mechanisms to design secure applications.
17PCS11 Mobile Computing	1. To familiarize the students with the buzz words and technology of mobile communication 2. Understand the GSM architecture 3. Understand the issues relating to Wireless applications 4. To develop the different applications that mobile computing offers to people, employees, and businesses 5. To develop high levels of technical competence in the field of mobile technology.
17PCS12	1. Review the fundamental concepts of a digital image processing system. 2. Analyze images in the frequency domain using various

Digital Image Processing	transforms. 3. Evaluate the techniques for image enhancement and image restoration. 4. Interpret Image compression standards. 5. Interpret image segmentation and representation techniques.
17PCSE06 (Elective – II) Internet of Things	1. Apply the concepts of IOT. 2. Apply IOT to different applications. 3. Analysis and evaluate protocols used in IOT. 4. Design and develop smart city in IOT. 5. Analysis and evaluate the data received through sensors in IOT.
17PCSP05 Python Programming Lab	1. Implement Basic Python programs to solve simple problems. 2. Implement Conditionals and Loops for Python Programs. 3. Use functions and represent Compound data using Lists, Tuples and Dictionaries. 4. Read and write data from & to files in Python and develop Application using Python. 5. Understand the process of designing and implementing Web applications using Python.
17PCS06 Mobile Application Development Lab	1. Demonstrate the android features and create, develop using android. 2. Demonstrate and Understanding anatomy of an Android application. 3. Apply the android geo location based services. 4. Develop various Android applications related to layouts & rich uses interactive interfaces. 5. Develop Android applications related to mobile related server-less database like SQLITE.
Course Outcomes M. Sc. Computer Science IV – Semester	
Course	**Outcomes**
17PCSE10 (Elective – III) Cloud Computing	1. Define Cloud Computing and memorize the different Cloud service and deployment models. 2. Describe importance of virtualization along with their technologies. 3. Use and Examine different cloud computing services. 4. Analyze the components of open stack & Google Cloud platform and understand Mobile Cloud Computing. 5. Design & develop backup strategies for cloud data based on features
17PCSE14 (Elective – IV) Web Technologies	1. Design a static webpage by applying HTML elements. 2. Apply CSS concepts for designing HTML web pages. 3. Develop DHTML pages by using JavaScript, JQuery with

	DOM events. 4. Implement a webpage with database connectivity using Java. 5. Create rich internet application using XML and AJAX.
17PCSPR1 Project Work and Viva – voce	1. Knowledge of basic SW engineering methods and practices, and their appropriate application. 2. Knowledge and application of collaborative tools for SW development. 3. Successful implementation of teamwork behavior and policies in a large class project. 4. Students will demonstrate a breadth of knowledge in computer science, as exemplified in the areas of systems, theory and software development. 5. Students will demonstrate ability to conduct a research or applied Computer Science project, requiring writing and presentation skills which exemplify scholarly style in computer science.

M.Sc. APPLIED MICROBIOLOGY

Course Outcomes	After completion of these courses students should be able to
SEMESTER – I	
GENERAL MICROBIOLOGY	1. Learning the scientific methods and the history of science is the embodiment of scientific knowledge. 2. As an introductory part of Microbiology, students will get the basic ideas and practices from the contribution of several Microbiologists in the field of microbiology. 3. They will have to know the diversity of microbial world like algae, fungi, protozoa and their general characteristics and importances. 4. They will be understood various laboratory practices, and biosafety techniques 5. They will have to know about applications of important instruments like biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter.
IMMUNOLOGY AND IMMUNO TECHNOLOGY	1. Demonstrable detailed knowledge and understanding of immunology and the way it is

	applied in diagnostic and therapeutic techniques and research. 2. Demonstrate knowledge and practical skills in undertaking simple immunological experiments that mimic those under taken in diagnostic laboratories and research laboratories. 3. Demonstrate literature review skills in undertaking a large survey of a complex field with in immunology 4. Adhere to safe working practice in a mixed microbiology/immunology laboratory 5. Outline the regulation of immune response and disorders of the immune system
CELL AND MOLECULAR BIOLOGY	1. To studying this course students get benefited by knowing the structure and function of various cell organelles of the eukaryotic cells. 2. They will also get the thorough knowledge about cell cycle, cell signaling pathways. 3. They will be able to get the practical knowledge of cell division, polyploidy by studying different stages of Mitosis and meiosis. 4. Compare the mechanisms involved in translation between prokaryotes and eukaryotes 5. Assess the concept of gene regulation in prokaryotes and eukaryotes
BASICS OF PHYTOCHEMISTRY	1. Explain basic metabolic pathways of plants and formation of different secondary metabolites through various biosynthetic pathways in plants 2. Describe utilization of radioactive isotopes in the investigation of biosynthetic pathways 3. Explain source, chemistry, therapeutic uses of various secondary metabolites containing drugs. 4. Describe methods of extraction, analysis and commercial application of various secondary metabolites containing drugs. 5. Describe methods for industrial production, estimation and utilization of some therapeutically important phytoconstituents

SEMESTER – II	
MEDICAL BACTERIOLOGY AND MYCOLOGY	1. This course provides learning opportunities in the basic principles of medical microbiology and infectious disease. 2. It covers mechanisms of infectious disease transmission, principles of aseptic practice, and the role of the human body's normal microflora. 3. The course provides the conceptual basis for understanding pathogenic microorganisms and the mechanisms by which they cause disease in the human body. 4. It also provides opportunities to develop informatics and diagnostic skills, including the use and interpretation of laboratory tests in the diagnosis of infectious diseases. 5. To understand the importance of pathogenic bacteria in human disease with respect to infections of the respiratory tract, gastrointestinal tract, urinary tract, skin and soft tissue. .
INDUSTRIAL AND PHARMACEUTICAL MICROBIOLOGY	1. Get equipped with a theoretical and practical understanding of industrial microbiology 2. Know how to source for microorganisms of industrial importance from the environment 3. Know about design of bioreactors, factors affecting growth and production, heat transfer, oxygen transfer 4. Understand the rationale in medium formulation & design for microbial fermentation, sterilization of medium and air 5. Appreciate the different types of fermentation processes
GENETIC ENGINEERING AND ADVANCES IN BIOTECHNOLOGY	1. Explain the physiological processes that occur during plant growth and development Describe the methodology involved in plant tissue culture and plant transgenics 2. Discuss issues related to plant nutrition, quality improvement, environmental adaptation, transgenic crops and their use in agriculture 3. Elucidate the significance of transgenic plants as bioreactors for the production of enzymes, plantibodies, edible vaccines and therapeutic proteins 4. Understand , conduct and gain a thorough

	knowledge to perform plant tissue culture experiments Explain the basics of animal biotechnology 5. Elucidate the molecular techniques involved in gene manipulation and rDNA technology
BIO INSTRUMENTATION AND BIOLOGICAL TECHNIQUES	1. Discuss the applications of biophysics and principle involved in bioinstruments 2. Describe the methodology involved in biotechniques 3. Describe the applications of bioinstruments 4. Demonstrate knowledge and practical skills of using instruments in biology and medical field 5. Perform techniques involved in molecular biology and diagnosis of diseases
SEMESTER – III	
MEDICAL VIROLOGY AND PARASITOLOGY	1. Students will be able to learn the nature, structure, general properties and their importance of different animal and plant viruses. 2. They will also know about Viral Transmission, Salient features of viral nucleic acids, Replication and also several disease caused by viruses and the way of preventation. 3. Identify the different types of parasites 4. Classify each parasite 5. Describe the structure of each parasite
Food, Dairy and Environmental Microbiology	1. By the study of food & diary microbiology the students are able to know the principles and methods of food preservation, production of different fermented foods, different food borne diseases: their causative agents, foods involved, symptoms and preventive measures. 2. They will have the know food sanitation and control. 3. The students will know about the cultural and rapid detection methods of food borne pathogens in foods and introduction to predictive microbiology. 4. Students will be able to know about water potability, microbial bioremediation, waste management, biogeochemical cycling and

	different microbial interactions. 5. Apply principles of various facets of food fermentation technology .
NANOTECHNOLOGY	1. Students learn the main manufacturing methods of Microelectronics and Nanoelectronics. 2. They understand the methods of Optical Lithography, Electron Beam lithography and Nanoimprint Lithography. 3. They learn the successive steps in building important electronic devices such as transistors and solar cells. 4. They learn the steps for making high-frequency transistors by self-aligning method, high-performance semi-transparent silicon solar cells, micro-bridges, micro-motors and biosensors. 5. Understand the nanoparticles applications in various field
SOIL, AGRICULTURAL MICROBIOLOGY AND BIO DEGRADATION	1. Attainment of course objectives will mean realization of the various beneficial effects of soil microorganisms on soil health, 2. Students learn about that some soil microbes are deleterious to agronomic crops. 3. Students will learn that some soil animals and what they eat are of ecological importance; thus, planteating insects and mollusks may add organic matter to the soil; insects, arachnids, and worms that consume dung and plant litter mix it with soil and speed up its decay; and, plant parasitic nematodes reduce soil's productivity. 4. The knowledge acquired in Soil Microbiology will enhance the students' competency in the performance of their duties as future employees in the field of Soil Microbiology 5. Students will learn that the soil is an excellent habitat for multitude of microorganisms balancing the soil ecosystem

SEMESTER – IV	
RESEARCH METHODOLOGY, BIO STATISTICS AND BIO INFORMATICS	1. To develop aptitude for formulating research problem and experimental planning. 2. To learn about data collection and statistical analysis. 3. To be trained in statistical basis of biological assay. 4. To introduce various biological databases (Primary, secondary and composite databases), biological information system(SRS, ENTREZ). 5. Understand Sequence similarity tools (FASTA ,BLAST).Sequence information sources of nucleotide (GenBank, EMBL, EBI, DBJ ,UCSC)and protein sequence information sources (PIR, ExPASY, UniProt KB, SwissProt and TrEMBL)and Phylogenetic analysis.
HUMAN ANATOMY AND PHYSIOLOG	1. Use anatomical terminology to identify and describe locations of major organs of each system covered.. 2. Explain interrelationships among molecular, cellular, tissue and organ functions in each system. 3. Describe the interdependency and interactions of the systems. 4. Explain contributions of organs and systems to the maintenance of homeostasis, 5. Identify causes and effects of homeostatic imbalances. Describe modern technology and tools used to study anatomy and physiology

Master of Computer Applications

Course Outcomes MCA III – Semester	
Course	**Outcomes**
17PCA11 Java Programming	1. Identify classes, objects, members of a class and relationships among them needed for a specific problem 2. Write Java application programs using OOP principles and proper program structuring 3. Demonstrate the concepts of polymorphism and inheritance 4. Write Java programs to implement error handling techniques using exception handling

	5. Write Java programs to implement file handling techniques
17PCA12 Visual Programming	1. Design, create, build, and debug Visual Basic applications 2. Explore Visual Basic's Integrated Development Environment (IDE) Implement syntax rules in Visual Basic programs and explain variables and data types used in program development 3. Apply arithmetic operations for displaying numeric output and write and apply decision structures for determining different operations 4. Write and apply loop structures to perform repetitive tasks 5. Write and apply procedures, sub-procedures, and functions to create manageable code.
17PCA13 Discrete Structures	1. Write an argument using logical notation and determine if the argument is or is not valid 2. Demonstrate the ability to write and evaluate a proof or outline the basic structure of and give examples of each proof technique described 3. Understand the basic principles of sets and operations in set and to prove basic set equalities 4. Apply counting principles to determine probabilities 5. Demonstrate an understanding of relations and functions and be able to determine their properties
17PCA14 Operating Systems	1. Understand structure of OS, process management and synchronization 2. Analyze and design Memory Management 3. Interpret the mechanisms adopted for file sharing in distributed Applications 4. Conceptualize the components and can do Shell Programming 5. Know Basic Linux System Administration and Kernel Administration
17PCAE01 (Elective – I) Computer Graphics	1. Develop line and circle generation algorithms 2. Apply 2D and 3D transformations 3. Develop clipping algorithms for point, line and polygons 4. Learn the concepts of projections 5. To learn more viewing and graphics pipeline

17PCAP06 Java Programming Lab	1. Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity 2. Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem 3. Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved 4. Demonstrate understanding and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development 5. Identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with response to events
17PCAP07 Visual Programming Lab	1. Design, create, build, and debug Visual Basic applications and to apply arithmetic operations for displaying numeric output 2. Apply decision structures for determining different operations and Write and apply loop structures to perform repetitive tasks 3. Write and apply procedures, sub-procedures, and functions to create manageable code 4. Create one and two dimensional arrays for sorting, calculating, and displaying of data 5. Write Visual Basic programs using object-oriented programming techniques and Write Windows applications using forms, controls, and events.
17PCAP08 Python Programming Lab	1. Implement Basic Python programs to solve simple problems. 2. Write, Test and Debug Python Programs and Implement Conditionals and Loops for Python Programs. 3. Use functions and represent Compound data using Lists, Tuples and Dictionaries. 4. Read and write data from & to files in Python and develop Application using Python. 5. Understand the process of designing and implementing Web applications using Python.

Course Outcomes MCA IV – Semester	
Course	**Outcomes**
17PCA15 Software Engineering	1. Learn the phases of software development 2. Develop process models and process system models 3. Gather, understand, analyze and specify requirements 4. Develop architectural diagram, and implement by following coding principles 5. Apply testing strategies and handle software product maintenance issues
17PCA16 Mobile Computing	1. To familiarize the students with the buzz words and technology of mobile communication 2. Understand the GSM architecture 3. Understand the issues relating to Wireless applications 4. To develop the different applications that mobile computing offers to people, employees, and businesses 5. To develop high levels of technical competence in the field of mobile technology.
17PCA17 Data Mining Techniques	1. To introduce the fundamental concepts of data mining and Recognize various types of data mining tasks 2. To introduce mathematical and statistical models used in data Classification 3. To define, understand and interpret association rules 4. Discuss the clustering algorithms to solve real-world problems 5. To create sample data of iris using preprocessing concept using case study
17PBAED2 (EDC – I) Stress Management	1. This course provides understanding stress such as work related stress and individual stress 2. This course serves time management such as importance of planning the day and developing concentration 3. This course serves career plateau such as Identifying Career plateaus and Structural and Content Plateauing and Making a fresh start 4. This course provides controlling crisis management 5. This course provides self development
17PCAE06 (Elective – II) Soft Computing	1. List the facts and outline the different process carried out in fuzzy logic, ANN and Genetic Algorithms 2. Explain the concepts and meta-cognitive of soft computing 3. Apply Soft computing techniques the solve character recognition, pattern classification, regression and similar problems 4. Outline facts to identify process/procedures to handle real

	world problems using soft computing and Evaluate various techniques of soft computing to defend the best working solutions 5. Design hybrid system to revise the principles of soft computing in various applications.
17PCAP09 Mobile Application Development Lab	1. Demonstrate the android features and create, develop using android and Demonstrate and Understanding anatomy of an Android application. 2. Apply the android geo location based services and Illustrate the android wifi features and advance android development Demonstrate the Linux security and implement ADL interface. 3. Apply essential Android Programming concepts. 4. Develop various Android applications related to layouts & rich uses interactive interfaces. 5. Develop Android applications related to mobile related server-less database like SQLITE.
17PCAP10 Data Mining Lab	1. The data mining process and important issues around data cleaning, pre-processing and integration 2. The principle algorithms and techniques used in data mining, such as clustering, association mining, classification and prediction 3. Synthesize the data mining fundamental concepts and techniques from multiple perspectives 4. Develop skills and apply data mining tools for solving practical problems and Advance relevant programming skills 5. Gain experience and develop research skills by reading the data mining literature
17PHR01 Human Rights	1. Apply effective written and oral communication skills to business and legal situations 2. Analyze the global legal environment 3. Students will graduate with the ability to analyze complex problems, find and deploy a variety of legal authorities, and communicate effectively in a variety of settings 4. Use critical thinking skills in business situations 5. Apply an ethical understanding and perspective to business situations
Course Outcomes MCA V – Semester	
17PCA18 Big Data Analytics	1. Explain the motivation for big data systems and identify the main sources of Big Data in the real world 2. Demonstrate an ability to use frameworks like Hadoop,

	NOSQL to efficiently store retrieve and process Big Data for Analytics 3. Implement several Data Intensive tasks using the Map Reduce Paradigm and Apply several newer algorithms for Clustering Classifying and finding associations in Big Data 4. Design algorithms to analyze Big data like streams, Web Graphs and Social Media data 5. Design and implement successful Recommendation engines for enterprises
17PCA19 .Net Programming	1. Understand the development and deployment cycles of enterprise applications 2. Utilize the .NET framework to build distributed enterprise applications 3. Develop ASP.NET Web Services, secure web services, and .NET remoting applications 4. To develop web applications using a combination of client-side and server-side technologies 5. To understand and experiment with the deployment of enterprise applications
17PCA20 Open Source Technologies	1. To learn fundamentals of Web concept in PHP 2. Introduction the creation of static web page using HTML 3. Describe the importance of CSS in web development 4. To learn the function of JavaScript as a dynamic webpage creating tool and to learn PHP as a server side Programming language 5. To learn the principles behind using MySQL as a backend DBMS with PHP
17PCAE09 (Elective – III) Image Processing	1. Review the fundamental concepts of a digital image processing system. 2. Analyze images in the frequency domain using various transforms. 3. Evaluate the techniques for image enhancement and image restoration and Categorize various compression techniques. 4. Interpret Image compression standards. 5. Interpret image segmentation and representation techniques.
17PCAE14 (Elective – IV) Internet of Things	1. Apply the concepts of IOT and Identify the different technology. 2. Apply IOT to different applications. 3. Analysis and evaluate protocols used in IOT. 4. Design and develop smart city in IOT. 5. Analysis and evaluate the data received through sensors in IOT.
	1.

17PCAP11 Big Data Analytics Lab	2. Demonstrate capability to use Big Data Frameworks like Hadoop and Program applications using tools like Hive, pig, NO SQL and MongoDB for Big data Applications 3. Construct scalable algorithms for large Datasets using Map Reduce techniques 4. Implement algorithms for Clustering, Classifying and finding associations in Big Data 5. Design and implement algorithms to analyze Big data like streams, Web Graphs and Social Media data and construct recommendation systems 6. Apply the knowledge of Big Data gained to fully develop a BDA application for real life applications.
17PCAP12 .Net Programming Lab	1. To utilize the .NET framework to build distributed enterprise applications 2. To develop web applications using a combination of client-side and server-side technologies 3. To understand and experiment with the deployment of enterprise applications 4. To develop client and server side programming using database connectives 5. To connect SQL based on .Net programming
17PCAP13 Software Development Lab	1. Identify and define the problem statement and Define and justify scope of the proposed problem 2. Gather and analyze system requirements 3. Propose an optimized solution among the existing solutions 4. Practice software analysis and design techniques 5. Develop technical report writing and oral presentation skills

Course Outcomes MCA
VI – Semester

Course	Outcomes
17PCAPR1 Project Work and Viva – voce	1. Identify, define and justify scope of the proposed problem 2. Gather and analyze system requirements 3. Propose an optimized solution among the existing solutions 4. Practice software analysis and design techniques 5. Develop a functional application based on the software design 6. Apply coding, debugging and testing tools to enhance the quality of the software 7. Construct new software system based on the theory and practice gained through this exercise 8. Prepare the proper documentation of software projects following the standard guidelines 9. Learn technical report and oral presentation skills

M.Sc MATHEMATICS – COURSE OUTCOME

SEMESTER I	
LINEAR ALGEBRA	CO-1 Describe the concept of a basis for a vector space. CO-2 Represent linear transformations by matrices.. CO-3 Describethe concepts of eigenvalue, eigenvector and characteristc polynomial. CO-4 Investigate properties of vector spaces and subspaces using by linear transformations. CO-5 Determine whether a linear transformation is diagonalizable or not.
REAL ANALYSIS	CO-1 Describe the fundamental properties of the real numbers that underpin the formal development of real analysis; CO-2 Demonstrate an understanding of the theory of sequences and series, continuity, differentiation and integration; CO-3 Demonstrate skills in constructing rigorous mathematical arguments; CO-4 Apply the theory in the course to solve a variety of problems at an appropriate level of difficulty; CO-5 Demonstrate skills in communicating mathematics.
MECHANICS	CO-1Understand the formation of differential equation which will help to study th dynamics of mechanical system. CO-2Study the Lagrange's and Hamilton's equations. CO-3Learn the Hamilton-jacobian theory and seperability. CO-4Know the canonical transformation,lagrange and poisson brackets
ORDINARY DIFFERENTIAL EQUATIONS	CO-1Solve the differential equations by using various methods. CO-2Annihilator method to solve non homogeneous equations. CO-3Study the wronskian and linear independence,reduction of the order of homogeneous equation.

	CO-4Understand the Bessel,Legendre equation and their properties. CO-5Find the solution of first order differential equation.
-NUMERICAL ANALYSIS	CO-1learn the principles for designing numerical schemes for differential equations. CO-2analyze the consistency, stability and convergence of a numerical scheme. CO-3make a connection between the mathematical equations or properties and the corresponding physical meanings. CO-4use a programming language or mathematical software to implement and test the numerical schemes.
SEMESTER II	
ALGEBRA	CO-1Find the number of Sylow subgroups. CO-2Find the number of non-isomorphic abelian groups. CO-3Find the splitting field, Galois group of the given polynomial. CO-4Check whether the given polynomial is solvable by radicals or not. CO-5Understand the Wedderburn's theorem on division rings.
FLUID DYNAMICS :	CO-1Recognize and find the values of fluid properties and relationship between them and understand the principles of continuity, momentum, and energy as applied to fluid motions. CO-2Identify these principles written in form of mathematical equations. CO-3Apply dimensional analysis to predict physical parameters that influence the flow in fluid mechanics. CO-4Analyze the problems related to elementary fluid

	dynamics especially for incompressible flows using Bernoulli equation in particular CO-5Analyze different fluid flow models using finite control volume and differential analysis approaches.
COMPLEX ANALYSIS	CO-1 Familiar with the modeling assumptions and derivations that lead to Complex Analysis CO-2 Recognize the major classification of analytic functions, harmonic functions, conformal mapping and the qualitative difference between the complex integration & Real integration CO-3 Express the Cauchy's Derivative formulas CO-4 Define the concept of the Residue Theorem. CO-5 Demonstrate understanding and appreciation of deeper aspects of complex analysis such as the Riemann Mapping theorem.
DISCRETE MATHEMATICS	CO-1express a logic sentence in terms of predicates, quantifiers and logical connectives. CO-2apply the rules of inference and methods of proof including direct and indirect proof forms, proof by contradiction and mathematical induction. CO-3solve mathematics problems that involve computing permutations and combinations of a set, fundamental enumeration principles. CO-4evaluate Boolean functions and simplify expressions using the properties of Boolean algebra.
EDC :STATISTICAL METHODS:	CO-1Apply various types of sampling methods to data collection. CO-2Create and interpret frequency tables. CO-3Display data graphically and interpret graphs: stemplots, histograms, and box plots. CO-4calculate the measures of the center of data: mean, median,

	and mode. CO-5Recognize, describe, and calculate the measures of the spread of data: variance, standard deviation, and range
SEMESTER III	
PARTIAL DIFFERENTIAL EQUATIONS	CO-1 Familiar with the modeling assumptions and derivations that lead to PDE's. CO-2 Recognize the major classification of PDEs and the qualitative difference between the classes of equations. CO-3 be competent in solving linear PDEs using classical methods.
TOPOLOGY	CO-1 Understand various concepts of Topology. CO-2 Demonstrate an understanding of the concepts of metric spaces and topological spaces, and their role in mathematics. CO-3 Demonstrate an understanding of the concepts of Hilbert spaces and Banach spaces, and their role in mathematics. CO-4 knowledge of basic topology to formulate and solve problems of a topological nature in mathematics and other fields where topological issues arise. CO-5 Learn about the connected and compact space.
MEASURE THEORY AND INTEGRATION	CO-1 Knowledge of measure and outer measure,generalization of integrals with help of measures. CO-2 Understand and analyze outer measure and measurable se ts. CO-3 Understand and analyze Lebesgue measre and measure space. CO-4 Analyse and apply the Riemann integral. CO-5 Apply the differentiation and integration.
CALCULUS OF VARIATIONS	CO-1 Know different types of variational problems and finding their extremals.

AND INTEGRAL EQUATIONS :	CO-2 Know different types of variational problems with moving boundaries. CO-3 Find the solution of Fredholm & Voiterra integral equations through different methods CO-4 Analyse Hilbert Schmidt theory.
SEMESTER IV	
FUNCTIONAL ANALYSIS :	CO-1 Understand the relationship between metric space, normed space, inner product space, CO-2 understand properties of continuous linear functionals on Banach space. CO-3 understand various types of operators on Hilbert space. CO-4 know Regular elements, singular elements, spectrum of Banach algebra &its ideals.
PROBABILITY THEORY	CO-1 Understand the axiomatic formulation of modern Probability Theory and think of random variables as an intrinsic need for the analysis of random phenomena. CO-2 Characterize probability models and function of random variables based on single & multiples random variables. CO-3 Evaluate and apply moments & characteristic functions and understand the concept of inequalities and probabilistic limits. CO-4 Understand the concept of random processes and determine covariance and spectral density of stationary random processes. CO-5 Demonstrate the specific applications to Poisson and Gaussian processes and representation of low pass and band pass noise models.

GRAPH HEORY	CO-1 identify the graphs of connectivity and tree. CO-2 find the Independent set and cycle graph. CO-3 understand graph coloring. CO-4 Understand the planer and nonplaner graph.
PROGRAMMING WITH C++	CO-1 Learn the fundamental programming concepts and methodologies which are essential to building good C++ programs. CO-2 Practice the fundamental programming methodologies in the C/C++ programming language via laboratory experience. CO-3 Code,document,test,and implement a well-structured,robust computer program using the C++ programming language. CO-4 Write reusable modules (collections of functions). CO-5 Introduction to the use of the C++ programming language as an aid to solving mathematical and scientific problems.students design, write,and implement programs .
C++ PROGRAMMING LAB	CO-1 Implement the concepts of object oriented programming and apply string functions to perform operator overloading. CO-2 Demonstrate virtual functions and inheritance and also implement files and command line arguments. CO-3 Develop solutions for a range of problems using objects and classes. CO-4 Programs to demonstrate the implementation of constructors, destructors and operator overloading. CO-5 Apply fundamental algorithmic problems including type casting, inheritance and polymorphism.