Dr. C.S.N. DEGREE & P.G. COLLEGE
BHIMAVARAM - 534 203, W.G.Dt., A.P., INDIA
Recognised by APSCHE, Approved by AICTE, AISCHE Code- C-23946
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PROGRAM OUTCOMES AND COURSE OUTCOMES

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DEPARTMENT OFB.COM(Vocational Computers)

PROGRAM OUTCOMES

PSO 1: To understand the nature, scope and concepts of Accounting, Business Operations and Management.

PSO 2: To enable the students to understand the concepts of computer software and its applications in business operations.

PSO 3: To equip the students with business analytics and e-commerce skills.

PSO 4: To develop the students with communication, leadership and entrepreneurial skills.

PSO 5: To make them learn the latest technologies and their application in modern business operations.

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COURSE OUTCOMES

COMPUTER FUNDAMENTALS AND PHOTOSHOP

Semester-I

CO1: Handle a computer system for day-to-day use.

CO2: Enumerate different types of input/ output devices and types of memory

CO3: Perform basic arithmetic operations using different number systems including binary arithmetic

CO4: Differentiate between system and application software.

CO5: Prepare documents / spreadsheets.

Accounting-I

SEMESTER-I

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

CO1: Build an understanding of theoretical framework of accounting and be able to prepare financial statements.

CO2: Explain and determine depreciation and inventory value

CO3: Develop understanding of accounting for hire purchase transactions and lease transactions.

CO4: Understand branch and departmental accounting CO5

CO5: develop the skill of preparation of trading and profit and loss account and balance sheet using computerized accounting or prepare accounts for dissolution of a partnership firm.

Business Organization & Management

SEMESTER-I

CO-1: Understand dynamics of business organisations and management practices with respect to stakeholders.

CO-2: Understand varied perspectives related to business environment and entrepreneurship

CO-3: Analyze how organisations adapt to an uncertain environment and decipher decision making techniques managers use to influence and control the internal environment.

CO-4: Analyze the relationship amongst functions of management i.e. planning organizing, directing and controlling.

CO-5 :Appreciate the change in working pattern of modern organisations

DSC 2 B- BUSINESS ECONOMICS

CO-1:To study and understand business economics concepts and their application in business firm.

CO-2: To understand dynamics s of consumers buying behavior and their implications in taking business decisions.

CO-3: To be able to forecast the consequences of a change in determinants of demand on revenue

CO-4: To study and understand production and cost functions, pricing under various Market structures.

CO-5: To understand macro concepts: national income and economic systems. To study and understand structural reforms.

ACCOUNTING-2

SEMESTER-II

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

CO1: Build an understanding of theoretical framework of accounting and be able to prepare financial statements.

CO2: Explain and determine depreciation and inventory value

CO3: Develop understanding of accounting for hire purchase transactions and lease transactions.

CO4: Understand branch and departmental accounting CO5

CO5: develop the skill of preparation of trading and profit and loss account and balance sheet using computerized accounting or prepare accounts for dissolution of a partnership firm.

DSC 1 C - Corporate Accounting

Semester-III

CO-1 Develop an understanding of accounting for share capital and debentures.

CO-2: Prepare financial statements of a company.

CO-3: Develop understanding of cash flow statements.

CO-4: Understand the accounting for amalgamation of companies.

CO-5: Prepare consolidated balance sheet for Holding company.

DSC 2C - Business Statistics

SEMESTER –III

CO-1: Acquire proficiency in using different mathematical tools (matrices, calculus and mathematics of finance) in solving real life business and economic problems.

CO-2: Develop an understanding of the various averages and measures of dispersion to describe statistical data.

CO-3: Understand the relationship between two variables through correlation and regression.

CO-4: Understand the construction and application of index numbers to real life situations.

CO-5 :Understand the trends and tendencies over a period of time through time series analysis.

OFFICE AUTOMATION TOOLS

SEMESRTER-III

CO-1: To Understand the fundamental concepts underlying accounting, finance, management and marketing.

CO-2: To Utilize the Accounting Information in the business processes and practices, such as problem analysis and decision making.

BUSINESS LAWS

SEMESTER-IV.

CO-1: Understand basic aspects of contracts for making the agreements, contracts and subsequently enter valid business propositions.

CO-2: Handle the execution of special contracts used in different types of business.

CO-3 :Learn legitimate rights and obligations under The Sale of Goods Act.

CO-4: Acquire skills to initiate entrepreneurial ventures as LLP.

CO-5: Understand the fundamentals of Internet based activities under The Information Technology Act.

ACCOUNTING FOR SERVICE ORGANISATION

SEMESTER –IV

CO-1:To Understand the fundamental concepts underlying accounting, finance, management and marketing.

CO-2: To Utilize the Accounting Information in the business processes and practices, such as problem analysis and decision making.

BANKING THEORY PRACTICE

SEMESTER-V.

CO-1: To discuss and evaluate the theories relating to the role of banks as financial intermediaries.
CO-2: To discuss and explain how bank-based systems differ from market-based system.

CO-3: To Understand the role of transaction costs and informational asymmetries in the operation of the banking system.

TAXATION

SEMESTER-V

CO-1: To understand the Auditors' liabilities, and be able to apply case law in making a Judgement whether auditors might be liable to certain parties.

CO-2: To learn the concepts of income tax, tax procedure and how to calculate the incomes, taxable Income and apply them in real life situations

CO-3: To learn the concepts of income tax, tax procedure and how to calculate the incomes, taxable Income and apply them in real life situations

CO-2: To understand role of Financial Accounting, Cost Accounting and Management Accounting

CO-3: To understand sampling techniques and auditing in a computer environment

Database Management Systems (DBMS)

SEMESTER-V

CO-1: Differentiate between database systems and file systems.

CO-2: Describe the features of database management systems.

CO-3: Analyze the problem and arrive at an information model in the form of an er diagram.

CO-4: Normalize a database.

CO-5: Transform an er model into a relational database schema.

CENTRAL BANKING

SEMESTER-V

Co-1: It includes areas such as central Bank ,banking in india, banker and customer relationship, various service provided to customer from banks etc.

Co-2: To familiarize the students with regard to organization

working and importance of Reserve bank of india.

Co-3: To understand various types of negotiable instruments.

Co-4: To provide through knowledge of Banking system in India.

COST ACCOUNTING

SEMESTER-V

CO-1: Understand conceptual framework of Cost Accounting.

CO-2:Understand in detail the accounting and control of material and labour cost.

CO-3: Understand classification, allocation, apportionment and absorption of overheads in cost determination.

CO-4:Calculate the cost of products, jobs, contracts, processes and services.

CO-5: Have basic understanding of cost accounting book keeping systems and reconciliation

MANAGEMENT ACCOUNTING

SEMESTER –VI

CO-1: Understand thoroughly the conceptual framework of Management Accounting; different forms of accounting—Financial,

Cost and Managerial; types of costs for decision making and cost control; cost control and cost reduction.

CO-2: Understand the concept of marginal cost and marginal costing; preparation of income statements using absorption and variable costing; learning of cost-volume-profit analysis and break-even analysis using mathematical and graphical approaches; and their application in businesses.

CO-3: Understand the concept of relevant cost and make decisions related to different business situations using marginal costing and differential costing techniques.

CO-4: Understand preparation of various types of budgets and budgetary control system as a tool of managerial planning and control; Ability to understand standard costing system as a tool of managerial control; calculation of variances in respect of each element of cost and sales; control ratios.

CO-5: Have basic understanding of techniques of performance measurement such as Responsibility Accounting, Divisional Performance Measurement and Transfer Pricing

AUDITING

SEMESTER-VI

Co-1:The end of the course, the student will able to: Understanding the meaning and necessity of audit in modern era

C0-2:Comprehend the role of auditor in avoiding the corporate frauds.

Co-3:Identify the steps involved in performing audit process.

Co-4: Determine the appropriate audit report for a given audit situation

Co-5: Apply auditing practices to different types of business entities.

MARKETING

SEMESTER-VI :

Co-1 : Understand various concepts and theories of marketing

management to apply them in marketing context.

Co-2: Demonstrate a sound knowledge of conventional and latest marketing ideas,and of the theories on which these ideas are based.

Co-3:Able to understand and find the market segments.

Co-4: Estimate the effectiveness of marketing mix activities

E -Commerce

SEMESTER-VI

Co-1: provide exposure to the students about information technology, networks and internet.

Co-2: To provide them with the fundamental knowledge of the use of computers in business.

C0-3:to understand the various concepts of e-commerce.

Co-4: to understand the methodology for online business dealing using e-commerce infrastructure.

TALLY WITH GST APPLICATIONS

SEMESTER-VI

CO-1:Understand the basic principles underlying the Indirect Taxation Statutes.

CO-2: Examine the method of tax credit. Input and Output Tax credit and Cross Utilisation of Input tax credit

CO-3: Identify and analyze the procedural aspects under different applicable statutes related to GST.

CO-4: Compute the assessable value of transactions related to goods and services for levy

CO-5:determination of duty liability. Develop various GST Returns and reports for business transactions in Tally.

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DEPARTMENT OF BCOM

PROGRAM OUTCOMES

PSO 1 : To understand the nature, scope and conceptsAccounting, Business Operationsand Management.

PSO 2 : To analyse the relationship between Accounting,Auditing and Taxation.

PSO 3 : To understand the application of Corporate Accounting Principles and Practices inreal time business situations.

PSO 4 : To equip the students with leadership skills and knowledge in computing skills.

PSO 5 : To enable the students to understand the legal environment and its effect onbusiness, industry, commerce and management.

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ACCOUNTING-2

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CO-2:To discuss and explain how bank-based systems differ from market-based system

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CO-4: To discuss and evaluate the theories relating to the role of banks as financial intermediaries

BUSINESS LAWS

SEMESTER-IV.

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ACCOUNTING FOR SERVICE ORGANISATION

SEMESTER -IV

CO-1:To Understand the fundamental concepts underlying accounting, finance, management and marketing.

CO-2: To Utilize the Accounting Information in the business processes and practices, such as problem analysis and decision making.

Income Tax Law &Practice

SEMESTER –IV

CO-1: Understand the basic concepts in the law of income tax and determine the residential status of different persons.

CO-2: Identify the five heads in which income is categorised and to compute income under the heads ‘Salaries’ and ‘Income from House Property’.

CO-3: Compute income under the head ‘ Profits and gains of business or profession’, ‘Capital gains’ and ‘Income from other sources’.

CO-4: Understand clubbing provisions, aggregate income after set-off and carry forward of losses, and deductions allowed under the Income Tax Act.

CO-5: Compute tax liability of individuals and firms and understand the provisions of filing return of income.

TAXATION

SEMESTER-V

C0-1: To provide working knowledge of framework of taxation system in India.

Co-2: To familiarize and educate the students with the concepts of Income Tax in India.

Co-3:To enable the students acquire an understanding of the Terminologies of direct

taxation laws, determining residential status of individuals & Basis for charging tax.

Co-4: To develop knowledge in computing Income from various heads, Exemptions and deducations applicable with reference to resident individual.

COST ACCOUNTING

SEMESTER-V

CO-1: Understand conceptual framework of Cost Accounting.

CO-2:Understand in detail the accounting and control of material and labour cost.

CO-3: Understand classification, allocation, apportionment and absorption of overheads in cost determination.

CO-4:Calculate the cost of products, jobs, contracts, processes and services.

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CO-2: Understand the concept of marginal cost and marginal costing; preparation of income statements using absorption and variable costing; learning of cost-volume-profit analysis and break-even analysis using mathematical and graphical approaches; and their application in businesses.

CO-3: Understand the concept of relevant cost and make decisions related to different business situations using marginal costing and differential costing techniques.

CO-4: Understand preparation of various types of budgets and budgetary control system as a tool of managerial planning and control; Ability to understand standard costing system as a tool of managerial control; calculation of variances in respect of each element of cost and sales; control ratios.

CO-5: Have basic understanding of techniques of performance measurement such as Responsibility Accounting, Divisional Performance Measurement and Transfer Pricing

AUDITING

SE**MESTER-VI**

CO-1:**SE**To provide working knowledge of the framework of auditing system in India.

CO-2: To familiarize and educate the students with the concepts of auditing in India.

CO-3:To enable the students acquire an understanding of the tools, techniques and procedure of audit.

CO-4: To develop an understanding of the duties, responsibilities and liabilities of a company auditor

MARKETING

SEMESTER-VI:

Co-1 : Understand various concepts and theories of marketing

management to apply them in marketing context.

Co-2: Demonstrate a sound knowledge of conventional and latest marketing ideas,and of the theories on which these ideas are based.

Co-3:Able to understand and find the market segments.

Co-4: Estimate the effectiveness of marketing mix activities4

MARKETING FINANCIAL SERVICE

SEMESTER-VI

CO-1: To provide working knowledge of functioning of services offered by the financial services institutions operating in India

CO-2: TO familiarize and educate the student with the concepts of leasing,mutual funds and venture capital

Co-3: To enable the students acquire an understanding of the terminologies of securitization , credit rating and foctoring.

FINANCE SERVICE

SEMESTER-VI

CO-1: Explain the nature, scope and objective of financial management, along with Time Value of Money, Risk & Return.

CO-2: Analyze Capital Budgeting Process and Techniques including NPV, IRR and Profitability Index.

CO-3: Examine various Capital structure theories and estimating cost of capital.

CO-4: Critically examine basic Theories and policies of Dividend.

CO-5: Estimate working capital along with an overview of cash receivables and inventory

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B.Sc - Botany, Zoology, Chemistry (B.Z.C)

Programme Specific Outcomes

PSO 1: To understand principles of origin of life and its evolutionary trends, Microbial

diversity, chemical theory related to origin of life

PSO 2: To analysis the taxonomic range of various life forms as per their external characters

and internal chemical constitutions (chemo taxonomy)

PSO 3: The knowledge About of ecological and phyto geographical studies related in

environmental biodiversity with biotic and abiotic factors

PSO 4: Skills to study the principles of tissue culture techniques in biology leads to various

diversity of life forms (hybrids) by using chemically synthesised growth hormones.

PSO 5: Ability to design the evolution of drugs form the biological sources and its

applications without any side effects in nature.

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COURSE OUTCOMES

ZOOLOGY

ANIMAL DIVERSITY - NONCHORDATES

Semester I

CO1	To instill knowledge across different Areas of Inveretebrates.
CO2	To be familiarized with the life cycles and mode of reproduction in different invertebrates Animal groups.
CO3	To understand the systemic and functional morphology of various groups of Invertebrates.
CO4	To study their economic importance, affinities and adaptations

ANIMAL DIVERSITY - CHORDATES

SEMESTER I

CO1	To instill knowledge across different Areas of chordates
CO2	To acquire knowledge on the life cycles and mode of reproduction

	in different vertebrates
CO3	To understand the systemic and functional morphology of various groups of chordates,
CO4	To study their economic importance, affinities and adaptations

CYTOLOGY, GENETICS AND EVOLUTION

SEMESTER III

CO1	To know the different types of cells
CO2	To be able to Name the cell organelles, List of cell organelles
CO3	To Know MENDAL LAWS The inter-relationship between Organisms in population and communities
CO4	To understand and communicate the major evolutionary innovations in animal groups and describe the functional Significance of associated morphologies and behaviours.

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

SEMESTER IV:1

CO1	To study the concepts of Digestion,Respiration and other phyiological activities of mammals and Reproduction
CO2	To Know The inter-relationship between Organisms in population and communities
CO3	To study the population dynamics and Population control Propagate and follow environment friendly practices.
CO4	To study the concepts of zoogeography and, zoogeographical importance Of Indian subcontinent.

ANIMAL BIOTECHNOLOGY

SEMESTERV:

CO1	To study the concepts of Digestion,Respiration and other phyiological activities of mammals
CO2	To Know MENDAL LAWS The inter-relationship between Organisms in population and communities
CO3	To Understand and communicate the major evolutionary

	innovations in animal groups
CO4	To Understand the organic evolution

Elective VII-A Immunology

SEMESTERV:

CO1	To Learn about Immunogloblins and Types
CO2	To understand the Immunological disorders
CO3	To understand the Innate and acquired immunity
CO4	To learn about oncology

CLUSTER ELECTIVE VIII-B-1

AQUACULTURE

SEMESTER-VI :

CO1,2,	To gain knowledge, understanding and skills required to apply theoretical AQUACULTURE & To understand the aquaculutre systems
CO3,4	To know the principles of fishery management, aquaculture and

	fish Biology in industry. & Aquaculture in india and world

CLUSTER ELECTIVE VIII-B-2

AQUACULTURE MANAGEMENT

SEMESTERVI:

CO1,2,	To improve scientific, technical and vocational skills required in the area of employment in the fisheries industry & Aquaculture Management
CO3,4	To improve practical skills such as fish surveying, fish husbandry, identification and treatment Of diseases and Prevention methods

CLUSTER ELECTIVE VIII-B-3

POSTHARVEST TECHNOLOGY

VI SEMESTER :

CO1	To learn about Handling and principles of fish preservation
CO2	To gain knowledge about Processing of Fish products
CO3	To understand the importance of sanitation and Quality control
CO4	To raise knowledge on Quality assurance and management and certification

Course outcomes

BOTANY

MICROBIAL DIVERSITY, ALGAE AND FUNGI

Semester -I

CO1	To know about the origin and evolution of life, formation of earth in the universe and existence of life on earth.
CO2	To know about microbial diseases regarding to various micro organism in man, animals and plants.
CO3	To gain knowledge on Algae for growing the populations with lot of Economic importance as food, fodder and feed etc.,
CO4	To gain knowledge of fungi as pathogen causing many famines as in the past and to overcome and manage the fungal disease and protect the life forms on the earth.

Diversity of Archaegoniates&Plant Anatomy

SEMESTER- II

CO1	To Know the structure of non-vascular plants.
CO2	To Know the importance of mass plants.
CO3	To know the structure of vascular plants.
CO4	To know the importance plant anatomy

PLANT TAXONOMY AND EMBRYOLOGY

Semester –III

CO1	To acquire knowledge to maintain botanical garden worldwide.
CO2	To acquire the knowledge of classification of the plants and the comparison, origin and evolution of angiosperms which are the most important species in our daily life.
CO3	To acquire the knowledge of the development of embryo and structure.
CO4	To know the pollination and fertilization methods to develop with new genetically combinations leading to new varieties.

Plant Physiology and Metabolism

SEMESTER –IV

CO1	To Know the Process of various metabolic activities in plant body
CO2	To Know the process of photosynthesis and respiration
CO3	to know the importance of phyto hormones
CO4	To know the process of stress physiology

Cell Biology, Genetics and Plant Breeding

SEMESTER- V

CO1	To gain knowledge regarding the unit of life that is cell, types, functions of the various organelles of the cell.

CO2	The know the DNA Structure which is very useful at molecular levels of genes in various aspects of life quality of genetical characters and forensic methods of the society etc.
CO3	To have the knowledge of elements of environment.
CO4	To understand the importance of Climatic factors like light, temperature, in related to growth of plant.

PLANT ECOLOGY& PHYTOGEOGRAPHY

SEMESTER- V

CO1	To Know the Process of various metabolic activities in plant body
CO2	To know about variuos methods in tissue culture
CO3	To know the importance of tissue culture and biotechnology
CO4	To know the applications of bio technology.

Cluster Electives, CLUSTER–B

Biological instrumentation and Methodology

SEMESTER- VI

C.O.1	Students are able to understand about Culturing and Microscopic Methods.
C.O.2	Students will gain knowledge on Biochemical and Immulogical Methods.
C.O.3	Students are able to understand about Sterility testing for

	Pharmaceutical Products.
C.O.3	At the end of the course, the students will have sufficient scientific understanding of the basic concepts in instrumentation used in Biotechnology.

CLUSTER ELECTIVE -2-B

Mushroom Culture and Technology

SEMESTER- VI

CO1	**Gain the knowledge of cultivation of different types of edible mushrooms**
CO2	**Manage the diseases and pests of mushrooms. Identify edible types of mushroom**
CO3	**Packaging, Storing and grading of mushroom; post harvest procedure**
CO4	**Develop research aptitude. Develop competency in self-employment and income generation**

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COURSE OUTCOMES

CHEMISTRY

Inorganic & Organic Chemistry

Semester -1:

CO1	To Describe the trends in the physical and chemical properties of group 13 to group 17 elements. Know the Chemistry of some important compounds of Boron, Carbon, Silicone etc.
CO2	To Identify and judge the structure, type of reaction, mechanism and chemical behavior of an organic compound during its transformation from reactants to products.
CO3	To identify the reason for the aromaticity of various organic compounds that are used in the manufacturing of many products.
CO4	To understand the importance of Structural theory in the organic chemistry which provides a strong basic knowledge for the students that helps in their further studies.

PHYSICAL CHEMISTRY

SEMESTER: II

CO1	To Understand the formation of bonds and interactions between the atoms, molecules, ions crystals and other stable substances

	that are used in attaining the best knowledge about future projects like quantum mechanics. Rationalize the existence of compounds and properties, structures and uses of various molecules.
CO2	To understand the spatial arrangement of atoms that determine the structure of a compound which is fundamental study all the concepts of organic chemistry with the help of Stereochemistry
CO3	To gain the knowledge about various synthetic techniques and synthesized products that helps a lot while working in manufacturing companies. Learn about various techniques for the conversion of different states of a substance (Liquefaction of gases, condensation, distillation etc.,) that are used in daily life
CO4	To identify a type of reaction involving in the formation of a product .The practical knowledge is very essential for the identification of various ions and elements.

INORGANIC & ORGANIC CHEMISTRY

Semester:III

CO1	To understand the ways in which mono, di and unsaturated carboxylic acids are easily prepared by at industrial level. knowing about the active methylene compounds Studying about oxidizing and reducing Reagents, reactions and their mechanisms are very useful for the establishment of small industries and also for their self employment
CO2	To study d block elements which is useful in determination of

	colored complex formation in Dye industry and formation alloys which are essential for the manufacture of utensils and vessels that are used in daily life
CO3	To Various theories studied by the students involved in bonding in metals is very useful in gaining knowledge about thermal and electrical conductance of metals.
CO4	To gain the knowledge of conductors, insulators and semi conductors will help the students in building their career in battery industry

SPECTROSCOPY & PHYSICAL CHEMISTRY

SEMESTER :IV

CO1	To be able to generate an Electric Current in an Electro Chemical Cell. This is the basis of all batteries and Fuel Cells.
CO2	To gain command on Dilute Solutions, Elevation of B.P. & depression of Freezing point, osmotic pressure, colligative properties
CO3	To gain command on Phase rule, components and degrees of freedom, eutectic point, Pb-Ag system, NaCl system and freezing mixtures.
CO4	To know about Spectroscopy, electromagnetic spectrum, Electronic, IR spectroscopies, selection rules applications and NMR s-pectroscopy, chemical shift,m spin-spin coupling.

INORGANIC, ORGANIC & PHYSICAL CHEMISTRY

SEMESTER-V

CO1	To gain knowledge of the laws of physical chemistry such as chemical equilibrium, law of thermochemistry , distribution law, etc. can be deduced from law of thermodynamics. Moreover, it can predict the feasibility of a process and extent of yield of the product obtain.
CO2	To understand chemical kinetics which deals with the measurement of rates of reactions proceeding under given conditions, hence study of this topic help them to locate favorable conditions to speed up a reaction, there by getting the products in a short time.
CO3	To understand the laws of photochemistry and to know about a number of applications of photochemical process which are useful in daily life such as fluorescence, phosphorescence, photosensitization etc.
CO4	To gain knowledge on carbohydrates which constitutes one of the most important group of natural products. By their study of classification, structural elucidation, properties, and their interconversions are useful to understand about important foodstuffs and other forms of carbohydrates. Amino acids are another important natural products as they are building units of other natural products like enzymes, peptides, proteins etc. their study is necessary to understand structure of various substances present in living organisms.

INORGANIC CHEMISTRY

SEMESTER-V

CO1	To Describe the trends in the physical and chemical properties of group 13 to group 17 elements. Know the Chemistry of some important compounds of Boron, Carbon, Silicone etc.
CO2	To Identify and judge the structure, type of reaction, mechanism and chemical behavior of an organic compound during its transformation from reactants to products.
CO3	To identify the reason for the aromaticity of various organic compounds that are used in the manufacturing of many products.
CO4	To understand the importance of Structural theory in the organic chemistry which provides a strong basic knowledge for the students that helps in their further studies.

CLUSTER-A-1

POLYMER CHEMISTRY

SEMESTER VI

CO1	To be able to recognize different polymeric materials commonly seen in our environment and their applications.
CO2	To explain the general reaction course and reaction mechanism of free radical, ionic and Zeigler – Natta Polymerization.
CO3	To know the method of calculating the degree of polymerization

	and molecular weight of polymers by Viscometry, Osmometry, and light scattering methods.
CO4	To determine glass transition temperature and various factors effecting it. Also the free volume theory and WLF equation is learnt. Describe the effect of addition of various polymer additives to enhance the properties of polymeric materials.

CLUSTER ELECTIVE – VIII-A-2

INSTRUMENTAL METHODS OF ANALYSIS

SEMESTER VI

CO1	To acquire fundamental knowledge of spectroscopy and chromatographic techniques.
CO2	To understand the instrumentation and application of spectroscopy through U.V, I.R, N.M.R, for the quantitative and qualitative analysis of organic compounds (molecules) useful in analysis of drugs (pharmacy industry).
CO3	To acquire the knowledge of handling sophisticated instruments like spectrophotometer which are used to identify functional groups (I.R)
CO4	To leran about atomic absorbtion, emmmision and flurosence spectroscopies, electro analytical methods and radio chemical methods.

CLUSTER-A-2

INSTRUMENTAL METHODS OF ANALYSIS

SEMESTER VI

CO1	To gain knowledge about various forms, formulation and therapeutic uses of drugs. Can identify different modes of administration of drugs which helps in creating awareness while using medians.
CO2	To learn about the structures, preparation methods and analysis of various basic drugs which will be very helpful if they chose the field of pharmaceuticals in their career.
CO3	To identify various elements or substituents present in the food material that are often consumed in daily diet and also useful in some manufacturing industries.
CO4	To know about the major diagnostic methods which can be useful in creating awareness among themselves and also the people around them.

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B.Sc - Mathematics, Physics, Chemistry (M.P.C)

Programme Specific Outcomes

PSO 1: Understand the theoretical concepts of physical and chemical properties of materials and the role mathematics with them in a quantitative way.

PSO 2: Analyse the concepts of mathematics, physics and chemistry and understand the relation among them like chemistry,

mathematical modeling of physics and chemistry problems

Skills needed to handle instruments and adopt lab procedures to study physical chemical properties of materials

PSO 3: Mathematical, numerical techniques required to model them.

PSO 4: Ability to interlink the skills and knowledge in mathematics, physics and chemistry and develop an aptitude to address the problems in biophysics, stock market analysis.

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COURSE OUTCOMES

MATHS

DIFFERENTIAL EQUATIONS

Semester-I

CO1	To Understand how to differentiate linear and non-linear differential equations.
CO2	To Apply different methods for solving differential equations of first order but not of first degree.
CO3	To find the solution of higher-order linear differential equations with constant coefficients.
CO4	To Use the method of "variation of parameters" to find the solution of higher-order linear differential equations with variable coefficients and solve the Cauchy-Euler equations

SOLID GEOMETRY

SEMESTER – II

CO1	To understand geometrical terminology for angles, triangles, quadrilaterals and circles, measure angles using a protractor, use geometrical results to determine unknown angles.
CO2	To find the areas of triangles, quadrilaterals and circles and shapes based on these
CO3	To Define parallel lines, Recognize and create parallel lines on

	graphs and with equations, define perpendicular lines, Recognize and create graphs and equations of perpendicular lines
CO4	To recognise line and rotational symmetries and the applications of spheres

ABSTRACT ALGEBRA

Semester-III

CO1	To be able to assess properties implied by the definitions of groups
CO2	To be able to use various canonical types of groups (including cyclic groups and groups of permutations)
CO3	To be able to analyze and demonstrate examples of subgroups, normal subgroups and quotient groups
CO4	To be able to use the concepts of isomorphism and homomorphism for groups

REAL ANALYSIS

SEMESTER –IV

CO1	To Understand the concepts of limits, Continuity, Discontinuity, Uniform Continuity
CO2	To Use the definitions of convergence as they apply to sequences, series, and functions
CO3	To apply the Mean Value Theorem and the Fundamental Theorem of Calculus to problems in the context of real analysis

CO4	To identify Riemann Integral functions

RING THEORY & VECTOR CALCULUS

SEMESTER – V

CO1	To be able to compute and analyze the vector-valued functions of a real variable and their curves and in turn the geometry of such curves including curvature, torsion and the Frenet-Serre frame and intrinsic geometry
CO2	To gain the ability to compute and analyze integral curves of vector fields and solving differential equations to find such curves
CO3	To be able to compute and analyze the differential ideas of divergence, curl, and the Laplacian along with their physical interpretations, using differential forms or tensors to represent derivative operations
CO4	To acquire the knowledge to compute and analyze the integral ideas of the functions defined including line, surface and volume integrals - both derivation and calculation in rectangular, cylindrical and spherical coordinate systems and understand the proofs of each instance of the fundamental theorem of calculus

LINEAR ALGEBRA

SEMESTER – V

CO1	To recognize the concepts of the terms span, linear independence,

	basis , dimension and apply these concepts to various vector spaces and subspaces
CO2	To use matrix algebra and the related matrices to linear transformations,
CO3	To be able to Compute and use eigenvectors and eigenvalues
CO4	To Determine and use orthogonality

ELE1CTIVE–VII-(B)

NUMERICAL ANALYSIS

SEMESTER – VI

CO1	To analyze and detect different form of errors and also will be able to solve Algebraic and Transcendental equations using different methods.
CO2	To Interpolate the functions within the range using equally and un equally spaced points
CO3	To understand the Least Squares Method and be able to curve fit data using several types of curves (straight line, second degree parabola, power curve, exponential curve)
CO4	To solve the solution of a linear system of equations using direct or iterative methods. • To solve the selected class of differential equations using Taylor, Picards, Euler‘s, RungeKutta, Adams and Milne‘s method.

ELECTIVE– VII-(C)

NUMBER THEORY

SEMESTER – VI

CO1	Will be able to derive numerical methods for approximating the solution of problems of continuous mathematics
CO2	To obtain numerical approximations to the first and second derivatives of certain functions • Calculate a definite integral using an appropriate numerical method
CO3	To implement a variety of numerical algorithms using appropriate technology
CO4	To Compare the viability of different approaches to the numerical solution of problems arising in roots of solution of non-linear equations, interpolation and approximation, numerical differentiation and integration, solution of linear systems

COURSE OUTCOMES

PHYSICS

MECHANICS& PROPERTIES OF MATTER

Semester-I

CO1	To learn about Scalar vector fields, Curl, Divergence, gradient concepts, Line, surface and volume integrals. They would also learn about Stokes, gauss, Green's theorems and their applications.
CO2	To gain knowledge on motion of variable mass system, Collisions in two and three dimensions, Rutherford scsttering problem.
CO3	To understand the concepts of rotational kinematics of rigid body, Moment of inertia tensor, Euler equations, Precision of top, equinoxes and Gyroscope. Students would also learn about types of beams, load analysis in various configurations and mechanics of cantelever.
CO4	To gain understanding on conservative forces, relation between conservative force and potential, equation of motion under central forces, Keppler's laws and Coriolis force. They would also learn about Galelian-Lorentz frames of references, Lorentz transformations, Michelson-Morley experiment, Postulates of special theory of relativity, length contraction, time delation, addition of masses, mass energy relation and 4 verctor notation.

Waves & Oscillations

SEMESTER II

CO1	To learn about physical properties of Simple Harmonic Motion (SHM), Torsional pendulum, Compound pendulum and their applications, Lissajous figures.
CO2	To be able to solve the differential equations for forced harmonic oscillator and damped harmonic oscillator and compare the results with simple harmonic oscillator. They would also learn about Fourier series analysis of various wave forms.
CO3	To know the gravitational potential due to hollow and solid spheres and circular disks. They would also learn about the basics of seismic waves, seismographs, epicenter, focus determination and applications of seismology.
CO4	To solve the wave equation for vibrating strings and study various parameters like modes, overtones, energy transport, transverse impedance etc. They would also learn about basics of ultrasonics, production detection of ultrasonics, measurement of frequency and velocity of ultrasonics and the applications of ultrasonics.

WAVE OPTICS

Semester-III

CO1	To learn about the matrix methods in optics, matrices for translation, refraction, image formation by spherical surfaces and coaxial optical systems. They would also learn about various monochromatic and chromatic aberations and their removal techniques.
CO2	To understand the principle of superposition, coherence, Interference by division of wavefront and amplitude, Fresnel's bi-prism, Lloyd's mirror, thin film interference, wedge shaped film interference, Newton's rings, Michelson's interferometer and their applications to sodium D lines and thickness of thin film.
CO3	Students would learn about Fresnel and Fraunhoffer diffraction, Fraunhofferdiffrraction due to circular apperture, single slit, double slit, N-slit, grating. They would also learn about Fresnel's half period zones, zone plate, phase reversal zone plates, comparison of zone plate & convex lens, interference & diffraction.
CO4	To learn about methods of polarization, Brewster's law, Malus law, Nicol prism, Quarter wave plate, half wave plate, babinet's compensator and optical activity analysis by Laurent's half shade polarimeter. They would also learn about principles of LASER, Einstein coefficients, He-Ne laser, Ruby laser, applications of laser, Principles of optical fiber communication, classification of optical fibers, applicat ions of optical fiers, principles of holography,

	limitations of Gabor's hologram and applications of holography.

Thermodynamics &Radiation Physics

SEMESTER-IV

CO1	To learn about Maxwell's distribution law, Tooth wheel experiment, viscosity of gases, thermal conductivity and diffusion of gases.
CO2	To learn about reversible, irreversible processes, Carnot's theorem, Carnot's engine, Kelvin's scale, entropy, disorder, T-S diagram and other applications of entropy.
CO3	To understand thermodynamic potentials, Maxwell equations, Clausius-Clayperon's equation, Cp/Cv, Cp-Cv for perfect gas, J-K effect, J-K coefficient for perfect and Vanderwall gases. They would also learn about Joul Thomson cooling, liquification of helium, Adiabatic demagnetization, principle of refrigeration, airconditioning, effects of CFC gases, applications of low temperature physics.
CO4	To learn about Wein's law, Rayleigh-jeans law, Planks theory of radiation, various ty pes of pyrometers, determination of solar constant and effective temperature of temperature. To learn about concepts of ensembles, M-B, B-E, F-D statistics comparison, Applications of FD statistics to white dwarfs and Neutron stars.

Electricity, Magnetism and Electronics

Semester -V

CO1	To understand the concepts of electric field and electic potential due to point charge,solidsphere,cylinder.these concepts will enhance the student towards the problems come across in the real life.
CO2	To learn about the concept of capacitance.various types of capacitors.how can we store energy in the electric capacitor and the applications of capacitors in various applications
CO3	To learn about the concepts of Hall effect,using this we can find the charge particles in the given material. Also to learn about the particle accelarators like cyclotron, synchrotron and cyclo synchrotron and their working principles
CO4	To be able to learn about the concepts of Biot savart's law,Faraday's law and it's applications.Students are also able to learn the network theorems like Thevenins theorem – Norton's theorem for circuit analasis

Modern Physics

Semester V

CO1	To be learn about the concepts of atomic models and their drawbacks.students would also learn about Stern

	&Gerlachexperiment Vector atom model, this model gives the exitance of spin of an electron.Study of fine spectra and Zeeman effect on various elements.
CO2	To learn about the concepts of molecular spectra like rotational spectra,vibrationalspectra.students would also learn raman spectra and its applications like determination of structure of the given molecule
CO3	To understand the importance of Quantammechanics,study the basic concepts invloved in the origin of quantammechancis like uncertainty principle,debrogli matter waves,photo electric effect,Students also study the Davison and Germerexperiment,it conforms the particle nature of the electron.
CO4	To be able to learn about the importance of Heisenberg's uncertainty principle for position and momentum. To be able to learn Schrodinger time independent and time dependent wave equations. To understand the significance of Wave function properties, Basic postulates of quantum mechanics

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COURSE OUTCOMES

CHEMISTRY

Inorganic & Organic Chemistry

Semester -1:

CO1	To Describe the trends in the physical and chemical properties of group 13 to group 17 elements. Know the Chemistry of some important compounds of Boron, Carbon, Silicone etc.
CO2	To Identify and judge the structure, type of reaction, mechanism and chemical behavior of an organic compound during its transformation from reactants to products.
CO3	To identify the reason for the aromaticity of various organic compounds that are used in the manufacturing of many products.
CO4	To understand the importance of Structural theory in the organic chemistry which provides a strong basic knowledge for the students that helps in their further studies.

PHYSICAL CHEMISTRY

SEMESTER: II

CO1	To Understand the formation of bonds and interactions between the atoms, molecules, ions crystals and other stable substances that are used in attaining the best knowledge about future

	projects like quantum mechanics. Rationalize the existence of compounds and properties, structures and uses of various molecules.
CO2	To understand the spatial arrangement of atoms that determine the structure of a compound which is fundamental study all the concepts of organic chemistry with the help of Stereochemistry
CO3	To gain the knowledge about various synthetic techniques and synthesized products that helps a lot while working in manufacturing companies. Learn about various techniques for the conversion of different states of a substance (Liquefaction of gases, condensation, distillation etc.,) that are used in daily life
CO4	To identify a type of reaction involving in the formation of a product .The practical knowledge is very essential for the identification of various ions and elements.

INORGANIC & ORGANIC CHEMISTRY

Semester: III

CO1	To understand the ways in which mono, di and unsaturated carboxylic acids are easily prepared by at industrial level. knowing about the active methylene compounds Studying about oxidizing and reducing Reagents, reactions and their mechanisms are very useful for the establishment of small industries and also for their self employment
CO2	To study d block elements which is useful in determination of colored complex formation in Dye industry and formation alloys

	which are essential for the manufacture of utensils and vessels that are used in daily life
CO3	To Various theories studied by the students involved in bonding in metals is very useful in gaining knowledge about thermal and electrical conductance of metals.
CO4	To gain the knowledge of conductors, insulators and semi conductors will help the students in building their career in battery industry

SPECTROSCOPY & PHYSICAL CHEMISTRY

SEMESTER :IV

CO1	To be able to generate an Electric Current in an Electro Chemical Cell. This is the basis of all batteries and Fuel Cells.
CO2	To gain command on Dilute Solutions, Elevation of B.P. & depression of Freezing point, osmotic pressure, colligative properties
CO3	To gain command on Phase rule, components and degrees of freedom, eutectic point, Pb-Ag system, NaCl system and freezing mixtures.
CO4	To know about Spectroscopy, electromagnetic spectrum, Electronic, IR spectroscopies, selection rules applications and NMR s-pectroscopy, chemical shift,m spin-spin coupling.

INORGANIC CHEMISTRY

SEMESTER-V

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CLUSTER-A-1

POLYMER CHEMISTRY

SEMESTER VI

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CO2	To explain the general reaction course and reaction mechanism of free radical, ionic and Zeigler – Natta Polymerization.
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CLUSTER ELECTIVE – VIII-A-2

INSTRUMENTAL METHODS OF ANALYSIS

SEMESTER VI

CO1	To acquire fundamental knowledge of spectroscopy and chromatographic techniques.
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CO4	To leran about atomic absorbtion, emmmision and flurosence spectroscopies, electro analytical methods and radio chemical methods.

CLUSTER-A-2

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SEMESTER VI

CO1	To gain knowledge about various forms, formulation and therapeutic uses of drugs. Can identify different modes of administration of drugs which helps in creating awareness while using medians.
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B.Sc., Mathematics, Electronics, Computer Science (M.E.Cs)

PROGRAM OUTCOMES

PSO 1: Understand the concepts of basic electronic components, networks, communication systems, microprocessors and micro controllers, algorithms, C language, Arduino programming, Networking, cloud and Big Data.

PSO 2: Analyse the concepts of mathematics, Electronics and computer Networks and able to use them in solving real world problems.

PSO 3: Acquire the skills to use various electronic components, microprocessor, microcontroller, Arduino, Raspberry PI and simulators.

PSO 4: Ability to interlink the skills developed and gets an aptitude to address the problems in smart home design, smart vehicles, smart sensors in various fields.

COURSE OUTCOMES

ELECTRONICS

Circuit analysis & Electronic devices-1

Semester I

CO1	To learn about the concvepts of RMS value of sine wave, j-operator, resistance, reactance and admittance concepts.
CO2	To learn about the concepts of KCL and KVL and how to apply them to mesh analysis and node analysis on circuits consisting of resistors and sources.
CO3	To understand Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Reciprocity theorem, Millman's theorem and their applications.
CO4	To gain knowledge on RC, RL circuits, their frequency response and their applications as Low pass, High pass filters; differentiator and integrator.

Circuit Analysis & Electronic devices -2

Semester II

CO1	To learn about formation of P-N Junction, Junction capacitance, effect of temperature on reverse current, VI charactristics,

	applications of diode and a few two termincal devices like Zener diode, Tunnel diode and Varactor diode.
CO2	To learn about CB, CE CC configurations of BJT, h-parameters, lode line analysis and biasing of BJT.
CO3	To understand the differences between JFET and BJt, V-I charactristics of JFET, parameters of JFET, applications of FET and MOSFET. They would also learn about UJT charactristics, applications.
CO4	To learn about the SCR construction, two transistor model of SCR, charactristics and applications of SCR. They would also learn about structure and operation of LED, LDR, PV cell, Photo diode.

Analog Circuits & Communication-1

Semester III

CO1	To learn about various rectifier configurations using diodes and their parameters like ripple factor,efficiency etc. They would also learn about regulation and hormonic components in the rectified output.
CO2	To learn about various filters using inductors and capacitors, series, shunt regulators and 78xx, 79xx IC regulators. They would also learn aboutSwitch mode powersupply.
CO3	To learn about RC coupled CE amplifier, the concepts of negative and positive feedback. They would also learn about the effect of negative feedback on various amplifier circuit parameters.
CO4	To learn about the basic components of operational amplifier, the

	working of differential amplifier in various configurations. They would also learn about various input and output paramaters of op-Amp.

Analog Circuits & Communication -2

Semester IV

CO1	To learn about basic op-Amp circuits, inverting, non-inverting amplifiers, frequency response of op-Amp. They would also learn about the interpratation of op-Amp data sheets.
CO2	To learn about the applicatuions of op-Amps for various mathematical operations, usage of op-Amp as oscillators, and voltage regulators.
CO3	To learn about basics of communication systems, AM, FM and PM. They would also learn about the basics of Amplitude Modulation, modulator & demodulator circuits.l
CO4	To understand the concepts of Frequency Modulation, generation and detection of FM waves, advantages of FM over AM and block diagrams of AM and FM radio receivers.

Digital Electronics & Microprocessor 8085 -1

Semester V

CO1	To know about Various number systems and conversions among them. THey would also learn about various logic families like RTL, DTL, ECL, TTL, CMOS etc and about universal logic gates.
CO2	To learn about De-Morgan Theorems, Boolean identities, Karnaugh maps and applications of them to calculate Sum of Products and Product of Sum of Boolean expressions.
CO3	To learn about Multiplexers, de-multiplexers, half adder, full adder and various flip flops like RS, JK, D, T, Master-slave flip flops.
CO4	To learn about Synchronous, Asynchronous counters, Up/Down counters, and working of 7490 decade counter.

Embedded Systems and Applications -1

Semester V

CO1	To learn about the architecture of 8051 microcontroller and program counter and memory organisation in the micro controller and their applications in the digital systems.
CO2	To learn about Pin diagram, Port organisation, I/O Programming, Bit manipulation. Interrupts and timer. with this concepts they can understand the structure of digital systems and their works.
CO3	To learn about Addressing modes, instruction set and assembly

	language programming of 8051. By using the instruction set various operations using microcontroller can be done.
CO4	To learn the Time Delay Generation and Calculation; Timer/Counter Programming, machine -cycle frequency calculation using microcontroller. Find out the outputs of various programmes using microcontroller.

COURSE OUTCOMES

Computer Science

COMPUTER FUNDAMENTALS AND PHOTOSHOP

Semester-I

CO1	To acquire the basic knowledge on computer hardware and software.
CO2	To learn the concepts and be able to work on adobe Photoshop applications.
CO3	To get the ability to create and edit photo albums
CO4	The apply the knowledge gained in the classroom to design and edit Banners and visiting cards etc..

PROGRAMMING IN C

SEMESTER : II

CO1	To appreciate and understand the working of a digital computer
CO2	To analyse a given problem and develop an algorithm to solve the problem
CO3	To understand the 'C' language constructs in the right way
CO4	To apply the knowledge to Design, develop and test programs

	written in 'C'

OBJECT ORIENTED PROGRAMMING USING JAVA

Semester –III

CO1	To Understand the concept and underlying principles of Object-Oriented Programming
CO2	To Understand how object-oriented concepts are incorporated into the Java programming language
CO3	to acquire and improve problem-solving and programming skills using OOP concept
CO4	To become familiar with the fundamentals and acquire programming skills in the Java language.

DATA STRUCTURES

SEMESTER –IV

CO1	To acquire the knowledge of arrays, records, linked structures, stacks, queues, trees, and graphs as represented in memory and its applications
CO2	To Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
CO3	To discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.

CO4	To describe the concept of recursion, give examples of its use, describe how it can be implemented using a stack.

Data Base Management System

SEMESTER –V

CO1	To gain knowledge on database structure and its design
CO2	To understand different data models used for database design
CO3	To understand database transactions and data recovery
CO4	To apply the knowledge of DML,DDL,DCL commands to manipulate data in the database

Software Engineering

SEMESTER –V

CO1	To design and develop Windows application using different Windows technologies that use a variety of GUI controls and classes to fulfill specific user requirements.
CO2	To explain how event driven applications use threading to perform time-consuming operations.
CO3	To demonstrate how to use specific features of the GUI programming language to write objectoriented programs and handle run-time errors.
CO4	To explain in a public setting how user interfaces should be

	designed to accommodate human physiology and limitations.

Distributed Systems

SEMESTER –VI

CO1	**Understand the advanced database concepts & relevant technologies.**
CO2	**Identify & use database concepts for variety of applications and implement PL/SQL**
CO3	**Interpret transaction processing & query processing methods.**
CO4	**Recognize the latest concepts in database management such as data mining, big data**

Cloud Computing

SEMESTER –V

CO1	**Understand various basic concepts related to cloud computing technologies, architecture and concept of different cloud models: IaaS, PaaS, SaaS. Cloud virtualization, cloud storage, data management and data visualization.**
CO2	**Understand different cloud programming platforms & tools and familiar with application development and deployment using cloud platforms.**
CO3	**Learn the basics of Hive, HQL, HBase schema design, PIG and NoSQL**
CO4	**Learn basics of Big data, Hadoop and Map Reduce.**

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SEMESTER – V

CO1	To be able to compute and analyze the vector-valued functions of a real variable and their curves and in turn the geometry of such curves including curvature, torsion and the Frenet-Serre frame and intrinsic geometry
CO2	To gain the ability to compute and analyze integral curves of vector fields and solving differential equations to find such curves
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LINEAR ALGEBRA

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CO1	To recognize the concepts of the terms span, linear independence, basis , dimension and apply these concepts to various vector spaces and subspaces
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ELECTIVE– VII-(C)

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CO2	To obtain numerical approximations to the first and second derivatives of certain functions • Calculate a definite integral using an appropriate numerical method
CO3	To implement a variety of numerical algorithms using appropriate technology
CO4	To Compare the viability of different approaches to the numerical solution of problems arising in roots of solution of non-linear equations, interpolation and approximation, numerical differentiation and integration, solution of linear systems

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BSC (MICRO BIOLOGY , BIOTECHNOLOGYBIOCHEMISTRY)

PROGRAM OUTCOMES

POS-1 : ACQUIRED BASIC KNOWLEDGE AND IMPORATANCE OF MICROORGANISMS

POS-2 : LEARN ABOUT STRUCTURE OF CELL AND CELL ORGANELLES, GENETICS, IMMUNOLGY , IMPORTANCE OF DNA AND RNA

POS-3: UNDERST AND THE ROLE OF BIOTECHNOLOGY IN PLANTS AND ANIMALS LEARN DEVELOPMENT OF NEW TECHNIQUES

POS-4: ACQUIREDTHE KNOWLEDGE AND IMPORTENCE OF BIOFERTILIZERSAND BIOPESTICIDES

POS-5: BASIC KNOWLEDGE ON STRUCTURE & PROPERTIES OF CARBOHYDATES , PROTEINS , AND LIPIDS

POS-6: TO LEARN THE SAFEHANDLING OF SAMPLE AND INSTRUMENTATION APPLICATIONS

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COURSE OUTCOMES

MICROBIOLOGY

INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY

Semester –I

CO1	To know about bacteriology, virology, basic as well as modern microbial techniques and will be skilled in sterilization, pure culture and other techniques.
CO2	To know about fundamental aspects of the basic biology of bacteria, virus, protozoa and the types of microorganisms and isolate, characterize and classify microbes.
CO3	To gain a strong grounding in microbial genetics also the microbiology students will be able to describe how microbes are used as model systems to study basic biology and other fields.
CO4	To gain the knowledge about isolation and preservation of microbes
CO5	To learn aboout the structure, differences, structure and replication of microbes

MICROBIAL BIOCHEMISTRY & METABOLISM

SEMESTER- II

CO1	To learn about the biomolecules and nuclicacidds of life
CO2	To learn skills about the insrumentation
CO3	To Gain the basic knowledge about the enzymes and their classification
CO4	To Gain the knowledge about the growth and nutrient types of microbes
CO5	To learn about microbial respiration , fermentation and photosynthesis

MICROBIOLOGY

Semester –III

CO1	. To learn aboout the structure, differences, structure and replication of microbes
CO2	To study in detail about Microorganisms like bacteria and viruses - their structure, life cycle, history, classification and their importance a. To apply the knowledge about micro organisms in daily life like maintaining hygiene,and taking food rich in probiotics for healthy life.
CO3	To study the food habits of diverse microorganisms under the name microbial nutrition. To acquire the ability to decide which nutrition should be supplied to a particular micro organism for its growth and to apply this knowledge for carrying out project.
CO4	To know about the favourable and unfavourable conditions,

	growth properties, mechanisms to control growth of microbes. To use this knowledge in controlling harmful microorganisms and thus avoiding occurrence of infectious diseases.

IMMUNOLOGY AND MEDICAL MICROBIOLOGY

SEMESTER:-IV

CO1	To gain Knowledge about types and Organs involved in immune responses
CO2	To be able to know the Basics of immunology and types, structure of antigens and antibodies
CO3	To gain the skills about general methods and principle of laboratory diagnosis
CO4	To learn about the Anti microbial agents
CO5	To gain the knoeledge about causative agents of different diseases

ENVIRONMENTAL & AGRICULTURAL MICROBIOLOGY

SEMESTER- V

CO1	To be able to gain the knowlwdge and techniques used in agricultural field
CO2	To Explain the interactions between Microorganisms and the food environment and factors influencing their growth and survival.

CO3	To know about bacteriology, virology, basic as well as modern microbial techniques and will be skilled in sterilization, pure culture and other techniques.
CO4	To know about fundamental aspects of the basic biology of bacteria, virus, protozoa and the types of microorganisms and isolate, characterize and classify microbes.

FOOD AND INDUSTRIAL MICROBIOLOGY

SEMESTER –V

CO1	To Explain the interactions between Microorganisms and the food environment and factors influencing their growth and survival.
CO2	To Describe the characteristics, identification and detection of food borne microbes.
CO3	To Perform microbial investigations.
CO4	To students understand the technologies implemented by Food and industrial microbiology .
CO5	To Learn about Role of Microbes in Bio geo chemical cycles

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COURSE OUTCOMES

BIOTECNOLOGY

MICROBIOLOGY AND CELL BIOLOGY

Semester –I

CO1	To learn about contributions of various scientists in the field of Biotechnology and microscopy, various staining methods useful for the study of microorganisms in detail. To be motivated to pursue research through keen observations.
CO2	To study in detail about Microorganisms like bacteria and viruses - their structure, life cycle, history, classification and their importance a. To apply the knowledge about micro organisms in daily life like maintaining hygiene,and taking food rich in probiotics for healthy life.
CO3	To study the food habits of diverse microorganisms under the name microbial nutrition. To acquire the ability to decide which nutrition should be supplied to a particular micro organism for its growth and to apply this knowledge for carrying out project.
CO4	To know about the favourable and unfavourable conditions, growth properties, mechanisms to control growth of microbes. To use this knowledge in controlling harmful microorganisms and thus avoiding occurrence of infectious diseases.
CO5	To study the detailed structure and the sub cellular structures, various mechanisms occurring in the eukaryotic cell, which helps in designing drugs in case there is abnormal cell division etc.

MACROMOLEULES, ENZYMOLOGY AND BIOENERGETICS

SEMESTER –II

CO1	To know about the discovery,structure and properties, stabilizing forces of various kinds of DNA. The understanding of the basic molecule of life like DNA for inspiring research in various fields and specifically in life science for gene therapy, designing drugs etc.
CO2	To know about the structures, classification physic-chemical properties of the building blocks of proteins i.e., amino acids. To learn about the mechanism of diseases resulting due to abnormal protein structures..
CO3	To learn about the classification, structure, nomenclature and importance of a major nutrient that is carbohydrate. To learn about the polysaccharides present in nature and various conditions arising due to lack of improper intake of carbohydrates.
CO4	To learn about the structure, classification, nomenclature, inhibition, kinetics of the enzymes the knowledge of which is useful for application in medical field to cure diseases arising due to non-functional or absence of enzymes.
CO5	To study regulation, inhibition, Bypass reactions of various pathways taking place in living cells in detail as any abnormalities or diseases arising due to dysregulation of the pathways is easily understood and solution can be provided through research.

IMMUNOLOGY

SEMESTER : IV

CO1	To learn about the basic mechanisms, distinctions and functional interplay of innate and adaptive immunity and the cellular/molecular pathways of humoral/cell-mediated adaptive responses.
CO2	To learn about the structure,classes,types of Antibody and Antigens and factors affecting antigenicity.
CO3	To understand how disease causing microorganism can be used as a weapon to fight against the same microorganism.
CO4	To get better understanding about vaccination, blood transfusion, grafting etc.
CO5	To gain knowledge that helps to take up research to find medicines for present incurable diseases.

GENETICS & MOLECULAR BIOLOGY

SEMESTER : V

CO1	To study about macromolecules responsible for life on earth.

CO2	To acquire knowledge on Organelle genome organization and various gene families
CO3	To know the level of expression by transcription and translation.
CO4	To learn the molecular mechanisms responsible for diseases and may take up research in this field.
CO1	To gain and apply knowledge of Biotechnology, Science and Engineering concepts to solve problems related to field of Biotechnology

GENE EXPRESSION &r DNA TECHNOLOGY

SEMESTER : V

CO1	To replicate strategies of Nucleic acids
CO2	To learn about the Mutational changes, damage and their repair
CO3	To Know about the Structure ,types,functions of RNA and ribosomes and genetic code
CO4	To gain the knowledge about types and regulation of gene expression , protein synthesis
CO5	To learn about Basic principles of Genetic Engineering

Cluster Electives – III

Plant Biotechnology and Animal Biotechnology

SEMESTER –VI

CO1	To gain and apply knowledge of Biotechnology, Science and Engineering concepts to solve problems related to field of Biotechnology
CO2	To design, perform experiments, analyze and interpret data for investigating complex problems in biotechnology Engineering and related fields.
CO3	To demonstrate knowledge of project and finance management when dealing with Biotechnology Engineering problems
CO4	To gain concept of vaccines and trnasgenic plant and animal production.
CO5	To have overall view about IPR issues.

Environmental Biotechnology

SEMESTER –VI

CO1	To learn about Ecology, various ecosystems, Bio-geo chemical cycles.
CO2	To learn about pollutants. maintenance of standards, Biological indicators
CO3	To learn about Biocides, wate disposal - effluent treatment methods,
CO4	To have idea about Bioremediation,GM microbes in the environmental management.

Industrial Biotechnology

SEMESTER –VI

CO1	To learn about important Microorganisms. variousMedium and Inoculum Preparation.
CO2	To have knowledge on types of bioreactors. Analysis of various types of bioreactors
CO3	To have knowledge about fermentation, Production of Citric Acid by by Fermentations.
CO4	To acquire knowledge about various of recombinant proteins having therapeutic and diagnostic applications

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COURSE OUTCOMES

BIOCHEMISTRY

Biomolecules

SEMESTER –I

CO1	Appreciation of the role of water in biological system.
CO2	Ability to comprehend the structure, function and acid base properties of amino acids.
CO3	Introduction to the structure, properties and roles of carbohydrates.
CO4	Appreciation of the varied roles of lipids including distribution in different biological membranes
CO5	Understanding nucleic acid chemistry and structure.

Nucleic acids and Biochemical Techniques

SEMESTER –II

CO1	Students will learn the basic aspects of the structure of DNA and RNA along with unusual structures of DNA. Students will also be made aware of the other roles that nucleotides can play in the

	body
CO2	Students will learn about the principle and applications of spectrophotometry and flourimetry. Students will learn the principle of various chromatographic techniques like gel filteration, Ion exchange.
CO3	Students will learn about electrophoretic techniques, their principle and applications in analyzing proteins and nucleic acids Students will learn about the basic rules of sedimentation, various types of centrifuges and rotors.
CO4	Students will learn and understand the different cell culture and microbiological techniques used in biochemistry.
CO5	Students will learn about various microscopes and slide preparation, histology and staining techniques..

Enzymology and bioenergetics

SEMESTER –III

CO1	Knowledge about the basic properties and characteristics of enzymes and their action; insights into the factors affecting enzyme activity.

CO2	Students will learn about the kinetics of enzyme catalyzed reactions and bisubstrate reactions
CO3	Outline of the inhibitors of enzymes and their clinical importance..
CO4	Understand the basic mechanisms of photophosphorylation in plants and microbes
CO5	Understand the concept of chemiosmotic theory and the mechanism of Oxidative phosphorylation and ATP synthesis.

Intermediate metabolism

SEMESTER –IV

CO1	Students will learn the concepts of metabolism with an emphasis on glycolysis and gluconeogenesis
CO2	Students will learn about glycogen synthesis, breakdown, glycogen storage diseases, Calvin cycle C3 and C4 pathways in plants
CO3	The students will learn about overview, enzymes and regulation of citric acid cycle and glyoxylate cycle in plants. They will also learn about hormonal regulation of carbohydrate metabolism and

	diseases associated with metabolic irregularities.
CO4	The students will learn about lipid digestion, Fatty acid oxidation, and Ketone-body metabolism. Students will gain insight into de novo synthesis and degradation of purine and pyrimidine nucleotides, regulation and salvage pathways. Further, the students will learn about the inhibitors of nucleotide metabolism and disorders related to purine and pyrimidine metabolism.
CO5	The students will learn about synthesis of saturated, unsaturated, odd and even chain fatty acids and regulation of fatty acid metabolism. They will also learn about the synthesis of glycerophospholipids and sphingolipids. Cholesterol metabolism, diseases associated with abnormal lipid metabolism

Physiology, Clinical Biochemistry and Immunology

SEMESTER –V

CO1	Students will be introduced to hormones, various types of cellular signaling, classical and modern endocrine methodologies. They will understand the concept of signal, reception, transduction, amplification and response, Scatchard analysis, signal transduction and steroid receptors.

CO2	Appreciate the significance of the adrenal histology with respect to synthesis of cortical and medullary hormones. The concept of blood pressure regulation and electrolyte balance will be understood. Role of medullary hormone epinephrine in fight and flight response, general adaptation syndrome and the biochemical changes during acute and chronic stress will be learned.
CO3	Knowledge about the synthesis, structure and biochemical functions of the thyroid gland secretions, factors that monitor calcium homeostasis in the human body and hormonal networks that regulate growth and repair.
CO4	Gain knowledge about histology of gastrointestinal tract with respect to regulation secretion of gastrointestinal hormones, regulation of satiety and appetite. Other topics include glucose homeostasis and role of hormones and other factors in the same. Students will get an insight into dysregulations that lead to pathophysiologies like anorexia, bulimia, diabetes, obesity and metabolic syndrome.
CO5	To learn about the basic mechanisms, distinctions and functional interplay of innate and adaptive immunity and the cellular/molecular pathways of humoral/cell-mediated adaptive responses Students will be taught about the historical perspective

	of immunology, They will learn about the cells and organs of the immune system and innate immune mechanisms.

Molecular Biology & Recombinant DNA Technology

SEMESTER –V

CO1	Students will learn about the complexity of DNA double helix structure, nature of nuclotides, melting of DNA and understand the importance of supercoiling of DNA Understand the details of DNA replication and importance of various proteins and enzymes involved in replication and application of inhibitors
CO2	To learn about the Mutational changes, damage and their repair
CO3	To Know about the Structure ,types,functions of RNA and ribosomes and genetic code
CO4	To gain the knowledge about types and regulation of gene expression , protein synthesis
CO5	To learn about Basic principles of Genetic Engineering

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BA (SOCIAL WORK,ECONOMICS,GEOGRAPHY)

PROGRAM OUTCOMES

PSO 1:Understand the physical and political boundaries of dynasties from ancient period to modern times

PSO 2:Toanalyse the influence of Indian location and geographical features such as Himalayas and oceans, plains attract the foreign invaders for political and commercialestablishments.

PSO 3:To study and understand the concept of Economics, problems.

PSO 4:Understand the basic concepts of geomorphology, natural resources, mineralexploration, procedural and object oriented programming, remote sensing.

PSO 5: Analyse the properties of various rocks, minerals, various climatic conditions, areal. interpretation using image processing tools.

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Course outcomes

Social work

SOCIAL WORK PROFESSION, PHILOSOPHY AND BASIC SOCIAL SCIENCES CONCEPTS-I

Semester-I

CO1	Promoting the development of social work as a profession through cooperation based on professional values, standards, ethics, human rights, training and working conditions.
CO2	To understand the political framework for social welfare
CO3	To know the basic concepts of economics and structure of economy
CO4	To understand the basic concepts and processes in social psychology and its relevance to Social Work

SOCIAL WORK PROFESSION, PHILOSOPHY AND BASIC SOCIAL SCIENCES CONCEPTS-II

SEMESTER –II

CO1	Able to understand the basic sociological concepts and notions of society.
CO2	Able to know the basic concept of economics and structure of

	economy.
CO3	To learn method of conducting a review of literature
CO4	Able to explore the knowledge about political framework in the context of social welfare.

SOCIAL WORK METHODS-I

Semester –III

CO1	To understand the individual, family and their problems and the social contextual factors affecting t.
CO2	To understand Social Casework as a method of Social Work practice
CO3	To gain knowledge about the basic concepts, tools, techniques, processes and Skills of working with individual
CO4	To develop an understanding of application of case work in diverse settings.

SOCIAL WORK METHODS-II

SEMESTER –IV

CO1	To work in agencies working in different types of areas of Social Work practice
CO2	To develop work plan in consultation with agency supervisor.
CO3	To develop capacity for observation and analysis of social realities
CO4	To practice the methods of working with individuals and groups.

FIELDS OF SOCIAL WORK

SEMESTER –V

CO1	To understand the basics of field work
CO2	To understand the concept of self, developing self awareness and orientation to field work.
CO3	To be familiarized with the professional role of Social Workers
CO4	To practice the methods of working with individuals and groups.

NON-GOVERNMENTAL ORGANIZATIONS

SEMESTER –V

CO1	To understand the fundamental concepts and components of community, community organization and social action
CO2	To understand the models of community organization and social action
CO3	To understand the relationship of community organization and social action with other methods of social work
CO4	To understand various social movements in India.

SOCIAL PROBLEMS AND WELFARE SERVICES IN INDIA

SEMESTER -VI

CO1	Acquaint themselves with the basic concepts of Sociology like society, community, association, culture, social change, social stratification etc..
CO2	Know the basic social institutions like family, marriage, kinship in a scientific way
CO3	Explain social change and the factors affecting social change. Realize the importance of cultural lag to understand social change.
CO4	Learn about the Constitutional Provision for the protection of minorities and other weaker section in India.

SOCIAL WORK ON HIV/AIDS

SEMESTER-VI

CO1	. To acquire a basic understanding of the concept of health and well-being in the context of development
CO2	To build an understanding of the basic health care system in India and health care access
CO3	To develop a knowledge base of the national health policy and programs
CO4	To gain knowledge about HIV.

COURSE OUTCOMES

Economics

Micro Economics – Consumer Behavior

Semester I

CO1	To gain knowledge on how households (demand) and business (supply) firms interact in various market structures to determine price and quantity of a good produced.
CO2	To Understand that Economics is about the allocation of scarce resources, that scarcity forces choice, trade-offs exist and that every choice has an opportunity cost.
CO3	To Demonstrate the concepts of Micro Economics using a production possibility frontier diagram.
CO4	To understand how comparative advantage provides the basis for gains through trade.

Micro Economics - Production and Price theory

Semester II

CO1	To understand Producers equilibrium with the help of isoquants, expansion path and elasticity of substitution
CO2	To understand Different types of markets and their features

CO3	To identify and list the determinants of the demand and supply for goods in a competitive market and explain how that demand and supply together determine equilibrium price.
CO4	To demonstrate marginal productivity theory of distribution, theory of wages, identify different types of rent, illustrate different theories of interest and profit.

Macro Economics - National Income, Employment and Money

Semester III

CO1	To understand the difference between Micro and Macro Economics, importance of macro Economics and Macro Economic variables
CO2	To be able to define and explain the process of calculating national income, identify its components, demonstrate circular flow of income, analyse the various identities with government and international trade
CO3	To Demonstrate the meaning and functions of money, illustrate various versions of quantity theory of money
CO4	To explain the meaning of consumption function, relationship between APC and MPC, consumption and income, concept of multiplier and accelerator, MEC and rate of interest.

Macro Economics - Banking and International Trade

Semester IV

CO1	To analyse different phases of trade cycles, demonstrate various phases of trade cycles, understand the impact of cyclical fluctuations on the growth of business, and lay policies to control trade cycles.
CO2	To Illustrate the meaning of inflation, identify different kinds of inflation, causes and effects of inflation on different sectors of the economy, describe different measures to control it.
CO3	To Identify types of banks, explain the meaning and functions of commercial banks, illustrate how bank create credit, and suggest the instruments to control it
CO4	To Explain economic growth and development, determinants of economic development and measurement of economic development.

Economic Development and Indian Economic

Semester V

CO1	To develop ideas of the basic characteristics of Indian economy and Andhra Pradesh economy
CO2	To understand 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.
CO3	To Understand agriculture as the foundation of economic growth and development, analyse the changing nature of agriculturalsector and its contribution to the Indian economy
CO4	To be aware of the economy as a whole, and to understand the basic features of Andhra Pradesh's economy, sources of revenue, how the state government finance its progrmmes and projects.

Indian and Andhra Pradesh Economy

Semester V

CO1	To understand the meaning and difference of internal and external trade
CO2	To Understand the different theories of international trade
CO3	To analyze the protection policy of the international trade.
CO4	To assess the recent trends in the foreign trade, EXIM policy and FDI in India

COURSE OUTCOMES

Geography

Geography of India

SEMESTER –I

CO1	To gain the knowledge of Physical features of India, Climate, Soils, Rivers and Vegetation
CO2	To understand the issues of Population of India and Migration
CO3	To have knowledge of Human Settlements in India and Urbanization
CO4	To understand the varieties of resources of India with special emphasis on Minerals and fuels of India

Physical Geography – I

SEMESTER –II

CO1	To know the details of the Interior of the earth and theories of Isostacy, Continental drift and understand the Major landforms
CO2	To acquire knowledge of Earth quakes and Volcanoes and understand the classification of Rocks Weathering the Erosion
CO3	To have the knowledge of landforms process and development of River, Wind and Wave action

CO4	To gain the knowledge of landforms process and development of Karst and Glacial action

Physical Geography-II

Semester-III

CO1	To know the difference between Weather and Climate and knowledge of Atmospheric structure and composition, Insolation, Temperature and atmospheric pressure and knowledge of pressure belts
CO2	To acquire the knowledge of Winds and their classification, atmospheric disturbances and understand the Humidity and Precipitation
CO3	To acquire the knowledge of Sub-Marine relief features of Ocean, Salinity and Temperature of Oceans
CO4	To understand about the Wave and Tides and knowledge of Ocean Current and Deposits

Human Geography

SEMESTER –IV

CO1	To acquire the knowledge of objectives of Human and Economic Geography and their activities
CO2	To have the knowledge of Man and Environment and Resources
CO3	To acquire the knowledge of Major Human races and to know the knowledge of Population growth and their distribution
CO4	To acquire the knowledge of Human settlements and Urbanization

	and to understand the different crop patterns in the World

Introduction to Geographical Information System(GIS)

SEMESTER-V

CO1	To acquire the knowledge of Fundamentals of Geographical Information System, Data output, Input, Data Storage and Analysis
CO2	To understand Components of Geographic Information System
CO3	To have good knowledge of Data base Management System, Functions and Analysis
CO4	To have the knowledge of relation between R.S and GIS

Regional Geography of Asia - I (A1 Cluster)

Semester-VI

CO1	To know the knowledge of Relief and Physical aspects of Asia
CO2	To acquire the knowledge of Natural Vegetation and Agriculture of Asia
CO3	To acquire the knowledge of Minerals and Industries of Asia
CO4	To understand the issues of Population and Urbanization

Regional Geography of A.P (B1 Cluster)

CO1	To acquire the knowledge of physical aspects,climate and drainage system of Andhra Pradesh
CO2	To understand the different types of soils and vegetation
CO3	To acquire the knowledge of Agriculture, Irrigation Projects and Minerals
CO4	To acquire the knowledge of Population and Settlements

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Program Outcomes (POs) Course Outcomes (COs)

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DEPARTMENT OF MICROBIOLOGY

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PO1: Foster learning through accumulation of knowledge in Science.

PO2 :Identify complex problems in the society which can be addressed through science.

PO3 :Formulate strategies and design experiments to address the societal problems using first principles of basic sciences and applied sciences.

PO4 :Adopt appropriate scientific techniques and resources to solve societal issues with an understanding of the limitations.

PO5 :Critically and analytically evaluate and interpret research based data to provide valid conclusions and solutions.

PO6: Demonstrate leadership qualities by working collaboratively in a team, to set goals, communicate scientific information to stakeholders, comprehend and write reports, develop documentation, make presentation and to give and receive clear instructions.

PO7: Apply ethical principles, commit to professional ethics and responsibilities and norms of the scientific practice.

PO8: Engage in life-long learning in the broadest context of scientific advancement.

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COURSE OUTCOMES

SEMESTER –I

General Microbiology

CO1	Apply concepts of microscopy for identifying various microbes
CO2	Experiment different microbial culturing techniques
CO3	Distinguish bacteria based on taxonomy
CO4	Summarize factors on microbial growth
CO5	Classify the virus based on structure, and replication

SEMESTER -I

Bacteriology and Virology

CO1	To familiarize with basics of enzymes, their kinetics, mechanism of inhibition, enzyme units and underlying principle of measurement of enzyme activity.
CO2	To learn the laboratory method of Isolation and purification of extracellular enzymes and determination of Km and Vmax value for that enzyme.
CO3	Classify the virus based on structure, and replication
CO4	To understand the importance, principle and types of chromatography techniques and their role in the study quantitave Distinguish lytic and lysogenic viruses
CO5	Interpret concepts of recombination in phages. Summarize applications of viruses in various areas

SEMESTER –I

Biomolecules

CO1	Appreciation of the role of water in biological system.
CO2	Ability to comprehend the structure, function and acid base properties of amino acids.
CO3	Introduction to the structure, properties and roles of carbohydrates.
CO4	Appreciation of the varied roles of lipids including distribution in different biological membranes
CO5	Understanding nucleic acid chemistry and structure.

SEMESTER –I

Analytical Techniques

CO1	To understand the principles, instrumentation, types of centrifuge with an emphasis on applications of Analytical centrifuge. To impart knowledge on various techniques of purification of bio molecules by chromatography and their application.
CO2	To become equipped with the operational principle and working methods of spectral instruments
CO3	To procure knowledge on the principles and techniques of various types of electrophoresis with emphasis on recovery and identification of electrophoresed molecules

CO4	To acquaint the concept of radioactivity and its types of decay. To describe the methods of detection and measurement of radioactivity based on different principle
CO5	LApplication of knowledge for the characterization of Biomolecules.

SEMESTER –II

Microbial Physiology and Metabolism

CO1	To get an insight into the various biochemical principles governing the physiology of microorganisms.
CO2	To familiarize with the characteristic, types and structural features of important bio-molecules (carbohydrate, protein, lipid, amino acids) that form the building block of cellular organisms.
CO3	To develop the concept on the type, nature and other features of enzyme molecules that controls the different physiological processes of microbes and other cellular organisms.
CO4	Comprehend the concept of bioenergetics and thermodynamic principles in biology.
CO5	Understand the physiological importance and metabolism of vitamins.

SEMESTER –II

Cell Biology and Enzymology

CO1	To get an insight into the concept of prokaryotic and eukaryotic cells, and different cell organelles and functional role in cellular life.
CO2	To learn the basis of cell to cell communication in cellular life and the mechanism of cellular signaling maintained by them.
CO3	Knowledge about the basic properties and characteristics of enzymes and their action; insights into the factors affecting enzyme activity.
CO4	Outline of the inhibitors of enzymes and their clinical importance..
CO5	Students will learn about the kinetics of enzyme catalyzed reactions and bisubstrate reactions

Molecular and Microbial Genetics

CO1	State the fundamentals of microbial genetics, processes behind mutations and other genetic changes.
CO2	Compare the structural variations of DNA and genome organization
CO3	Illustrate Replication, Transcription ,translation and gene regulation
CO4	Differentiate between the process of DNA replication in bacteria and viruses.
CO5	Assemble the knowledge of fungal and phage genetics and the structure and function of YACs and YIPs with their applications in genetic engineering.

SEMESTER –II

Immunology

CO1	Name the components of the immune system and their biological functions
CO2	Discuss the concepts behind blood grouping and Rh incompatibilities.
CO3	Demonstrate the technical knowhow of diagnostic techniques in immunology.
CO4	Distinguish the immunological disorders among human population.
CO5	Recommend the medical applications of immunology in disease diagnosis and immunotherapy.

SEMESTER-III

Molecular Microbiology

CO1	Recall the significance of central dogma of gene action
CO2	Summarize the structure and properties of DNA and RNA in both prokaryotic and eukaryotic cell.
CO3	Illustrate the central molecular biological processes and their regulation
CO4	Compare and contrast the molecular processes between prokaryotic and eukaryotic systems
CO5	Appraise the differences in the regulation of molecular processes between prokaryotic and eukaryotic systems

Genetic Engineering

CO1	Discuss the process of cloning and expression of gene and other techniques in genetic engineering & Biotechnology
CO2	Perform DNA extraction from bacterial cell and estimation of purity.
CO3	Perform PCR assays and DNA manipulations techniques.
CO4	Acquiring knowledge of mechanisms of cell membrane transport.
CO5	Explain the application of modern biotechnological tools in cutting-edge research

Bioinformatics, Microbial Genomics & Proteomics

CO1	Operate various softwares to examine the data collected
CO2	Assess different biological databases, sequence alignment and phylogenetics
CO3	To urderstand various operators like position , momentum & energy
CO4	Discuss the basic background of proteomic and various tools and their application in understanding the proteome and its analysis
CO5	Introduces various programming and software tools involved in genome annotation, mol. Phylogeny.

Medical Microbiology

CO1	State the significance of normal human flora, various host-pathogen interactions, and human microbiome project.
CO2	Discuss the pathogenicity, epidemiology, laboratory diagnosis, treatment, and prevention of important bacterial diseases
CO3	Illustrate the pathogenicity, epidemiology, laboratory diagnosis, treatment, and prevention of significant viral diseases.
CO4	Illustrate the pathogenicity, epidemiology, laboratory diagnosis, treatment, and prevention of significant viral diseases.
CO5	Assemble the concept of collection, transport, and processing of major clinical samples and immunomolecular diagnostic methods.

SEMESTER –IV

Fermentation Technology & Industrial Microbiology

CO1	Know about the design of bioreactors, factors affecting growth, strategies of upstream processing and downstream processing, and design for microbial fermentation
CO2	Discuss the strategies for various culture preservation techniques, microbial strain improvement methods and industrial media formulation.
CO3	Assemble the knowledge of patent laws, their legal implications, handling and disposal of bio-hazardous materials, good laboratory and manufacturing practices.
CO4	knowledge about - combining living matter, in the form of organisms or enzymes, with nutrients under specific optimal conditions to make a desired product
CO5	Antibiotics, synthetic antimicrobial agents and Regulations aspects in pharmaceutical industry

Environmental Microbiology

CO1	Gain knowledge on the microorganisms present in the environment
CO2	Examine the types of microorganisms in the environment
CO3	To urderstand various operators like position , momentum & energy
CO4	Formulate methods for exploiting microorganisms for human benefit
CO5	To Explain the interactions between Microorganisms and the food environment and factors influencing their growth and survival

Food and Agriculture Microbiology

CO1	To understand the principles of microorganisms during various food-processing and preservation steps.
CO2	To comprehend the interactions between microorganisms, food, environment, and factors influencing their growth and survival.
CO3	To get an insight view of the concepts and types of antibody, antigen -antibody reactions, vaccines, immunization programme and antibiotics
CO4	To understand the identification of diseases by performing the diagnostic tests and estimation of potency of antibiotic by various microbial assay
CO5	Be able to diagnose plant diseases caused by various microbes and concept of biopesticides to cure these diseases.

Biostatistics & Research Methodology

CO1	Describes the mathematical tools involved in evaluation of the various dataset generated and their evaluation via statistics.
CO2	Student will be able to understand explain and apply the biostatistics, computer andresearch methodology during his further studies.
CO3	Assemble the knowledge of patent laws, their legal implications, handling and disposal of bio-hazardous materials, good laboratory and manufacturing practices.
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CO3	Assemble the knowledge of patent laws, their legal implications, handling and disposal of bio-hazardous materials, good laboratory and manufacturing practices.

Dr. C.S.N. DEGREE & P.G. COLLEGE

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DEPARTMENT OF BIOTECHNOLOGY

Dr. C.S.N. DEGREE & P.G. COLLEGE
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PROGRAM OUTCOMES

PSO-1: Have basic and advanced understanding of Biotechnology in its various domains including, health, nutrition, agriculture, biodiversity conservation, Biosafety etc.

PSO-2: Address research questions related to all the above mentioned domains through carrying out specific experiments.

PSO-3: Appear and successfully qualify the higher level examinations of various agencies like DBT(Department of Biotechnology), CSIR (Council of Scientific and Industrial Research), ARS (Agriculture Research Services), ICAR(Indian Council of Agriculture Research),and many more, so as to get chance to do research from reputed institutes within country and abroad with sound fellowships

PSO-4: Have enough subject knowledge to move ahead in entrepreneurship endeavors in biotechnology. Students will be able to demonstrate their ability to apply biotechnological research strategies to provide potential solution for global environmental issues like climate change, Acid rain, ozone depletion, industrial waste treatment and bioremediation etc

PSO5: Postgraduate students will be able to demonstrate and apply their knowledge of cell biology, biochemistry, microbiology and molecular biology to solve the problems related to the field of biotechnology.

PSO6: Postgraduate students will be able to demonstrate and apply the principles of bioprocess engineering in the design, analysis, optimization and simulation of bioprocess operations.

PSO7: Students will be able to gain fundamental knowledge in animal and plant biotechnology and their applications.

PSO8: Students will be equipped to understand three fundamental aspects in biological phenomenon: a) what to seek; b) how to seek; c) why to seek?

PSO9: Student will be able to (a) Describe fundamental molecular principles of genetics; (b) Understand relationship between phenotype and genotype in human genetic traits; (c) Describe the basics of genetic mapping; (d) Understand how gene expression is regulated.

PSO10: Students will be able to (a) To elaborate concepts of biochemistry with easy to run experiments; (b) To familiarize with basic laboratory instruments and understand the principle of measurements using those instruments with experiments in biochemistry.

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COURSE OUT COMES

SEMESTER-I

Cell Biology

CO1	Be able to understand about the functions of different cellular components and cellular level
CO2	Be able to understand about the role of cytoskeleton in cell shape, support and movement inside the cell.
CO3	Be able to interpret the way of transport of different molecules across the plasma membrane.
CO4	Be able to interpret about the relationship between neighboring cells and extracellular environment as well as response of different cells against different type of signaling molecules.
CO5	Be able to get inside the molecular event of cell cycle and cancer to understand possible mechanism and cure.

Biomolecules

CO1	Understanding the laws of thermodynamics, concepts of entropy, enthalpy and free energy changes and their application to biological systems and various biochemical studies and reaction
CO2	Students will be able to demonstrate an understanding of fundamental biochemical principles, such as the structure/function of bimolecular, metabolic pathways, and the regulation of biological/biochemical processes.
CO3	Students will gain proficiency in basic laboratory techniques in both chemistry and biology, and be able to apply the scientific method to the processes of experimentation and hypothesis testing..
CO4	Students will be able to apply and effectively communicate scientific reasoning and data analysis in both written and oral forums.
CO5	Students will understand and practice the ethics surrounding scientific research.

Microbiology

CO1	To understand the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, hot air oven, light microscope, pH meter) used in the microbiology laboratory. Students also learn the basics of preparing common microbial media used for isolation and maintenance of microbial isolates.
CO2	To understand the basic microbial structure and function and study the comparative characteristics of prokaryotes and eukaryotes and the structural similarities and differences among various physiological groups of bacteria/archaea..
CO3	To get an insight into the laboratory techniques for the isolation and enumeration of microorganisms from different environmental spheres like soil, water and air.
CO4	Students also learn the basics of isolating bacteria in pure cultures by streaking method and determination of bacterial growth curve. To understand general bacteriology and microbial techniques for isolation of pure cultures of bacteria and fungi.

Analytical Technique

CO1	The student will learn the various analytical techniques and their applications in separation and isolation of cells and tissues for studying their functional abnormalities
CO2	The practicals will provide the expertise to the student for quantification of electrolytes and other metal ions, hormones and identification of bacteria
CO3	The expertise gained by the student in this course can be useful in food industries, pharma industries, clinical and microbiological labs.
CO4	Students will learn about the principle and applications of

	spectrophotometry and flourimetry. Students will learn the principle of various chromatographic techniques like gel filteration, Ion exchange
CO5	Students will learn about electrophoretic techniques, their principle and applications in analyzing proteins and nucleic acids Students will learn about the basic rules of sedimentation, various types of centrifuges and rotors. Students will learn about various microscopes and slide preparation, histology and staining techniques..

SEMESTER-II

Molecular Biology

CO1	Students will learn about the complexity of DNA double helix structure, nature of nuclotides, melting of DNA and understand the importance of supercoiling of DNA Understand the details of DNA replication and importance of various proteins and enzymes involved in replication and application of inhibitors
CO2	Students will be able understand the application of renewable sources and explain their conversion process to meet the energy demand.
CO3	To Know about the Structure ,types,functions of RNA and ribosomes and genetic code
CO4	Clarify application of microorganisms in varied fields of environmental biotechnology like bioremediation, biofertilizers and waste water treatment, organic waste management.
CO5	Describe role of microorganism in recycling soil nutrients, biodegradation of complex plant polymers, sustaining and improving plant growth through improving nutrient availability, production of plant growth promoting substances and inhibiting pathogens

Enzymology

CO1	Knowledge about the basic properties and characteristics of enzymes and their action; insights into the factors affecting enzyme activity.
CO2	Students will learn about the kinetics of enzyme catalyzed reactions and bisubstrate reactions
CO3	Outline of the inhibitors of enzymes and their clinical importance..
CO4	To have the concept of different terminologies in understanding enzymes as well as their historical perspective. The students can earn the knowledge of different applications of enzymes in various industry and medical field.
CO5	To learn about the structure, classification, nomenclature, inhibition, kinetics of the enzymes the knowledge of which is useful for application in medical field to cure diseases arising due to non-functional or absence of enzymes.

Immunology

CO1	To learn about the basic mechanisms, distinctions and functional interplay of innate and adaptive immunity and the cellular/molecular pathways of humoral/cell-mediated adaptive responses.
CO2	To learn about the structure,classes,types of Antibody and Antigens and factors affecting antigenicity.
CO3	To understand how disease causing microorganism can be used as a weapon to fight against the same microorganism.
CO4	To get better understanding about vaccination, blood transfusion, grafting etc.
CO5	To gain knowledge that helps to take up research to find medicines for present incurable diseases.

Bioinformatics and Biostatistics

CO1	To develop an understanding of basic theory of computational tools to solve biological problems
CO2	To gain working knowledge of these computational tools and methods in order to validate and facilitate wet lab work
CO3	To appreciate, apply & develop relevant algorithms for investigating specific contemporary biological questions across scientific community.
CO4	Critically carry out the biological data analysis and interpret results using advanced statistical tools & methods.
CO5	To develop an understanding of basic theory of computational tools to solve biological problems.

SEMESTER-III

Cell culture Technology and Tissue Engineering

CO1	Knowing and understanding the principles of cell culture techniques
CO2	Managing to manipulate with cell cultures
CO3	Knowing and understanding the cell culture problems and possibilities.
CO4	Knowing required conditions for cell cultures, knowing of media and the equipment required for cell culture.
CO5	Ability to characterize cell culture problems, present possibilities, applications and future perspectives

Plant Biotechnology

CO1	To gain and apply knowledge of Biotechnology, Science and Engineering concepts to solve problems related to field of Biotechnology. Be able to understand the production of useful products using metabolic engineering and importance of IPR
CO2	To design, perform experiments, analyze and interpret data for investigating complex problems in biotechnology Engineering and related fields.
CO3	To demonstrate knowledge of project and finance management when dealing with Biotechnology Engineering problems
CO4	To gain concept of vaccines and transgenic plant and animal production. Be able to understand the production of useful products using metabolic engineering and importance of IPR
CO5	Be able to understand the utility of PGPR and genetic engineering technique for quality production.

Animal and Aquaculture Biotechnology

CO1	Explaining the evolution of marine biology.
CO2	Summarize aquatic habitats to acquire knowledge
CO3	Translate the significance of biotechnological implementations in marine and aquatic sector y
CO4	Formulate ideas for the production of genetically modified organisms.
CO5	Having a clear understanding of the subject related concepts and contemporary issues. Utilize the concept of molecular techniques involved in animal conservation.

Medical and Environmental Biotechnology

CO1	Evaluate the biology of various diseases. Assess disease etiology, respective diagnosis, and molecular therapeutic approaches
CO2	Students will be able understand the application of renewable sources and explain their conversion process to meet the energy demand.
CO3	To learn about Ecology, various ecosystems, Bio-geo chemical cycles.
CO4	Clarify application of microorganisms in varied fields of environmental biotechnology like bioremediation, biofertilizers and waste water treatment, organic waste management.
CO5	Discover various diagnostic methods and imaging techniques. Relate histocompatibility, transplantation and stem cell culture

SEMESTER –IV

Industrial Biotechnology

CO1	To learn about important Microorganisms. variousMedium and Inoculum Preparation.
CO2	To have knowledge on types of bioreactors. Analysis of various types of bioreactors
CO3	To have knowledge about fermentation, Production of Citric Acid by by Fermentations.
CO4	To acquire knowledge about various of recombinant proteins having therapeutic and diagnostic applications

.

Genetic Engineering and Gene Transfer Techniques

CO1	The ultimate goal of this subject is to develop student's understanding towards the identification and characterization of proteins expressed in a genome.
CO2	Learn on assigning gene function through mutagenesis and genetic engineering and will be able to conduct gene expression profiling.
CO3	This subject will cover recent developments in genetics, epigenetics, small RNAs, proteomics, gene expression, mutagenesis and mapping genes.
CO4	Acquire skills in the techniques of Site directed mutagenesis, Transposon tagging and targeted genome editing technologies.
CO5	It aims to teach students advanced technologies, research methods with major emphasis on the applications of DNA sequencing and protein analysis techniques

Proteomics and Genomics

CO1	Describe the basics in the field of proteomics
CO2	Classify various techniques that are used in the study of proteomics. Illustrate the biological importance of protein-protein interaction, modeling and protein database, and their clinical relevance
CO3	Compare different methods available to study DNA and RNA sequence analyses
CO4	Build a foundation in the fundamental principles of genomics
CO5	Apply genomic data to provide new insights in the fields of biology and medicines

Bioethics, IPR and Research Methodology

CO1	The primary objectives of this course are to identify and discuss the role and importance of research in sciences.
CO2	The course identifies and discusses the complex issues inherent in selecting the research problem, research design and implementing a research project
CO3	This subject will introduce basic concepts of ethics and safety that are essential for different disciplines of science and procedures involved and protection of intellectual property and related rights.
CO4	To understand the risks, ethics and safety of biotechnology based research and products related to various environmental factors.
CO5	To collect data relating to variables which will be examined and calculate descriptive statistics from these data

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DEPARTMENT OF BIOCHEMISTRY

PO-1: Understand biochemistry at the atomic level, draw molecules and reaction mechanisms perfectly.

PO-2: Understand in detail about amino acid structures, types of amino acids, classifications, structure of proteins and types of proteins.

PO-3: Learn the molecular structures of 20 amino acids, differentiating essential and non-essential amino acids, biologically important modified amino acids and their functions.

PO-4; Recognize thes tructural levels of organization of proteins,3D structure of proteins, its functions, denaturation (hemoglobin, myoglobin etc.).

PO-5: Learn how amino acids and proteins are metabolized, emphasizing the role of few intermediates of their metabolism, monitoring the deficiency and abundance disorders of amino acid metabolisms and the role of enzymes in the regulation of the pathways

PO-6: Describe/recognize lipid and porphyrin structures, lipoproteins and functions of porphyrins (heme, chlorophyll etc.). Code Course Title HPW Credits BI 101T Chemistry and Metabolism of Proteins and Lipids and Porphyrins (core) 4 4

PO-7: Describe what happens: - when lipids are metabolized, cholesterol, prostaglandins etc. are synthesized, emphasizing the genetic defects of lipid metabolism.

PO-8: Understand the relationship between the properties of macromolecules and cellular activities, cell metabolism and chemical composition

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COURSE OUTCOMES

SEMESTER-1

Cell Biology

CO1	Be able to understand about the functions of different cellular components and cellular level
CO2	Be able to understand about the role of cytoskeleton in cell shape, support and movement inside the cell.
CO3	Be able to interpret the way of transport of different molecules across the plasma membrane.
CO4	Be able to interpret about the relationship between neighboring cells and extracellular environment as well as response of different cells against different type of signaling molecules.
CO5	Be able to get inside the molecular event of cell cycle and cancer to understand possible mechanism and cure.

Biomolecules

CO1	Describe the chemical and molecular foundations of life and the role of energy rich compound in biological systems
CO2	Define the structure, properties and roles of carbohydrates.
CO3	Classify the nature, structure and importance of enzymes in living systems.
CO4	Explain the structure, properties and roles of lipids in biological system.
CO5	Discuss structure, function and acid base properties of amino acids.

Microbiology

CO1	To understand the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, hot air oven, light microscope, pH meter) used in the microbiology laboratory. Students also learn the basics of preparing common microbial media used for isolation and maintenance of microbial isolates.
CO2	To understand the basic microbial structure and function and study the comparative characteristics of prokaryotes and eukaryotes and the structural similarities and differences among various physiological groups of bacteria/archaea..
CO3	To get an insight into the laboratory techniques for the isolation and enumeration of microorganisms from different environmental spheres like soil, water and air.
CO4	Students also learn the basics of isolating bacteria in pure cultures by streaking method and determination of bacterial growth curve. To understand general bacteriology and microbial techniques for isolation of pure cultures of bacteria and fungi.
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Analytical Techniques

CO1	The student will learn the various analytical techniques and their applications in separation and isolation of cells and tissues for studying their functional abnormalities
CO2	The practicals will provide the expertise to the student for quantification of electrolytes and other metal ions, hormones and identification of bacteria
CO3	The expertise gained by the student in this course can be useful in food industries, pharma industries, clinical and microbiological labs.
CO4	Students will learn about the principle and applications of spectrophotometry and flourimetry. Students will learn the principle of various chromatographic techniques like gel filteration, Ion exchange
CO5	Students will learn about electrophoretic techniques, their principle and applications in analyzing proteins and nucleic acids Students will learn about the basic rules of sedimentation, various types of centrifuges and rotors. Students will learn about various microscopes and slide preparation, histology and staining techniques..

SEMESTER –II

Molecular Biology

CO1	Students will learn about the complexity of DNA double helix structure, nature of nuclotides, melting of DNA and understand the importance of supercoiling of DNA Understand the details of DNA replication and importance of various proteins and enzymes involved in replication and application of inhibitors
CO2	Students will be able understand the application of renewable sources and explain their conversion process to meet the energy demand.
CO3	To Know about the Structure ,types,functions of RNA and ribosomes and

	genetic code
CO4	Clarify application of microorganisms in varied fields of environmental biotechnology like bioremediation, biofertilizers and waste water treatment, organic waste management.
CO5	Describe role of microorganism in recycling soil nutrients, biodegradation of complex plant polymers, sustaining and improving plant growth through improving nutrient availability, production of plant growth promoting substances and inhibiting pathogens

Enzymology

CO1	Knowledge about the basic properties and characteristics of enzymes and their action; insights into the factors affecting enzyme activity.
CO2	Students will learn about the kinetics of enzyme catalyzed reactions and bisubstrate reactions
CO3	Outline of the inhibitors of enzymes and their clinical importance..
CO4	To have the concept of different terminologies in understanding enzymes as well as their historical perspective. The students can earn the knowledge of different applications of enzymes in various industry and medical field.
CO5	To learn about the structure, classification, nomenclature, inhibition, kinetics of the enzymes the knowledge of which is useful for application in medical field to cure diseases arising due to non-functional or absence of enzymes.

Immunology

CO1	To learn about the basic mechanisms, distinctions and functional interplay of innate and adaptive immunity and the cellular/molecular pathways of humoral/cell-mediated adaptive responses.
CO2	To learn about the structure,classes,types of Antibody and Antigens and factors affecting antigenicity.
CO3	To understand how disease causing microorganism can be used as a weapon to fight against the same microorganism.
CO4	To get better understanding about vaccination, blood transfusion, grafting etc.
CO5	To gain knowledge that helps to take up research to find medicines for present incurable diseases.

Bioinformatics and Biostatistics

CO1	To develop an understanding of basic theory of computational tools to solve biological problems
CO2	To gain working knowledge of these computational tools and methods in order to validate and facilitate wet lab work
CO3	To appreciate, apply & develop relevant algorithms for investigating specific contemporary biological questions across scientific community.
CO4	Critically carry out the biological data analysis and interpret results using advanced statistical tools & methods.
CO5	To develop an understanding of basic theory of computational tools to solve biological problems.

SEMESTER –III

Endocrinology

CO1	Understand the basic classification of Hormones
CO2	Understand the structure synthesis, degradation of hormones
CO3	Describe the metabolic aspect of hormones
CO4	Illustrate the signal transduction process
CO5	Describe the various types of receptor fro secreted molecules

Physiology and Bioenergetics

CO1	Understand Anatomy & Physiology of various systems in Human which gives a clear picture about various systems and their respective disorders.
	Comprehend the concept of bioenergetics and thermodynamic principles in biology.
CO3	Describe the biological membranes in the physical and chemical mechanisms involved in the energy transformations associated with ATP formation in respiration and photosynthesis.
CO4	Explain the chemical, thermodynamic and structural bases of energy transformations for ATP formation and for the cell tasks of biosynthesis, transport and mechanics
CO5	Apply open-system thermodynamics to the study of energy in living systems

Intermediary Metabolism

CO1	Students will learn the concepts of metabolism with an emphasis on glycolysis and gluconeogenesis
CO2	Students will learn about glycogen synthesis, breakdown, glycogen storage diseases, Calvin cycle C3 and C4 pathways in plants
CO3	The students will learn about overview, enzymes and regulation of citric acid cycle and glyoxylate cycle in plants. They will also learn about hormonal regulation of carbohydrate metabolism and diseases associated with metabolic irregularities.
CO4	The students will learn about lipid digestion, Fatty acid oxidation, and Ketone-body metabolism. Students will gain insight into de novo synthesis and degradation of purine and pyrimidine nucleotides, regulation and

	salvage pathways. Further, the students will learn about the inhibitors of nucleotide metabolism and disorders related to purine and pyrimidine metabolism.
CO5	The students will learn about synthesis of saturated, unsaturated, odd and even chain fatty acids and regulation of fatty acid metabolism. They will also learn about the synthesis of glycerophospholipids and sphingolipids. Cholesterol metabolism, diseases associated with abnormal lipid metabolism

Gene regulation and Genetic Engineering

CO1	The ultimate goal of this subject is to develop student's understanding towards the identification and characterization of proteins expressed in a genome.
CO2	Learn on assigning gene function through mutagenesis and genetic engineering and will be able to conduct gene expression profiling.
CO3	This subject will cover recent developments in genetics, epigenetics, small RNAs, proteomics, gene expression, mutagenesis and mapping genes.
CO4	Acquire skills in the techniques of Site directed mutagenesis, Transposon tagging and targeted genome editing technologies.
CO5	It aims to teach students advanced technologies, research methods with major emphasis on the applications of DNA sequencing and protein analysis techniques

SEMESTER –IV

Plant and Environmental Biochemistry

CO1	All students will gain experience in critical thinking through discussions and a critique on a scientific article and graduate student will gain experience at writing a grant pre-proposal
CO2	This course includes topics in photosynthesis, carbohydrates, nitrogen and lipid metabolism, specialized metabolism and plant metabolic engineering. Flux and genomics-based techniques, such as proteomics, transcriptomics and metabolomics are discussed in relation to metabolism.
CO3	All students will gain experience in critical thinking through discussions and a critique on a scientific article and graduate student will gain experience at writing a grant pre-proposal.
CO4	understand the current applications of biotechnology to environmental quality evaluation, monitoring and remediation of contaminated environments.
CO5	The aim of environmental biochemistry is to teach students to monitor the environmental pollution. As main goals are pointed out the following: 1 - To identify monitoring parameters used in water and wastewater characterization 2 - To describe the main technologies applied in effluent treatment

Clinical Biochemistry and Human Nutrition

CO1	General health and common diseases, To learn how to analyse the samples (Blood, urine, pleural fluid, synovial fluid, cerebro spinal fluid and tissues and histology)
CO2	Aquire knowledge on detection of body metabolites and its importance, liver function and kidney function
CO3	diagnostic importance of various metabolic disorders and clinical aspects of various metabolic disorders.
CO4	Students will gain the knowledge regarding nutritional classification of food, method and media of cooking, nutritive value and processing, storage of plant based foods.
CO5	Understand the functions and sources of nutrients, role of nutrients in maintenance of goof health. Gain knowledge about food pyramid, vegetarian diet, menu planning and nutritional needs during infancy to adolescents.

Applied Biochemistry and cancer biology

CO1	*Applied Biochemistry* provides a forum for case studies and practical concepts of biotechnology, utilization, including controls, statistical data analysis, problem descriptions unique to a particular application, and bioprocess economic analyses.
CO2	identify the inborn error of CHO metabolism by its genetic defect. compare different types of lipoproteins disorders. Describe the biochemical basis of prophyria.
CO3	Understand the nature of cancer and the (molecular) processes underlying cancer formation and progression.
CO4	Demonstrate knowledge of the principles underlying anti-cancer therapies.
CO5	Understand, analyse and critically assess published scientific data

Omics, Bioethics and Research Methodology

CO1	The primary objectives of this course are to identify and discuss the role and importance of research in sciences.
CO2	The course identifies and discusses the complex issues inherent in selecting the research problem, research design and implementing a research project
CO3	This subject will introduce basic concepts of ethics and safety that are essential for different disciplines of science and procedures involved and protection of intellectual property and related rights.
CO4	To understand the risks, ethics and safety of biotechnology based research and products related to various environmental factors.
CO5	To collect data relating to variables which will be examined and calculate descriptive statistics from these data

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DEPARTMENT OF CHEMISTRY

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PROGRAME OUT COMES

PO 1: Master of Science in Chemistry basically aims at the training of students with a detailed knowledge base in Chemistry of potential utility in academia as well as Industry through advanced course work and laboratory work in the department and a project work in industries or premier institutions

PO 2; To qualify NET/GATE/SET/Civil Services and other competitive examinations.

PO 3: For exploring global level research opportunities for doctoral and post-doctoral studies.

PO 4: For professional employment in different domains such as academics, industries, analytical laboratories, scientific organizations, entrepreneurship, administrative positions etc.

PO 5:For enhancing the connectivity between academic and industrial institutions.

PO 6.: Use UV, IR, and NMR to determine molecular structure.

PO 7:Lead compound medicinal chemistry research.

PO 8: Improve the student's ability in the field of organic research.

PO 9: Proper mechanisms are used to synthesize natural goods and medicines.

PO 10: Asymmetric synthesis research.

PO 11 :Determine the aromatic properties of various substances.

P 12:Determine the response processes and assign a final grade.

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COURSE OUT COMES

Semester-I

General Chemistry-I

CO1	Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in Analytical, Inorganic, Organic and Physical Chemistries. Majors to be certified by the American Chemical Society will have extensive laboratory work and knowledge of Biological Chemistry.
CO2	Students will be able to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments.
CO3	simple quantum mechanical treatments of atoms and molecules. chemical reactions involve the flow of energy
CO4	current bonding models for simple inorganic and organic molecules in order to predict structures and important bonding parameters. general periodicity patterns of (organic/inorganic) molecules, and the ability to design synthetic approaches to such species. the idea of a mole and the use of stoichiometr
CO5	fundamental atomic structure and the periodicity of elements in the periodic table

Inorganic Chemistry-I

CO1	Students learn the basics of ionic and covalent bonding, lattice energy, hydration energy
CO2	This course enables the students to understand VSEPR theory and MOT theory.
CO3	This course enables the students to understand VSEPR theory and MOT theory.
CO4	This course will Enlighten the students to understand Noble gas chemistry, Graphiticcompounds, HSAB Concept,
CO5	Theories of redox indicators and sampling techniques.

Organic Chemistry-I

CO1	Students gain an understanding of all details of aliphatic/ aromatic electrophilic substitution reactions and aromatic nucleophilic substitution reactions
CO2	Students learn about various free radical reactions and elimination reactions including pyrolytic eliminations.
CO3	Students gain an understanding of formation and hydrolysis of esters, Addition ofcarbon-carbon multiple bonds and addition to carbon-heteroatom multiple bonds.
CO4	categorize reactions based on the oxidising and reducing agents
CO5	appreciate the role of photochemistry and the significant applications

Physical Chemistry-I

CO1	To understand the theoretical basis of catalysis, corrosion and various complexreactions which find relevance in biological processes and are of industrial importance.
CO2	The students are introduced to the modern techniques developed for the practicalapplications of these concepts in different areas of science and technology.
CO3	This course enable the students to handle issues related to corrosion in the day to day life and in industrial reactors; enzyme mediated reactions in biochemistry, biotechnology and pharmaceutical chemistry etc.
CO4	This course enables the students to understand VSEPR theory and MOT theory
CO5	the basics of electrochemistry, and the relationship of electrical parameters to thermodynamic and stoichiometric parameters

General Chemistry-II

CO1	the fundamentals of acid/base equilibria, including pH calculations, buffer behavior, acid/base titrations, and their relationship to electrophiles and nucleophiles
CO2	the thermodynamic and kinetic forces involved in chemical reactions which determine how much and how soon products are formed
CO3	the basics of electrochemistry, and the relationship of electrical parameters to thermodynamic and stoichiometric parameters
CO4	current bonding models for simple inorganic and organic molecules in order to predict structures and important bonding parameters
CO5	general periodicity patterns of (organic/inorganic) molecules, and the ability to design synthetic approaches to such species.

Inorganic Chemistry-II

CO1	separate common and rare cations ..
CO2	analyse and report cations in a mixture.
CO3	estimate the metal ions in complexes..
CO4	develop skill of designing and performing the synthesis of inorganic complexes.
CO5	operate sophisticated instruments like spectronic 20D+ and UV Visible spectrophotometer.

Organic Chemistry-II

CO1	apply the reactions of carbonyl compounds to organic synthesis..
CO2	. design and analyze synthetic strategy for organic compounds and sketch the rearrangements.
CO3	construct correlation diagrams for pericyclic reaction and to predict the stereochemistry.
CO4	categorize reactions based on the oxidising and reducing agents
CO5	appreciate the role of photochemistry and the significant applications of photochemistry in research

Physical Chemistry-II

CO1	classify molecules into point groups
CO2	construct the character table for point groups
CO3	predict the IR and Raman active vibration modes for molecules based on group theory
CO4	relate uncertainty and correspondence principles for the derived wave functions from Schrodinger wave equations
CO5	distinguish radial/probability functions and curves and judge the shapes of s and p orbitals using quantum mechanical approach

Organic Reaction Mechanisms-I and Pericyclic reactions-I

CO1	Understand different types of pericyclic and photochemical reactions.
CO2	the course is to make students familiar with the concepts and applications in two important topics in advanced organic chemistry, namely concerted organic reactions and organic photochemistry..
CO3	Pericyclic reactions are concerted organic reactions and are governed by Woodward-Hoffmann rules.
CO4	Photochemical reactions of different types of carbonyl compounds.
CO5	the concepts involved in understanding organic photochemical reactions, their mechansims and applications in organic synthesis will be presented.

Organic Spectroscopy-I

CO1	Gain insight into the basic principles of UV, IR and NMR spectroscopic techniques
CO2	Use spectroscopic techniques to determine structure and stereochemistry of known and unknown compounds
CO3	Develop a sound understanding of the structure of Pharmaceutical Compounds. They will also understand the importance of different classes of drugs and their applications for treatment of various diseases
CO4	Understand the chemistry of biodegradable and conducting polymers and appreciate the need of biodegradable polymers with emphasis on basic principle
CO5	LLearn about the chemistry of natural and synthetic polymers including fabrics and rubbers. Know applications of various types of dyes including those in foods and textiles

Organic Synthesis-I

CO1	To know synthetically the processes relevant organic-chemical reactions and be able to discuss the mechanism of these reactions
CO2	Predict the basic mechanism of an organic reaction
CO3	To learn about the synthesis and applications of the organic reagents like 9-Borabicyclo(3.3.1)nonane (9-BBN) and organosilanes
CO4	Knowledge of the increasingly important role played by organic and transition metals reagents and catalysts with their corresponding proposed reaction mechanisms.
CO5	Analyze the chemistry of protection and de-protection strategies involved in hydroxyl group by ether and ester, carbonyl group, and amino groups and functional group interconversion by substitution reactions.

Chemistry of Natural Products

CO1	Learn the different types of alkaloids, glycosides & terpenes etc and their chemistry and medicinal importance
CO2	Explain the importance of natural compounds as lead molecules for new drug discovery. Learn the constituent present in crude drugs responsible for anti-diabetic activity
CO3	Discuss rDNA technology tool for new drug discovery. Explain vitamins Chemistry and Physiological significance of Vitamin
CO4	Elaborate general methods of structural elucidation of compounds of natural origin.
CO5	Elaborate general methods of structural elucidation of compounds of natural origin. Elaborate general methods of structural elucidation of compounds of natural origin.

Semester-IV

Organic Reaction MechanismsII and Organic Photochemistry

CO1	The fundamental principles of different instrumentation techniques and their use applied sciences
CO2	Basics of photochemical reactions and their use for solving advanced problems
CO3	Concept of solid state reactions.
CO4	Photochemical reactions of different types of carbonyl compounds.
CO5	Electronic properties of metals and band theory

Organic Spectroscopy-II

CO1	the absorption laws. measurement of the spectrum
CO2	Calculation of λmax values by Woodward-Fieser rules for diens, α,β-unsaturated carbonyl compounds and aromatic compounds
CO3	Principle of NMR, chemical shift, coupling constant. Equivalence/nonequivalence of protons and carbons
CO4	Factors affecting the chemical shifts. Improved NMR techniques: chemical and instrumental techniques
CO5	Principle of Mass spectroscopy. fragmentation technique. mass spectra of some chemical classes

Organic Synthesis-II

CO1	To know synthetically the processes relevant organic-chemical reactions and be able to discuss the mechanism of these reactions
CO2	Predict the basic mechanism of an organic reaction
CO3	To learn about the synthesis and applications of the organic reagents like 9-Borabicyclo(3.3.1)nonane (9-BBN) and organosilanes
CO4	Knowledge of the increasingly important role played by organic and transition metals reagents and catalysts with their corresponding proposed reaction mechanisms.
CO5	Analyze the chemistry of protection and de-protection strategies involved in hydroxyl group by ether and ester, carbonyl group, and amino groups and functional group interconversion by substitution reactions.

Bio-Organic Chemistry

CO1	Students will understand the metabolism of carbohydrates, lipids, and proteins in humans.
CO2	They will be able to describe in structures and words the metabolism of sugars through the pathways of glycolysis, the citric acid cycle, and the electron transport chain.
CO3	students will understand the structure and reactivity of organic functional groups, such as alcohols, aldehydes, carboxylic acids, and amides. For example, students will learn that aldehydes and ketones typically undergo addition reactions.
CO4	Students will understand the structure and reactivity of the biomolecules that have those functional groups. For example, students will be able to demonstrate that carbohydrates are aldehydes and ketones that undergo addition reactions to form hemiacetals and polysaccharides with acetal linkages.
CO5	apply protecting groups in organic chemistry. understand the link between molecular structure and function of biomolecules

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DEPARTMENT OF MBA

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PROGRAM OUTCOMES

P0-1. Demonstrate the knowledge of management science to solve complex corporate problems using limited resources

P0-2. Research literature and identify and analyze management research problems.

P0-3. Identify business opportunities, design and implement innovations in work space.

P0-4. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to management practice.

P0-5. Apply ethical principles for making judicious managerial decisions.

P0-6. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

P0-7.Communicate effectively with various stakeholders

PO-8.Engage in independent and life-long learning .

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COURSE OUTCOME

SEMESTER-I

Perspectives of Management

CO1	Students will be able to remember various approaches to management
CO2	Students will be able to look at multiple perspectives of empirical understanding of various organizational processes.
CO3	Students will be able to analyze the roles and functions of managers at various levels.
CO4	Students will evaluate various approaches to handling crisis in organizations and study their outcome

Accounting for Management

CO1	Students would explain the significance of basic concept, importance & functions of Management Accounting.
CO2	Students would illustrate the Vertical format of financial statements, and also tools of financial analysis such as Trend Analysis, Comparative Analysis and Common Size Statement.
CO3	Students would calculate the various ratios and would be able to discuss the significance and use of the various ratios.
CO4	Students would be able to prepare cashflow statements using Indirect method.

Business Environment

CO1	Identify and evaluate the complexities of business environment and their impact on the business.
CO2	Analyze the relationships between Government and business and understand the political, economic, legal and social policies of the country.
CO3	Analyze current economic conditions in developing emerging markets, and evaluate present and future opportunities.
CO4	Gain knowledge about the operation of different institutions in international business environment.

Managerial Economics

CO1	Describe the fundamental tools and theories of managerial economics
CO2	Analyse the demand elasticity for a product
CO3	Compare micro and macro-economic indicators
CO4	Analyse recent budget, fiscal discipline and disinvestment proposals of the government of India.

Managerial Communication Skills

CO1	Explain the differences in communication methods and the suitability according to different businesses.
CO2	Prepare and deliver effective presentations and pitches to suit various business scenarios
CO3	3 Identify common social media platforms used by businesses.
CO4	Write different types of reports with appropriate format, organization and language

Organisational Behaviour

CO1	Define fundamental accounting concepts Define fundamental accounting concepts, the elements of financial statements, and basic Accounting vocabulary
CO2	Analyse the financial, Funds flow and cash flow statements of companies
CO3	Identify the different cost concepts, cost management techniques and capital issues
CO4	Analyse the audit reports through different audit techniques

Quantitative Techniques for Management

CO1	Recognize different components of Information Technology.
CO2	Design a database.
CO3	Understand E-commerce models used in a business.
CO4	Analyze impact of E-banking on the business.

SEMESTER-II

Marketing Management

CO1	Develop an integrated marketing communications plan* for a *product**, concept, good and/or service based on an identified market need or target.
CO2	Develop strategies for the efficient and effective placement/ distribution of *products**, concepts, goods, and services that respond to evolving markets.
CO3	Plan, prepare and deliver a sales presentation or pitch that addresses the needs of the client.
CO4	Employ the management techniques of planning, organizing, directing, and controlling of marketing functions and activities in response to the business needs of the organization.

Financial Management

CO1	Demonstrate the basic functions, decisions and responsibilities of a financial manager
CO2	Evaluate the techniques of investment proposals
CO3	Enable the students to learn the art of getting things done in the modern business world.
CO4	Apply the appropriate financial management strategy

Human Resource Management

CO1	Develop a conceptual as well as practical understanding of human resource planning, deployment, maintaining HR Information
CO2	Determine the requirements of human resources in the organization
CO3	Demonstrate an understanding of HR Accounting and HR audi
CO4	Analyse HR Planning policies and practices of any three product and service organizations

Operations Management

CO1	understand the input–process–output framework, the extensions of it, and apply them to a wide range of operations
CO2	examine the types of transformation processes occurring within operations
CO3	define the roles and responsibilities of operations managers and the challenges they face
CO4	understand the content of an operations strategy and the decisions involved.

Operations Research

CO1	Solve linear programming problems using appropriate techniques and optimization solvers, interpret the results obtained.
CO2	Analyse the quantitative mathematical models for managerial decision making
CO3	Develop plans for optimum use of various resources
CO4	Formulate strategies for real business problem

Computer Applications in Management

CO1	Understand and remember the introduction, Meaning and Definition of Database, Database Environment
CO2	Remember the in details of software development process
CO3	Understand issues /challenges in analysis, design, implementation, maintenance etc.
CO4	Analyze the ability to analyze, design, verify, validate, implement, apply and maintain software systems.

Research Methodology for Management

CO1	Students who complete this course will be able to understand and comprehend the basics in research methodology and applying them in research/ project work.
CO2	This course will help them to select an appropriate research designT•
CO3	The course will also enable them to collect the data, edit it properly and analyse it accordingly. Thus, it will facilitate students' prosperity in higher education.
CO4	With the help of this course, students will be able to take up and implement a research project/ study.

Entrepreneurship

CO1	Demonstrate an understanding of entrepreneurship and types of small businesses.
CO2	Identify various environmental factors influencing entrepreneurship.
CO3	Analyse recent trends in entrepreneurial innovations and ventures of small firms.
CO4	Develop entrepreneurial decision-making skills.

VUCA management

CO1	Ensure that there is a clear understanding of VUCA leadership to eliminate misinterpretation
CO2	Gain more motivated, confident, and proficient future leaders in the organisation
CO3	Increase positive interpersonal behaviour and communication skills of individuals and leadership in the organisatio
CO4	Increase decision making, strategy, and positive leadership across the organisation

Corporate Legal Framework

CO1	DESCRIBE the key terms involved in each Act.
CO2	SUMMARIZE the key legal provisions of each Act.
CO3	LLUSTRATE the use of the Acts in common business situations.
CO4	OUTLINE the various facets of basic case laws of each Act from a legal and managerial perspective
CO5	L€arn classic and quantum mechanics

Strategic management

CO1	Demonstrate the application of costing systems in manufacturing concern
CO2	Explain different cost drivers to attain competitive advantage
CO3	Distinguish conventional and activity-based costing system
CO4	Determine COQ, BPR and TQM practices

SEMESTER-III

FINANCIAL MANAGEMENT

1.Financial Markets & Services

CO1	Examine the role of Indian financial system in the economic development
CO2	Demonstrate the constituents of Indian Financial System
CO3	Apply financial concepts for proper fund management in an organization
CO4	Integrate the functions of organized financial markets at domestic & international level

2.Security Analysis & Portfolio Management

CO1	Identify various investment avenues.
CO2	Determine the price of equity and debt instruments.
CO3	Construct bond and equity portfolio based on risk & return P
CO4	Evaluate the performance portfolio

MARKETING MANAGEMENT

1.Consumer Behaviour & Customer Relationship Management

CO1	able the students to learn the art of getting things done in the modern business world. Enable the students to learn the art of getting things done in the modern business world.
CO2	Able to explain the basic concepts and models of consumer behavior.
CO3	Able to analyze the effects of psychological, socio-cultural and demographic factors on the consumer decision process with their results.
CO4	Able to distinguish the relationship between consumer behavior and marketing practices.

2.Services Marketing

CO1	Explain the unique challenges of services marketing
CO2	To Prepare service blue printing
CO3	Examine services audit plan for services
CO4	Formulate service marketing mix for new services

HUMAN RESOURCE MANAGEMENT

1.Industrial Relations Compensation & Welfare Management

CO1	Explain the concepts of Industrial Relations
CO2	Identify the reasons for industrial disputes and their resolution
CO3	Prepare an effective mechanism for implementing labour laws
CO4	Demonstrate an understanding of various labour laws

2.Compensation & Welfare Management

CO1	Remember the elements of compensation structure
CO2	Understanding philosophy of human resources and the concept of reward strategy with special reference of compensation remuneration
CO3	Applying various costing elements by conducting a remuneration survey
CO4	Analyze the CTC (cost to company) of each employee while considering the inflation factor

SEMESTER-IV

FINANCIAL MANAGEMENT

1.Financial Derivatives

CO1	To know developnent ofquantum mecharics in Chcmistry
CO2	To learn De Broglie hypothcsis and the uncertainly principte
CO3	To urderstand various operators like position , momentum & energy
CO4	Learn to solve Sctrodingcr cquation
CO5	L€arn classic and quantum mechanics

2.Behavioral finance

CO1	To understand some psychological biases which lead to various anomalies
CO2	Identify the behavioural bias and psychological characteristics of investors.
CO3	Apply analytical skills for financial decision making.
CO4	Conduct a relative valuation for financial investments.

3.International Financial Management

CO1	Demonstrate the importance of international financial management
CO2	Determine International monitory system and exposure management
CO3	Evaluate the techniques of capital budgeting, capital structure and Working capital of an MNC
CO4	Explain International accounting procedures and taxation policies

1.Sales & Distribution Management

CO1	Demonstrate an understanding of the concept of sales and distribution management and their interrelationship
CO2	Apply skills and methods required for sales force management and their role and responsibilities
CO3	Examine the theories of rural distribution and retailing.
CO4	Understand the process of marketing logistics.

2.Advertising and Brand Management

CO1	Examine the role and importance of advertising
CO2	Analyse the task of advertising under contemporary conditions
CO3	Evaluate advertising policies, plans and campaign
CO4	Develop advertising research and media planning.

3.Retail Marketing Management

CO1	Understand the concepts of retailing and retail management
CO2	Examine the role of retail market strategies.
CO3	Identify retail management policies, pricing and promotional techniques.
CO4	Examine the retail store management and CRM practices.

1.Performance Management & Counseling

CO1	DESCRIBE key components and applicability of theories of Performance Management System
CO2	DEMONSTRATE the communication skills required when managingachievement and underachievement.
CO3	IDENTIFY factors affecting Performance Measurement
CO4	ANALYZE various tools for performance assessment
CO5	COMPARE various organizational performance management Systems and best practices.

2.Strategic Human Resources Management

CO1	Define the concept and key terms associated with the global strategic management.
CO2	Describe in detail global strategic alliance, merger and acquisitions.
CO3	Demonstrate various global organisation models in global strategic management context.
CO4	Explain globalization, innovation, and sustainability and challenges to strategic management

3.International Human Resources Management

CO1	Demonstrate the basic concepts of IHRM
CO2	Examine specific issues in IHRM
CO3	Identify the HR challenges faced by MNCs
CO4	Analyse IHRM practices in selected countries

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DEPARTMENT OF MCA

PO1: Computational Knowledge: Apply the knowledge of computing fundamentals to various real life applications to any given requirement.

PO2 Problem Analysis: Identify, formulate and solve complex computing problems reaching substantiated conclusions.

PO3 Development of Solutions: Design and evaluate solutions for complex computing problems with appropriate consideration.

PO4 Investigations of complex Computing problems: Use research-based knowledge and research methods for analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 Modern Tool Usage: Create, identify and apply appropriate techniques, resources, and modern computing tools to complex computing activities.

PO6 Professional Ethics: Understand and commit to professional ethics and cyber regulations for professional computing practices.

PO7 Life-long Learning: Identify the need and have the ability, to engage in independent learning as a computing professional.

PO8 Project management and finance: Understand and apply computing, management principles to manage multidisciplinary projects.

PO9 Communication Efficiency: Communicate effectively with the computing community and with society.

PO10 Societal and Environmental Concern: Understand and assess societal, environmental, health, safety, legal, and cultural issues.

PO11 Individual and Team Work: Function effectively in diverse teams and in multidisciplinary environments.

PO12 Innovation and Entrepreneurship: Identify a timely opportunity and using innovation to pursue that opportunity.

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COURSE OUTCOMES

Semester-I

Computer Fundamentals and Programming in C

CO1	To know developnent ofquantum mecharics in Chcmistry
CO2	To learn De Broglie hypothcsis and the uncertainly principte
CO3	To urderstand various operators like position , momentum & energy
CO4	Learn to solve Sctrodingcr cquation

Data Structures

CO1	Understand the Fundamentals and Basic concepts of C Programming.
CO2	Understand about in detail about Arrays, Functions and Pointers.
CO3	Understand the concepts of Derived Data Types and Data Structures.
CO4	Understand the concepts of Linked Lists, Trees, Graphs, Searching and Sorting

Discrete Mathematical Structures

CO1	Understand about introduction of discrete mathematical structures.
CO2	Understand the Counting Techniques and Recurrence relations
CO3	Understand about in detail about Graphs and Trees.
CO4	Understand about Boolean Algebra and Models of Computation.

Computer Organization

CO1	Understand the basics of Digital Logic Circuits and Digital Components.
CO2	Understand about the Concepts of Data Representation, Register Transfer and Micro Operations
CO3	Understand the concept of Basic Computer Organization and Design and Central Processing Unit.
CO4	Understand about the concept of Input /Output Organization and Memory Organization.

Management Accountancy

CO1	Understand the basic concept of Principles Of Accounting and Final Accounts
CO2	Understand about in detail about Ratio Analysis.
CO3	Understand about the concepts of Costing, Budget and Budgetary Control, Marginal Costing.
CO4	Understanding the Introduction To Computerized Accounting System

Semester-II

Probability, Statistics & Queuing Theory

CO1	To know developnent ofquantum mecharics in Chcmistry
CO2	To learn De Broglie hypothcsis and the uncertainly principte
CO3	To urderstand various operators like position , momentum & energy
CO4	Learn to solve Sctrodingcr cquation
CO5	L€arn classic and quantum mechanics

Database Management Systems

CO1	Able to understand the Introduction of Database System, Data Modeling Using the Entity-Relationship Model
CO2	Able to understand Relational Data Model and Relational Database Constraints, Relational Algebra and Relational Calculus, Schema Definition, Basic Constraints and Queries
CO3	Able to understand Relational Database Design, Indexing Structures for files
CO4	Able to understand Transaction Processing, Concurrency Control Techniques

Object Oriented Programming With C++ & JAVA

CO1	Understand Introduction to OOP and concept of Inheritance.
CO2	Understand about Interfaces, Packages and Enumeration, Exceptions & Assertions
CO3	Understand about MultiThreading and Applets.
CO4	Understand the concept of Event Handling and Abstract Window Toolkit.

Formal Languages & Automata Theory

CO1	Understand the concept of Finite Automata and Regular Expressions, Regular sets &Regular Grammars.
CO2	Understand the concept of Context Free Grammars and Languages, Push down Automata
CO3	Understand about Turing Machines, Universal Turing Machines and Undecidability in detail.
CO4	Understand the concept of The Propositional calculus and The Predicate calculus

Information Systems & Organizational Behavior

CO1	To know developnent ofquantum mecharics in Chcmistry
CO2	To learn De Broglie hypothcsis and the uncertainly principte
CO3	To urderstand various operators like position , momentum & energy
CO4	Learn to solve Sctrodingcr cquation

Computer Networks

CO1	Understand the basics of computer networks and Data Communication.
CO2	Understand about Data Link Layer, IEEE Standards, design issues in networks
CO3	Understand about Data Link Layer, IEEE Standards, design issues in networks
CO4	Overview of various types of Network Devices and different types of Networks

Artificial Intelligence and Expert Systems

CO1	Understand the basic concept of Artificial Intelligence.
CO2	Understand the algorithms and logics in Artificial Intelligence.
CO3	Understand about the theories and functions related to Artificial Intelligence
CO4	Understanding the concept, characteristics and applications of Expert Systems.

Design and Analysis of Algorithms

CO1	Understand about the Asymptotic Notations, Mathematical Analysis of Non-recursive and recursive Algorithms and Selection Sort and Bubble sort, Sequential Search and Exhaustive Search.
CO2	Understand about the Divide-and-Conquer technique, Decrease-and-Conquer and Transform-and-Conquer techniques
CO3	Understand the Optimal Binary Search Trees, The Knapsack Problem Prim's Algorithm, Kruskal's Algorithm, Dijkstra's Algorithm
CO4	Understand about the Decision Trees, P, NP and NP- complete problems, Backtracking, Branch-and-Bound, Approximation Algorithms for NP-hard Problems.

Operating Systems

CO1	Understand the concept of Introduction to Operating Systems and Process Management.
CO2	Understand about Process Synchronization and Deadlocks in detail.
CO3	Understand about the concept of Memory Management, File System Implementation, Mass-storage structure.
CO4	Understand the concept of Protection and Case Study.

Web Technologies

CO1	Understand the concept of Networking Protocols and OSI Model, Internetworking Concepts, Devices, Basics, History and Architecture.
CO2	Understand about TCP/IP and Electronic commerce in detail.
CO3	Understand about the concept of Web Technology and types of Web Pages.
CO4	Understand the concept of Middleware and Component-based E-commerce Architectures, EDI, XML and WAP.

Semester-IV

Information Security and Cryptography

CO1	Able to understand the security approaches and techniques, Introduction to number theory
CO2	Able to Symmetric key and Asymmetric key cryptographic algorithms
CO3	Able to understand the User Authentication Mechanisms ,System security
CO4	Able to understand the Internet Security Protocols and Network Security

CLOUD COMPUTING

CO1	Able to understand about the Cloud Computing basics, Intranet and Cloud, Services and Business Applications, Salesforce.com, Organization and CloudComputing
CO2	Able to understand about the Hardware and Infrastructure , Overview of Software as a Service, Overview of Industries Software plus Services, Mobiledevice Integration
CO3	Able to understand about Developing the Applications like Google, Microsoft,Intuit QuickBase, Local Clients and thin clients
CO4	Able to understand about the Migrating the Cloud, Cloud Services

Operations Research

CO1	Understand Operations Research and Linear Programming.
CO2	Understand the concept of Dual problems and Transportation Model.
CO3	Understand about Network Models, Integer Programming, Dynamic Programming
CO4	Understand the concept of Deterministic Inventory Models, Game theory.

Object Oriented Software Engineering

CO1	Able to understand about the Introduction to Object Oriented Software Engineering, Object Orientation, Requirements Engineering
CO2	Able to understand about the Unified Modeling Language & Use Case Modeling, Class Design and Class Diagrams
CO3	Able to understand about the Software Design and Architecture, Design Patterns
CO4	Able to understand about the Software Testing, Software Project Management, Software Process Models

Data Warehousing and Data Mining

CO1	Able to understand about the overview of Data Warehouse Basic Concepts, Data Warehouse Modelling, Pre-processing
CO2	Able to understand about the Introduction to Data Mining , Basic Statistical Descriptions of Data, Data Visualization, Measuring data Similarity and Dissimilarity
CO3	Able to understand about the Concept Description, Generalization by AOI , Mining Frequent Patterns, Associations and Correlations, Mining Frequent Itemset
CO4	Able to understand about the Basic Concepts of Classification ,Different Methods of Classification

Semester-V

Wireless and Adhoc Networks

CO1	*To **List** the different modes of communication and **explain** the evolution of different mobile communication technologies*
CO2	***Summarize** the challenges of wireless transmission and different design models.*
CO3	*To i**llustrate** the working of a cellular network and **discuss** issues related to cellular network design.*
CO4	*To **Illustrate** different digital modulation and noise handling techniques used in Wireless Communication*

Cyber Security

CO1	Understand about information security and Threats, Data Leakage
CO2	To learn De Broglie hypothcsis and the uncertainly principte Understand about Cyber Security Introduction, Cyber Security Evolution
CO3	Understand about Cyber Security Objectives, Guidance for Decision Makers, CyberGovernance Issues
CO4	Understand about Cyber User Issues, Cyber Conflict Issues, Cyber Management Issues, Cyber Infrastructural Issues

Big Data Analytics

CO1	Understand about introduction to Big Data and Hadoop
CO2	Understand about Real Time Analytics, Map Reduce Programming
CO3	Understand about Streaming in Spark, Machine Learning, Map Reduce Advanced Programming
CO4	Understand about Graph Representation in Map Reduce, Graph Analytics in Spark, Programming with RDDs-Basics, Spark SQL overview

1.DISTRIBUTED SYSTEMS

CO1	Able to understand about the Cloud Computing basics, Intranet and Cloud, Services and Business Applications, Salesforce.com, Organization and CloudComputing
CO2	Able to understand about the Hardware and Infrastructure , Overview of Software as a Service, Overview of Industries Software plus Services, Mobile device Integration
CO3	Able to understand about Developing the Applications like Google, Microsoft,Intuit QuickBase, Local Clients and thin clients
CO4	Able to understand about the Migrating the Cloud, Cloud Services

2.INTERNET OF THINGS

CO1	Able to understand about the Introduction to Internet of Things, IoT EnablingTechnologies, IoT Levels & Deployment Templates Domain Specific IoTs
CO2	Able to understand about the IOT & M2M, SNMP
CO3	Able to understand about the IoT Platforms Design Methodology
CO4	Able to understand about the IoT Physical Devices & Endpoints

3.IMAGE PROCESSING

CO1	To study the image fundamentals and mathematical transforms necessary for image processing.
CO2	To study the image enhancement techniques
CO3	To study image restoration procedures.
CO4	To study the image compression procedures.

Elective II

BLOCK CHAIN TECHNOLOGY

CO1	Understand about Understand block chain technology.
CO2	Understand about Understand Cryptocurrency
CO3	Understand about Understand Smart contract
CO4	Understand about Develop block chain based solutions and write smart contract using Ethereum Framework.

2.FOUNDATIONS OF DATA SCIENCE

CO1	Understand about Key concepts in data science, including tools, approaches, and application scenarios
CO2	Understand about Topics in data collection, sampling, quality assessment and repair
CO3	Understand about Topics in statistical analysis and machine learning
CO4	Understand about State-of-the-art tools to build data-science applications for different types of data, including text and CSV data

3.HUMAN –COMPUTER INTER ACTION

CO1	can outline and discuss usability goals and user experience goals for designing an interactive product
CO2	can identify suitable methods for evaluating interactive technologies
CO3	can discuss the conceptual, practical, and ethical issues involved in evaluation
CO4	can discuss the advantages and disadvantages of low-fidelity and hi-fidelity prototypes

Elective III

1.PYTHON PROGRAMMING

CO1	Able to understand the basics of Python Programming language
CO2	Able to use various functions and methods of Python Programming
CO3	Able to comprehend Multithread Programming and GUI Programming
CO4	Able to understand Web Programming and Database Programming

2.PERI PROGRAMMING

CO1	To identify basic perl constructs and to outline perl debugging commands.
CO2	To create and design simple perl programs with the available perl pre-defined functions.
CO3	To demonstrate perl subroutines and perl references
CO4	To Apply Data Structures on perl programs and perl formats. To install HTTP server and to design and execute perl programs through CGI.

3.PHP PROGRAMMING

CO1	How to use PHP's built-in server to serve static resources
CO2	How to use PHP to add some dynamic aspects to our pages
CO3	The difference between `GET` and `POST` requests
CO4	How to build a custom solution that catches PHP errors and exceptions and shows a proper error page for them

Elective IV

1.MACHINE LEARNING

CO1	Learn the basics of learning problems with hypothesis and version spaces
CO2	Understand the features of machine learning to apply on real world problems
CO3	Characterize the machine learning algorithms as supervised learning and unsupervised learning and Apply and analyzethe various algorithms of supervised and unsupervised learning
CO4	Analyze the concept of neural networks for learning linear and non-linear activation functions. Learn the concepts in Bayesian analysis from probability models and methods

2.EMBEDDED SYSTEMS

CO1	Able to understand the basic architecture of 8051 micro controller
CO2	Able to understand various software architectures in embedded systems.
CO3	Able to understand Advanced Controller and Processors, Advanced Microcontrollers ATOM processor - Architecture-Instruction set.
CO4	Able to understand embedded software development tools.

ROBOTICS

CO1	Able to understand the basic of control systems and components
CO2	Able to understand robot end effectors its Types, Tools as End Effectors,Gripper Selection and Design Forward and Inverse Kinematics
CO3	Able to understand robot end effectors its Types, Tools as End Effectors,Gripper Selection and Design Forward and Inverse Kinematics
CO4	Able to understand robot programming, Motion Commands, program Controland Subroutines. Programming methods and Branching.

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DEPEPARTMENT OF ENGLISH

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PROGRAM OUTCOMES

POS-1. To introduce students to the major movements and figures of English Literature through a study of selected literary texts/pieces published during the period prescribed for study.

POS- 2. To enhance learners' literary sensibility and their emotional response to literary texts and to help them understand the thematic and stylistic preoccupations of the writers prescribed for study.

POS-3. To enable them to critically examine the writers' thematic concerns and to point out the (in) significance of such concerns in the postcolonial context.

POS-4. To help them recognize the distinctive ways in which the writers differed, in their ideological positions, from their counterparts belonging to different ages.

POS-5. To introduce the rise of humanism, the rise of the sonnet sequence, Elizabethan drama, the University Wits, Shakespeare's theatre and audience, Metaphysical poetry, the Neoclassical Age, the Romantic Movement, etc.

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COURSE OUTCOMES

Semester –I

INTRODUCTION TO LITERATURE

CO1	Develop an interest in literature.
CO2	Acquire knowledge about history of English literature.
CO3	Understand the different genre of literature.
CO4	Develop linguistic competence and analytical skills.

POETRY:THE RENAISSANCE TO THE 18TH CENTURY

CO1	Able to understand the basic of control systems and components
CO2	Able to understand robot end effectors its Types, Tools as End Effectors,Gripper Selection and Design Forward and Inverse Kinematics
CO3	Able to understand robot end effectors its Types, Tools as End Effectors,Gripper Selection and Design Forward and Inverse Kinematics
CO4	Able to understand robot programming, Motion Commands, program Controland Subroutines. Programming methods and Branching.

DRAMA:THE RENAISSANCE TO THE18TH

CO1	Able to understand the basic of control systems and components
CO2	Able to understand robot end effectors its Types, Tools as End Effectors,Gripper Selection and Design Forward and Inverse Kinematics
CO3	Able to understand robot end effectors its Types, Tools as End Effectors,Gripper Selection and Design Forward and Inverse Kinematics
CO4	Able to understand robot programming, Motion Commands, program Controland Subroutines. Programming methods and Branching.

CENTURYPROSE &FICTION:THE RENAISSANCE TO THE 18TH CENTURY

CO1	Students will be able to appreciate fiction of different countries up to 19th Century in the light of various movements and aspects of fiction.
CO2	Students will understand major trends and writers in Fiction through detailed study of selected novels.
CO3	Students will be able to interpret and critically appreciate the novels of the selected authors with reference to the realism (naturalism) and psychology.
CO4	Students will be able to critically appreciate representative 19th century American short fiction.

INTRODUCTION TO THE STUDY OF LANGUAGE & LANGUAGE SKILLS

CO1	Demonstrate their ability to describe properly basic aspects of language structure like speech sounds, words and sentences.
CO2	Apply basic linguistic analytical techniques to languages that are unfamiliar to them.
CO3	Demonstrate their understanding of how the systems of a language interact with each other to connect meaning to form.
CO4	This course gives an introduction to human language, its structure .

Semester –II

POETRY: 19TH CENTURY

CO1	Students will be able to trace the development of verse tradition through PindaricOde, American Romanticism,
CO2	Students will be able to locate a specific poem in historical and social context.
CO3	Students will be able to interpret and aesthetically appreciate poems.
CO4	Students will be able to understand the difference between implicit and explicit meaning of poems.

DRAMA: 19TH & 20TH CENTURIES

CO1	Have firsthand knowledge of major dramatists and their work from Elizabethan to the Modern age.
CO2	Be acquainted with the literary movements, development of English drama and variety of experiments made like revenge tragedy, romantic comedy, satirical comedy, historical play, poetic drama, tragicomedy etc.
CO3	Familiar with dramatic art and techniques and later may adopt their performing art as his/her vocation.
CO4	Demonstrate understanding of social and artistic movements that have shaped English theatre. Analyze and interpret texts and performances both in writing and orally.

PROSE& FICTION: 19TH CENTURY

CO1	To develop the language ability of the students.
CO2	To enable the students to comprehend the idea contained in the prose.
CO3	To develop an appreciation for the literary content.
CO4	To enhance creative and critical thinking. To familiarize with eminent prose writers and their works.

THE 20TH CENTURY BRITISH LITERATURE

CO1	Study of essays in the period as a vehicle of representing personal experiences, moved into literary, social and cultural criticism and engaged in polemic and persuasion.
CO2	Discussion on variety of contemporary issues.
CO3	To study key ideas and texts analysing the intellectual shifts in the reading of culture,language and literature in the 20th century and the emergence of Theory
CO4	S ection II deals with ideas associated with movements like Structuralism, Post Structuralism, and Feminism etc

INTRODUCTION TO COMMUNICATION SKILLS

CO1	Understanding the nature of language of cinema
CO2	Getting acquainted with the visual mode of story-telling.
CO3	Imbibing potential for cross culture communication.
CO4	Gaining knowledge of the medium and models of communication.

Semester – III

AMERICAN LITERATURE: EARLY TO THE 19TH CENTURY

CO1	Develop passion for literature.
CO2	Gain knowledge of the major traditions of American literature.
CO3	Become accomplished and active readers.
CO4	Develop writing and oral communication skills and may develop an appreciation for different genres. Subroutines. Programming methods and Branching.

INDIAN WRITING IN ENGLISH

CO1	appreciate the historical trajectory of various genres of Indian Writing in English from colonial times to till the present
CO2	analyze Indian literary texts written in English in terms of colonialism, postcolonialism, regionalism, and nationalism
CO3	Understand the role of English as a medium for political awakening and the use of English in India for creative writing
CO4	analyze how the sociological, historical, cultural and political context impacted the texts selected for study

POST COLONIAL LITERATURE

CO1	Identify key questions, authors, and literary forms in postcolonial literature
CO2	Think critically about these texts in relation to postcolonial theory
CO3	Situate these works in their larger cultural contexts
CO4	Develop interpretative skills of close reading Offer nuanced interpretations, articulate coherent arguments, and develop research skills through your written essays

INTRODUCTION TO ENGLISH LANGUAGE TEACHING.

CO1	• Students will heighten their awareness of correct usage of English grammar in writing and speaking
CO2	• Students will improve their speaking ability in English both in terms of fluency and comprehensibility
CO3	• Students will give oral presentations and receive feedback on their performance
CO4	• Students will increase their reading speed and comprehension of academic articles

Semester –IV

AMERICAN LITERATURE: MODERN & CONTEMPORARY

CO1	Perceive the evolving of a great nation-America from a Puritan narrow foundation
CO2	Trace the belief and faith in humanity which is the true foundation of Democracy.
CO3	Envision the universal philosophical vision about life, work, and humanity in the poetry of Frost
CO4	Develop a viewpoint in the light of the Psychological study

	of the concept of racial prejudices, collective unconscious and understanding the relevance of human dignity in life.

INDIAN LITERATURE IN ENGLISH TRANSLATION

CO1	Reading Japji is to reach into our inner conscience cuts through the folds of our ego so as to understand the true purpose of life.
CO2	Tracing the relevance of Tagore's Novel in modern times for its delineation of the conflict between the forces of fanatic Nationalism and humanism
CO3	Understanding the rich heritage of Sanskrit drama from Kalidas Kavya and the concepts of Epic and lyric
CO4	Attempting to reconcile Modernity and tradition through works of Anantha Murthy which challenges the orthodoxy of Brahmanism..

CONTEMPORARY LITERARY THEORY

CO1	apply critical and analytical skills and methods to key texts and ideas in twentieth and twenty-first century literature
CO2	demonstrate a detailed knowledge and understanding of some of the thematic and formal innovations as well as the controversies and contexts of literature in the twentieth century and beyond
CO3	demonstrate a general understanding of the concepts and principles of recent innovations in literary-critical methodology;
CO4	apply an independent approach to knowledge that uses rigorous methods of inquiry and appropriate methodologies

	that are applied with intellectual honesty and a respect for ethical values

WOMEN'S WRITING

CO1	Discourse on growing feminist awareness of women's lives and their representation
CO2	To examine how women's texts pay attention to the historical and political conditions of their times, to the status and condition of women and to the ways in which they embody a politics of resistance.
CO3	know some of the developments, themes, and narrative strategies of English-language feminist fiction
CO4	know the central points of a selection of feminist theory, and can use it as a context for reading literary texts can use secondary literature in your own research

FURTHER STUDIES IN THEORY & PRACTICE OF ENGLISH LANGUAGE TEACHING

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CO4	Able to understand robot programming, Motion Commands,

	program Controland Subroutines. Programming methods and Branching.

TRANSLATION:THEORY & PRACTICE

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CO4	Able to understand robot programming, Motion Commands, program Controland Subroutines. Programming methods and Branching.

MODERN CLASSICS IN ENGLISH TRANSLATION

CO1	Understanding concepts
CO2	Expressing concepts through writing
CO3	Demonstrating conceptual and textual understanding in tests and exams
CO4	Able to understand robot programming, Motion Commands, program Controland Subroutines. Programming methods and

Branching.

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DEPARTMENT OF SOCIAL WORK

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PROGRAM OUTCOMES

POs:1 To equip candidates with the knowledge of working with people and the ability in problem solving through Field experience

POs:2 To promote among trainees a sense of commitment and dedication to strive for equity, social justice, social harmony and peace

POs:3 To sensitize the trainees to involve themselves for the cause of poor, subaltern under privileged and disadvantaged section of the society

POs:4 To develop confidence among the trainees to feel themselves as change agents for social change and transformation.

POs:5 To equip trainees for disaster management and rehabilitation process

POS:6 Demonstrate Ethical and Professional Behavior

POS:7 Engage Diversity and Difference in Practice

POS-8 Advance Human Rights and Social, Economic, and Environmental Justice.Engage In Practice-informed Research and Research-informed Practice

POS:9Engage in Policy Practice.Engage with Individuals, Families, Groups, Organizations, and Communities

POS:10 Assess Individuals, Families, Groups, Organizations, and Communities

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COURSE OUTCOMES

SEMESTER – I

History Philosophy and Field Practice

CO1	Knowledge about the definition and division of Orthodox school and Heterodox Schools of Indian Philosophy.
CO2	Description of Carvaka Philosophy and gain knowledge about the Epistemology,Metaphysics, Ethics and Materialism of Carvaka view
CO3	Description of the different concepts of Jaina Philosophy as well as the theory of reality and seven forms of judgements. Knowledge about the life and four noble truths as well as the various theories associated with Boudha Philosophy.
CO4	Description, analysis of various concepts of Nyaya school, know the instruments, methodology and classification of perception.

Dynamics of Human Behaviour

CO1	identifying components of the self with emphasis on functional psychological processing
CO2	stating basic tenets of various neurobiological, biological, psychological, social learning, cognitive, and / or personality explanations of functional human behavior
CO3	paraphrasing strategic approaches for the development and / or change to functional behavior posited by biological, psychological, social / learning, cognitive and / or personality theories of human behavior
CO4	demonstrating how strategic approaches for the development and / or change to functional behavior posited by biological, psychological, social / learning, cognitive and / or personality theories of human behavior would differentially explain the same observed behavior

Social Case Work

CO1	Develop understanding of working with individuals
CO2	Learn different approaches, processes and interventions of case work practice
CO3	Develop skills and techniques of working with individuals in different settings.
CO4	Explore and develop the professional self and skills of a practitioner

Socia l Group Work

CO1	Understand group as a dynamic social unit and a resource for intervention
CO02	Develop practical understanding of application of the group work method in various practice settings
CO3	An understanding of various theoretical frameworks and their applications for group work practice
CO4	Develop and strengthen professional skills for effective group work practice

Community Organization

CO1	Students will be able to understand the importance and implications of community organization.
CO2	Students will be able to analyze the community development needs, issues and respective solutions for a given community
CO3	Students will be able to demonstrate their skills and efficiency in community mobilization as a method of social work.
CO4	Students will be able to describe the need and significance of participation and participatory methods in community development process.

SEMESTER – II

Social Action fSSor Social Change

CO1	Students will begin engaging with organizations and communities to identify needs and possibilities for change (journaling).
CO2	To demonstrate effective interpersonal and critical thinking skills that are useful in working with organizations and communities (class participation, paper).
CO3	To demonstrate research skills and strategies to gather and utilize data that can be used to assess needs and plan interventions (class participation).
CO4	To demonstrate knowledge of generalist practice model and how to apply it to develop interventions for organizations and

communities (tests).

Counseling and Communication

CO1	Students demonstrate an understanding of conversation skills.
CO2	Students identify the elements of the communication model.
CO3	Students research, prepare, and deliver a speech.
CO4	tudents participate effectively in small group interactions.

Problems and Social Legislation

CO1	Develop an insight on social legislations, its objectives and scope in relation to Indian Constitution
CO2	Understand social legislation for vulnerable, weaker and special groups in India.
CO3	Acquire critical understanding of social legislation and social protection
CO4	Create awareness about the preventive and remedial services of government and nongovernment organizations and role of social workers, media and other stakeholders

Social Work Research and Social Statistics

CO1	To acquire knowledge about meaning, nature, scope and importance of social work research
CO2	To develop an understanding of scientific approach to human inquiry in comparison to the native or common sense approach in various aspects, and its process
CO3	To acquire Research knowledge and skills to be able to undertake independent research projects. To develop an understanding of statistical tools and learn to use.
CO4	To develop skills for graphical preservation like graphs, diagrams, charts and tables. To enable the students familiarize with various methods of sampling.
CO5	L€arn clasic and quantum mechanics

Disaster Management

CO1	Apply social work knowledge and skills for rebuilding of communities and societies devastated by disasters.
CO2	Organize and participate in community pre-disaster planning and management.
CO3	Plan and develop interventions focused on vulnerable groups.
CO4	Apply critical skills of emergency planning and management in disaster situations.

SEMESTER-III

Social Policy and Planning

CO1	To develop an understanding of the nature of social policy in the contemporary cultural /social political, economic contexts. to acquire knowledge of policy analysis and policy formulation processes
CO2	To develop critical insights into the working of policies, institutional mechanisms and stakeholder participation. To examine intervention strategies and their application to wider situations- study best practices in policy intervention
CO3	To develop necessary skills in the area of policy analysis, formulation and implementation
CO4	Understand and locate social policy within the specific socio-political and economic contexts. Understand policy formulation, stake holder participation, implementation mechanisms and justice concerns

Social Work with Elderly and Differentially abled

CO1	Understand the diverse continuum of theories defining the characteristics of old age from disengagement to active ageing.
CO2	Develop a comprehensive understanding of the vulnerabilities and capabilities of older persons and examine the effectiveness of social security measures.
CO3	Explore the changes in the social systems and institutions affecting the role and relationship of aged people in the contemporary world.
CO4	Comprehend the role of social worker in gerontological setting and develop competence and skills in geriatric care.

Participatory Development

CO1	The benefits, variations and forms of participatory development. The importance of involving local stakeholders at all stages of a community project, including research, design, implementation, monitoring, evaluation, and advocacy
CO2	The essential tools and techniques for participatory development articipatory approaches to community project planning
CO3	The human rights of active engagement of local stakeholders and women
CO4	The value of breaking down conventional hierarchies of knowledge, power, and capabilities to ensure project success

Programmes for the Rural and Tribal community Development

CO1	To know developnent ofquantum mecharics in Chcmistry
CO2	To learn De Broglie hypothcsis and the uncertainly principte
CO3	To urderstand various operators like position , momentum & energy
CO4	Learn to solve Sctrodingcr cquation
CO5	L€arn classic and quantum mechanics

(A)Human Resource Management

CO1	Develop an understanding of the human resource systems in the organisations
CO2	Human Resource Planning, recruitment, selection and on boarding
CO3	Build knowledge of the applicable labour laws in the organisations
CO4	Develop appropriate skills and competencies in managing and developing human resources

(B)Rural Community Developmen the Family Changing Trends

CO1	Understand rural diversity, economic, political, social and natural realities
CO2	Understand rural diversity, economic, political, social and natural realities
CO3	Develop critical understanding of rural policies and programs in agriculture, livelihoods and basic services
CO4	Develop critical understanding of community development approaches and interventions

SEMESTER-IV

Development Administration

CO1	Explain the basic concepts of Meaning, Nature, Scope of Development Administration
CO2	Understanding the ideas of context of Development Administration and Political, Economic, Cultural, Administrative and Social.
CO3	Explain the Decentralization of Powers in India, State Planning and District administration and Field Agencies
CO4	Analyze the Reforming Administrative System, Autonomy and Accountability of Administration and Corruption in Administration

Management of Voluntary Organizations

CO1	To understand evolution of voluntary Action in India. To understand the concept of Voluntary Action
CO2	To learn De Broglie hypothcsis and the uncertainly principte. To enable the students to understand the influence of voluntary action on social welfare and development
CO3	To enable students in designing strategies for changes in social institutions, cultural values and organizations. To train the students in social action and political Good fit to solve mass problems of society
CO4	To orient the students to different methods of project appraisal. To sensitize the students about resource partnership with district, state and central departments

Social Work with HIV/AIDS

CO1	Develop critical understanding of community development approaches and interventions
CO2	learn the social dimension of HIV/AIDS
CO3	deal with programmes and people Living with HIV/AIDS (PLHA)
CO4	get acquainted with different prevention strategies of prevention, treatment and rehabilitation of PLHIV

Women Empowerment

CO1	To understand women as a target client group for social work intervention. To study the historical factors affecting the status of women in India
CO2	To critically understand the role of society and culture in the status of women including that of patriarchy and stereotypes. To make students to understand that Gender discrimination is an important phenomenon
CO3	To enable the students to understand the concepts of Sex ratio and infant mortality rate. To develop capacity to analyze women's problems, identify causative factors and assess their magnitude.
CO4	To understand the different Laws related to women. To acquire competency to apply knowledge of Laws related to women in social work practice

Industrial Relations and Labour Welfare Dissertation

CO1	Students should able to elaborate the concept of Industrial Relations.
CO2	The students should able to illustrate the role of trade union in the industrial setup. Students should able to elaborate Industrial Dispute settlement procedures
CO3	Students should able to outline the important causes & impact of industrial disputes
CO4	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.

Urban Community Development

CO1	Gain theoretical perspectives on urbanization and urban society
CO2	Acquire comprehensive knowledge on urban policies and programmes in India
CO3	Develop skills and competencies to work with urban communities
CO4	Learn to solve Sctrodingcr cquation
CO5	L€arn classic and quantum mechanics

Social Work with Children

CO1	Understand the changing structural and functional dynamics of family systems
CO2	Learn assessment of family relations and design suitable interventions for ensuring family well-being
CO3	Examine state of children in India, their vulnerabilities and efficacy of policies and programmes for the children
CO4	Comprehend the social work resp

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