

## **B.Sc.**

### **Programme Outcomes**

- PO1: Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- PO2: Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO3: Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO4: Modern tool usage:** Create, select and apply appropriate techniques, resources, and modern technology and IT tools to complex science and technological activities.
- PO5: Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable Development.
- PO6: Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- PO7: Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- PO8. Life-long learning:** Recognize the need and ability to engage in independent and lifelong Learning in the context of technological change.

### **B.Sc. Chemical Technology**

#### **Program Specific Outcomes:**

##### **Students will be able to:**

- PSO1:** Understand the basic concepts of Maths, Physics and Chemistry to apply in the field of Chemical Technology.
- PSO2:** Understand the basic concepts of various unit operations and unit processes in Chemical Technology
- PSO3:** Apply the theoretical knowledge, problem solving techniques and skills acquired through practicals in Chemical and Pharmaceutical industries.
- PSO4:** Design the equipment required to carry out the various unit operations and unit processes in Chemical and Pharmaceutical industries.

#### **Physics I**

- CO1:** Apply the laws of motion on variable mass systems and explain the conservation principles of mechanical energy and momentum
- CO2:** Distinguish the mechanics of rigid bodies with respect to kinematics.  
Analyze the principles of interference optics.
- CO3:** Explain the mechanics of continuous media and solve problems.
- CO4:** Categories different semiconductors of solids and analyze basic electronics of rectifiers

and diodes.

**CO5:** Apply the principles of fiber optics for signal propagation.

### **Physics II**

**CO1:** Explain the fundamentals of vibrations and the concept of Meissner Effect & BCS theory of superconductivity.

**CO2:** Compare Damped and forced oscillations and distinguish different types of lasers and its applications.

**CO3:** Distinguish Fresnel's, Fraunhofer diffraction and analyse wavelength of monochromatic light and Grating. Analyze ultra-Sonic's to determine velocity of sound in different media.

**CO4:** Analyze Polarization, Double refraction, optical activity and identify its role in designing Nicol's prism, Half-shade polarimeter.

**CO5:** Apply crystallography principles of solid state physics to explain packing fractions and crystal structures of solids by Laue, Powder diffraction methods.

### **Physics III**

**CO1:** Use Gauss's Law principle to explain charged sphere, cylinder, and potential due to charged spherical conductor and Solve problems.

**CO2:** Analyze Nano science technology and survey different types of Nano materials, Synthesis of Nano particles and its applications.

**CO3:** Compare various types of transistors and analyse CB-CE-CC configurations, Hybrid parameters.

**CO4:** Explain the physics of Passive Electronic components and Magneto statics.

**CO5:** Classify digital electronics of binary number system, its conversions and analyse different amplifiers, Oscillators.

### **Physics IV**

**CO1:** Analyze moving charge in electric and magnetic field, Identify it's role in particle accelerators, magnetic field due to straight wire and circular coil.

**CO2:** Compare the effects of electromagnetic induction in moving conductors, solenoid, Transformers and survey digital electronics of Logic Gates.

**CO3:** Compare varying and alternating currents through L-R, L-C, C-R and L-C-R circuits.

**CO4:** Apply the Principles of Quantum mechanics and wave mechanics in solving quantum problems.

**CO5:** Analyze Nuclear structure, Binding energy, nuclear forces and survey different nuclear models.

### **Chemistry I**

**CO1:** Analyse the structure of various molecules/ions based on LCAO, MOT, VESPER theory.

**CO2:** Explain the synthesis and structure of S & P block elements

**CO3:** Explains the fundamentals and understanding of extraction of metals and alloys

**CO4:** Explain the fundamentals of Organic molecules

**CO5:** Explain the Organic reaction reaction mechanisms

## **Chemistry II**

- CO1:** Analyse the energy change in a given physical/chemical processes
- CO2:** Apply the concept of feasibility of processes
- CO3:** Examine the Colligative properties by various experiments
- CO4:** Summarisation of Basic gas laws and their deviation and demonstration
- CO5:** Explain the various phases in a heterogeneous system, apply the concept to separate various phases.

## **Chemistry III**

- CO1:** Explain synthesis and properties of Halogens, Alcohols, Phenols and Ethers
- CO2:** Compare the synthesis and properties of Aldehydes and ketones
- CO3:** Explain the preparation, properties of 'd' and 'f' Block elements
- CO4:** Compare the electrical conductivities of various Conductors and their related laws
- CO5:** Evaluate Cell Potential, Compare various Electrodes and their functions

## **Chemistry IV**

- CO1:** Compare preparation and properties of Aliphatic and Aromatic Carboxylic Acids
- CO2:** Compare Synthesis and properties of Nitro compounds and Hetero cyclic compounds
- CO3:** Synthesis and structural analysis of Carbohydrates and Amino Acids
- CO4:** Interpretation of Metal Complexes based on LFT, CFT and MOT
- CO5:** Application of Catalyst, Reaction mechanism of complexes and OMC, preparation and properties and their uses

## **Chemistry V**

- CO1:** Determine the Extraction, structure and uses of Alkaloids, Terpenoids, Steroids and Dye stuffs
- CO2:** Application of Polymers, development of Polymers and Rubbers
- CO3:** Classification of Drugs, demonstration of drugs and explanation of their action
- CO4:** Explain the Fundamental concepts of Spectroscopic techniques
- CO5:** Evaluate Order and Molecularity of reactions, application of Photo chemical reactions

## **Chemical Process Principles**

- CO1:** Solve problems to calculate composition of solids and fluids and density of gaseous mixtures.
- CO2:** Apply Rault's Law and Dalton's Law to solve problems in gaseous mixtures
- CO3:** Solve material balance problems with and without chemical reactions.
- CO4:** Apply energy balance to calculate enthalpy changes
- CO5:** Use energy balance to calculate enthalpy changes accompanying chemical reactions.

### **Chemical Reaction Engineering**

- CO1:** Classify chemical reactions, define rate equation and can test mechanism.
- CO2:** Explain the dependency of rate constant on temperature from different theories and Calculate rate constant
- CO3:** Use rate equation to calculate the specific rate constant and the order of the reaction for irreversible reactions in case of constant volume Batch Reactor.
- CO4:** Use rate equation to calculate the rate constant for reversible reactions in case of Constant Volume Batch Reactor and rate constant in case of Variable Volume Batch Reactor.
- CO5:** Use the performance equation to design single ideal reactors.

### **Environmental Engineering and Safety**

- CO1:** Classify the industrial effluents and Oxygen Demands.
- CO2:** Select a suitable equipment and treatment process to control pollution caused by industrial liquid wastes.
- CO3:** Select a suitable equipment and treatment process to control pollution caused by industrial gaseous effluents and solid waste.
- CO4:** Explain the safety aspects of a chemical industry such as hazards involved in the chemical industry and preventive measures to be taken.
- CO5:** Identify the effects of toxic agents on human health and will be able to understand how to handle flammable materials in chemical industries

### **Heat Transfer**

- CO1:** Apply Fourier's law of heat conduction to calculate rate of heat transfer by conduction in solids.
- CO2:** Apply the different equations for different situations to calculate the rate of heat transfer through fluids without phase change by convection.
- CO3:** Explain heat transfer to fluids with phase change.
- CO4:** Explain the construction and working of Heat Exchangers.
- CO5:** Explain the construction and working of evaporators.

### **Refractory Technology**

- CO1:** Classify and select the refractory materials
- CO2:** Describe the manufacturing procedure, properties and uses of some important refractory materials.
- CO3:** Identify the refractory's used in Iron and Steel, Glass and Cement industries.
- CO4:** Explain the testing procedures for some important properties of refractory materials and describe the properties and uses of insulating refractories.
- CO5:** Choose the special refractories for specified applications and describe refractory cement.

### **Mathematics- I**

- CO1:** Construct the vector-valued functions of a real variable and their curves, Gradient vector fields and constructing potentials. Define the directional flow especially in the description of electromagnetic fields, fluid flow in physical sciences.
- CO2:** Identify the importance of vector fields in day to day life. Calculate the mass, area and momentum and also measure the energy of steady flows using integrations.
- CO3:** Develop factual knowledge including the mathematical notation and terminology in geometry; points, lines, and angles; planar figures.
- CO4:** Describe the surface area of sphere - great circle and volume of sphere, cone.
- CO5:** Apply matrix theory to solve homogeneous and non-homogeneous system. Define Eigen values and Eigen vectors.

### **Mathematics- II**

- CO1: Classify** the differential equations with respect to their order and linearity. Solve differential equations of first order using numerical and analytical methods such as Integrating Factors.
- CO2: Solve** higher order non- Homogeneous Equations with Constant Coefficients. Obtain exact and numerical solutions using differential equations technology.
- CO3: Solve** higher order non- Homogeneous Equations with variable Coefficients. Obtain exact and numerical solutions using differential equations technology.
- CO4: Identify** the relationship between a real function and its derivative at a point which in turn helps them solve the system using integrations.
- CO5: Identify** different tests for convergence and divergence of a given series.

### **Mathematics- III**

- CO1: Categorize** the theoretical and practical aspects of the use of numerical methods.
- CO2: Explain** how the common numerical methods and are used to obtain approximate solutions to intractable mathematical problems.
- CO3: Develop** numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations.
- CO4: Analyze** and evaluate the numerical solution of algebraic equations.
- CO5: Develop** numerical methods to fit a curve within the given points.

### **Mathematics- IV**

- CO1:** State the definition of a simple group, calculate composition factors and composition series of certain groups. Use the subgroup criterion to prove that various subsets are subgroups of some given group.
- CO2:** Explain whether a given group is cyclic, and given a finite cyclic group, find a generator for a subgroup of a given order.
- CO3:** Identify homomorphism in a group, determine whether or not they are isomorphic.
- CO4: Analyse** the Fourier transform of elementary functions from the definition.
- CO5:** Solve Wave, heat and Laplace equations using Fourier transform.

### **Chemical Technology-II**

**CO1:** Explain Nuclear materials

**CO2:** Explain natural product industries, soaps and detergents

**CO3:** Describe microware, biotechnology, isolation, cultivation and growth of micro organisms

**CO4:** Explain pulp and paper industry

**CO5:** Explain food industry

### **Instrumentation & Process Control**

**CO1:** Explain the qualities of measurement

**CO2:** Choose a suitable thermometer for a given application and describe the methods for composition analysis of moisture in gases

**CO3:** Explain various pressure and vacuum measurement instruments and process instrumentation

**CO4:** Describe the role of process dynamics and control

**CO5:** Describe controllers and final controller elements

### **Mass Transfer Operations--I**

**CO1:** Describe the principles of diffusion

**CO2:** Explain the principle of distillation and types of distillation

**CO3:** Analysis of fractionating column by McCabe Thiele Method

**CO4:** Explain the principle and applications of Leaching process

**CO5:** Explain the principles of extraction and extraction equipment

### **Mass Transfer Operations - II**

**CO1:** Explain the principle and applications of absorption and will be able to design packed column

**CO2:** Describe humidity and its measurement and equipment for humidification operations

**CO3:** Choose drying equipment and will be able to do calculations in drying

**CO4:** Choose suitable equipment to carry out adsorption

**CO5:** Explain membrane separation process and will be able to classify membranes

### **Organic Surface Coatings Technology**

**CO1:** Describe the organic surface coatings.

**CO2:** Explain pigments and extruders.

**CO3:** Explain resins, plasticizers and additives.

**CO4:** Explain paints with reference to testing and applications.

**CO5:** Select coatings for different applications in chemical industries.

### **Chemical Technology-I**

**CO1:** Basic knowledge of describing a chemical industry. Explain manufacturing of sulphur and sulphuric acid

**CO2:** Explain manufacture of industrial fuel gases. Explain manufacture of oxygen

**CO3:** Explain manufacture of ammonia & urea. Explain manufacture of Nitric acid &

Ammonium nitrate

**CO4:** Explain manufacture of Chloro alkali industries

**CO5:** Explain manufacture of cement. Explain manufacture of magnesium compounds from sea water

### **Chemical Technology-II**

**CO1:** Identify basic refinery operations. Explain manufacturing of Methanol, Vinyl chloride

**CO2:** Explain the manufacturing of Acetone, Acrylonitrile Explain the manufacture of Isoprene, Butadiene.

**CO3:** Explain the manufacture of aromatic hydrocarbons

**CO4:** Explain the manufacture of pesticides.

**CO5:** Explain the manufacture of polymers.

### **Fluid Mechanics**

**CO1:** Understand of basic unit and dimensions in fluid mechanics. Describe basic principles of fluid mechanics

**CO2:** Identify fluid flow problems with the application of the momentum and energy equations. Describe friction and losses in fluid flows.

**CO3:** Capability to analyze pressure drops in packed bed Knowledge of fluidization.

**CO4:** Capability of measuring flows Knowledge of flow meters.

**CO5:** Describe piping layout. Describe equipment's in transportation of fluids

### **Solar Processing Technologies**

**CO1:** Identify different forms of energies. Describe transformation of energy.

**CO2:** Identify the need for energy conservation. Describe significance of solar energy

**CO3:** Describe harnessing of solar energy.

**CO4:** Describe applications of solar energy

**CO5:** Identify ISO standards for solar applications

### **Mechanical Unit Operations**

**CO1:** Explain agitation equipment, flow patterns and design of power required for agitation equipment. Explain mixers for pastes and free flowing solids

**CO2:** Identify the need for screen analysis and storage of solids. Explain conveying systems.

**CO3:** Explain size reduction equipment's. Capability of problem solving pertaining to size reduction equipment's

**CO4:** Identify the need for size separations. Explain screening equipment's

**CO5:** Explain centrifugal separation process. Explain crystallization equipment.

## **B.Sc Agricultural Science and Rural Development**

**PSO1:** Knowledge on crop production and crop improvement techniques.

**PSO2:** Knowledge on farm management economics, various agricultural extension methods and communication techniques to serve farming community and industries.

**PSO3:** To develop scientific, technical and practical skills related to lab and field in various plant and animal related courses with critical thinking and strong ethical foundation.

**PSO4:** Develops entrepreneurship qualities at various levels by taking apt decisions to enhance the success of an agricultural enterprise or an organization.

### **Fundamentals of Agronomy & Agricultural Heritage**

**CO1:** Classify agroclimatic zones of India and Telangana, explain various methods of sowing and tillage.

**CO2:** List of various methods of weed control and irrigation

**CO3:** Classify manures and fertilizers and explain plant ideotypes

**CO4:** Explain various practices of indigenous technology

**CO5:** Describe agricultural heritage, different civilizations and history of agriculture development

### **Fundamentals of Genetics**

**CO1:** Express knowledge on Mendel's Laws

**CO2:** Classify types of alleles

**CO3:** Explain chromosomal aberrations and solves problems on chi square

**CO4:** Classify mutations and extra chromosomal inheritance

**CO5:** Analyzes the structure and expression of gene

### **Fundamentals of Soil Science**

**CO1:** Defines soil and describes different soil forming processes, explains soil profile and differentiates surface soil and subsurface soil

**CO2:** Explain different Physical properties of soil and their influence on crop growth

**CO3:** Explain different chemical and biological properties of soil and its importance in agriculture

**CO4:** Differentiates and explains role of organic matter and humus. Describes carbon cycle and C:N ratio

**CO5:** Classify different soil groups of India, Telangana and A.P

### **Introduction To Plant Pathogens**

**CO1:** Illustrates pathogenic fungi and types of reproduction in fungi

**CO2:** Classify Kingdom Fungi into phylum, sub phylum and orders

**CO3:** Recognizes phylum Ascomycota and Basidiomycota with examples

**CO4:** Differentiates Rust, Smut and Bunt Fungi

**CO5:** Illustrates various plant parasitic viruses and nematodes

### **Fundamentals of Agricultural Economics**

**CO1:** Explain basic concepts in micro economics

**CO2:** Distinguish consumer behaviour analysis, IC analysis and demand analysis

**CO3:** Interrelate among production, cost concepts, supply and market structure

**CO4:** Illustrate the functions of money and national income



CO5: Apply various economic systems in daily life

### **Fundamentals of Horticulture**

CO1: Define various branches.

CO2: Distinguish methods of Propagation.

CO3: Identify and explain various vegetative propagation Method

CO4: Distinguish and differentiate growth regulators and effects

CO5: Classify and compare irrigation and fertilizer application methods

### **Rural Sociology and Educational Psychology**

CO1: Describe the importance of rural sociology in agriculture extension.

CO2: Explain different concepts in rural sociology like social stratification, culture, social institutions, social change and social ecology

CO3: Explain the concept of rural development in India.

CO4: Explain the importance of educational psychology in agricultural extension with special emphasis on leadership, personality and motivation

CO5: Apply various theories of motivation, intelligence, process of teaching and learning with special reference to extension teaching.

### **Agrometeorology & Climate Change**

CO1: Define meteorology, climatology, Agrl. Meteorology, wind, types of wind and describe structure of atmosphere

CO2: Explain solar radiation, factors affecting distribution of solar radiation, atmospheric temperature and its importance

CO3: Differentiate between precipitation and condensation and identify their different forms

CO4: Classify and explain characteristics of different clouds. Explain south west and north east monsoons

CO5: Identify weather hazards and categorize types of weather forecasting

### **Introduction To Forestry**

CO1: Defines various branches of forestry, silviculture and its classification

CO2: Explain various forest policies and types of regeneration

CO3: Describes different tending operations followed in forestry

CO4: Explain importance of agro forestry in India

CO5: Select suitable practices for raising Subabul and Eucalyptus

### **Agricultural Microbiology**

CO1: Describe various contributions of eminent scientists in microbial world.

CO2: Explain morphological types of bacteria, bacteria cell structure microbial nutrition, metabolic pathways & growth cycle of bacteria.

CO3: Explain bacterial genetics, role of microbes in fertility of soils and plant growth, cycle of major elements Co<sub>2</sub>, N<sub>2</sub>.

CO4: Differentiate types of fermentation and identify PGPR organisms and biological nitrogen fixation

CO5: Prepare Biofertilizers, biopesticides, silage, biofuel, biogas, biomanures and their

production technologies,

### **Fundamentals Of Entomology**

- CO1:** Explains the history, Scope and importance of entomology and insect body wall and body segmentation
- CO2:** Identify and recognize various structures and functions of insect antenna, legs, wings and different types of larval and pupal forms of insect.
- CO3:** Illustrates various physiological systems of insect body
- CO4:** Describes the characters of insects belongs to the orders Orthoptera, Isoptera. Thysanoptera, Lepidoptera and develops ability to identify various insects
- CO5:** Identify the characters of insects belongs to the orders Coleoptera, Hymenoptera, Diptera, Hemiptera and develops ability to identify various insects

### **Fundamentals of Crop Physiology**

- CO1:** Explain the importance of crop physiology, crop water relations and seed germination
- CO2:** Apply the knowledge of photosynthesis and respiration in increasing crop productivity
- CO3:** Apply the knowledge of nutrio-physiology and flowering physiology in increasing crop productivity
- CO4:** Explains the role of plant growth regulators in agriculture and horticulture
- CO5:** Analyze growth and development of major crops

### **Soil and Water Conservation Engineering**

- CO1:** Explain importance of soil and water conservation, water erosion
- CO2:** Explain erosion control measures
- CO3:** Explain irrigation water measurement techniques
- CO4:** Describe irrigation pumps and discharge calculation
- CO5:** Explain drip and sprinkler irrigation system

### **Protected Cultivation And Secondary Agriculture**

- CO1:** Describe the various types of greenhouses
- CO2:** Illustrate structure and different materials for construction of greenhouse
- CO3:** Explain the different irrigation systems used in greenhouse
- CO4:** Explain winnowing, winnowers and moisture measurement
- CO5:** Explain types of mechanical drying and handling equipment

### **Fundamentals of Plant Biochemistry And Biotechnology**

- CO1:** Identify the structures and importance of carbohydrates and lipids
- CO2:** Classify peptides, proteins and enzymes
- CO3:** Explain structure of nucleic acids and illustrate metabolism
- CO4:** Prepare nutrient media and use of various cultures
- CO5:** Analyze genetic engineering techniques

### **Crop Production – I**

- CO1:** Explains various crop production techniques from sowing to harvest for Rice and wheat
- CO2:** Explains various crop production techniques from sowing to harvest for maize and sorghum
- CO3:** Explains various crop production techniques from sowing to harvest for pearl millet, finger

millet, foxtail millet, kodo-millet, proso-millet, little-millet

**CO4:** Explains various crop production techniques from sowing to harvest for Red gram, Bengal gram, green gram, black gram, cowpea, horse gram

**CO5:** Explains various crop production techniques from sowing to harvest for different forage crops

### **Dryland Agriculture and Water Shed Management**

**CO1:** Differentiate dry farming, dryland farming and rainfed farming, classification of Land Use and various types of drought

**CO2:** Identify various dry farming implements and describe various types of tillage

**CO3:** Explain various alternate land use systems and Dryland technologies for black and red soils

**CO4:** Classify of various types of erosion and mulches

**CO5:** Choose various moisture conservation measures and concepts of watershed management

### **Weeds and Their Management**

**CO1:** Classify weeds based on various criteria

**CO2:** Classify different methods of weed control and herbicides

**CO3:** Analyze the mode of action of herbicides and errors in herbicide application

**CO4:** Explain selectivity of herbicides and interaction of herbicides with fertilizers and agrochemicals

**CO5:** Compare weed management practices of cereals, pulses, oil seeds, vegetables and orchards

### **Cell Biology and Plant Genetics**

**CO1:** Identify and recognize the function of various cell organelles

**CO2:** Explain the process of cell division and to explain chromosomal aberration

**CO3:** Sketch the nature of genetic material and recognize the nature of DNA

**CO4:** Distinguish between allelic and non-allelic interaction

**CO5:** Analyze the structure and expression of gene

### **Introduction to Plant Pathology & Plant Disease Control**

**CO1:** Illustrates pathogenic fungi and types of reproduction in fungi

**CO2:** Classify Kingdom Fungi into phylum, sub phylum and orders

**CO3:** Recognizes phylum Ascomycota and basidiomycota

**CO4:** Differentiates rust, smut and bunt Fungi

**CO5:** Illustrates various plant parasitic viruses and nematodes

### **Principles of Crop Physiology**

**CO1:** Explain the importance of crop physiology, crop water relations and seed germination

**CO2:** Apply the knowledge of photosynthesis and respiration in increasing crop productivity

**CO3:** Apply the knowledge of nutritio-physiology and flowering physiology in increasing crop productivity

**CO4:** Explains the role of plant growth regulators in agriculture and horticulture

**CO5:** Analyze growth and development of major crops

### **Agricultural Chemicals**

- CO1: Differentiate organic compounds and inorganic compounds
- CO2: Classify inorganic insecticides with examples
- CO3: Illustrate various organic, natural and synthetic insecticides
- CO4: Understands various organochlorine, carbamate and phosphorus compounds
- CO5: Analyzes various fungicides and pesticide residues influence on environment

### **Irrigation Water Management**

- CO1: Classify major, medium and minor irrigation projects
- CO2: Solve sample problems on available soil moisture and explain various soil moisture constants
- CO3: Differentiate Net and Gross Irrigation requirements and sub divide indirect methods of soil moisture estimation
- CO4: Judge different approaches of scheduling irrigation and different methods of irrigation
- CO5: Explain various irrigation efficiencies and water management practices for different crops.

### **Soil Fertility, Manures and Fertilizers**

- CO1: Define and list out macro and micronutrient
- CO2: Differentiate and Classify Manures and Fertilizers and different composting methods
- CO3: Explain characteristics and manufacturing process of nitrogenous, phosphatic and potassic fertilizers.
- CO4: Differentiate and classify complex, mixed and bio-fertilizers
- CO5: Compare and judge various methods of soil fertility evaluation

### **Entomology – II(Taxonomy And Pest Control)**

- CO1: Explains the principles of insect taxonomy and classify the class insecta and describes the characters of insects belongs to the orders Coleoptera, Lepidoptera, Isoptera and develops ability to identify various insects.
- CO2: Describes the characters of orders Hemiptera, Dictyoptera and Thysanoptera and develops ability to identify various insects
- CO3: Identify the characters of orders Hymenoptera, Diptera and Orthoptera and develops ability to identify various insects
- CO4: Explain the methods of pest control and apply knowledge on application of pest control methods
- CO5: Apply the concepts of IPM and recent methods of pest control

### **Introduction to Plant Biotechnology**

- CO1: Choose different sterilization techniques and cultures
- CO2: Identify techniques in tissue culture
- CO3: Explain methods of somatic hybridization and cryopreservation
- CO4: Identify methods of gene transfer
- CO5: Explains procedure of PCR

### **Rural Development**

- CO1: Describe the different concepts involved in rural development and memorize different rural

- development programs of India during pre-independence and post-independence era.
- CO2:** Appraise the linkage between democratic decentralization and rural development
  - CO3:** Select the different agricultural development programs and social justice and poverty alleviation programmes in India
  - CO4:** Distinguish between administration and management
  - CO5:** Choose people's participation as one of the major factors for successful implementation of rural development programmes with special focus on women

### **Crop Production-II (Oil Seeds & Commercial Crops)**

- CO1:** Explains various crop production techniques from sowing to harvest for Groundnut, Sesame, Soybean, Sunflower
- CO2:** Explains various crop production techniques from sowing to harvest for Safflower, Castor, Rapeseed & Mustard, Linseed, Niger
- CO3:** Explains various crop production techniques from sowing to harvest for Cotton and Sunhemp
- CO4:** Explains various crop production techniques from sowing to harvest for Jute, Mesta, Agave
- CO5:** Explains various crop production techniques from sowing to harvest for Sugarcane, Sugar-beet, Tobacco

### **Principles of Plant Breeding**

- CO1:** Recognizes the benefits of plant breeding and crop genetic resources
- CO2:** Interpret the methods of breeding and to illustrate the methods
- CO3:** Explain the importance of different breeding methods
- CO4:** Compare the methods of population improvement
- CO5:** Formulate special breeding methods

### **Crop Pests and Their Management**

- CO1:** Identify the host range, nature of damage, damaging symptoms, life cycles and management of different pests of cereal crops.
- CO2:** Identify the host range, nature of damage, damaging symptoms, life cycles and management of different pests of Fiber crops, oilseeds and pulse crops
- CO3:** Identify the host range, nature of damage, damaging symptoms, life cycles and management of different pests of Coconut and fruit crops.
- CO4:** Identify the host range, nature of damage, damaging symptoms, life cycles and management of different pests of vegetable crops
- CO5:** Identify the host range, nature of damage, damaging symptoms, life cycles and management of pests of stored products

### **Production and Farm Management Economics**

- CO1:** Analyze laws of returns and factor product relationship
- CO2:** Judge input output relationship in agricultural production
- CO3:** Apply cost analysis in agricultural production
- CO4:** Make up law of equi-marginal returns in agricultural production
- CO5:** Distinguish types and systems of farming

### **Farm Equipment and Machinery**

- CO1: Generalizes types of engines and solves problems related to mechanical power
- CO2: Explain fuel system, cooling system and solves problems on tractor power
- CO3: Differentiates types of ploughs and their parts
- CO4: Classify various harrows, cultivators and other implements
- CO5: Sketches various fertilizer and seeding equipments

### **Production Technology of Vegetables, Aromatics And Medicinal Plants**

- CO1: Describe various production techniques in Solanaceous vegetables
- CO2: Apply various cultural operation to produce cruciferous vegetable
- CO3: Explain different cultivation practices in leguminous vegetables
- CO4: Explain techniques of producing Essential oil from Aromatic crops
- CO5: Appraise Importance of medicinal values of different plants

### **Agricultural Extension & Programme Planning**

- CO1: Explain the importance of extension education in agriculture sector.
- CO2: Organize different agricultural extension methods with reference to group contact methods.
- CO3: Organize different agricultural extension methods with reference to mass contact methods.
- CO4: Apply the principles of journalism in Agricultural extension and prepare different types of Audio Visual aids
- CO5: Solving of the problems of villages by applying Participatory Rural Appraisal (PRA) technique

### **Seed Science and Production Technology**

- CO1: Describes concepts of seed quality and genetic purity
- CO2: Interpret the varietal and hybrid seed production techniques of various crops
- CO3: generalize various techniques of hybrid seed production
- CO4: Explains steps in seed processing and field inspection
- CO5: Judges IPRs and their relevance in seed industry

### **Agricultural Cooperation, Finance & Marketing**

- CO1: Appraise the agricultural co-operation movement in India
- CO2: Illustrate cooperative credit structure
- CO3: Distinguish between 3R's, 5C's and 7P's
- CO4: Differentiate between regulated and co-operative markets
- CO5: Combine marketable and marketed surplus in agricultural marketing

### **Crop Diseases & Their Mangement**

- CO1: Identify different diseases of cereal crops and gain knowledge about their management.
- CO2: Identify different diseases of oil seed crops and gain knowledge about their management.
- CO3: Identify different diseases of Pulses, Flower and Spices crops and gain knowledge about their management.
- CO4: Identify different diseases of Vegetable crops and gain knowledge about their management.
- CO5: Identify different diseases of Horticulture crops and gain knowledge about their management.

### **Production Technology of Fruits, Spices And Plantation Crop**

**CO1:** Plan for laying out of orchard

**CO2:** Identify problems in raising of Mango, Banana, Sopota crops

**CO3:** Demonstrate the methods of planting and regulating flowering and fruiting in citrus, Guava, Papaya and pineapple, to select suitable training and pruning methods for Grape, Pomegranate and Ber.

**CO4:** Distinguish harvesting indices for Ginger, Turmeric, Pepper and cardamom for monetary returns

**CO5:** Demonstrate Production and processing of plantation crops.

### **Livestock and Fish Production Management**

**CO1:** Explains role of livestock in Indian economy and statistics of livestock population

**CO2:** Explains maintenance of farm records, their importance and utility

**CO3:** Differentiates digestive systems of ruminants, swine and poultry

**CO4:** Describes Broiler & Layer management along with disease prevention

**CO5:** Describes fishery resources in India and the statistics of fishery in India

### **Applied Statistics**

**CO1:** Explains the importance of concept of variability, measures spread or dispersion, understands and identify its cause to provide a basis for action, describes importance of normal distribution in statistics

**CO2:** Interprets meaning of correlation co-efficient in context, identification of two variables, technology to find 'r'

**CO3:** Judges appropriate method and identify problem and apply test via p value and CI

**CO4:** Judges appropriate chi-square test for independence and goodness of fit

**CO5:** Analyzes the results of designed experiment in order to conduct the appropriate statistical analysis of data.

### **Principles of Food Processing and Preservation**

**CO1:** Define food processing and preservation, Classify foods for processing and preservation

**CO2:** List out methods of food preservation

**CO3:** Explain processing methods of cereals, millets and legumes

**CO4:** Explain processing methods of fruits and vegetables and oil seeds

**CO5:** Explain processing methods of spices and plantation crops

### **Agricultural Waste Management**

**CO1:** Describes impact of agricultural waste on environment, kinds of wastes and role of soil and plants in waste management

**CO2:** Explains impact of agricultural waste on soil quality and plant quality and sources of waste from agriculture, agro industries and urban waste

**CO3:** Explains utilization of agricultural waste and in-situ management and composting types

**CO4:** Describes Influence of Agricultural waste on water, air and animal resources

CO5: Suggests waste management methods and techniques

### **Rural Agricultural Work Experience Programme**

CO1: Apply the knowledge of the various agricultural operations involved in Crop Production

CO2: Apply the knowledge of Crop Protection techniques in the host farmers field

CO3: Survey on socio economic status of farmers in the village

CO4: Organize method demonstration and agricultural exhibition in the villages for benefit of farmers

CO5: Prepare report in prescribed format in crop production, crop protection, Agri. Economics, Ag. Extension and KVK activities

### **Industry Internship Programme**

CO1: Select the agro-industry based on the interest of the students

CO2: Apply various techniques and skills in Agro-Industry

CO3: Formulate research proposal

CO4: Makeup of project report

CO5: Defend the research project

### **Farming Systems and Sustainable Agriculture**

CO1: Describe concepts of farming systems and its components

CO2: Explains concepts, components and factors affecting sustainable agriculture

CO3: Explains environmental pollution in agro ecosystem, excess use of fertilizers and pesticides and control measures

CO4: Develop methods and practices for managing and conserving natural resources

CO5: Explain and Apply knowledge of organic farming methods for sustainable agriculture

### **Agri Business Management and International Trade**

CO1: Explain structure of Agri-business management

CO2: Prepare Balance sheet in Agri business

CO3: Plan for financial management in Agri business

CO4: Develop agro-based industries

CO5: Appraise the role of international trade in agri-business

### **Economic Entomology**

CO1: Illustrates the concepts of morphology of silkworms, Moriculture and ability to identify, recognize and manage the pests and diseases of mulberry.

CO2: Apply the concepts of silkworm rearing, management of silkworm pests and diseases and imparts knowledge on rearing equipment and appliances

CO3: Describes the concepts of silkworm moulting, spinning and cocoon formation and post cocoon technology.

CO4: Demonstrate the concepts of honey bee rearing and interpret the uses of byproducts

CO5: Analyze the process of Lac culture its uses and describes the importance of vermi-culture.

### **Communication and Transfer of Agricultural Technologies**

CO1: Recognize the importance communication in transfer of agricultural technologies.

CO2: Explain the process of diffusion and adoption of innovations.



- CO3: Differentiate between an entrepreneur and a manager.  
CO4: Apply the concepts of generation, incubation and commercialization of business ideas in the development of entrepreneurship  
CO5: Formulate the project proposal for setup industry

### **Post Harvest Technology of Field Crops**

- CO1: Explain different types of threshers  
CO2: Explain decorticators, shellers, crushers and ginning of cotton  
CO3: Use of different drying methods  
CO4: Explain parboiling and milling of paddy  
CO5: Design different grain storage structures

### **Livestock and Fish Production Management**

- CO1: Explains role of livestock in Indian economy and statistics of livestock population  
CO2: Explains maintenance of farm records, their importance and utility  
CO3: Differentiates digestive systems of ruminants, swine and poultry  
CO4: Describes Broiler & Layer management along with disease prevention  
CO5: Describes fishery resources in India and the statistics of fishery in India

### **Floriculture and Landscaping**

- CO1: Explain special techniques involved in production of commercial flowers  
CO2: Select suitable practices for raising Gladiolus, carnation, Tuberose, Jasmine  
CO3: Describe various production techniques in Gerbera, Marigold, crossandra, Antirrhinum  
CO4: Explain various features of ornamental Gardening.  
CO5: Design various Greenhouses for protected cultivation.

### **Fundamentals of Horticulture**

- CO1: Define various branches.  
CO2: Distinguish methods of Propagation.  
CO3: Identify and explain various vegetative propagation Method  
CO4: Distinguish and differentiate growth regulators and effects  
CO5: Classify and compare irrigation and fertilizer application methods, Explain various features of ornamental Gardening

## **B.Sc. Computer Science and Engineering**

### **Program Specific Outcomes:**

#### **Students will be able to:**

- PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.  
PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.

**PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.

**PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

### **Physics**

**CO1: Apply** Fundamental electromagnetic concepts for various applications including wireless and optical communications.

**CO2: Design** different applications of lasers and fiber optics in the field of industry, medical and telecommunications

**CO3: Distinguish** the various crystalline materials and to understand the crystallographic techniques

**CO4: Apply** concepts of wave and particle nature of material particles for various engineering applications.

**CO5: Develop** different devices with more efficiency using superconducting and Nano materials.

### **Mathematics**

**CO1:** Choose appropriate data structures to represent data items in real world problems

**CO2:** Illustrate non-linear data structures like linked list

**CO3:** Organize the data using sorting in various linear data structures and determine time complexity.

**CO4:** Construct data with non-linear data structure using trees.

**CO5:** Explain the concept of graphs and B-trees

### **Electronic Devices and Circuits**

**CO1:** Explain the various voltages across and current flow through electronic devices in various configurations, junction with varying doping concentrations

**CO2:** Design and construct amplifier and oscillator circuits and differentiate between them

**CO3:** Design and construct a DC power supply

**CO4:** Analyze various factors influencing a transistor.

**CO5:** Analyze the characteristics of amplifiers, timers and oscillators

### **Problem Solving and Programming in ‘C’**

**CO1:** Explain the basic introduction of computer and programming languages

**CO2:** Categorize different data types, operators and data input /output functions in ‘C’.

**CO3:** Develop programs using ‘C’ control structures, arrays and string concept.

**CO4:** Sub divides larger problems into smaller ones using ‘C’ functions.

**CO5:** Create programs using the concept of structures, union and file handling in ‘C’.

### **Mathematics II**

**CO1:** Categorize the vector-valued functions of a real variable and their curves, Gradient vector fields and constructing potentials.

**CO2:** Analyze the differential ideas of divergence, curl, and the Laplacian along with their

physical interpretations

**CO3:** Use the applications of Green's theorem in the plane, Gauss divergence theorem and Stoke's theorem.

**CO4:** Formulate the solution set of a system of linear equations

**CO5:** Solve the characteristic polynomial, eigenvectors, Eigenvalues.

### **Logical and Digital Circuits**

**CO1:** Convert different type of codes and number systems which are used in digital communication and computer systems.

**CO2:** Employ the codes and number systems converting circuits and Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency.

**CO3:** Analyze different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods.

**CO4:** Design different types of with and without memory element digital electronic circuits for particular operation, within the realm of economic, performance, efficiency, user friendly and environmental constraints.

**CO5:** Assess the nomenclature and technology in the area of memory devices and apply the memory devices in different types of digital circuits for real world application.

### **Data Structures through 'C'**

**CO1:** Choose appropriate data structures to represent data items in real world problems

**CO2:** Illustrate non-linear data structures like linked list

**CO3:** Organize the data using sorting in various linear data structures and determine time complexity

**CO4:** Construct data with nonlinear data structure using trees.

**CO5:** Explain the concept of graphs and b trees

### **Shell Programming**

**CO1:** Understand Unix Operating system and types of shell

**CO2:** Apply file related and disk related commands

**CO3:** Demonstrate the use of VI editor

**CO4:** Interpret various Unix commands

**CO5:** Apply loop control structures to solve problems

### **Operating System**

**CO1:** Explain functions, types and structures of operating system

**CO2:** Analyze various process management concepts including scheduling and synchronization

**CO3:** Demonstrate process synchronization and dead locks

**CO4:** Solve issues related to file system interface

**CO5:** Choose an appropriate Page replacement algorithm

### **Electrical Circuits and Machines**

**CO1:** Student will be able to analyze the electrical circuits with help of KCL and KVL techniques.

- CO2:** Students will be able to explain the operation of DC generator and analyze the Characteristics of DC generator.
- CO3:** Student will be able to explain the principle of operation of DC motor and analyze their Characteristics. Acquire the skills to analyze the starting and speed control methods of DC motors.
- CO4:** Judge to develop equivalent circuit and evaluate performance of transformers.
- CO5:** Ability to identify speed – torque characteristics of induction motor and understand starting methods of induction motor.

### **Programming in C++**

- CO1:** Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
- CO2:** Understand dynamic memory management techniques using pointers, constructors, destructors
- CO3:** Describe the concept of function overloading, operator overloading, virtual functions and polymorphism.
- CO4:** Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.
- CO5:** Demonstrate file handling in C++.

### **Discrete Mathematics**

- CO1:** Develop understanding of Logic Sets and Functions
- CO2:** Evaluate and apply the fundamental concepts in graph theory
- CO3:** Develop an understanding of how graph and tree concepts are used to solve problems arising in the computer science
- CO4:** Express the concepts and results of Number Theory
- CO5:** Identify methods and techniques used in number theory

### **Probability and Statistics**

- CO1:** Employee the principles of linear regression and correlation, including least square method, predicting a particular value of Y for a given value of X and significance of the correlation coefficient.
- CO2:** Use discrete and continuous probability distributions, including requirements, mean and variance, and making decisions.
- CO3:** Able to perform and analyze hypotheses tests of means, proportions and variances using both one-and two-sample data sets.
- CO4:** Able to apply the appropriate Chi-Squared test for independence and goodness of fit. Can differentiate between the test statistics to be used for dependent and independent samples
- CO5:** Understand the concepts of quality control, chance and assignable causes of variation, control charts for variables.

### **Computer Organization**

- CO1:** Demonstrate knowledge of register organization of a basic computer system
- CO2:** Explain machine language of a basic computer system.

- CO3:** Appraise in-depth understanding of control unit organization and micro programmed control.
- CO4:** Apply various algorithms to perform arithmetic operations and propose suitable hardware for them
- CO5:** Analyze and emphasize various communication media in the basic computer system using design of various memory structures

#### **Database Management Systems**

- CO1:** Represent logical database using Entity Relationship and Enhanced ER model.
- CO2:** Formulate database using relational algebra and organize relation using normalization
- CO3:** Design SQL queries and implements PL/SQL.
- CO4:** Classify the storage and file structure, storage access, indexing and hashing techniques of the database
- CO5:** Explain the concept of Transactions, recovery system and concurrency control.

#### **Java Programming**

- CO1:** Understand fundamentals of object oriented concepts, classes, objects and methods
- CO2:** Apply inheritance, packages and exceptional handling techniques
- CO3:** Demonstrate Threads and applet programming.
- CO4:** Express event handling and swing components.
- CO5:** Design interactive programs using swing

#### **Microprocessor Systems and Applications**

- CO1:** To Understand the Architecture of 16-bit Microprocessor 8086 along with different modes of operation
- CO2:** Apply knowledge and demonstrate programming proficiency using the various addressing modes and data transfer instructions of the 8086t microprocessor
- CO3:** Analyze different assembly language programs
- CO4:** Identify the circuitry to the Microprocessor I/O ports in order to interface the processor to external devices
- CO5:** To combine the different interfacing components of the microprocessor to form a computing Machine.

#### **Object Oriented Systems Development**

- CO1:** Explain basics of OOSD concepts
- CO2:** Categorize Object oriented methodologies and UML diagrams.
- CO3:** Choose classification theory and performing case studies.
- CO4:** Design models based on Object oriented concept.
- CO5:** Identify software quality, system usability, measuring and satisfaction

#### **Software Testing and Quality**

- CO1:** Express importance of testing in software development process, glass-box testing, black-box testing, and how to report and analyze bugs
- CO2:** Design different types of test case.
- CO3:** Organize how to build testing strategy, establishing software testing methodology and software testing techniques.
- CO4:** Identify the definition of quality, metrics for software quality and inspection techniques

**CO5:** Explain software configuration management, software reengineering and software restructuring techniques

### **Software Engineering**

**CO1:** Design software through various process models.

**CO2:** Analyze Object Oriented concepts and various Models

**CO3:** Choose different designs and architectures.

**CO4:** Explain components, golden rules and design evaluation.

**CO5:** Select testing techniques and determine its quality.

### **Operation Research**

**CO1:** Identify the various techniques of operations research and to translate a real – world Problem, given in words, into a mathematical formulation.

**CO2:** Construct the simplex table and to plan the optimum results.

**CO3:** Use the program for optimizing the cost involved in transportation problems

**CO4:** Develop and solve transformation models and assignment models

**CO5:** Design the sequence of jobs and to make up the total process time

### **Mobile Application and Development**

**CO1:** Compare different mobile application models/architectures and patterns

**CO2:** Apply a mobile development framework to the development of a mobile application.

**CO3:** Explain components and structure of a mobile development framework.

**CO4:** Develop advanced Java programming competency by developing a maintainable and efficient Record Management System.

**CO5:** Develop Mobile Application using HTTP

### **Web Technologies**

**CO1:** Illustrate basic html scripts to design web pages

**CO2:** Explain about cascading style sheets

**CO3:** Analyze java script programming using operators, expressions, functions

**CO4:** Classify event handling in java script and introduction to xml

**CO5:** Develop PHP programs and database connectivity through MySQL

### **Computer Networks**

**CO1:** Identify basic computer network topologies and protocols and explain Data Communication System components

**CO2:** Classify different error detecting techniques.

**CO3:** Construct sub-netting and routing mechanisms.

**CO4:** Sketch the routing protocols and analyze how to assign the IP addresses for the given network

**CO5:** Develop network design and implementation

### **Advanced Java**

**CO1:** Understand and develop concepts of data structures using Java library.

**CO2:** Develop component-based Java software using JavaBeans and create well-formed XML

document.

**CO3:** Develop client/server applications using Servlets and JSP.

**CO4:** Update and retrieve the data from the databases using SQL

**CO5:** Identify the type of socket used for connection and implement TCP/IP socket programming

### **E-Commerce**

**CO1:** Explain ecommerce basics and regulatory environment

**CO2:** Identify EDI and risks associated, maintained and recovery plans.

**CO3:** Classify security, cryptography and messaging protocols briefly

**CO4:** Use Firewalls, Intelligent Agents and EPS.

**CO5:** Apply retailing and advertising techniques and B2B business.

### **Principles of Information Security**

**CO1:** Explain concepts of confidentiality, availability and integrity (CIA) in context of Information security

**CO2:** Identify the risk, assess and risk control strategies.

**CO3:** Demonstrate expertise in configuring host and network level technical security controls to include host firewalls, user access controls, host logging, network filtering, intrusion detection and prevention

**CO4:** Analyze systems, tools, methods, and techniques for securing digital information within an organization

**CO5:** Develop encryption and decryption techniques

### **Cloud Computing**

**CO1:** Understand basic advantages and disadvantages of cloud computing

**CO2:** Classify design and architecture of cloud computing, types of clouds and services of cloud computing

**CO3:** Explain cloud computing technology and examples

**CO4:** Analyze virtualization and virtualization techniques

**CO5:** Apply of market oriented cloud computing and third party services

### **Data Mining**

**CO1:** Demonstrate an understanding of the importance of data mining and its related areas.

**CO2:** Organize and prepare the data needed for data mining using pre preprocessing techniques

**CO3:** Perform exploratory analysis of the data to be used for mining.

**CO4:** Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets.

**CO5:** Define and apply metrics to measure the performance of various data mining algorithms.

**CO6:** Analyze the problem domain, use the data collected in enterprise apply the appropriate data mining technique, interpret it.

### **Python Programming**

**CO1:** Demonstrate basic programming techniques.

**CO2:** Apply concepts of functions, sequences, dictionaries

- CO3: Appraise how to implement modules, files, exceptions
- CO4: Create object oriented programming
- CO5: Explain GUI programming, database and network programming

## **B.Sc. Computer Systems and Engineering**

### **Programme Specific Outcomes**

#### **Students will be able to:**

- PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
- PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
- PSO3: Apply the theoretical foundations of computer science in modeling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
- PSO4: Demonstrate proficiency in hardware and software installation and configuration
- PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field

### **Electronic Devices and Circuits**

- CO1: Define and classify the various electronic components
- CO2: Explain the functioning of electronic devices
- CO3: Construct and understand the functioning of BJT
- CO4: Apply the behaviour of transistor in building amplifier
- CO5: Explain the operation of amplifiers and oscillators

### **Problem Solving and Programming in C**

- CO1: Explain the basic introduction of computer and programming languages.
- CO2: Categorize different data types, operators and data input /output functions in 'C'.
- CO3: Develop programs using 'C' control structures, arrays and string concept.
- CO4: Sub divides larger problems into smaller ones using 'C' functions.
- CO5: Create programs using the concept of structures, union and file handling in 'C'.

### **Engineering Drawing and Engineering Workshop**

- CO1: Explain the concept of drawing instruments and represent the lines used in the drawing
- CO2: Prepare the different types of construction by selecting the type of construction



- CO3:** Differentiate drawing from each other, identify the problem, and select the proper portion of the points, lines to solve the problem
- CO4:** Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes
- CO5:** Create the view by looking at the drawing like top, front and side view

### **Logic and Digital Circuits**

- CO1:** Explain the binary logic and switching circuits
- CO2:** Solve Boolean algebra and Boolean functions
- CO3:** Design Boolean functions using universal gates
- CO4:** Construct the arithmetic circuits and digital comparators
- CO5:** Construct and analyze the various combinational circuits

### **C++ and Data Structures**

- CO1:** Differentiate between object-oriented programming and procedure-oriented programming.
- CO2:** Develop programs using object oriented programming features.
- CO3:** Organize the data using sorting and various linear data structures and determine the time complexity
- CO4:** Illustrate non-linear data structures like trees, graph
- CO5:** Choose appropriate data structures to represent data items in real world problems

### **PC Hardware and Software Installation**

- CO1:** Identify the basic components of computers
- CO2:** Differentiate between internal and external connectors
- CO3:** Analyze different types of processors in market
- CO4:** Choose RAM and Hard disk drives for a computer
- CO5:** Develop skill to Assembly and Disassembly a system

### **IT Hardware and Networking**

- CO1:** Identify Motherboard and its components.
- CO2:** Analyze the working of various input and output devices
- CO3:** Explain the working of various storage devices
- CO4:** Explain Assembling and repairing of Desktop Computer with all its hardware components.
- CO5:** Identify different types of networking devices

### **Digital System Design**

- CO1:** Explain the functioning of sequential circuits
- CO2:** Apply the flip flops in constructing the counters and registers
- CO3:** Explain the arithmetic and logic micro operations
- CO4:** Design the arithmetic unit and logic unit
- CO5:** Construct and analyze the ALU

### **Java Programming**

- CO1:** Differentiate between object-oriented programming and procedure-oriented programming
- CO2:** Apply object-oriented programming features for solving a given problem.

- CO3:** Select an appropriate exception handling depending on application.
- CO4:** Design file operations using java standard library
- CO5:** Develop interactive programs using applet and swing

### **Probability and Statistics**

- CO1:** Determine the relation between any two factors using the concepts of correlation and regression and calculate the mean and variance for the random events.
- CO2:** Apply the distributions both discrete and continuous for the problems in different fields and learn the importance of normal distribution and its applications in real life.
- CO3:** Differentiate between different sampling techniques to be used in different situations and draw the inference based on the sample for a population when the sample size is large.
- CO4:** Compare networking services
- CO5:** Plan installation of required services in organization

### **Server Administration**

- CO1:** Choose different editions of operating system
- CO2:** Organize topologies in active directory
- CO3:** Compare different services in active directory
- CO4:** Compare networking services
- CO5:** Plan installation of required services in organization

### **Computer Organization**

- CO1:** Demonstrate knowledge of register organization of a basic computer system
- CO2:** Explain machine language of a basic computer system.
- CO3:** Appraise in-depth understanding of control unit organization and micro programmed control.
- CO4:** Apply various algorithms to perform arithmetic operations and propose suitable hardware for them.
- CO5:** Analyze and emphasize various communication media in the basic computer system using design of various memory structures

### **Operating Systems**

- CO1:** Explain functions, types and structures of operating system
- CO2:** Analyze various process management concepts including scheduling and synchronization
- CO3:** Illustrate the concepts of memory management and I/O system.
- CO4:** Solve issues related to file system interface.
- CO5:** Choose an appropriate Page replacement algorithm

### **Microprocessors and Applications**

- CO1:** Explain the architecture of 8086 based micro computer
- CO2:** Develop the assembly language programs for 8086 based micro computer
- CO3:** Develop the interfacing circuits for 8086 based micro computer
- CO4:** Explain 8086 based microcomputer interrupt mechanism
- CO5:** Use 8086 based microcomputer to explain serial communication

### **Electrical Circuits and Machines**

- CO1:** Analyze the electrical circuits with help of KCL and KVL techniques.
- CO2:** Explain the operation of DC generator AND DC motor and analyze the Characteristics of DC generator and DC Motor
- CO3:** Analyze the starting and speed control methods of DC motors.
- CO4:** Understand to develop equivalent circuit and evaluate performance of transformers
- CO5:** Understand the operation of various special machines.

### **Software Testing and Quality**

- CO1:** Express importance of testing in software development process, glass-box testing, black-box testing, and how to report and analyze bugs
- CO2:** Design different types of test case
- CO3:** Organize how to build testing strategy, establishing software testing methodology and software testing techniques.
- CO4:** Identify the definition of quality, metrics for software quality and inspection techniques.
- CO5:** Explain software configuration management, software reengineering and software restructuring techniques.

### **Software Engineering**

- CO1:** Design software through various process models
- CO2:** Analyze Object Oriented concepts and various Models
- CO3:** Choose different designs and architectures
- CO4:** Explain components, golden rules and design evaluation
- CO5:** Select testing techniques and determine its quality

### **Ethical Hacking**

- CO1:** Explain essential terminology and phases of hacking
- CO2:** Analyze how to perform reconnaissance in various organizations
- CO3:** Identify different types of scanning methods
- CO4:** Explain the maintenance of access gained through hacking
- CO5:** Design techniques used to avoid the traces of attacks in order to escape from the legal Punishment by a malicious hacker.

### **Web Security**

- CO1:** Understand Architecture of the World Wide Web and encryption
- CO2:** Understand SSL and TLS
- CO3:** Explain digital certificates with PGP
- CO4:** Explain cookies and Web bugs, privacy protecting techniques
- CO5:** Explain how to secure your web service, protecting your DNS

### **Principles of Information Security**

- CO1:** Explain concepts of confidentiality, availability and integrity (CIA) in context of Information security

- CO2:** Identify the risk, assess and risk control strategies.
- CO3:** Demonstrate expertise in configuring host and network level technical security controls to include host firewalls, user access controls, host logging, network filtering, intrusion detection and prevention
- CO4:** Analyze systems, tools, methods, and techniques for securing digital information within an organization
- CO5:** Develop encryption and decryption techniques.

### **Database Management Systems**

- CO1:** Represent logical database using Entity Relationship and Enhanced ER model.
- CO2:** Formulate database using relational algebra and organize relation using normalization.
- CO3:** Design SQL queries and implements PL/SQL.
- CO4:** Classify the storage and file structure, storage access, indexing and hashing techniques of the database.
- CO5:** Explain the concept of Transactions, recovery system and concurrency control.

### **Advanced Server Administration**

- CO1:** Distinguish and describe the windows server 2012
- CO2:** Explain directory services and configure DHCP sever
- CO3:** Identify the prerequisites to install DNS service
- CO4:** Tell about file services and do install WDS
- CO5:** Originate the required services

### **Computer Networks**

- CO1:** Identify basic computer network topologies and protocols and explain Data Communication System components
- CO2:** Classify different error detecting techniques.
- CO3:** Construct sub-netting and routing mechanisms.
- CO4:** Sketch the routing protocols and analyze how to assign the IP addresses for the given network
- CO5:** Develop network design and implementation

### **Internet of Things**

- CO1:** Identify the importance of IOT and its applications
- CO2:** Differentiate between IOT and M2M, SDN and NFV
- CO3:** Apply logical design using python
- CO4:** Understand building of IOT devices and Raspberry PI
- CO5:** Explain the working of WAMP server and AWS

### **Cryptography and Network Security**

- CO1:** Identify information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of finite fields and number theory.
- CO2:** Apply Public Key Cryptographic Technique for securing messages
- CO3:** Use an appropriate message authentication code.
- CO4:** Compare the performance of different message digest algorithms for verifying the integrity of varying message sizes

**CO5:** Compare different IEEE standards and electronic mail security

### **Linux Administration**

**CO1:** Describe the Installation of Linux and User, Group Administration, ACL

**CO2:** Explain the configuration NFS, FTP and Send mail server

**CO3:** Explain the configuration DHCP and SELinux

**CO4:** Explain the configuration SAMBA and DNS server

**CO5:** Explain the configuration Apache server, disk quotas

## **BSc Biotechnology**

### **Programme Specific Outcomes**

#### **Students will be able to:**

**PSO1:** Understand the nature and basic concepts of Biotechnology, Genetics, and Chemistry and apply knowledge to identify, analyze and understand concepts to solve problems related to field of Biotechnology and engineering

**PSO2:** Design to perform experiments and interpret data for investigating complex problems and to develop solution to Biotechnology problems by applying appropriate tools while keeping in mind safety factor for environmental & society

**PSO3:** Develop oral and written communication skills to justify societal, health, safety and legal issues and understand his responsibilities in biotechnological practices

### **Biochemistry and Metabolism**

**CO1:** Understand carbohydrates and its complex biochemical pathways within living cells

**CO2:** Classify types of lipids and explain their role in biological systems

**CO3:** Explain physical and chemical properties of amino acids and proteins

**CO4:** Understand the structure of DNA and RNA

**CO5:** Identify chemical nature of enzymes and Vitamins

### **Cell Biology & Molecular Genetics**

**CO1:** Understand cytological, biochemical, physiological and genetic aspects of cell.

**CO2:** Illustrate about the organizational and functional aspects of different types of cell organelles.

**CO3:** Explain structure and functions of different types of cell organelles.

**CO4:** Understand the mechanism of DNA Replication, Denaturation & Reassociation kinetics

**CO5:** Understand fundamentals of DNA damage and repair, including types of mutation and repair mechanisms

### **Genetic Analysis**

**CO1:** Understand genetics and its fundamentals of origin and history

- CO2: Understand different types of mendelian gene interactions
- CO3: Illustrate different types sex determination mechanisms in organisms
- CO4: Understand non Mendelian gene interactions
- CO5: Understand the mechanisms of transfer of genetic information at prokaryotic level

### **Chemistry-I**

- CO1: Analyse the energy changes in a given physical or chemical process.
- CO2: Apply the concept of feasibility of a process.
- CO3: Compare the electrical conductivities of various conductors.
- CO4: Evaluate cell potential, compare various electrodes.
- CO5: Explain various phases in a heterogeneous system, apply the concept to separate various Phases.

### **Immunology**

- CO1: Understand concepts of nonspecific, specific immunity, organs of immune system.
- CO2: Identify the structure, function, and characteristics of immunoglobulins, State the principle of the routine serologic procedures performed in the laboratory.
- CO3: Understand antibody diversity MA Production & applications
- CO4: Illustrate the relevance of Vaccines& immunity to infection and disease.
- CO5: Understand inflammation, allergic reactions &autoimmunity

### **Biotechnology and Human Welfare**

- CO1: Explain the Production of industrially important products
- CO2: Identify the techniques of genetic engineering for production of transformed plants
- CO3: Develop biodegradable biopolymers
- CO4: Understand the basic concepts of forensic science
- CO5: Apply the concepts of biotechnology in medicine

### **Microbial Biotechnology**

- CO1: Categorize major groups of microorganisms
- CO2: Choose appropriate methods for control of the growth of microorganisms
- CO3: Identify and culture the bacteria
- CO4: Explain the concepts of Microbial metabolism
- CO5: Apply the principles of Fermentation for production of commercially important products

### **Chemistry-II**

- CO1: Analyse the structures of various molecules/ions based on LCAO concept.
- CO2: Explain the synthesis and structures of compounds of P-Block elements.
- CO3: Explain the synthesis and structures of compounds of P-Block elements.
- CO4: Explain the fundamentals of organic molecules.
- CO5: Explain the organic reaction mechanisms

### **Bio-Analytical Techniques**

- CO1: Explain the operating conditions for the various separation techniques.
- CO2: Separate biomolecules using Electrophoretic techniques

- CO3: Analyze the working principles of analytical instruments
- CO4: Understand the application of radioactivity in the analysis of biomolecules
- CO5: Apply the concepts of nanotechnology in medicine

### **Recombinant DNA Technology**

- CO1: Explain basic and advanced Concepts of rDNA technology
- CO2: Understand the cloning strategies and screening of recombinants.
- CO3: Analyze methodology of PCR and sequencing
- CO4: Select appropriate vector used for cloning
- CO5: Apply rDNA Technology principles for Pharmaceutical applications.

### **Molecular Biology**

- CO1: Explain the fine structure analysis of gene
- CO2: Illustrate the structure of proteins
- CO3: Analyse the mechanisms of central dogma in prokaryotes and eukaryotes
- CO4: Explain the molecular mechanisms of gene regulation
- CO5: Identify the structure of transposable elements

### **Chemistry-III**

- CO1: Explain synthesis and properties of alcohols, phenols and ethers.
- CO2: Compare synthesis and properties of aldehydes and ketones.
- CO3: Explain synthesis and properties of carboxylic acids, illustrate applications of carbanions.
- CO4: Analyse the three dimensional view of a organic molecule, optical isomerism.
- CO5: Explain the properties of d- and f-block elements

### **Plant Biotechnology**

- CO1: Understand basic Concepts of plant tissue culture techniques
- CO2: Identify the techniques of plant tissue culture for crop improvement
- CO3: Produce somatic hybrids and artificial seeds
- CO4: Explain the large scale culture of plant cells for production of secondary metabolites
- CO5: Apply the technology of plant transformation

### **Human Genetics**

- CO1: Understand different types of inheritance patterns with example
- CO2: Apply the basic knowledge to understand haemoglobin and its variants and disorders
- CO3: Understand the biology of cancer
- CO4: Apply the basic knowledge to understand the gene therapy for inherited diseases
- CO5: Understand on prenatal diagnosis and genetic counselling.

### **Biostatistics**

- CO1: Understand definition and importance of biostatistics in different areas
- CO2: Illustrate about the graphical representation of data
- CO3: Recognize about measures of central tendency
- CO4: Understand measures of dispersion.
- CO5: Understand the techniques of sampling

### **Stem cell Biology**

**CO1:** Classify types of stem cells

**CO2:** Understand the process of isolation, culturing and identification of Embryonic stem cells

**CO3:** Identify Adult stem cells

**CO4:** Apply the principles of genetic engineering to modify Stem cells

**CO5:** Apply the concept of Tissue Engineering in production of complete organ

### **Biodiversity**

**CO1:** Understand biodiversity and its importance at global & national levels.

**CO2:** Understand values of biodiversity and microbial taxonomy and toxins

**CO3:** Illustrate different types of diversity and relate their ways to conserve wild life

**CO4:** Understand extinct threatened and endangered species, biodiversity Hotspots & their protection

**CO5:** Understand importance of biodiversity conservation

### **Chemistry-IV**

**CO1:** Evaluate the concept of critical phenomenon, real gas.

**CO2:** Apply the concept of colligative property and determine molar mass of unknown compound.

**CO3:** Analyse the structures of various complexes

**CO4:** Compare the aromaticity and synthesis of heterocyclic compounds

**CO5:** Explain synthesis and structures of carbohydrates and amino acids.

### **Bioprocess & Fermentation Technology**

**CO1:** Explain fermentor design & types of fermentor

**CO2:** Understand concepts on screening, strain improvement, batch & continuous fermentation

**CO3:** Analyse & control of different bioprocess parameters

**CO4:** Understand concepts of downstream process

**CO5:** Explain production of different fermented products

### **Medical Biotechnology**

**CO1:** Understand concepts on vaccines, different types of vaccines and their production

**CO2:** Evaluate different markers and methods used for diagnosing diseases

**CO3:** Illustrate different therapeutic agents and relate them for treating disease

**CO4:** Understand advanced techniques & strategies used in treating disease

**CO5:** Understand Blood clotting factors drug discovery, designing, properties & delivery.

### **Microbial Physiology**

**CO1:** Identify historical perspectives in Microbiology

**CO2:** Understands the structure of Prokaryotes

**CO3:** Identify the Growth phases of bacteria

**CO4:** Explain the concepts of transport of nutrients

**CO5:** Analyze the methods of Preservation and Maintenance of Microbial Cultures



### **Environmental Biotechnology**

**CO1:** Understand concepts of Food chain, ecological pyramids, global warming and ecosystem

**CO2:** Understand xenobiotic, effluents, types of recalcitrants & different methods of waste water treatment

**CO3:** Understand concepts of Biodegradation, Biodegradative pathways & Bioremediation

**CO4:** Explain about Bioleaching, renewable, on renewable resources & Biosensors.

**CO5:** Explain about Biofuel production & role of cellulose in biofuel production.

### **Evolutionary Biology**

**CO1:** Identify the historical review of evolution

**CO2:** Understands the concepts of origin of cell

**CO3:** Classify the types of fossils

**CO4:** Explain the concepts of natural selection

**CO5:** Explain the role of extinction in evolution

### **IPR, Bioethics & Biosafety**

**CO1:** Understand basic issues of biosafety for human health and environment

**CO2:** Explain necessity of Bioethics and causes of unethical acts

**CO3:** Identify types of IPR

**CO4:** Analyze different aspects in carrying out research

**CO5:** Explain the theories of Entrepreneurship

### **Animal Biotechnology**

**CO1:** Explain basic concepts of animal cell culture

**CO2:** Classify the types of animal cell culture media

**CO3:** Design bioreactors suitable for large scale culture of animal cells

**CO4:** Apply the principles of genetic engineering to transfect animal cells for industrial use

**CO5:** Apply the concepts of transgenic animal

### **Chemistry-V**

**CO1:** Analyse various nuclear processes and applications of radio isotopes.

**CO2:** Explain fundamental concepts of spectroscopic techniques.

**CO3:** Compare synthesis and properties of nitrogen compounds

**CO4:** Evaluate photo processes and compare various organometallic compounds

**CO5:** Evaluate order and molecularity of a reaction and catalytic processes.

### **Enzyme Technology**

**CO1:** Understand the principles of enzyme technology

**CO2:** Explain procedure for production and purification of Crude enzymes

**CO3:** Demonstrate the methods of immobilization

**CO4:** Design immobilized enzyme reactors

**CO5:** Identify the applications of biosensor in healthcare and environment

### **Industrial Fermentations**

- CO1:** Develop industrial fermentation process
- CO2:** Understand the production of microbial metabolites
- CO3:** Analyze the production processes of secondary metabolites
- CO4:** Explain the production of industrial enzymes
- CO5:** Explain the methods of Production of biotechnology products

### **Fundamentals of Genomics and Proteomics**

- CO1:** Understand the genome and its diversifications
- CO2:** Apply the basic knowledge to understand genome sequencing methods
- CO3:** Explain principles and software's and data bases for genome analysis
- CO4:** Evaluate and analyze methods for secondary structure and natures of proteins
- CO5:** Characterization of proteins by different advanced techniques

### **Ecology and Environment Management**

- CO1:** Understand the concepts of ecology and ecosystem.
- CO2:** Explain basic concepts of hydrosphere, Fresh water Aquatic and Marine ecosystem.
- CO3:** Understand the concepts of biogeochemical cycles and Energy transfer in ecosystem
- CO4:** Explain different types of wastes and waste management
- CO5:** Understand the concepts of Environmental cleanup and role of biotechnology in protection and preservation of environment

### **Bioinformatics**

- CO1:** Explain INSDC & different types of format.
- CO2:** Understand different types of data bases available and scoring matrix significance in alignment of sequences
- CO3:** Explain principles and algorithms of pairwise and multiple alignments, and sequence similarity searching
- CO4:** Evaluate and analyse methods for secondary structure prediction and phylogenetic tree construction
- CO5:** Understand on modeling of unknown protein structure by using template and application of bioinformatics in various fields

## **Dept. of Maths, Statistics & Computer Science**

### **Descriptive Statistics & Probability Distribution-I**

- CO1: Organize**, manage and present data and Analyze statistical data using measures of central tendency
- CO2: Analyze** the statistical data using dispersion and location.
- CO3: Use** the basic probability rules, including additive and multiplicative laws, using the terms, independent and mutually exclusive events.
- CO4: Develop** the probability density function of transformation of random variables.
- CO5: Identify** probabilities, and derive the marginal and conditional distributions of bivariate random variables.

### **Descriptive Statistics & Probability Distributions-II**

- CO1: Use** discrete and continuous probability distributions, including requirements, mean and variance, and making decisions
- CO2: Identify** the characteristics of different discrete distributions.
- CO3: Apply** the normal probability distribution including standard normal curve calculations of appropriate areas.
- CO4:** Choose exponential, beta and Gamma distributions to solve statistical problems.
- CO5: Develop** different distributions to solve various statistical problems.

### **Statistical Methods and Inference-I**

- CO1: Interpret** the correlation between two variables.
- CO2: Distinguish** the principles of linear regression and correlation, including least square method, predicting a particular value of Y for a given value of X and significance of the correlation coefficient.
- CO3: Show** the association between the attributes.
- CO4: Generalize** the properties of estimators.
- CO5: Differentiate** Maximum likely hood estimation and method of moments

### **Statistical Inference -II**

- CO1: Develop** the distributional results needed for statistical inference.
- CO2: Analyze** hypotheses tests of means, proportions and variances using both one-and two-sample data sets.
- CO3: Explain** Chi-Squared test for independence of attributes and goodness of fit.
- CO4: Differentiate** between the tests statistics to be used for dependent and independent samples.
- CO5: Design** the test statistic to be used when the nature of the distribution is unknown.

### **Applied Statistics -I**

- CO1: Classify** the analysis of variance of one-way and two-way classifications.
- CO2: Design** experiments, carry them out, and analyze the data they yield
- CO3:** Tell the difference between CSO and NSSO.
- CO4: Demonstrate** understanding of the concepts of time series and its applications in different areas.
- CO5: Differentiate** various measures of secular trend and seasonal indices

### **Applied Statistics – II**

- CO1: Analyze** the concepts of quality control, chance and assignable causes of variation, control charts for variables and attributes.
- CO2: Classify tolerance** limits, specification limits and process capability limits.
- CO3: Select** the appropriate index numbers and calculate an indices from given data
- CO4: Construct** the cost of living index numbers and wholesale price index numbers.
- CO5: Develop** the knowledge on vital statistics, and calculate fertility rates from given data

### **Operations Research**

- CO1: Identify** the various techniques of operations research and to translate a real – world

problem, given in words, into a mathematical formulation.

**CO2: Construct** the simplex table and to plan the optimum results.

**CO3: Use** the program for optimizing the cost involved in transportation problems

**CO4: Develop** and solve transformation models and assignment models

**CO5: Design** the sequence of jobs and to make up the total process time

### **Design of Sampling Surveys**

**CO1: Analyze** the practical issues arising in sampling studies.

**CO2: Explain** the concepts of simple random sampling with and without replacement.

**CO3: Distinguish** between simple random sampling and stratified random sampling.

**CO4: Compare** simple random sampling, stratified random sampling and systematic sampling.

**CO5: Choose** the equilibrium price and quantity from a table of prices and the related quantity supplied and quantity demanded

### **Advanced Operations Research**

**CO1: Analyze** various queuing models and obtain the least waiting time.

**CO2: construct** the network models and determine the start and finish time.

**CO3: Design** new simple models, like CPM, PERT to improve decision –making and develop critical thinking and objective analysis of decision problems.

**CO4: Identify** the saddle point for games with mixed strategies.

**CO5: Construct** the different models involved in game theory.

### **Abstract Algebra**

**CO1: Demonstrate** important mathematical concepts in abstract algebra such as definition of a group, order of a finite group and order of an element.

**CO2: Analyze** different types of subgroups such as normal subgroups, cyclic subgroups and understand the structure and characteristics of these subgroups

**CO3: Solve** the algebraic problems using appropriate techniques.

**CO4: Analyze** the knowledge and understanding of fundamental concepts including groups, subgroups, normal subgroups, homomorphism and isomorphism.

**CO5: Demonstrate** knowledge and understanding of rings, fields and their properties.

### **Differential Calculus And Differential Equations:**

**CO1: Classify** the differential equations with respect to their order and linearity. Solve differential equations of first order using numerical and analytical methods such as Integrating Factors.

**CO2: Analyze** and Solve basic application problems described by first order differential equations. Such as orthogonal trajectories

**CO3: Solve** second order Homogeneous Equations with Constant Coefficients. Obtain exact and numerical solutions using differential equations technology.

**CO4: Construct** the vector-valued functions of a real variable and their curves, Gradient vector fields and constructing potentials.

**Co5: Identify** the differential ideas of divergence, curl, and the Laplacian along with their physical interpretations.

### **Discrete Mathematics**

- CO1: Develop** understanding of Logic Sets and Functions
- CO2: Understand** Boolean algebra and basic properties of Boolean algebra; able to simplify simple Boolean functions by using the basic Boolean properties.
- CO3: Develop** an understanding of how graph and tree concepts are used to solve problems arising in the computer science
- CO4: Evaluate** and apply the fundamental concepts in graph theory
- CO5: Apply** graph theory based tools in solving practical problems.

### **Elementary Number Theory**

- CO1: Express** the concepts and results of Number Theory.
- CO2: Demonstrate** knowledge and understanding of topics including, divisibility, prime numbers, congruences, Diophantine equations.
- CO3: Identify** methods and techniques used in number theory.
- CO4: Solve** challenging problems in Number Theory.
- CO5: Develop** a deeper conceptual understanding of the theoretical basis of number theory and cryptography.

### **Functions of Complex Variables**

- CO1: Represent** complex numbers algebraically and geometrically, define and analyze limits and continuity for complex functions as well as consequences of continuity.
- CO2: Apply** the concept and consequences of analyticity and the Cauchy-Riemann equations and of results on harmonic and entire functions including the fundamental theorem of algebra.
- CO3: Analyze** sequences and series of analytic functions and types of convergence.
- CO4: Solve** complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem in its various versions, and the Cauchy integral formula.
- CO5: Classify** singularities and poles, find residues and evaluate complex integrals using the residue theorem. Represent functions as Taylor, power and Laurent series

### **Laplace Transforms And Fourier Series**

- CO1: Solve** the Laplace transform of standard functions from the definitions.
- CO2: Use** the appropriate shift theorems in finding Laplace and inverse Laplace transforms
- CO3: Combine** the necessary Laplace transform techniques to solve second-order ordinary differential equations.
- CO4: Analyze** the Fourier transform of elementary functions from the definition.
- CO5: Develop** real and complex forms of the Fourier series for standard periodic waveforms and convert from real-form Fourier series to complex-form and vice-versa.

### **Linear Algebra**

- CO1: Construct** mathematical arguments that relate to the study of introductory linear algebra.
- CO2: Solve** the characteristic polynomial, eigenvectors, eigenvalues.
- CO3: Analyze** finite and infinite dimensional vector spaces and subspaces over a field and their properties, including the basis structure of vector spaces

- CO4: Use** the definition and properties of linear transformations and matrices of linear transformations and change of basis, including kernel, range and isomorphism.
- CO5: Explain** orthogonality on vector spaces and compute inner products and, including Gram-Schmidt orthogonalization

### **Numerical Analysis**

- CO1: Categorize** the theoretical and practical aspects of the use of numerical methods.
- CO2: Explain** how the common numerical methods and are used to obtain approximate solutions to intractable mathematical problems.
- CO3: Develop** numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations.
- CO4: Analyse** and evaluate the accuracy of common numerical methods.
- CO5: Select** appropriate numerical methods to apply to various types of problems in engineering and science in consideration of the mathematical operations.

### **Real Analysis**

- CO1: Categorize** the real line as a complete, ordered field.
- CO2: Use** the definitions of convergence as they apply to sequences, series, and functions.
- CO3: Identify** the continuity, differentiability, and inerrability of functions defined on subsets of the real line.
- CO4: Apply** the Mean Value Theorem and the Fundamental Theorem of Calculus to problems in the context of real analysis.
- CO5: Explain** the Riemann integrability and the Riemann-Stieltjes integrability of a bounded function and prove a selection of theorems concerning integration.

### **Solid Geometry**

- CO1: Use** key standards and conventions to communicate graphic ideas and information
- CO2: Demonstrate** knowledge and understanding of plane and solid geometry.
- CO3: Develop** factual knowledge including the mathematical notation and terminology in geometry; points, lines, and angles; planar figures.
- CO4: Evaluate** the surface area of sphere - great circle and volume of sphere, cone.
- CO5: Explain** the properties of a cylinder. Measure and determine the surface area and Volume of a cylinder.

### **Fundamentals Of Information Technology**

- CO1:** Understand basic computer terminology and number systems
- CO2:** Explain about operating systems, and its types
- CO3:** Apply modern means of communications , types of networks and topologies
- CO4:** Identify different applications of Information system
- CO5:** Classify Internet and networks

### **Problem Solving and Programming through C**

- CO1:** Understand the basic introduction of computer and programming language
- CO2:** Identify 'C' data types, operators and data input /output functions
- CO3:** Categorize 'C' control structures, arrays and string concept
- CO4:** Explain 'C' function, recursion, pointers and dynamic memory allocation
- CO5:** Express the concept of structures, union and file handling in 'C'.

### **C++ and Numerical Methods**

- CO1:** Understand C++ programming basics ,operators ,data types
- CO2:** Apply constructors and destructors
- CO3:** Explain Inheritance, polymorphism
- CO4:** Create classes for file streams
- CO5:** Develop solutions of equations with numerical analysis

### **Data Base Management Systems**

- CO1:** Describe Entity Relationship and Enhanced ER model.
- CO2:** Understand the relational model, reduction to relation schema, relational algebra and normalization
- CO3:** Identify SQL- the standard language of relational databases and PL/SQL programming
- CO4:** Explain the storage and file structure, storage access, indexing and hashing techniques of the database
- CO5:** Understand the concept of Transactions, recovery system and concurrency control.

### **System Analysis and Design**

- CO1:** Understand the system development environment
- CO2:** Apply the structuring system requirements
- CO3:** Explain design objectives and transform analysis
- CO4:** Identify Object oriented system design and development
- CO5:** Construct UML diagrams

### **Computer Networks**

- CO1:** Understand and identify basic computer network topologies and protocols and explain Data Communication System components and functions of each layer in OSI model and its protocols.
- CO2:** Classify different error detecting techniques.
- CO3:** Create skills of sub-netting and routing mechanisms.
- CO4:** Identify different internetworking devices
- CO5:** Compare different OSI upper layers

### **Java Programming**

- CO1:** Understand java program structure and differentiate between object-oriented programming and procedure- oriented programming.
- CO2:** Apply Operators and expressions, decision making and classes ,objects and methods

concepts

**CO3:** Explain Use of Arrays ,Strings and Packages

**CO4:** Solve Multithreading ,exception handling mechanism, with basic applet programming

**CO5:** Develop interactive programs using applet working with graphics AWT

### **Operating Systems**

**CO1:** Identify the main components of an OS & their functions

**CO2:** Analyze various issues in Inter Process Communication (IPC) and the role of OS in IPC.

**CO3:** Explain Process synchronization, Deadlocks-deadlock characterization, methods for handling deadlocks

**CO4:** Compare the concepts and implementation Memory management policies and virtual memory

**CO5:** Understand the working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS

### **Software Engineering**

**CO1:** Explain engineering through various process models.

**CO2:** Identify analyze Requirements, Object Oriented and various modeling's.

**CO3:** Categorize design and architecture

**CO4:** Classify Components, golden rules and design evaluation

**CO5:** Understand testing techniques to evaluate quality metrics

## **B.Sc. Computer Data Science & Data Analytics Engg.**

### **Program Specific Outcomes:**

#### **Students will be able to:**

**PSO1:** Apply computer science languages and algorithms, as well as mathematical and statistical models for developing solutions to the real world problems.

**PSO2:** Understand the fundamentals of Computer Organization, Operating Systems and networking related concepts and apply the knowledge of computer systems in designing and building software solutions.

**PSO3:** Demonstrate, identify, formulate and analyse diverse big data problems helping in business decision making. Apply supervised and unsupervised machine learning methodologies.

**PSO4:** Apply appropriate Data Mining and Text Mining techniques for cleaning, processing and transforming the data. Analyze and interpret the data using an ethically responsible approach and derive insights from it.

### **General English I**

Through an exposure to contemporary passages, the students would be able to have a grasp on the language of today, with specific emphasis on the Listening, Speaking, Reading and Writing skills.



Through the components of a passage, vocabulary and grammar section, speaking component and writing segments, there is a holistic development for language proficiency and fluency.

The students would specifically be able to:

- CO1:** Distinguish between words which are either spelt or pronounced alike, yet render distinct meanings; imparting a sound clarity on everyday usage and miscommunications embedded in language
- CO2:** Develop the art of parallel listening and writing; the art of swift, crisp and organized writing through note making
- CO3:** Improve diction and gain understanding on the tense component, a pivotal constituent for language structuring.
- CO4:** Transfer the data in pictorial or graphical representations to a textual format, in order to restate information in different forms in their present academic or future professional lives.
- CO5:** Identify with economical word constructions, paying specific attention to vocabulary building in English
- CO6:** Construct their writing skills in writing formal letters and to design their curriculum vitae efficiently to venture into future job endeavors
- CO7:** Interpret subject-verb agreement, the basic part involved in sentence constructing to improve their linguistic skills
- CO8:** Gain knowledge to plan technical and project reports for, writing responses to instructions for a person in authority, or for presenting a proposal to the clients.
- CO9:** Extend their language efficiency through the grammar component of commonly confused and misspelt words, and errors related to vocabulary and different aspects of grammar, which would be seemingly helpful for language delivery
- CO10:** Cite varied sources of references, and become skilled at constructing a bibliography, an important piece of academic writing to acknowledge the author's debt to others, for facts and ideas a book or paper is built on

### **Fundamentals Of Information Technology**

- CO1:** Understand basic computer terminology and number systems.
- CO2:** Learn about operating systems, and its types.
- CO3:** Learn about the applications of Information technology
- CO4:** Importance of system development and the phases of SDLC
- CO5:** Use of modern means of communications, types of networks and topologies

### **Differential Equations and Number Theory**

- CO1:** Classify the differential equations with respect to their order and linearity. Solve differential equations of first order using numerical and analytical methods such as Integrating Factors.
- CO2:** Analyze and Solve basic application problems described by first order differential equations. such as orthogonal trajectories.
- CO3:** **Solve** second order Homogeneous Equations with Constant Coefficients. Obtain exact and numerical solutions using differential equations technology.
- CO4:** Express the concepts and results of Number Theory.
- CO5:** Demonstrate knowledge and understanding of topics including, divisibility, prime numbers, congruences.

### **Descriptive Statistics And Probability Distributions – I**

- CO1:** Organize, manage and present data and Analyze statistical data using measures of central tendency
- CO2:** Analyze the statistical data using dispersion and location.
- CO3:** Use the basic probability rules, including additive and multiplicative laws, using the terms, independent and mutually exclusive events.
- CO4:** Develop the probability density function of transformation of random variables.
- CO5:** Identify probabilities, and derive the marginal and conditional distributions of bivariate random variables.

### **Problem Solving and Programming through C**

- CO1:** Understand the basic introduction of computer and programming language.
- CO2:** Identify 'C' data types, operators and data input /output functions.
- CO3:** Categorize 'C' control structures, arrays and string concept.
- CO4:** Explain 'C' function, recursion, pointers and dynamic memory allocation.
- CO5:** Express the concept of structures, union and file handling in 'C'.

### **General English-II**

To enhance the learner's communication skills by giving adequate exposure to increase their proficiency in reading, writing, listening and speaking skills and the related sub skills.

Students will be able to:

- CO1:** Have a sound understanding on the formation of words and in describing the functional grammatical component in the sentence.
- CO2:** Apply their writing skills for brief write ups and speaking skills for responding to opinion based questions.
- CO3:** Identify the appropriate Modal Auxiliary verbs for the apt meaning and usage
- CO4:** Learn the art of constructing an exhaustive report to suit varied circumstances and instances
- CO5:** Create an outlook into Indian Literature; alongside develop and chisel their communication skills
- CO6:** Demonstrate their descriptive skills for effective expression in writing
- CO7:** Recognize the moral element which underlies in the short story; an exposure to informal language
- CO8:** Discover and to enhance recall and comprehension of the content material
- CO9:** Develop listening and speaking skills through effective sentence constructions and efficient delivery
- CO10:** Paraphrasing ideas and thoughts in a coherent, neat and organized manner for sound writing propagandas

### **Indian Heritage and Culture**

- CO1:** This unit makes the student to *understand* better about the origin of ancient Indian culture the contributions of great rulers from both north and south India for Indian culture in ancient days
- CO2:** Students will Analyse how Persian culture entered into India and it influence the Fine Arts of Indian society like Classical Music, Dance and Architecture.

- CO3:** Student is able to assess how the Indian orthodox society turn into modern and western society in the 19th century. It also edifies the students with spiritual doctrines of various Religions.
- CO4:** Students will *evaluate* various challenges face by the youth and the evils effects of terrorism on society
- CO5:** The topics in the unit Create belongingness among the students by bringing awareness of the rights and duties to make the world a better place and it throw light on gender sensitization issues of women, Children and LGBT

### **Abstract Algebra**

- CO1:** Demonstrate important mathematical concepts in abstract algebra such as definition of a group, order of a finite group and order of an element.
- CO2:** Analyze different types of subgroups such as normal subgroups, cyclic subgroups and understand the structure and characteristics of these subgroups
- CO3:** Solve the algebraic problems using appropriate techniques.
- CO4:** Analyze the knowledge and understanding of fundamental concepts including groups, subgroups, normal subgroups, homomorphism and isomorphism.
- CO5:** Demonstrate knowledge and understanding of rings, fields and their properties.

### **Numerical Analysis**

- CO1:** Categorize the theoretical and practical aspects of the use of numerical methods.
- CO2:** Explain how the common numerical methods and are used to obtain approximate solutions to intractable mathematical problems.
- CO3:** Develop numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations.
- CO4:** Analyse and evaluate the accuracy of common numerical methods.
- CO5:** Select appropriate numerical methods to apply to various types of problems in engineering and science in consideration of the mathematical operations.

### **Descriptive Statistics and Probability Distributions – II**

- CO1:** Use discrete and continuous probability distributions, including requirements, mean and variance, and making decisions
- CO2:** Identify the characteristics of different discrete distributions.
- CO3:** Apply the normal probability distribution including standard normal curve calculations of appropriate areas.
- CO4:** Choose exponential, beta and Gamma distributions to solve statistical problems.
- CO5:** Develop different distributions to solve various statistical problems.

### **Data Structures through C**

- CO1:** Choose appropriate data structures to represent data items in real world problems
- CO2:** Illustrate non-linear data structures like linked list
- CO3:** Organize the data using sorting in various linear data structures and determine time complexity
- CO4:** Construct data with nonlinear data structure using trees.
- CO5:** Explain the concept of graphs and b trees

### **Python Programming**

- CO1: Implement the structure and components of a Python program.
- CO2: Express how to write loops and decision statements in Python.
- CO3: Interpret how to write functions and pass arguments in Python.
- CO4: Explain build and package Python modules for reusability.
- CO5: Create files and handle exceptions

### **Python Programming**

- CO1: Implement the structure and components of a Python program.
- CO2: Choose appropriate data structures.
- CO3: Interpret how to write functions and pass arguments in Python.
- CO4: Categorize different exception.
- CO5: Understand basic GUI programming

### **Computer Organization**

- CO1: Understand basic Circuit designing and number systems
- CO2: Explain about how data transferred from one register to another register
- CO3: Construct designing of control unit and Central Processing Unit
- CO4: Classify different types of computer arithmetic operations
- CO5: Categorize all peripheral devices and memory

### **Statistical Methods and Inference – I**

- CO1: Interpret the correlation between two variables.
- CO2: Distinguish the principles of linear regression and correlation, including least square method, predicting a particular value of Y for a given value of X and significance of the correlation coefficient.
- CO3: Show the association between the attributes.
- CO4: Generalize the properties of estimators.
- CO5: Differentiate Maximum likely hood estimation and method of moments

### **Database Management Systems**

- CO1: To describe Entity Relationship and Enhanced ER model.
- CO2: To understand the relational model, reduction to relation schema, relational algebra and normalization.
- CO3: To use SQL- the standard language of relational databases and PL/SQL programming.
- CO4: To understand the storage and file structure, storage access, indexing and hashing techniques of the database.
- CO5: To understand the concept of Transactions, recovery system and concurrency control.

### **Accounting and Financial Management**

- CO1: To describe the need and importance of accounting and infer the various principles of accounting

- CO2: To Explain about branches of accounting
- CO3: To analyze the financial position of an organization
- CO4: To interpret the sources of finance.
- CO5: To create budgets for key factors of organization.

### **R Programming**

- CO1: Understand basic concept of R.
- CO2: Demonstrate programming concepts and data structures in R.
- CO3: Analyze a large problem by sub dividing it into smaller components using functions
- CO4: Choose an appropriate graphic for analysis and analyze data using summary statistics.
- CO5: Choose the type of regression based on data set.

### **Data Mining and Data Warehousing**

- CO1: To understand the concepts of data mining and its importance
- CO2: Analyze different classification and clustering methods using algorithms
- CO3: Explain the data flow and the concepts of warehousing
- CO4: Express how to build data marts and to learn about dimensional modeling.
- CO5: Identify concepts of Extraction, Transformation and loading.

### **Operating Systems**

- CO1: Identify the main components of an OS & their functions
- CO2: Analyze various issues in Inter Process Communication (IPC) and the role of OS in IPC.
- CO3: Explain Process synchronization, Deadlocks-deadlock characterization, methods for handling deadlocks.
- CO4: Compare the concepts and implementation Memory management policies and virtual memory.
- CO5: Understand the working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS

### **Statistical Inference –II**

- CO1: Develop the distributional results needed for statistical inference.
- CO2: Analyze hypotheses tests of means, proportions and variances using both one-and two-sample data sets.
- CO3: Explain Chi-Squared test for independence of attributes and goodness of fit.
- CO4: Differentiate between the tests statistics to be used for dependent and independent samples.
- CO5: Design the test statistic to be used when the nature of the distribution is unknown.

### **Java Programming**

- CO1: Write java programs and differentiate between object-oriented programming and procedure-oriented programming.
- CO2: Apply object-oriented programming features for solving a given problem.
- CO3: Incorporate exception handling mechanism.
- CO4: Implement Use java standard API library to handle file operations.
- CO5: Develop interactive programs using applet and swing

### **Operations Research**

- CO1:** Identify the various techniques of operations research and to translate a real – world problem, given in words, into a mathematical formulation.
- CO2:** Construct the simplex table and to plan the optimum results.
- CO3:** Use the program for optimizing the cost involved in transportation problems
- CO4:** Develop and solve transformation models and assignment models
- CO5:** Design the sequence of jobs and to make up the total process time

### **Data Visualization Tools**

- CO1:** Understand the way of representing visual data and its applications.
- CO2:** Demonstrate data visualization using combination of various charts.
- CO3:** Apply visualizing techniques using matplotlib package.
- CO4:** Design effective graphical analysis in R
- CO5:** Construct data visualizations with Tableau to create customized dashboards and reports.

### **Software Testing & Quality**

- CO1:** Analyze importance of testing in software development process, apply glass-box testing, black- box testing, and how to report and analyze bugs
- CO2:** Identify problem tracking system, different types of testing and test case design.
- CO3:** To understand how to build testing strategy, establishing software testing methodology and software testing techniques.
- CO4:** Explain the definition of quality, metrics for software quality and inspection techniques.
- CO5:** Classify software configuration management, software reengineering and software restructuring techniques.

### **Software Engineering**

- CO1:** Explain engineering through various process models.
- CO2:** Identify analyze Requirements, Object Oriented and various modeling's.
- CO3:** Categorize design and architecture
- CO4:** Classify Components, golden rules and design evaluation.
- CO5:** To understand testing techniques to evaluate quality metrics

### **Text Mining**

- CO1:** Demonstrate an understanding of the importance of Text mining and its related areas
- CO2:** Compare the appropriate data mining methods like classification and clustering.
- CO3:** Apply the concepts of information extraction and retrieval.
- CO4:** Identify how to apply metrics to measure the performance of various mining algorithms.
- CO5:** Analyse the data visualization techniques, use the data collected in enterprise apply the interpret it.

### **Data Analytics and Decision Making**

- CO1:** Understand the role of data in evidence based decision making
- CO2:** Examine the systems by which data is or can be made available
- CO3:** Possess an understanding of measurement issues and processes for understanding

relationships based on statistical theory

**CO4:** Apply modern quantitative tools to data analysis in a business context

**CO5:** Analyse and interpret data to provide meaningful information to assist in decision making

### **Machine Learning Techniques**

**CO1:** Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc.

**CO2:** Classify the learning algorithms and apply to the given data set.

**CO3:** Identify the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and un-supervised learning.

**CO4:** Evaluate and interpret the results of the algorithms.

**CO5:** Design and implement machine learning solutions to classification, regression, and clustering problems

### **Computer Networks**

**CO1:** Understand and identify basic computer network topologies and protocols and explain Data Communication System components.

**CO2:** Describe the functions of each layer in OSI model and its protocols.

**CO3:** Classify different error detecting techniques.

**CO4:** Build skills of sub-netting and routing mechanisms.

**CO5:** Classify the routing protocols and analyze how to assign the IP addresses for the given network

### **Data Security**

**CO1:** Identify some of the factors driving the need for data security

**CO2:** Examine and classify particular examples of attacks

**CO3:** Classify the terms vulnerability, threat and attack

**CO4:** Analyze physical points of vulnerability in simple networks

**CO5:** Compare and contrast symmetric and asymmetric encryption systems and their vulnerability to attack, and explain the characteristics of hybrid systems.

### **Cloud Computing**

**CO1:** Understand distributed systems for cloud computing

**CO2:** Identify cloud servers, types and components

**CO3:** Analyse cloud architectural information in the present generation of market

**CO4:** Compare types of clients in the cloud and virtualization

**CO5:** Examine virtual machines the market and usage

### **Marketing Data Analytics**

**CO1:** Understand market research methods

**CO2:** Analyze consumer behaviour and marketing strategy

**CO3:** Identify market basket analysis

- CO4:** Examine survival analysis
- CO5:** Classify customer segmentation

### **Social Media Analytics**

- CO1:** Identify various platforms in social media
- CO2:** Understand processing of social media
- CO3:** Compare differences between twitter and other social media networks
- CO4:** Analyze Facebook information and write business cases
- CO5:** Differentiate social media networks Instagram (i.e., usage of instagram and data processing techniques also they will get idea)

### **Big Data Analytics**

- CO1:** Explain the motivation for big data systems and identify the main sources of Big Data in the real world.
- CO2:** Develop technical skills in predicative and prescriptive modeling to support business decision-making.
- CO3:** Implement several Data Intensive tasks using the Map Reduce Paradigm.
- CO4:** Understand Hadoop ecosystem such as YARN and HIVE-QL for structured databases.
- CO5:** Demonstrate an ability map-reduce programming using PIG and NoSQL databases for storing purpose and process for Big Data Analytics

## **B.Sc. Electronics Technology**

### **Program Specific Outcomes:**

#### **Students will be able to:**

- PSO1:** Students will be able to understand the concepts and apply fundamentals of electronics in various domains of analog and digital systems.
- PSO2:** Design and analyze various functional elements of different modes of communications systems
- PSO3:** Implement and demonstrate variety of automation systems by controlling, processing different signals according to the required specifications.
- PSO4:** Compete with the people who are using electronic hardware and software IT tools for the design and analysis of complex electronic systems in furtherance to research activities.
- PSO5:** Excellent adaptability to changing work environment, good inter personal skills as a leader in a team with good skills to communicate in both oral and written forms.

### **General English-I**

Through an exposure to contemporary passages, the students would be able to have a grasp on the language of today, with specific emphasis on the Listening, Speaking, Reading and Writing



skills. Through the components of a passage, vocabulary and grammar section, speaking component and writing segments, there is a holistic development for language proficiency and fluency.

The students would specifically be able to:

**CO1:**

1. Distinguish between words which are either spelt or pronounced alike, yet render distinct meanings; imparting a sound clarity on everyday usage and miscommunications embedded in language
2. Develop the art of parallel listening and writing; the art of swift, crisp and organized writing through note making

**CO2:**

1. Improve diction and gain understanding on the tense component, a pivotal constituent for language structuring.
2. Transfer the data in pictorial or graphical representations to a textual format, in order to restate information in different forms in their present academic or future professional lives.

**CO3:**

1. Identify with economical word constructions, paying specific attention to vocabulary building in English
2. Enhance their writing skills in writing formal letters and to structure their curriculum vitae efficiently to venture into future job endeavors

**CO4:**

1. Learn subject-verb agreement, the basic part involved in sentence constructing to improve their linguistic skills
2. Gain knowledge in framing technical and project reports for writing responses to instructions for a person in authority, or for presenting a proposal to the clients.

**CO5:**

1. Polish their language efficiency through the grammar component of commonly confused and misspelt words, and errors related to vocabulary and different aspects of grammar, which would be seemingly helpful for language delivery
2. Cite varied sources of references, and become skilled at constructing a bibliography , an important piece of academic writing to acknowledge the author's debt to others, for facts and ideas a book or paper is built on.

### **Programming in C & Data Structures**

**CO1:** Describe the features of Procedure Oriented Programming

**CO2:** Solve real life problems using Arrays and Functions

**CO3:** Differentiate between call by value and call by reference

**CO4:** Understand the concepts of Pointers and Dynamic Memory Allocation

**CO5:** Analyze data structures like stacks, linked lists

### **Mathematics Foundation for Electronics**

**CO1:** Categorize the differential equations with respect to their order and linearity. Solve differential equations of first order using numerical and analytical methods such as Integrating Factors.

**CO2:** Analyze and Solve basic application problems described by first order differential equations. Such as circuits, orthogonal trajectories.

**CO3:** Solve second order Homogeneous Equations with Constant Coefficients. Obtain exact and numerical solutions using differential equations technology.

**CO4:** Formulate the solution set of a system of linear equations. .

**CO5:** Solve the characteristic polynomial, eigenvectors, eigenvalues.

### **Mechanics (Physics-I)**

**CO1:** Explain basic laws of motion and laws of mechanics

**CO2:** Apply laws of motion on rigid bodies to study their fundamental laws

**CO3:** Identify the importance of basic laws to study the motion of planets

**CO4:** Able to judge relative motion of systems

**CO5:** Analyze waves and their propagation mathematically

### **Basic Circuit theory and Network Analysis**

**CO1:** Apply technique electrical networks in presence of active and passive elements.

**CO2:** Classify Electrical networks with network topology concepts.

**CO3:** Analyze magnetic circuit with various dot conventions. Electrical networks by using principles of network theorems

**CO4:** Analyze R, L, C network with sinusoidal excitation

**CO5:** Use R, L, network with variation of any one of the parameters i.e R, L, C. and f

### **General English-II**

To enhance the learner's communication skills by giving adequate exposure to increase their proficiency in reading, writing, listening and speaking skills and the related sub skills.

Students will be able to:

**CO1:**

1. Have a sound understanding on the formation of words and on the functional grammatical component in the sentence.
2. Enhance their writing skills for brief write ups and speaking skills for responding to opinion based questions.

**CO2:**

1. Identify the appropriate Modal Auxiliary verbs for the apt meaning and usage
2. Learn the art of exhaustive report writing to suit varied circumstances and instances

**CO3:**

1. Have a glimpse into Indian Literature; alongside develop and chisel their communication skills
2. Enhance their descriptive skills for effective expression in writing

**CO4:**

1. Grasp the moral element which underlies in the short story ; an exposure to informal language
2. Discover and to enhance recall and comprehension of the content material

**CO5:**

1. Develop listening and speaking skills through effective sentence constructions and efficient delivery
2. Paraphrasing ideas and thoughts in a coherent, neat and organized manner for sound writing propagandas

**Indian Heritage & Culture**

**CO1:**

1. This unit makes the student to understand better about the origin of ancient Indian culture
2. Student will come to know the contributions of great rulers from both north and south India for Indian culture in ancient days

**CO2:**

1. Students will understand how Persian culture entered into India and how it influenced.
2. It also helps the student to know the Fine Arts of India like Classical Music, Dance etc.

**CO3:**

1. This unit explains how Indian orthodox society turn into modern and into western lifestyle in 19th century.
2. It gives a Glimpse of Indian freedom movement and also edifies the student with spiritual doctrines of the country by explaining various Religions.

**CO4:**

1. By studying this unit student will learn the rights of children and various challenges facing by the youth of Indian society.
2. It helps them to understand the evils of terrorism and its impact on society

**CO5:**

1. These topics in the unit help the students to know various gender issues like women rights and about LGBT issues.
2. Student will know his rights and duties to make the world a better place to live

**Object Oriented Programming with C++**

**CO1:** Memorize the concepts of Object oriented programming

**CO2:** Apply Control structures to write programs

**CO3:** Differentiate the types of constructors

**CO4:** Demonstrate polymorphisms and types of Inheritance

**CO5:** Analyze the concept of Template and files.

**Vector Calculus, 3d-geometry, Fourier series**

**CO1:** Categorize the vector-valued functions of a real variable and their curves, Gradient vector fields and constructing potentials.

**CO2:** Analyze the differential ideas of divergence, curl, and the Laplacian along with their physical interpretations.

**CO3:** Use the applications of Green's theorem in the plane, Gauss divergence theorem and

Stake's theorem.

**CO4:** Solve the Laplace transform of standard functions from the definitions.

**CO5:** Combine the necessary Laplace transform techniques to solve second-order ordinary differential equations.

### **Waves and Oscillations**

**CO1:** Explain concepts of wave and its characteristics

**CO2:** Differentiate types of waves and oscillations

**CO3:** Apply the concept of wave propagation to the strings

**CO4:** Apply the concept of wave propagation to the bars.

**CO5:** Design a new application based on ultrasonic sound.

### **Electronic Devices and Circuits**

**CO1:** Study the crystal structure and analyze the behaviour of semiconductor material

**CO2:** Explain the various voltages across and current flow through a pn junction with varying doping concentrations

**CO3:** Explain the various voltages across and current flow through any Transistor in various configurations junction with varying doping concentrations which help to realize an amplifier circuit.

**CO4:** Analyze various factors influencing a transistor.

**CO5:** Understand the type of semiconductor material used in power and opto electronic devices and analyze the current flow through them.

### **Repair and Maintenance of Home Appliances**

**CO1:** Identify various electronic components.

**CO2:** Construct a dc power supply.

**CO3:** Explain the characteristics of transistors.

**CO4:** Choose an operating system for the required application.

**CO5:** Demonstrate the working of electrical appliance.

### **Functions of a Complex Variable**

**CO1:** Represent complex numbers algebraically and geometrically and define.

**CO2:** Apply limits and continuity for complex functions as well as consequences of continuity.

**CO3:** Analyze the concept and consequences of analyticity and the Cauchy-Riemann equations.

**CO4:** Solve complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem in its various versions, and the Cauchy integral formula.

**CO5:** Classify singularities and poles, find residues and evaluate complex integrals using the residue theorem. Represent functions as Taylor, power and Laurent series

### **Electromagnetic Theory**

**CO1:** Explain fundamental laws governing EM fields and evaluate the physical quantities of EM fields (field intensity, flux density, etc.) in different media using the fundamental laws.

- CO2:** Design storage devices using dielectrics, capacitors, inductors using laws of EM fields
- CO3:** Apply principles of magneto statics to the solutions of problems relating to the magnetic field and magnetic potential and to describe magnetic field around a moving charge.
- CO4:** Apply laws of EMI on devices like betatron , moving ballistic galvanometer ,transformers, etc.....
- CO5:** Analyze Electromagnetic wave propagation and importance of Maxwell's equations.

### **Logic & Digital Circuits**

- CO1:** Convert different type of codes and number systems which are used in digital communication and computer systems.
- CO2:** Employ the codes and number systems converting circuits and Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency.
- CO3:** Analyze different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods.
- CO4:** Design different types of with and without memory element digital electronic circuits for particular operation, within the realm of economic, performance, efficiency, user friendly and environmental constraints.
- CO5:** Assess the nomenclature and technology in the area of memory devices and apply the memory devices in different types of digital circuits for real world application.

### **Electronic Wave Shaping Circuits**

- CO1:** Design and construct a DC power supply
- CO2:** Analyze the function of wave shaping circuits and differentiate between linear and non linear wave shaping.
- CO3:** Design and construct amplifier and oscillator circuits and differentiate between them
- CO4:** Classify different types of power amplifiers
- CO5:** Design and construct different types of timing circuits

### **Group Theory & Differential Calculus**

- CO1:** Apply concepts in abstract algebra such as definition of a group, order of a finite group and order of an element.
- CO2:** Categorize types of subgroups such as normal subgroups, cyclic subgroups and understand the structure and characteristics of these subgroups.
- CO3:** Understand the definitions of Homomorphism –Cayley's theorem.
- CO4:** Analyze the consequences of Rolle's Theorem and the Mean Value theorem for differentiable functions.
- CO5:** Apply divergence test to determine divergence of an infinite series.

### **Modern Physics**

- CO1:** Explain different types of atomic spectrums
- CO2:** Classify the different molecular spectrums
- CO3:** Analyze nucleus and compare with atom

- CO4:** Survey on microscopic particles
- CO5:** Develop new types of materials for different applications

### **Electronic Communication Techniques**

- CO1:** To recognize the basic components of a communication system
- CO2:** To illustrate the basic modulation systems and classification
- CO3:** To sketch the modulated wave forms
- CO4:** To classify analog and digital communication system
- CO5:** To differentiate new digital, mobile techniques

### **Linear Integrated circuits**

- CO1:** To understand the basic differential amplifier, the basic building block of operational amplifier and its practical details.
- CO2:** To explain the general linear application of an operational amplifier.
- CO3:** To describe the wave generation wave shaping circuits of op-amp.
- CO4:** To identify the non-linear applications.
- CO5:** To create the specialized IC applications.

### **Java**

- CO1:** Express java program structure and differentiate between object-oriented programming and procedure- oriented programming.
- CO2:** Apply Operators and expressions, decision making branching and looping
- CO3:** Explain Use of Classes, objects, methods, Arrays and its types.
- CO4:** Solve Multithreading, exception handling mechanisms
- CO5:** Develop applet programs to create interactive web pages

### **Computer Organization**

- CO1:** To understand basic computer operations
- CO2:** To explain basic computer organizational design
- CO3:** To classify the different blocks of the basic computer
- CO4:** To compare data transfer with different addressing modes
- CO5:** To analyze the memory organization

### **Numerical Analysis**

- CO1:** Identify the theoretical and practical aspects of the use of numerical methods.
- CO2:** Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.
- CO3:** Apply numerical methods to obtain approximate solutions to mathematical problems.
- CO4:** Develop numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations.
- CO5:** Analyze and evaluate the numerical solution of ordinary differential equations.

### **Microprocessor & Microcontroller**

- CO1:** Explain the microprocessor's internal architecture and its operation within the area of manufacturing and performance.
- CO2:** Apply knowledge and demonstrate programming proficiency using the various addressing modes and instructions of the target microprocessor.
- CO3:** To analyze the need of various interfacing devices like 8255, 8259 along with interrupt types and stack
- CO4:** To explain the co-processor to perform mathematical operations, USART, DMA and timers functional block diagrams
- CO5:** To explain the difference between processor and controller with architecture of 8051.

### **Microwaves & Devices**

- CO1:** To define the radio wave spectrum and microwave applications
- CO2:** To explain the use of micro wave components and their applications
- CO3:** To survey the structural and operational characteristics of microwaves along with their applications
- CO4:** To compare the basic microwave devices and circuits
- CO5:** To combine the microwave tubes and devices

### **Transmission Lines & Wave guides**

- CO1:** Discuss the propagation of signals.
- CO2:** Analyze signals at radio frequencies
- CO3:** Connect different wave guides and impedance matching devices
- CO4:** Explain radio propagation in guided systems.
- CO5:** Utilize cavity resonator.

### **Optical Fiber Communication**

- CO1:** Classify different optical fibers and wave propagation through them.
- CO2:** Characterize the luminance by and current through the devices.
- CO3:** Characterize the illumination on and current through the devices.
- CO4:** Combine two optical fibers.
- CO5:** Apply their acquired skill set in various applications on civil and military.

### **Electronic Instrumentation**

- CO1:** Understand the different types of instruments
- CO2:** Analyze different types of digital voltmeter
- CO3:** Demonstrate the CRO in different conditions
- CO4:** Explain different types of Transducers.
- CO5:** Use Data Acquisition and conversion

### **Management of Modern Organization**

- CO1:** To identify and interpret the various principles and importance of management



- CO2:** To explain and demonstrate the uses of planning and organizing
- CO3:** To classify and combine the various techniques of control and coordination
- CO4:** To point out and develop the essence of motivation and direction of the students
- CO5:** To interrelate and understand the essence of leadership and importance of communication

### **Thermodynamics & Optics**

- CO1:** Explain basic concepts of thermodynamics.
- CO2:** Design a thermodynamic system.
- CO3:** Survey on microscopic particles.
- CO4:** Analyze wave nature of light and its characteristics.
- CO5:** Analyze wave nature of light and its characteristics.

### **Linear Control Systems**

- CO1:** Able to analysis of Transfer function, block diagram reduction techniques and SFG.
- CO2:** Analyze the different motors like servo motors.
- CO3:** Understands the time response of different systems.
- CO4:** Analyze the stability of the systems.
- CO5:** Design different functions polar and bode plots.

### **Micro Controller & Embedded systems**

- CO1:** Apply knowledge and demonstrate programming proficiency and instructions of microcontroller
- CO2:** To interface various devices –input and output to interact with microcontroller and study various operating systems
- CO3:** Explain block diagram of 80286, Operation of various types of DMA to have efficient system design
- CO4:** To analyze how time management can be done to accomplish a work so that scheduling can be done for various external interrupting devices
- CO5:** To analyze how compilation process is done, distinguish between native, cross processor along with processor and IO dependent.

### **IT Hardware and Networking**

- CO1:** Identify PC Component and various Expansion Cards
- CO2:** Distinguish keyboard types, mouse and printers
- CO3:** Compare different HDD, DVD and SMPS
- CO4:** Show assembly and disassembly of PC
- CO5:** Demonstrate different networking devices

### **Electrical Machines**

- CO1:** Student will be able to analyze the electrical circuits with help of KCL and KVL techniques.
- CO2:** Students will be able to explain the operation of DC generator and analyze the

Characteristics of DC generator.

**CO3:** Student will be able to explain the principle of operation of DC motor and analyze their Characteristics. Acquire the skills to analyze the starting and speed control methods of DC motors.

**CO4:** Judge to develop equivalent circuit and evaluate performance of transformers.

**CO5:** Ability to identify speed – torque characteristics of induction motor and understand starting methods of induction motor.

### **Industrial Electronics**

**CO1:** Understand the different power electronics components.

**CO2:** Analyze the different heating methods.

**CO3:** Design of different inverters.

**CO4:** Analyze the different rectifiers.

**CO5:** Able to understand the different switches.

### **Robotics**

**CO1:** Apply the programming concepts of micro controllers

**CO2:** Categorize various types of motors and distinguish between.

**CO3:** Select an appropriate sensor to design their circuit

**CO4:** Design their project

**CO5:** To develop a communication link between two or more electronic modules or systems.

## **B.Sc. Food Technology and Management**

### **Program Specific Outcomes:**

#### **Students will be able to:**

**PSO1:** Understand the concept of Food Technology and Management

**PSO2:** Analyse various food safety laws , regulations and Acts

**PSO3:** Apply the knowledge of processing and preservation techniques in increasing the shelf life of food products

**PSO4:** Think critically about marketing and management strategies related to food.

### **Food Chemistry**

**CO1:** Evaluate the importance and role of carbohydrates in food.

**CO2:** Analyze the functional properties of proteins in food.

**CO3:** Explain the oxidative reactions of lipids in food

**CO4:** Classify the enzymes of importance in food

**CO5:** Evaluate the role of water in food

### **Microbiology Of Food And Water**

**CO1:** Identify different microorganisms associated with food

**CO2:** Evaluate the microbial estimation in food.

- CO3: Analyze microorganisms associated with various food groups
- CO4: Evaluate the various food preservation techniques.
- CO5: Explain various food borne illnesses.

### **Food Safety, Quality Control and Sensory Evaluation**

- CO1: Create Knowledge on various food hazards.
- CO2: Evaluate the importance of food laws and acts.
- CO3: Analyze quality aspects of food commodities.
- CO4: understand the subjective and objective testes of sensory parameters.
- CO5: Evaluate the role of sanitation and hygiene in food industry.

### **Food microbiology and food safety**

- CO1: Identify different microorganisms associated with food
- CO2: Understand the factors affecting growth of microorganisms.
- CO3: Evaluate the microbial estimation in food.
- CO4: Create Knowledge on various food hazards.
- CO5: Analyze the recent concerns in food safety and new and emerging pathogens.

### **Food Biochemistry**

- CO1: Evaluate various analytical methods
- CO2: Classify carbohydrates and different metabolic pathways
- CO3: Classify lipids and fatty acids and synthesis of fatty acids
- CO4: Distinguish transamination and deamination
- CO5: Demonstrate protein biosynthesis

### **Technology of Fermented Foods and Beverages**

- CO1: Prepare various kinds of pickles
- CO2: Prepare different oriental and traditional fermented foods
- CO3: Differentiate natural & artificial sugars ,colours ,flavours and preservatives
- CO4: Classify fruit based, carbonated, synthetic beverages
- CO5: Explain process of various alcoholic beverages

### **Technology of Fruits and Vegetables**

- CO1: Explain processing methods and role of F&V in human diet
- CO2: Tell about Post harvest handling methods and treatments of F&V
- CO3: Explain process of canning ,machinery and storage in foods
- CO4: Prepare various products of F&V
- CO5: Classify fruit beverages and methods of preservation

### **Food and Human nutrition**

- CO1: Describe the general classification, examples, deficiencies, functions of nutrients
- CO2: Create various diet plans for various age groups
- CO3: Analyze the assessment of nutritional status

**CO4:** Compare different international agencies in overcoming malnutrition

### **Food Processing and Preservation**

**CO1:** Create knowledge on various food processing operations

**CO2:** Explain about the technologies of colloids in foods

**CO3:** Create knowledge on water disposal and sanitation

**CO4:** Apply the minimal processing and hurdle technology

**CO5:** Point out the different food additives and contaminants in foods

### **Technology of Food Preservation**

**CO1:** Classify different microorganisms based on various factors

**CO2:** Categorize the changes occurring during low temperature preservation

**CO3:** Categorize the changes occurring during high temperature preservation

**CO4:** Explain the various factors affecting preservation by drying method

**CO5:** Apply various methods of food preservation using recent technologies

### **Food Processing and Quality Control (Geid)**

**CO1:** Create knowledge on various principle in food preservation

**CO2:** Explain about the various processing methods of fruits and vegetables

**CO3:** Explain about the various processing steps involved in chocolate manufacturing

**CO4:** Prepare the various dairy products

**CO5:** Analyze the different foods by using food laws and regulations

### **Technology of Oils and Fats**

**CO1:** Explain composition and classification of fats and oils

**CO2:** Create knowledge on various characteristics of fats

**CO3:** Explain the various steps involved in processing of fats

**CO4:** Create value added products from fats

**CO5:** To show how to utilize the by-products from oil refining industries

### **Food Supply Chain and Management**

**CO1:** Explain about the objectives and functions of SCM

**CO2:** Create knowledge on value chain and value delivery system in SCM

**CO3:** Formulating the supply chain strategy

**CO4:** Use the best practices and bench marketing

**CO5:** Create the logistics organization for effective supply chain management

### **Extrusion Technology**

- CO1:** Compare the advantages and disadvantages of extrusion
- CO2:** Design single and double screw extruder
- CO3:** Differentiate the chemical and nutritional changes occur in food during extrusion
- CO4:** Make the different processing of snack foods and animal foods by using extrusion
- CO5:** Prepare the RTE cereals and texturized vegetable protein

### **Sugar Confectionery**

- CO1:** Compare the different types of sugars and their properties.
- CO2:** Apply the uses of oils & fats, milk products, colors and flavors in confectionery items.
- CO3:** To develop hard boiled sweets, toffee, caramel, fudge and cocoa chocolate.
- CO4:** To produce gums & jellies, cream paste, liquorice paste & aerated confectionery.
- CO5:** To produce tablets, lozenges, panned sweets, gums and cereal bars.

### **Baking Science & Technology**

- CO1:** To plan the ingredients used in bread making.
- CO2:** To develop bread making process.
- CO3:** To produce different types of biscuits.
- CO4:** To construct the recipe for cakes.
- CO5:** To prepare wafers, frozen dough products and flat breads.

### **Food Packaging**

- CO1:** Identify the importance, functions and design of packaging.
- CO2:** Classify the food packaging materials.
- CO3:** Explain the flexible packaging materials and their properties
- CO4:** Evaluate the packaging material, package performance and packaging equipment.
- CO5:** Compare the recent trends in packaging.

### **Food Plant Sanitation & Waste Management**

- CO1:** Plan food plant layout and equipment design
- CO2:** Evaluate food plant hygiene and sanitation
- CO3:** Classify the wastewater treatment systems
- CO4:** Differentiate the different biological treatments of wastewater
- CO5:** Explain the utilization of food industry wastes

### **Programme Outcomes – (B.Com/ BBA)**

- PO1: Business and Management Knowledge:** Apply the in depth knowledge acquired in the Disciplines of Commerce, Business and Management, E-commerce, finance,

accounting, auditing, marketing to solve complex problems in the business world.

**PO2: Development of Business Solutions:** Identify, formulate and develop solutions in different fields such as Banking, Insurance, and Finance. Core competencies can be gained to impart skills in Accounting, Management and Leadership, Communication and overall personality development.

**PO3: Solving Research Problems:** Utilize Research Methodology and Project work to infer and interpret data in order to provide valid conclusions in business.

**PO4: Modern Business tools and Techniques:** explain, select, analyze and apply relevant management techniques, resources, modern business tools, models and practices for holistic development of the learner.

**PO5: The Manager, the businessman, the entrepreneur and the Society:** Apply contextual and skill-based knowledge to identify the micro and macro factors which affect an organization.

**PO6: Practical exposures:** identify and equip learners to face the modern day challenges in Commerce and business.

**PO7: Globalization and Ethics:** Design and apply value based curriculum committed to Professional ethics and responsibilities, so as to render global citizens with a human touch.

## **B.Com Honours**

### **Programme Specific Outcomes:**

**PSO1:** Demonstrate theoretical cum practical knowledge gained in the study of Financial Management, Financial & Advanced Accounting. Corporate Accounting and Management accounting while utilizing principles, techniques and methods such as Standard Costing. Budgetary Control and Marginal Costing etc.

**PSO2:** Capability to analyze and demonstrate learning of tax laws and issues relating to individuals and firms, thereby acquiring practical skills to work as an accountant, tax accountant and a Chartered Accountant.

**PSO3:** Ability to acquire skills in Auditing & Accounting standards. Business Laws & Banking laws so as to implement them effectively in an organization and pursue advance courses such as CA. CPA, ICWA.

### **Financial Accounting - I**

**CO1:** Describes the need and importance of accounting.

**CO2:** Explains about subdivision of journal

**CO3:** Compares the cashbook and passbook balances to reconcile the difference.

**CO4:** Analyses the financial position of an organization

**CO5:** Identifies the mistakes in books of accounts and helps in correcting them.

### **Principles of Management**

**CO1:** To identify and interpret the various principles and importance of management

- CO2:** To explain and demonstrate the uses of planning and organizing
- CO3:** To classify and combine the various techniques of control and coordination.
- CO4:** To point out and develop the essence of motivation and direction to the students
- CO5:** To interrelate and understand the essence of leadership and the importance of communication

### **Fundamentals of Business Statistics**

- CO1:** Organize, manage and present data. Can represent the statistical data in diagrammatic and graphical form.
- CO2:** Calculate measures of central tendency.
- CO3:** Analyse the data using measures of dispersion.
- CO4:** Evaluate the nature for the statistical data using skewness and moments.
- CO5:** Determine the relation between any two factors using the concepts of correlation and regression analysis.

### **Managerial Economics**

- CO1:** Understand the basic terms and concepts used in the managerial economics
- CO2:** Appraise the behaviour of consumers through the demand and indifference analysis
- CO3:** Interpret the behaviour of producer through supply, production and other related concepts
- CO4:** Differentiate the market forms and the price and output determination under each type of market.
- CO5:** Infer the impact of the macro economic factors on the business concerns.

### **Financial Accounting – II**

- CO1:** Introduces To The basic concepts of partnership and explains the admission of a partner.
- CO2:** Demonstrates the accounting treatment relating to retirement and death of a partner.
- CO3:** Identifies the rules applicable for winding up of partnership and insolvency of a partner.
- CO4:** Shows the method of finding out profits and financial position by using incomplete records.
- CO5:** Illustrates method of preparing books under hire purchase and instalment purchase system

### **Banking Theory and Practice**

- CO1:** To identify and illustrate the origin and growth of banking in India.
- CO2:** To interpret the features of various types of negotiable instruments.
- CO3:** To demonstrate and apply the steps involved in opening a bank account.
- CO4:** To appraise and criticize the various types of collateral securities and point out the precautions to be taken by a banker while advancing loans against different types of securities.
- CO5:** To understand the organizational structure and functions of co-operative banks, Nabard and RBI.

### **Fundamentals of Business Mathematics**

- CO1:** To solve linear equations.
- CO2:** To get solutions of real life problems by using logarithms and set theory.
- CO3:** To solve the problems in business line like banking sector.
- CO4:** To get maximum profit and minimum loss in company productivity.
- CO5:** To measure areas & volumes

### **Advanced Statistics**

- CO1:** Derive the probability mass and density functions of random variables and then to calculate mean and variance.
- CO2:** Identify the characteristics of different discrete distributions like binomial, poisson and negative binomial distributions.
- CO3:** Able to perform and analyse hypothesis tests of means, proportions and variances using both one-and two-sample data sets.
- CO4:** Able to apply the appropriate chi-squared test for independence and goodness of fit.
- CO5:** Demonstrate understanding of the concepts of time series and its applications in different areas.

### **E-commerce**

- CO1:** Explain the e-commerce applications and frameworks.
- CO2:** Identify consumer oriented applications.
- CO3:** Express differences between EDI and mime.
- CO4:** Analyze corporate digital library
- CO5:** Survey the consumer search resources and information.

### **Advanced Accounting**

- CO1.** States various methods for preparing branch accounts.
- CO2.** Describes the allocation and interdepartmental transfer of expenses.
- CO3.** Analyses the financial position of non-trading concerns.
- CO4.** Evaluate the different situation of capital issue to public issue of shares at par, premium and forfeiture.
- CO5.** Explains about sources of funds through issue of debentures and various methods of redemption.

### **Direct Taxes**

- CO1:** To understand the basic definitions of income tax, agricultural income, residential status and exempted incomes.
- CO2:** To show the computation of income from the head salaries and house property as per it act.
- CO3:** To identify the income from business, profession and capital gains.
- CO4:** To compute total income of individuals and huf.
- CO5:** To assess the tax liability of individuals and huf as per it act.

### **Business Law**

- CO1:** Demonstrate an understanding of the legal environment of the business.



- CO2:** Explains legality of object and consideration, discharge of a contract and remedies available.
- CO3:** Identify the recognition of transactions involving the sales of goods act.
- CO4:** Dramatize the application of consumer protection act.
- CO5:** To recognize intellectual property rights and introduction to it act 2000 and right to information act.

### **Economic Environment of Business**

- CO1:** To describe changing dimensions of business environment.
- CO2:** Select key macroeconomic indicators and differentiate between economic growth and development.
- CO3:** To analyse problems and policies of Indian industries.
- CO4:** To compare merits and demerits of foreign capital in Indian economy.
- CO5:** To combine various business regulations for effective corporate governance.

### **Corporate Accounting**

- CO1:** To understand the various types of capital structures of the company and their representation in the balance sheet, preparation of financial statements with profits before incorporation.
- CO2:** Explains the valuation of shares and goodwill.
- CO3:** Analyses amalgamation in the nature of merger and purchase and accounting treatment for internal reconstruction.
- CO4:** Demonstrates the accounting systems of a banking company under the guidance of RBI.
- CO5:** Helps to prepare insurance accounts as per IRDAI guidelines.

### **Company Law**

- CO1:** To develop basic knowledge of provisions of companies act 2013.
- CO2:** To describe the capital structure of company through issues of shares and alteration of share capital.
- CO3:** Explain the borrowing powers of a company and consequences of ultra vires borrowing.
- CO4:** State various provisions of the companies act relating to company management and meetings.
- CO5:** To identify various modes of winding up and legal provisions applicable.

### **Indirect Taxes**

- CO1:** To describe basic scheme of GST, GST council power and functions.
- CO2:** To explain various GST acts and also various definitions
- CO3:** To identify the registration procedure, levying of GST and exemptions
- CO4:** To analyse different types of assessments and returns under GST
- CO5:** To appraise the exemption procedure as per customs legislations in India.

### **Research Methodology**

- CO1:** To understand and interpret the basic meaning of research, to define the research problem at hand and construct the procedure for undertaking research.
- CO2:** To formulate hypothesis and develop an appropriate research design.

- CO3:** To classify the different sources of data and analyze the various methods of data collection.
- CO4:** To develop the most appropriate sample size and design as well as determination of sampling and non-sampling errors.
- CO5:** To classify the various types of attitude measurement scales and applies the principles and format of report writing and presentation.

### **Marketing Management**

- CO1:** Explains the concept of marketing and sketches the marketing environment.
- CO2:** Classifies the market and identifies the various market segments
- CO3:** Point out the marketing mix with reference to product and price
- CO4:** Analyzes the promotion mix and the channels of distribution.
- CO5:** Explains service marketing mix and points out the importance of direct and online marketing.

### **Advanced Corporate Accounting**

- CO1:** To explain legal provisions of holding company's under schedule iii of companies act and preparation of consolidated balance sheet.
- CO2:** To show the capital structure of holding company and subsidiary companies and preparation of accounts relating to intercompany transaction.
- CO3:** To analyse public utility company's double accounting system.
- CO4:** To differentiate between operating and financial lease.
- CO5:** To appraise the liquidation process of the company through preparation of statement of affairs, deficiency account, liquidated financial statement.

### **International Marketing and Export Management**

- CO1:** Analyze the process of international markets and classify India's export trade
- CO2:** Describe the important factors of international marketing environment and differentiate marketing research, market selection, and market segmentation
- CO3:** Analyze the importance of product and distribution strategies
- CO4:** Differentiate the need for promotion mix strategies and pricing decisions
- CO5:** Explain foreign exchange strategies, differentiate balance of payments and balance of trade, and interpret international economic organizations

### **Corporate Governance and Business Ethics**

- CO1:** Identify and explain the importance of values and ethics.
- CO2:** Analyze and interpret the various theories of ethical value system.
- CO3:** Point out the relationship between law and ethics and understand the impact of law on the business.
- CO4:** Explain the corporate governance codes, transparency and disclosure in the corporate.
- CO5:** Identify and point out the global issues of governance.

### **Financial Management – I**

- CO1:** To interpret the concept of business finance, finance decision and functions of finance manager.
- CO2:** To understand the concept of capital budgeting and evaluate npv and cash flows for investment analysis.
- CO3:** To explain the basic concepts of cost of capital and its significance.
- CO4:** To distinguish between financial and operating leverages and to explain the capital structure theories.
- CO5:** To appraise the knowledge on dividend theories.

### **Costing Accounting and Control – I**

- CO1:** To understand importance of cost accounting in organization.
- CO2:** To describe the principles of managing inventories of materials and the procedures for accounting inventory.
- CO3:** To describe the principles and practice of costing labour to a business.
- CO4:** To describe the principles and process of overhead cost analysis.
- CO5:** To apply the operation of process costing methods.

### **Accounting for Management – I**

- CO1:** To explain an overview of management accounting, its need, scope and functions.
- CO2:** To prepare the financial statements and show its analysis and interpretation.
- CO3:** To apply different formula in ratio analysis.
- CO4:** To illustrate the preparation of funds flow statement.
- CO5:** To illustrate the preparation of cash flow statement.

### **Financial Markets and Institutions**

- CO1:** To classify about financial markets and services.
- CO2:** To explain about the capital markets with reference to stock market as per SEBI regulations.
- CO3:** To sketch the working of money market in the Indian financial system.
- CO4:** To analyse the derivatory and depository system.
- CO5:** To appraise financial service system relating to mutual funds and merchant banking.

### **Human Resource Management**

- CO1:** To understand the concept of HRM, functions and changing role of a HR manager
- CO2:** To distinguish between the various methods of job design and interpret the techniques of acquisition of human resource.
- CO3:** To explain the importance of HRP and point out the various HRD approaches for work life balance and describe the concept of job evaluation.
- CO4:** To analyse the core concepts of HRD, TQM and understand the concept of career development.
- CO5:** To explain the various concepts of worker's participation and quality of work life.

### **Accounting for Management – II**

- CO1:** To find/ understand the relation among cost, volume & profit  
**CO2:** Enable the students to prepare various kinds of budgets.  
**CO3:** To solve linear programming problems, transportation problems.  
**CO4:** To understand responsibility accounting, human resource accounting & inflation accounting.  
**CO5:** To create and write the various reports to provide the required information for management.

### **Labour Law**

- CO1:** To understand various provisions of factories act.  
**CO2:** To explain the rules regarding workmen compensation and provident fund act.  
**CO3:** To illustrate the gross profits of a banking company and non-banking company.  
**CO4:** To show various adjudication machinery.  
**CO5:** Tells about rights, duties and liabilities of registered trade unions.

### **Financial Management – II**

- CO1:** To show the working capital management of an organization.  
**CO2:** To demonstrate various techniques of inventory management and receivables management.  
**CO3:** To prepare cash budget as part of cash management.  
**CO4:** To analyse security and portfolio management.  
**CO5:** To appraise mergers and acquisitions for restructuring of corporation.

### **Costing Accounting and Control – II**

- CO1:** To distinguish between service costing, job costing and batch costing systems.  
**CO2:** To prepare contract accounts with reference to long term and continuous projects.  
**CO3:** To show the preparation of process accounts.  
**CO4:** To compare variances between standard cost and actual cost  
**CO5:** To develop tenders and quotations

### **Auditing and Accounting Standards**

- CO1:** To understand the basic concepts of auditing and the nature and scope of auditing.  
**CO2:** To organize the various steps in an auditing process and point out the techniques of vouching of cash payments and receipts.  
**CO3:** To analyze the features and importance of internal control, check and audit.  
**CO4:** To prepare different types of audit reports and explain the procedure for appointment and removal of a company auditor.  
**CO5:** To understand the regulatory framework in which accounting standards are formulated and operated

## **B.Com Advertisement Sales Promotion and Sales Management**

### **Programme Specific Outcomes**

- PSO1:** Understand the nature and basic concepts of Accounts and Marketing, and how effectively helpful to the business organizations.  
**PSO2.** Analyze the relationship between business and society, and the various ways business

respond to socio-political-religious and economic factors.

**PSO3.** Apply basic philosophies and tools of marketing management

**PSO4.** Measure the application of various management accounting tools in decision making.

### **Course Outcomes**

#### **Financial Accounting – I**

**CO1:** Describes the need and importance of accounting.

**CO2:** Explains about subdivision of journal

**CO3:** Compares the cashbook and passbook balances to reconcile the difference.

**CO4:** Analyses the financial position of an organization

**CO5:** Identifies the mistakes in books of accounts and helps in correcting them.

#### **Business Economics**

**CO1:** Understand the basic terms and concepts used in the managerial economics

**CO2:** Appraise the behaviour of consumers through the demand and indifference analysis

**CO3:** Interpret the behaviour of producer through supply, production and other related concepts

**CO4:** Differentiate the market forms and the price and output determination under each type of market.

**CO5:** Infer the impact of the macro economic factors on the business concerns.

#### **Financial Accounting – II**

**CO1:** Introduces to the basic concepts of partnership and explains the admission of a partner.

**CO2:** Demonstrates the accounting treatment relating to retirement and death of a partner.

**CO3:** Identifies the rules applicable for winding up of partnership and insolvency of a partner.

**CO4:** Shows the method of finding out profits and financial position by using incomplete records.

**CO5:** Illustrates method of preparing books under Hire purchase and instalment purchase system

#### **Advanced Accounting**

**CO1:** States various methods for preparing branch accounts.

**CO2:** Describes the allocation and interdepartmental transfer of expenses.

**CO3:** Analyses the financial position of non-trading concerns.

**CO4:** Evaluate the different situation of capital issue to public issue of shares at par, premium and forfeiture.

**CO5:** Explains about sources of funds through issue of debentures and various methods of redemption.

#### **Business Law**

**CO1:** Demonstrate an understanding of the legal environment of the business.

**CO2:** Explains legality of object and consideration, discharge of a contract and remedies available.

**CO3:** Identify the recognition of transactions involving the sales of goods act.

**CO4:** Dramatize the application of consumer protection act.

**CO5:** To recognize intellectual property rights and introduction to IT act 2000 and right to information act.

### **Corporate Accounting**

**CO1:** Understands the various types of capital structures of the company and their representation in the balance sheet, preparation of financial statements with profits before incorporation.

**CO2:** Explains the valuation of shares and goodwill.

**CO3:** Analyses amalgamation in the nature of merger and purchase and accounting treatment for internal reconstruction.

**CO4:** Demonstrates the accounting systems of a banking company under the guidance of RBI.

**CO5:** Helps to prepare insurance accounts as per IRDAI guidelines.

### **Marketing Management**

**CO1:** Explains the concept of marketing and sketches the marketing environment.

**CO2:** Classifies the market and identifies the various market segments

**CO3:** Point out the marketing mix with reference to product and price

**CO4:** Analyzes the promotion mix and the channels of distribution.

**CO5:** Explains service marketing mix and points out the importance of direct and online marketing.

### **Financial Management**

**CO1:** To interpret the concept of business finance, finance decision and functions of finance manager.

**CO2:** To understand the concept of capital budgeting and evaluate NPV and Cash Flows for investment analysis.

**CO3:** To explain the basic concepts of cost of capital and its significance.

**CO4:** To distinguish between financial and operating leverages and to explain the capital structure theories.

**CO5:** To appraise the knowledge on dividend theories.

### **Costing Accounting**

**CO1:** To understand importance of cost accounting in organization.

**CO2:** To describe the principles of managing inventories of materials and the procedures for accounting inventory.

**CO3:** To describe the principles and practice of costing labour to a business.

**CO4:** To describe the principles and process of overhead cost analysis.

**CO5:** To apply the operation of process costing methods.

### **Financial Statement Analysis**

**CO1:** To explain an overview of management accounting, Its need, Scope and functions.

- CO2:** To prepare the financial statements and show its analysis and interpretation and to apply different formula in ratio analysis.
- CO3:** To illustrate the preparation of funds flow statement.
- CO4:** To illustrate the preparation of cash flow statement.
- CO5:** To find/understand the relation among cost, volume & profit and enable the students to prepare various kinds of budgets.

### **Human Resource Management**

- CO1:** To understand the concept of HRM, functions and changing role of a HR manager
- CO2:** To distinguish between the various methods of job design and interpret the techniques of acquisition of human resource.
- CO3:** To explain the importance of HRP and point out the various HRD approaches for career planning and development and describe the concept of Performance evaluation and workers participation in management.
- CO4:** To analyze the core concepts of International HRM and understand the aspects of E-HRM.
- CO5:** To explain the various concepts of Knowledge Management and role of leader in organization

## **B.Com. Generals**

### **Programme Specific Outcomes**

- PSO1:** Appraise the multi-dimensional business situations and assess the financial health of companies by understanding and applying the wide knowledge of accounting, technical and analytical skills obtained from various core courses such as Financial Accounting, Financial Management, Business Statistics, Business Economics, International Business etc.
- PSO2:** Develop problem solving skills, technical skills, leadership skills, communication skills and inter personal skills so as to enable them to establish and/or manage their business effectively.
- PSO3:** Integrate knowledge, skill and attitude that will sustain an environment of learning, creativity and ethics among the students and also make them good citizens with excellent professional attitude in the corporate world.
- PSO4:** Create better solutions to the problems in the field of commerce by advancing research in Finance, Marketing, and Human Resources etc.

### **Business English – I**

- CO1:** Students will be able to identify elements, forms and style of letters.
- CO2:** They will be able to create quotations related to inviting, sending and placing orders.
- CO3:** Students will be able to identify qualities and functions of a sales letter.
- CO4:** Students will be able to use the format of a sales letter.
- CO5:** They will also be able to understand and write the functions, structure and types of memorandum.
- CO6:** Students will be able to understand and design a notice, agenda and minutes.

- CO7:** They will be able to demonstrate the guidelines for answering and making effective telephone calls.
- CO8:** They will be able to understand and implement note making.
- CO9:** Students will use the strategies for reading comprehension and recognize the aspects of efficient training.
- CO10:** They will also have a better understanding of scanning and proof reading incomprehension.

### **Indian Heritage and Culture**

- CO1:** To understand better about the origin of ancient Indian culture and the contributions of great rulers from both north and south India for Indian culture in ancient days.
- CO2:** To indicate how Persian culture entered into India and its influence.
- CO3:** To express how Indian orthodox society turn into modern and western lifestyle in 19th century.
- CO4:** To point out the various challenges faced by the youth of Indian society, the evils of terrorism and its impact on society.
- CO5:** To identify and express various gender issues like women rights and LGBT issues.

### **Business Economics**

- CO1:** To demonstrate understanding of concepts of business environment.
- CO2:** To apply different methods of demand forecasting based on time period and nature of product.
- CO3:** To analyze different types of production function
- CO4:** To identify various market structures and analyze price-output decision in different markets
- CO5:** To analyze importance of international trade to Indian economy and evaluate effects of government policy on trade.

### **Fundamentals of IT**

- CO1:** Understand basic computer terminology and number systems.
- CO2:** Explain about operating systems, and its types.
- CO3:** Identify different applications of information technology
- CO4:** Classify phases of software development life cycle
- CO5:** Categorize modern means of communications, types of networks and topologies

### **Financial Accounting –I**

- CO1:** To describe the need and importance of accounting and infer the various principles of accounting
- CO2:** Explain about sub divisions of journal.
- CO3:** Compare cash book and pass book balances and reconcile the differences.
- CO4:** To analyze the financial position of an organization
- CO5:** To identify the mistakes in books of accounts and rectifying them

### **Business Organization**

- CO1:** To interpret the fundamental concepts of business and classify the features of trade, industry and commerce.



- CO2.** To identify the various characteristics and functions of an entrepreneur.
- CO3.** To distinguish and sub divide the various forms of business organization.
- CO4.** To appraise, criticize and compare the advantages, disadvantages and suitability of sole proprietorship and partnership form of business organization.
- CO5.** To plan, combine and organize the various stages involved in the formation of a joint stock company.

### **Business English –II**

- CO1:** Students will be able to identify the elements of claim and adjustment letters.
- CO2:** Students will also be able to draft claim letters and adjustment letters.
- CO3:** They will be able to identify nature and types of credit letters.
- CO4:** Students will be able to recognize tone and style of collection letters.
- CO5:** Students will comprehend the general guidelines to write application letters and resumes.
- CO6:** They will also be able to execute the form and content of an application letter and resume.
- CO7:** Students will also be able to understand characteristics and importance of business reports.
- CO8:** They will also be able to prepare a good business report.
- CO9:** Students will be able to understand the techniques of describing machines and mechanisms.
- CO10:** They will also be able to describe and create good technical reports.

### **Value Education and Personality Development**

- CO1:** Students will be able to identify accepted norms and counter values.
- CO2:** They will be able to differentiate the various dimensions of human development.
- CO3:** Students will be able to demonstrate love and experience of god.
- CO4:** They will be able to identify the basic issues of life and happiness as a life goal.
- CO5:** They will be able to understand the importance of concern for others.
- CO6:** They will be able to critique the various problems that deter the growth of the society.
- CO7:** The students will be able to recognize the traits of a good personality.
- CO8:** They will be able to identify their personality by self-exploration.
- CO9:** Students will be able to interpret the purpose of life and goal setting.

**CO10:** They will be able to learn self-management.

### **Fundamentals of Business Mathematics**

- CO1:** Construct algebraic models and use the quadratic formula to describe real-life situations. Be able to decide what type of model fits the situation best:
- CO2:** Analyze and use linear models to answer questions about the situations they represent knowledge including the mathematical notation and terminology used in matrices.
- CO3:** Construct mathematical expressions that involve matrices and linear systems of linear equations.
- CO4:** Apply index laws to simplify and evaluate arithmetic expressions. Understand particular types of sequences called arithmetic progression and also find arithmetic mean (am) between two given numbers.
- CO5:** Solve by converting the logarithmic equations to exponential equations. Evaluate the impact of compound interest on simple financial decisions.

### **Business Statistics – I**

- CO1:** Organize, manage and present data. Understand the merits and limitations in using the statistical data.
- CO2:** Represent the statistical data in the form of diagrams and graphs.
- CO3:** Analyze statistical data using measures of central tendency.
- CO4:** Compare the homogeneity of the statistical data using different methods of dispersion.
- CO5:** Identify the symmetric and nature of the statistical data using the concepts of skewness and moments.

### **Financial Accounting – II**

- CO1:** To explain the basic concepts of partnership and the admission of partner.
- CO2:** To demonstrate the accounting treatment relating to retirement and death of partner.
- CO3:** To identify the rules applicable for winding up of a partnership and insolvency of partner.
- CO4:** To show the methods of finding out the profits and financial position by using incomplete records.
- CO5:** Illustrate methods of preparing books under hire purchase and instalment system.

### **Principles of Management**

- CO1:** To identify and interpret the various principles and importance of management.
- CO2:** To explain and demonstrate the importance of planning and organizing.
- CO3:** To classify and combine the various techniques of control and coordination.
- Co4:** To point and develop the essence of motivation and direction to the students.
- Co5:** To inter relate the essence of leadership and the importance of communication.

### **Banking**

- CO1:** To identify and illustrate the origin and growth of banking in India.
- CO2:** To interpret the features of various types of negotiable instruments.
- CO3:** To demonstrate and apply the steps involved in opening a bank account.
- CO4:** To appraise and criticize the various types of collateral securities and point out the precautions to be taken by a banker while advancing loans against different types of

securities.

**CO5:** To understand the organizational structure and functions of co-operative banks, nabard and RBI.

### **Corporate Governance and Business Ethics**

**CO1:** To identify and explain the importance of values and ethics

**CO2:** To analyze and interpret the various theories of ethical value system.

**CO3:** To point out the relationship between law and ethics and understand the impact of law on business.

**CO4:** To explain the various corporate governance codes, transparency and disclosure in the corporate

**CO5:** To identify and point out the global issues of governance.

### **Business Statistics – II**

**CO1:** Interpret the correlation between two variables.

**CO2:** Apply the principles of linear regression and correlation, including least square method, predicting a particular value of y for a given value of x and significance of the correlation coefficient.

**CO3:** Plan the future events using the concepts of time series analysis.

**CO4:** Select the appropriate index numbers and calculates indices from given data.

**CO5:** Compare and analyze the different sampling techniques like simple, stratified and systematic sampling.

### **Advanced Accounting**

**CO1:** State the various methods for preparing branch accounts.

**CO2:** Describe the allocation and interdepartmental transfer of expenses.

**CO3:** Analyze the financial position of non-trading concerns.

**CO4:** Evaluate the different situation of capital issue to public issue of shares at par, premium and forfeiture.

**CO5:** Explain about sources of funds through issue of debentures and various methods of redemption.

### **Banking Theory & Practice**

**CO1:** To identify and illustrate the origin and growth of banking in India.

**CO2:** To interpret the features of various types of negotiable instruments.

**CO3:** To demonstrate and apply the steps involved in opening a bank account.

**CO4:** To appraise and criticize the various types of collateral securities and point out the precautions to be taken by a banker while advancing loans against different types of securities.

**CO5.** To understand the organizational structure and functions of co-operative banks, Nabard and RBI.

### **Direct taxes**

**CO1:** To understand the basic definitions of income tax, agricultural income, residential

status and exempted incomes.

**CO2:** To show the computation of income from the head salaries and house property as per IT act.

**CO3:** To identify the income from business, profession and capital gains.

**CO4:** To compute total income of individuals and huf.

**CO5:** To assess the tax liability of individuals and huf as per IT act.

### **Environmental Studies and Gender Sensitization**

**CO1:** Understand the importance of environmental education, conservation of natural resources & understand the importance of ecosystems and biodiversity

**CO1:** Understand the pollution problems and apply the environmental science knowledge on solid waste management, disaster management

**CO3:** Apply the environmental science knowledge to improve the resources

Evaluate and understand the sustainable environmental conditions and control methods

**CO4:** Identify the interactions and intersections of identities (e.g., gender, race, ethnicity, class, sexuality, and so on) and assess the ways in which they contribute to instances of privilege and power dynamics across cultures, space, and time. And their problems

**CO5:** Understand the gender problems and ways of addressing them, including interactions across local to global scales in communities and overcome inequalities with legislations

### **Corporate Accounting**

**CO1:** To understand the various types of capital structures of the company and their representation in the balance sheet, preparation of financial statements with profits before incorporation.

**CO2:** Explain the valuation of shares and goodwill.

**CO3:** Analyze amalgamation in the nature of merger and purchase and accounting treatment for internal reconstruction.

**CO4:** Demonstrate the accounting systems of a banking company under the guidance of RBI.

**CO5:** To prepare insurance accounts as per IRDAI guidelines.

### **Financial Services and Markets**

**CO1:** To explain and analyze the various functions and importance of Indian financial system.

**CO2:** To classify capital market and assess the rational content and current reforms to capital market regulations

**CO3:** To analyze the features of money market and list out the various money market instruments

**CO4:** To identify and interpret the services provided by a merchant banker.

**CO5:** To explain the process of securitization of debt and compare the various types of financial derivatives

### **Indirect Taxes**

**CO1:** To describe basic scheme of GST, GST council power and functions.

**CO2:** To explain various GST acts and also various definitions

**CO3:** To identify the registration procedure, levying of GST and exemptions

**CO4:** To analyze different types of assessments and returns under GST

**CO5:** To tell the GST network, GST suvida providers and GST ecosystem.

### **Business Law**

**CO1:** Demonstrate an understanding of the legal environment of the business.

**CO2:** Explains legality of object and consideration, discharge of a contract and remedies available.

**CO3:** Identify the recognition of transactions involving the sales of goods act.

**CO4:** Dramatize the application of consumer protection act.

**CO5:** To recognize intellectual property rights and introduction to it act 2000 and right to information act.

### **Research Methodology**

**CO1:** To understand and interpret the basic meaning of research, to define the research problem at hand and construct the procedure for undertaking research.

**CO2:** To formulate hypothesis and develop an appropriate research design.

**CO3:** To classify the different sources of data and analyze the various methods of data collection.

**CO4:** To develop the most appropriate sample size and design as well as determination of sampling and non-sampling errors.

**CO5:** To classify the various types of attitude measurement scales and applies the principles and format of report writing and presentation.

### **International Business**

**CO1:** Explain the overview of international business and demonstrate the environment of international business.

**CO2:** Explain about the various forms of trade regulation and integration.

**CO3:** Sketch the various modes of entering the international market.

**CO4:** Point out the conceptual framework of e-business and policy framework for global E-business.

**CO5:** Analyze the intercultural communication on the global perspective.

### **Public Relation and Corporate Communication**

**CO1:** To understand the importance of a positive attitude and ways to build a positive attitude.

**CO2:** To apply the various principles and techniques of time management and stress management.

**CO3:** To point out and demonstrate the various methods of enhancing creativity.

**CO4:** To demonstrate communication and soft skills and develop matter for speech.

**CO5:** To choose the right career and identify the pathway to a successful career.

### **Human Resource Management**

**CO1:** To understand the concept of HRM, functions and changing role of an HR manager.

- CO2:** To distinguish between the various methods of job design and interpret the techniques of acquisition of human resource.
- CO3:** To demonstrate and classify the methods of training and motivating human resources in an organization.
- CO4:** To analyze the various aspects of e-HRM.
- CO5:** To point out and appraise the recent trends in HRM.

### **Financial Management**

- CO1:** To interpret the concept of business finance, finance decision and functions of finance manager.
- CO2:** Able to understand the concept of cost of capital and leverages and calculate the cost of capital and leverages of a business concern
- CO3:** To interpret the concept of capital budget and will be able to apply the techniques of ARR, NPV, IRR, PI etc.
- CO4:** To understand the concept of working capital management and apply the concept and able to determine working capital requirement of a business organization.
- CO5:** To interpret the concept of cash management and cash budgeting and receivables management.

### **Cost Accounting - I**

- CO1:** To understand the basics of cost, scope, methods of costing.
- CO2:** To explain the principles of managing inventory, cost account of materials, procedure for accounting inventory.
- CO3:** To describe the principles and practice of labour cost to a business.
- CO4:** To describe the principles and procedures of overhead cost analysis.
- CO5:** To explain the need for reconciliation of financial and cost accounting , cost control and reduction.

### **Entrepreneurship Development**

- CO1:** Understand the nature and basic concept of entrepreneur and entrepreneurship.
- CO2:** Demonstrate the knowledge of entrepreneurship development programmes
- CO3:** Recognise the need for project report and analyze the concepts of project formulation
- CO4:** Interpret factory design and factory layout and identify the importance of standardization and quality control
- CO5:** Differentiate small and large scale industries and identify the reasons for sickness of small scale industries

### **Marketing Management**

- CO1:** Explains the concept of marketing and sketches the marketing environment.
- CO2:** Classify the marketing environment and identify the various forces operating in the marketing environment.
- CO3:** Point out the marketing mix with reference to product and price.
- CO4:** Analyze the promotion mix and the channels of distribution.
- CO5:** To formulate the service marketing mix and points out the importance of direct and

online marketing.

### **Auditing and Accounting Standards**

- CO1:** To understand the basic concepts of auditing and the nature and scope of auditing.
- CO2:** To organize the various steps in an auditing process and point out the techniques of vouching of cash payments and receipts.
- CO3:** To analyze the features and importance of internal control, check and audit.
- CO4:** To prepare different types of audit reports and explain the procedure for appointment and removal of a company auditor.
- CO5:** To understand the regulatory framework in which accounting standards are formulated and operated.

### **Company Law**

- CO1:** To develop basic knowledge of provisions of companies act 2013
- CO2:** To describe the capital structure of company through issue of shares and alteration of share capital.
- CO3:** To explain the borrowing powers of a company and consequences of ultra vires borrowings.
- CO4:** To state the various provisions of the companies act relating to company management and meetings.
- CO5:** To identify various modes of winding up and legal provisions applicable.

### **International Marketing and Export Management**

- CO1:** To analyze the process of international marketing and classify india's export trade.
- CO2:** To describe the important factors of international marketing environment differentiate marketing research, market selection and market segmentation.
- CO3:** Analyze the importance of production and distribution strategies.
- CO4:** Differentiate the need for promotion mix strategies and pricing decisions.
- CO5:** Explain foreign exchange strategies, differentiate balance of payments balance of trade and interpret international economic organizations.

### **Principles of Insurance**

- CO1:** To understand the various concepts of insurance and risk management
- CO2:** To explain the role of insurance in economic development and distinguish between life and non-life insurance.
- CO3:** To analyze the need and behaviour of insurance customers and understand the concept of pooling in insurance.
- CO4:** To appraise and criticize the various insurance plans and products available in the insurance market.
- CO5:** To classify different types of financial losses and principles.

### **E-Commerce**

- CO1:** Describe electronic commerce framework and www architecture.
- CO2:** Classify mercantile process models and types of electronic payment systems.
- CO3:** Apply EDI implementations and analyze intra organizational electronic commerce.
- CO4:** Design corporate digital library, advertising and marketing on the internet.
- CO5:** Identify consumer search and resource discovery, on demand education and digital copy rights.

### **Financial Statement Analysis**

- CO1:** To describe the role of management accounting information in managerial planning and decision making
- CO2:** To prepare and interpret the comparative and common size statements and ratio analysis
- CO3:** To analyze funds flow and to prepare the fund flow statement
- CO4:** To analyze cash flow and prepare cash flow statement
- CO5:** To develop an understanding of budgetary control methods.

### **Cost Accounting- II**

- CO1:** To distinguish between service costing, job costing and batch costing.
- CO2:** To prepare cost sheet with reference to long term continuous project.
- CO3:** To prepare process costing account.
- CO4:** To compare variance in standard and actual cost.
- CO5:** To develop tenders and quotations.

## **B.Com Computers**

### **Programme Specific Outcomes:**

#### **Students will be able to:**

- PSO1:** Understand the role of different business organizations and its challenges
- PSO2:** Demonstrate accounting skills for business and service oriented activities and interpret the results to various users
- PSO3:** Analyze the importance of various disciplines of commerce – finance, marketing, auditing, management etc.
- PSO4:** Appraise problem solving techniques through computers for business solutions
- PSO5:** Create and empower students with progressive attitude to pursue higher education and research

### **Business Economics**

- CO1:** Demonstrate understanding of concepts of business economics.
- CO2:** Apply different methods of demand forecasting based on time period and nature of product.
- CO3:** Analyze different types of production function



- CO4:** Compare various market structures and analyze price-output decision in different markets
- CO5:** Analyze importance of international trade to Indian economy and evaluate effects of government policy on trade

### **Financial Accounting – I**

- CO1:** Describe the need and importance of accounting.
- CO2:** Explain about subdivision of journal
- CO3:** Compare the cashbook and passbook balances to reconcile the difference.
- CO4:** Analyze the financial position of an organization
- CO5:** Identify the mistakes in books of accounts and helps in correcting them.

### **Business Organisation and Management**

- CO1:** Identify and interpret the various principles and importance of management
- CO2:** Explain and demonstrate the uses of planning and organizing
- CO3:** Classify and combine the various techniques of control and coordination.
- CO4:** Point out and develop the essence of motivation and direction to the students
- CO5:** Interrelate and understand the essence of leadership and the importance of communication

### **Fundamentals of Information Technology**

- CO1:** Understand basic computer terminology and number systems
- CO2:** Explain about operating systems, and its types.
- CO3:** Identify different applications of information technology
- CO4:** Classify phases of software development life cycle
- CO5:** Compare modern means of communications, types of networks and topologies

### **Indian Economy**

- CO1.** Explain basic characteristics of Indian economy
- CO2.** Illustrate the contribution of agriculture sector to India's development
- CO3.** To explain impact of new economic reforms in Indian economy
- CO4.** To compare types of unemployment and identify causes of inflation.
- CO5.** To critically evaluate the impact of foreign investment in India.

### **Business Mathematics**

- CO1.** To apply various concepts of quadratic equations to find solution of real life problems
- CO2.** Evaluate different idea of logarithms to simplify multiplication and division of numbers
- CO3.** Classify different types of matrices and procedures to find solution of real life problems
- CO4.** Describe the theoretical concepts of differentiations
- CO5:** Identify the differentiation concept to find maximum profit and minimum loss in business process

## **Financial Accounting – II**

- CO1:** Introduce basic concepts of partnership and explains the admission of a partner.
- CO2:** Demonstrate accounting treatment relating to retirement and death of a partner.
- CO3:** Identify the rules applicable for winding up of partnership and insolvency of a partner.
- CO4:** Show the method of finding out profits and financial position by using incomplete records.
- CO5:** Illustrate method of preparing books under hire purchase and installment purchase system

## **Programming in ‘C’**

- CO1:** Describe the structure of ‘c’ program
- CO2:** Analyze the application of controls structures and arrays
- CO3:** Classify the types of functions and storage classes
- CO4:** Apply pointers to enhance program efficiency
- CO5:** Evaluate the file system

## **Business Statistics**

- CO1:** Explain the statistical terminology and consider the options for designing a sample.
- CO2:** Represent the statistical data in diagrammatic and graphical form.
- CO3:** Identify the different statistical techniques used to calculate the descriptive statistics.
- CO4:** Analyze the relation between any two factors using the concepts of correlation and regression analysis
- CO5:** Plan the future events using the concepts of time series analysis and also to determine the value of money, inflation and deflation

## **Advanced Accounting**

- CO1:** State various methods for preparing branch accounts.
- CO2:** Describe the allocation and interdepartmental transfer of expenses.
- CO3:** Analyze the financial position of non-trading concerns.
- CO4:** Evaluate the different situation of capital issue to public issue of shares at par, premium and forfeiture.
- CO5:** Explain about sources of funds through issue of debentures and various methods of redemption.

## **Business Law**

- CO1:** Demonstrate an understanding of the legal environment of the business.
- CO2:** Explain legality of object and consideration, discharge of a contract and remedies available.
- CO3:** Identify the recognition of transactions involving the sales of goods act.
- CO4:** Dramatize the application of consumer protection act.
- CO5:** Recognize intellectual property rights and introduction to it act 2000 and right to information act.

## **Direct Taxes**

- CO1:** Understand the basic definitions of income tax, agricultural income, residential status

and exempted incomes.

**CO2:** Show the computation of income from the head salaries and house property as per it act.

**CO3:** Identify the income from business, profession and capital gains.

**CO4:** Compute total income of individuals and huf.

**CO5:** Assess the tax liability of individuals and huf as per it act.

### **Object Oriented Programming through 'C++'**

**CO1:** Describe the concepts of object oriented programming

**CO2:** Apply control structures to write programs for application development

**CO3:** Differentiate the types of constructors

**CO4:** Demonstrate polymorphism and types of inheritance

**CO5:** Evaluate the concept of templates and files

### **Environmental Studies and Gender Sensitization**

**CO1:** Understand the importance of environmental education, conservation of natural resources & understand the importance of ecosystems and biodiversity

**CO2:** Understand the pollution problems and apply the environmental science knowledge on solid waste management, disaster management

**CO3:** Apply the environmental science knowledge to improve the resources, evaluate and understand the sustainable environmental conditions and control methods

**CO4:** Identify the interactions and intersections of identities (e.g., gender, race, ethnicity, class, sexuality, and so on) and assess the ways in which they contribute to instances of privilege and power dynamics across cultures, space, and time. And their problems

**CO5:** Understand the gender problems and ways of addressing them, including interactions across local to global scales in communities and overcome inequalities with legislations

### **Research Methodology**

**CO1:** Understand and interpret the basic meaning of research, to define the research problem at hand and construct the procedure for undertaking research.

**CO2:** Formulate hypothesis and develop an appropriate research design.

**CO3:** Classify the different sources of data and analyze the various methods of data collection.

**CO4:** Develop the most appropriate sample size and design as well as determination of sampling and non-sampling errors.

**CO5:** Classify the various types of attitude measurement scales and applies the principles and format of report writing and presentation.

### **Corporate Accounting**

**CO1:** Understand the various types of capital structures of the company and their representation in the balance sheet, preparation of financial statements with profits before incorporation.

**CO2:** Explain the valuation of shares and goodwill.

**CO3:** Analyze amalgamation in the nature of merger and purchase and accounting treatment

for internal reconstruction.

**CO4:** Demonstrate the accounting systems of a banking company under the guidance of rbi.

**CO5:** Help to prepare insurance accounts as per irdai guidelines.

### **Banking Theory and Practice**

**CO1:** Identify and illustrate the origin and growth of banking in India.

**CO2:** Interpret the features of various types of negotiable instruments.

**CO3:** Demonstrate and apply the steps involved in opening a bank account.

**CO4:** Appraise and criticize the various types of collateral securities and point out the precautions to be taken by a banker while advancing loans against different types of securities.

**CO5:** Understand the organizational structure and functions of co-operative banks, Nabard and RBI.

### **Indirect Taxes**

**CO1:** Describe basic scheme of GST, GST council power and functions.

**CO2:** Explain various GST acts and also various definitions

**CO3:** Identify the registration procedure, levying of GST and exemptions

**CO4:** Analyze different types of assessments and returns under GST

**CO5:** Tell the GST network, GST suvida providers and GST eco system.

### **Indirect taxes**

**Co1.** Describe basic scheme of GST, GST council power and functions.

**Co2.** Explain various GST acts and also various definitions

**Co3.** Identify the registration procedure, levying of GST and exemptions

**Co4.** Analyze different types of assessments and returns under GST

**Co5.** Tell the GST network, GST suvida providers and GST eco system.

### **Database Management System**

**CO1:** Understand database design using e-r diagrams

**CO2:** Classify normalization and relational algebra

**CO3:** Create database tables to implement queries

**CO4:** Analyze procedural languages and storage media

**CO5:** Evaluate transactions and its recovery system

### **Marketing Management**

**CO1:** Explain the concept of marketing and sketches the marketing environment.

**CO2:** Classify the market and identifies the various market segments

**CO3:** Point out the marketing mix with reference to product and price

**CO4:** Analyze the promotion mix and the channels of distribution.

**CO5:** Explain service marketing mix and points out the importance of direct and online marketing.

### **International Business**

**CO1:** Explain the overview of international business and demonstrate the environment of

international business.

**CO2:** Explain about the various forms of trade regulation and integration.

**CO3:** Sketch the various modes of entering the international market.

**CO4:** Point out the conceptual framework of e-business and policy framework for global e-business.

**CO5:** Analyze the intercultural communication on the global perspective.

### **Human Resource Management**

**CO1:** Understand the concept of HRM, functions and changing role of a HR manager

**CO2:** Distinguish between the various methods of job design and interpret the techniques of acquisition of human resource.

**CO3:** Explain the importance of HRP and point out the various HRD approaches for work life balance and describe the concept of job evaluation.

**CO4:** Analyze the core concepts of HRD, TQM and understand the concept of career development.

**CO5:** Explain the various concepts of worker's participation and quality of work life.

### **Corporate Governance and Business Ethics**

**CO1:** Identify and explain the importance of values and ethics.

**CO2:** Analyze and interpret the various theories of ethical value system.

**CO3:** Point out the relationship between law and ethics and understand the impact of law on the business.

**CO4:** Explain the corporate governance codes, transparency and disclosure in the corporate.

**CO5:** Identify and point out the global issues of governance.

### **Financial Management**

**CO1:** Interpret the concept of business finance, finance decision and functions of finance manager.

**CO2:** Understand the concept of capital budgeting and evaluate NPV and cash flows for investment analysis.

**CO3:** Explain the basic concepts of cost of capital and its significance.

**CO4:** Distinguish between financial and operating leverages and to explain the capital structure theories.

**CO5:** Appraise the knowledge on dividend theories.

### **Cost Accounting**

**CO1:** Understand importance of cost accounting in organization.

**CO2:** Describe the principles of managing inventories of materials and the procedures for accounting inventory.

**CO3:** Describe the principles and practice of costing labour to a business.

**CO4:** Describe the principles and process of overhead cost analysis.

**CO5:** To apply the operation of process costing methods

### **E-Commerce**

**CO1:** Understand the framework for web applications

**CO2:** Classify the consumer oriented applications and electronic payment systems

- CO3:** Evaluate the role of internal commerce and impact of advertising
- CO4:** Appraise digital libraries in information search and discovery
- CO5:** Analyze technological components, digital copyrights and mobile commerce

### **Java**

- CO1:** Write java programs and differentiate between object-oriented programming and procedure-oriented programming.
- CO2:** Apply object-oriented programming features for solving a given problem.
- CO3:** Create packages and interfaces mechanisms.
- CO4:** Analyze exception-handling, threads and applets
- CO5:** Create interactive GUI programs using AWT package.

### **Auditing and Accounting Standards**

- CO1:** Understand the basic concepts of auditing and the nature and scope of auditing.
- CO2:** Organize the various steps in an auditing process and point out the techniques of vouching of cash payments and receipts.
- CO3:** Analyze the features and importance of internal control, check and audit.
- CO4:** Prepare different types of audit reports and explain the procedure for appointment and removal of a company auditor.
- CO5:** Understand the regulatory framework in which accounting standards are formulated and operated.

### **Company Law**

- CO1:** Develop basic knowledge of provisions of companies' act 2013.
- CO2:** Describe the capital structure of company through issues of shares and alteration of share capital.
- CO3:** Explain the borrowing powers of a company and consequences of ultra-vires borrowing.
- CO4:** State various provisions of the companies act relating to company management and meetings.
- CO5:** Identify various modes of winding up and legal provisions applicable.

### **System Analysis and Design**

- CO1:** Demonstrate an understanding of the importance of system development environment
- CO2:** Interrelate the appropriate data flow diagram methodology
- CO3:** Apply the concepts of designing interfaces and dialogs
- CO4:** Differentiate between client servers and file server architecture
- CO5:** Analyze object oriented methods and different UML diagrams

### **Management Information Systems**

- CO1:** Understand the overview of management information systems
- CO2:** Describe the IS framework and its types and its strategic uses
- CO3:** Sketch the systems development processes
- CO4:** Appraise the management challenges – security and processing
- CO5:** Classify business applications of information technology

### **Entrepreneurship Development**

- CO1:** Understand the nature and basic concept of entrepreneur and entrepreneurship.
- CO2:** Demonstrate the knowledge of entrepreneurship development programmes
- CO3:** Recognise the need for project report and analyze the concepts of project formulation
- CO4:** Interpret factory design and factory layout and identify the importance of standardization and quality control
- CO5:** Differentiate small and large scale industries and identify the reasons for sickness of small scale industries

### **Financial Statement and Analysis**

- CO1:** Describe the role of management accounting information in managerial planning and decision making
- CO2:** Prepare and interpret the comparative and common size statements and ratio analysis
- CO3:** To analyze funds flow and to prepare the fund flow statement
- CO4:** Analyze cash flow and prepare cash flow statement
- CO5:** Develop an understanding of budgetary control methods.

### **Web Programming**

- CO1:** Describe the structure of html and various tags
- CO2:** Apply style sheets to web pages
- CO3:** Apply JavaScript to write programs
- CO4:** Categorize and distinguish objects in JavaScript
- CO5:** Appraise xml and XSL

## **BBA**

### **Programme specific outcomes:**

- PSO1:** Understand the importance of teamwork and group dynamics in achieving organizational goals and demonstrate ability to work effectively as a team.
- PSO2:** Analyze the dynamics of the organizational conflict, various leadership styles and their execution.
- PSO3:** Think critically of diverse global perspectives and challenges of global business.
- PSO4:** Apply the knowledge of entrepreneurship, finance, marketing, HR, and computer-based information systems to business operations.

### **Course Outcomes**

### **Fundamentals of Information Technology**

- CO1:** Understand basic computer terminology and number systems.
- CO2:** Identify different operating systems, and its types.
- CO3:** Classify different applications of information technology
- CO4:** Analyse the importance of system development and the phases of SDLC
- CO5:** Categorize modern means of communications, types of networks and topologies.

### **Banking Theory & Practice**

- CO1:** Identify and illustrate the origin and growth of banking in India
- CO2:** Demonstrate and apply the steps involved in opening various types of bank accounts
- CO3:** Appraise and criticize the various types of collateral securities and point out the precautions to be taken by a banker while advancing loans against different types of securities
- CO4:** Understand the functions and organizational structure of cooperative banks, Nabard and RBI.
- CO5:** Interpret the features of various types of negotiable instruments.

### **Financial Accounting-I**

- CO1:** Describe the need and importance of accounting.
- CO2:** Explain about subdivision of journal
- CO3:** Compare the cashbook and passbook balances to reconcile the difference.
- CO4:** Analyze the financial position of an organization
- CO5:** Identify the mistakes in books of accounts and helps in correcting them.

### **Principles of Management**

- CO1:** Identify and interpret the various principles and importance of management
- CO2:** Explain and demonstrate the uses of planning and organizing
- CO3:** Classify and combine the various techniques of control and coordination.
- CO4:** Identify the essence of motivation and direction
- CO5:** Interrelate and understand the essence of leadership and the importance of communication

### **Fundamentals of Business Statistics**

- CO1:** Organize, manage and present data. Can represent the statistical data in diagrammatic and graphical form
- CO2:** Calculate measures of central tendency.
- CO3:** Analyze the data using measures of dispersion.
- CO4:** Evaluate the nature for the statistical data using skewness and moments.
- CO5:** Determine the relation between any two factors using the concepts of correlation and regression analysis



### **Corporate Governance & Business Ethics**

- CO1:** Identify and explain the importance of values and ethics.
- CO2:** Analyze and interpret the various theories of ethical value system.
- CO3:** Point out the relationship between law and ethics and understand the impact of law on the business.
- CO4:** Explain the corporate governance codes, transparency and disclosure in the corporate.
- CO5:** Identify and point out the global issues of governance.

### **Financial Accounting-II**

- CO1:** Explain the basic concepts of partnership and explain the admission of a partner.
- CO2:** Demonstrate the accounting treatment relating to retirement and death of a partner.
- CO3:** Identify the rules applicable for winding up of partnership and insolvency of a partner.
- CO4:** Show the method of finding out profits and financial position by using incomplete records.
- CO5:** Illustrate method of preparing books under hire purchase and instalment purchase system

### **Managerial Economics**

- CO1:** Understand the basic terms and concepts used in the managerial economics
- CO2:** Appraise the behaviour of consumers through the demand and indifference analysis
- CO3:** Interpret the behaviour of producer through supply, production and other related concepts.
- CO4:** Differentiate the market forms and the price and output determination under each type of market.
- CO5:** Infer the impact of the macro economic factors on the business concerns.

### **Principles of Management**

- CO1:** Identify and interpret the various principles and importance of management
- CO2:** Explain and demonstrate the uses of planning and organizing
- CO3:** Classify and combine the various techniques of control and coordination.
- CO4:** Identify the essence of motivation and direction
- CO5:** Interrelate and understand the essence of leadership and the importance of communication

### **Taxation**

- CO1:** Explain the role, need of tax and give knowledge about taxation system in india.
- CO2:** Explain various sources of income tax and determines income tax payable on individual salary, income from house property.
- CO3:** Analyze and prepare over all calculation of tax liability of individual.
- CO4:** Describe the assessment, role of income tax.
- CO5:** Describe about indirect tax and role of g.s.t, its meaning, features, history and role.

### **Fundamentals of Business Mathematics**

- CO1:** Use the quadratic formula to find all real solutions. Compute the discriminant and state the number and type of solutions.

- CO2:** Perform standard operations with matrices including addition, scalar multiplication, and multiplication. Compute the inverse of a matrix.
- CO3:** Understand particular types of sequences called arithmetic progression, geometric progression and also find arithmetic mean (a.m), geometric mean (g.m) between two given numbers.
- CO4:** Understand the idea of differentiation from first principles - differentiate power functions.
- CO5:** Learn about integration and about some of the common techniques employed to obtain integrals. Interpret distinction between a definite and an indefinite integral.

### **Research Methodology**

- CO1:** Understand and interpret the basic meaning of research, to define the research problem at hand and construct the procedure for undertaking research.
- CO2:** Formulate hypothesis and develop an appropriate research design.
- CO3:** Classify the different sources of data and analyze the various methods of data collection.
- CO4:** Develop the most appropriate sample size and design as well as determination of sampling and non-sampling errors.
- CO5:** Classify the various types of attitude measurement scales and applies the principles and format of report writing and presentation.

### **Advanced Accounting**

- CO1:** State various methods for preparing branch accounts.
- CO2:** Describe the allocation and interdepartmental transfer of expenses.
- CO3:** Analyse the financial position of non-trading concerns.
- CO4:** Evaluate the different situation of capital issue to public issue of shares at par, premium and forfeiture.
- CO5:** Explain about sources of funds through issue of debentures and various methods of redemption.

### **Macro Business Environment**

- CO1:** Define and explain process of calculating national income.
- CO2:** Describe circular flow of income through various sectors of economy.
- CO3:** Illustrate meaning of inflation and identify different kind of inflation, causes and effects of inflation of different sectors of economy.
- CO4:** Appraise the importance of planning undertaken by government of India and economic reforms adopted by government.
- CO5:** Develop understanding towards role of foreign investment in development of Indian industries.

### **E-Commerce**

- CO1:** Explain electronic commerce framework and www architecture.
- CO2:** Select mercantile process models and types of electronic payment systems.

- CO3:** Apply EDI implementations and analyze intra organizational electronic commerce
- CO4:** Design corporate digital library, advertising and marketing on the internet.
- CO5:** Identify consumer search and resource discovery, on demand education and digital copy rights.

### **Corporate Accounting**

- CO1:** Understand the various types of capital structures of the company and their representation in the balance sheet, preparation of financial statements with profits before incorporation.
- CO2:** Explain the valuation of shares and goodwill.
- CO3:** Analyse amalgamation in the nature of merger and purchase and accounting treatment for internal reconstruction.
- CO4:** Demonstrate the accounting systems of a banking company under the guidance of RBI.
- CO5:** Analyze insurance accounts as per irdai guidelines.

### **Financial Management**

- CO1:** Interpret the concept of business finance, finance decision and functions of finance manager.
- CO2:** Understand the concept of cost of capital and leverages and calculate the cost of capital and leverages of a business concern.
- CO3:** Interpret the concept of capital budget and will be able to apply the techniques of ARR, NPV, IRR, PI etc.
- CO4:** Understand the concept of working capital management and apply the concept and able to determine working capital requirement of a business organization.
- CO5:** Interpret the concept of cash management and cash budgeting and receivable management.

### **Marketing Management**

- CO1:** Explain the concept of marketing and sketches the marketing environment.
- CO2:** Classify the market and identify the various market segments.
- CO3:** Point out the marketing mix with reference to product and price.
- CO4:** Analyze the promotion mix and the channels of distribution.
- CO5:** Explain service marketing mix and points out the importance of direct and online marketing.

### **Human Resource Management**

- CO1:** Understand the concept of HRM, functions and changing role of a HR manager
- CO2:** Distinguish between the various methods of job design and interpret the techniques of acquisition of human resource.

- CO3:** Explain the importance of HRP and point out the various HRD approaches for work life balance and describe the concept of job evaluation.
- CO4:** Analyse the core concepts of HRD, TQM and understand the concept of career development.
- CO5:** Explain the various concepts of worker's participation and quality of work life.

### **International Business**

- CO1:** Explain the overview of international business and demonstrate the environment of international business.
- CO2:** Explain about the various forms of trade regulation and integration.
- CO3:** Sketch the various modes of entering the international market.
- CO4:** Point out the conceptual framework of e-business and policy framework for global e-business.
- CO5:** Analyze the intercultural communication on the global perspective.

### **Leadership & Change Management**

- CO1:** Recognize the qualities of a leader, analyze various leadership theories and illustrate the different leadership styles.
- CO2:** Analyze the forces of change and interpret the techniques of change management.
- CO3:** Classify the various types of organizational change.
- CO4:** Point out the reasons for resistance to organizational change and recognize the methods of overcoming resistance.
- CO5:** Develop the most suitable plan for successful implementation and organization of change in an organization.

### **Quantitative Techniques**

- CO1:** Understand the characteristics of different types of decision-making environments and the appropriate decision making approaches and tools to be used in each type.
- CO2:** Build and solve transportation models. Analyze the cases of unequal supply and demand, unacceptable routes, and maximization objective for a transportation problem.
- CO3:** Understand the mathematical tools that are needed to solve optimization problems, and be familiar with the special features of the trans-shipment problem.
- CO4:** Design new simple models, like: CPM, PERT to improve decision –making and develop critical thinking and objective analysis of decision problems
- CO5:** Understand the terminology & nomenclature appropriate queuing theory, and demonstrate the knowledge of various queuing models.

### **Cost Accounting**

- CO1:** Understand importance of cost accounting in organization.
- CO2:** Apply the principles of managing inventories of materials and the procedures for accounting inventory.
- CO3:** Apply the principles and practice of costing labour to a business.
- CO4:** Apply the principles and process of overhead cost analysis.

**CO5:** Apply the operation of unit or output costing and process costing methods.

### **Business Laws**

**CO1:** Demonstrate an understanding of the legal environment of the business.

**CO2:** Explain legality of object and consideration, discharge of a contract and remedies available.

**CO3:** Identify the recognition of transactions involving the sales of goods act.

**CO4:** Dramatize the application of consumer protection act.

**CO5:** Recognize intellectual property rights and introduction to it act 2000 and right to information act.

### **Strategic Management**

**CO1:** Explain the strategic management process and craft strategies.

**Co2.** Analyse the components of environment analysis in depth.

**Co3.** Formulate the various corporate strategies.

**Co4.** Plan and produce strategies tailoring to fit specific industry.

**Co5.** Explain the various issues and importance of strategic leadership.

### **Financial Markets & Institutions**

**CO1:** Explain and analyze the various functions and importance of indian financial system

**CO2:** Classify capital markets and assess the rational content and current reforms to capital market regulations

**CO3:** Analyze the features of money market and list out the various money market instruments

**CO4:** Identify and interpret the various services provided by a merchant banker

**CO5:** Explain the meaning, origin, and types of funds

### **Retail Marketing & Customer Relationship Management**

**CO1:** Understand the important concepts of retailing.

**CO2:** Sketch the importance of merchandise management and phases in merchandise planning.

**CO3:** Explain the concept of human resource management in retailing

**CO4:** Explain and understand the approaches to develop customer service.

**CO5:** Analyse the various steps involved in crm process.

### **Entrepreneurship Development**

**CO1:** Understand the nature and basic concepts of entrepreneur and entrepreneurship

**CO2:** Demonstrate the knowledge of entrepreneurship development programmes

**CO3:** Recognize the need for project report and analyze the concepts of project formulation

**CO4:** Interpret factory design and factory layout and identify the importance of standardization

and quality control.

**CO5:** Differentiate small and large scale industries and identify the reasons for sickness of small scale industries.

### **Management Accounting**

**CO1:** Explain an overview of management accounting, its need, scope and functions.

**CO2:** Prepare the financial statements and show its analysis and interpretation and apply different formula in ratio analysis.

**CO3:** Illustrate the preparation of funds flow statement and cash flow statement.

**CO4:** Explain marginal costing and budgetary techniques

**CO5:** Understand importance of standard costing and analyze variance analysis

### **Company Law**

**CO1:** Develop basic knowledge of provisions of companies' act 2013.

**CO2:** Describe the capital structure of company through issues of shares and alteration of share capital.

**CO3:** Explain the borrowing powers of a company and consequences of ultra vires borrowing.

**CO4:** State various provisions of the companies act relating to company management and meetings.

**CO5:** Identify various modes of winding up and legal provisions applicable.

### **International Accounting and Finance**

#### **Programme Specific Outcomes:**

#### **Students will be able to:**

**PSO1:** Understand the nature and basic concepts of International Accounting & Finance and express them effectively in the provisions according to the International Financial Reporting Standards.

**PSO2:** Ability to apply and analyze the provisions in application of through and fare views of auditing and accounting to check the true and fair accounting to be maintained

**PSO3:** Think critically to integrate knowledge, skill and attitude that will sustain an environment of learning and creativity among the students.

**PSO4:** Apply and appreciate the benefits of experiential learning by displaying good work habits, time management and self-discipline.

**PSO5:** Interpret and develop the students ability to clear all the Fundamental and professional level papers of ACCA.

### **Accountant in Business**

- CO1:** To make the students understand the structure of business organizations.
- CO2:** To explain the accounting and reporting systems and their relationship with other business functions.
- CO3:** To point out the importance of leadership & motivation theories.
- CO4:** To explain the importance of communication in business.
- CO5:** To analyze the professional ethics in accounting & business.

### **Financial Accounting**

- CO1:** Describe the regulatory framework of ifrs.
- CO2:** Understand the various accounting standards and their applications.
- CO3:** Apply the provisions of accounting standards to various concepts.
- CO4:** Analyze the financial position of an organization
- CO5:** Evaluate the profitability position of a company in terms of ratios

### **Cost Accounting –I**

- CO1:** To understand the role of management information in planning, controlling and decision making
- CO2:** To describe the principles of managing inventories of materials and the procedures for accounting for inventory
- CO3:** To describe the principles and practice of costing labour to a business
- CO4:** To describe principles and processes of overhead cost analysis
- CO5:** To understand the implications of marginal costing in contrast to absorption costing for management information

### **Taxation- I**

- CO1:** To describe the basic terminology of Indian taxation system.
- CO2:** To differentiate the allowances as fully taxable, partly taxable, not taxable, and computation of income from salary
- CO3:** To explain the valuation of income from house property.
- CO4:** To apply the provisions relating to income from business and profession
- CO5:** To evaluate the computation of capital gain LTCG and STCG

### **Business Laws**

- CO1:** Demonstrate an understanding of the legal environment of the business.
- CO2:** Explains legality of object and consideration, discharge of a contract and remedies available.
- CO3:** Identify the recognition of transactions involving the sales of goods act.
- CO4:** Dramatize the application of consumer protection act.
- CO5:** To recognize intellectual property rights and introduction to it act 2000 and right to information act.

### **Cost Accounting –II**

- CO1:** To apply the operation of process costing methods
- CO2:** To prepare budgets for an organization and apply the statistical techniques in cost and

management accounting

**CO3:** To identify the methods for assessing the viability of capital investments

**CO4:** To produce operating statements using basic standards and variances

**CO5:** To understand the scope of performance measurement and performance indicators

### **Taxation-II**

**CO1:** To describe the basic concept of income from securities and income from other sources

**CO2:** To differentiate the provisions relating to set off and carry forward of losses

**CO3:** To explain the procedures of deductions and gross total income and tax liability

**CO4:** To apply operations of assessing officer, assessment and types of assessments and filing of returns

**CO5:** To evaluate the computation of GST on goods and services

### **Financial Reporting**

**CO1:** To organize the international financial reporting standards

**CO2:** To classify accounting for transactions

**CO3:** To analyze the interpretation of financial statements

**CO4:** To prepare financial statements

**CO5:** To prepare consolidated financial statements

### **Management Accounting Techniques – I**

**CO1:** Understand the modern management accounting techniques.

**CO2:** Application of specialist cost techniques in management accounting.

**CO3:** Understanding emerging decision making techniques of management accounting.

**CO4:** Application of emerging decision making techniques in management accounting.

**CO5:** To implement the budgetary control strategies in management accounting

### **Advanced Accounting**

**CO1:** States various methods for preparing branch accounts.

**CO2:** Describes the allocation and interdepartmental transfer of expenses.

**CO3:** Analyses the financial position of non-trading concerns.

**CO4:** Evaluate the different situation of capital issue to public issue of shares at par, premium and forfeiture.

**CO5:** Explains about sources of funds through issue of debentures and various methods of redemption.

### **Fundamentals of Information Technology**

**CO1:** Students will be able to explain about computer.

**CO2:** They will get identify different types of operating systems

**CO3:** Students will be able to analyze usage of computers in commercial, scientific and entertainment

**CO4:** Students will be able to classify types of software's

**CO5:** Students will be able to choose network service and usage

### **Financial Management**



- CO1:** To explain the nature and purpose of financial management and discuss the impact of macroeconomic policy
- CO2:** To identify the nature and role of capital markets both nationally and internationally
- CO3:** To analyze basic investment appraisal techniques and working capital management
- CO4:** To suggest appropriate sources of finance for a business and valuing the businesses and financial assets
- CO5:** To compare and evaluate the methods of foreign currency risk management

### **Corporate Accounting**

- CO1:** To understand the various types of capital structures of the company and their representation in the balance sheet, preparation of financial statements with profits before incorporation.
- CO2:** Explains the valuation of shares and goodwill.
- CO3:** Analyses amalgamation in the nature of merger and purchase and accounting treatment for internal reconstruction.
- CO4:** Demonstrates the accounting systems of a banking company under the guidance of rbi.
- CO5:** Helps to prepare insurance accounts as per IRDAI guidelines.

### **Management Accounting Techniques – II**

- CO1:** To illustrate quantitative analysis in budgeting & learning curve effect.
- CO2:** To apply the formulae of advanced variances in standard costing.
- CO3:** To explain performance analysis & behavioural aspects in management.
- CO4:** To point out the performance management information systems & importance of management reports.
- CO5:** To evaluate transfer pricing & performance analysis in private sector & in not for profit organizations.

### **Business Statistics**

- CO1:** Students will be able to know basic statistical concepts for collection, organization and its limitations. They will also be able to determine the considerations and options for designing a sample.
- CO2:** Students will be able to represent the statistical data in diagrammatic and graphical form.
- CO3:** Students will be able to measures of central tendency, dispersion and symmetrical nature for the given data.
- CO4:** Students will be able to analyze the relation between any two factors using the concepts of moments, skewness, and correlation and regression analysis.
- CO5:** Students will be able to predict the future events and/or estimating unobservable components like trend and seasonal effects by using the concepts of time series analysis. They will also be able to determination of the value of money using price index numbers and displays the change in price levels and depicts inflation or deflation.

### **Entrepreneurial Development**

- CO1:** Understand the nature and basic concept of entrepreneur and entrepreneurship.
- CO2:** To analyze the idea generation and assessment process.
- CO3:** Recognise the need for project report and analyze the concepts of project formulation

and differentiate small and large scale industries and identify the reasons for sickness of small scale industries

**CO4:** Demonstrate the knowledge of entrepreneurship development programmes

**CO5:** To identify and explain the importance of values and ethics

### **Auditing and Assurance**

**CO1:** To explain the audit and assurance

**CO2:** To organize the audit planning and control

**CO3:** To interpret the performance analysis

**CO4:** To identify the evidence

**CO5:** To describe review and reporting

### **Marketing Management**

**CO1:** Explains the concept of marketing and sketches the marketing environment.

**CO2:** Classifies the market and identifies the various market segments

**CO3:** Point out the marketing mix with reference to product and price

**CO4:** Analyzes the promotion mix and the channels of distribution.

**CO5:** Explains service marketing mix and points out the importance of direct and online marketing.

### **Research Methodology**

**CO1:** To understand and interpret the basic meaning of research, to define the research problem at hand and construct the procedure for undertaking research.

**CO2:** To formulate hypothesis and develop an appropriate research design.

**CO3:** To classify the different sources of data and analyze the various methods of data collection.

**CO4:** To develop the most appropriate sample size and design as well as determination of sampling and non-sampling errors.

**CO5:** To classify the various types of attitude measurement scales and applies the principles and format of report writing and presentation.

### **Performance Management- I**

**CO1:** To describe the strategic planning and control

**CO2:** To analyze the external influences on performance

**CO3:** To organize the performance measurement systems and design

**CO4:** To describe strategic performance measurement-I

**CO5:** To classify strategic performance measurement-II

### **Human Resource Management**

**CO1:** To understand the concept of HRM, functions and changing role of a HR manager

**CO2:** To distinguish between the various methods of job design and interpret the techniques of acquisition of human resource.

**CO3:** To explain the importance of HRP and point out the various hrd approaches for work life balance and describe the concept of job evaluation.

**CO4:** To analyze the core concepts of HRD, TQM and understand the concept of career development.

**CO5:** To explain the various concepts of worker's participation and quality of work life.

### **Advanced Auditing and Assurance**

**CO1:** To explain the audit and assurance

**CO2:** To organize the audit planning and control

**CO3:** To interpret the performance analysis

**CO4:** To identify the evidence

**CO5:** To describe review and reporting

### **Performance Management- II**

**CO1:** To explain the performance evaluation

**CO2:** To organize the performance measurement and control.

**CO3:** To interpret the performance analysis

**CO4:** To identify the current developments

**CO5:** To defend recent trends in performance management

### **International Business**

**CO1:** Explains the overview of international business and demonstrates the environment of international business.

**CO2:** Explains about the various forms of trade regulation and integration.

**CO3:** Sketches the various modes of entering the international market.

**CO4:** It point out the conceptual framework of e-business and policy framework for global e-business.

**CO5:** It analyzes the intercultural communication on the global perspective.

### **Corporate Governance and Ethics**

**CO1:** To analyze and interpret the various moral stances required for corporate governance.

**CO2:** To identify and explain the roles and responsibilities of directors and board committees.

**CO3:** To demonstrate how risk is identified and assessed.

**CO4:** To explain the various risk management strategies.

**CO5:** To recognize the need and importance of business ethics and values

### **E-Commerce**

**CO1:** Explain electronic commerce framework and www architecture

**CO2:** Select mercantile process models and types of electronic payment systems.

**CO3:** Apply EDI implementations and analyze intra organizational electronic commerce

**CO4:** Choose advertising and marketing on the internet.

**CO5:** Identify consumer search and resource discovery, on demand education and digital copy rights

### **Corporate Reporting**

**CO1:** To organize the international financial reporting standards

**CO2:** To classify accounting for transactions

**CO3:** To prepare financial statements

**CO4:** To prepare financial statements

**CO5:** To analyze current issues

## **B.A. Mass Communication**

### **Programme Outcomes**

**PO1: Critical Thinking:** Take informed actions after identifying the assumptions that frame our thinking and actions, critically evaluate. The validity of arguments and conclusion, and looking at our ideas and decisions (intellectual, organizational, and personal)From Different perspectives.

**PO2: Effective Communication:** Speak, read, write and listen clearly in person and through electronic media in English and in one Indian Language, and make meaning of the word by connecting people, ideas, books, media, and technology.

**PO3: Social Interaction:** Elicit views of others, mediate disagreements and help reach conclusions in group settings.

**PO4: Conduct Investigation of Complex Problems:** Use research based knowledge and research methods including design of experiments, Analysis and interpretation of data, and synthesis of information to provide valid conclusion

**PO5: Effective Citizenship:** Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civil life through a volunteering.

**PO6: Ethics:** Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

**PO7: Environment and Sustainability:** Understand the issues of environmental contexts and sustainable development.

**PO8: Self-Directed and Lifelong Learning:** Acquire the ability to engage in independent and lifelong learning in the broadest manual.

### **Programme Specific Outcomes:**

**PSO1:** Understand the nature and basic concepts of Mass Communication and express them effectively in writing, speaking and audio-visual medium.

**PSO2:** Analyze the relationship between media and society, and the various ways individuals respond to socio-political-religious-cultural-ethical

-economic and sustainable goals.

**PSO3:** Think critically about debut, films, documentaries, articles, editorials and music while taking into account diverse interpretations from different viewpoints. Being exposed to wide range of perspective the students gain the ability to construct a public opinion which is socially responsible, ethical and humane leading to effective citizenship.

**PSO4:** Apply the theories of Mass Communication to understand complex problems of society and create a content, catering to the needs of pluralistic society.

**PSO5:** Designing creative content that suits for various media platform.

### **Introduction to Mass Communication**

**CO1:** Students understand what's human communication, it's types and how communication differs in various levels

**CO2:** Students understand the characteristics, nature and scope of journalism and mass communication

**CO3:** Students apply different communication models to help communicate messages and understand the audience.

**CO4:** Students analyze by applying various theories used in mass communication and understand audience behavior and reactions, hence, giving an insight in Indian Media.

**CO5:** Students understand how traditional media and various folk forms help people communicate to the audience.

### **Introduction to Socio- Political India:**

**CO1:** Students understand the current social, economic and cultural conditions and problems of India

**CO2:** Students understand the Indian political system, Panchayat Raj and the understanding of the Indian Constitution.

**CO3:** Students understand the various statuses of different sectors of Indian societies and the schemes involved to alleviate them.

**CO4:** Students apply the concepts of human rights in India and how it is implemented by various organizations.

**CO5:** Students understand Globalization, its impact and the crisis agriculture society which also includes the civil movements involved.

### **Digital Audio Production**

**CO1:** Students design sound by using these components of sound.

**CO2:** Students understand the history of recording and format. They learn the use of RTA software.

**CO3:** Students understand the importance of the sound equipment in sound designing.

**CO4:** Students apply the concepts of sound production while designing the sound.

**CO5:** Students learn the process of sound mixing.

### **Indian Print Journalism:**

**CO1:** Students analyze the working of the press in India and it's changing landscape globally.

**CO2:** Students understand the working of press from the past and various pioneers involved in the evolution of Press in India.

- CO3:** Students evaluate the working of regional press from the past and various pioneers involved in the evolution of Regional Press in India.
- CO4:** Students understand the coverage of People's movement by Indian Press and their representation.
- CO5:** Students remember the impact of globalization on the press and Emergence of social media as the 5<sup>th</sup> estate in democracy.

### **Introduction to Electronic Media**

- CO1:** Students understand the origin and growth of Indian radio and All India Radio.
- CO2:** Students understand the status of radio in the era of TV and New media and its new trends.
- CO3:** Students understand the origin and growth of TV in India and various projects related to its' growth.
- CO4:** Students understand the growth and new trends of TV after the separation of DD from AIR and the Prasar Bharathi Act.
- CO5:** Students remember the introduction of cable TV, STAR and ZEE network and the new trends in TV.

### **Digital Photography**

- CO1:** Students understand the origin and history of Photography and the various Camera components.
- CO2:** Students apply the Types of cameras, lenses and the rules of Photography
- CO3:** Students create photographs with the usage of lights and flash.
- CO4:** Students understand the various types of Photography in Media.
- CO5:** Students analyze the post- production process of Photography using software's and it's digital storage formats

### **Photography**

- CO1:** Students understand the evolution of photography and the basic terms involved in photography.
- CO2:** Students analyze the functions of the parts of a camera and usage of different types of cameras.
- CO3:** Students learn and apply the composition of shots and importance of lighting and it's techniques in photography.
- CO4:** Students evaluate the editing software techniques and usage of apt storage devices.
- CO5:** Students apply techniques involved in various forms of photography in the current market.

### **Film Appreciation**

- CO1:** Students understand and describe the importance of films in the society and the evolution of cinema from the past.
- CO2:** Students understand the rules of film and the art of making aesthetic cinema.
- CO3:** Students analyze the techniques involved in making effective films.
- CO4:** Students create films through these elements of film.
- CO5:** Students understand about world-wide cinema and different genres of films.

### **Media, Culture And Society**

- CO1:** Students understand the nature and scope of media and learn about different theories involved in consuming media messages.
- CO2:** Students understand the media and the psychological effects of media content on the society.
- CO3:** Students evaluate the impact of media on an individual and society and why people use media.
- CO4:** Students analyze culture, its ideology and pop-culture.
- CO5:** Students understand the unconventional forms of media in modern society.

### **History Of Indian Journalism**

- CO1:** Students understand the press and its role and its evolution through the years.
- CO2:** Students remember in detail about the history of press and its contribution in the nationalist movement.
- CO3:** Students understand the introduction of local press and newspapers in different regional languages.
- CO4:** Students understand the role of press in society through various movements.
- CO5:** Students understand the trends that evolved in press.

### **Elements Of Film**

- CO1:** Students understand the concept of film and Indian Cinema
- CO2:** Students analyze the process of film production and the stages involved in it.
- CO3:** Students analyze the technical and visual aspects of film making.
- CO4:** Students understand the evolution of films through historic movements and films.
- CO5:** Students understand the concepts and types of documentary.

### **Television Production**

- CO1:** Students understand the types of television and structure of a television studio.
- CO2:** Students apply the scripting techniques for television production.
- CO3:** Students analyze the technical functioning of camera and its parts.
- CO4:** Students analyze the basic editing and lighting techniques.
- CO5:** Students understand the role of Director and Producer

### **Reporting And Editing**

- CO1:** Students apply the basics of reporting and the qualities of a reporter and the privileges given to reporters.
- CO2:** Students apply the news elements and sources, different formats of news writing and types of lead.
- CO3:** Students understand the different tools of news gathering, interviews, principles of editing and style sheet.
- CO4:** Students apply the principles and techniques of writing headlines and editorials and their types.
- CO5:** Students analyze the importance of newspaper design and layout, page makeup, caption and cutline.

### **Film Studies**

- CO1:** Students understand the history of cinema, evolution of narratives, film language and classic Hollywood narratives, and the discovery of shot.
- CO2:** Students understand about classic and modern Hollywood cinema and Japanese cinema.
- CO3:** Students understand about French new wave, Italian neo-realism and Indian art cinema.
- CO4:** Students apply the film theory and criticism, cinema and storytelling, cinematic codes, cinematography and editing.
- CO5:** Students understand the genre and form of Indian cinema, song and dance sequences, films on social issues and censorship.

### **Digital Film Making**

- CO1:** Students understand different film movements, development of classical Indian and Hollywood cinema and Origin of classical narrative.
- CO2:** Students analyze the aspects and process of pre-production in film making
- CO3:** Students analyze the production process, role of director, understand cinematography and work with sound.
- CO4:** Students apply basic methodology and grammar of editing and use of visual effects
- CO5:** Students understand Film distribution, marketing and the film market

### **Advertising**

- CO1:** Students understand the nature and scope of advertising and its role in society
- CO2:** Students understand the evolution and role of advertising in PR.
- CO3:** Students analyze the advertising in various forms of media
- CO4:** Students apply advertising in the concept of marketing and media planning
- CO5:** Students analyze the various aspects and stages of advertising

### **Media Laws And Ethics**

- CO1:** Students understand the various laws and features of Indian Constitution and its implications in the societal norms.
- CO2:** Students understand the laws related to the Press; rights, liabilities and limitations in Indian context
- CO3:** Students apply the special privileges of Indian Parliament; the rights and legalities in Indian context with regard to the Press.
- CO4:** Students understand the significance of various mass media Acts; its implications to the Press freedom and the legalities associated with it with a Journalistic approach.
- CO5:** Students analyze the legalities with respect to the two Press Commissions in India and its implications on Print and Electronic Media.

### **Development Communication**

- CO1:** Students understand the basis of Development Communication and its importance for the development of the backward societies.
- CO2:** Students understand the socio-economic prospects and decentralization patterns for the betterment of underdeveloped nations through mass Media.



- CO3:** Students analyze the importance of implementing rural development strategies for the community development in Rural India.
- CO4:** Students evaluate the conceptual patterns of Development Support Communication and also to inculcate the Participatory communication process.
- CO5:** Students analyze the ongoing issues of rural origins and it allows implementing the awareness strategies and problem oriented approaches through the usage of Mass media.

### **Mass Media Research**

- CO1:** Students understand the genesis of conducting a Scientific Research in the field of Mass Media.
- CO2:** Students apply the Methodologies of the Scientific Research to conduct their research intending on the specified subject matter.
- CO3:** Students analyze various methods of Qualitative Research in order to find out the research findings of the specific subject matter.
- CO4:** Students analyze various methods of Quantitative Research in order to find out the research findings of the specific subject matter.
- CO5:** Students evaluate various underlying theories of Mass media in order to understand the effects of the desired outcomes of the subjective research outcomes.

### **Media Management**

- CO1:** Students understand the conceptual patterns of mass media organizations and its underlying trends of media management and ownership prospects.
- CO2:** Students apply them to strategically approach in the Print media.
- CO3:** Students analyze a broader picture of the management process of Film Industry and also to understand the transitional shifts in the field of Cinema.
- CO4:** Students evaluate by decoding the changing trends in the Broadcast media.
- CO5:** Students understand the broader perspective on various Government regulatory mechanisms and policies.

### **New Media Studies**

- CO1:** Students understand the conceding factors of Digitalization and its implications.
- CO2:** Students apply the Digital Media Trends as a medium of mass media and also make them understand the utilization of CMC in the various new Media entities.
- CO3:** Students analyze the conceptualized patterns of new media entities and its connection to the real life events.
- CO4:** Students understand the complexities of aspects such as Online Relationships, Virtual and Impersonal complexities of the Digital communication trends.
- CO5:** Students understand the theoretical frameworks and conceptualized patterns of New Media Effects and legalities

### **Online Journalism**

- CO1:** Students understand the Journalistic approaches through new media entities
- CO2:** Students apply the salient features of Online Journalism which helps them to communicate the intended information through the resources available in this field.
- CO3:** Students create the underlying concepts of Participatory communication via multimedia approaches of Online Journalism
- CO4:** Students create and utilize the sources of Online Journalistic approaches through the

means of Social Networking platforms.

**CO5:** Students analyze the laws and ethics of Digital Media Trends.

### **Radio Production**

**CO1:** Students understand the conceptual process of Radio Production.

**CO2:** Students evaluate the complexities of Radio Production as a means of mass communication.

**CO3:** Students create the Radio scripts and other practical implications of the radio production.

**CO4:** Students evaluate the complexities of the Radio Broadcasting in detail.

**CO5:** Students create Radio News Report and also the Radio feature reporting.

### **Public Relations**

**CO1:** Students understand the theoretical knowledge of the conceptual patterns of PR as a tool of mass communication and also apply PR as a Management function.

**CO2:** Students apply the principles of PR as a process of mass communication and also helps them to achieve the interrelationships with the clients.

**CO3:** Students apply the Organizational structure of Public Relations and also to learn about the process of Public Relations under different occasions of marketing.

**CO4:** Students analyze the complexities of Public Relations and its 3 tier systems. They also create the practical knowledge to build the positive relationships with the PR Agencies and clients.

**CO5:** Students create an Event through PR as a tool of management communication and also to engage the intended target audience.

## **B.Sc. Multimedia & Animation**

### **Programme Specific Outcomes:**

**PSO1:** Identify and memorize the concepts of (2d/3d) pipeline for preproduction, production & post production.

**PSO2:** Recognize the principles of visual art& design, advertising, gaming, theatre arts& its elements with illustration, perspective & composition.

**PSO3:** Identify user interface of Autodesk Maya, adobe compositing, web design and ad word.

**PSO4:** Apply the elements of visual language of dots, lines, shapes, forms, contour & texture for preproduction of animation films & game designing concepts.

**PSO5:** Analyse, Distinguish & identify the figurative reading of picturesque relationship among elements like perception, verbalization & creativity.

**PSO6:** Apply the software skills of Maya for the production, compositing and editing for post production of demo reels.

**PSO7:** Develop creative thinking while producing different animation films required for

production houses.

**PSO8:** Develop the behaviour & consequences in media & employee relationships.

### **Indian Heritage and Culture**

**CO1:** This unit makes the student to *understand* better about the origin of ancient Indian culture the contributions of great rulers from both north and south India for Indian culture in ancient days.

**CO2:** Students will *Analyse* how Persian culture entered into India and it influence the Fine Arts of Indian society like Classical Music, Dance and Architecture.

**CO3:** Student is able to *assess* how the Indian orthodox society turn into modern and western society in the 19th century .It also edifies the students with spiritual doctrines of various religions.

**CO4:** Students will *Evaluate* various challenges face by the youth and the evils effects of terrorism on society

**CO5:** The topics in the unit Create belongingness among the students by bringing awareness of the rights and duties to make the world a better place and it throw light on gender sensitization issues of women, Children and LGBT.

### **Principles of Visual Design**

**CO1:** Recognise the principles of Visual Design

**CO2:** Tell the importance of visual language in daily life

**CO3:** Apply, organize, sketch& paint using the elements of visual language of Dots, Lines, and Shapes, Forms, Contour& texture.

**CO4:** Analyse, distinguish identify the figurative reading of picturesque relationship among elements like perception, verbalization& creativity.

**CO5:** Compare visual building by exaggeration, distortion, stylization & abstraction

### **Graphic Designing**

**CO1:** Memorize & recognizes, History, Generations, introduction to Hardware and software.

**CO2:** Analyze & compare raster graphic, vector graphic.

**CO3:** Apply the Photoshop software for editing images, doing 2Danimation.

**CO4:** Students will also be able to understand

**CO5:** Apply the software Illustrator to blend shapes, colors, text & transforming objects.

### **Basic Concepts of Arts**

**CO1:** Describe, define & recognize the Variety of art media & Art careers.

**CO2:** Explain and interrelate the different modes of art.

**CO3:** Describe & memorize the evolution and history of art.

**CO4:** Demonstrating of artist's knowledge, art style and movement.

**CO5:** Judge, criticize Visual Art and compare fine arts and commercial art.

### **Programming Through 'C'**

- CO1:** Memorize & recognize the basic C program, work flow and Compiling a C programme.
- CO2:** Explain the different types of variables, data types, output formats.
- CO3:** Show how conditional statements work.
- CO4:** Analyse Array Basics & functions in C language.
- CO5:** Compose Random numbers, strand fractions, using strings in a programme.

### **Introduction to Animation**

- CO1:** Identify the history of Animation
- CO2:** Compare the Traditional and Computer generated Animation.
- CO3:** Compare in which way the 2D, 3D Animation pipe line works.
- CO4:** Describes the History of Disney & Pixar Animation studios.
- CO5:** Creates advance flip card animation, building models, and lighting.

### **Camera Techniques**

- CO1:** Describe early experiments in photography, history of camera.
- CO2:** Categorize various types of lens & characteristics of lens, focal length etc.
- CO3:** Generalize the importance of light, properties of light & basic lighting techniques.
- CO4:** Explain colour theory, colour psychology, camera angles and movements.
- CO5:** Demonstrate video camera operation.

### **Concept Development**

- CO1:** Identify, list & memorize basic story of idea & organize ideas into concepts.
- CO2:** Explains, differentiates & distinguish about narrative structure & Case study of Animation Films.
- CO3:** Define & explain the Visual elements in concept development.
- CO4:** Demonstrate, distinguish & explain about Illustration, Perspective & Composition.
- CO5:** Define, Classify & explains, the Framing, Movement and Meaning

### **Web Design**

- CO1:** Define & identify the user interface for web design.
- CO2:** Explain basic tags & advanced tags, elements, heading, link forms, images, tables, formats, frame settings etc.
- CO3:** Design front page, layout design, background etc. using Photoshop.
- CO4:** Design banners, animation, twining types, button creation, linking text type's etc. using flash.
- CO5:** Develop the technical skills to create the site with link page, image importing HTML conversion.

### **Creative Arts**

- CO1:** Recognize the principles of Visual Design
- CO2:** Tell the importance of visual language in daily life.
- CO3:** Apply, organize, sketch& paint using the elements of visual language of Dots, Lines, and Shapes, Forms, Contour& texture.
- CO4:** Analyse, distinguish identify the figurative reading of picturesque relationship among elements like perception, verbalization& creativity.
- CO5:** Compare visual building by exaggeration, distortion, stylization & abstraction.

### **Introduction to Maya**

- CO1:** Recognize narrative elements & elements of script format.
- CO2:** Explain the content, plane of discourse, point of View etc.
- CO3:** Identify narrative functions & means of expression on plane of discourse & event.
- CO4:** Differentiate narrative fiction and documentary, narrative approach image and sound.
- CO5:** Appraise the narrative efficiency & richness with the use of metonym & metaphor.

### **Narrative Techniques**

- CO1:** Recognize narrative elements & elements of script format.
- CO2:** Explain the content, plane of discourse, point of View etc.
- CO3:** Identify narrative functions & means of expression on plane of discourse & event.
- CO4:** Differentiate narrative fiction and documentary, narrative approach image and sound.
- CO5:** Appraise the narrative efficiency & richness with the use of metonym & metaphor.

### **Media Education**

- CO1:** Describe Media, new media literacy, media message.
- CO2:** Recognize community, society, democracy and their role in media.
- CO3:** Generalize the thinking about behaviour & consequences in media.
- CO4:** Analyse the thinking about the health issues (tobacco, alcohol & drugs) portrayed by media.
- CO5:** Develop teaching methodologies of project based learning as projected by media.

### **Environmental Studies & Gender Sensitization**

- CO1: Understand** the importance of Environmental education, conservation of natural resources & understand the importance of ecosystems and biodiversity.
- CO2: Understand** the pollution problems and apply the environmental science knowledge on solid waste management, disaster management.
- CO3: Apply** the environmental science knowledge to improve the resources and Evaluate and understand the sustainable environmental conditions and control methods.
- CO4: Identify** the interactions and intersections of identities (e.g., gender, race, ethnicity, class, sexuality, and so on) and assess the ways in which they contribute to instances of privilege and power dynamics across cultures, space, and time. And their problems.
- CO5: Understand** the gender problems and ways of addressing them, including interactions

across local to global scales in communities and overcome inequalities with legislations.

### **Video Editing (Premier & Sound Forge)**

**CO1:** Describe the Historical development of editing.

**CO2:** Explain stages of editing, selection of shots, assembly & fine cut, principles of continuity editing.

**CO3:** Create basic transitions like cut, dissolve, fade in, fade out, and intercut, cross cut, jump cut.

**CO4:** Do the titles and credits using linear, on linear, offline, online editing through final cut pro and avid.

**CO5:** Do the sound editing using nonlinear editing techniques, capturing & importing footage.

### **Visual Aesthetics and Analysis**

**CO1:** Define & describes Visual message and meanings different perceptions of visual messages.

**CO2:** Classify, explain& interpret the Navarrete theories and principles of Art.

**CO3:** Explain & defend the major art movement in India and in the Western countries.

**CO4:** Analyse & compare Signs codes, connotations, image, semiotic, syntagmatic and paradigmatic approach.

**CO5:** Compare, criticize & judge the Gender issues along the Psychoanalytic & Feministic approach.

### **Introduction to Advertising**

**CO1:** Describe evolution of advertising in India & World. Define advertising meaning, objective, need & role.

**CO2:** Classify the different types of advertising media, product, and service, institutional/corporate, PSA, financial, global industrial.

**CO3:** Compare AAI, ASCI, IMRB, ABC, NRS, TRP, Pre-test and post- test methods, digital media, communication technology.

**CO4:** Identify creativity in advertising, needs of research in advertising.

**CO5:** Appraise Copy right Act, National symbols and emblems act, Ambiguous advertising, Vulgarity in advertising, Ethics and Codes of advertising

### **Introduction to Gaming**

**CO1:** Identify History of Gaming industry, introduction to different types of consoles/platforms.

**CO2:** Explain the Design document, types of design document, Game play mechanics, platforms and its limitations.

**CO3:** Differentiate isometric view, side scrolling and open world games, types of game genres.VR, AR and MR.

**CO4:** Interpret Maya LT & Unity 3D basic user interface, role of lighting & VFX for gaming

**CO5:** Explain spine animation, sprite sheet, texture atlas, openGL.

### **Compositing (After Effects)**

- CO1:** Identify user interface for compositing , Views and Previews, Layers and Properties & Animation, Colours, Masks, Transparency and Keying, Text, Drawing and Painting, Motion Tracking, Effects and Animation, Pre-sets, Rendering and Exporting.
- CO2:** Differentiate Image Based Motion Graphics & Video Based Motion Graphics
- CO3:** Create Effects & Title effects.
- CO4:** Do colour correction & Keying after effects tools.
- CO5:** Use Match mover, Motion tracking Overview, Motion Tracking, Workflow and Controls, Rotoscoping , Wire Removal.

### **Digital Advertising**

- CO1:** Identify Digital advertising Fundamentals, Ad Words User Interface, and Strategic flow for Ad activities.
- CO2:** Explain Facebook advertising Fundamentals. Profiles and pages, business categories, getting assets ready. Creating Facebook pages, Page info and settings. Pin post and highlights, Scheduling posts. Facebook events, Reply and messages, Facebook insights reports.
- CO3:** Explain Video Flow, Google Pages for YouTube Channel. Channel ART, Channel Links, Channel Keywords. Branding Watermark.
- CO4:** Produce Videos for YouTube with the knowledge of Camera Angles, Setting up Lightings, Shooting Techniques.Editing Videos, Editing Audio, Background Music.White Board Animation, Publishing HD Videos
- CO5:** Creating Animated Contents, Designing Image Ads.Creating Animated Ads, Examples on Animated Ads, Creating Video Ads.Hi-Jack Competitor's Video Audience Practical Examples.

### **Corporate Communication**

- CO1:** Describe Concept, Definition, Nature, Scope Functions of PR Role of PR, Historical perspective of PR, Corporate Communication and Publicity, Propaganda, Advertising and Lobbying.
- CO2:** Explain Corporate Communication Publics; Internal and External, Corporate communication Process; Four stages of Corporate Communication Corporate Communication Consultancy and Counselling.
- CO3:** Explain Tools of Corporate Communication; House Journals, Press Release, Press Conference, Planned Tours, Brochures, Posters, Open House Exhibitions, Audio-visual Aid, TV, Film, Radio, Video and Demonstrations
- CO4:** Apply Corporate Communication and Management, Employee Relations, Financial Relations, Consumer Relations Media Relations, Corporate Communication in Crisis Management, Case Studies
- CO5:** Evaluate Corporate Communication Programs, Event Management Process & Techniques, Broadcasting; Genesis and Growth of media units in Central Govt. Corporate Communication Research.

### **Digital Painting**

- CO1:** Describe Digital painting. Photoshop Basics with Workspace using Photoshop and Photoshop Vector Tools.
- CO2:** Explain Role of colour in digital painting and colour theory. Create an original vehicle concept Drawing utilizing the techniques learned in the previous exercises
- CO3:** Explain Advanced Painting Techniques. Creating the illusion of volume and space with light and shadow.
- CO4:** Paint Digitally a Fantasy or Science Fiction City in Perspective.
- CO5:** Explain blend & shading. Layers, touch up, detail, blending, filters. Custom Brushes for Rock, Metal, Stone Textures, Trees, leaves and Branches.

### **Production Management**

- CO1:** Explain, express demonstrate the work flow in 2D/3D production houses.
- CO2:** Shows & interrelate the basic preparation for modelling demo reel.
- CO3:** Plan how to make a scene for animation.
- CO4:** Plan how to combine hardware particles for a scene.
- CO5:** Formulate Dynamic related visual Effects.

### **Theatre Arts**

- CO1:** Identify Origin and development of Indian Theatre, Theatre Arts, the Elements of Theatre, and History of Theatre Arts & Theatre for personality development.
- CO2:** Explain Folk Art Working on Body, Mind, Voice, Improvisation and imagination.
- CO3:** Apply Theatre design - Direction, Stage Mgt & Sets and Props Costumes, Light and Sound, Backstage, theme, Creating a framework and script, designing Stage management, Budgeting and Marketing.
- CO4:** Create masks for stock characters. Costumes and make-up, stop motion, puppetry, Incorporating dialogue and acting.
- CO5:** Analyse play, Production Design and Art Direction Story, Plot and Themes, Symbols, Character Development.

### **Department of Psychology, English, Journalism**

- PSO1:** Understand the nature and basic concepts of Psychology, English literature, and Journalism and express them effectively in writing and speech.
- PSO2:** Analyse the relationship between individual and society, and the various ways individuals respond to socio-political-religious and economic factors.
- PSO3:** Think critically about arguments and texts while taking into account diverse interpretations from different subject positions and acquire the ability to act in a socially responsible, ethical and humane way, grooming themselves towards effective citizenship.
- PSO4:** Apply the theories of Psychology, English Literature, and Journalism in conducting investigations on complex problems concerning the human being, his behaviour and



existence in society.

### **English-I**

**CO1:** Identify the various roles of editors in a newspaper agency.

**CO2:** Identify and apply the various techniques of good news writing.

**CO3:** Identify and apply the rules of word usage through specific examples.

**CO4:** Judge the importance of chronology in a news story.

**CO5:** Compose better introductions.

### **Introduction to Psychology I**

**CO1:** Understand various historical and modern perspectives of Psychology.

**CO2:** Explain the biological foundations of human behaviour.

**CO3:** Analyze the mechanisms of human sensation and perception.

**CO4:** Explain the principles of learning

**CO5:** Classify the various types of memory

### **Introduction to English Language and Literature**

**CO1:** Identify characteristic features and causes of growth of the English language

**CO2:** Appraise the historical and literary aspects of the Age of Chaucer and Shakespeare

**CO3:** Point out the literary contributions of Chaucer and Shakespeare in the context of the Middle English age and the Elizabethan Age respectively.

**CO4:** Appraise the historical and literary aspects of the Puritan, Restoration and Augustan ages.

**CO5:** Appraise historical and literary aspects of the Pre-Romantic, Romantic, Victorian and Modern ages.

### **Introduction to Communication and Journalism**

**CO1:** Understand and analyze the role of communication and various models of communication.

**CO2:** Understand the concept of mass communication and the history of mass media in India and compare different forms of mass media

**CO3:** Discuss and differentiate the types of contemporary Newspapers and magazines in English and Telugu.

**CO4:** Learn and Differentiate Types of Newspapers and Magazines

**CO5:** Appraise and understand the ethics of Journalism.

### **English II**

**CO1:** Identify the structure of a news story.

**CO2:** Classify background to news stories as background for interest and background for intelligibility and compare the two kinds of background.

**CO3:** Identify the features of news features editing.

**CO4:** Analyse the various techniques of editing and rewriting a news story.

CO5: Apply the principles of editing on various news stories.

### **Textual Taxonomy of the Literary Genre**

CO1: Interpret the basic poetic terms, forms, devices.

CO2: Analyse the purposes of and gauge appropriate responses to rhetorical tools.

CO3: Apply the basics of dramatic art, primary types of drama and dramatic devices.

CO4: Analyse the different types of essays and novels.

CO5: Survey genres of the short story, the biography and the autobiography.

### **Introduction to Psychology II**

CO1: Analyze the fundamental processes underlying human behavior such as thinking, intelligence

CO2: Understand the basic theories of human motivation and emotion.

CO3: Apply the principles of psychological testing.

CO4: Evaluate various theories of human personality.

CO5: Understand altered states of human consciousness.

### **Middle English and Elizabethan Age**

CO1: Identify the socio-political features of the Middle English age through literary study.

CO2: Identify and analyse literary, social, cultural and historical contexts through a study of Chaucer's 'The Canterbury Tales.'

CO3: Identify and analyse literary, social, cultural and historical contexts through a study of Marlowe's 'Dr. Faustus.'

CO4: Identify and analyse literary, social, cultural and historical contexts through a study of Shakespeare's selected sonnets and his dramatic comedy.

CO5: Identify and analyse literary, social, cultural and historical contexts through a study of Bacon's selected essays.

### **Introduction to Socio Political India**

CO1: Understand the concept of Indian society and analyse the socio-cultural changes in contemporary India.

CO2: Analyse the constitutional rights, duties and the structure of Indian Government.

CO3: Identify various marginalized groups in India and to assess various beneficial policies implemented by the government.

CO4: Understand the concept and types of human rights and subdivide the role of UN and other NGO's in preserving them.

CO5: Identify and analyse various social, cultural and economic impacts of Globalization on the Indian society.

### **Communication Skills/ Career Skills/ Psychology for Living**

CO1: Understand the relevance of psychology in everyday life.

CO2: Explain the importance of self and relationships in one's life.

CO3: Identify various types of disintegrative experiences in daily life.

**CO4:** Appraise upon the mechanisms of growth and self actualization.

**CO5:** Evaluate the importance of recognizing and managing emotions in oneself and others.

### **Enhancing Psychological Competencies**

**CO1:** Understand the importance and the need to enhance psychological competencies

**CO2:** Analyze the mechanisms of hope, optimism, resilience and subjective well being

**CO3:** Explain the workings of anxiety, depression, stress and coping methods in everyday life.

**CO4:** Explain the meaning and nature of emotions.

**CO5:** Evaluate the meaning and nature of pro-social behavior

### **Statistics in Psychology**

**CO1:** Explain various methods of data representation

**CO2:** Analyze the measures of central tendency

**CO3:** Understand the concept of normal distribution curve.

**CO4:** Explain the significance of mean.

**CO5:** Identify various types of correlation methods.

### **Age of Milton, Dryden and Pope**

**CO1:** Identify the poetic characteristics of Milton and Dryden and situate them in the literary scenes of the Puritan and Restoration ages respectively.

**CO2:** Distinguish the poetic features unique to Metaphysical poetry and understand its unique place in the literature of its time.

**CO3:** Show Donne, Marvel and Herbert's place in the universe of Metaphysical poetry and assess their contributions as metaphysical poets through a study of select poems.

**CO4:** Identify and analyse literary, social, cultural and historical contexts of Pre-Romantic poetry through a study of Gray's elegy.

**CO5:** Identify and analyse literary, social, cultural and historical contexts of the Augustan age through a study of Pope's mock epic.

### **Newspaper Management**

**CO1:** Identify and discuss various ownership patterns of mass media in India.

**CO2:** Discuss the organizational structure and Categorise the functions of various departments in a Newspaper organization.

**CO3:** Appraise the role of various Apex bodies in media sector.

**CO4:** Assess and criticize the various press laws and acts in India

**CO5:** Distinguish and understand the problems of small newspapers and large newspaper organization.

### **Enhancing Psychological Competencies- II**

**CO1:** Understand the importance of psychological competencies.

**CO2:** Apply the mechanisms of mindfulness.

**CO3:** Analyze the benefits of critical thinking, reasoning and logic.

**CO4:** Identify the reasons for enhancing psychological competencies.

**CO5:** Appraise the psychological challenges in contemporary life.

### **Personality Theories and assessment**

- CO1: Understand the various factors influencing personality
- CO2: Analyze major theoretical perspectives of personality.
- CO3: Explain the trait and type theories of personality.
- CO4: Apply various methods of personality assessment
- CO5: Classify various types of psychological tests.

### **The Victorian Age**

- CO1: To classify the writers and their writings with relevance to their genres and to create a sound understanding on the background to the age.
- CO2: To sketch the functioning of the age with specific reference to the literary genre *Drama*
- CO3: To demonstrate their reading skills in the literary genre of the *Novel* and further be able to visualize and relate to the happenings in the age through the fiction.
- CO4: To analyze and interpret the thought, complexities and poetical devices integrated in the literary genre *Poetry*.
- CO5: To criticize the literary texts having an orientation to the critical perspectives functional in the Victorian era.

### **New Literatures in English**

- CO1: Recognize the basic concepts and features of colonial and post-colonial literature and apply related literary terms.
- CO2: Compare diverse post-colonial angles through the poetry of Angelou, Hope and Ramanujan.
- CO3: Analyze the importance of Chinua Achebe as a post-colonial novelist through a study of 'Things Fall Apart.'
- CO4: Praise the importance of Wole Soyinka as a post-colonial dramatist through a study of 'The Lion and The Jewel.'
- CO5: Compare diverse post-colonial angles through the short stories of Gabriel Marquez and Patrick White and the essays of Emerson and Walker.

### **History of Indian Press**

- CO1: Understand the evolution, appraise various roles of press. Understand the history and origins of Press and Point out the role of journalists in the Indian freedom movement.
- CO2: Identify the origin and development of regional press selecting various contemporary newspapers.
- CO3: Identify the origin and development of regional press selecting various contemporary newspapers.
- CO5: Understand and criticize the impact of globalization and corporatization on Indian press

### **Reporting and Editing**

- CO1: Understand the concept of reporting and survey various privileges and duties of a reporter.
- CO2: Assess and Interpret the elements, structure and the types of News.

**CO3:** Discuss and Judge the techniques of reporting and art of editing.

**CO4:** Identify the types of headlines and the functions of editorial.

**CO5:** Analyse the layout of the newspaper with emphasis on picture editing and page makeup.

### **Organizational Behavior/Health Psychology Advertising/Online Journalism**

**CO1:** Understand the concept and challenges of Organisational behaviour

**CO2:** Explain various methods of personnel selection

**CO3:** Identify various factors influencing productivity and job satisfaction.

**CO4:** Analyze the effects of noise and fatigue in the physical environment.

**CO5:** Evaluate various techniques of stress management.

### **Advertising/Online Journalism**

**CO1:** Discuss and construct the overview of online journalism around the world.

**CO2:** Identify the various tools of online journalism.

**CO3:** Assess the concepts of citizen and participatory journalism.

**CO4:** Analyse the role of new media and social networks.

**CO5:** Understand and appraise the security and ethical challenges in online journalism.

### **Specialized Reporting**

**CO1:** Understand and Judge the role of media in reporting crime.

**CO2:** Describe the principles of Political reporting and media's role in shaping public opinion.

**CO3:** Understand and Analyze national politics and Indian judicial system.

**CO4:** Analyse the techniques of sports reporting.

**CO5:** Understand fashion journalism and appraise working in fashion journalism

### **Abnormal Psychology**

**CO1:** Classify various forms of abnormal behaviour.

**CO2:** Explain various types of anxiety and somatoform disorders

**CO3:** Identify various types of mood disorders.

**CO4:** Analyze the characteristics of various types of personality disorders.

**CO5:** Understand the various types of therapies in psychology

### **Romantic Age**

**CO1:** Compare the socio-political features of the Romantic Age with the previous age through the ideological differences.

**CO2:** Assess the environmental ethics of Coleridge's The Rime of the Ancient Mariner. Analyse ideological, social, cultural and historical contexts through a study of poetry of Shelley and Keats.

**CO3:** Illustrate the social issues of the age with reference to 'The Chimney Sweepers.'

**CO5:** Identify the construction of gender and the ideological assumptions of the Regency Period through a study of Austen's 'Pride and Prejudice.'

### **Indian Writing in English**

- CO1:** Identify Indian Writing in English as a distinct approach to English literature from the Indian perspective.
- CO2:** Recognise and analyse Indian English writing themes, historical background, major writers of fiction, Non-Fiction, Poetry and Drama.
- CO3:** Identify and analyse literary, social, cultural and historical contexts through a study of Narayan's 'The Guide.'
- CO4:** Analyse literary, social, cultural and historical contexts through a study of selected Indian English short stories.
- CO5:** Analyse selected Indian English poems by representative writers to form an understanding of literary, social, cultural and historical contexts.

### **American Literature/Popular Literature**

- CO1:** Appraise the scope of popular literature in literary studies and analyse the main genres of Popular literature.
- CO2:** Distinguish folk literature as a distinct genre of literary studies and compare its different forms.
- CO3:** Classify Horror, detective fiction and thriller as distinct genres of popular literature.
- CO4:** Identify the basic concepts of science fiction as a literary genre through a study of two representative texts.
- CO5:** Differentiate between comics and graphic novels and analyse their literary features.

### **Public Relations & Corporate Communication/Editorial Writing**

- CO1:** Definition PR and Analyze various functions and types of Public relations in an organization
- CO2:** Analyze the Role of PR in Mass media and Understand Four Key stages of PR
- CO3:** Learn and categorize Public Relation tools and understand Anticipatory PR – Crisis management –Image management - event management
- CO4:** Discuss Media relations and infer coordination with media
- CO5:** Introduction to E- Communication and Categorize E- Journals, Websites, Intranet, Blogs and Web-based Media

### **Social Psychology**

- CO1:** Understand the methods of Social Psychology.
- CO2:** Explain various theories of attribution.
- CO3:** Evaluate various theories of attitude formation.
- CO4:** Understand the nature and various factors influencing pro-social behaviour.
- CO5:** Explain the determinants of human aggression.

### **Developmental Psychology**

- CO1:** Understand the concept of human development.
- CO2:** Explain the processes of change occurring during stage of prenatal development and infancy.
- CO3:** Evaluate various aspects of biological and psychosocial development in childhood.
- CO4:** Analyse various biological and psychological changes occurring during adolescence.

**CO5:** Identify the role of family, peers and community in influencing development in various stages of adulthood.

### **Literature of Modern Age**

**CO1:** Appraise the contribution of representative Modern English poets through a study of their selected poems.

**CO2:** Analyse the features of Modern English essays through a study of Woolf's and Gardiner's essays.

**CO3:** Appraise the contribution of E M Forster as a modern novelist with reference to his novel 'A Passage to India.'

**CO4:** Identify and analyse the features of Modernist short stories through a study of selected short stories.

**CO5:** Identify issues of class and language in Shaw's 'Pygmalion.'

### **B.Com Honours Strategic Finance**

#### **Sem 1**

#### **Business English – I**

**CO1.** Students will be able to identify elements, forms and style of letters and will be able to create quotations related to inviting, sending and placing orders.

**CO2.** Students will be able to identify qualities and functions of a Sales Letter in order to enable them use the format of a Sales Letter.

**CO3.** To understand and write the functions, structure and types of memorandum and design a notice, agenda and minutes.

**CO4.** To demonstrate the guidelines for answering and making effective telephone calls in order to enable understand and implement Note making.

**CO5.** To have a better understanding of scanning and proof-reading incomprehension.

### **Fundamentals of Business Mathematics**

**CO 1.** To solve linear equations.

**CO 2.** To get solutions of real-life problems by using logarithms and set theory.

**CO 3.** To solve the problems in business line like banking sector.

**CO 4.** To get maximum profit and minimum loss in company productivity.

**CO 5.** To measure areas & volumes

### **Fundamentals of Information Technology**

**CO1.** Understand basic computer terminology and number system.

**CO2.** Explain about operating systems, and its types.

**CO3.** Identify different applications of Information technology.

**CO4.** Classify phases of Software Development Life Cycle

**CO5.** Categorize modern means of communication, types of networks and topologies.

### **Financial Accounting - I**

**CO1.** Describes the need and importance of accounting.

**CO2.** Explains about subdivision of journal

**CO3.** Compares the cashbook and passbook balances to reconcile the difference.

**CO4.** Analyses the financial position of an organization

**CO5.** Identifies the mistakes in books of accounts and helps in correcting them.

### **Financial Planning and Performance**

**CO1.** To understand strategic planning and budgeting and recall the models with process.

**CO2.** To classify forecasting techniques and demonstrate the budget.

**CO3.** To prepare an annual profit plan.

**CO4.** To analyse performance measures by using flexible budgets and compare actual results to planned results.

**CO5.** To propose performance measure and discuss key performance indicators.

## **SEM II**

### **Business English II**

**CO1.** Students will be able to synthesize the theoretical knowledge of business communication through report writing and letter writing.

**CO2.** Students will be able to identify the elements of Claim and Adjustment letters.

**CO3.** Students will also be able to draft claim letters and adjustment letters.

**CO4.** They will be able to identify nature and types of credit letters.

**CO5.** Students will be able to recognise tone and style of Collection Letters.

**CO6.** Students will comprehend the general guidelines to write application letters and resumes.

### **Value Education And Personality Development**



**CO1.** Students will be able to identify Accepted norms and Counter values and will be able to differentiate the various Dimensions of Human Development.

**CO2.** Students will be able to demonstrate Love and Experience of God.

**CO3.** They will be able to identify the Basic Issues of Life and Happiness as a life goal.

**CO4.** They will be able to understand the importance of Concern for others and critique the various problems that deter the growth of the society.

**CO5.** The students will be able to recognize the traits of a good personality and they will be able to identify their personality by Self-Exploration

**CO6.** Students will be able to interpret the Purpose of Life and Goal Setting

### **Managerial Economics**

**CO-1** To define managerial economics and to describe the economic concepts, tools, and practices used in managerial economics.

**CO-2** To explain demand analysis and to apply demand forecasting methods based on nature of product.

**CO-3** To analyse input-output relation in different time periods.

**CO-4** To identify and distinguish different market structure in price – output decision.

**CO-5** To compare different pricing strategies.

### **Financial Accounting – II**

**CO1.** Introduces to the basic concepts of partnership and explains the admission of a partner.

**CO2.** Demonstrates the accounting treatment relating to retirement and death of a partner.

**CO3.** Identifies the rules applicable for winding up of partnership and insolvency of a partner.

**CO4.** Shows the method of finding out profits and financial position by using incomplete records.

**CO5.** Illustrates method of preparing books under Hire purchase and instalment purchase system.

### **Financial control**

**CO-1** To define cost behaviour and types of costs.

**CO-2** To classify costing systems and compare different types of costs.

**CO-3** To solve problems in supply chain management.

**CO-4** To criticize and conclude the basis of internal auditing.

**CO-5** To develop and create a business continuity plan.

### **Fundamentals of Business Statistics**

**CO1:** Organize, manage and present data. Can represent the statistical data in diagrammatic and graphical form.

**CO2:** Calculate measures of central tendency.

**CO3:** Analyse the data using measures of dispersion.

**CO4:** Evaluate the nature for the statistical data using skewness and moments.

**CO5:** Determine the relation between any two factors using the concepts of correlation and regression analysis.

### **SEM III**

#### **Advanced Statistics**

**CO1:** Derive the probability mass and density functions of random variables and then to calculate mean and variance.

**CO2:** Identify the characteristics of different discrete distributions like binomial, poisson and negative binomial distributions.

**CO3:** Able to perform and analyse hypothesis tests of means, proportions and variances using both one-and two-sample data sets.

**CO4:** Able to apply the appropriate chi-squared test for independence and goodness of fit.

**CO5:** Demonstrate understanding of the concepts of time series and its applications in different areas.

### **Ecommerce**

**CO1.** To measure areas and Volumes describe electronic commerce framework and WWW architecture.

**CO2.** Classify mercantile process models and types of electronic payment system.

**CO3.** Apply EDI implementations and analyse intra organisational electronic commerce.

**CO4.** Design corporate digital library, advertising and marketing on the internet.

**CO5.** Identify consumer search and resource discovery, on demand education and digital copy rights.

### **Financial Reporting**

**CO1.** Students will be able to prepare financial statements according to US GAAP and IFRS.

**CO2.** Students will be able to appropriately account and report assets and liabilities.

**CO3.** Students will be able to develop conceptual understanding on equity transactions.

**CO4.** Students will be able to recognize revenue recognition principles.

**CO5.** Students will be able to analyse reports on financial statements.

### **Direct Taxes**

- CO1:** To understand the basic definitions of income tax, agricultural income, residential status and exempted incomes.
- CO2:** To show the computation of income from the head salaries and house property as per it act.
- CO3:** To identify the income from business, profession and capital gains.
- CO4:** To compute total income of individuals and HUF.
- CO5:** To assess the tax liability of individuals and HUF as per IT act.

### **Financial Decision Making**

- CO1.** Students will be able to understand a Common size financial statement and recall and relate the financial ratios.
- CO2.** Students will be able to identify the relationship between risk and return and utilize the knowledge of long-term financial management.
- CO3.** Students will be able to examine financial markets and regulations and analyse working capital management.
- CO4.** Students will be able to explain mergers and acquisitions, bankruptcy.
- CO5.** Students will be able to analyse corporate restructuring.

## **SEM IV**

### **Economic Environment of Business**

- CO1:** To describe changing dimensions of business environment.
- CO2:** Select key macroeconomic indicators and differentiate between economic growth and development.
- CO3:** To analyse problems and policies of Indian industries.
- CO4:** To compare merits and demerits of foreign capital in Indian economy.
- CO5:** To combine various business regulations for effective corporate governance.

### **Corporate Accounting**

- CO1:** To understand the various types of capital structures of the company and their representation in the balance sheet, preparation of financial statements with profits before incorporation.
- CO2:** Explains the valuation of shares and goodwill.
- CO3:** Analyses amalgamation in the nature of merger and purchase and accounting treatment for internal reconstruction.
- CO4:** Demonstrates the accounting systems of a banking company under the guidance of RBI.
- CO5:** Helps to prepare insurance accounts as per IRDAI guidelines.

### **Principles of Management**

- CO1:** To identify and interpret the various principles and importance of management
- CO2:** To explain and demonstrate the uses of planning and organizing
- CO3:** To classify and combine the various techniques of control and coordination.
- CO4:** To point out and develop the essence of motivation and direction to the students

**CO5:** To interrelate and understand the essence of leadership and the importance of Communication

### **Financial Decision Making II**

**CO1.** Student will be able to define marginal, sunk and opportunity costs and recall cost volume profit analysis.

**CO2.** Student will be able to demonstrate understanding of pricing methodologies.

**CO3.** Student will be able to identify a system of investment decision and develop stage of capital budgeting.

**CO4** Student will be able to demonstrate understanding enterprise risk management.

**CO5.** Student will be able to understand the importance of ethics for management accounting and financial management professional.

### **Research Methodology**

**CO1:** To understand and interpret the basic meaning of research, to define the research problem at hand and construct the procedure for undertaking research.

**CO2:** To formulate hypothesis and develop an appropriate research design.

**CO3:** To classify the different sources of data and analyse the various methods of data collection.

**CO4:** To develop the most appropriate sample size and design as well as determination of sampling and non-sampling errors.

**CO5:** To classify the various types of attitude measurement scales and applies the principles and format of report writing and presentation.

## **B.COM - BUSINESS PROCESS MANAGEMENT FIRST YEAR- SEMESTER-I**

### **Financial Accounting - I**

**CO1:** Describes the need and importance of accounting.

**CO2:** Explains about subdivision of journal

**CO3:** Compares the cashbook and passbook balances to reconcile the difference.

**CO4:** Analyses the financial position of an organization

**CO5:** Identifies the mistakes in books of accounts and helps in correcting them.

### **Principles of Management**

**CO1:** To identify and interpret the various principles and importance of management

**CO2:** To explain and demonstrate the uses of planning and organizing

**CO3:** To classify and combine the various techniques of control and coordination.

**CO4:** To point out and develop the essence of motivation and direction to the students

**CO5:** To interrelate and understand the essence of leadership and the importance of communication

### **Fundamentals of Business Statistics**

- CO1:** Organize, manage and present data. Can represent the statistical data in diagrammatic and graphical form.
- CO2:** Calculate measures of central tendency.
- CO3:** Analyse the data using measures of dispersion.
- CO4:** Evaluate the nature for the statistical data using skewness and moments.
- CO5:** Determine the relation between any two factors using the concepts of correlation and regression analysis.

### **Business Economics**

- CO1.** Understand the basic terms and concepts used in the Business economics.
- CO2.** Appraise the behavior of consumers through the demand and indifference analysis
- CO3.** Interpret the behavior of producer through supply, production and other related concepts
- CO4.** Differentiate the market forms and the price and output determination under each type of market.
- CO5.** Infer the impact of the different phase of business cycle and impact of deficit balance of payment.

### **FIRST YEAR- SEMESTER-II**

#### **Financial Accounting – II**

- CO1:** Introduces To The basic concepts of partnership and explains the admission of a partner.
- CO2:** Demonstrates the accounting treatment relating to retirement and death of a partner.
- CO3:** Identifies the rules applicable for winding up of partnership and insolvency of a partner.
- CO4:** Shows the method of finding out profits and financial position by using incomplete records.
- CO5:** Illustrates method of preparing books under hire purchase and instalment purchase system

#### **Managerial Economics**

- CO1.** Understand the basic terms and concepts used in the Managerial economics.
- CO2.** Interpret the behavior of producer through cost and revenue concepts in different time perspective.
- CO3.** Differentiate the various Pricing strategies and the various degrees of Price discrimination.
- CO4.** Evaluate the various Capital Budgeting decision and the methods.
- CO5.** Infer the impact of the macro economic factors on the business concerns

#### **Fundamentals of Business Mathematics**

- CO1:** To solve linear equations.
- CO2:** To get solutions of real life problems by using logarithms and set theory.
- CO3:** To solve the problems in business line like banking sector.
- CO4:** To get maximum profit and minimum loss in company productivity.
- CO5:** To measure areas & volumes

## **Fundamentals of Information Technology**

- CO 1.** Understand basic computer terminology and number systems.
- CO 2.** Explain about operating systems, and its types
- CO 3.** Identify different applications of Information technology.
- CO 4.** Classify phases of Software Development Life Cycle
- CO 5.** Categorize modern means of communications, types of networks and topologies

## **SECOND YEAR- SEMESTER-III**

### **Direct Taxes**

- CO1:** To understand the basic definitions of income tax, agricultural income, residential status and exempted incomes.
- CO2:** To show the computation of income from the head salaries and house property as per it ACT.
- CO3:** To identify the income from business, profession and capital gains.
- CO4:** To compute total income of individuals and HUF.
- CO5:** To assess the tax liability of individuals and HUF as per it act.

### **Business Law**

- CO1:** Demonstrate an understanding of the legal environment of the business.
- CO2:** Explains legality of object and consideration, discharge of a contract and remedies available.
- CO3:** Identify the recognition of transactions involving the sales of goods act.
- CO4:** Dramatize the application of consumer protection act.
- CO5:** To recognize intellectual property rights and introduction to it act 2000 and right to information act.

### **Advanced Accounting**

- CO1.** States various methods for preparing branch accounts.
- CO2.** Describes the allocation and interdepartmental transfer of expenses.
- CO3.** Analyses the financial position of non-trading concerns.
- CO4.** Evaluate the different situation of capital issue to public issue of shares at par, premium and forfeiture.
- CO5.** Explains about sources of funds through issue of debentures and various methods of redemption.

### **Banking Theory**

- CO 1.** To Understand the General Overview of Banking and Retail Banking
- CO 2.** To Analyze about the Cards overview and types
- CO 3.** Explain about the Consumer Loans and Mortgages
- CO 4.** Interpret Cash Management and Payment Services

**CO 5** Evaluate the Trade Finance, Collections, payments, Guarantees & settlements and value added services

## **Retail Environment And Market Research**

**CO1:** To understand and interpret the basic meaning of Marketing Research, and Consumer Behaviour

**CO2:** To classify the different segmentation and analyze the overview of retailing.

**CO3:** To critically evaluate the application of Marketing Mix and Consumer Research

**CO4:** To explain and Differentiate Product Management, Brand management & media management

**CO5:** To critically evaluate the application of Consumer Research, Retail Research & Media Research

## **SECOND YEAR- SEMESTER-IV**

### **Corporate Accounting**

**CO1:** To understand the various types of capital structures of the company and their representation in the balance sheet, preparation of financial statements with profits before incorporation.

**CO2:** Explains the valuation of shares and goodwill.

**CO3:** Analyses amalgamation in the nature of merger and purchase and accounting treatment for internal reconstruction.

**CO4:** Demonstrates the accounting systems of a banking company under the guidance of rbi.

**CO5:** Helps to prepare insurance accounts as per IRDAI guidelines.

### **Company Law**

**CO1:** To develop basic knowledge of provisions of companies act 2013.

**CO2:** To describe the capital structure of company through issues of shares and alteration of share capital.

**CO3:** Explain the borrowing powers of a company and consequences of ultra vires borrowing.

**CO4:** State various provisions of the companies act relating to company management and meetings.

**CO5:** To identify various modes of winding up and legal provisions applicable.

### **Indirect Taxes**

**CO1:** To describe basic scheme of GST, GST council power and functions.

**CO2:** To explain various GST acts and also various definitions

**CO3:** To identify the registration procedure, levying of GST and exemptions

**CO4:** To analyse different types of assessments and returns under GST

**CO5:** To appraise the exemption procedure as per customs legislations in India.

### **Principles of Insurance**

- CO1:** To Explain Overview of Insurance and types
- CO2:** Demonstrate of Life Insurance & Annuity
- CO3:** Evaluate and understand the Property & Casualty Insurance
- CO4:** To Explain about Healthcare Insurance
- CO5:** To critically evaluate the application of the Retirement Services

### **Costing Accounting**

- CO1:** To understand importance of cost accounting in organization.
- CO2:** To describe the principles of managing inventories of materials and the procedures for accounting inventory.
- CO3:** To describe the principles and practice of costing labour to a business.
- CO4:** To describe the principles and process of overhead cost analysis.
- CO5:** To apply the operation of process costing methods.

### **Capital Markets**

- CO 1.** To Understand Capital Markets and Types of Securities
- CO 2.** To explain about the Financial Markets
- CO 3.** To Describes Investment Banking
- CO 4.** To Explain Funds and kinds of funds
- CO 5.** To understand Private Equity, Credit Risk and Market Risk Management



## **Master of Computer Applications (MCA)**

### **Program Outcomes**

- PO1: Engineering knowledge:** Apply the knowledge of mathematics, computer science, various programming languages, databases and operating system to develop a software system.
- PO2: Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems to reach substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3: Design/development of solutions:** Design solutions for complex engineering problems and System components or processes that meet the specified needs of public health and safety.
- PO4: Continuous learning:** Recognize the needs and improves the ability to engage in independent and life-long learning as trends changes in technology.

### **Programme Specific Outcomes:**

- PSO1:** To consolidate foundation of mathematics, computer science and problem solving methodology for effective implementation in the area of software development. To inculcate advance knowledge about various sub-domains of computer science and applications.
- PSO2:** To prepare graduates to achieve peer-recognition, as an individual and in a team, through demonstration of good analytical, design and implementation skills.
- PSO3:** To improve the ability to test and analyze the qualities of various subsystems and to integrate them together to evolve a larger and better computing system, that includes the concept of mathematics, computer engineering and related disciplines to meet the user objective .

### **Probability and Statistics**

- CO1:** Classifying data and choose graphical representation
- CO2:** Explanation of descriptive measures
- CO3:** Evaluation of correlation, regression and testing.
- CO4:** Application of probability and distributions
- CO5:** Identification of data and applying specific distributions.

### **Discrete Mathematics**

- CO1:** Define Statements, connectives, how to apply connectives, working with sets, and subsets and represent them in Venn diagrams
- CO2:** Explains about relations, ordering, functions, lattices and Boolean algebra illustrating with examples.
- CO3:** Explains about algebraic structures and groups by applying various theorems and solving for an appropriate result.
- CO4:** Explains about algebraic structures and groups by applying various theorems and solving for an appropriate result.
- CO5:** Constructs graphs, trees and planar graphs.

### **Computer Programming and Problem Solving Using C**

- CO1:** Understand the basic introduction of programming language, algorithms, flowcharts and Identify 'C' data types, operators and data input /output functions.
- CO2:** Understand 'C' control structures, arrays and its applications.
- CO3:** Explain 'Functions, Recursion and string concept.
- CO4:** Demonstrate 'C' Pointers, recursion and dynamic memory allocation.
- CO5:** Express the concept of structures, union and file handling in 'C'.

### **Computer Architecture**

- CO1:** Demonstrate knowledge of register organization of a basic computer system
- CO2:** Explain machine language of a basic computer system.
- CO3:** Appraise in-depth understanding of control unit organization and micro programmed control.
- CO4:** Apply various algorithms to perform arithmetic operations and propose suitable hardware for them
- CO5:** Analyze and emphasize various communication media in the basic computer system using design of various memory structures

### **Operations Research**

- CO1:** Identifying the methods to solve LPP.
- CO2:** Applying OR to transportation problems.
- CO3:** Applying OR to Assignment problems and IPP.
- CO4:** Creating the network diagrams for Project management problems.
- CO5:** Analyzing the game theory problems.

### **C++ and Data Structures**

- CO1:** Differentiate between object-oriented programming and procedure-oriented programming.
- CO2:** Develop programs using object oriented programming features.
- CO3:** Develop programs using polymorphism.
- CO4:** Understand the linear data structures like linear lists, stacks and queues.
- CO5:** Understand the non-linear data structures like trees, graphs.

### **Operating Systems**

- CO1:** Explain OS structures and process management concepts including scheduling.
- CO2:** Illustrate the concepts of memory management and file system
- CO3:** Analyze various process synchronization problems and deadlocks
- CO4:** Identify the results of disk scheduling algorithms and I/O systems
- CO5:** Describe various operating systems like Windows XP , Linux pertaining with Process , File , I/O management

### **Computer Networks**

- CO1:** Defines Data Communication, components of networks, explains the type of Transmission media and describes the functions of each layer in OSI and TCP/IP model.
- CO2:** Describes the functions of Data link Layer and explains the various protocols.

**CO3:** Classify the routing protocols and analyze how to assign the IP addresses for the given network.

**CO4:** Describe the Transport layer header format and services

**CO5:** Explain the functions of Presentation layer and Application layer

### **Management Information Systems and M-Commerce**

**CO1:** Understand use of information technology and business process in engineering and information technology

**CO2:** Interrelate applications of information technology

**CO3:** Compare various decision making systems

**CO4:** Cover broad range of issues from b2c , b2b and c2c

**CO5:** Expose the awareness of m commerce applications

### **Software Engineering**

**CO1:** Define Software Engineering and how to apply the software engineering lifecycle by demonstrating competence in planning, analysis, design, implementation and maintenance..

**CO2:** Explains about Software Requirement and Specifications (SRS) and classifies the various Software Architectures.

**CO3:** Explains about Software Requirement and Specifications (SRS) and classifies the various Software Architectures.

**CO4:** Analyzes the various programming principles and guidelines and Compares the Testing techniques

**CO5:** Analyzes the various programming principles and guidelines and Compares the Testing techniques

### **Database Management Systems**

**CO1:** Represent logical database using Entity Relationship and Enhanced ER model.

**CO2:** Formulate database using relational algebra and organize relation using normalization

**CO3:** Design SQL queries and implements PL/SQL.

**CO4:** Classify the storage and file structure, storage access, indexing and hashing techniques of the database.

**CO5:** Explain the concept of Transactions, recovery system and concurrency control

### **Design and Analysis of Algorithms**

**CO1:** Define Elementary data structures

**CO2:** Explaining divide and conquer, greedy methods with examples

**CO3:** Explaining dynamic programming and traversals

**CO4:** Explaining back tracking and branch and bound

**CO5:** Analysis of NP-Hard and NP-Complete problems

### **Object Oriented Principles using Java**

**CO1:** Explain the benefits of JAVA's compared to other Programming Language. The student will be able to identify classes, objects, Interfaces. The student will be able to **demonstrate** the concepts of polymorphism and inheritance

**CO2:** Create Java programs to implement error handling techniques using exception handling

and Multi-Threading concepts

**CO3:** Identify usage of collection framework.

**CO4:** Distinguish different Byte Streams and Character Streams.

**CO5:** construct applets and JDBC programs

### **Distributed Systems**

**CO1:** Defines Distributed systems, goals, processes and identifies the advantages and challenges in designing distributed algorithms for different primitives like mutual exclusion, deadlock detection, agreement, etc.

**CO2:** Explains about Name entities and illustrates the various synchronization algorithms

**CO3:** Differentiate between different types of faults and fault handling techniques in order to implement fault tolerant systems.

**CO4:** Compares the various Distributed Object Systems along with their related Case studies.

**CO5:** Constructs the algorithms related to Distributed Shared memory and Distributed Scheduling.

### **Data Warehousing and Data Mining**

**CO1:** To understand the concepts of data mining and its importance and FIM algorithms.

**CO2:** Analyze different classification and clustering methods using algorithms

**CO3:** Explain the data flow and the concepts of warehousing

**CO4:** Express how to build data marts and to learn about dimensional modeling.

**CO5:** Identify concepts of Extraction, Transformation and loading

### **Network Security**

**CO1:** Identify the need for security, classical encryption techniques and acquire fundamental knowledge on Block cipher operations.

**CO2:** Apply Public Key Cryptographic Technique for securing messages

**CO3:** Use an appropriate message authentication codes and Digital signatures

**CO4:** Explain distribution of public keys and Kerberos

**CO5:** Compare SSL ,TLS , electronic mail security and IP security

### **Advanced Java**

**CO1:** Describe different AWT and Swings Classes. Students can design GUI based applications.

**CO2:** Describe different AWT and Swings Classes. Students can design GUI based applications.

**CO3:** Describe different AWT and Swings Classes. Students can design GUI based applications.

**CO4:** Design applications based on MVC architecture using EJB. Student can identify different Enterprise Java Beans

**CO5:** Compare Servlet and JSP features and can design Presentation logic.

### **Web Technologies**

**CO1:** Define css collections and events

**CO2:** Demonstrate XML and AJAX

**CO3:** Explain basics of PHP

**CO4:** Selecting the database connections

**CO5:** Explain Advanced oops concepts with PHP.

### **Software Testing**

- CO1:** Express importance of testing in software development process, glass-box testing, black-box testing, and how to report and analyze bugs
- CO2:** Design different types of test case
- CO3:** Organize how to build testing strategy, establishing software testing methodology and software testing techniques.
- CO4:** Identify the definition of quality, metrics for software quality and inspection techniques.
- CO5:** Explain software configuration management, software reengineering and software restructuring techniques.

### **Big Data Analytics**

- CO1:** Describe different AWT and Swings Classes. Students can design GUI based applications.
- CO2:** Develop web based applications using servlets.
- CO3:** Compare Servlet and JSP features and can design Presentation logic.
- CO4:** Compare Servlet and JSP features and can design Presentation logic.
- CO5:** Compare Servlet and JSP features and can design Presentation logic.

### **Semantic Web and Social Networks**

- CO1:** Defines Distributed systems, goals, processes and identifies the advantages and challenges in designing distributed algorithms for different primitives like mutual exclusion, deadlock detection, agreement, etc.
- CO2:** Explains about Name entities and illustrates the various synchronization algorithms
- CO3:** Differentiate between different types of faults and fault handling techniques in order to implement fault tolerant systems.
- CO4:** Compares the various Distributed Object Systems along with their related Case studies.
- CO5:** Constructs the algorithms related to Distributed Shared memory and Distributed Scheduling.

### **Python & R Programming**

- CO1:** Understand the basic concepts of Python objects and control structures.
- CO2:** Explain Python functions, modulus, packages and exceptions and develop programs using object oriented programming
- CO3:** Demonstrate file handling and database Programming. Apply Python for Data Analytics.
- CO4:** Understand basic concept of R and demonstrate programming concepts and data structures in R.
- CO5:** Choose an appropriate graphic for analysis and analyze data using summary statistics. Choose the type of regression based on data set.

### **Object Oriented System Development**

- CO1:** Describing the basic concepts of modeling.
- CO2:** Explanation of Basic and Advanced Behavioral Modeling
- CO3:** Explanation of Architectural Modeling and creation of UML diagrams

CO4: Applications of UML Unified Software Development Process

CO5: Applications of UML Core workflows.

## **M.Sc Organic Chemistry**

### **Program Specific Outcomes**

- PSO1: Understands, identify and interrelate** with the background of organic reaction mechanisms, complex Stereo chemical structures, molecular rearrangements, instrumental method of chemical analysis and separation techniques
- PSO2: Analyses** the importance of various elements in the periodic table, coordination chemistry and structure of molecules, properties of compounds, and structural determination of complexes using theories.
- PSO3: Gathers attention** about the physical aspects of atomic structure, dual behaviour, reaction pathways with respect to time, various energy transformations, molecular assembly in Nano level, electrochemistry & **infer** their significance
- PSO4: Learns, constructs and analyses** the potential uses of analytical techniques, medicinal chemistry and green chemistry.
- PSO5: Organise** and carry out experiments in the area of organic analysis, estimation, separation, derivative process, preparation, conductometric, potentiometric and solve spectral analysis

### **Inorganic Chemistry-I**

- CO1: Understands** the concept of bonding in metal complexes
- CO2: Interrelates** 3-D structures of molecules with their symmetry elements
- CO3: Categorises** the mechanisms of inorganic complexes
- CO4: Analyses** the stability of the complexes through equilibria
- CO5: Identifies** the ligational aspects of diatomic molecules

### **Organic Chemistry-I**

- CO1: Acquires** the 3-D aspects of organic molecules
- CO2: Understands** and **compares** the organic reaction mechanisms
- CO3: Develops** the fundamentals of reactive intermediates
- CO4: Appreciates** the various steps involved in the molecular rearrangements
- CO5: Perceives** the concept of conformational analysis

### **Physical Chemistry-I**

- CO1: Learns** the classical status of thermodynamics
- CO2: Recognises** the dynamics of electrode reactions
- CO3: Perceives** the postulates of quantum chemistry
- CO4: Analyses** the importance of rates of chemical reactions
- CO5: Gains the potential** on concepts of photochemical reactions

### **Analytical Techniques & Spectroscopy-I**

- CO1: Recognises** the importance of various chromatographic techniques
- CO2: Understands** the magnetic properties of nuclei
- CO3: Analyses** the approach of IR and Raman spectra for structural elucidation

- CO4: **Identifies** the electronic transitions in organic molecules
- CO5: **Gains** knowledge about electronic spin spectroscopy

### **Inorganic Chemistry-II**

- CO1: **Perceives understanding** about terms, term symbols and microstates
- CO2: **Enlightens** the knowledge about higher pointgroups
- CO3: **Analyses** the reaction pathways of complex formation
- CO4: **Learn** the structural patterns of metal clusters
- CO5: **Validate** the role of bioinorganic chemistry in everyday life

### **Organic Chemistry-II**

- CO1: **Develops** an understanding about organic reaction mechanisms
- CO2: **Appreciates** the fundamentals of pericyclic reactions
- CO3: **Apply** the theories of pericyclics to molecular reactions
- CO4: **Understands** the importance of photochemistry
- CO5: **Gains** the **potential** of organic reagents

### **Physical Chemistry-II**

- CO1: **Appreciates** the fundamentals of molecular thermodynamics
- CO2: **Recognises** the various electrochemical reactions
- CO3: **Applies** the wave mechanics for determining atomic structures
- CO4: **Understands** the importance of quantitative mechanics in electronic filling
- CO5: **Visualises** the macromolecular structures

### **Analytical Techniques & Spectroscopy-II**

- CO1: **Summarises** the concepts of hyphenated techniques
- CO2: **Distinguish** and identify first and non-first NMR spectra
- CO3: **Gain knowledge** about mass spectrometry
- CO4: **Analyse** the chemical structure using mass fragmentation
- CO5: **Validates** the structure of molecular ions through PES

### **Organic Chemistry-III**

- CO1: **Perceives** the concept of conformational analysis
- CO2: **Analyses** the cruciality of stereochemical process
- CO3: **Classify** and interrelates types of asymmetric synthesis
- CO4: **Understands** and formulates retrosynthesis
- CO5: **Learns** new techniques and concepts in organic synthesis

### **Organic Chemistry-IV**

- CO1: **Appreciate** the importance of protecting groups
- CO2: **Gains** the potential of organic reagents in synthesis
- CO3: **Enlightens** the knowledge about new synthetic reactions
- CO4: **Determines** the chemical environment of  $^{13}\text{C}$  in organic molecules
- CO5: **Analyses** the chemical structure using 2D NMR and ORD

### Natural Products

- CO1: **Understands** the importance of natural products
- CO2: **Determines** the structure of alkaloids by chemical methods
- CO3: **Analyses** the complex structure of steroids and hormones
- CO4: **Acquires** the knowledge of prostaglandins
- CO5: **Recognises** the Biosynthetic pathways

### Bioorganic Chemistry

- CO1: **Appreciate** the importance of carbohydrates and proteins
- CO2: **Visualises** the role of nucleic acids and lipids
- CO3: **Categorises** enzymes and their action
- CO4: **Identifies** the enzyme models and their transformations
- CO5: **Perceives** the concept of coenzymes

### Heterocyclic Chemistry

- CO1: **Understands** the background of heterocyclics
- CO2: **Compares** the reactivity of aromatic and nonaromatic heterocyclics
- CO3: **Differentiate** five and six membered heterocyclics
- CO4: **Distinguish** heterocyclics with more than two heteroatoms
- CO5: **Recognises** the large ring and other heterocyclics

### Green Chemistry

- CO1: **Learns** the basics of green chemistry
- CO2: **Understand** the use of ultrasounds and microwave in organic synthesis
- CO3: **Appreciates** the importance of solid free synthesis
- CO4: **Perceives** the concept of phase transfer catalysis and crown ethers
- CO5: **Gains** knowledge about multicomponent reactions

### Organic Chemistry-V

- CO1: **Gains** knowledge about principle of drug design and discovery
- CO2: **Appreciates** the role of SAR and QSAR studies
- CO3: **Infers** about drugs acting on metabolic processes
- CO4: **Identifies** drugs acting on ion channels and receptors
- CO5: **Analyses** importance of drugs acting on genetic material

### Analytical Methods

- CO1: **Perceives** the concepts the GC and HPLC
- CO2: **Validates** the role of hyphenated techniques
- CO3: **Understands** the importance of electro analytical methods
- CO4: **Analyses** the chemical structure of Uv-visible spectroscopy
- CO5: **Determines** the chemical environment of  $^1\text{H}$ NMR spectroscopy

### Nano & Polymer Chemistry

- CO1: **Gains** knowledge about basics of nanochemistry
- CO2: **Understands** the applications of nanomaterials



- CO3: **Determines** the various uses of polymers
- CO4: **Learns** the basics of green chemistry
- CO5: **Validates** the adverse effects of chemicals on environment

## **M.Sc. Food Technology**

### **Technology of Food Processing & Preservation**

- CO1: **Distinguish** various high temperature food preservation techniques
- CO2: **Classify** various low temperature food preservation techniques
- CO3: **Explain** the types and functions of Food Additives
- CO4: **Distinguish** various pressure activated membrane technologies
- CO5: **Differentiate** new techniques of food Preservation

### **Food Process Engineering-1**

- CO1: **Explain** the Basic Principles of Material Balances
- CO2: **Explain** the Basic Principles of Energy Balances and Heat properties
- CO3: **Analyse** the concept of Thermodynamics
- CO4: **Judge** the changes in thermodynamic properties associated with work and heat
- CO5: **Distinguish** various Rheological & Colligative properties of food materials

### **Technology of Animal Based Food Products**

- CO1: **Design** the layout of poultry processing and its maintenance
- CO2: **Identify** the various sources of red meat and its processing procedures
- CO3: **Identify** the various sea foods and its preservation techniques
- CO4: **Describe** the dairy processing & quality evaluation techniques
- CO5: **Recognize** the different types of dairy products

### **Advance Food Chemistry**

- CO1: **Classify** physicochemical properties of carbohydrates and proteins
- CO2: **Explain** the effect of processing on lipids – understand
- CO3: **Analyse** the minor food constituent changes during storage and processing
- CO4: **Distinguish** different food additives and their uses
- CO5: **Explain** the digestion, absorption and metabolism of nutrients in human system

### **Food Microbiology**

- CO1: **Identify** various classifications and biochemical changes related to microorganisms
- CO2: **Judge** the Contamination and spoilage of perishable food commodities
- CO3: **Categorize** various food borne infections and hygiene-sanitation control practices
- CO4: **Distinguish** qualitative and quantitative assay for detection and characterization of microorganisms
- CO5: **Generalize** microbial fermentation in Food Industry

### **Post-Harvest Technology of Plantation crops**

- CO1: **Identify** various classifications and biochemical changes related to microorganisms
- CO2: **Judge** the Contamination and spoilage of perishable food commodities

- CO3: **Categorize** various food borne infections and hygiene-sanitation control practices
- CO4: **Distinguish** qualitative and quantitative assay for detection and characterization of microorganisms
- CO5: **Generalize** microbial fermentation in Food Industry

#### **Technology of Cereals**

- CO1: **Explain** the criteria of wheat flour quality and dough rheology
- CO2: **Classify** the structure and composition of corn grain
- CO3: **Categorize** the types of rice milling and factors affecting rice yield during milling
- CO4: **Distinguish** between different parboiling methods of rice
- CO5: **Compare** different convenience foods of rice

#### **Food Process Engineering-Ii**

- CO1: **Explain** the concept of Fluid Dynamics
- CO2: **Analyse** the heat and Mass transfer process during dehydration
- CO3: **Solve** steady state heat transfer calculations
- CO4: **Demonstrate** heat exchanger equipment's and **explain** heat transfer equations
- CO5: **Use** Physical separation process and material handling equipment

#### **Instrumental Methods of Food Analysis**

- CO1: **Explain** the calibration and standardization of different instruments
- CO2: **Analyse** different spectroscopic and Refractometric techniques
- CO3: **Distinguish** various microscopic techniques in food analysis
- CO4: **Distinguish** various chromatographic techniques in food analysis
- CO5: **Generalize** various Separation techniques in food analysis

#### **Milling & Baking Technology**

- CO1: **Explain** the processing of various cereals
- CO2: **Explain** the processing of various Pulses
- CO3: **Generalize** production, processing and manufacturing of value-added product
- CO4: **Distinguish** various concepts of Baking Technology
- CO5: **Demonstrate** various methods for manufacturing of bakery products

#### **Technology of Food Fermentation**

- CO1: **Explain** various types fermented foods
- CO2: **Classify** types of beverages
- CO3: **Categorize** packaging, storage and quality evaluation of various Fruit Beverages
- CO4: **Distinguish** storage and quality characteristics of Synthetic beverages
- CO5: **Interrelate** the equipment's used for brewing and distillation of Fermented Beverages

#### **Technology of Sugar Confectionery and Chocolate Processing**

- CO1: **Describe** the general technical aspects of confectionery and its raw materials
- CO2: **Identify** the Manufacturing practices of flour
- CO3: **Identify** the Manufacturing practices of sugar confectionery products
- CO4: **Identify** the Manufacturing practices of Fruit confectionery products
- CO5: **Explain** the chocolate processing technology

### **Extrusion Technology**

- CO1:** **Describe** the processing technology of Single screw extruder
- CO2:** **Distinguish** the types of extruders used in different food processing unit
- CO3:** **Categorize** the processing methods into pre and post extrusion
- CO4:** **Identify** the Manufacturing practices of Breakfast Cereals and TVP
- CO5:** **Explain** the Manufacturing of different extruded Snack food

### **Advances in Food Packaging**

- CO1:** **Identify** various packaging requirements and selection of packaging materials on the basis of food type
- CO2:** **Categorize** Active and intelligent packaging techniques
- CO3:** **Generalize** Packaging-flavour interactions and novel applications in active packaging
- CO4:** **Identify** Green plastics for food packaging as Modern packaging systems
- CO5:** **Analyse** Shelf life of processed and packaged foods

### **Food Quality Systems and Management**

- CO1:** **Identify** various quality attributes- physical, chemical, nutritional and microbial
- CO2:** **Explain** Computer-aided sensory evaluation procedures for food & beverages
- CO3:** **Categorize** concepts of Quality Control, Quality Assurance and Total Quality Management
- CO4:** **Categorize** various organizations dealing with inspection, traceability, authentication certifications and quality assurance
- CO5:** **Distinguish** Global Food Safety Standards and Export import policy and documentation

### **Energy Conservation & Auditing**

- CO1:** **Identify** basic principles & fundamentals of energy conservation
- CO2:** **Explain** energy conservation in thermal utilities
- CO3:** **Apply** Energy management & auditing
- CO4:** **Interrelate** and match energy usage to requirement
- CO5:** **Generalize** energy monitoring and targeting

### **Food and Nutrition**

- CO1:** **Explain** all concepts of Nutrition & Nutrients
- CO2:** **Identify** various Vitamins & Minerals in food
- CO3:** **Classify** the concepts of Food Energy & Recommended daily allowances
- CO4:** **Generalize** the Nutritional Status as programs to combat malnutrition of deficiency disorders
- CO5:** **Distinguish** various Supplementary Foods & Novel Foods

### **Technology Of Food Preservation & Processing**

- CO1: **Explain** all concepts of High Temperature Processing
- CO2: **Explain** all concepts of Low Temperature Processing
- CO3: **Classify** different membrane technologies related to pressure activated membrane processes
- CO4: **Generalize** the concept of Food Additive usage & Fermentation processes
- CO5: **Distinguish** various techniques in food processing & preservation

### **Food Laws, Regulations & Standards**

- CO1: **Explain** all concepts of food safety and standards and food safety strategies
- CO2: **Apply** concepts related to prevention and control of microbiological and chemical hazards.
- CO3: **Classify** different Indian Food Regulatory Regimes
- CO4: **Judge various** International Food Standards
- CO5: **Distinguish** various Voluntary National Food Standards and Nutritional Labelling

### **Food Toxicology and Allergens**

- CO1: **Explain** all concept of Allergens and microbiological, nutritional and environmental Hazards
- CO2: **Classify** different Food allergy and sensitivity related to food
- CO3: **Judge** various natural food toxicants & biological factors that influence toxicity
- CO4: **Distinguish** various Quantitative and qualitative analysis of toxicants in foods
- CO5: **Classify** various toxicants formed during food processing & storage

### **Food Supply & Cold Chain Management**

- CO1: **Illustrate** the importance of cold chain in food processing industry
- CO2: **Express** functions in cold storages - retail supermarket cold chain & display systems
- CO3: **Generalize** various temperature recording devices used during transport for documentation and traceability
- CO4: **Explain** Supply chain inventory management
- CO5: **Classify** Internet technologies and electronic commerce

## **MBA**

### **Program Outcomes**

**PO1: Managerial Skills:** Apply knowledge of management theories and practices to solve business problems.

**PO2: Decision making Skills:** Foster Analytical and critical thinking abilities for data-based decision making.

**PO3: Ethics:** Ability to develop Value based Leadership ability.

**PO4: Communication Skills:** Ability to understand, analyze and communicate global, economic, legal, and ethical aspects of business

**PO5: Leadership Skills:** Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment.

**PO6: Entrepreneurial Skills:** Ability to demonstrate the skills and appraise affairs related to entrepreneurship and develop as entrepreneurs.

**PO7: Strategic analysis:** To conduct strategic analysis using theoretical and practical applications.

**PO8: Cogent Skills:** To manage intra and inter organizational negotiations effectively in a cross cultural business environment.

### **Program Specific Outcomes**

**PSO1: Professional Skills:** Able to utilize the knowledge of management practices in innovative, dynamic and challenging environment in the organizations.

**PSO2: Creativity:** Create value through identifying customer needs and implementing integrated production and distribution of goods, services

**PSO3: Problem-Solving Skills:** Can develop capacity to adapt and innovative to solve problems, to cope with unforeseen events and to manage in unpredictable environments.

**PSO4: Successful Career and Entrepreneurship:** An understanding of social awareness and environmental wisdom along with ethical responsibility to have a successful career and to sustain passion and zeal for real world applications using optimal resources as an Entrepreneur.

### **Course Outcomes**

#### **Communicative Competence**

**CO1:** Apply effective communication and listening strategies in various formal scenarios.

**CO2:** Classify different types of communication.

**CO3:** Express language correctly to communicate appropriately.

**CO4:** Define different means of communication.

**CO5:** State different management communication.

#### **Management and Organization Behavior**

**CO1:** Understand the concept and process of management and organization behaviour.

**CO2:** Examine the historical roots of contemporary management practices.

**CO3:** Able to understand concept, nature of perception.

- CO4: Analyse the traditional and contemporary organizational designs and its structures.  
CO5: Know the various theories of motivation and leadership.

### **Information Technology Applications For Management**

- CO1: Apply IT concepts from business perspective  
CO2: Define different devices and software used in management.  
CO3: Use IT Applications for Management.  
CO4: Explain different input and output devices.  
CO5: Describe different information systems used in management.

### **Information Technology -Lab**

- CO1: Apply IT concepts from business perspective  
CO2: Define different devices and software used in management.  
CO3: Use IT Applications for Management.  
CO4: Explain different input and output devices.  
CO5: Describe different information systems used in management.

### **Managerial Economics**

- CO1: Understand micro economic environment, effective managerial decision-making process  
CO2: Understand of the theory and analytical tools that can be used in decision-making problems.  
CO3: Analyze Production and cost concepts  
CO4: Market structures and the price determination  
CO5: Formulate them into a managerial model to which decision making tools can be applied.

### **Financial Accounting and Analysis**

- CO1: Define financial accounting and accounting equations  
CO2: Construction of balance sheet  
CO3: Use of depreciation methods and valuation methods  
CO4: Analyse financial statements and financial ratios  
CO5: Explain fund flow and cash flow statements

### **Statistics for Management**

- CO1: Describe about probability and statistical tools.  
CO2: Explain basic concepts of probability  
CO3: Explain the distributions of probability.  
CO4: Analyze different types of sampling methods and large sample test.  
CO5: Formulate small sample test.

### **Principles of Marketing**

- CO1: Understand various facets of market, and its behavior.  
CO2: Apply the various tools for making strategies in the markets

- CO3: Create a marketing mix to bring sustainable profits
- CO4: Construct the promotional tools for marketing a product. the
- CO5: Analyze the various situations and stages in buying process.

### **Business Law and Ethics**

- CO1: Understand about self, strengths and weakness.
- CO2: Identify ones potential, self-image, and skills
- CO3: To analyze the various thinking process
- CO4: To develop life coping strategies
- CO5: To develop problem solving and decision making in life situations.

### **Value Education and Personality Development**

- CO1: Understand about self, strengths and weakness.
- CO2: Identify ones potential, self-image, and skills
- CO3: To analyze the various thinking process
- CO4: To develop life coping strategies
- CO5: To develop problem solving and decision making in life situations.

### **Human Resource Management**

- CO1: Understand HRM in the global perspective and as a strategic business partner
- CO2: Know more about how to acquire manpower , the selection process and the training process
- CO3: Understand career in the holistic perspective
- CO4: Understand the difference in mentoring and coaching
- CO5: Contemporary issues in talent management, the competence levels of employees

### **Economic Environment & Policy**

- CO1: Able to understand the concept of economic environment and its impact on economy.
- CO2: Know the nature and scope of business environment.
- CO3: Examine the various theories of income and employment.
- CO4: Know the concept of inflation, theories and its causes.
- CO5: Understand the evolution and structure of Indian Financial System.

### **Financial Management**

- CO1: Define financial functions and goals
- CO2: Use project evaluation techniques and approaches
- CO3: Analyse capital structure
- CO4: Apply dividend policies and decisions
- CO5: Explain working capital financing

### **Quantitative Methods for Decision Making**

- CO1: Describe various quantitative techniques and tools that help in decision making in different functional areas in industries.

**CO2:** Formulate concepts of linear and nonlinear Programming problems using different methods.

**CO3:** Solve linear programming problems using Simplex method and the concepts of Transportation problem and assignment problems.

**CO4:** Construct the concepts of CPM and PERT.

**CO5:** Explain the concepts of queuing theory, game theory and simulation.

### **Marketing Research**

**CO1:** Formulate various marketing research projects

**CO2:** Identify various opportunities and solve problems in the market.

**CO3:** Understand fundamental marketing research concepts, theories and principles in areas of marketing policy;

**CO4:** Construct a questioner using scales of measurement

**CO5:** Solve non parametric tests for attitude measurement.

### **Operations Management**

**CO1:** Define introduction to Operation Management.

**CO2:** Explain the role of operation management.

**CO3:** Organize the scheduling and control of production operations.

**CO4:** Identity quality control methods.

**CO5:** Describe materials management.

### **International Business**

**CO1:** Able to understand and appreciate the international business environment.

**CO2:** Know the importance, emergence and drivers of globalization.

**CO3:** Understand the various stages and approaches in international business.

**CO4:** Examine the different levels, benefits of economic integration.

**CO5:** Know the structure and functions of WTO.

### **Soft Skills**

**CO1:** Understand the importance of goal setting and set goals

**CO2:** Plan the time for a given schedule and life.

**CO3:** Apply the etiquette to impress and give good impression.

**CO4:** Develop group discussion skills

**CO5:** Prepare for interviews

### **Entrepreneurship Development**

**CO1:** Explain the concepts and trends of development in entrepreneurship

**CO2:** Define about the concept of evolution of entrepreneur.

**CO3:** explain various factors affecting entrepreneurial growth.

**CO4:** Describe how to prepare a business plan.

**CO5:** Identity the concept of venture capital financing and angel investors.

### **Financial Services**

**CO1:** Describe innovative financial products and services and their scope in global finance market.



- CO2:** Define merchant banking.
- CO3:** Explain hire purchase and leasing.
- CO4:** Distinguish discounting, types of factoring and forfeiting.
- CO5:** List credit rating agencies and credit cards.

### **Total Quality Management**

- CO1:** Know the importance of quality, concept of total quality management.
- CO2:** Able to understand the different techniques used to ensure quality in an organization.
- CO3:** Understand the various measurement tools, analytical tools and control tools to check the quality.
- CO4:** Analyse the quantitative techniques and qualitative techniques of TQM.
- CO5:** Examine the importance of six sigma in an organization.

### **Supply Chain Management**

- CO1:** Know the importance of quality, concept of total quality management.
- CO2:** Able to understand the different techniques used to ensure quality in an organization.
- CO3:** Understand the various measurement tools, analytical tools and control tools to check the quality.
- CO4:** Analyse the quantitative techniques and qualitative techniques of TQM.
- CO5:** Examine the importance of six sigma in an organization.

### **Strategic Management**

- CO1:** Able to understand the steps involved in strategic management process.
- CO2:** Know the significance and framework for industry analysis.
- CO3:** Analyse the importance of balance score card and different types of strategies used at corporate and business level.
- CO4:** Understand the various activities, benefits, growth and drivers of outsourcing.
- CO5:** Examine the various stages involved in the industry lifecycle.

### **Financial Risk Management**

- CO1:** Interrelate the risk and tools and techniques of risk management.
- CO2:** Define introduction to risk management.
- CO3:** Describe measurement and management of risk using derivatives.
- CO4:** Explain types of derivatives.
- CO5:** Classify types of SWAPS.

### **Compensation Management**

- CO1:** Understand the compensation context and the system to design packages
- CO2:** Differentiate the traditional and modern pay packages
- CO3:** Establish pay plans with HR strategy and business strategy
- CO4:** Design competitive systems with internal and external equity
- CO5:** Labour legislations in designing the application of the compensation systems

### **Product and Brand Management**

- CO1:** Develop a product policy

- CO2: Understand various theories on product lifecycle
- CO3: Apply the theories to develop a new product
- CO4: Organize the products in various perception maps for segmentation and new product creation.
- CO5: Developing a launching of product

#### **Investment management**

- CO1: Define fundamentals of fundamental management
- CO2: Explain bond valuation techniques
- CO3: Construct portfolio risk and return
- CO4: Identify over-priced and under priced securities
- CO5: Analyse fixed income securities

#### **Organizational development**

- CO1: Understand the problem solving approach at the organization level
- CO2: Will know the importance of values and beliefs systems of the organization
- CO3: Different theories of change and models
- CO4: Develop interventions to evaluate OD programs
- CO5: Concept of Team and the organizational confrontation approaches

#### **Integrated Marketing Communications**

- CO1: Prepare a promotional plan
- CO2: To differentiate the response process among consumers.
- CO3: Design a advertising strategy
- CO4: Apply the personal selling process.
- CO5: Understand various sales promotion tools.

#### **International Finance**

- CO1: Define international financial system
- CO2: Analyse foreign exchange market
- CO3: Identify risk management in multinational corporations
- CO4: Determine international money markets
- CO5: Explain risk management in multinational corporations.

#### **Performance & Knowledge Management**

- CO1: Understand the performance management systems in the organization
- CO2: Different appraisals methods prevalent in the industry
- CO3: Know more about performance reviews and improvement strategies
- CO4: Benchmarking and how competitors have their performance management systems
- CO5: Competency assessment of individuals

#### **Consumer Behavior**

- CO1: Analyze the impact of consumer personality and motivation on purchase behavior.
- CO2: Analyze learning principles in marketing

- CO3: Understand the lifecycle influence on purchase behavior.
- CO4: To distinguish the consumer decision making process.
- CO5: To classify the behavior of consumers based on constructs.

### **Cost & Management Accounting**

- CO1: Formulate the various objectives of cost control techniques
- CO2: Use control techniques and management
- CO3: Analyse standard costing and variance
- CO4: Evaluate strategic phrases
- CO5: Explain activity based costing methods

### **Leadership & Change Management**

- CO1: Examine the purpose of leadership development
- CO2: Leadership development through company run programs
- CO3: Understand the empowerment programs and mentoring programs
- CO4: Change concepts and the perspectives of change
- CO5: Contemporary models of change management

### **Services & Retail Marketing**

- CO1: Understand the service sector, its customers
- CO2: Distinguish the service marketing mix
- CO3: Create strategies to overcome 4Is of services
- CO4: Understand the factors influencing retail
- CO5: Formulate strategies for a successful retail outlet.

## **M. Sc. Biotechnology**

### **Programme Outcomes**

- PO1: Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- PO2: Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO3: Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO4: Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- PO5: Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable

development.

**PO6: Individual and team work:** Function objectively as an individual and as a member in diverse teams.

**PO7: Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.

**PO8: Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

### **Programme Specific Outcomes:**

**PSO1:** Students will gain and apply knowledge of Biotechnology comprised of science and Engineering components to solve problems related to field of biotechnology.

**PSO2:** Students will be able to design, perform experiments, analyze and interpret data for investigating complex problems in the area of biotechnology

**PSO3:** Post Graduate students will be able to decide and apply appropriate tools and techniques in biotechnological manipulation.

**PSO4:** Post Graduate students will be able to justify societal, health, safety and legal issues and understand his responsibilities in biotechnological engineering practices.

**PSO5:** Post Graduates will be able to understand the need and impact of biotechnological solutions on environment and societal context keeping in view need for sustainable solution.

**PSO6:** Post Graduates will be able to undertake any responsibility as an individual and as a team in a multidisciplinary/ cross cultural environment

**PSO7:** Post Graduates Students will develop oral and written communication skills.

### **Genetics**

**CO1:** Explains the basics of genetics, Mendel's laws and dominance-recessive relationships

**CO2:** Gives detailed information about chromosomes and pedigree analysis in man

**CO3:** Explains the variations in chromosomal structure and numbers

**CO4:** Describes linkage and gene mapping concepts

**CO5:** Clearly gives information about Organellar inheritance in contrast to Mendelian inheritance

### **Cell Biology**

**CO1:** Structures and purposes of basic components of prokaryotic and eukaryotic cells, especially membranes, and organelles.

**CO2:** How the cellular components are used in protein sorting through various pathways.

**CO3:** How Cell Signalling Works and how cells will communicate with the surrounding cells & can have a clear understanding of the signal

**CO4:** Cellular components underlying mitotic cell division

**CO5:** The knowledge how the cells undergo apoptosis and its applications

### **Biochemistry**

**CO1:** Explains Chemical bonds, molecular interactions in cell

**CO2:** Apply the knowledge of bonds & shows in representing structure of carbohydrates

**CO3:** Identifies the structure of lipids, relates & distinguishes with carbohydrates.

**CO4:** Compares, discriminates the structure & functional relationship of proteins & nucleic acids with other biomolecules in cell.

**CO5:** Explains the catalytic nature & kinetic properties & inhibition mechanisms of enzymes.

### **Microbiology**

- CO1:** Explains the basics of Microbiology. Different media used for their culturing and their identification methods
- CO2:** Gives detailed information about systemic classification of Bacteria, Algae, Archae and Fungi
- CO3:** Explains in detail about microbial physiology and their growth
- CO4:** Describes about microbial genetics like Transformation, Transduction, and recombination
- CO5:** Clearly gives information about classification of viruses and chemotherapeutic agents

### **Immunology**

- CO1:** Explains the basics of immunology
- CO2:** Gives detailed information about antigens and their pathways
- CO3:** It gives knowledge about various types of Immunoglobulin structures their and functions
- CO4:** explains about Organization of MHC complex and Transplantation
- CO5:** Summarizes about cell mediated and humoral responses and auto immune diseases

### **Molecular Biology**

- CO1:** Know the life with molecular functionalities, chemical and molecular processes that occur in and between cells.
- CO2:** Knowledge about the changes or losses in cell function, includes alterations of cell function brought about by mutations and DNA repair
- CO3:** Concept of gene structure and function, gene expression and gene regulation at transcriptional level.
- CO4:** Concepts of translation and gene expression and gene regulation at translational level.
- CO5:** How genes are evolved by gene rearrangements and recombination and by transposons. Development of solid foundation and requisite research aptitude for further higher studies on epigenetic analysis

### **r- DNA Technology**

- CO1:** Explains usage of enzymes in molecular cloning
- CO2:** Apply the principles of Vectors used in molecular cloning
- CO3:** Illustrates Construction of Genomic and cDNA Libraries
- CO4:** Describes Techniques employed in molecular cloning
- CO5:** Relates Selection and Analysis of recombinant Clones

### **Biochemical Techniques**

- CO1:** Explains different types of chromatography
- CO2:** Explains different types of electrophoresis.
- CO3:** Identifies separation of cell organelles, biomolecules by different centrifugation techniques.
- CO4:** Identifies& applies, the colorimetry& spectrophotometry to detect biomolecules..
- CO5:** Explains the application of radioisotopes in various metabolic studies

### **Plant Biotechnology**

- CO1:** Use protocols for preparation of Culture Media, Cell Culture and Micro Propagation
- CO2:** It relates the techniques used for Protoplast Culture and Soma clonal Variations in Plants
- CO3:** It evaluates Production of Commercially Useful Compounds By Cell Cultures
- CO4:** This study differentiate between Molecular Mechanisms of Abiotic & Biotic Stress Tolerance in plants
- CO5:** It explains Transformation Techniques in Transgenic Plants

### **Animal and Medical Biotechnology**

- CO1:** The basics of maintenance of mammalian cell and generation of cell line using proper sterile techniques and optimum conditions of growth to develop mammalian cells.
- CO2:** To identify and comprehend experimental knowhow of various techniques involved in cell separation and quantitation using latest technology also know how to relate and evaluate the applications of animal biotechnology In gene therapy, animal breeding, cloning.
- CO3:** The knowledge to know about the stem cell technology and regenerative Medicine.
- CO4:** How genetic disorders are arising
- CO5:** Knowledge regarding various therapeutics, DNA based Vaccine, gene products in medicine and healthcare.

### **Bioinformatics**

- CO1:** It summarizes foundations of Bioinformatics
- CO2:** To explain methods for Comparison and evaluation of data
- CO3:** Analysis of Genomic Applications of Bioinformatics
- CO4:** Analysis of Proteomic Applications of Bioinformatics
- CO5:** It summarise Applications of Bioinformatics

### **Fermentation Technology**

- CO1:** Explains the Process of fermentation.
- CO2:** Summarizes the different types of designs of fermentors and operations.
- CO3:** Identifies & relates microbiological and the fermentation media, illustrates the principles of upstream process of fermentation
- CO4:** Compares, discriminates the product isolation with product purification methods. Explains & interprets the product purification strategies
- CO5:** Evaluates, relates the principles of upstream & downstream process of fermentation in different fermentative productions

### **Biostatistics, Ethical Issues & Research Methodology**

- CO1:** Introduction to Bio-Statistics
- CO2:** Descriptive Statistics & Probability Distribution
- CO3:** Statistical Inference of Qualitative & Quantitative Variables
- CO4:** It describes importance of ethics in life. It values good laboratory and manufacturing practices.
- CO5:** Integrates training from different sources to solve a problem during research and writing a publication

### **Food Biotechnology**

- CO1:** Explains the nutrients present in diet & aspects of food different food additives.
- CO2:** Summarizes the different methods of food preservation & processing
- CO3:** Identifies the nutrients in functional foods, relates & distinguishes bioactive compounds role in functional foods.
- CO4:** Compares, discriminates the GM Foods with functional foods. Explains & interprets the safety of GM foods with traditional foods.
- CO5:** Evaluates, relates the principles of food preservation & processing in food safety

### **Nano-Biotechnology**

- CO1:** Explains new horizons of science by fundamental study of Nanotechnology
- CO2:** It extends Nanotechnology different areas and its utilization

**CO3:** Categorize different types of Nano Structures by their fundamental properties and utility in different areas

**CO4:** Support of Nano-biotechnology in Health Care

**CO5:** Summarizes the Applications of Nano-biotechnology

### **Bioelectronics**

**CO1:** The basics electronic components involved in the applications of biology.

**CO2:** The similarities between electronic components and biologically active materials

**CO3:** Various types of Biosensors used in biology.

**CO4:** The applications of biosensors in various fields related to biology like health care, agriculture etc.

**CO5:** Knowledge about Bio inspired systems.

### **Basic Biotechnology**

**CO1:** Explains the basics in Biotechnology

**CO2:** Gives detailed information about concepts in Genetics

**CO3:** Explains the basics in Microbiology

**CO4:** Describes concepts of Plant Biotechnology

**CO5:** Clearly gives information about applications of Biotechnology in various fields