Govt. V.Y.T. PG Autonomous College
Durg (C.G.), Pin-491001, INDIA

{Erstwhile: Govt. Arts & Science College, Durg}

PO, PSO & CO

Program Outcome (PO)
Program Specific Outcome (PSO)
Course Outcome (CO)

Session 2019-2020

Re-accredited Grade "A+" By NAAC
College with Potential for Excellence (CPE) Phase-III by UGC
Awarded Star College by DBT, New Delhi

Govt. V.Y.T. PG Autonomous College, Durg
Programme Outcomes

Undergraduate Programme

At the end of UG programme, students will be able to:

- **Critical thinking:** Identify and analyze current issues and trends in higher education and come-up with intellectual, organizational, and personal ideas and decisions from different perspectives
- **Effective citizenship:** Understand the administration of college, including the roles and functions of the major administrative units and develop ability to act with an informed awareness of issues and participate in civic life activities for comprehensive development
- **Effective communication:** Communicate clearly and effectively using the professional standards of their fields
- **Environment and sustainability:** Understand the issues of environmental contexts and demonstrate the knowledge for sustainable development
- **Ethics:** Express legal and ethical issues and understand the moral dimensions of decisions and responsibilities
- **Life-long learning:** Gain ability to engage in independent and life-long learning with socio-technological changes

Post Graduate Programme

At the end of PG programme, students will be able to:

- **Disciplinary knowledge:** Accomplish profound expertise in discipline and increase ability to function in multidisciplinary domains
- **Effective citizenship:** Investigate individual, institutional and national values and understand the impact of cultural variations and technological advancement, innovations and applications
- **Leadership qualities:** Capability of working as a team and setting direction and using management skills to achieve the Vision and Mission
- **Research aptitude:** Manage ability to exercise research intelligence in investigations/ innovations and to communicate research findings in a clear, concise manner
- **Ethical awareness:** Gain knowledge of ethical principles and commit to professional ethics
- **Self-directed learning and digital learning:** Ability to work independently, identify appropriate resources required for projects, manage projects, enable learning through ICT tools and integrate self-directed learning, digital learning with life-long learning

Ph.D. Programme

At the end of Ph.D. programme, students will be able to:

- **Scientific Reasoning:** Critically apply theories, methodologies, and knowledge to address fundamental questions in their primary area of study
- **Problem solving:** Formulate and write research grant proposals with effective questions, hypotheses and experimental designs
- **Analytical thinking:** Develop the inductive and deductive reasoning skills to drive research projects productively and independently

- **Communication/digital skills:** Instill oral, written and digital communication skills sufficient to publish and present work, apply knowledge to undergraduate teaching and assessment of student learning
- **Moral and Ethical reasoning:** Ability to imbibe moral/ ethical values, follow the principles of ethics in their field and in academia, avoid unethical behavior such as fabrication, misrepresentation of data, committing plagiarism, non adherence to IPR etc.
- **Leadership Readiness:** Interact with people from diverse backgrounds as both leaders/mentors and team members with integrity and professionalism

Programme Specific Outcomes and Course Outcomes

Under Graduate Programme in Physics

The Programme Speific Outcomes of B.Sc. Physics

The syllabi are framed in such a way that it bridges the gap between plus two and post graduate levels of Physics by providing a more complete and logical framework in almost all areas of basic Physics:

- To develop in students, the knowledge in students about the importance and scope of the subject.
- To prepare students to have basic Knowledge of Physics
- To equip students to handle the apparatus used in our daily life. To prepare students for a variety of carrier options in the field of Physics.
- To develop critical thinking skills in students
- To familiarize the students with the emerging areas of Physicsand their applications in various areas of Physical Sciences.to expose the students to use different processes used in the industry according to the preset requirement.
- To attract young minds to the potentially rich and employable field of Physics.
- To develop the skill to handle common apparatus of Physics.
- To develop skill in in practical work, experiments and laboratory use of Physics.
- To be able to work independently and to collaborate effectively in team work and and team building.

In this way the course provides with ample opportunities for the student to learn about the basic laws of Physics and how to handle the instruments and proper functioning of the simple instruments.

Course Outcomes of B.Sc. Part-I Physics

Paper I: Mechanics, Oscillations and Properties of Matter

After the completion of the course, Students will be able to:

- This course gives abroad knowledge aboutthe basic laws of mechanics. Also it deals with the basic forces like centripetal, centrifugal forces, Coriolis forces and their applications.
- It also gives the knowledge about the conservative Forces and non-conservative forces and central forces. Kepler’s Laws, Gravitational Law and potential is also described in this course. Laws of conservation of linear momentum, angular momentum and energy. Rotatory Motion, Laws of inertia, products of Inertia, Euler’s Equation.

- Knowledge of simple harmonic oscillator and derivation of the differential equations of S.H.O. and examples were discussed. Damped and forced oscillations were also discussed.
- Motion of charged particles in electric and magnetic field were also discussed. Some instruments like linear oscillator, cyclotron magnetic selector is discussed. In case of properties like elasticity stress and strain, Hooke's law, Young's modulus, modulus of rigidity, elastic constants and relation between different elastic constants were calculated.
- In case of kinematics of Moving Fluids – equation of continuity, stream line flow, Euler's equation of motion, capillary action, Stoke's law, Poiseuiie's formula were taught. In case of surface tension- cohesive and adhesive forces, capillarity, Jaeger's method, Quinke's method were discussed.

Paper II: Electricity, Magnetism and Electromagnetic Theory

After the completion of the course, Students will be able to:

- 1.Know the vocabulary and concepts of physics as it applies to: Principles of Electric Fields, Gauss's Law, Electric Potential, Capacitance and Dielectrics, Current and Resistance, Direct Current Circuits, Magnetic Fields, Sources of Magnetic Fields, Faraday's Law, Inductance, Alternating Current Circuits, and Electromagnetic Waves.
- 2.Get the knowledge about different types of forces help the students in their daily life.
- 3.The course provides the students about the knowledge of Gauss and Ampere law which are very useful in electromagnetic theory. Be able to use electromagnetic theory and principles in a wide range of applications.
- 4.Explain various phenomenon like Ferromagnetism, ant ferromagnetism etc Understand the relation in between Electromagnetic theory.
- 5.Gain confidence in their ability to apply mathematical methods to understand electromagnetic problems to real-life situations.
- The course will give knowledge about the basic concept of magnetism and Maxwell equations . Explain various phenomenon considering Maxwell equations..

Practicals

Practicals based on simple mechanics and oscillations and electricity which are used in our daily life are taught.

Course Outcomes of B.Sc. Part-II Physics

Paper – I Thermodynamics, Kinetic Theory and Statistical Physics

After the completion of the course, Students will be able to:

- The laws of thermodynamics- zeroth law, concept of path function and point function, first law, internal energy as a state function, reversible and irreversible change, Carnot theorem and second law, Claussius theorem inequality. Entropy, change of entropy in simple cases The thermodynamic scale of temperature, its identity with the perfect gas scale. Impossibility of attaining the absolute zero, third law of thermodynamics.
- Thermodynamic variables, Maxwell's general relationships, Vander waal's gas, Clausiuss-Clapeyron heatequation. Thermodynamic potentials and relation with thermodynamical variables. Cooling due to adiabatic demagnetization, Black body radiation: Stefan – Boltzmann law, spectral distribution, Wien's displacement law, Rayleigh jean's law, Planck's quantum postulates, Planck's Law.

- Maxwellian distribution of speeds and of velocities, experimental verification, distinction between mean, r.m.s. and most probable speed values. Doppler broadening of spectral lines.
- Molecular collisions, mean free path and collision cross sections, estimates of molecular diameter and mean free path, Transport of mass, momentum and energy and inter-relationship.Boyle temperature and inversion temperature, liquefaction of hydrogen and helium. Refrigeration cycles, meaning of efficiency.
- The statistical basis of thermodynamics: thermodynamic probability, statistical postulates. Concept of Gibb's ensemble,Concept of phase space, canonical phase space, γ phase space and μ phase space. Boltzmann canonical distribution law and its application, law of equipartition of energy. Transition to quantum statistics: 'h' as a natural constant and its effects, cases of particle in a one dimensional box and one dimensional harmonic oscillator.
- Indistinguishability of particles, Bose Einstein and Fermi Dirac conditions, concept of partition function, Derivation of Maxwell Boltzmann, Bose Einstein and Fermi Dirac statistics through canonical partition function. Limits of B.E.and F.D. statistics to M.B. statistics. Application of B.E. statistics and F.D.statistics.

Paper-II Waves, Acoustics and Optics

After the completion of the course, Students will be able to:

- Speed of transverse waves on a uniform string, longitudinal waves in a fluid. Energy density and energy transmission, gravity waves and ripples. Group velocity and phase velocity and their measurements, Harmonics and production and detection of ultrasonic and infrasonic waves and their application.
- Reflection, refraction and diffraction of sound: impedance matching for transducers, diffraction of sound, principle of a sonar system, sound ranging.
- Fermat's Principle of extremum path, the aplanatic point of a sphere and other applications, Cardinal Points Lagrange's equation of magnification, telescopic combinations, monochromatic aberrations, aspherical mirrors and Schmidt corrector plates, Ramsdon and Hygen's eyepieces.
- The principle of superposition, two slit interference, coherence, Rayleigh refractometer, localized fringes, thin films,
- Haldinger fringes**:**. Michelson interferometer, its application Twymann- green interferometer and its uses, Tolansky fringes, Febry –Perot interferometer and etalon.
- Fresnel half period zones, zone plates, Fraunhoffer resolution of images, Rayleigh criterion.
- Diffraction gratings: Diffraction at N parallel slits, plane diffraction grating, , resolving power of a grating and comparison with resolving power of prism and of a Fabry- Perot etalon.
- Double refraction and optical rotation: rotation of plane of polarization, origin of optical rotation in liquids and in crystals.
- Laser system: Purity of a spectral line, coherence length and coherence time, spatial coherence of a source, Einstein's A and B coefficients, Spontaneous and induced emissions, conditions for laser action, population inversion, types of laser: Ruby and He-Ne semiconductor lasers.
- Application of laser in communication, Holography and non-linear optics

Practicals

Students are familiarized with practicals based on heat and optics which are useful in our daily life.

Course Outcomes of B.Sc. Part-III, Physics Programme

Paper – I Relativity, Quantum Mechanics, Atomic Molecular and Nuclear Physics.

After the completion of the course, Students will be able to:

- Reinternal frames, Galilean invariance and conservation laws, Michelson-Morley exexperiment, search for ether. Postulates for the special theory of relativity, Lorentz transformations, length contraction time dilation, velocity addition theorem, variation of mass –energy equivalence, particle with a zero rest, Compton effect.
- Origin of the quantum theory: failure of classicalphysics, photoelectric effect.Wave-particle duality and uncertainty principle: de Broglie's hypothesis for matter waves. Davission and Germer's experiment. Consequence of de Broglie's concepts. Quantum mechanics: Schrodinger's equation postulates of quantum mechanics, operators, expectation values, boxes, harmonic oscillator, potential step, potential barrier, Hydrogen atom: natural occurrence of n, I and m quantum numbers
- USpectra of hydrogen, deuteron and alkali atoms spectral terms, doublet fine structure screening constants for alkali spectra for s,p,d and f states, selection rules.
- quantization of vibrational and rotational energies, determination of internuclear distance, pure rotational and rotation vibration spectra. Dissociation limit for the ground and other electronic states, transition rule for pure vibration and electronic vibration spectra. Raman effect, Stokes and anti-Stoke lines, complimentary charcter of Raman and infrared spectra, experimental arrangements for Raman spectroscopy.
- Interaction of charged particles and neutrons with mater, working of nuclear detectors, G-M counter, proportional counter and scintillation counter, cloud chambers, spark chamber, emulsions. Structure of nuclei, basic properties deuteron binding energy, p-p and n-p scattering and general concepts of nuclear forces. Beta decay, range of alpha particle Geiger-Nuttal law. Gamow's explanation beta decay, alpha decay, continuous and discreate spectra. Nuclear reactions, channels, compound nucleus, direct reaction (concepts). Shell model & liquid drop modal, fission and fusion (concepts), energy production in stars by p-p and carbon cycles (concepts).

Paper-II Solid State Physics, Solid State Devices and Electronics

After the completion of the course, Students will be able to:

- Elements of symmetry, Seven System, Cubic lattices, Crystal planes, miller indices, Laue's equation for X-ray diffraction, Bragg's law, Bonding in solids classification. Specific heat of solids, Dulong-petit's law, Einstein and Debye theories. Brillouin zone.
- Schrodinger equation in a constant potential. Density of states. Fermi Energy. Energy bands in solid, Kroning penny model Metals, insulator and semiconductors. Hall effect. Dia, Para and ferromagnetism. Langevin's theory of dia and para-magnetism.
- Curieweiss's law. Qualitative description of ferromagnetism (magnetic domains) B-H.curve and Hysteresis loss.

- Intrinsic semiconductor, carrier concentration in thermal equlibrium, Fermi level, impurriy, doped semiconductor, doner and acceptor levels, Diode equation, junction breakdown, Depletion width and junction capacitance, abrupt junction breakdown, Tunnel diode, Zener diode. Light emitting diode, solar cell, Bipolar transistors, pnp and npn transistors, characteristics of transistors, different configuration, current amplification factor, FET.
- Half and full wave rectifier, efficiency, ripple factor, Filters, Inductor filter, Tand π filters, Zener diode, regulated power supply.Applications of Transistors. Bipolar Transistor as amplifier. Single stage and CE small signal amplifiers, Emitter follower, transistor power amplifier, Transistor as oscillator, Wein-Bridge and Hartley oscillator.
- Introduction to computer organization, time-sharing and multi programming systems, window base word-processing packages, MS word. Introduction to C programming and application to simple problems of arranging numbers in ascending/descending order: sorting a given data in an array, solution of simultaneous equation.

Practicals

Students are familiarized with practicals based on electronics and and computer programming and they can handle the instruments which are useful in our daily life .

B.Sc. Part-I Electronics

Paper I : Network Analysis and Analog Electronics

After the completion of the course, Students will be able to

- Apply their knowledge in analysing Circuits by using network theorems.
- Understand working and applications of semiconductor devices.
- Understand the current voltage characteristics of semiconductor devices.
- Know the concept of feedback amplifier and their characteristics.

Paper II : Linear and Digital Integratedcircuits

After the completion of the course, Students will be able to

- Define the basic concepts related to Op-amp andexplain the working of op-amp based circuits.
- Understand fundamentals of Number Systems, Boolean algebra and minimization techniques.
- Design combinational and sequential digital circuits.
- Understand working and applications of analog to digital and digital to analog converters.

B.Sc. Part-II Electronics

Paper I : Communication Electronics

After the completion of the course, Students will be able to

- The different modulation and demodulation techniques used in analogand digital communication.
- Explain the basics of satellite communication.
- Understand GSM, CDMA, TDMA and FDMA concepts.

- Study of evolution of mobile communication generations 2G, 3G and 4G with their characteristics and limitations.

Paper-II : Microprocessor and Microcontroller

After the completion of the course, Students will be able to

- Develop an assembly language program in 8085 microprocessor using the internal organization for the given specification.
- Describe the architecture and functional block of 8051 microcontroller.
- Develop an embedded C andassembly language programin 8051 microcontroller using the internal functional blocks for the given specification.

B.Sc. Part-III Electronics

Paper I : **Power Electronics, Microprocessor and it Fundamental's**

After the completion of the course, Students will be able to

- Acquire knowledge about various power semiconductor devices.
- Develop an assembly language program in 8085 microprocessor.
- Explain various peripherals devices such as 8155, 8355 and 8279.
- Understanding of different types of computer networks and computer network models.

Paper-II : Communication System

After the completion of the course, Students will be able to

- Understand the effects of noise in communication system.
- Understand and explain AM, SSB systems and their quantitative analysis.
- Comprehend angle modulation and demodulation circuits**.**
- Understand and illustrate digital communication techniques.

Department of Chemistry
UG Programme

Programme Specific Outcome (PSO):

Upon completion of the B.Sc. Degree (with Chemistry), the students would be able:

- To have a firm foundation in the fundamentals/concepts/theories and its applications in various branches of chemistry.
- To explain/compare the various aspects and present the concepts of chemistry effectively.
- To understand the structure and properties of atoms/molecules/compounds and characteristics/ mechanisms of chemical reactions.
- To analyze problems and apply the principles/concepts in finding their solutions.
- To acquaint with safety measures in laboratory and develop skills in proper handling of chemicals and apparatus/instruments. PSO6: To carry out experiments, record the observations and present the inference/results.

B.Sc. Part–I Chemistry

Paper- I Inorganic Chemistry

After completion of the course, students would be able:

- To have knowledge of atomic structure, wave mechanical concept of atom and electronic configuration of elements.
- To understand about periodic properties and their variations along periods and groups.
- To explain chemical bonding involved in ionic and covalent compounds.
- To gain insight into valence bond theory, molecular orbital theory and concept of hybridization.
- To describe the properties of s, p block elements and noble gases.
- To understand the concept and develop skill for qualitative analysis of inorganic mixture.

Paper- II Organic Chemistry

Paper- III Phyical Chemistry

B.Sc. Part–II Chemistry

Paper-I Inorganic Chemistry

After completion of the course, the students would be able:

- To know the meaning of various terms involved in co-ordination Chemistry
- To understand Werner‟s formulation of complexes and identify the types of valences.
- To know the limitations of VBT.
- To draw the geometrical and optical isomerism of complexes
- To effectively solve practical problems of analytical chemistry of non-aqueous solutions.

Paper- II Organic Chemistry

After completion of the course, the students would be able:

- To illustrate structure and reaction of alkyl and aryl halides, phenol, carbonyl compounds, carboxylic acids and amines.
- To explain difference between nucleophilic substitution and elimination reactions and to predict kinetics and stereochemical aspects of substitution reactions.
- To explain mechanism of nucleophilic addition reactions and reactivity of carbonyls.
- To predict and describe mechanism of name reactions.
- To explain acidity of carboxylic acids based on various field effects.
- To predict basicity and stereochemistry of amines, to illustrate synthetic transformation of aryl diazonium salts.

Paper-III Physical Chemistry

After completion of the course, the students would be able:

- To have a firm foundation of thermodynamics and its applications, explain first and second laws, thermodynamic properties and calculate various thermodynamic functions.

- To discuss the concepts/laws of thermochemistry, heat of reaction and its applications.
- To explain criteria of thermodynamic equilibrium, concept of fugacity, thermodynamic derivation of relations between the various equilibrium constants
- To understand and apply concept of ionic equilibria, salt hydrolysis and buffer solution.
- To define terms related to phase rule and Nernst distribution law and draw and interpret phase diagram and its application.
- To differentiate between thermal and photochemical processes, explain laws of photochemistry, low and high quantum yields, photochemical processes and reactions.

B.Sc. Part–III, Chemistry

Paper-I Inorganic Chemistry

After completion of the course, students would be able:

- To understand about limitation of VBT and concept of CFT and its limitations.
- To know the magnetic properties of complexes and able to interpret spectra of transition metal complexes.
- To understand nomenclature, classification, structure and properties of organometallic compounds.
- To know the role of trace and essential elements in biological process structure and mechanism of hemoglobin.
- To understand role of hard and soft acids and bases in chemistry and their structure.

Paper-II Organic Chemistry

After completion of the course, the students would be able:

- To learn about the common organometallic reactions and draw reasonable reaction mechanisms.
- To know about the synthetic applications of enolates and thio compounds.
- To have a general overview on the carbohydrates, their structures and properties.
- To describe the chemical structure of proteins and understanding of constituents of amino acid and structure of nucleic acids.
- To acquire knowledge about different mechanisms involved in polymerization, useful polymers and their structures.
- To know about various synthetic dyes and their structures.
- To be able to explain basic principles of UV-Visible, IR and Mass spectroscopy, and their applications, the magnetic properties of atomic nucleus and resonance and interpretation of NMR spectra.

Paper-III Physical Chemistry

After completion of the course, the students will be able

- To have a firm foundation of the fundamentals/concepts/principles/postulates of quantum mechanics and understand the need for development of quantum mechanics.
- To understand the applications of quantum mechanics in the study of black body radiation, photoelectric effect, simple quantum mechanical models, bonding in molecules and molecular spectroscopy.

- To explain and compare the basic ideas of Valence Bond Theory and Molecular Orbital Theory and apply LCAO method to hydrogen molecular ion, hybrid orbitals and Huckel MO Theory to simple conjugated systems.
- To describe the fundamentals and applications of electromagnetic spectrum, microwave, infrared, Raman, electronic spectroscopy, photochemistry and third law of thermodynamics and its significance.
- To correlate the relation between physical/magnetic properties with molecular structure and elucidate structure of molecules on its basis.
- To analyze problems and apply the principles/concepts in finding their solutions.

B.Sc. Industrial Chemistry

Programme Specific Outcome (PSO):

Upon completion of B.Sc. Degree Programme (with Industrial Chemistry), the students would be able

- To have a knowledge of history, development, fundamentals and uses of various aspects in Industrial Chemistry.
- To explain the concepts and application of chemistry in various industries.
- To acquaint with the principles/concepts/pre-requisites/management involved in industries.
- To understand the various processes of industries through theory, project and industrial visits.
- To get familiarized with safety measures in laboratory and develop skills in proper handling of chemicals and apparatus/instruments.
- To carry out experiments, record the observations and present the inference/results.

B.Sc. I Industrial Chemistry

Paper- I Industrial Aspects of Organic & Inorganic Chemistry

After completion of the course, the students would be able:

- To understand about IUPAC nomenclature of organic compound, petroleum and natural gases.
- To have a detailed idea about coal - types, properties, distillation and chemicals derived from coal.
- To know about renewable natural resources.
- To learn about basics of metallurgical operations and the physicochemical principles of extraction of important metals.
- To gain insight into industrial importance of inorganic materials - alumina, silica, zeolites, mica, clay and carbon.

Paper-II Industrial Sspects of Physical Chemistry, Material and Energy Balance

After completion of the course, the students would be able:

- To have knowledge of classification, types and properties of colloids
- To gain insight into surface chemistry - surfactants, detergents, micelles and adsorption
- To understand about catalysts and catalysis, types, factors affecting, mechanism, phase transfer catalysis and enzyme catalysis.

- To learn about various dimensions and units used for basic chemical calculations.
- To understand the concept related to material balance for systems with and without chemical reactions.
- To know about energy balance – heat capacity and enthalpy changes in gaseous and liquid systems.

Paper- III Unit Operation in Chemical Industry and Utilities, Fluid Flow and Heat Transport in Industry

After completion of the course, the students would be able:

- To have knowledge of instruments, principles of distillation and procedure involved for separation and apply to industrial processes.
- To gain insight into types of absorbents to be utilized in various types of plants and types of evaporators and its application in various industries
- To understand about filtration methods, filter media and aids, types of filters, drying procedures and their application in various industrie.s
- To learn about types of fuels, its advantages and disadvantages and develop ability to characterize the fuels
- To understand the concept related to fluid flow – types of pumps and its application, types of boilers, its working and importance
- To know about Working, types of heat exchangers, its application and conservation of energy

B.Sc. II Industrial Chemistry

Paper- I

After completion of the course, the students would be able:

- To have basic idea of material science, nature of materials and manufacturing of quality products.
- gain insight into various materials - metals and alloys, cement and ceramics, their properties, applications, manufacturing process and its economic relevance.
- To understand about polymeric material and composites, physico-chemical properties and correlations between structure and properties in polymeric materials with wide industrial applications and composite structures.
- To learn about glasses with one or more components, formation, crystallization, physico-chemical properties, production and applications.
- To acquire basic electrochemical knowledge of corrosion processes, corrosion forms and their repercussions and able to apply corrosion protection measures.
- To gain knowledge of the different types of pollution from industries, their effects, environmental regulatory legislations and standards and evaluation methods.

Paper- II

After completion of the course, the students would be able:

- To understand about unit processes in organic chemicals manufacture involving nitration, nitrating agents, kinetics and mechanism of nitration processes.
- To gain knowledge about halogenation, kinetics, reagents for halogenation, commercial manufacture of chloro-compounds.

- To understand about sulphonation, sulphonating agents, chemical and physical factors, kinetics and mechanism of sulphonation reaction, commercial sulphonation.
- To acquaint with principles and equipments for effluent treatment and waste management.
- To know about filters, precipitators, eliminators, scrubbers, absorbers, solid waste management and industrial safety

Paper- III

After completion of the course, the students would be able:

- To understand about oxidation reaction, oxidising agents, commercial manufacture of important organic compound by oxidation.
- To gain knowledge about hydrogenation reaction, catalysts for hydrogenation, manufacture of organic compounds.
- To understand about esterification and amination reaction and amination by reduction and aminolysis.
- To understand concept of construction, principle and working of temperature and pressure measuring instruments.
- To know about liquid level measurement, density and viscosity measurement

B.Sc. III Industrial Chemistry

Paper- I Chemical Process and Industrial Economics

After completion of the course, the students would be able:

- To gain knowledge of the process of estimating the costs associated with completing a project within scope and according to its timeline.
- To understand about various resources for fixed assets and land and gain knowledge regarding start-up.
- To determining the real value of assets and fixing right price for products.
- To develop ability to calculate profit.
- To learn about management skills and become efficient managers.
- To deal with controlling and regulating the flow of material in relation to changes in variables like demand, prices, availability, quality, delivery schedules etc

Paper- II Pharmaceuticals

After completion of the course, the students would be able:

- To correlate and compare historical background/development of Indian and other important pharmacopoeias and understand formulations/routes of administration/aseptic conditions/sterilization and need for sterilization in pharmaceuticals.
- To describe the manufacture and quality specifications of pharmaceutical excipients/additives and applications of sutures, ligatures in surgical dressing.
- To acquaint with the packaging/ancillary materials, machinery and important legal aspects of food and drugs industry.
- To explain and compare the various statistical tools, testing methods employed for pharmaceutical quality control.

- To understand fundamentals and applications of crystallization, distillation, extraction techniques and various chromatographic techniques like paper HPLC, GLC, TLC, column and ion chromatography for evaluation/identification of crude drugs.
- To describe the principle and applications of UV-Visible, IR, AAS, NMR spectroscopy, Flame photometry, X-Ray Fluorescence and Ion Selective Electrodes in pharmaceuticals.

Paper- III DRUGS

After completion of the course, the students would be able:

- To learn classification of crude drugs and manufacture of sulpha drugs.
- To have knowledge of chemical constitution of plants and isolation procedures for active ingredients for alkaloids.
- To get an introductory idea of Antimicrobial, Analgesic Barbiturates Blockers and Cardiovascular drugs.
- To understand the structure, function, deficiency disease caused by steroidal hormones and vitamins.
- To know about fermentation process and product processing.
- To gain insight into manufacture of antibiotics.

Department of Mathematics

Program outcomes upon completion of the B. Sc. Degree program, the graduate will be able to:

- Persue as higher studies in mathematics in reputed institute of our country like IITs, IESER and central university etc.
- To appear in several competitive examination like CGPSC, UPSC, MAT, Railways, SSC etc.
- To explain the core ideas and the techniques of mathematics at the college and school.
- To develop the logical approach to take decision in complicated decision.

B.Sc. Part-I Mathematics

Paper–I Algebra and Trignometry

After completion of the course, the students would be able:

- To solve linear equation using matrix method.
- To apply Caley Hamilton Theorem for finding inverse of matrix.
- To learn about solution of cubic equation (Cardon Method) and biquadratic equation.

Paper–II Calculus

After completion of the course, the students would be able:

- To apply higher order derivation in order to get expansion of functions (Taylor and Machaurins series)
- To trace various equations by applying concept of asymptotes, nodes, cusps, singular point etc.
- To apply techniques of differential equation in finding general and singular solution.

- To learn geometric meaning of differential equation.

Paper–III Vector analysis and geometry

After completion of the course, the students would be able:

- To learns analytical geometry with the help of vectors.
- To learn application of Gauss Theorem, Stocks theorem in the setting of differential forms.
- To learnsabout various surface represented by general equation of conicoids.
- To learn geometric meaning of differential equation.
- Method of variation of parameters for obtaining solution of given differential equations

B.Sc. Part-II Mathematics

Papert – I Advanced Calculus

After completion of the course, the students would be able:

- To understand concept of convergence of sequence, series and their various properties.
- To learn about continuity, sequential continuity, uniform continuity.
- To learn the application of mean value theorem and its geometrical meaning.
- Understand function of several variables and its partial derivatives.
- To learn application of partial differentiation in obtaining envelops and evaluates of given family of curves.
- To understanding Beta Gamma function and its applications.

Paper – II Differential Equation

After completion of the course, the students would be able:

- To solve Laplace transformation of derivatives and integral, solution of integrals and system of differential equations.
- To learn partial differential equations and its various type, Charpits general method of solutions.
- To learn partial differential equation of second and higher order, Homogeneous and nonhomogeneous equation with constant coefficient, Mobious method.
- To learn series solution of differential equation, series method Bessels and Legendrs function with their properties, Orthogonalityof functions, Legendre polynomial etc.
- To understand variational problem with fixed boundary, Euler equation for functional containing first order derivatives, variational problem with moving boundaries, variational principle of least action.

Paper – III Mechanics

After completion of the course, the students would be able:

- To understand various analytic condition of equilibrium principle of virtual work, catenary.
- To learn forces in three dimensional, poinsot central axis with problem, null lines and planes.
- To understand simple harmonic motion, Velocity and Acceleration along radial and crossradial direction, problem on central orbits.

- To understand Kaplers Law, motion on smooth and rough plane curves, Resisting medium, Motion of particle of varying mass, acceleration in terms of different coordinates.

B.Sc. Part-III Mathematics

Paper – I Analysis

After completion of the course, the students would be able:

- To learn series and their convergence, various test of convergent, Implicit function, Fourier series etc.
- To learn Reimman integration, mean value theorem, Integral as a function of parameter etc.
- To understand concept of complex number, complex valued function, Analytic function, Conformal mapping etc.
- To learn metric spaces, Quasi metric space, Contraction principle, Complete metric space, various types of spaces, viz separable, countableetc.
- To learn sequential compactness, Connectedness etc.

Paper – II Abstract Algebra

After completion of the course, the students would be able:

- To understand Group Automorphism, Sylow's theorems.
- To understand Homomorphism of rings, Idea of Ideals, Euclidian rings, Modules etc.
- To learn Vector spaces its property, Idea of dimension, dimension of sums of subspace.
- To learn Linear transformation with their matrix representation, Rank and nullity, digonalization, bilinear quadratic Hamiltons forms etc.
- To understand Inner product space, Orthogonal vectors, Gram Schmidthorthogonalization process etc.

Paper – III Discrete Mathematics

After completion of the course, the students would be able:

- To understand the concept of directed graphs, connected and strongly connected graphs etc.
- To understand various graphs. Eulerian and Hamiltonian graph with special importance.
- To understand finite state machine and their application.
- To learn discrete numeric function its use in recurrence relation and generating function.
- Application of Boolean algebra in switching circuits.

Department of Botany

Program Specific Outcomes of the B.Sc. Botany

- To provide thorough knowledge about various plant groups from primitive to highly evolved.
- To make the students aware about conservation and sustainable use of plants.
- To address the socio-economical challenges related to plant sciences.
- To facilitate students for taking up and shaping a successful career in Botany.
- To prepare for competitive exams conducted by service commission like UPSC, PSC, IFS etc
- To create foundation for further studies in Botany.

B.Sc. Part-II Botany

Paper – I Plant Taxonomy, Economic Botany, Plant Anatomy and Embryology

After completion of the course, the students would be able:

- Understanding of morphology,and processing and economic value of plant sources of cereals, legumes,spices, oil,rubber, timber and medicines.
- The students will learn about the use of fibre plants, beverages, fruits and vegetables that are integral to day to day life of plants.
- Understand the diversity of angiosperms.
- Understand the distinguishing features of angiosperm families.
- Know the role of Phytochemistry and Numerical taxonomy in classification of plants.
- Students understand how different plant tissue evolve and modify their structure and functions with respect to their environment.

Paper – II Ecology and Plant Physiology

After completion of the course, the students would be able:

- Understand about plants and environment
- Become familiar with community ecology and ecosystem
- Become acquainted with population ecology bio-geographical regions & vegetation type of India Will get knowledge about medicinal plants, fiber , vegetables , oil, spices , rubber yielding plants.
- Know importance and scope of ecology and plant physiology
- Understand the plant and plant cells in relation to water
- Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reaction C3 and 4 pathways.
- Will get the knowledge of respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.
- Learn about the movement of sap and absorption of water in plant body.
- Understand the plant movement Learn and understand about mineral nutrition in plants.

B.Sc. – Part-III Botany

Paper-I Plant Physiology, Biochemistry and Biotechnology

After completion of the course, the students would be able:

- Understand the biochemical nature of cell.
- Know the chemical nature of biomolecules.
- Understand the different types of interaction in Biomolecules.
- Structure and general features of enzymes.
- Concept of enzyme activity and enzyme inhibition.
- Learn about the movement of sap and absorption of water in plant body.
- Understand the movement.
- Understand lipid metabolism in plants.
- Know about photosynthesis and respiration in plants .
- Know about nitrogen metabolism and its importance.
- Understand the fundamentals of Recombinant DNA technology .
- Know about the genetic engineering.
- Understand the principle and basic protocol used for plant tissue culture

Paper-II Ecology and Utilization Of Plants

After completion of the course, the students would be able:

- Understand about plants and environment
- Become familiar with community ecology and ecosystem
- Become acquainted with population ecology bio-geographical regions & vegetation type of India Will get knowledge about medicinal plants, fiber, vegetables, oil, spices, rubber yielding plants.

B.Sc. Part-I Zoology

Paper-I Cell Biology and Invertebrates

After successful completion the student would be able:

- To explain the importance of cell as a structural and functional unit of life and compares between prokaryotic and eukaryotic system
- To understand the structure and function of different cell organelles with cell division and understand the general idea about cellular immunity and cell transformation
- To explain the importance of classification of invertebrate animals and classifies them effectively using the six levels of classification
- To understand the Systematic position, habit and habitat, morphology and various systems in type animals from each phylum of invertebrate
- To comprehend and analyze the adaptive changes that have occurred in invertebrates

Paper-II Chordata and Embryology

Course Outcomes:

After successful completion the student would be able:

- To explain the importance of classification of vertebrate animals and classifies them effectively using the six levels of classification
- To understand the Systematic position, habit and habitat, morphology and various systems in type animals from each phylum of vertebrate
- To comprehend and analyze the adaptive changes that have occurred in vertebrates
- To understand the principles and process of gametogenesis, fertilization and cleavage
- To know the process of differentiation and organogenesis, development of extra embryonic membrane and placenta in mammals

B.Sc. Part-II Zoology

Paper-I Anatomy and Physiology

After successful completion the student would be able:

- To explain the comparative anatomy of various organ systems of vertebrates
- To evaluate the physiological functioning of different organs

Paper-II Vertebrate Endocrinology, Reproductive Biology, Behaviour, Evolution and Applied Zoology

Course Outcomes:

After successful completion the student would be able:

- To understand the hormonal regulation of physiological processes in vertebrates to appreciate the basic concepts of hormonal regulation of reproduction in vertebrates to understand the environmental influence and ecological aspects of behavior to understand

Animal behavior and response of animals to different instincts To understand the scope of aquaculture

B.Sc. Part-III Zoology

Paper-I Ecology, Environmental Biology, Toxicology, Microbiology and Medical Micro Biology

After successful completion the student would be able:

- To understand the basic theories and principles of ecology, ecosystems and their functioning To be aware of toxicants, their impacts on environment and remedial measures To understand the microbial world, its structure and function and to familiarize with the applied aspects of microbiology To make them aware of the pathogens, health related problems, their origin and treatment

Paper-II Genetics, Cell-Physiology, Biochemistry, Biotechnology and Biotechniques

After successful completion the student would be able:

- To get an in depth understanding of human genetics and genetic disorders
- To develop critical thinking, skill and research aptitude in the frontier areas of the biochemistry and biotechnology
- To understand the basic principle applications of analytical and separation techniques.

Department of Geology

B.Sc. Geology

Program Specific Outcomes:

The student graduating with the Degree B.Sc. Geology will be able to:

- Acquire a solid base of knowledge in the science of geology as a whole as well as earth materials, earth history, sedimentation and stratigraphy, deformational processes and structural features, and geomorphic processes and landforms
- Understand the geologic time scale and place important geologic events in a temporal framework
- Demonstrate the ability to use Clinometers and Brunton compass, and images in geological investigations
- Understand the pathways and influence of water and other fluids at Earth's surface and in the subsurface
- Interpret topographic maps and terrain models and create profiles
- Interpret geologic maps and construct cross sections from them
- Distinguish between various structural features and determine the types of stress responsible for their formation
- Describe and interpret types of surfacial deposits and landforms
- Apply principles of mathematics, chemistry, and physics to geologic problems
- Develop proficiency in oral and written communication of geologic concepts.

B.Sc. Part – I Geology

Paper-I Geodynamics & Geomorphology

On completion of Course, the students will be able to:

- Discuss about basics of Geology, Solar system and Atmosphere
- Evaluate the Theories of Origin of Earth and Age of the Earth

- Demonstrate the Geological time scale and internal structure of the Earth
- Explain the agents of weathering and its products
- Discuss the theory of plate tectonics and demonstrate the causes of Earthquakes and volcanoes.
- Outline about the concept of geomorphology and geological work of wind
- Demonstrate the landforms created by river and lakes.
- Evaluate the landforms created by Groundwater and describe about drainage pattern
- Explain about the landforms developed by glaciers
- Describe the geological work of sea.

Paper-II Mineralogy and Crystallography

The students will be able to:

- Identify the physical and chemical properties of the minerals
- Explain about verities of minerals in Quartz and Feldspar Groups
- Demonstrate minerals in Pyroxene Groups.
- Classify the minerals in Amphibole, Olivine, Mica, Garnet minerals.
- Identify the Optical Characteristics of various Minerals.
- Explain about the basics of crystallography, various crystal forms, Crystallographic Axis and symmetry elements
- Differentiate Isometric and Tetragonal crystal forms.
- Identify and describe the Hexagonal, rhombohedral and mineral forms
- Identify the Orthorhombic, Monoclinic and triclinic crystal forms.
- Describe about Twinning in crystals.

Geology Lab Course

The students will be able to:

- Identify the megascopic properties of Quartz and Feldspar group of minerals
- Outline the megascopic properties of pyroxene group of minerals
- Demonstrate the megascopic properties of Amphibole group of minerals
- Describe the megascopic properties of olivine and Mica group of Minerals.
- Describe about Microscopic identification of minerals.
- Identify the various crystal Systems and Symmetry through crystal models
- Assess the miller Indices of the crystal models
- Identify Twining in crystals.
- Identify and describe various landforms in geomorphologic models.
- Interpret topographical maps

B.Sc. Part – II Geology

Paper-I Petrology

The students should be able to

- Discuss about the formation of igneous rocks, their texture and structures
- Explain about forms and classification of igneous rocks
- Identify, describe and classify sedimentary rocks using hand specimens
- Describe the formation of sedimentary rocks, their textures and structures
- Explain about the formation of metamorphic rocks, their texture and structure
- Identify and classify various types of metamorphic rocks.

- Explain the concept of metamorphic facies, ACF, AKF and AFM diagrams

Paper-II Structural Geology

The students will be able to:

- Explain about parts of fold and classify various folds
- Recognize and classify the faults in the field and on geological map
- Identify and classify Unconformities
- Discuss about various types of Joints
- Demonstrate the origin of foliation and lineation
- Identify the top and bottom of rock beds in a series of rocks

Lab Course

The students will be able to:

- Analyze the contour maps and assess the strike and dip using Clinometers and Brunton compass
- Compute the thickness of the outcrops
- Identify the true and apparent dip through trigonometrical calculation and graphical method
- Construct geological cross section from given geological map
- Identify igneous, sedimentary and metamorphic rocks in hand specimen
- Describe microscopic properties of igneous, sedimentary and metamorphic rocks

B.Sc. Part – III Geology

Paper-I: Earth Process and Resources

Paper the students will be able to:

- Explain about the formation of mineral deposits
- Demonstrate the distribution of mineral resources.
- Discuss the Classification of the mineral deposits
- Outline the various mineral resources of India
- Explain about the mineral policies of India.
- Understand about the origin, occurrence and properties of Coal
- Discuss the age and occurrences of the coal
- Explain about the petrography of Coal
- Outline the origin and occurrences of the Petroleum

Paper-II: Natural Environment, Remote sensing, Groundwater and Mineral Exploration On completion of Course

The students will be able to:

- Understand the basics of Environmental Geology and Natural Disaster Management
- Evaluate the impact of human activities on soil, groundwater and other natural resources
- Describe about the basic principles of Geophysics and its application.
- Explain the field procedure and interpretation of geophysical data for groundwater exploration.
- Explain the various geological methods of Mineral exploration
- Describe geophysical methods of mineral exploration
- Understand the methods of groundwater exploration
- Outline the basics of engineering geology and its applications.

- Understand the occurrence and availability of groundwater resources and the role of the hydrologic cycle
- Explain fundamentals of Aerial photographs and Satellite Imageries and application of remote sensing in geological studies.

Lab Course

The students will be able:

- Identify ore forming minerals in hand specimen.
- Demarcate ore deposits and economic mineral deposits in Outline map of India.
- Estimate the ore reserves from the given data.
- Interpret aerial photographs with the help of stereoscope.
- Visually interpret satellite Imageries.
- Construct and interpret water table maps on the basis of given data

Department of Microbiology

Programme Specific Outcomes (PSOs)

By the end of this programme, the students will be able to:

1. **Understand the contribution of various scientists and scope of different branches of microbiology**
2. **Recognize various kinds of prokaryotic and eukaryotic microbes and their importance**
3. **Explain and describe importance of organic compounds and their chemistry**
4. **Make clear the structure of DNA, RNA and Protein**
5. **Understand the physiological behavior of microorganisms**
6. **Comprehend the importance of instruments and techniques in microbiology**
7. **Value the nature of macromolecules**
8. **Know the Environmental and Medical insight of microorganisms**

B.Sc. Part-I

Course Outcomes

Paper – I General Microbiology and Basic Technique

Upon successful completion of the course students will be able

- To learn history, development and fundamentals of microbiology
- To understand basic techniques to study microorganisms
- To get information about different branches of microbiology
- To acquire awareness about the life cycle of significant individuals
- To gain the knowledge of economic importance of microorganisms

Paper – II Biochemistry and Physiology

Upon successful completion of the course students will be able –

- To be familiar with structure and functions of main building blocks of life
- To learn about structure, types and functions of DNA and RNA
- To know the role of catalysts in vital activities
- To get overview of microbial metabolism
- To grasp the mechanism of microbial growth and nutritional transport for growth

Lab Course 01

Upon successful completion of the lab course students will be able –

- To be familiar with common laboratory tools and techniques of microbiology

- To understand the methods of obtaining microorganisms under lab conditions forϖ study
- To differentiate microorganisms on the basis of microscopic features
- To retain information regarding the properties of biochemical compounds and their detection in biological system
- To study the production of enzymes and their role

B.Sc. Part-II

Paper – I Molecular Biology and Genetic Engineering

Upon successful completion of the course students will be able –

- To be trained with the fundamentals of molecular biology
- To understand the central dogma of protein synthesis
- To study the alteration, repair and regulation of gene
- To gain knowledge of genetic database
- To get approach of genetic modifications and its detectionϖ

Paper - II Bioinstrumentation and Biostatistics

Upon successful completion of the course students will be able –

- To be aware of different types of microscope and their applications
- To understand the instruments used for separation and analysis of bio-molecules
- To get an overview about the concept of biostatistics
- To know the methods of analysis of quantitative data

Lab Course 02

Upon successful completion of the lab course students will be able –

- To understand the fundamental genetic properties of microorganisms
- To learn the genetic modification practices in microorganisms and their detection
- To perform the experiments based on analytical instruments
- To separate bio-molecules and study their properties
- To understand the behavior of genetic material under laboratory conditions

B.Sc. Part-III

Paper – I Molecular Biology and Genetic Engineering

Upon successful completion of the course students will be able –

- To be trained with the fundamentals of molecular biology
- To understand the central dogma of protein synthesis
- To study the alteration, repair and regulation of gene
- To gain knowledge of genetic recombination

Paper – II Environmental and Medical Microbiology

Upon successful completion of the course students will be able –

- To be trained with the fundamentals of environmental microbiology
- To understand the soil, water, food and air microflora
- To study the concept of industrial microbiology
- To gain knowledge of waste treatment

Lab Course 03

Upon successful completion of the lab course students will be able –

- To gain practical knowledge about molecular properties of protein and DNA
- To recognize aeromicroflora of the area

- To be able to assess potability of water
- To identify with soil microflora
- To find out biofertilizer organisms from soil

B.Sc. Part –I Biotechnology

Paper – I Biochemistry, Biostastics and Computers

Upon successful completion of the lab course students will be able –

- The outcome of course will be understanding of biochemical process, validation of data and application of computer for understanding of life.
- Learning Outcome – The student will learn about validation of data by statistical application and computation of data by computer application.

B.Sc. Part-2 Biotechnology

Paper– I Molecular Biology and Biophysics

Upon successful completion of the lab course students will be able –

To understand about gene structure & functions and application of physics in biological science. Learning Outcome – The student will learn about behaviour of gene and operation of various instruments.

Paper – II Recombinant Dna Technology

Upon successful completion of the lab course students will be able –

To understand applications of recombinant DNA technology. Learning Outcome – The student will learn about restriction enzyme, cDNA library, monoclonal antibody, DNA fingerprinting etc.

B.Sc. Part -3 Biotechnology

Paper – I General Biotechnology

Upon successful completion of the lab course students will be able –

To inherit information's about broader application of biotechnology. Learning Outcome – Student will learn about tissue culture, molecular marker, environmental process and fermentation process.

Paper – II Immunology

Upon successful completion of the lab course students will be able –

In this course student will understand various aspect of immunological process. Learning Outcome – The student will learn about antigen-antibody, cell mediated immunity and pathogenicity due to autoimmunity.

B.Sc./B.A.-I, II, III Anthropology

Program Specific Outcomes of Anthropology:

- The program outcomes are specific enough to explain how those broad expectations are accomplished within a given program, and course outcomes will specify what expectations an instructor has for the course, which are related to one or more program outcomes

Çgnh foHkkx

ikBîØe vfèkxe ifj.kke ¼Lukrd½

ch-,-@ch-,lh-@ch-d,e- Hkkx&l

ikBîØe dkM %

bl ikBîØe dk i.k dju d i'pkr fo|kFkÊ

- Çgnh e ç;ktukRed rFkk dk;'khy Hkk"kk d çfr ltx gkxA
- Hkk"kk&lcèkh lHkkfor v'kf);k l ifjfpr gk ldx rFkk ekud Hkk"kk dk 0;ogkj dju e l{ke gk ldxA
- noukxjh fyfi dh oKkfudrk rFkk dl;Vj e mld vuç;kx l ifjfpr gk ldxA
- Çgnh lkfgR; d iBu&ikBu d çfr #fp tkxr gk ldxhA
- NÙkh lx< dh LFkkuh; lL—fr vkj mld oHko l ifjfpr gk ldxA

ch-,-@ch-,lh-@ch-d,e Hkkx&ll

ikBîØe dkM %

bl ikBîØe dk vè;;u dju d i'pkr fo|kFkÊ

- Lor=rk lxke d opkfjd ifjç{; vkj egki#"kk d Çpru d fo"k; e tku ldxA
- Hkkjro"k d lkL—frd vrhr vkj ijEijk d fo"k; e tku ldxA
- ç;ktukRed Hkk"kk dh lkekU; tkudkjh vkj le> fodflr dj ldxA
- Çgnh dh 0;kdj.k dh dkfV;k dk Kku çkIr dj ldxA
- lVhd vkj funk"k Çgnh Hkk"kk fy[ku dk dk'ky lh[k ldxA

ch-,-@ch-,lh-@ch-d,e Hkkx&lll

ikBîØe dkM %

bl ikBîØe dk vè;;u dju d mijkr fo|kFkÊ dk

- Çgnh d lkfgR; l lkekU; ifjp; gk ldxkA
- Hkkjr dh lekftd&vkËFkd leL;kvk rFkk lex jk"Vh; fodkl dh j.kuhfr d fo"k; e Kku fodflr gkxkA
- Çgnh e vfHk0;fä dh i)fr;k l ifjp; gkxk rFkk mld lEç"k.k&dk'ky e ofèn gk ldxhA
- dkedkth Hkk"kk fy[ku dk dk'ky fodflr gk ldxkA
- Hkkjrh; lL—fr d leUo;kRed LoHkko d çfr foÜokl tkxr gk ldxkA

ch-,- Hkkx&l] Çgnh lkfgR;

çFke ç'ui= ½**çkphu Çgnh&dk0;**½

ikBîØe dkM %

bl ikBîØe dk vè;;u dju d mijkr fo|kFkÊ

- eè;dkyhu lkfgR; l vkjfHkd ifjp; çkIr dj ldxA
- eè;dkyhu Çgnh dk0;&Hkk"kk l ifjfpr gk ldx
- Çgnh dh lkfgfR;d ijijk dk vkjfHkd Kku çkIr dj ldx
- Hkkjrh; lL—fr] fo'k"kr% Hkfä;xhu lL—fr d leUo;kRed LoHkko d çfr lonu'khy gkxA
- Çgnh dh Hkfä;xhu lkfgfR;d fojkIr l d çfr xkjo dk vuHko dj ldxA

f}rh; ç'ui= ½**Çgnh dFkk lkfgR;**½

ikBîØe dkM %

bl ikBîØe dk vè;;u dju d mijkr fo|kFkÊ

- Çgnh dFkk lkfgR; d Øfed fodkl dh tkudkjh çkIr dj ldxA
- çepn d vk[;ku&dk'ky vkj mudh lkekftd lonu'khyrk l ifjfpr gk ldxA
- Çgnh e dgkuh foèkk d Lo:i dk Kku vkj mld lkn; dk vkLokn çkIr dj ldxA
- dFkk&lkfgR; d çfr #fp fodflr dj ldxA
- dFkk&Hkk"kk dh ckjhfd;k dk le> ldxA

ch-,- Hkkx&II] Çgnh lkfgR;

çFke ç'ui= ¼vokphu Çgnh&dk0;½
ikBîØe dkM %
bl ikBîØe dk vè;;u dju d mijkr fo|kFkÊ dk
- Çgnh dh vkèkfud dfork d fodkIØe d fo"k; e lkekU; tkudkjh gk ldxhA
- Nk;kokn d dk0;kRed lkn; dk le>u dh –f"V vkj çj.kk çkIr gk ldxhA
- Nk;koknkÙkj dk0; d jk"Voknh Loj dk le>u e lgk;rk fey ldxhA
- ç;kxoknh dfork dk le>u d l= çkIr gk ldxA
- Çgnh&dfork d çfr #fp d ifj"dkj dh –f"V vÆtr dj ldxA

f}rh; ç'ui=] ¼Çgnh fucèk rFkk vU; x|&foèkk,½
ikBîØe dkM %
bl ikBîØe dk vè;;u dju d mijkr fo|kFkÊ
- Çgnh&x| d opkfjd vkj lkn;kRed i{k l ifjfpr gk ldxA
- Çgnh&ukVd d vkjfHkd nkj e mld mifuo'k&fojkèkh LoHkko d ckj e tku ldxA
- Çgnh&,dkdh d fo"k; e vkjfHkd Kku çkIr dj ldx
- Çgnh&fucèk d Lo:i vkj lkn; l ifjp; gk ldxk
- x|&lkfgR; vkj mldh ijEijk d çfr #fp fodflr dj ldxA

ch-,- Hkkx&III] Çgnh lkfgR;

çFke ç'ui= ¼tuinh; Hkk"kk&lkfgR;] NÙkh lx<h½
ikBîØe dkM %
bl ikBîØe dk vè;;u dju d mijkr fo|kÆFk;k e
- NÙkh lx<h Hkk"kk ,o lL—fr d çfr vfHk#fp vkj ltxrk fodflr gkxhA
- NÙkh lx<h lkfgR; dh fofHkUu foèkkvk dk ifjp; çkIr gk ldxkA
- NÙkh lx<h lL—fr d LoHkko d fo"k; e lkekU; le> fodflr gk ldxhA
- NÙkh lx<h e uohu lkfgfR;d foèkkvk d fodkl dk lE;d Kku çkIr gk ldxkA
- NÙkh lx<h lL—fr d çfr lEeku dk Hkko mRiUu gkxkA

f}rh; ç'ui= ¼Çgnh Hkk"kk&lkfgR; dk bfrgkl rFkk dk0;kx&foopu½
ikBîØe dkM %
bl ikBîØe dk vè;;u dju d mijkr fo|kFkÊ
- Çgnh&Hkk"kk dh mRifÙk rFkk mld ,frgkfld fodkl dk lefpr Kku çkIr dj ldxA
- Çgnh&Hkk"kk d fofoèk :ik d 0;kogkfjd rFkk vuç;kxkRed i{k dk lE;d Kku çkIr dj ldxA
- Çgnh lkfgR; d ,frgkfld fodkIØe l ifjfpr gk ldxA
- Çgnh&lekt d lkekftd&lkL—frd fodkl d lekukrj Çgnh&Hkk"kk vkj lkfgR; d fodkl&Øe dh le> çkIr dj ldxA
- dk0;&ltu d l)kfrd rFkk 'kkL=h; Lo:i l ifjfpr gk ldxA

English Language
B.A./B.Sc./B.Com./BCA. Part -I, II, III

Programme Specific Outcome :

- To equip the learner with knowledge of English as a world language
- To speak and write accurately in variety of contents and genres
- To create a discreet mind

B.A. Part-I, II, III

Paper-I & II

Course Outcome:

acquaints the student with

- Four genres of literature, literary and historical events.
- Pre and Post independent India
- Human Values , Professional Ethics ,Gender Issues and Environmental Concerns

Program Specific Outcome Graduation
B.A. Economics

students learn the basic concepts of micro economics and macro economics which makes the base of all the economic studies. They get to learn about the Indian economy, different patterns of consumption ,production and distribution in the economy. Students also learn about the different levels and status of agricultural economics, poverty and employment in the country.they get to learn about the policies and programmes of the government for the welfare of the society through welfare economics concept.papers like environmental economics which add value to their education .they get to know about the different concepts related to the environment and the importance of sustainable development.

Subject Combination Outcome Graduation:

1) Economics, Hindi Literature, Geography

The combination of above subject is very important. In Economics students learn the basic concepts of micro economics and macro economics which makes the base of all the economic studies. They get to learn about the Indian economy, different patterns of consumption ,production and distribution in the economy. Students also learn about the different levels and status of agricultural economics, poverty and employment in the country. They get to learn about the policies and programmes of the government for the welfare of the society through welfare economics concept. Papers like environmental economics which add value to their education. they get to know about the different concepts related to the environment and the importance of sustainable development. Geography gives them opportunity to learn about the geographical structure of the country and the world. They get to know about the availability of the natural resources in difeerent parts and hence know the reasons for their economic strength.a student who learns both the subject can easily relate the geography of the nation to its economy. The knowledge of hindi helps the student to make a strong base to communicate and share their knowledge with the world.

2) Economics, Hindi Literature, Sociology

The combination of above subject is very important. In Economics students learn the basic

concepts of micro economics and macroeconomics which makes the base of all the economic studies. They get to learn about the Indian economy, different patterns of consumption ,production and distribution in the economy. Students also learn about the different levels and status of agricultural economics, poverty and employment in the country. They get to learn about the policies and programmes of the government for the welfare of the society through welfare economics concept. Papers like environmental economics which add value to their education. they get to know about the different concepts related to the environment and the importance of sustainable development. Sociology is the study of the society and its social institutions. This subject gives them opportunity to learn about the social structure of the country and the world. They get to know about the behavior of the individual and the people and hence know the reasons for their strength and capacity and hence the economic strength of the country as a human capital.a student who learns both the subject can easily relate the society of the nation to its economy. The knowledge of hindi helps the student to make a strong base to communicate and share their knowledge with the world.

3) Economics, Hindi Literature, Political Science

The combination of above subject is very important. In Economics students learn the basic concepts of micro economics and macro economics which makes the base of all the economic studies. They get to learn about the Indian economy, different patterns of consumption ,production and distribution in the economy. Students also learn about the different levels and status of agricultural economics, poverty and employment in the country. They get to learn about the policies and programmes of the government for the welfare of the society through welfare economics concept. Papers like environmental economics which add value to their education. they get to know about the different concepts related to the environment and the importance of sustainable development. Political Science is the study of political structure of the country and the different parts of the world. Any economy is stable when its political situation is stable so the political understanding gives them opportunity to learn about the political structure of the country and the world. They get to know about the reasons behind the political stability and instability in different parts and hence know the reasons for their economic strength.a student who learns both the subject can easily relate the political situation of the nation to its economy. The knowledge of hindi helps the student to make a strong base to communicate and share their knowledge with the world.

4) Economics, Political Science and Sociology

The combination of above subject is very important. In Economics students learn the basic concepts of micro economics and macro economics which makes the base of all the economic studies. They get to learn about the Indian economy, different patterns of consumption ,production and distribution in the economy. Students also learn about the different levels and status of agricultural economics, poverty and employment in the country. They get to learn about the policies and programmes of the government for the welfare of the society through welfare economics concept. Papers like environmental economics which add value to their education. they get to know about the different concepts related to the environment and the importance of sustainable development. Political Science is the study of political structure of the country and the different parts of the world. Any economy is stable when its political situation is stable so the political understanding gives them opportunity to learn about the political structure of the country and the world. They get to know about the reasons behind the political stability and instability in different parts and hence know the reasons for their economic strength.a student who learns both the subject can easily relate the political situation of the nation to its economy. Sociology is the study of the society and its social institutions. This subject gives them opportunity to learn about the social structure of the country and the world. They get to know about the behavior of the individual and the people and hence know the reasons for their strength and capacity and hence the economic strength of the country as a human capital.a student who learns both the subject can easily relate the society of the nation to its economy. A combination of all the three subjects gives a complete

learning of the economy of the country with its geographical structure and social needs.

5) Economics, Political Science and Geography.

The combination of above subject is very important. In Economics students learn the basic concepts of micro economics and macro economics which makes the base of all the economic studies. They get to learn about the Indian economy, different patterns of consumption ,production and distribution in the economy. Students also learn about the different levels and status of agricultural economics, poverty and employment in the country. They get to learn about the policies and programmes of the government for the welfare of the society through welfare economics concept. Papers like environmental economics which add value to their education. they get to know about the different concepts related to the environment and the importance of sustainable development. Political Science is the study of political structure of the country and the different parts of the world. Any economy is stable when its political situation is stable so the political understanding gives them opportunity to learn about the political structure of the country and the world. They get to know about the reasons behind the political stability and instability in different parts and hence know the reasons for their economic strength.a student who learns both the subject can easily relate the political situation of the nation to its economy. Geography gives them opportunity to learn about the geographical structure of the country and the world. They get to know about the availability of the natural resources in difeerent parts and hence know the reasons for their economic strength.a student whop learns both the subject can easily relate the geography of the nation to its economy. The knowledge of hindi helps the student to make a strong base to communicate and share their knowledge with the world. A combination of all the three subjects gives a complete learning of the economy of the country with its geographical and political structure.

Department of Sociology
Programme Specific Outcomes

Sociology seeks to understand all aspects of human social behavior, including the behavior of individuals as well as the social dynamics of small groups, large organizations, communities, institutions, and entire societies. Sociologists are typically motivated both by the desire to better understand the principles of social life and by the conviction that Understanding these principles may aid in the formulation of Enlightened and effective social policy. Sociology Provides an intellectual background for students considering careers in the professions or Business.

Outcome for Sociology: **Meaning, Nature, Scope, Subject Matter and Signification Basic Concept: Society, Community, Institution, Association, Group, Status and Role**

POS 2: Contemporary Indian Society (B.A. part-I, Paper-II)

- Every society has its own peculiar structure and there are some institutions universal to every society, but with their unique manifestations in each society.
- There are some change agents and initiatives that enable the society to change with the passage of time.
- This paper focuses on the structure of the Indian society and the changing aspects with the processes operating, change agents and initiatives

Objectives: After studying the Contemporary Indian society, the student can Get an impression about the basic composition of Contemporary Indian society, its historical moorings, basic Philosophical foundations of the society and the institutions.
Learn about the changing institutions, the processes, the agents and the interventions that bring about change in the Indian society.
Learn about the concept and effects of Dowry, Domestic Violence and Divorce on society
Learning Outcomes: This paper is
expected Bring familiarity in a student about Indian society. It will present a Comprehensive, integrated and empirically –based
Profile of Indian Society. It is hoped that the structure and processes operative in the society, the change agents operating in Indian society
Presented in this Course will also enable students to gain a better understanding of their own situation and region.

Crime and Society (B.A. Part-II, Paper-II)

Social Research Method, Paper-II

Outcomes Contemporary Indian Society (BA Part-I, Paper-II):

- Classical View about Indian Society: Verna, karma, Ashram, Dharma and Purusharth
- The Structure and Composition of Indian Society: Structure: Village, Town. Cities. Urban- Rural Linkage Composition: Tribe, Dalit.
- Women & Minorities.
- Basic Institution of Indian Society: Caste System, Joint Family. Marriage and changing dimensions
- Guidelines of IQAC and submission of AQAR for Autonomous Colleges Page 5
- Familial Problems: Dowry, Domestic Violence, Divorce, Intra-Intergenerational conflicts, Problem of elderly
- Social Problems: Surrogated motherhood, Live in Relationship, Regionalism, Communalism, Corruption, Youth Unrest

Sociology of Tribal society (B.A. Part-II/III, Paper-I):

- The concept of tribe Characteristic of Tribal Society, Distinction of Tribe and caste
- Classification of Tribal peoples Food gatherers and hunters, Shifting cultivates, Nomads, Peasants, settled Agriculturist,Artisans,
- Socio -cultural Profile: Kinship, Marriage and Family, Religions beliefs Cultural traditions
- Social Mobility and change sensitization, Scheme of Tribal Development, Various Tribal Movement
- Problems of Tribal People: Poverty Illiteracy, Indebtedness, agrarian issues, exploitation study of tribal immunities in Chhattisgarh with special reference to “Oraon” “Kanwar” and “Gond”

B.A. Part-I, Political Science

Paper-I Political Theory
Course Outcomes:

Theory is the starting point of any social sciences that is why political theory is almost universalin B.A. Part-1, syllabus of political sscienc. proposed course acquittance to the students with

- Fundamental theories of political science.
- Basic Knowlegde of important concepts such as Liberty, Justice, Citizenship, Representation, rule of law etc .
- Role of politucal theory to understand political science and political life as well.

Paper-II Indian Government and Politics.

Proposed course acquaints the students with values and struggle of national movement . Explains costitutional development as back drop of Indian cosntituion . This course makes students familier with knowledge and execution of Indian constitution and political system .

Programme Specific Outcomes:

Unit-1 Explains the values and impotance of freedom struggle and constitutional development in the making of Indian constitution and evolutution of our democratic system and substantive democracy .

Unit-2 Learning out come is related to the basic fetures , fundamental rights , directive principles of state and amendment process of the constitution .

Unit-3 Explains the costitutional provisions and functioning of union executive and legislature.

Unit-4 Explains the constitutional plan of Judicial system of the country and state executive.

Unit-5 Explains very vibrant topics . From State legislature to election commission of India. It also explains executional outcomes of electoral democratic process like cast-politics interaction , communalism etc .

B.A. Part –II, Political Science

Paper-I Western Political Thought

Course Outcomes:

Political philosophy is base of political science . All concepts discourse and ideologiese come from the classics of political masters from Socretesto Marx and recent times . Therfore purpose of this course to acquaints the students to the political philosophers and their political philosophiese .

Programme Specific Outcomes:

Unit-1 Explains the ancient political philosophy given by founding fathers of political thought great Plao and Aristotle

Unit-2 This unit makes students familier to modern age of political philosophy . Emergence of nation state and soveriegnty in mechiaveli and hobes philosophy . Emergence of individualism and liberalism in Hobbes and John Lock’s philosophy . Social contract theory .

Unit-3and4 Explains the emergence of utilitarianism , Idealism and Marxism through their respective philosophers. Negative and positive liberty of Mill and Green ,idealism of kant and Hegel and Scientific Socialism of Marx .

Unit-5 Explains the political philosophy of ancient India and modern Indian thinkers . State and individual , role of state , from ancient India and socio-political thought Gandhi and Ambedkar.

Paper-II Comparative Government & Politics

Course Outcomes:

Comparative analysis is old but comparative politics is politics science of 20th century . Therefore this course make focus on

- Emergence of scientific and empirical study in late 19th andearly 20th century in political science .
- Contribution of David easton and Almond for developing new approaches and theories like system approach .
- Different types of governance and their comparative study . America as presidencial form , UK as parliamentary form, Switzerland as plural form and China as totalitarian form .

Programme Specific Outcomes:

Unit-1Explains the major provisions of constitution of America .

Unit-2Explains the major provisions of constitution of Britain .

Unit-3Explains the major provisions of constitution of switzerland.

Unit-4Explains the major provisions of constitution of China.

Unit-5Learning outcome of this unit is related to the basic knowledge of scientific and interdisciplinary study advocated by David easton and his colleagues. Behavioural revolution and system approach .

B.A. Part-III, Political Science

Paper-I International Politics

Course Outcomes:

The objectives of the course are

- To acquaints the students to the basics of international politics .
- To provide students the knowledge of theories of international politics
- To provide students thenkowledge of foreign policy and issues related to it's execution .

Programme Specific Outcoms:

Unit-1 & 2 Explains the concept and aproaches of international politics.

Unit-3 & 4 are related to the learning outcome of theoretical aspects of foreign policy execution of international politics likeconcepts of power, balance of power, diplomacy , disarmament etc .

Unit-5 Brings the political aspects of environmentalism, globalisation, and human right

Paper-II Public Administration

Course Outcomes:

Public Administration is new subject , only a century and few decades old . It is related to the welfare role of state . That is why it deals the problems and expertise related to the policy formation and execution . The course has main objective to make familier to the students to basic concepts of theoretical and practicle aspects of public administration .

Programme Specific Outcomes:

Unit-1 Explainsothe knowledge of basic Concept and approaches of public administration .

UNIT-2&3 Prrovides the nkowledge of theoretical aspects of public adminstrationlike theoriese of organisation and management .

UNIT-4&5 Provides the knowledge of practicle part of public administration like bureaucracy, budget administratio and control over administaration .

DEPARTMENT OF HISTORY

B.A. Part-I

Paper-I History of India from the Beginning to 1206 A.D.

Outcomes:

- This course will help student to understand the importance of sources in history, and students will able to cite desired sources in Indian history as well, it will also help them in different exams.
- To understand the significance of Jainism and Buddhism.
- Evaluate relevance of MouryanArt , Architecture, and Dhamma.
- Inspect history of regional kingdoms.
- Review the History of Chhattisgarh

Paper-II History of World from 1453 to 1890 A.D.

Outcomes:

- Student will understand the importance of Renaissance.
- Student will know importance of Industrial Revolution.
- Review Napoleon era.
- Evaluate eastern question.
- Check Impact of policies of Bismarck.

B.A. Part-II

Paper-I History of India 1206to 1761A.D.

Outcomes:

- Review the sources of Sultanate and Mughal period.
- Student will be able to do critical analysis of socio-economic conditions of this time period.
- Student will able to differentiate between Bhaktism and Sufism.
- Review the Vijaynagara Dynasty.
- Student will know administration of Shivaji and they can analyse Maratha rule in Chhattisgarh.

Paper-II History of World from 1789 to 1871 A.D.

Outcomes:

- Student can understand modernization of Japan and Impact of maize Reforms.
- Identifying Communism in China.
- Evaluating the First World War.
- Analysing long term effects of second world war.
- It will help them to Know Panchasheel theory.

B.A. Part-III

Paper-I History of India From 1761 to 1950 A.D.

Outcomes:

- Understanding the British expansion in India.
- Examine different land revenue systems
- Review the Indian Renaissance and its Impact
- This course Aims at analysing significance of Govt. Of India Act 1935.
- Learn the legacy of British Rule in India.

Paper-II History of World from 1871 to 1945 A.D.

Outcomes :

- Know the legacy of third Republic of France.
- This course will give students a basic understanding of background of First world War that in some way how it was result of policies of William II.
- Evaluating Russian Revolution.
- Comparison between Nazism and Fascism, it will give better understanding to students that How they effected world polity.
- Evaluating UNO and its achievements ;this will help them to analyse the current situation regarding world .

Department of Psychology

Program Specific Outcomes:

- Program Outcome of Bachelor of Arts (B.A.), Psychology Students are expected to quality teaching which help them in their future life to achieve the expected goals.
- Program also provide to platform to UG students for development Human values, Social Responsible and Creative ability

B.A. Psychology

Program Specific Outcomes:

- Enhancement of life and stress management skills.
- To measure intelligence, deprivation, depression, attitude, aptitude, interest, adjustment, skills etc. within the subject and client.
- Introduction to behavior therapy and techniques.
- Illustration and understanding of mental health disorder

B.A. Psychology syllabus includes six papers from six areas along with test and experiments of psychology. Each paper has specific outcomes. These are:

B.A. Part-I Psychology

Paper-I Basis Psychological Process of Psychology:

- Making familiar with the basic processor of Psychology.
- Making familiar with perception, attention and sensation.
- Acquaintance with memory and forgetting processes.
- Acquaintance with intelligence, motivation and emotions.
- Acquaintance with Personality and motivation.

Paper –II Psychopathology:

Course Outcome:

- Getting acquainted with field of psychopathology.
- Understanding abnormal behavior.

- Acquaintance with models of abnormality.
- Knowing about the nature, types and perspectives of Anxiety and disorders of childhood and adolescence.
- Knowing about the nature, types and perspectives of neuro-psychosis like Anxiety and mood disorders.
- Knowing about the nature, types and perspectives of psychosis like schizophrenia.
- Understanding the stress and its effect.
- Understanding the therapy for treatment psychological problem.

B.A. Part-II, Psychology

Paper – I Social Psychology

Course Outcome:

- Understanding the social process.
- Understanding the approaches of social psychology.
- Acquaintance with the pro-social behavior.
- Understanding the social, person and self perception.
- Understanding the social process.
- Understanding the attitudes, stereotypes and prejudice.
- Acquaintance with the leadership.
- Acquaintance with the knowledge of Interpersonal Attraction
- Understanding the Processes of Aggression.
- Acquaintance with the social issues like child labor.

Paper – 2 Psychological Assessment:

Course Outcome:

- Understating the Psychological tests.
- Getting acquainted with test construction.
- Imparting the knowledge and skills for administering psychological tests and writing their reports.
- Understating the use of Psychological tests in different field.

B.A. Part-III, Psychology

Paper-1 Psychological Statistics:

Course Outcome:

- Understanding the psychological statistics and uses of statistics in psychology.
- Knowing about the nature of score and variables.
- Knowing about the central tendencies and variability.
- Understanding the correlations.
- Getting acquainted with t-test.
- Understanding the non-parametric test like chi-square test.

Paper-II Developmental Psychology:

Course Outcome

- Understanding the beginning process of life.
- Understanding the self identity.
- Knowledge about the Prenatal, Infancy and childhood developmental Processes.

- Understand the Cognitive, Co- native and Behavioral processes of Adolescence, early Adulthood, Middle Adulthood and Late Adulthood.

Course Outcomes:

- Students will be understood socio-cultural diversity and individual differences.
- Students will be able to apply fundamental methods of psychology.
- Students will be learnt about basic knowledge of the social psychology, psychopathology, psychological assessment and psychological statistics in the life and public domain.
- Students will demonstrate effective written and oral communication before the public. Students will be understood the observation of behaviors.

Department of Sanskrit

B.A. Sanskrit

Impact of the Course:

- The Syllabi designed for B.A. Program is intended to trains the imagination and capacity to think critically and creatively about the world and their own country through the study of poetry, prose, dramatic, linguistics, narratology, and aesthetics in Malayalam Language and Literature.
- B.A. Sanskrit program tries to make the student community to study Post Colonial Theories of Literature as well as Cultural Studies, World Poetry, Epistemology, Sanskrit Language and Literature, and Eco-Criticism. In the First Year student sample a wide variety of literature and cultural theory and develop a solid basis of knowledge and skill which they then build on in years of two and three.
- The varied fact in curriculum encourage engagement with significant range of literacy non-literacy genres, including firm, theatre and popular art form which may lead our students towards universal concept. The character making and responsibility making syllabi develops student power of critically or analytical thinking alongside and appreciation of crafting of written utterances and enabling them to carry the quality of response into future reading.
- The program employs a variety of forms of assessment and includes unseen and revealed written course work essay, seminars, workshops, research reports, oral presentations. So the program can develop skill for employment future study both discipline related and transformable.

Course Outcomes of B.A. Sanskrit Programme

B.A. Part-I, Sanskrit

Paper-I Drama, grammar and translation

Unit - I

Swapnavasvadatam is the famous work of Sanskrit literature

Through this, students will be able to understand the ancient theatrical tradition of India

The play is written in simple Sahaj Pranjal language which will make students successful in understanding Sanskrit

The interpretation of swapnavasvadtam will help students to understand and learn Sanskrit language. In the pupils

Knowledge of Indian moral values and building sublime character

Unit-II

Swapnavasavadatam Review Question

In the critical questions the students have knowledge of the diverse sides of the epic in which they acquire knowledge of the different dimensions of the play in which poetic introduction ,poet introduction characterization nature illustration adornments get knowledge of Bodhan power is developed

Unit-III

A word form

The knowledge of the word form develops the ability of Sanskrit sentence building in students so that students can make sentence building language can understand literature easily

B.

The knowledge of metal diseases gives knowledge of the actions of Sanskrit so that students build sentences, understand the texts of Sanskrit, it is easy to read the reading of Sanskrit literature.

Questions Based on the Passage Read

This makes the students answer the poem questions by reading the unread passages it develops the language logic power increases the language scrapes in sentence formation Sanskrit gets proficiency in sentence formation

Unit-IV

Pratyahar Noun Treaty Inflection Meaning

Knowledge of grammar in Sanskrit is obtained through pratyahar in the initial form only through pratyahar.

In Sanskrit grammar the noun case has special significance Sanskrit grammar can be understood only by the knowledge of the noun through the noun he will be able to understand the whole grammar called ashtadhyay.

Unit-V

Hindi to Sanskrit Translation

Translation from Hindi language to Sanskrit language instills interest in Sanskrit among students. students acquire proficiency in translating from Golden Hindi translation to Sanskrit.

Paper-II Mattress Fiction & Literature History

Unit-I

Shuknasopadesh Interpretation

Shuknasopadesh is a very preachy aashakti mattress treatise for the pupils in which they are told about the various problems they face in life.

Unit-II

Interests Mitra Benefits

In this book, students and students learn important gnanpur in life through stories under which policy education etc. Indian ancient knowledge acquires two, it develops moral values and practical knowledge in them review questions of

Unit-II

Shuknasopadesh and hitopadesh review questions are asked under which students and students are able to review the treatise in which stories and sermons Kartar poets can understand topics like introduction and characterization.

Unit-IV

In this, students and students will be able to understand Vedic Sanskrit literature well and will be able to know mythological literature by reading it under vedangs, teachers will also get introduction about grammar free astrology, students and students will also be able to know about Aranyak and Upanishads

Unit-V

Poet Introduction

In this section students and students are introduced to the famous poets of Sanskrit literature in which they read about the great poets Mahakavi Kalidas Mahakavi Bharavi Mahakavi Magh Mahakavi harsh visakhadatta and Banabhatta etc.

B.A. Part-II

Paper-I

Unit-I

Subject Drama Grammar and Composition

Drama Naganand

This section features harshcharit Natak Nagananda, a famous play of Sanskrit literature in which students will be able to understand simple Sanskrit and develop their language skills.

Unit-II

Naganand

Critical questions

In this section students and students will study Naganand drama under which they are imparted knowledge of different dimensions of drama. In this, students and students understand the Ras Alankar kathasar characterization poet introduction of the play

Unit-III

Grammar Kartruvachya Karm Vachya And Bhavavachya

In Sanskrit, syntax is an important part of the students and students are taught reading in this section, under which they get knowledge of different types of sentence usage which develops their language skills and enable them to understand Sanskrit literature well.

Unit-IV

Samas Case

In Sanskrit, society is of great importance. understanding the Samas helps students and students to understand the texts of Sanskrit literature. knowledge of the society improves their language skills

Unit-V

Vakya rachna

Under this, students and students have to construct Sanskrit sentences under which students and students learn to construct sentences based on Sanskrit words, thereby developing Sanskrit sentence building skills in them.

Paper-II

Subject verse and literary history

Unit-I

Raghuvansh Epic II Canto

In this section, students get acquainted with the epic Raghuvansh of Mahakavi Kalidas , which describes the 29 Kings of Raghuvansh through which students get to know the tradition of Maha poetry

Unit-II

Raghuvansh Epic

Under this, students gain knowledge of the various parts of the epic under which the characteristics of the epic Ras Alankar poetry introduction poet introduction characterization learn

Unit-III

Ethics in this section students study the shlokas of the policy Century written by bharatari in which they are taught the ideal and ethical terms, thereby developing moral values among the students

Unit-IV

Literary History Epic & Prose Poetry

In this section students learn about the history of epic and prose poetry in which students study the various parts of the epic and get an introduction to them like Raghuvansh kumarasambhava buddhacharita.

Under prose poetry ten Kumar Charit Kadambari know prose poetry like Shivraj Vijay

Unit-V

Literature History Poetry Free And Fiction

Under this, students know about various lyricism in which they can understand the different dimensions of Sanskrit poetry world ,read famous works like Bhartrihari's century, season nawawad century, geetgovind, students get knowledge of various fiction literature of Sanskrit literature.

B.A. Part-III, Sanskrit

Paper-I

Drama Verses and Grammar

Unit-I

Knowledge Shakuntalam

In this, the students read the shakuntal play of Mahakavi Kalidas, which gives them knowledge of the famous creation of Indian theatrical tradition.

Unit-II

Reviews

In this, shakuntal is studied critically so that the students gain good knowledge of the topics mentioned in poetry, develop logic power, understand poetry introduction and poet introduction well.

Unit-III

The verses of the symptoms in students and students of Sanskrit in various verses of the knowledge provided is Which into intra such as the verses of the reading-reading plan from them Sanskrit picturesqueness and suavity is the realization of the verses sort the GA will be able to and he's poetry is well understood back.

Unit-IV

Grammar Short Theory Kaumudi

In this section, students study various suffixes such as tavyat aneer Yat students develop the ability of Sanskrit speech writing and syntax.

Unit-V

Grammar Short Theory Kaumudi

Fixed Case and Female Suffix

In this section, the knowledge of the mentioned words is imparted so that they understand the nature and suffixes of the Sanskrit language, get acquainted with the nature of the words and understand the nature of Sanskrit word formation.

Paper-II

Poetry & essay

Unit-I

Kiratarjuniya

First serg

In this, students know about the kiratarjuniyam epic which is said to be famous for Artha gauram.

They read kiratarjuniyam, a famous work for arthgambhasabh, which gives students the knowledge of the characteristic of Sanskrit meaning gandhasabh.

Unit-II

Reviews

In this Section, A Critical Study of kiratarjuniyam is carried out, which helps the students to learn the poetic characteristics of the girls and to gain knowledge of the various dimensions of the epic.

He studies the art side and sense critically .

Unit-III

Original Ramayana

Adi Kriti Mool Ramayana study of Valmiki ji and cosmic Sanskrit develops the tendency of teaching Sanskrit Studies in Sanskrit students.

Unit-IV

Decking

Under this, the students acquire knowledge of various Sanskrit adornments through Sanskrit texts which makes them easy to understand the literature in which they study the characteristics and examples of the adornments.

Unit-V

Essay

In this, students learn the writing of Sanskrit essays, they are taught to write essays on various important topics so that they are proficient in Sanskrit reading, writing and communication.

Specific of Programme

After studying Sanskrit, students will be able to work in different areas of the society; Sanskrit language is seen with respect in Sanatan Hinduism; after studying Sanskrit, students will be able to compete in various state competitions. You will be able to become a high officer by participating in it. You will be able to do the work of translator in newspapers in All India Radio. Professors in schools and colleges can work as teachers, religious leaders and priests in the army. Being a student of literature, one will also be able to succeed in areas like art and music writing.

Department of Commerce
B.Com

Program Outcome:

- This program could provide Industries, Banking Sectors, Insurance Companies, Financing companies, Transport Agencies, Warehousing, etc., well-trained professionals to meet the requirements.
- The potential of the students to make decisions at personal & professional level will increase after completion of this course.
- Students can independently start up their businesses.
- Students can get thorough knowledge of finance and commerce.
- The knowledge of different specializations like Accounting, Costing, Banking, and Finance with the practical exposure will help the students to stand in any kind of organization.
- To prepare students to get admission in various Masters's programs like M.Com, M.B.A and pursue various professional courses like C.A, CMA, C.S. etc.
- To develop entrepreneurial skills in students.

B. Com. Part-I

Grouping of Subjects:

Group-I	**Paper-I**	**Financial Accounting**
	Paper-II	**Business Communication**
Group-II	**Paper-I**	**Business Mathematics**
	Paper-II	**Business Regularity Framework**
Group-III	**Paper-I**	**Business Environment**
	Paper-II	**Business Economics**

Program Specific Outcome:

- The students can get the knowledge, skills, and attitudes during the end of the B.com degree course.
- By the goodness of the preparation they can turn into a Manager, Accountant, Management Accountant, Cost Accountant, Bank Manager, Auditor, Company Secretary, Teacher, Professor, Stock Agents, Government employments and so on.,
- Students will prove themselves in different professional exams like CA, CS, CMA, UPSC. As well as other courses.
- The students will acquire the knowledge, skills in different areas of communication, decision making, innovations, and problem-solving in day-to-day business activities.
- Students will gain thorough and systematic subject knowledge of various disciplines like finance, auditing and taxation, accounting, management, communication, computer etc.
- Students can also get the practical skills to work as an accountant, audit assistant, tax consultant, and other financial supporting services.
- Students will learn relevant Advanced accounting career skills, applying both quantitative and qualitative knowledge to their future careers in business.
- Students will be able to do their higher education and can research in the field of commerce and management.
- To develop entrepreneurial skills in students.
- Students can independently start up their businesses.
- The capability of the students to make decisions at personal & professional level will increase after completion of this course.

Course Outcomes:

Group-I

Paper-I Financial Accounting:

- To enable the students to learn principles and concepts of Accountancy.
- Students are enabled with the Knowledge of practical applications of accounting.
- The student will get thorough knowledge of the accounting practice prevailing in partnership firms and other allied aspects.
- To find out the technical expertise in maintaining the final books of accounts.

Paper-II Business Communication:

- To make the students aware of business communication.
- To understand the process and importance of communication.
- To develop awareness regarding new trends in business communication, various media of communication, and communication devices.
- To make the students understand about management Information System and its significance and working in an organization.
- Use current technology related to the communication field.
- The effective use of various types of oral, written, and digital communication modes
- This course will enable the students to learn effective business writing skills.
- This course will help to learn professional communication skills and develop the overall personality of the students.

Group-II

Paper-I Business Mathematics

- To understand the students to solve LPP to maximize the profit and to minimize the cost.
- Familiarity with Determinants and to learn the applications of matrices in business.
- To use and understand useful functions in business as well as the concept of EMI.
- To understand the different concepts of population and sample and to make students familiar with the Calculation of various types of averages and variation.

Paper-II Business Regularity Framework

- To provide knowledge regarding the Indian Contract Act-1872
- Students will learn the basic concepts, terms & provisions of Mercantile and Business Law.
- To develop the awareness among the students regarding these laws affecting trade business, and commerce.
- To enable the students to apply the provisions of business laws in business activities.

Group-III

Paper-I Business Environment

- To aware the students about the Business and Business Environment.
- To understand the impact of internal as well as the external environment in business.
- Study about Human Development Indicators and their role in designing development programs.
- Learn global economic issues and the role of international institutions in managing them.
- Study fundamental theories in International Business and examine the relative economic problems in the light of models and theories.
- Explain the economic trends and effect of Govt. policies as LPG.

Paper-II Business Economics

- To provide students knowledge of Micro Economic and Macro-Economic concepts and inculcate an analytical approach to the subject matter.
- To build-up, the student's interest by showing the relevance and the use of various economic theories in real-life situations.
- To apply economic reasoning to solve business problems.
- Able to analyze consumer behavior and consumer decisions.

- A thorough understanding of the firm's production processes and decisions.
- Understand various forms of market and factor pricing patterns.

B.Com. Part-II

Grouping of Subjects:

Group-I	**Paper-I**	**Corporate Accounting**
	Paper-II	**Company Law**
Group-II	**Paper-I**	**Cost Accounting**
	Paper-II	**Principal of Business Management**
Group-III	**Paper-I**	**Business Statistics**
	Paper-II	**Fundamentals of Entrepreneurship**

Course Outcomes :

Group-I

Paper-I Corporate Accounting

- This course aims to enlighten the students on the accounting procedures followed by the Companies act, 2013.
- Student's skills about accounting standards will be developed.
- To aware the students of the valuation of goodwill and shares.
- To impart knowledge about holding company accounts, amalgamation, absorption, and reconstruction of the company.
- To provide thorough knowledge about the accounting of companies

Paper-II Company Law

- To impart students with the knowledge of fundamentals of Company Law and provisions of the Companies Act of 2013.
- To acquaint the students with the duties and responsibilities of Key Managerial Personnel.
- To understand the importance of corporate governance.
- To learn about the stock market and listing of the companies.

Group-II

Paper-I Cost Accounting

- To understand Basic Cost concepts, Elements of cost, and cost sheet.
- Ascertainment of Material and Labor Cost.
- Student's potential to apply theoretical knowledge in the practical situation will be increased.
- Students can get knowledge of different methods and techniques of cost accounting.
- To impart knowledge about the concepts and application of Overheads.
- To enable the students to identify the methods and techniques applicable in different types of industries.
- To know the application of cost control techniques and Cost Audit.

Paper-II Principal of Business Management

- Understand the principles of business management and its scope and significance.
- Explain the process of business management and the functions of business management.
- List the characteristics and the importance and planning and decision making.
- Discuss the meaning of delegation of authority and coordination and controlling
- Justify the recent traits in management.

Group-III

Paper-I Business Statistics

- The student will be able to independently calculate basic statistical parameters
- The student will be able to interpret the meaning of the calculated statistical indicators.
- The student will learn probability theories and their practical application.
- To understand the applicability of advanced tools of statistics like parametric and non-parametric tests.
- Students will be familiar with various tools applicable in research work.

Paper-II Fundamentals of Entrepreneurship

- To develop entrepreneurial awareness among students.
- The student will be able to understand the basic development of entrepreneurship as a profession.
- The student will have a basic knowledge of human resource management for small businesses.
- The student will able to understand the differences between an entrepreneurial venture and an ongoing business operation.
- The student will able to understand the critical roles of marketing research, competitive analysis, consumer-value proposition, and market-entry strategy in the development of a business plan.
- The student will able to describe examples of entrepreneurial business and actual practice, both successful and unsuccessful, and explain the role and significance of entrepreneurship as a career, in the firm, and society.
- The student will able to understand the importance and role of ethics, sustainability, innovation and global issues for strategic decision making.
- The student will evaluate different modes of entering into entrepreneurship.
- The student will able to understand the importance and role of ethics, sustainability, innovation and global issues for strategic decision making.

B.Com. Part-III

Grouping of Subjects

Group-I	**Paper-I**	**Income Tax**
	Paper-II	**Auditing**
Group-II	**Paper-I**	**Indirect Tax With GST**
	Paper-II	**Management Accounting**
Group-A	**Paper-I**	**Financial Management**
	Paper-II	**Financial Market Operations**

Course Outcomes:

Group-I

Paper-I Income Tax

- To make aware of provisions of direct tax about Income Tax Act, 1961 and Income Tax Rules, 1962.
- To understand various tax rebates & relief and procedures to file an Income Tax return.
- Define the procedure of direct tax assessment.
- Define tax complicacies and structure.
- Aware of Income Tax authorities and their powers.
- Aware of appeal & revision, tax penalties, offenses, and prosecutions.
- To familiarise the students with Income Tax Act 1961 and to enable the students to compute Income taxable under various heads of Income.
- To provide insight regarding the e-filing of Income Tax returns.
- To enable the students to plan and manage income tax.

- To have an understanding of the determination of Total Income and tax payable and to get an
- Overview regarding returns to be filed by an individual and also assessment procedure.

Paper-II Auditing

- To familiarize the students with the principles and procedure of auditing.
- To enable the students to understand the duties and responsibilities of auditors and to undertake the work of auditing.
- To aware of a thorough understanding of different types of audit work.
- To give knowledge about preparation of Audit report.

Group-II

Paper-I Indirect Tax with GST

- The student will be able to understand the basic principles underlying the Indirect Taxation Statutes regarding Central Excise Act & Customs Act.
- The student will be able to identify and analyze the procedural aspects under different applicable statutes related to indirect taxation.
- To give the students a general understanding of the GST law in the country and provide an insight into practical aspects of GST and equip them to become tax practitioners.

- The student will be able to understand tax liability and taxable entities. Accounting treatment (simple and trilateral transactions).
- The student will be able to examine the method of the tax credit. Inflows and outflows. Outflows: tax imposition, tax exemption, tax deduction.

Paper-II Management Accounting

- To enable students to understand financial statements & accounting methods and techniques used for decision making.
- To provide students advanced knowledge in management accounting tools like ratio analysis, fund flow analysis and cash flow analysis
- To provide a thorough understanding of price level accounting.
- Use business finance terms and concepts when communicating.
- To knowledge about the budget and budgetary control.

Group-A

Paper-I Financial Management

- To build a thorough understanding of the central ideas and theories of modern finance
- To relate theory to practice so that students learn the practical applications of financial management concepts.
- To provide students basic knowledge in cost of capital, working capital management, and dividend policy decisions.
- Explain the financial concepts used in making a financial management decision.

Paper-II Financial Market Operations

- The student will able to understand the Indian banking system and describe the role of regulatory bodies in regulating how banks manage their capital.
- The student will able to describe the types of equity securities that companies can use to raise equity capital and how these securities can be listed and traded on the Indian Stock Exchange.
- The student will able to apply different company valuation techniques to determine share prices.
- The student will able to describe the characteristics of different types of debt securities and be able to price them.
- The student will able to describe different theories of how interest rates are determined and explain the relationship between the term to maturity, risk, and interest rates.

- The student will able to understand the mechanics and conventions of the foreign exchange market and the motivation of different participants in trading foreign currencies.

Post Graduation Courses
M.Sc. Physics

Programme Specific outcomes

- Students are expected to acquire acore knowledge in modern physics, including the major premises of classical mechanics, electromagnetic theory,optical electronics.
- Students are also expected to develop a written and oral communication skills in optical fiber communicating physics-related topics.
- Create, apply and disseminate knowledge leading to innovation
- Think critically, explore possibilities and exploit opportunities positively
- Work in teams, facilitating effective interaction in work places.
- Lead a sustainable life Embrace lifelong learning
- Perform basic, applied and collaborative research
- Students should learn how to design and conduct an experiment (or series ofexperiments) demonstrating their understanding of the scientific method andprocesses. Not only that they are expected to understand theanalytical methods required to interpret and analyze results and draw conclusions assupported by their data.
- Students will develop the proficiency in the acquisition of data using a variety of
- laboratory instruments and in the analysis and interpretation of such data.
- Students will realize and develop an understanding of the impact of physics andscience on society.
- Apply conceptual understanding of the physics to general real-world situations.
- Describe the methodology of science and the relationship between observation andtheory.
- Discover of physics concepts in other disciplines such as mathematics, computerscience, engineering, and chemistry.
- Analyze physical problems and develop correct solutions using natural laws.

Course Outcomes

Semester-I

Paper-I Mathematical Physics

- Determine the continuity, differentiability of functions
- Differential equation: Find the complementary function of PI and LDE.
- Distinguish the integral of infinite order into general and singular integrals.
- Solve and apply linear equation of order two and higher LDE using Laplace's Transformation.
- Solution by series expansion and Legendre, Bessel's, Hermite and Lagurre equation and physical applications of Legendre, Hermite and Lagurres polinomials.
- Analyze - Basic idea of Group, finite and infinite decimal Vector space and Subspace. Basic idea about matrix
- Compute with eigen Values and eigen vectors, characteristic polynomials and applying to basic digonalization of matrix
- Transforms likeLaplace's Transformation,Fourier series, Fourier Transformations.
  PDE : Be familiar with the modelling assumption and derive the idea to PDE.

Paper-II Classical Mechanics

- To know the effect of forces during static conditions.
- Understand the true nature of Newtonian mechanics.
- The Lagrangian and Hamiltonian approaches in classical mechanics.
- Kinematics and Dynamics of rigid body in detail and ideas regarding Euler's equations of motion
- Theory of small oscillations in detail along with basis of Free vibrations

After successful completion of this paper, the student will be well-versed in

The classical background of Quantum mechanicsand get familiarized with Poisson bracketsand Hamilton -Jacobi equation

Understand the concept of constant relative motion of different bodies in different frames of references

Understand the terminology used in Classical Mechanics.

Employ conceptual understanding to make predictions, and then approach theproblem mathematically.

Understand the important connections between theory and experiment

Paper-III: Quantum Mechanics

- To familiarize with basic non-relativistic quantum mechanics, old quantum theory, interpretation of wave function, uncertainty principle in quantum mechanics and commutation relations.
- To introduce Dirac delta function, box normalization, Hilbert space, matrix mechanics, Schrodinger, Heisenberg and interaction pictures, particle in a box, tunneling through a potential barrier, linear harmonic oscillator.
- To develop the idea of symmetry in space and time, spherical harmonics, angular momentum, addition of angular momenta and Clebsch-Gordon coefficients.
- To understand the basic concepts of hydrogen atom in quantum mechanics, time independent perturbation theory and its applications to harmonic oscillator, Zeeman effect without spin and Stark effect.

Paper-IV Electronic Devices

- **Transistors:** - BJT, JFET, MOSFET and MESFET: Structure working, Derivation of the equation for I-V characteristics under different condition.
- **Microwave Devices:** - Gunn diode (Transferred Electron Devices), Transit time devices—IMPATT diodes, TRAPATT Diode.
- **Photonic Devices** - Radiative and non-radiative transition, optical Absorption bulk and thin flim, photo conductive device (LDR), Photo detectors, solar cell open circuit voltage and short circuit current LED (high frequency limit effect of surface and indirect recombination current, operation of LED) laser condition for population inversion in active region, light confinement factor, optical gain.
- **Digital Electronic Devices:** Logic gates: OR, AND, NOT, NAND, NOR, Ex-OR, Ex-NOR GATES, Number system: binary numbers, binary to decimal conversion, decimal to binary conversion, binary addition, binary subtraction, 1's compliment, 2s compliments, binary multiplication and division, octal and hexadecimal numbers, BCD code and gray code. Boolean Algebra: De Morgen's theorem, laws and theorems of Boolean algebra, sum of product and product of sums simplification, Karnaugh map simplification.
- **Memory Devices:** RAM, ROM, PROM, EPROM, A/D and D/A converters, Static and dynamic random access memories (SRAM and DRAM), NMOS and CMOS, charge coupled devices (CCD) Microprocessor: introduction to a microprocessor. INTEL 8085 Architecture and pin diagram, CPU, Instruction set for 8085 microprocessor and programs.

Semester-II

Paper- I Quantum Mechanics

- To familiarize with time independent perturbation theory and Fermi-Golden rule, variation method, WKB approximation as well as adiabatic and sudden approximations.
- To introduce laboratory and centre of mass frames, scattering cross-sections, partial wave analysis, Born approximation.
- To develop the idea of identical particles in quantum mechanics and their collision, spin angular momentum, Pauli pin matrices, effect of identity and spin.
- To understand the basic concepts of semi classical theory of radiation and electric dipole transition, line width, quantization of electromagnetic field, creation and annihilation operators, spontaneous and stimulated emissions.

Paper-II Statistical Mechanics

- **Foundation of statistical mechanics** – Specification of the state of a system statistical ensemble, contact between statistical and thermo dynamical quantities, Micro canonical ensemble, perfect gas in micro canonical ensemble, partition function and its correlation with thermodynamic quantities nature of probability function partition function for canonical ensemble thermodynamic functions for canonical ensemble. Perfect mono atomic gas in canonical ensemble, Grand canonical ensemble: Partition function and thermo dynamic function for grand canonical ensemble, Perfect gas in grand canonical ensemble.
- Classical ideal gas entropy of mixing, Gibbs's paradox, Phase space Liouvelle's theorem, Maxwellian distribution from canonical distribution, Transition from classical statistical mechanics to quantum statistical mechanics, indistinguishability and quantum statistics .
- The density matrix, condition for statistical equilibrium, B.E., F.D. & M.B. statistics evaluation of constant α and β , Result of three statistics, Properties of ideal Bose gas, gas degeneracy, B.E. condensation, ideal fermi dirac gas – energy & pressure of gas & light and strong degeneracy.
- Virial equation of state Virial coefficients, cluster expansion for a classical gas. The Ising model in one dimension, exact solution of Ising model in one dimensions Phase transition, Phase transition of first and second kind, Landau's Phenomenological theory of phase transition.
- Thermo dynamic fluctuations spatial correlation in a fluid, The Langevin's theory of the Brownian motion, Einstein Relation and Expression for mobility(Nernst relation) Fokker – Planck equation, Fluctuation dissipation theorem.

Paper- III E.D. and Plasma

- To have review of Lorentz transformation of space and time and Maxwell's field equations in terms of four vectors, electromagnetic field tensor, Lienard -Wiechert Potential.
- To have knowledge of Larmour's formula, relativistic generalization of Larmour's formula, Bremrstrahlung radiation, Synchrotron Radiation, Cerenkev radiation, Abraham- Lorentz formula.
- The third basic idea of Plasma Production, Criteria for the definition of Plasma, plasma oscillations, plasma parameters. The occurance of plasma in nature
- Applications of Plasma Physics in Controlled thermonuclear fusion, gaseous discharge, the magnatohydrodynamic generator, Plasma propulsion, other Plasma devices, Theoritical description of Plasma phenomena-general considerations.

- Motion of charged particles in E-M field- uniform electrostatic field and uniform magnetostatic field; uniform electrostatic and magnetostatic fields Nonuniform E field, nonuniform B field.
- Students must have idea about the Elementary Concepts of Adiabatic invariants of First, second and third order.
- Elements of Plasma Kinetic Theory- Phase Space, Single particle and many particle phase space, volume elements, distribution function number density and average velocity.
- Derivation of Collisionless Boltzman equation, The Vlasov equation, continuity equation. The Saha ionization equation.
- The wave equation, phase velocity, wave packets and group velocity.

Paper- IV Atomic and Mol. Physics

- Describe the atomic spectra of one and two valance electron atoms.
- Explain the change in behavior of atoms in external applied electric and magnetic field.
- Explain rotational, vibrational, electronic and Raman spectra of molecules.
- Describe electron spin and IR spectroscopy and their applications.
- Be able to apply the principle of Raman spectroscopy and its applications in the different field of science & Technology.
- To become familiar with different resonance spectroscopic techniques and its applications and to find solutions to problems related different spectroscopic systems

After successful completion of the course, the student is expected to:

- know about different atom model and will be able to differentiate different atomicsystems, different coupling schemes and their interactions with magnetic and electric fields.
- Have gained ability to apply the techniques of microwave and infraredspectroscopy toelucidate the structure of molecules
- Be able to apply the principle of Raman spectroscopy and its applications in the differentfield of science & Technology.
- To become familiar with different resonance spectroscopic techniques and its applications
- to find solutions to problems related different spectroscopic systems.

Semester-III

Paper- I Solid State Physics

This Course Enables the Student

- Describe the difference between crystalline and amorphous materials.
- Describe the arrangement of atoms and ions in crystalline structures
- Schematically diagram face-centered cubic, body-centered cubic and hexagonal close-packed unit cells.
- Recognize and give the lattice parameter relationships for all seven crystal systems--i.e., cubic, hexagonal, tetragonal, rhombohedral, orthorhombic, monoclinic, and triclinic.
- Given a unit cell and the Miller indices for a plane, draw the plane represented by these indices referenced to this unit cell.
- Given the unit cell for some crystal structure, be able to draw the atomic packing arrangement for a specific crystallographic plane.
- Explain the use of X-ray diffraction measurements in determining crystalline structures

Learning Outcomes

This course acts as a bridge between a physicist and a material scientist.After successful completion of the course, the student is expected to:

- have a basic knowledge of crystal systems and spatial symmetries,- be able to accountfor how crystalline materials are studied using diffraction, including concepts like reciprocallattice and Brillouin zones
- know what phonons are, and be able to perform estimates of their dispersive and thermalproperties, be able to calculate thermal and electrical properties in the free-electron model
- know Bloch's theorem and what energy bands are and know the fundamental principlesof semiconductors
- know the fundamentals of dielectric and ferroelectric properties of materials
- know basic models of dia, para and ferro magnetism
- be able to explain superconductivity using BCS theory

Paper-II Nuclear Physics

After successful completion of the course:

- the student is expected to have a basic knowledge of nuclear size, shape, bindingenergy.etc and also the characteristics of nuclear force in detail
- Be able to gain knowledge about various nuclear models and potentials associated.
- Acquire knowledge about nuclear decay processes and their outcomes.

Paper- III Special Paper-I (Electronics)

- To learn about basic operational amplifier circuits.
- To study application of OPAMP as amplifiers
- To learn about different Communication Systems
- To learn about Summing Amplifier, Differentiator, Integrator, Clipping Clamping circuits, Multi-vibrators

Paper- IV Special Paper-II (Electronics)

- After successful completion of the course, the student is expected to
- Flip-flops: RS Flip-flop, level clocking,
- Edge triggered Flip Flops
- Principles of two cavity klystrons & reflux klystrons,
- principle of operation of magnetron

Semester-IV

Paper- I Laser Physics & Application of Laser

This Course Enables the Student

- Basic Laser principles, Laser behavior, Properties of laser radiations, Different types of Lasers and Laser applications
- Explain different Laser used and make a comparison between them.
- Explain Optical Fiber communication and its application
- To understand Nonlinear interaction of light with matter and their use in different optical devices.

Learning Outcomes

After successful completion of the course, the student is expected to

- Develop familiarity with the vast areas of laser and optical fiber communication system.
- Explore important connections between theory, experiment, and current applications of laser
- Understand Laser applications in industry, medicine, astronomy biologyandIsotope separation.

- be able to make optical alarm and optical sensor.

Paper-II Computational Methods & Programming

This Course Enables the Student to understand Curve fitting: Scatter diagram,

- Graphic method,
- Principle of least Square,
- Method of least squares to fit the straight line
- fitting a curve. Spline interpolation, Cubic Spline
- The students should be able to gets a wide knowledge of numerical methods in computational Physics that can be used to solve many problems which does not have an analytic solution

Paper- III Special Paper- Electronics

- This Course Enables the Student to understand
- Mathematical representation of of FM and PM signal, inter system comparison (FM & AM) generation of FM direct & indirect method.
- Phase Modulation.Techniques
- LAN, WAN and MAN, Wireless network, Network topology,
- OSI and TCP/IP reference model, comparison between them and their criticism, basic idea about ISDN.
- Time Division Multiple Access (TDMA)
- Frequency Division Multiple Access (FDMA), ALOHA.

Paper- IV Electronics

After successful completion of the course, the student is expected to

- To understand the Microprocessor
- Basic interrupt processing
- To understand Real mode and protected mode addressing.
- Data addressing, program memory addressing.
- Data movement Instructions MOV; push/pop

Department of Chemistry

Programme Outcome (PO) Upon completion of PG:

The students would be able:

- To understand and appreciate the diverse aspects and scope of advanced chemistry.
- To apply fundamental knowledge of the basic principles in various fields of Chemistry.
- To imbibe ethical/moral/social values and create awareness towards environment.
- To develop scientific temper/research aptitude, logical thinking, observative skills and the ability to draw inferences.
- To collaborate in team, enhance leadership qualities and make them competent and employable.
- To express the subject effectively and to improve presentation skills.

Programme Specific Outcome (PSO) Upon completion of the M.Sc. (Chemistry) Programme:

The students would be able:

- To understand systematically the fundamental concepts in Physical Chemistry, Organic Chemistry, Inorganic Chemistry, Analytical Chemistry and all other related areas of Chemistry.

- To explain/compare the various concepts and express the subject through writing and oral presentations effectively.
- To develop critical thinking ability by way of solving problems/numerical using basic chemistry knowledge and concepts.
- To inculcate a habit of self-learning continuously through use of advanced ICT technique and other available techniques/e-resources/books for academic advancement as well as for increasing employability opportunity.
- To work in team by contributing in laboratory engagements, project work, industrial visits and Chemical Society activities.
- To understand and develop moral/ethical/social awareness/values through extracurricular and extension activities.
- To acquaint with the basic principles of equipment/instruments and its applications.
- To carry out advanced experiments, record the observations, present the inference/results and discuss/interpret the result.
- To demonstrate experimental techniques and methods of advanced nature through project work and develop research aptitude.
- To make themselves competent for UGC-CSIR NET, GATE examinations etc.

Course Outcome (CO):

M.Sc. Chemistry Semester – I

Paper- I Coordination Chemistry

After completion of the course, students would be able:

- To understand Walsh diagram, bent rule, energetics of hybridization and MOT.
- To know structure of carbonyls, nitrosyls, dinitrogen and dioxygen complexes.
- To understand energy profile of a reaction and determination of stability constant of transition metal complexes.
- To know mechanism and kinetics of substitution and electron transfer reaction in complexes.

Paper- II Organic Reaction Mechanism

After completion of the course, the students would be able:

- To have a thorough idea about the basic concepts and reaction mechanism of various types of organic reactions.
- To get an idea about the mechanism and stereochemical aspects of elimination reactions.
- To understand the mechanism and stereochemistry of nucleophilic substitution reactions.
- To acquire the knowledge of mechanism of electrophilic substitution in aliphatic as well as aromatic compounds.
- To understand the mechanistic and stereochemical concepts of addition reactions.

Paper- III Mathematics for Chemists, Quantum Chemistry and Chemical Dynamics

After completion of the course, the students would be able:

- To have basic knowledge of mathematics – vector, matrix algebra, probability, calculus and its application in chemistry which adds value to the programme.
- To understand the basic postulates of quantum mechanics and solve Schrodinger wave equation for quantum mechanical models such as simple harmonic oscillator, particle in a 3D- box, rigid rotor, H atom.

- To explain/compare the basic ideas of variation theorem, perturbation theory and Huckel MO theory and its application.
- To discuss the quantum mechanical aspect of angular momentum and spin, RussellSaunders terms and coupling schemes, atomic states, atomic terms and evaluate term symbols.
- To describe different theories of reaction rates, fast reactions and its methods, kinetics and mechanism of photochemical and unimolecular reactions.
- To analyze problems and apply the principles/concepts in finding their solutions.

Paper-IV Group Theory and Computers for Chemists

After completion of the course, students would be able:

- To understand symmetry properties of compounds, character tables and their uses in spectroscopy.
- To know principles involved in interaction of electromagnetic radiation with matter.
- To understand basic structure of computers, memory and operating systems and 'C' language.
- To learn development of small computer codes involving simple formula in chemistry.

M.Sc. Chemistry Semester – II

Paper- I Transition Metal Complexes and Diffraction Methods

After completion of the course, students would be able:

- To understand how to interpret electronic spectra of complexes.
- To know magnetic properties of complexes of different geometry.
- To understand principle of electron diffraction and x-ray diffraction and their uses in structure determination of compounds.
- To understand neutron diffraction technique, metal cluster and metal polyacids.

Paper- II Concepts in Organic Chemistry

After completion of the course, the students would be able:

- Recognize and distinguish between aromatic and antiaromatic compounds by their structures.
- Explain different free radicals and mechanisms of different rearrangements via free radicals.
- Learn the terminology associated with conformational analysis and stereochemistry of various compounds
- Know the basic concept of different types of pericyclic reactions and rules governing them.

Paper-III Thermodynamics, Electrochemistry and Surface Chemistry

After completion of the course, the students would be able:

- To have knowledge and understanding of basic concepts in classical thermodynamics – partial molar properties, fugacity, activity and activity coefficient, construct and apply phase diagrams to 3-component systems.
- To illustrate the concepts in statistical thermodynamics – distribution, thermodynamic probability, partition function and its application and to compare Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac Statistics.
- To understand the fundamental concepts of irreversible thermodynamics and discuss the application of its laws.

- To explain and derive equations related to the theory of strong electrolytes – Debye-Huckel law and its extensions, structure/models and thermodynamics of electrified interfaces, polarography and its applications.
- To describe and interpret various adsorption isotherms and its applications, concept and various aspects of micelles and macromolecules.
- To analyze problems and apply the principles/concepts in finding their solutions.

Paper- IV Spectroscopy

After completion of the course, students would be able:

- To gain insight into the basic principle of molecular spectra, types of spectra and its origin.
- To know about rigid rotor, energy levels, origin of rotational spectra and its applications.
- To understand the theories/principles, predict the functional groups and differentiate between IR and Raman spectra
- To acquire knowledge of principle, technique, interpretation and applications of NMR spectroscopy.
- To get familiarized with principle and applications of photo electron and photo acoustic spectroscopy.
- To understand the theory, measurement technique and applications of ESR spectroscopy.

M.Sc. Chemistry Semester – III

Paper – I Applications of Spectroscopy

After completion of the course, students would be able:

- To gain detailed insight into the instrumentation and sample handling in IR spectroscopy, characteristic vibrational frequencies and factors effecting.
- To know about Optical Rotatory Dispersion (ORD) and Circular Dichroism (CD) deduction of absolute configuration and octant rule for ketones.
- To get to know in detail about the various effects, mechanism, correlations and advanced techniques related to proton and C-13 NMR spectroscopy.
- To get familiarized with various coupling and application to transition metal complexes.
- To understand the basic principle and application of Mossbauer spectroscopy.
- To acquaint with the principle and interpretation of Mass spectra and to elucidate structure of molecule on the basis of various spectral spectroscopic data.

Paper- II Bio-Organic Chemistry

After completion of the course, students would be able:

- The basic properties of enzymes, components of metabolic pathway and kinetics of enzyme action.
- Mechanisms of enzyme action and different kinds of enzyme catalyzed reactions.
- Different models of enzymes and co-enzymes, their structures and biological functions.
- Biotechnological applications of enzymes and constituents of biological cell.

Paper- III Environmental Chemistry

After completion of the course, the students would be able:

- To gain an insight into the various aspects of environment, biodistribution of elements, hydrological cycle, biogeochemical cycles and industrial pollutants.
- To know about chemical composition of various types of water bodies, water standards and sources of aquatic pollution.

- To have a knowledge of composition of soil - micro and macro nutrients, sources of soil pollution, waste treatment and biodegradability.
- To learn about major regions, chemical composition of atmosphere and chemistry of air pollution.
- To understand the techniques of sampling, measuring and monitoring air pollutants.
- To acquaint with the principle, sampling methods and procedure of analysis of water and soil parameters.
- To get familiarized with the public health significance of heavy metals and the general instrumental techniques for its analysis

Paper- IV Elective – A Bioinorganic & Supramolecular Chemistry

After completion of the course, students would be able:

- To understand role of iron and calcium in biological system, their storage, transport and regulation.
- To describe role and importance of metalloenzyme in biological system and uses of metals in medicine.
- To understand molecular recognition of supramolecular compounds.
- To explain transport processes and carrier design of supramolecular compounds, and supramolecular devices.

Paper- IV Elective – B Natural Products

After completion of the course, students would be able:

- Various types of natural products produced by plants, their structure elucidation and applications.
- Knowledge of chemistry and significance of Terpenes.
- Structure and biosynthesis of Steroids.
- Structure and biosynthesis of Hormones.
- Chemistry of plant pigments and Porphyrins, their structures and synthesis.

Paper– IV Elective - C Polymer and Nanochemistry

After completion of the course, the students would be able:

- To have knowledge and understanding of basic concepts of polymers, polymerization conditions and polymer reactions.
- To know about polymer properties, its characterization and the various techniques of polymer processing.
- To understand and discuss the kinetics/statistics/mechanism of polymerization and derive rate laws.
- To compare bulk and nanomaterials, explain the role of size, shape, properties and uses of nanomaterials
- To describe various methods for synthesis of nanoparticles and apply the synthetic pathways especially green route.
- To have an insight into the instrumentation/principle of various characterization techniques like EDAX, FTIR, SEM, TEM, etc and its application.

Paper– IV Elective - D Nanomaterials and Nanotechnology

After completion of the course, the students would be able:

- To have knowledge and understanding of basic concepts of nanostructures, nanoscale and effect of nano-dimension on properties.

- To gain insight into the various methods of synthesis of nanoparticles and apply it.
- To compare bulk and nanomaterials, explain the role of size, shape, properties and uses of nanomaterials
- To understand instrumentation/principle of various characterization techniques like DLS, FTIR, SEM, TEM, AFM etc and its application.
- To know about the various applications of nanomaterials especially in the field of biology.

M.Sc. Chemistry Semester-IV

Paper- I Solid State and Photochemistry

After completion of the course, the students would be able:

- Understand the origin and nature of defects and crystals.
- Get an idea about electrically conducting solids and superconductors.
- Apply the concept of band theory to explain the behavior of conductors.
- Understand the important aspects of photochemistry, photochemical reactions of carbonyl compounds and aromatic compounds.
- Identify the mechanism of rearrangement of different photo-cyclization reactions

Paper – II Biophysical Chemistry

After completion of the course, the students would be able:

- To have an idea about structure and function of cell membrane, ion transport the various aspects of environment, biodistribution of elements, hydrological cycle, biogeochemical cycles and industrial pollutants.
- To gain an insight into various essential and trace metals, Na+, K+ pump - role of metal ions in biological processes, transport and storage of dioxygen and model synthetic complexes.
- To understand structure and function of metalloproteins in electron transport processes and various nitrogenases model systems.
- To learn about DNA polymerization, metal complexes in transmission of energy, bioenergetics of biochemical reactions, hydrolysis of ATP and synthesis of ATP from ADP.
- To have basic knowledge of chain configuration of macromolecules, statistical distribution end to end dimensions, calculation of average dimensions for chain structures and protein folding problem.
- To get familiarized with forces of biopolymer interaction, binding processes, thermodynamics of biopolymer solutions, muscular contractions and energy generation in mechanochemical system and nerve conduction.

Paper- III Analytical Chemistry

After completion of the course, the students would be able:

- To have basic idea of role of analytical chemistry, sampling methods, techniques and safety measures.
- To define and calculate various statistical parameters and types of errors.
- To gain insight into composition of blood and techniques for the analysis of body fluids.
- To classify drugs and describe the screening methods.
- To have an insight into analysis of various contents in food, adulterants and contaminants in food.

- To acquaint with the types of fuels, analysis of various parameters and calorific value.

Paper- IV Elective – A, Organotransition Metal Chemestry

After completion of the course, students would be able:

- To learn alkyls and aryls of transition metals, fluxionality in compounds.
- To know synthesis, nature of bonding and reaction of alkylidenes & alkylidynes.
- To learn preparation properties, nature of bonding and reactions of transition metal π-complexes.
- To understand homogenous catalysis, bonding of hydrogen with transition metals.

Paper- IV, Elective – B, Medicinal Chemistry

After completion of the course, the students would be able:

- To know about the basics of drugs, drug design and important pharmacokinetic parameters.
- To get an insight into psychoactive drugs, their synthesis and chemotherapy of mental diseases.
- To learn the synthesis and properties of local anti-infective drugs, cardiovascular and anti-malarial drugs.
- To understand biosynthesis/synthesis, structure and applications of antibiotics.
- To know about types of cancer and chemistry of anti-neoplastic drugs.

Paper– IV Elective – C, Chemical Kinetics and Nuclear Chemistry

After completion of the course, the students would be able

- To have knowledge and understanding of types/kinetics of composite reaction and elucidate mechanism and derive rate laws.
- To calculate various activation parameters and predict feasibility of reaction of its basis.
- To understand and discuss the kinetics/mechanism of acid/base catalysis, enzyme and micellar catalysis.
- To know about the concept of acidity functions and illustrate the various rate correlations, isotopic effect and solvent effect.
- To have an insight into various aspects of nuclear models, nuclear reactions and nuclear reactors.
- To acquaint with the principles of radioactivity, its measurements, counters, application as tracers in probing reaction mechanism, determining structures, physicochemical properties and in chemical analysis.

M.Sc. Department of Mathematics

Program outcomes upon completion of the

M. Sc. Degree program, the studentwill be able to:

- PO No. - 1 Persue as higher studies in mathematics in reputed institute of our country like IITs, IESER and central university etc.
- PO No. – 2 To appear in several competitive examination like CGPSC, UPSC, MAT, Railways, SSC etc.
- PO No. – 3 To explain the core ideas and the techniques of mathematics at the college and school.
- PO No.- 4 To develop the logical approach to take decision in complicated decision.

Course Title, M. Sc. previous, Advance Abstract Algebra

- CO No. – 1 To recall properties of group specially normal series and use of series in Jorden Holder Theorem.
- CO No. – 2 To understand field extension with types of extension as- algebraic, transcendental, separable, inseparable and normal extension .
- CO No.- 3 More types and properties of field extension is recognized.
- CO No.- 4 To uderstand Galois theory and solvability of general equation by radicals.
- CO No.- 5 To recall module, Noetherian, Artinian modules and examples, Hilbert basis theorem and WedderzburnArtin theorem.
- CO No.- 6 To recall l Linear transformation, canonical form and nilpotent transformation, understand Jorden blocks and jorden forms.
- CO No.- 7 To understand smith normal form and rational canonical form.

Course Title, M. Sc. Previous, Real Analysis

- CO No. – 1 To learn sequences and series of functions and their convergence, various test for convergence.
- CO No. – 2 To learn Function of several variables, derivatives in open subsets, derivatives of higher order, partition of unity and Stock's Theorem.
- CO No.- 3 To understandRiemman and Stieltjes integral and its properties.
- CO No.- 4 To understand Idea of measures, measurable sets, Borel and Lebesgue measures.

Course Title, M. Sc. Previous, Topology

- CO No. – 1 To learn the concept of topology and algebraic topology.
- CO No. – 2 To learn the concept of separation axioms, connectedness, compactness and related topics.
- CO No.- 3 To understand the product topology, embedding, metrization and paracompactness.
- CO No.- 4 To understand Nets, Filters and ultrafilters. Fundamental group and covering spaces.
- CO No.- 5 To prove some related theorems on above topics.

Course Title, M. Sc. Previous, Complex Analysis

- CO No. – 1 To apply the concept and consequences of analyticity and the Cauchy Riemman equations and results on harmonic and entire functions including the fundamental theorem of algebra.
- CO No. – 2 To understand the application of the power series, expansion of analytic functions.
- CO No.- 3 To understand Conformal mapping and bilinear transformation and their properties.
- CO No.- 4 To use the Cauchy residue theorem to evaluate integral and sum series, analytic continuation and its properties, canonical products.
- CO No.- 5 To learn the range of analytic functions, Little picard theorem, Montel theorem etc.

Course Title, M. Sc. previous, Advance Discrete Mathematics

- CO No. – 1 To understand Algebraic structure, semugroups, monoids and operations on strings. Specially using in concatenation operations

- CO No. – 2 To learn various types of grammars, Application of pumping lemma, Polish Notations.
- CO No.- 3 To learn Finite autometa acceptors, nondeterministic finite autometa
- CO No.- 4 To learn mean terms, max terms, Boolean forms, Carnough mappings and minimization of Boolean function.
- CO No.- 5 To learn cosets, Partial order relations, Lattices and its various types.

M.Sc. Department of Mathematics

PO No. Program outcomes upon completion of the

M. Sc. Degree program, the studentwill be able to:

- PO No. - 1 Persue as higher studies in mathematics in reputed institute of our country like IITs, IESER and central university etc.
- PO No. – 2 To appear in several competitive examination like CGPSC, UPSC, MAT, Railways, SSC etc.
- PO No. – 3 To explain the core ideas and the techniques of mathematics at the college and school.
- PO No.- 4 To develop the logical approach to take decision in complicated decision.

Course Title, M. Sc. Final, Integration Theory & Functional Analysis

- CO No. – 1 To understand Sign measures and various theorems on measures, Riesz representation theorem, Fubinious Theorem.
- CO No. – 2 To learn Normlinear space and their completeness, Finite dimension norm linear space and compactness.
- CO No.- 3 To understand Nonlinear operators, convex functions, epi-graphs, Coercive mapping etc.
- CO No.- 4 To understand uniform boundedness theorem, Open and closed graph theorem and Hahn Banach theorem.
- CO No.- 5 To learn Hilbert space, Reflexiblityof Hilbert space. Self adjoint, Normal, Unitary operators.

Course Title, Partial Differential Equations

- CO No. – 1 To understand Laplace equations, Heat equations, wave equations, solution by spherical means.
- CO No. – 2 To understand Geometric optics, Stationary phase and Homogenization.
- CO No.- 3 To understand the modeling assumptions and derivations that leads to PDEs

Course Title, Mechanics

- CO No. – 1 To learn Genralized coordinates langranges equation of first kind cyclic coordinates.
- CO No. – 2 To understand Poisson's bracket hamilton's principle, principle of least action Poincare cardan integral invariant.
- CO No.- 3 To learn Whittaker equations hamillton Jacobi equation invariation of lagrange bracket under canonical transformation.
- CO No - 4 To Calculate the attraction for different types of objects.

Course Title, Programming in "C" (with ANSCI features)

- CO No. – 1 To learn over view of programming, Anatomy of C-functions, variables and constants.
- CO No. – 2 To find Different types of data.

- CO No.- 3 To learn the main function Complex declaration, Conditional Compilation, Line Control etc.
- CO No - 4 To learn Input and output streams, Buffering, closing and opening files. The slandered library for input \ output.
- CO No - 5 To address of an objects and pointers.
- CO No - 6 To learn Control flow conditional branching various types of loop.

Course Title, Operations Research

- CO No. – 1 To know the scope of operation research.
- CO No. – 2 To Formulate real world problems to linear programming problems. Solve this problem with various methods.
- CO No.- 3 Get acquired with various algorithm and techniques of above used methods.
- CO No - 4 To understand mathematical formulation and solution of assignment problems and transportation problems.
- CO No - 5 Know network analysis and methods to solve it.
- CO No - 6 To understand the use of dynamic programming in various fields.
- CO No. - 7 To understand Game theory, apply theory of queveing system and Inventory control to particle problems.
- CO No. - 8 Develop understanding of nonlinear programming.

Course Title, Fuzzy Sets and their Logics

- CO No. – 1 Relate mathematical logic with real life. In this unit some models are explained.
- CO No. – 2 To designed an expert system, this unit gives basic propositional rules.
- CO No.- 3 To learn the application of fuzzy set theory in the topic decision making, which is some what vague in nature.
- CO No - 4 Introduction and operation between fuzzy sets and fuzzy numbers.
- CO No - 5 To understand the difference between probability and possibility theory is explained through fuzzy sets.

M.Sc. Botany Semester – I

Course Outcomes:

Paper – I, Cell Biology

- To gain knowledge about “Cell Science.
- To understand the structure, chemistry and functions ofplant cell,cell wall and Plasma membrane.
- To know about the structure, biogenesis and functions of cell organelles.
- To understand genome organization in mitochondria and chloroplast.
- To understand the mechanism of cell cycle, growth and cell divisionin plants.
- To learn about mechanism of programmed cell death in plants.
- To have knowledge of the cell motility organization and functions of cytoskeleton.
- To develop skill in flow cytometry and hybridization techniques.
- Study of structure of plant cell organelles from electron micrographs.
- To study the Squash and Smear techniquesand showing the stages of mitosis (Onion root tips) and showing permanent slides/photographs of mitosis and meiosis .

Paper – II, Microbiology, Phycology and Mycology

- Student will able to understand the structure and replication of different microbes and know the disease caused by them, disease symptoms and their control.
- They will know all about algae including their habitat, range of thallus organization, reproduction and classification.
- Student will know all about fungi including morphology,mode of nutrition, reproduction, heterothallism and para sexuality, classification, disease symptoms and their control.
- Student will get knowledge of the life cycle of all groups of algae and fungi and their economic importance.

Paper –III, Biology and Diversity of Bryophyta, Pteridophyta and Gymnosperm

- Student will able to understand the evolutionary trends of Bryophyta, Pteridophyta and Gymnosperms.
- They will get knowledge about habitats, structure and life cycle of the different members of the plant groups of Bryophyta, Pteridophyta and Gymnosperms.
- They will get knowledge about economic importance of Bryophyta, Pteridophyta and Gymnosperms & also they will know about Azolla as a biofertilizer.
- They will able to understand about geological time scale and fossil plants.

Paper – IV, Plant Physiology

- Students understand examining methods of measuring primary productivity in different ecosystems, Mapping the distribution of primary productivity across the oceans and on land.
- Considering the science, technology, economics or ethics of agriculture and livestock production.
- Examining various impacts to the energy balance of ecosystems, such as fires, disease, population dynamics, and changes in land use.
- The basic principles of enzymology, to understand the relationship between proteins and the nucleic acids (DNA and RNA) that provide the blueprint for the assembly of proteins with in the cell.
- Genetic engineering is thus predominantly concerned with modifying the proteins that a cell contains, and genetic defects (in medicine) generally relate to the abnormalities that occur in the proteins within cells.
- Much of the molecular age of biochemistry is therefore very much focused on the study of the cell, its enzymes and other proteins, and their functions.
- Through this unit students understand Knowledge of plant water relationship. it is important because water is essential for both plants and animals.
- It serves as a medium for the dissolution of substances. A huge amount of water is taken up daily by plants and a considerable amount is lost in transpiration. The water requirement of different categories of plants is different.
- Students understand the signal transduction unit understand the basic principles of signal transduction mechanisms, in particular the concepts of response specificity, signal amplitude and duration, signal integration and intracellular location.

M.Sc. Botany Semester – II

Paper – I, Genetics

- Analyzing the structure of chromosomes and how the packaging of DNA occurs.

- Students can differentiate Euchromatin and Heterochromatin region of chromosome on the basis of staining properties.
- Students can draw a good karyotype and Idiograms of Karyotype, and also how the evolution of Karyotype takes place.
- Evaluating the different structural and numerical changes why? And how? It occurs in the chromosome students, can able to use the trisomic and monosomic for the chromosomes mapping.
- Categorizing the role and process of mutation and different mutagenic agent which brings about mutation in the organism.
- Students will also understand the role of mutation in crops improvement and permutation.
- Understanding of the history of gene from 'something', 'factor'; and gene and one gene one enzyme one character hypothesis.
- Students will also know the interaction of gene, genetic recombination producing the characters differently.

Paper – III, Molecular Biology

- To learn the biochemical nature and types of nucleic acids, their functions in living systems.
- To understand the process of proteins synthesis in prokaryotes and eukaryotes.
- To know the protein targeting to organelles.
- To obtain knowledge about mutation
- To know gene regulation in prokaryotes and eukaryotes.
- To construct the molecular map of genome (RFLP, RAPD, AFLP, VNTRs).
- To construct restriction mapping of DNA and measure DNA content of a cell.
- To study of chromosomal manipulation for obtaining a desire characters and improve quality in crops.

Paper – IV, Plant Metabolism

- Students understand the various plant metabolites are useful for human life, and the induction and reduction of these metabolites using modern biotechnical technique is of enormous potential important especially in the fields of agriculture and health.
- Plant Metabolism and Biotechnology describes the biosynthetic pathways of plant metabolites, their function in plants, and some applications for biotechnology.
- Plant Metabolism and Biotechnology is an essential guide to this important field for researchers and students of biochemistry, plant biology, metabolic engineering, biotechnology, food science, agriculture, and medicine. With the help of plant respiration units students understand, the metabolism in plants of organic molecules using enzymes to generate usable energy in the form of adenosine triphosphate (ATP).
- Plant respiration is an important biochemical process in plants whereby, in most cases, specific substrates are oxidized with a subsequent release of carbon dioxide (CO2).
- The adenosine triphosphate (ATP) generated by plant respiration (as well as that generated by photosynthesis)

Paper – I, Plant Development and Plant Resources

- To understand about life cycle of major group of plants viz. Angiosperms.
- Learn Seed germination,root microbe interaction shoot development.

- Analyse types and development of Wood.
- To know about leaf,stomata and genetics of flower development.
- Learn and analyse useful products of plants and about non wood forest To Products like Bamboo, Gum, and Dyes.

M.Sc. Botany Semester – III

Paper – II, Plant Ecology

- Skill to develop define ecology and the four levels of ecological research
- Describe examples of the ways in which ecology requires the integration of different scientific disciplines.
- Distinguish between abiotic and biotic components of the environment.
- Recognize the relationship between abiotic and biotic components of the environment. To understand ecosystem management.
- Students clearly understand between population & community ecology & their significant role in society.
- Through the Ecological succession" students observed process of change in the species structure of an ecological community over time. Within any community some species may become less abundant over some time interval, or they may even vanish from the ecosystem altogether.
- Similarly, over some time interval, other species within the community may become more abundant, or new species may even invade into the community from adjacent ecosystems.
- This observed change over time in what is living in a particular ecosystem is "ecological succession".

M.Sc. Botany Semester – I

Paper – I, Cell Biology

- To gain knowledge about "Cell Science.
- To understand the structure, chemistry and functions ofplant cell,cell wall and Plasma membrane.
- To know about the structure, biogenesis and functions of cell organelles.
- To understand genome organization in mitochondria and chloroplast.
- To understand the mechanism of cell cycle, growth and cell divisionin plants.
- To learn about mechanism of programmed cell death in plants.
- To have knowledge of the cell motility organization and functions of cytoskeleton.
- To develop skill in flow cytometry and hybridization techniques. Study of structure of plant cell organelles from electron micrographs.
- To study the Squash and Smear techniquesand showing the stages of mitosis (Onion root tips) and showing permanent slides/photographs of mitosis and meiosis .

M.Sc. Botany Semester – I

Paper – II, Microbiology, Phycology and Mycology

- Student will able to understand the structure and replication of different microbes and know the disease caused by them, disease symptoms and their control.
- They will know all about algae including their habitat, range of thallus organization, reproduction and classification.

- Student will know all about fungi including morphology,mode of nutrition, reproduction, heterothallism and para sexuality, classification, disease symptoms and their control.
- Student will get knowledge of the life cycle of all groups of algae and fungi and their economic importance.

M.Sc. Botany Semester – 1

Paper –III, Biology and Diversity of Bryophyta, Pteridophyta and Gymnosperm

- Student will able to understand the evolutionary trends of Bryophyta, Pteridophyta and Gymnosperms.
- They will get knowledge about habitats, structure and life cycle of the different members of the plant groups of Bryophyta, Pteridophyta and Gymnosperms.
- They will get knowledge about economic importance of Bryophyta, Pteridophyta and Gymnosperms & also they will know about Azolla as a biofertilizer.
- They will able to understand about geological time scale and fossil plants.

M.Sc. Botany Semester – I

Paper – IV, Plant Physiology

- Students understand examining methods of measuring primary productivity in different ecosystems, Mapping the distribution of primary productivity across the oceans and on land.
- Considering the science, technology, economics or ethics of agriculture and livestock production.
- Examining various impacts to the energy balance of ecosystems, such as fires, disease, population dynamics, and changes in land use.
- The basic principles of enzymology, to understand the relationship between proteins and the nucleic acids (DNA and RNA) that provide the blueprint for the assembly of proteins with in the cell.
- Genetic engineering is thus predominantly concerned with modifying the proteins that a cell contains, and genetic defects (in medicine) generally relate to the abnormalities that occur in the proteins within cells.
- Much of the molecular age of biochemistry is therefore very much focused on the study of the cell, its enzymes and other proteins, and their functions.
- Through this unit students understand Knowledge of plant water relationship. it is important because water is essential for both plants and animals.
- It serves as a medium for the dissolution of substances. A huge amount of water is taken up daily by plants and a considerable amount is lost in transpiration.
- The water requirement of different categories of plants is different.
- Students understand the signal transduction unit understand the basic principles of signal transduction mechanisms, in particular the concepts of response specificity, signal amplitude and duration, signal integration and intracellular location.

M.Sc. Botany Semester – II

Paper – I, Genetics

- Analyzing the structure of chromosomes and how the packaging of DNA occurs.
- Students can differentiate Euchromatin and Heterochromatin region of chromosome on the basis of staining properties.

- Students can draw a good karyotype and Idiograms of Karyotype, and also how the evolution of Karyotype takes place.
- Evaluating the different structural and numerical changes why? And how? It occurs in the chromosome students, can able to use the trisomic and monosomic for the chromosomes mapping.
- Categorizing the role and process of mutation and different mutagenic agent which brings about mutation in the organism.
- Students will also understand the role of mutation in crops improvement and permutation.
- Understanding of the history of gene from 'something', 'factor'; and gene and one gene one enzyme one character hypothesis. Students will also know the interaction of gene, genetic recombination producing the characters differently.

Paper – II Taxonomy of Angiosperms

- Student will able to get knowledge about taxonomic tools, species concept, ICBN, systems of classification and taxonomic evidences.
- They will understand the diversity of flowering plants including dicots and monocots, their economic importance.
- Student willable to identify scientifically the plants up to species level around their locality.

Paper – III Molecular Biology

- To learn the biochemical nature and types of nucleic acids, their functions in living systems.
- To understand the process of proteins synthesis in prokaryotes and eukaryotes.
- To know the protein targeting to organelles.
- To obtain knowledge about mutation
- To know gene regulation in prokaryotes and eukaryotes.
- To construct the molecular map of genome (RFLP, RAPD, AFLP, VNTRs).
- To construct restriction mapping of DNA and measure DNA content of a cell.
- To study of chromosomal manipulation for obtaining a desire characters and improve quality in crops.

Paper – IV Plant Metabolism

- Students understand the various plant metabolites are useful for human life, and the induction and reduction of these metabolites using modern biotechnical technique is of enormous potential important especially in the fields of agriculture and health.
- Plant Metabolism and Biotechnology describes the biosynthetic pathways of plant metabolites, their function in plants, and some applications for biotechnology.
- Plant Metabolism and Biotechnology is an essential guide to this important field for researchers and students of biochemistry, plant biology, metabolic engineering, biotechnology, food science, agriculture, and medicine. With the help of plant respiration units students understand, the metabolism in plants of organic molecules using enzymes to generate usable energy in the form of adenosine triphosphate (ATP).
- Plant respiration is an important biochemical process in plants whereby, in most cases, specific substrates are oxidized with a subsequent release of carbon dioxide (CO_2). The

adenosine triphosphate (ATP) generated by plant respiration (as well as that generated by photosynthesis).

M.Sc. Botany Semester – III

Paper – I Plant Development and Plant Resources

- To understand about life cycle of major group of plants viz. Angiosperms.
- Learn Seed germination,root microbe interaction shoot development. Analyse types and development of Wood.
- To know about leaf,stomata and genetics of flower development.
- Learn and analyse useful products of plants and about non wood forest To Products like Bamboo, Gum, and Dyes.

Paper – II Plant Ecology

- Skill to develop define ecology and the four levels of ecological research
- Describe examples of the ways in which ecology requires the integration of different scientific disciplines.
- Distinguish between abiotic and biotic components of the environment. Recognize the relationship between abiotic and biotic components of the environment.
- To understand ecosystem management. Students clearly understand between population & community ecology & their significant role in society.
- Through the Ecological succession" students observed process of change in the species structure of an ecological community over time. Within any community some species may become less abundant over some time interval, or they may even vanish from the ecosystem altogether. Similarly, over some time interval, other species within the community may become more abundant, or new species may even invade into the community from adjacent ecosystems.
- This observed change over time in what is living in a particular ecosystem is "ecological succession".

Paper – III Biotechnology and Genetic Engineering of Plants

- To gain the knowledge on application of biotechnology for the production of plant resources and production of new varieties.
- To Understand the basic knowledge about tissue culture tools, medium, sterilization and techniques of tissue culture. Learn about the production of Synthetic seeds, secondary metabolites, strategies of conservation of plants. Know about the morphogenesis and organogenesis in plants. Learn the specific and non-specific methods of gene transfer. Course Outcomes Learn various techniques in Plant Biotechnology like aseptic handling of plant materials, culture of callus, protoplasts and production of artificial seeds.
- To able to understand the techniques of morphogenesis, organogenesis and methods of gene transfer.

Paper-IV Microbial Ecology

- Know about genetic microbial technique for isolation of pure culture techniques. Master aseptic techniques and be able to perform routine culture effectively.
- Know various culture media and their applications and also understand means of sterilizations. Comprehend various methods for identification of unknown microorganisms. Demonstrate theory & practical skill of various instruments and microscopy. Understand the various microbial interaction specially mycorrhiza, root

nodules. Conceptual basis for understanding the human body's normal micro flora. Understand various biogeochemical cycles. Students will be able to demonstrate concept of Bio-fertilizer, Bio-pesticides and their applications.

M.Sc. Botany Semester – III

Paper-IV Ethnobotany

- The study of ethno medicine is concerned with the study of the traditional medical system from the indigenous point of view.
- The ethno medical approach proves particularly useful for the study of indigenous therapeutic agents that enables to understand the healing practices according to indigenous explanatory models and its correlation to the modern medicine or allopathy. Ethno medicine will strengthen our understanding of the issues relating to tribal problems and development.

M.Sc. Botany Semester – IV

Paper – I Plant Reproduction and Utilization of Resources

- To understand various methods of vegetative reproduction such Air Layering, Budding,Grafting. Significance of double fertilization in Angiosperms.
- They know about allergies from pollen grains and pollen storage.
- Learn about endosperm ,embryo,polyembryony and seedless fruits.
- Analyse importance of Avenue trees and uses of medicinal plants.
- Learn about Biodiversity of Ethnobotanical Plants of Chhattisgarh.

M.Sc. Botany Semester – IV

Paper – II Plant Ecology – II (Pollution & Biodiversity Conservation)

- With the Study the pollution & pollution control students understand two specific concepts served as the basis for the control approach:-
- The assimilative capacity concept, which asserts the existence of a specified level of emissions into the environment which does not lead to unacceptable environmental or human health effects. Principle of control concept, which assumes that environmental damage can be avoided by controlling the manner, time and rate at which pollutants enter the environment.
- Application of appropriate technologies is based on a systematic analysis of the source and nature of the emission or discharge in question, of its interaction with the ecosystem and the ambient pollution problem to be addressed, and the development of appropriate technologies to mitigate and monitor pollution impacts. Students will help understand the conservation of plant biodiversity.
- It is important issue concerning the human population worldwide.
- The anthropogenic pressure, the introduction of alien species, as well as domesticated species and chronic weed infestation have dramatic effects on plant diversity, which is reflected in an increase in the number of threatened species. Students understand Plant biodiversity is a natural source of products to the medical and food industries & their significant value for breeding programs and for developing more productive crops and more resistant plants to biological and environmental stresses

M.Sc. Botany Semester – IV

Paper – III, Biotechnology and Genetic Engineering of Microbes

- The course acquaints the students with concepts of Recombinant DNA technology.

- The course content is so designed as to make students aware about the materials and methods being used in the transfer of DNA and its expression in the target organisms. Students learn the science and basic techniques of genetic manipulation and educate them with the scope of the subject.

M.Sc. – Botany Semester – IV

Paper-IV, Elective – I, Microbial Ecology

- Appreciate the diversity of microbes and microbial communities. Comprehend the various methods to determine the quality of water. Understand the methods employed in waste water treatment.
- Learn the basic principles of infectious disease in plant and human. Students will acquire a thorough knowledge about the disease caused by bacteria, virus and fungi.
- Students will be able to know about water portability microbial, bioremediation, waste management, biogeochemical cycling.

M.Sc. Botany Semester – IV

Paper-IV, Elective –II, Ethnobotany

- Ethnobotanical research can provide a wealth of information regarding both past and present relationships between plants and the traditional societies.
- Ethnobotany may also prove an important tool in the search of new pharmaceuticals.
- In addition to its traditional roles in economic botany and exploration of human cognition, ethnobotanical research may be applied to current areas of study such as biodiversity prospecting and vegetation management.
- It is hoped that, in the future, ethnobotany may play an increasingly important role in sustainable development and biodiversity conservation.

M.Sc. Department of Zoology

Program Specific Outcome (PSO):

M.Sc. Zoology The programme enables the students:

- To give comprehensive understanding about the principles of taxonomy, cellular and molecular biology, genetics, ecology and evolution
- To acquire knowledge on the various aspects of zoological sciences, cell biology, genetics, taxonomy, physiology, applied zoology, general embryology and public health
- To recognize the scientific facts behind natural phenomena
- To develop insight and improve their analytical communication and professional skills
- To understand the applications of zoological sciences in Biotechnology, Apiculture, Poultry, Fisheries, Aquaculture, Agriculture and vermiculture
- To gained the knowledge to use modern sophisticated equipments and tools

M.Sc. Zoology Semester - I

Paper- I Biosystematics and Taxonomy

After successful completion of these courses the student would be able:

- To understand the relevance of Biosystematics and its importance in resolving classical and applied research problems
- To understand the importance and applications of various species concepts and speciation in systematics; they will also be able to understand the merits and demerits of various schools of biological classification

- To versed with the collection and identification techniques and use of various tools in taxonomy as well as learn to use taxonomic keys as a cognitive aid
- To understand the basic principles of ICZN and their interpretations in resolving various taxonomic problems
- To help students acquire an in-depth knowledge on the field of diversity and relationship in the animal world
- To appreciate the concept of biological conservation and the relationships between organisms and their surroundings

Department of Microbiology

M.Sc. Microbiology

Program Specific Outcome (PSO):

The programme enables the students –

- To give comprehensive understanding about the diversity of microbes, their organizational units and response towards other life entities
- To inculcate the students to the knowledge of molecular characters and genetic performance of microorganisms
- To study the behavior of microorganisms in terms of physiology and construct relations among them
- To make the hypothetical assumptions about the life forms and establish the facts with data interpretation
- To develop capability of handling of instruments and to build inference for scientific conclusions
- To create employable skills in the field of medical, food and industrial microbiology
- To build the competency for use of knowledge in relation with environment consciousness, ethical values and socio-economical aspects
- To be able to analyze problems involving microbes, articulate this with peers/ team members/ other stake holders, and undertake remedial measures
- To develop a broader perspective of the discipline of Microbiology to enable the students to identify challenging societal problems to plan professional career and develop innovative solutions

Course Outcomes

Semester-I

Paper – I Bacteriology and Virology

Upon successful completion of the course students will be able:

To learn the diversity among bacteria and their respective formsϖ To have idea about the classification and grouping of bacteria through diverse systemsϖ To know the nutritional requirements for cultivation of bacteria under laboratory conditionsϖ To obtain an exposure to the viruses, related agents and bacteriophages and their organizationsϖ To acquire an initiative about the cultivation of viruses and estimation of their harshness inϖ experimental samples To get an overview of viral diseases of plants and animalsϖ

Paper – II Phycology and Mycology

Upon successful completion of the course students will be able:

To Know the diversity and life cycle of Eukaryotic Microorganismsϖ To understand the importance of existence and the life cycle patterns of major groupsof Algae andϖ Fungi To be able to relevant the knowledge of evolutionary relationship among fungal groupsϖ To get insight into useful fungal activities and their importanceϖ To analyze the information regarding representative members of Algae and Fungiϖ

Paper – III Biochemistry

Upon successful completion of the course students will be able:

To learn the characters and classes of basic building blocks and their biological significanceϖ To be familiar the students with bio-molecular derivatives and their importanceϖ To Study the structure, properties and biological importance of DNA and RNA.ϖ To understand conceptual knowledge of properties, structure, function of enzymes, enzyme kinetics andϖ their regulation

Paper – IV Fundamentals of Immunology

Upon successful completion of the course students will be able:

Toenable the concept of immune system and immunityϖ To learn the methods of immunogenic reactionsϖ To understand variety of operation related to immune responseϖ To conceptualize the origin of lymphocytic clonesϖ To know the theory of immunization and immune therapyϖ To get an idea about tumor immunity, hypersensitive reactions and cytokines

Semester-II

Paper – I Molecular Biology

Upon successful completion of the course students will be able:

- To get an in depth understanding of DNA, its replication and inhibitors of DNA replication
- To gain knowledge to define the relationship of sequential steps of transcription, genetic code and translation for synthesis of protein
- To analyze and compare the concepts of regulation of genetic expressions

Paper – II Microbial Genetics

Upon successful completion of the course students will be able:

- To understand the mechanism of damage and repair of DNA in living system
- To gain the knowledge of causes and consequences of alterations or modifications in DNA structures
- To study the different ways of gene transfer in microorganisms
- To get an idea about the tools used in genetic analysis
- To learn the genetic makeup of bacteriophage and their life cycle

Paper – III Microbial Physiology

Upon successful completion of the course students will be able:

- To get an overview of bioenergetics
- To understand the mechanism of anabolism and catabolism
- To study the metabolism of important bio-molecules

Paper – IV Biostatistics

Upon successful completion of the course students will be able:

- To get an introduction about the concept of biostatistics in microbiology
- To learn about basic measures to compile the observation, analyse and make inference
- To get ability to apply proper method to prove the significance of observations
- To be able to explain the discrepancy in results during scientific experiments
- To demonstrate the knowledge to design an experiment and to control the factors affecting the testing

Semester III

Paper – I Biophysical Techniques, Instrumentation and Bioinformatics

Upon successful completion of the course students will be able:

- To gain the skill to deal with microscope
- To study the different separation techniques used for isolation and purification of bio molecules
- To enable the mechanism of radioactive detection, measurement and applications in biological experiments
- To study the origin, importance and applications of techniques like spectroscopy, NMR, ESR and PCR
- To understand the concept of Bioinformatics
- To know the forms of biological informations
- To learn the available resourse and toolsϖ

Paper – II Medical Microbiology

Upon successful completion of the course students will be able:

- To get an overview of discovery and development of medical microbiology and contributions of pioneers in the field of medical microbiology
- To understand the basic principles of medical microbiology and infectious diseases
- To study the classification of different disease causing agents like bacteria, viruses, fungi and protozoa with examples of some common diseases.
- To learn the diagnostic skills for infectious diseases.
- To recognize the measures taken for control of diseases through different systemsϖ

Paper – III, A (Elective) A Food and Dairy Microbiology

Upon successful completion of the course students will be able:

- To understand the idea microorganisms associated with food and factor for their growth.
- To be acquainted with the principles of food preservation
- To study the food spoilage and food born infections through different agents
- To know the measures taken for food quality control
- To get an overview of various food types prepared as of microbial fermentationϖ

Paper – III, B (Elective) B Agriculture Microbiology M

Upon successful completion of the course students will be able:

- To understand the habitat of microorganisms.
- To be familiar with the pathogenic characters of microorganisms
- To know the degradation and toxic effects of microorganisms
- To study positive effects of microorganismsϖ

M.Sc. Microbiology Semester IV

Paper – I Environmental Microbiology

Upon successful completion of the course students will be able:

- To understand the different branches of environmental microbiology
- To study the interactions of microbes in different environments
- To get idea about the role of microorganisms in their respective environments
- To familiarise the concept of decomposition by microbesϖ

Paper – II Industrial Microbiology and Fermentation Technology

Upon successful completion of the course students will be able:

- To understand the history and scope of industrially important microorganisms
- To be acquainted with the mechanism of strain improvement strategies
- To gain skill to deal with new ideas through modern techniques
- To get overview of different products of microbial origin for commercial production

Paper – III A (Elective) A Microbial Biotechnology

Upon successful completion of the course students will be able:

- To learn about core techniques and cloning vectors used in rDNA Technology
- To be able to estimate different strategies used for genetic manipulation
- To learn the sequential steps for creation of important products
- To know about genetically modified organisms and their impact on environment
- To understand about PCR technique and its applications
- To gain the knowledge of rights, ethical issues and safety aspects about microbial biotechnology

Paper – III B (Elective) B Microbial Genomics and Proteomics

Upon successful completion of the course students will be able:

- To understand the broader biology of microorganisms for their genetic composition
- To contributes substantial characteristics required for genomic studies
- To be familiar with techniques of identification of genetic material
- To generate a basic knowledge about current applied techniques for proteomic studies

,e-,- fgUnh iFke leLVj

ikB;de vf/kxe ifj.kke (Course learning Outcome) LukrdkRrj

iFke i"u i=] fgUnh lkfgR; dk bfrgkl ¼ Hkkx&1

¼vkfndky ,o io e/;dky½

- bfrgkl&n"ku vkj lkfgR;frgkl d chp lEc/kk dk Kku gkxkA
- fgUnh&lkfgR; d ,frgkfld fodkl vkj fgnh lekt d fodkl d chp ikjLifjd lEc/k dh le> fufer gkxhA

- HkfDr vknkyu d lkekftd ifji{; vkj jk"Vh; lkekfld lLdfr d fodkl e mld iHkko dk le>u dh nf"V fodflr gkxhA
- Hkkjrh; lLdfr d cgyrkoknh vkj leUo;oknh Lo:i ij fo'okl ink gkxkA

f}rh; i"u i=] ikphu ,o e/;dkyhu dk0; ¼jkl k dk0; ,o fux.k HkfDrdk0;½ Hkkx&1

- e/;dkyhu lkerh lekt d Hkhrj fodflr dk0;ck/k dh tkudkjh vkj le> fodflr gkxhA
- HkfDr vknkyu d ifroknh LoHkko dk Kku gk ldxkA
- e/;dkyhu lkfgR; lLdfr d ifr vfHk:fp tkxr gkxhA
- ikphu dky d fgnh lkfgR; dh lkekftd lonuk dk Kku gkxkA

rrh; i"u i=] dk0; 'kkL= ,o lkfgR;kykpu ¼lkfgR; d fl/nkr rFkk vkykpuk 'kkL=½

- Hkkjrh; rFkk ik'pkR; lkfgR; d 'kkL=h; ekun.Mk l ifjp; gk ldxkA
- lkfgR; d vk'klu ,o eY;kdu dh nf"V fodlfr gk ldxhA
- vkykpuk dh 'kkL=h; rFkk mUeDr i/nfr dk Kku gk ldxkA
- dk0;'kkL=h; i/nfr d vk/kkj ij oreku le; d lkfgR; dh vkykpuk dk i/nfrxr Kku gk ldxkA

prFk i"u i=] vk/kfud x|&lkfgR; ¼ukVd ,o dgkuh½ Hkkx&1

- fgUnh dh vk/kfud ukV;&ijEijk dk Kku gk ldxkA
- fgUnh&fuc/k d x|kRed oHko dk lk{kkRdkj gk ldxkA
- fgUnh&dgkuh dh ijEijk dk Kku gk ldxkA
- x|&y[ku dk 0;kogkfjd if'k{k.k ikIr gk ldxkA

ipe i"u i=] tuinh; Hkkk"kk ,o lkfgR; % NRrhlx<h ¼Hkkx&1½ NRrhlx<h Hkkk"kk]
lLdfr ,o ykdokM-e;

- NRrhlx< d Hkkxkfyd Lo:i] ,frgkfldrk vkj lkLdfrd of"k"V; dk Kku gkxkA
- NRrhlx<h d ykd lkfgR; l ifjp; gk ldxkA
- NRrhlx<h ykd thou d fo"k; e lkekU; tkudkjh ikIr gk ldxhA
- NRrhlx<h tkuu&lh[ku dh ij.kk mRiUUk gkxhA lkFk gh NRrhlx<h lLdfr] ijEijk] jhfr&fjokt l ifjp; gkxkA

odfYid i"u i=] Çgnh] ipe ç'ui= ¼odfYid½] ykd&lkfgR;
ikBîØe dkM %

bl ikBîØe dk vè;;u dju d mijkr fo|kFk;k e

- Hkkjrh; ykdthou d l)kfrd Lo:i d çfr le> fodflr gk ldxhA
- n'k dh ykd&link d çfr tkx:drk fodflr gk ldxhA
- ykd&lkfgR; vkj lL—r okXe; d chp lokn dk lE;d Kku gk ldxkA
- vfHktkr lkfgR; vkj ykd&lkfgR; d chp vrjlcèkk dh le> fodflr gk ldxhA
- Jethoh lekt vkj mldh lL—fr d çfr lonu'khyrk vkj lEeku d Hkko dk fodkl gkxkA

,e-,- fgUnh f}rh; leLVj

iFke i"u i=] fgUnh lkfgR; dk bfrgkl] Hkkx&2 ¼mRrj e/;dky l vk/kfud dky rd½

- jhfrdky dh lkfgfR;d ijEijk dk lE;d Kku gk ldxkA
- vk/kfudrk vkj uotkxj.k dh Kku&ijEijk vkj mldh lkfgfR;d i"BHkfe dh tkudkjh gk ldxhA

- fgUnh d vk/kfud lkfgR; dh lkekftd i"BHkfe l voxr gk ldxA
- fgUnh e x| d fodkl d ,frgkfld ifji{; dh tkudkjh gk ldxhA

f}rh; i"u i=] ikphu ,o e/;dkyhu dk0;] Hkkx&2 ¼lx.k HkfDr dk0; ,o jhfr dk0;½

- HkfDr lkfgR; d Lo:i rFkk mldh lonuk l ifjp; gkxkA
- HkfDr dk0; d nk 'kh"k gLrk{kjk] ljnkl vkj ryhnkl dh dk0; lonuk vkj mudh ltukRedrk l ifjp; gkxkA
- jhfr lkfgR; d Lo:i rFkk mldh lonuk l ifjp; gkxkA
- e/;dkyhu lkfgR; dh ,frgkfld i"BHkfe dh tkudkjh gk ldxhA

rrh; i"u i=] dk0; 'kkL= rFkk lkfgR;kykpu % Hkkx&2
¼leh{kk d ie[k fl/nkr rFkk fgUnh leh{kk 'kkL=½

- vk/kfud lkfgR;&leh{kk dh ie[k oPkkfjd i.kkfy;k ,o mld ekun.Mk l lkekU; ifjp; gkxkA
- fgUnh&vkykpuk dh fofHkUu /kkjkvk dk Kku gk ldxkA
- fgUnh d ie[k vkykpdk dh leh{kk&nf"V dh tkudkjh gkxh fgUnh d futh leh{kk&'kkL= dh lHkkoukvk dk ydj nf"V fodflr gkxhA
- 0;kogkfjd leh{kk dh i/nfr dk Kku gk ldxkA

prFk i"ui=] vk/kfud x|&lkfgR;% Hkkx&2 ¼miU;kl] ,dkdh ,o pfjrkRed dfr½

- fgUnh d x|&lkfgR; l lkekU; ifjp; gk ldxkA
- miU;kl d vuHko&llkj d lk{; l lkekftd okLrfodrk d lk{kRdkj dk vH;kl gkxkA
- ,dkdh&fo|k d fo"k; e tkudkjh gkxh rFkk lkekftd thou d lkFk ,dkdh d lEcU/kk dk Kku gkxkA
- fgUnh d dFkrj x|&lkfgR; l ifjp; gkxkA

ipe i"ui=] tuinh; Hkk"kk ,o lkfgR; % NRrhlx<h Hkkx&2 ¼NRrhlx<h dk0; ,o x|&lkfgR;½

- NRrhlx<h d f'k"V lkfgR; dk Kku gk ldxkA
- NRrhlx< d dkfrdkjh ;k/nk ohjukjk;.k flg d t>k: 0;fDrRo rFkk iFke Lok/khurk l?k"k e mud ;kxnku d fo"k; e tkx:drk mRiUu gkxhA
- NRrhlx<h miU;kl vkj ukV;lkfgR; l ifjp; gkxkA
- NRrhlx<h lh[ku dh ij.kk mRiUu gkxhA

odfYid i"u i=
,e-,- f}rh; leLVj] Çgnh] ipe ç'ui=] ¼odfYid½] ykd&lkfgR;
¼NÙkhlx<h ykd&lkfgR;½
ikBîØe dkM %
bl ikBîØe dk vè;;u dju d mijkr fo|kFk;k dk

- NÙkhlx< dh okfpd ijEijk vkj mldh le) fojklr dk lE;d Kku gk ldxkA
- NÙkhlx< d ykd thou d fo"k; e le> vkj lonu'khyrk fodflr gk ld
- NÙkhlx<h ykd lkfgR; dk lefpr Kku gk ldxkA
- NÙkhlx< d lkL—frd vrhr d çfr xkjo dk ckèk gkxkA
- NÙkhlx< d Jethoh lekt vkj mldh lL—fr d çfr lonu'khyrk vkj lEeku d Hkko dk fodkl gkxkA

,e-,- fgUnh rrh; leLVj

iFke i"u i=] Hkk"kk foKku&Hkkx&1

- Hkk"kk foKku d l/nkfrd vkj ljpukRed i{k dk Kku gkxkA
- Hkk"kk dh :i&ljpuk vkj 0;kdj.k d l/nkfrd i{k dh tkudkjh gkxhA
- /ofu&ljpuk vkj mldh l/nkfrdh dk Kku gkxkA
- Hkk"kk e vFkkiu dh i/nfr dk Kku gkxkA

f}rh; i"u i=] i;kVueyd fgUnh& Hkkx&1 ¼jkT;Hkk"kk fgnh½] dEI;fVx ,o i=dkfjrk½

- fgnh Hkk"kk d 0;kogkfjd ,o i;kVukRed i{k dk Kku gkxkA
- dk;ky;hu fgnh dh lkekU; tkudkjh gkxhA
- fgnh e dEI;fVx i.kkyh dk Kku gkxkA
- fgnh&i=dkfjrk d Lo:i rFkk dk;i.kkyh dh tkudkjh gkxhA

rrh; i"u i=] vk/kfud dk0;] Hkkx&1 ¼Nk;kokn ,o ioorh dk0;½

- f}onh&;xhu dk0;/kkjk l ifjp; gkxkA
- Nk;kokn d dk0;&of"k"V; dk Kku gkxkA
- fgUnh d lkfgfR;d iVkxj.k dk Kku gkxkA
- efFkyh'kj.k xlr] ilkn] fujkyk vkj egknoh oek d dk0;&of'k"V; dh tkudkjh gkxhA

prFk i"u i=] Hkkjrh; lkfgR;] Hkkx&1 ¼Hkkjrh; lkfgR; dk l/nkfrd i{k½

- Hkkjrh; lkfgR; d l/nkfrd i{k dk Kku gkxkA
- Hkkjr dh lkLdfrd cgyrk d ifr tkx:drk fodflr gkxhA
- Hkkjrh; lkfgR; dh cgHkk"kh ijEijk e fofo/krk vkj ,dkRerk d ifr ltxrk mRiUu gkxh rFkk fofo/krk d lEeku dk Hkko fodflr gkxkA
- Hkkjrh; lkfgR; dh ijEijk e oreku nkj d lkfgR; d ,frgkfld fodkl dh le> fodflr gkxhA

ipe i"u i=] i=dkfjrk&if"k{k.k] Hkkx&1 ¼i=dkfjrk dk Lo:i½

- of"od] Hkkjrh; rFkk Hkk"kk;h Lrj ij i=dkfjrk d mn; ,o fodkl d bfrgkl&de dh tkudkjh gkxhA
- fgnh&i=dkfjrk d Lo:i vkj i.kkyh dk Kku gkxkA
- i=dkfjrk d ic/kkRed rFkk idk;kRed i{k dh le> fodflr gkxhA
- i=dkfjrk dh dk;fof/k dk Kku gkxkA

odfYid i"u i=

,e-,- rrh; leLVj] Çgnh] ipe ç'ui=] ¼odfYid½] jkT;Hkk"kk&çf'k{k.k Hkkx&1

ikBîØe dkM %

bl ikBîØe dk vè;;u dju d mijkr fo|kFk;k e

- jkT;dh; dk; rFkk ç'kklu&0;oLFkk e jkT;Hkk"kk d :i e Çgnh dh vko';drk] mi;kfxrk vkj mld vuç;kx d fo"k; e Kku gkxkA
- Hkkjr&tl cgHkk"kh lekt e lid Hkk"kk d :i e Çgnh dh mi;kfxrk d ckj e le> fodflr gk ldxhA
- jkT;Hkk"kk d :i e Çgnh dh loèkkfud fLFkfr rFkk lcfèkr loèkkfud çkoèkkuk dk Kku gk ldxkA
- Çgnh&Hkk"kk d ekudhdj.k d {k= e gk jg dk;k dh tkudkjh gk ldxhA

- Çgnh e ç'kklfud dkedkt dju e lkeF; fodflr gk ldxkA

,e-,- fgUnh prFk leLVj

iFke i"u i=] Hkk"kk foKku] Hkkx&2 ¼fgnh Hkk"kk ½ ,frgkfld fodkl ,o vk/kfud Lo:i½

- fgnh Hkk"kk d fodkl d bfrgkl de vkj mldh ijijk dh tkudkjh gkxhA
- fgnh in"k dh tuinh; ckfy;k vkj miHkk"kkvk dh fo"k"krkvk rFkk mud Hkkxkfyd {k=&foLrkj dk Kku gkxkA
- fgnh Hkk"kk d idk;kRed i{k vkj mldh lo/kkfud fLFkfr dk Kku gkxkA
- fgnh e dEl;fVx dh i/nfr dh lkekU; tkudkjh gkxhA

f}rh; i"u i=] i;ktueyd fgnh ¼Hkkx&2½ ehfM;k&y[ku ,o vuokn

- tulpkj d Lo:i] i/nfr vkj ifd;k dh lkekU; tkudkjh gkxhA
- tulpkj ek/;ek dh Hkk"kk d of"k"V; dk Kku gkxkA
- fgnh e vuokn dh ifd;k vkj ifof/k dh tkudkjh gkxhA
- vuokn d fl/nkr vkj 0;kogkfjd i{k dk Kku gkxkA

odfYid i"u i=

Çgnh] ipe ç'ui=] ¼odfYid½] jktHkk"kk&çf'k{k.k Hkkx&2

ikBîØe dkM %

bl ikBîØe dk vè;;u dju d mijkr fo|kFkÊ

- dEl;Vj e Çgnh d vuç;kx d fo"k; e tku ldxA
- dk;ky;hu vfHky[kk d Çgnh vuokn d 0;kogkfjd i{k d lcèk e tku ldxA
- Çgnh e rduhdh vkj oKkfud 'kCnkoyh vkj mud 0;ogkj d fo"k; e tku ldxA
- Çgnh e oKkfud rduhdh ç'kklfud fofèk 'kCnkoyh fp= ;kx d fo"k; e tku ldxA
- lpuk çk|kfxdh u Çgnh d vuç;kx d fo"k; e tku ldxA

rrh; i"u i=] vk/kfud dk0;] Hkkx&2 ¼ixfroknh ,o mRrjorh dk0;½

- ixfroknh dk0; d opkfjd vkj lonukRed Lo:i l ifjp; gkxkA
- i;kxoknh dk0; d opkfjd vkj lonukRed Lo:i dk Kku gkxkA
- vK; vkj efDrck/k dh ych dforkvk d cgku fgnh dh ych dforkvk d Lo:i vkj jpukfo/kku d ckj e le> fodflr gkxhA
- ukxktu vkj f=ykpu dh dk0;xr vfHkyk{kf.kdrkvk l ifjp; gkxkA

prFk i"u i=] Hkkjrh; lkfgR;] Hkkx&2

¼Hkkjrh; lkfgR; % if"pekRrj ,o nf{k.kkR; Hkk"kkvk dk lkfgR;½

- ejkBh lkfgR; vkj lLdfr l fo|kfFk;k dk lkekU; ifjp; gk ldxkA
- iMkh jkT; egkjk"V dh lLdfr dk Kku gku l jk"Vh; leUo; dk Hkko fodflr gkxkA
- ey;kye rFkk dUuM dh fof"k"V dfr;k dk v/;;u fd, tku l nf{k.kkR; lLdfr l Hkh ifjp; gkxk rFkk leUo; Hkkouk dk Hkh fodkl gkxkA
- Hkkjrh;rk d lkLdfrd L=krk d ifr ltxrk mRiUu gkxhA

ipe i"u i=] i=dkfjrk if'k{k.k] Hkkx&2 ¼byDVkfud ,o fi.V i=dkfjrk½

- byDVkfud i=dkfjrk dh idfr ,o ifof/k dk Kku gkxkA
- tu&lid dh fof/k dk lkekU; Kku gk ldxkA

- lfo/kku inRr ekfyd vf/kdkjk fo"k"krk ok.kh&Lokr=; d ykdrkf=d vf/kdkjk d fo"k; e le> fodfl r gkxhA
- i=dkfjrk d dr0; ,o nkf;Ro i{k dk Kku gkxkA

M.A. English, Semester I and II

Programme Outcome :

- The student will have been familiarised with the representative literary text in multiple genres and major events in the history of English Literature.

Programme Specific Outcome :

- The student will have read diverse literary works and will have developed an appreciation of their aesthetic qualities and will have understood diverse cultures.

CourseOutcome :

- The student acquires knowledge about the growth of English language and literature from the age of Chaucer upto the Age of Interrogation.
- These studies sensitises students into an emphatic understanding of Human Values, Professional Ethics, Environmental Issues and Gender Issues

M.A. English, Semester III and IV

Programme Outcome :

- The student will have been familiarised with representative literary text, scientific study of English language and the key concepts, texts of literary criticism.

Programme Specific Outcome :

- The student will have read diverse literary works and critical theories and will have learnt to apply critical approaches to the reading and analysis of literary works in various genres.

Course Outcome :

- The student gets familiarised with the thematic concepts, genres of Indian Writing in English, American Literature and Colonial & Postcolonial literature.
- These studies sensitizes students into an emphatic understanding of Human Values,Professional Ethics ,Environmental and Gender Issues

M.A. Economics

Course Outcome:

- **Micro Economic Analysis :**
  The outcome of the paper is to understand the micro economic units of the economy.it is to understand the behavior of the individual and the individual firm.it makes the student understand the consumer78ehavior , a producer's78ehavior , cost theory , helps to understand different types of market and theory of distribution.
- **Macroeconomics :**
  The outcome of this course is that it helps to understand the macro economic state of the economy.it helps to understand the aggregate demand, employement and the national income or GDP of the e conomy.it helps to understand the development and growth of an economy.
- **Quantitative Methods :**
  the outcome of this is to help students understand the economic analysis of the economic problems with the help of the statistical tools.
- **Economics of Growth and Development :**
  This paper focus on the development and growth issues of the economy of any country.it

deals with the models of economic growth to explain the change in the variables of economic growth in an economy.

- **Public Economics :**
  This paper basically deals with the government participation in the economy with government expenditure and revenue, taxation and public debt.
- **International Economics :**
  The outcome of this course is that it helps to understand the foreign trade of the country. Its helps students to understand the import and export concept necessary for the Indian economy.
- **Labour Economics :**
  The outcome of this course is that it helps to understand the concept of labour market and its contribution in the growth or development of any region.it helps to understand the structure of the Indian market and its problems. different ACTs and laws are learnt by the students.
- **Industrial Economics :**
  This course helps to understand the concepts like market product, market differentiation , market innovation, market structure, industrial location theories.
- **Agricultural Economics :**
  This paper helps to understand the agricultural development taking place in india .it covers the progress of the agriculture since independence and also focuses on the analysis of agricultural research.
- **Environmental Econmomics :**
  It is basically a value-added paper which focuses on the concept of environment and its relation with economics. It gives an insight about the taxes and discounts made by the government for the production of different goods in the country to control or minimize the pollution.it helps to understand the different environmental values and costs related to it.it helps to understand the need of environmental conservation and protection in India and Globally. The paper focuses on the Resources available in any country and its optimum utilization for the economic growth with minimum environmental degradation. The Course adds a value as well as a moral value to the students to save our environment with sustainable development.
- **Indian Economy :**
  This course focus on all the past and current issues of Indian economy. Whether it is agriculture or the industries of the policies of government.it gives all the data related to the national income and the growth of an economy.

M.A. Sociology

Outcome of Classical Sociological Tradition, Thinkers and Modern Theoris:

- Social events are changing rapidly. Be it the principals of sociology whether it is classical or traditional or modern students, a group is creating a subtle understanding.
- These principles have been proved in the past, but in today's circumstances, studying them will give students a perspective with self- imagination.
- The Society is organized in every age with a new circumstance. The study of these theories suggests have never remained separate from social life, but have existed from the root.
- The way scholars like Mark, Weber, Durkheim interpret the transition, it gives the student a new perspective.
- All these principles with their originality create a new perspective in the present circumstances so that they can prove the meaning of their own participation in the creation of future society.

Outcome of M.A. Sociology I & II Semester Research Methodology:

- Knowledge of research and process including reading, assessment and development is indentified.
- Students understand the fundamentals of research knowledge in research methodology.
- Can understand current events using differences in qualitative and conformational methods.
- Identifies the role and importance and develops a utilitarian perspective.
- A scientific approach to viewing social events develops. Understands the difference between real knowledge and Common sense.

Outcome for M.A. III & IV Semester Outcome of Criminology I & II

- The existence of any society depends on the organization. Through the organization's bill, criminology also helps in
- Providing complete information about criminals and in analyzing their personality.
- This theory helps students to understand both the causes and treatment of crime.
- Thought this scripture, it helps students to find out about those situations so that they can be controlled.
- Thought this Shastra, it helps students to gain knowledge about punishment and improvement in criminals. Also helps students to get knowledge of deviant behavior of people.
- Through this, it is mandatory for the students to improve the criminals and re-establish them in the society.
- Students can understand various problems of society from social and psychological point of view.

Outcome for Rural Society in India (M.A. Sem-I, Paper-IV)

CO 1: Rural Society:

- Concepts and Characteristics,
- Peasant society and Agrarian Society.
- Tribe- Concepts and Characteristics
- Change in Rural Society

CO 2: Social Issues

- Migration
- Land Alienation
- Green Revolution
- Folk Culture

CO 3: Contemporary Issues

- Health
- Education
- Poverty & Indebtedness
- Changing status of Rural Women

CO 4: Movement & Changes

- Peasant Movement- Concepts, Causes and Type
- Tibhaga
- Telangana
- Tribal Movement

COURSE: Rural Sociology (MA Sem-2. Paper-IV)

CO 1: Approaches and Scope

- Scope of Rural Sociology
- Approaches To the Study of Rural Sociology – Historical, Structural Functional, Comparative Interdisciplinary and Cross- Cultural
- Approach

- Caste – Meaning, Definition, Characteristics, Function, Importance and Demerits, Changes and Caste Tension
- Jajmani System - Meaning, Definition, Characteristics, Importance, Demerits and Changes in Jajmani System

CO 2: Rural Social Structure

- Social Structure – Meaning, Definition, Characteristics
- Rural Social Stratification – Meaning, Definition, Characteristics, Main Base, Stratification and Caste System
- Rural Economy - Meaning, Concept, Types - Agriculture, Alericulture, Floriculture, Livestock Breeding,
- Handicrafts, Small & Cottage Industry
- Caste Panchayat, Dominant Castes and Rural Factions – Meaning, Definition, Concept, Role of Caste
- Panchayat in Rural Societies, General features of Faction, Types of Factions, Folk society & Factionalism,Caste & Faction
- Guidelines of IQAC and submission of AQAR for Autonomous Colleges Page 6

CO 3: Major Rural Institutions

- Rural Family and Rural Joint Family – Meaning, Definition, Characteristics, Changes in Rural Family,
- Factors Responsible for Changes in Rural Family.
- Rural Religion - Meaning, Definition, Meaning of Rural Religion, Characteristics Role of Religion in Rural life.
- Rural Leadership – Meaning, Definition, Characteristics and Types, Changing Pattern of Rural Leadership.
- Rural Power Structure – Meaning, Definition, Characteristics, Changing Stages of Power, Indian Rural Power Structure

CO 4: Development and Change

- Impact of Industrialization and Urbanization on Rural Society – Meaning, Definition, Characteristics,
- Changes in Rural Society due to Industrialization & Urbanization
- Sanskritization – Meaning, Definition, Characteristics, Process, Social Change, Favorable Conditions
- Rural Development Programme – Meaning, Definition, Major Rural Development Programme - Integrated
- Rural Development Programme, Antyoday Programme, National Rural Employment Programme,
- Swarnajayanti Gram Swarojgar Yojana (SGSY), Rural Landless Employment Guarantee Programme (RLEGP)
- Globalization and its Impact on Rural India – Meaning, Definition, Characteristics, Globalization & Agrarian

COURSE: Perspective of Studies to Indian Societies-I (MA Sem-3. Paper-II)

CO 1: Indological / Textual

- Approach of Study ,Major Trends in Indian Sociology, Indological Perspective - Meaning of Indological
- Perspective, Basic Assumptions of Indological Perspective
- G.S. Ghurye ,Life Sketch and Main Works, Indological Perspective of G.S. Ghurye
- Louis Dumont.Life Sketch and Main Works, Indological Perspective of Louis Dumont
- Criticism of Indological Perspective

CO 2: Structural Functionalism Perspective

- Approach of Study, Meaning and Definition, Basic Assumptions of Structural – Functional, Utility of
- Structural- Functional Perspective and Major Limitations of Structural- Functional Perspective
- M.N. Srinivas, Life Sketch and Main Works, Structural- Functional Study of Rampura Village
- S.C. Dube, Life Sketch and Main Works, Structural- Functional Analysis of Samirpet Village, Introducing
- Samirpet Village, Social Structure of Samirpet Village.
- Criticism of Structural Functionalism Perspective

CO 3: Marxian

- Approach of Study: Marxian Perspective - Meaning, Definition, Main Assumptions of Marxian Perspective
- D.P. Mukherji: Life Sketch and Main Works, Marxian Perspective of D.P. Mukherji
- A.R. Desai: Life Sketch and Main Works, Desai's Marxian Perspective
- Criticism of Marxian Perspective

CO 4: Subaltern Perspective

- Approach of Study - Meaning, Definition, Concept of Subaltern Perspective
- B.R. Ambedkar - Life Sketch and Main Workers, Subaltern Perspective of B.R. Ambedkar
- David Hardiman - Life Sketch and Main Workers, Subaltern Perspective of David Hardiman
- Criticism of Subaltern Perspective

COURSE: PERSPECTIVES OF STUDY TO INDIAN SOCIETY – II (MA Sem-4. Paper-II)

CO 1: Synthesis of Textual and Field Views

- Approach of Study - Meaning of Field View, Importance of Field View and Interface between Classical and Field Views
- Irawati Karve's Life Sketch and Main Works, Irawati Karve's Analysis of Indian Society
- Guidelines of IQAC and submission of AQAR for Autonomous Colleges Page 7
- A.M. Shah's - Life Sketch and Main Works, A.M. Shah's – Analysis of Indian Society
- Criticism of Textual and Field Views

CO 2: Civilization

- Approach of Study – Civilization View, Meaning, Definition, Main Characteristics of Civilization, Meaning of Civilization Perspective
- N.K. Bose – Life Sketch and Main Works, Civilization Perspective N.K. Bose, Culture and Civilization,
- Architecture and Civilization
- Surjit Sinha – Life Sketch and Main Wores, Civilization Perspective of Surjit Sinha
- Criticism of Civilization Perspective

CO 3: Current Debates

- Contextualization - Joint Family, Caste System and Village Community
- Indigenization, Ideological Classical Perspective
- Use of Native Categories
- Text and Context

CO 4: Debate on "For Sociology of India"

- Sociology for India – Indianization of Sociology
- Sociology in India - Contribution of Bombay School, Lucknow School and Delhi School
- Trends and Possibility of Sociology in India

- Major Obstacles in the Development of Sociology in India

Outcome for M.A. III & IV Semester Outcome of Criminology I & II

- The existence of any society depends on the organization. Through the organization's bill, criminology also helps in
- Providing complete information about criminals and in analyzing their personality.
- This theory helps students to understand both the causes and treatment of crime.
- Thought this scripture, it helps students to find out about those situations so that they can be controlled.
- Thought this Shastra, it helps students to gain knowledge about punishment and improvement in criminals. Also helps students to get knowledge of deviant behavior of people.
- Through this, it is mandatory for the students to improve the criminals and re-establish them in the society.
- Students can understand various problems of society from social and psychological point of view.

Outcome for M.A. III & IV Semester Outcome of Criminology I & II

- The existence of any society depends on the organization. Through the organization's bill, criminology also helps in
- Providing complete information about criminals and in analyzing their personality.
- This theory helps students to understand both the causes and treatment of crime.
- Thought this scripture, it helps students to find out about those situations so that they can be controlled.
- Thought this Shastra, it helps students to gain knowledge about punishment and improvement in criminals. Also helps students to get knowledge of deviant behavior of people.
- Through this, it is mandatory for the students to improve the criminals and re-establish them in the society.
- Students can understand various problems of society from social and psychological point of view.

Outcome of M.A. Sociology I & II Semester Research Methodology

- Knowledge of research and process including reading, assessment and development is indentified.
- Students understand the fundamentals of research knowledge in research methodology.
- Can understand current events using differences in qualitative and conformational methods.
- Identifies the role and importance and develops a utilitarian perspective.
- A scientific approach to viewing social events develops. Understands the difference between real knowledge and Common sense.

Outcome of Classical Sociological Tradition, Thinkers and Modern Theoris

- Social events are changing rapidly. Be it the principals of sociology whether it is classical or traditional or modern students, a group is creating a subtle understanding.
- These principles have been proved in the past, but in today's circumstances, studying them will give students a perspective with self- imagination.
- The Society is organized in every age with a new circumstance. The study of these theories suggests have never remained separate from social life, but have existed from the root.
- The way scholars like Mark, Weber, Durkheim interpret the transition, it gives the student a new perspective.

- All these principles with their originality create a new perspective in the present circumstances so that they can prove the meaning of their own participation in the creation of future society.

M.A. Sociology III Semester Outcomes of Sociology of Development

- The existence of the any society depends on development and change. Reading the paper gives students a deep and Theoretical identification of universal facts such as change. The rationality of change and development can be Understood as the behavioral consequences of the students.
- By studying the sociology of development, understanding the plan of the past and the future strategy can be formulated. With the changing nature of society.
- The study of these two major concepts can explain the work-cause relationship and evaluation of events.
- Sociology of development can provide a new perspective in understanding Indian Society.
- The difference between the theory and behavioral results of its study can be understood also the results of sociology of Development can be monitored and evaluated.

M.A. III & IV Industrial Sociology

Industry and society in India:

- Industrial Sociology is an important subject for the study of the growing industrial society under which scientific study of industrial society is done.
- Second Industrial Sociology Who provides practical and scientific first to understand society.
- Industry is not just a group of instruments. This subject provides the values of human relations in the students. To understand this. Through its past and new studies, it will provide a new mature to the student.
- This branch is very important for understanding the honorable aspects of industrial life.
- Industrial Sociology as a practical subject provides the basis for understanding and using the sociological concept in the context of industries.

M.A. History

Semester-I

Paper-I : Methodology of History

Outcomes:

- Students will be able to learn :
- The philosophies of different Historian.
- Scientific approach in History.
- Different theories and ideologies of history. For eg: Marxist theory, Imperial theory, Subaltern theory.
- Relation of history with different subjects geography economics literature etc.
- Prejudices and Biases of history.

Paper-II : Modern World 1870 to 1920

Outcomes:

- Students are going to attain knowledge of :
- Global History.
- Problem solving skills through the event of history.

- Historical research, Analysis, Presentation.
- First World War.
- Revolution.

Paper-III : Ancient and Medieval Chhattisgarh

Outcomes:

- Students will be able to learn the regional history.
- The subject is going to help students to attend general knowledge about the Chhattisgarh which will help them in competitive exams.
- Students will be able to understand the evolution and development of Chhattisgarh.
- Students will be able to analyse past relation with present situation in terms of Politics, Culture and Administration etc.
- Student will be able to analyse Maratha rule in Chhattisgarh.

Paper-IV: Tourism-In Theory & Practices

Outcomes:

- The subject is going to open the different option.
- Students are going to learn about the different places in India in terms of religion, culture and history.
- Students are going to learn about many new cultures.
- Students are going to learn about many new cultural historical and religious places in Chhattisgarh.

- The subject also provide minute details on the successful tourism and travel in the country

Paper-V: Political & Administrative History of India (From Rig Vedic Period to 1206 A.D.)

Outcomes:

- The subject is going to to give knowledge about ancient India.
- The subject will also be helpful to prepare for competitive exam.
- Students will understand the political and administrative development in ancient period in India.
- Students will come to know about the the greatness of different Indian rulers.
- Students will understand the nature of contemporary happening in perspective of the past.

Semester-II

Paper-I: Historiography

Outcomes:

- Describe salient features of the tradition of history
- writing during the ancient, medieval and modern
- periods.
- Explain the Modern European Traditions of History
- Writing like Positivist, Marxist and Annals traditions.
- Critically examine Modern Indian Traditions of
- History Writing
- Understand the tradition of writing ‘History from
- Below’ in India.

Paper-II: Contemporary World (1920 to 1950 A.D.)

Outcomes:

- Critically explain the legacy of 19th Century
- Analyse the emergence of the World Order upto
- 1919
- Understand the nature and effects of World War I
- Explain the developments in World History during
- the period between the two World Wars
- Understand the impact of the Second World War

Paper-III: Modern Chhattisgargh

Outcomes:

- The Modern history of Chhattisgarh.
- They would also be able to know the different dynasties ruled in Chhattisgarh.
- They would learn about the national movements in Chhattisgarh.
- They would have a comprehensive knowledge of the administration changes
- in Chhattisgarh through nineteenth century.
- It will help to understand the history of Chhattisgarh which became important in the course of history.

Paper-IV: Tourism-in Theory & Practices

Outcomes:

- A student with a strong sense of history and a very strong historical background is best suited to the field of tourism.
- The job prospects for the students of history are greater compared to others with not so similar a background.
- The introduction of 'Theory and practices of Tourism' as an elective subject will facilitate the students know the basics of tourism and will enthuse their interests in the tourism industry.

Paper-V: Political & Administrative History of India (1206 TO 1707 A.D.)

Outcomes:

- This course aims to acquainting students with Political and economic background, Agrarian economy and Trade and Commerce under sultanate rule and Mughals.
- It acquainting students with Monetary System, Towns and Cities and Emergence of Regional States under the study period.
- They will be able to analyse the relation of the past with the present situations.
- It will help them to get prepared for the various competitive exams.

Semester-III

Paper-I: Political & Administrative History of India (1757 to 1857 a.d)

Outcomes:

- Discuss the advent of Europeans and their administration.
- Evaluate the Anglo-Mysore wars and Anglo-Sikh wars.

- Administrative development under the Governor General of India.
- Development of public service under the colonial rule.

Paper-II: Socio-Economic Changes in Modern India
(1757 TO 1857 A.D.)

Outcomes:

- Social status of pre and post colonial India.
- Modernization in india in the field of education ,press and society.
- Understand about the Socio-religious reform movements in 19th century.
- Study of new land revenue system in india.
- Study of commercialization of agriculture and rural indebtedness.

Paper-III: History of Indian National Movement
(1857 TO 1919 A.D.)

Outcomes:

- Study of first war of independence.
- State the role of moderates and extremists in the freedom movement.
- To develop understanding by studying the development of the peasentmovment.
- Gandhi ji early political life.

Paper IV: Cultural history of india
(form beginning to 1206 A.D.)

Outcomes:

- Understand the salient features of Indus valley civilization.
- Evaluate the features of Buddhism and Jainism
- Visualize the art and architecture of Mauryas.
- Identify the culture of Guptas

Paper-V: Constitutional History of India
(1773 TO 1947 A.D.)

Outcomes:

- The constitutional development in 17th century to 19th century.
- The early 18thcentury turn to diffentchater acts during English colonial
- rule.
- The rise of the English Company as a political entity in India and the
- development of colonial rule.
- The transition to colonialism viewed from the perspective of the local,the regional and individual histories. This offers fresh perspective on our methodologies of studying the rise of 'modern' India.

Semester-IV

Paper-I: Political & Administrative Hstory of India
(1858 to 1950 a.d.)

Outcomes:

- Students will Know how to define the development of political institutions in India during British period.

- Understand and explain the British Historiography on India, e.g. writings and approach of William Jones, James Mill and T.B Macaulay.

- Students will understand and be able to describe the strategies of Imperial Expansion via wars and alliances.

Paper-II: Socio-Economic Changes in Modern India
(1858 To 1964 A.D.)

Outcomes:

- Students will know how to define various Socio-economic changes under British in India.
- Analyze the impact of epoch making events introduction of railways and modern industry in India.
- Describe the first developed banking system, fiscal system and tariff policy under British India.
- Analyze causes and impact of economic drain from India to England.
- Analyze the impact of Orientalist- Anglicist Debate on education system in British India.
- Know about Development and Growth of Modern Education under British India.
- Analyze causes and impact of Socio-Religious Reform Movements in India.

Paper-III: History of Indian National Movement
(1920 to 1947a.d)

Outcomes:

- Students will know how to define various economic changes under British in India.
- Analyze the impact of epoch making events introduction of railways and modern industry in India.
- Describe the first developed banking system, fiscal system and tariff policy under British India.
- It will help them to get prepared for the various competitive exams.

Paper-IV: Cultural History of India
(1206 to 1947 a.d.)

Outcomes:

- This course introduces the students how India's society and culture undergoes a sea change during the medieval and modern Period.
- It aims to teach them how political developments in a country are shaped and influenced by the social, religious, economical, educational and cultural conditions.
- It makes them clear that Indian culture is an amalgamation of several cultures.
- Further, it helps to inculcate the social and moral values among the students.
- It provides the students a glimpse of the richness of ancient Hindu art, architecture and literature.
- Students will understand the Hindu religious movements, customs, traditions, languages, literature, art and architecture.

Paper-V : Indianconstitution

Outcomes:

- To Enable the student to understand the importance of constitution

- To understand the structure of executive, legislature and judiciary
- To understand philosophy of fundamental rights and duties
- To understand the autonomous nature of constitutional bodies like SupremeCourt and high court, controller and auditor general of India and election commission of India.
- To understand the central and state relation, financial and administrative.
- Able to analyze the History, features of Indian constitution, the role Governor and Chief Minister, role of state election commission, the decentralization of power between central, state and local self-government.

M.Com. (Master of Commerce)

Programme Objectives (POs) :

With the vision "to nurture the young brains, to make them better employable and socially responsible citizens by encapsulating them with the right set of knowledge for a better tomorrow", Department of Commerce focuses on building conviction with impartiality and modesty, create an enabling environment for innovative thought processes and nurture open-mindedness, equitability, and perseverance. The M.Com program aims to provide:

- A conducive environment that holistically engages students through an all-encompassing knowledge impartation,
- Research orientation,
- Developing entrepreneurial skills,
- Sound theoretical foundation,
- Formulating business problems and provide innovative solutions thus molding them into future visionaries, management leaders that are compassionate yet efficient.

Program Outcomes:

- To acquaint students with conventional as well as contemporary areas in the discipline of Commerce.
- To enable a student well versed in national as well as international trends.
- To enable the students for conducting business, accounting, and auditing practices, the role of regulatory bodies in corporate and financial sectors nature of various financial instruments.
- To provide an in-depth understanding of all core areas specifically Advanced Accounting, International Accounting, Management, Security Market Operations and Business Environment, Research Methodology and Tax planning.

Program Specific Outcomes:

After the completion of the M.Com Course, a student is able

- For pursuing research in their chosen areas.
- For teaching in Schools and Colleges after qualifying requisite tests.
- For working as a data analyst.
- To work as investment consultants after a brief internship in suitable organizations absorbed in the Banking and Insurance sector as executives

M.Com. Previous (Semester I & II)

Paper-I **Managerial Economics**
Paper-II **Statistical Analysis**
Paper-III **Corporate Financial Accounting**
Paper-IV **Principles & Practice of Insurance**
Paper-V **Business Environment**

Paper-I Managerial Economics

Course Objectives:

- To help the students form a clear idea of Managerial Economics.
- To enable the students to understand the determination of price under different market forms.
- To enable the students to understand the situation of consumer and producer equilibrium.
- To describe the concept of Inflation and its consequences in an economy.
- To learn the calculation of national income.

Course Outcomes:

- Ability to forecast demand in light of changing circumstances and to formulate business plans.
- Ability to chalk out Business Policies.
- Knowledge about Profit Planning and control.
- Skill to analyze effects of Government Policies.
- Understand how households (demand) and businesses (supply) interact in various market structures to determine the price and quantity of a good produced.
- Understand the links between household behavior and the economic models of demand.
- Understand the links between production costs and the economic models of supply.
- Apply the concept of opportunity cost
- Analyze operations of markets under varying competitive conditions
- Understand the causes and consequences of business cycles

Paper-II Statistical Analysis

Course Objectives:

- To bring out the importance of statistics in solving different research problems.
- To enable the students in-depth understanding of the concepts of probability, sampling, correlation and their applicability.
- To help the students gain a comprehensive view of the usage and importance of various software in solving different statistical problems.

Course Outcomes:

- Development of logical reasoning ability in students.
- Knowledge about the applicability of various parametric and non-parametric tests.
- Ability to use SPSS and other statistical softwares to solve statistical problems.
- Ability to make decisions under uncertain business situations.

Paper-III Corporate Financial Accounting

Course Objectives:

- To give a broad view of the provisions to be followed for the preparation of final accounts of companies as per Companies Act 2013.
- To give a detailed view of legal provisions regarding the calculation of managerial remuneration.
- To explain the concept of divisible profits and its implications in various accounting procedures leading to the preparation of Final Accounts if a Company as per Company Act.
- To give a comprehensive view of legal provisions governing the audit of Companies and its various kinds.

Course Outcomes:

- Ability to calculate Goodwill, evaluate shares adopting different methods, and preparation of final accounts of Indian Companies.

- Understanding of the provisions regarding the appointment, qualifications, duties and liabilities of an auditor.
- Clarity about the applicability of different types of audits

Paper-IV Principles & Practice of Insurance

Course Objectives:

- To provide a fundamental understanding of the structure of the Insurance sector in India and its management.
- To equip the students regarding the regulatory environment in which insurance companies operate.
- To give an insight into innovations in the insurance sector.
- To make the students understand the various risks faced by the insurance sector in India.

Course Outcomes:

- Understanding the operations and working of insurance companies in India.
- Capability to assess the significance of online insurance.
- Knowledge regarding different models of insurance in India.
- Understanding of the different techniques of risk management in the insurance sector.

Paper-V Business Environment

Course Objectives:

- To give an insight into the concept of the business environment and its components.
- To familiarize with Economic systems & their types.
- To enable the students to analyze the Positive and Negative impact of Liberalization, Privatization and Globalization in the Indian economy.
- To make the students aware of provisions of FEMA, The Consumer Protection Act 1986, The Environment Protection Act 1986 and various regulatory policies of the Indian Government.
- To describe the implication of Deficit Financing, Disinvestment of Public enterprises and Demonetization, etc. in the Indian Economy.

Course Outcomes:

- Skill to identify and differentiate various Micro and Macro factors affecting the functioning of Business.
- Ability to analyze the Indian Economy in light of changing government regulatory policies.
- Understanding of the targets and priorities of five years plans.
- Ability to file a complaint against unfair trade practices under Consumer Protection Act.
- Familiarization with the objectives and strategies in Economic planning with special reference to Planning Commission and NITI Aayog.

M.Com. Final (Semester III & IV)

Paper-I Management Concept & Organisational Behaviour

Paper-II Accounting for Managerial Decisions

Paper-III Advanced Cost Accounting

Paper-IV Marketing Management

Paper-V Research Methodology

Paper-I Management Concept & Organisational Behaviour

Course Objectives:

- To enable the students to analyze the implementation of different functions of management.
- To develop an understanding regarding the role of leaders in the decision-making process in an organization.

- To help students get an insight into the behavior of individuals and groups in an organization.
- To assess the role of emotional intelligence in an organization.

Course Outcomes:

- Ability to execute managerial tasks of planning, organizing, and controlling.
- Understanding of different styles of leadership and their impact on the decision-making process.
- In-depth understanding of emotional labor and different types of emotions.
- Ability to analyze challenges and opportunities in the field of organizational behavior.

Paper-II Accounting for Managerial Decisions

Course Objectives:

- To introduce a separate branch of accounting i.e. Management Accounting and its relevance in a business organization.
- To enable the students to understand Managerial behavior, Control structure, and Control Process under different circumstances.
- To understand the applicability of certain contemporary techniques of management i.e. Target Costing, Value Chain Analysis, Activity Based Costing, etc.
- To familiarize the students about the various measures of segment performance evaluation like Balanced Scorecard, Economic Value Added.
- To enable the students to understand the objectives of managerial reporting and reporting requirements at different levels of management.

Course Outcomes:

- Familiarization with the Management Control Systems.
- Ability to understand Managerial Behaviour and Control Structure prevalent under varied business environment.
- Skill to evaluate the Segment Business Units.
- Familiarization with Contemporary issues in management.
- Clarity about the reporting requirements of management.

Paper-III Advanced Cost Accounting

Course Objectives:

- To introduce a separate branch of accounting i.e. cost Accounting and its relevance in a business organization.
- To enhance the abilities of learners to develop the concept of Cost accounting and its significance in the business.
- To enable the students to understand , develop and apply the techniques of costing in the decision making in the corporate world.
- To equip the students with knowledge and skill to design and implement cost control through costing techniques.
- To learn about the Kaizen costing and various methods to reduce the cost of production.

Course Outcomes:

- Familiarization with the cost Management Control Systems.
- Ability to understand Managerial Behavior and Control Structure prevalent under varied business environment.
- Skill to evaluate the Segment Business Units.
- Familiarization with Contemporary issues in cost management.
- Clarity about the reporting requirements of cost management.

Paper-IV Marketing Management

Course Objectives:

- To develop an understanding of the holistic nature of Marketing.
- To enable the students to understand the techniques to scan the Marketing Environment.
- To make students understand the different buying behavior of consumers.
- To familiarize the students with the techniques of Market segmentation, Product Pricing, Promotion, Packaging and distribution.
- To familiarize with the importance of social responsiveness in marketing decisions.

Course Outcomes:

- Familiarization with Marketing Concepts and Philosophies.
- Ability to understand the changing Marketing Environment.
- Knowledge of different consumer and business buying behaviors.
- Familiarization with product-related decisions.

Paper-V Research Methodology

Course Objectives:

- To introduce the concept of Research and Research Methodology.
- To enable the students to understand the Quantitative and Qualitative Methods for conducting research.
- To make students understand Tabular and Graphical Description of Data.
- To enable the students to use SPSS for solving the research data.
- To enable the students to understand the Structure and Components of the Research Report.
- To enable the students to write the research report using hypothetical data.

Course Outcomes:

- Familiarization with Research and research problems.
- Understanding of the Quantitative and Qualitative Methods of research.
- Ability to represent data in tabular as well as graphical manner.
- Skill to write Research paper.

Subject: Seminar in Each Semester

Course Objectives:

- To create research ability among the students in writing seminar reports on some current issues of the economy and curriculum.
- To enable the students to use some statistical techniques in showing the trend of the various economic variables used in the study.
- To make students understand the need and objectives of the study by giving real-world examples.
- To make the students develop logical reasoning and built up confidence in themselves while answering any question in case if there is questioning on their topic

Course Outcomes:

- Basic orientation towards research.
- Understanding the practical application of theoretical models in the discipline of Commerce, Economics and Business Administration, etc.
- Clarity regarding the difference between qualitative and quantitative methods of research while writing a seminar report.
- Detailed knowledge about SPSS, SAS, Eviews, Minitab etc.,and its application.

Department of Computer Science
B.Sc. (CS), B.Com. (CA), BCA, PGDCA

Program Outcomes (POs)

BCA: Program Outcomes

At the end of the three year BCA program the students will be able to:

- Understand, analyze and develop computer programs in the areas related to algorithm, web design and networking for efficient design of computer based system.
- Work in the IT sector as system engineer, software tester, junior programmer, web developer, system administrator, software developer etc.
- Apply standard software engineering practices and strategies in software project development using open source programming environment to deliver a quality of product for business success

B.Sc. (Computer Science): Program Outcomes

At the end of the three year BCA program the students will be able to:

- To develop an understanding and knowledge of the basic theory of Computer Science and Information Technology with good foundation on theory, systems and applications such as algorithms, data structures, data handling, data communication and computation.
- To develop the ability to use this knowledge to analyse new situations
- To acquire necessary and state-of-the-art skills to take up industry challenges. The objectives and outcomes are carefully designed to suit to the above-mentioned purpose.
- The ability to synthesize the acquired knowledge, understanding and experience for a better and improved comprehension of the real-life problems
- To learn skills and tools like mathematics, statistics, physics and electronics to find the solution, interpret the results and make predictions for the future developments.

B.Com.(Computer Application): Program Outcomes

- The students will be ready for employment in functional areas like accounting, taxation, banking, insurance and corporate law.
- An attitude for working effectively and efficiently in a business environment. Learners will gain knowledge of various disciplines of commerce, business, accounting, economics, and finance, auditing and marketing.

PGDCA: Program Outcomes

- PGDCA equips the students with skills required for designing, developing applications in Information Technology.
- Students will able to learn the latest trends in various subjects of computers & information technology.

Program Specific Outcomes

BCA

- At the end of the three year BCA program the students will be able to: Understand, analyze and develop computer programs in the areas related to algorithm, web design and networking for efficient design of computer based system.
- Equip themselves to potentially rich & employable field ofcomputer applications.
- Pursue higher studies in the area of Computer Science/Applications.
- Take up self-employment in Indian & global software market.
- Meet the requirements of the Industrial standards.

B.Sc. (CS)

A graduate with a B.Sc. in Computer Science will have the ability TO:

- Demonstrate mastery of Computer Science in the following core knowledge areas of:
- Development of Computer Hardware and Architecture

- Data Structures and Programming Languages
- Databases, Software Engineering and
- Apply problem-solving skills and the knowledge of computer science to solve real world problems.
- Develop technical project reports and present them orally among the users

B.Com. (CA)

- To make the students efficient in office automation with computers and computer software applications
- To facilitate the students to join professional courses
- To develop subject skill within various discipline of commerce, business, accounting, economics, finance, auditing and marketing with soft skills in Tally and ERP, E-commerce PSO4 Helps to acquire entrepreneurship.

PGDCA

- To expose the students to open Source technologies so that they become familiar with it and can seek appropriate opportunity in trade and industry.
- Able to provide socially acceptable technical solutions to real world problems with the application of modern and appropriate programming techniques.
- Design applications for any desired needs with appropriate considerations for any specific need on societal and industrial aspects.

Course Outcomes:

BCA-101 -Discrete Mathematics

- Upon completion of the course, the student will be able to use logical notation
- Perform logical proofs
- Apply recursive functions and solve recurrence relations
- Determine equivalent logic expressions
- Describe useful standard library functions, create functions, and declare parameters
- Uses of graphs and trees
- Apply basic and advanced principles of counting
- Define sets and sequences and calculate discrete probabilities.
- Design and evaluate Euler and Hamilton circuits

BCA-102 - Computer Fundamentals

- Understand the history and various generations of computer, characteristics of computer and its types, logic gates, number system
- Be able to identify computer hardware and peripheral devices
- Be familiar with various types of software and software applications
- Understand Memory and file management
- Understand the DOS commands and Windows features.

BCA-103– Programming in C Language

- Understand the basic terminology used in computer programming
- Understand different data types, operators and its types, operator precedence and associativity in C language.
- Design programs involving decision structures, loops and functions.
- Explain the difference between call by value and call by reference.

- Understand the dynamics memory by the use of pointers.
- Use different data structures and create/update basic data files and Apply logical skills to programming in a variety of languages

BCA-105 – PC Software and Multimedia

- Understand creating and formatting basic documents in word processor software with their properties.
- Understand the creating and using formulas and charts in worksheets
- Able to create presentations and can apply various animations on it.
- Understand the creating and using structure query language queries in database
- Able to understand, create and manage various multimedia and its tools.

BCA-105–Web Technology and E-Commerce

- Understand the basics of Internet and its protocol.
- Analyse a web page and identify its elements and attributes.
- Create web pages using HTML and Cascading Styles sheets
- Build dynamic web pages using JavaScript (client side programming).
- Understand and develop a PHP Programs with their environment.
- Understand the basics of E-Commerce.

BCA-106 - Communication Skills

- Students will be able to understand and apply knowledge of human communication and language processes as they occur across various contexts, e.g., interpersonal, intrapersonal, small group, organizational, media, gender, family, intercultural communication, technologically mediated communication, etc. from multiple perspectives.
- Presentation skills training courses provide strategies to plan, structure and deliver powerful presentations. Learn how to structure presentations in order to deliver effective messages as well as receive the coaching to dramatically improve your personal presentation. This specific program is one of the leading presentation skills training courses developed to help people engage audiences.
- A group discussion among students is being organized to see and evaluate their thinking skills, listening abilities and how they are communicating their thoughts. One should learn to control the conversation through listening attentively and then having the perseverance to mould it towards his/her own direction.
- Develop, exhibit and accurate sense of self and nurture a deep understanding of personal motivation. Develop an understanding of and practice personal and professional responsibility.
- To practice and develop writing processes pertaining to invention, revision, organization, drafting through multiple drafts, editing, and adjusting for rhetorical context (purpose, audience, persona). To discuss and share writing and reading with one another and develop a shared vocabulary for talking about writing.

BCA-107 –PC Software Lab

- Understand creating and formatting basic documents in word processor software with their properties.
- Understand the creating and using formulas and charts in worksheets
- Able to create presentations and can apply various animations on it.

- Understand the creating and using structure query language queries in database
- Able to understand, create and manage various multimedia and its tools.

BCA-108 - C Language Lab

- Design programs using control statements and operators of C- language.
- Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.
- Design graphics programs using C language.

BCA-109 –Web Technology Lab

- Design web pages.
- Format and validate web pages.
- Design web sites and deploy it on web servers.

BCA-201- Calculus and Differential Equations

- Recognise differential equations that can be solved by each of the three methods – direct integration, separation of variables and integrating factor method – and use the appropriate method to solve them
- use an initial condition to find a particular solution of a differential equation, given a general solution
- check a solution of a differential equation in explicit or implicit form, by substituting it into the differential equation
- understand the terms 'exponential growth/decay', 'proportionate growth rate' and 'doubling/halving time' when applied to population models, and the terms 'exponential decay', 'decay constant' and 'half-life' when applied to radioactivity
- Solve problems involving exponential growth and decay.

BCA-202 - Database Management System

- Knowledge & Understanding : Databases and their design & development
- Intellectual Cognitive/ analytical skills: Normalization of Databases.
- Practical Skills :Using SQL and PL/SQL.
- Transferable skills: Usage of DBMS design and administration.
- Gather data to analyse and specify the requirements of a system.
- Design system components and environments.
- Build general and detailed models that assist programmers in implementing a system.

BCA-203 - Programming in C++

- Understand object-oriented programming features in C++.
- Apply these features to program design and implementation.
- Understand object-oriented concepts and how they are supported by C++.
- Gain some practical experience of C++.
- Apply the facilities offered by C++ for Object-Oriented Programming.

BCA-204 – Computer Networks

- CO1. State the fundamentals related to network security and basics of IPv6 and IPsec.
- CO2. State the fundamentals related to network security and basics of IPv6 and IPsec.
- CO3. Explain various protocols related to internet key exchange.
- CO4. Study Adhoc network and its protocols.
- CO5. Define various examples of wireless communication system, standards related to 2G and 3G wireless networks.

BCA-205 – Operating System with Linux

- Understand the basics of operating systems like kernel, shell, types and views of operating systems
- Describe the various CPU scheduling algorithms and remove deadlocks.
- Explain various memory management techniques and concept of thrashing.
- Use disk management and disk scheduling algorithms for better utilization of external memory.
- Recognize file system interface, protection and security mechanisms.
- Explain the various features of distributed OS like Unix, Linux, windows etc.

BCA-206 – Fundamental Course

- Students will be able to understand about the Indian history of arts, sculpture archeology, iconography & other social arts.
- Students will be able to understand about the Indian literature.
- Students will be able to understand about the Indian Freedom Struggle and contribution of revolutionaries in freedom struggle.
- Students will be able to understand and understand about the Indian Constitution.
- Students will be able to understandcommunication processes and personality development

BCA-207 - OOPS Lab Using C++

- Understand key features of the object-oriented programming language such as encapsulation (abstraction), inheritance, and polymorphism.
- Design and implement object-oriented applications.
- Analyse problems and implement simple C++ applications using an object-oriented software engineering approach.

BCA-208 – RDBMS Lab

- Demonstrate an understanding of the relational data model.
- Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.
- Formulate, using relational algebra, solutions to a broad range of query problems.
- Formulate, using SQL, solutions to a broad range of query and data update problems

BCA-209 – Operating System Lab

- Students will be able to understand key features of the various Operating System.
- Implement various commands of Linux Operating System.
- Students will be able to understand the directory structure of Operating System..

BCA-301 (Part-A) – Calculus & Geometry

- Gain Knowledge of fundamental concepts of real numbers and Verify the value of the limit of a function at a point using the definition of the limit
- Introduction to sequence and series.
- Learn to check function is continuous understand the consequences of the intermediate value theorem for continuous functions.
- Introduction to analytical geometry of 2 dimensional.
- Study of lines in 2 and 3 dimension and Finding equation in various form of line, circle, ellipse, sphere, cones etc.

BCA-301 (Part-B) - Differential Equations & Fourier Series

- Check a solution of a differential equation in explicit or implicit form, by substituting it into the differential equation
- Understand the terms 'exponential growth/decay', 'proportionate growth rate' and 'doubling/halving time' when applied to population models, and the terms 'exponential decay', 'decay constant' and 'half-life' when applied to radioactivity
- Solve problems involving exponential growth and decay.
- TO represent periodic functions using Fourier series
- Get an idea of power series method to solve differential equations Familiar with Legendre equation and Legendre polynomial

BCA-301 (Part-C) –Computer System Architecture

- Describe the fundamental organisation of a computer system and number systems
- Explain the Boolean algebra with simplification methods and various types of logic circuits
- Explain fundamental functions of CPU Organization.
- Describe basic concept of Input-output organization
- Distinguish the organization of various parts of a system memory hierarchy and memory management system.

BCA-302 – Programming in Java

- The students will understand about the basic concept Java language.
- Understand the concept of multiple inheritance and using and importing package in Java
- Students will have the knowledge of Exception handling and multithreading concept in Java.
- Students will have the knowledge of basic IO Streams and basics of network programming with concept of database connectivity in Java.
- Design and implement an java application using GUI packages as well as Applet programming

BCA-303 – Operating System

- Understand the basics of operating systems like kernel, shell, types and views of operating systems
- Describe the various CPU scheduling algorithms and remove deadlocks.
- Explain various memory management techniques and concept of thrashing.
- Use disk management and disk scheduling algorithms for better utilization of external memory.
- Recognize file system interface, protection and security mechanisms.
- Explain the various features of distributed OS like Unix, Linux, windows etc.

BCA-304 - Software Engineering

- Understand the importance of the stages in the software life cycle.
- Understand the various process models.
- Understand the concept of software requirement specification.
- Be able to design software by applying the software engineering principles.
- Understand the concept of software requirement specification.

BCA-305 (Part-A) – Multimedia tools and application

- Understand the concept and Needs and areas of use, Development platforms for multimedia.
- Understand the concept of sound and formats and basic concept of animations.

- Understand the various formats of video formats and video editing and movie making tools.
- Understand the various Authoring tools for CD Based Multimedia.
- Understand the Multimedia on the Web.

.BCA-305 (Part-B) – Multimedia tools and application Lab

Upon completion of the course the participant will be able to:

- Create a well-designed, interactive Web site with respect to current standards and practices
- Demonstrate in-depth knowledge in an industry-standard multimedia development tool and its associated scripting language
- Determine the appropriate use of interactive verses standalone Web applications
- Create time-based and interactive multimedia components
- Identify issues and obstacles encountered by Web authors in deploying Web-based applications

BCA-306-Financial Accountancy

- Understand the basic concepts of Financial Accounting
- Prepare final accounts of sole trader
- Calculate Profits or losses from incomplete records
- Understand concepts of cost accounting.
- Understand concepts of Budgetary and Budgetary control

BCA-307 – Programming in Java Lab

Upon completion of the course the participant will be able to:

- Understand and implement the Basic language fundamentals of Java.
- Create a full set of UI widgets and other components, including windows, menus, buttons, checkboxes, text fields, scrollbars and scrolling lists, using Abstract Windowing Toolkit (AWT) & Swings.
- Apply event handling on AWT and Swing components.
- Learn to access database through Java programs, using Java Data Base Connectivity (JDBC).

BCA-308- Project

Upon completion of the course the participant will be able to:

- Understand the requirement and analyse the client for the software development process.
- Create a well-designed, interactive software with respect to current standards and practices
- Demonstrate in-depth knowledge in an industry-standard software development tool.
- Determine the appropriate use of Language tools to develop and deploy software

B.Sc. (Computer Science) : Course Outcome

B.Sc. Part-I (CS)

Paper - I - Computer Fundamentals:

Upon completion of the course the participant will be able to:

- Understand the history and various generations of computer, characteristics of computer and its types, logic gates, number system
- Be able to identify computer hardware and peripheral devices

- Be familiar with various types of software and software applications
- Understand Memory and file management
- Understand the DOS commands and Windows features.

Paper-II–Programming in C Language:

Upon completion of the course the participant will be able to:

- Understand the basic terminology used in computer programming
- Understand different data types, operators and its types, operator precedence and associativity in C language.
- Design programs involving decision structures, loops and functions.
- Explain the difference between call by value and call by reference.
- Understand the dynamics memory by the use of pointers.
- Use different data structures and create/update basic data files and Apply logical skills to programming in a variety of languages

'C' Language Lab:

- 1Design programs using control statements and operators of C- language.
- Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.
- Design graphics programs using C language.

B.Sc. Part-II (CS)

Paper-I-Computer Hardware:

Upon completion of the course the participant will be able to:

- Understand the classification and organization on computer.
- Understand theCPU organization and various addressing modes and instruction formats
- Understand theUnderstand Memory hierarchy and working process of memory devices
- Understand the working of Input output devices
- Understand the system software and programming techniques.

Paper - II - Computer Software:

Upon completion of the course the participant will be able to:

- Analyse a web page and identify its elements and attributes.
- Create web pages using HTML and Cascading Styles sheets
- Gain some practical experience of C++.
- Apply the facilities offered by C++ for Object-Oriented Programming.
- Design program using multiple inheritance and pointers in C++

Computer Software Lab:

Upon completion of the course the participant will be able to:

- Understand the difference between object oriented programming and procedural oriented language and data types in C++.
- Program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.

B.Sc. Part-III (CS)

Paper-I-Computer Hardware:

Upon completion of the course the participant will be able to:

- Understand the Organization of Micro-computers.
- Explain about system hardware and organizations of personal computers

- Explain about organisation of operating system with system hardware
- Understand the working process of DOS and their memory management techniques.
- Understand the organization of hardware by operating system.

Paper-II-Computer Software:

Upon completion of the course the participant will be able to:

- Understand The Visual Basic Integrated Development Environment (IDE) and its wealth of development tools.
- Build effective user interfaces with Visual Basic controls, forms, and other GUI components.
- Learn the use of the debugging and testing tools available in Visual Studio.
- Use Database access using Visual Basic's ADO Control and data-aware components like the Data Grid and Data Environment Designer.
- Use the Packaging and Deployment tool to deliver completed applications to end users.

Computer Software Lab:

Upon completion of the course the participant will be able to:

- Understand the difference between Console programming and GUI programming.
- Able to design GUI Application using The Visual Basic Integrated Development Environment (IDE) and its wealth of development tools.
- Able to design a software with database.

B.Com. (Computer Application) : Course Outcome

B.Com (CA) Part-I

Paper-I-Computer Fundamentals :

Upon completion of the course the participant will be able to :

- Understand the history and various generations of computer, characteristics of computer and its types, logic gates, number system
- Be able to identify computer hardware and peripheral devices
- Be familiar with various types of software and software applications
- 4. Understand Memory and file management
- Understand the DOS commands and Windows features.

Paper-II–PC Software and Multimedia:

Upon completion of the course the participant will be able to:

- Understand creating and formatting basic documents in word processor software with their properties.
- 2Understand the creating and using formulas and charts in worksheets
- Able to create presentations and can apply various animations on it.
- Understand the creating and using structure query language queries in database
- Able to understand, create and manage various multimedia and its tools.

Computer Practical

- Understand creating and formatting basic documents in word processor software with their properties.
- Understand the creating and using formulas and charts in worksheets
- Able to create presentations and can apply various animations on it.
- Understand the creating and using structure query language queries in database
- Able to understand, create and manage various multimedia and its tools.

B.Com. Part-II (CA)

Paper - I - Internet Application and Ecommerce:

- Understand the basics of Internet and its protocol.
- Analyse a web page and identify its elements and attributes.
- Create web pages using HTML and Cascading Styles sheets
- Build dynamic web pages using JavaScript (client side programming).
- Understand the basics of E-Commerce.

Paper - II - RDBMS

- Knowledge & Understanding : Databases and their design & development
- Intellectual Cognitive/ analytical skills: Normalization of Databases.
- Practical Skills :Using SQL and PL/SQL.
- Transferable skills: Usage of DBMS design and administration.
- Gather data to analyse and specify the requirements of a system.
- Design system components and environments.
- Build general and detailed models that assist programmers in implementing a system.

Computer Practical

- Analyse a web page and identify its elements and attributes.
- Create web pages using HTML and Cascading Styles sheets.
- Demonstrate an understanding of the relational data model.
- Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.

B.Com. Part-III (CA)

Paper- I–Programming in Visual Basic:

Upon completion of the course the participant will be able to:

- Understand The Visual Basic Integrated Development Environment (IDE) and its wealth of development tools.
- Build effective user interfaces with Visual Basic controls, forms, and other GUI components.
- Learn the use of the debugging and testing tools available in Visual Studio.
- Use Database access using Visual Basic's ADO Control and data-aware components like the Data Grid and Data Environment Designer.
- Use the Packaging and Deployment tool to deliver completed applications to end users.

Paper-II–MIS & SAD:

Upon completion of this course, students will be able to:

- Relate the basic concepts and technologies used in the field of management information systems;
- Compare the processes of developing and implementing information systems.
- Outline the role of the ethical, social, and security issues of information systems.
- Translate the role of information systems in organizations, the strategic management processes, with the implications for the management.
- Apply the understanding of how various information systems like DBMS work together to accomplish the information objectives of an organization.

Computer Practical:

Upon completion of the course the participant will be able to:

- Understand the difference between Console programming and GUI programming.
- Able to design GUI Application using The Visual Basic Integrated Development Environment (IDE) and its wealth of development tools.

- Able to design a software with database.

PGDCA : Course Outcome

PGDCA-101: Introduction to Software Organization.

After studying this course, you should be able to:

- Understand the history and various generations of computer, characteristics of computer and its types, logic gates, number system
- Understand computer organization and memory devices.
- Familiar with various types of software and software applications
- Familiar with various types of Programming language and language translators.
- Familiar with various Internet and Computer network basics.

PGDCA-102 – Programming in C Language

- Understand the basic terminology used in computer programming
- Understand different data types, operators and its types, operator precedence and associativity in C language.
- Design programs involving decision structures, loops and functions.
- Explain the difference between call by value and call by reference.
- Understand the dynamics memory by the use of pointers, structure and union.

PGDCA-103: Office Automation and Tally

- Understand creating and formatting basic documents in word processor software with their properties.
- Understand the creating and using formulas and charts in worksheets
- Able to create presentations and can apply various animations on it.
- Understand the creating and using structure query language queries in database
- Able to create and manage transactions of various accounts in tally software.

PGDCA-104 – Practical based on PGDCA 103

- Understand creating and formatting basic documents in word processor software with their properties.
- Understand the creating and using formulas and charts in worksheets
- Able to create presentations and can apply various animations on it.
- Understand the creating and using structure query language queries in database
- Able to understand, create and manage accounts in tally.

PGDCA-105 – Practical based on PGDCA 102

- Design programs using control statements and operators of C- language.
- Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.
- 3 Design graphics programs using C language.

PGDCA-106- Programming in Visual Basic

Upon completion of the course the participant will be able to:

- Understand The Visual Basic Integrated Development Environment (IDE) and its wealth of development tools.
- Build effective user interfaces with Visual Basic controls, forms, and other GUI components.
- Learn the use of the debugging and testing tools available in Visual Studio.
- Use Database access using Visual Basic's ADO Control and data-aware components like the Data Grid and Data Environment Designer.

- Use the Packaging and Deployment tool to deliver completed applications to end users.

PGDCA-107- DBMS

- Knowledge & Understanding : Databases and their design & development
- Intellectual Cognitive/ analytical skills: Normalization of Databases.
- Practical Skills:Using SQL and PL/SQL.
- Transferable skills: Usage of DBMS design and administration.
- Gather data to analyse and specify the requirements of a system.
- Design system components and environments.
- Build general and detailed models that assist programmers in implementing a system.

PGDCA-108- Essentials of E-Commerce & HTML

- Understand the basics of Internet and its protocol.
- Analyse a web page and identify its elements and attributes.
- Create web pages using HTML and Cascading Styles sheets
- Build dynamic web pages using JavaScript (client side programming).
- Understand the basics of E-Commerce.

PGDCA- 109- Practical Based on PGDCA 106, 107, 108

Upon completion of the course the participant will be able to:

- Understand the difference between Console programming and GUI programming.
- Able to design GUI Application using The Visual Basic Integrated Development Environment (IDE) and its wealth of development tools.
- Able to design a software with database.

PGDCA-110 - Project

Upon completion of the course the participant will be able to:

- Understand the requirement and analyse the client for the software development process.
- Create a well-designed, interactive software with respect to current standards and practices
- Demonstrate in-depth knowledge in an industry-standard software development tool.
- Determine the appropriate use of Language tools to develop and deploy software.