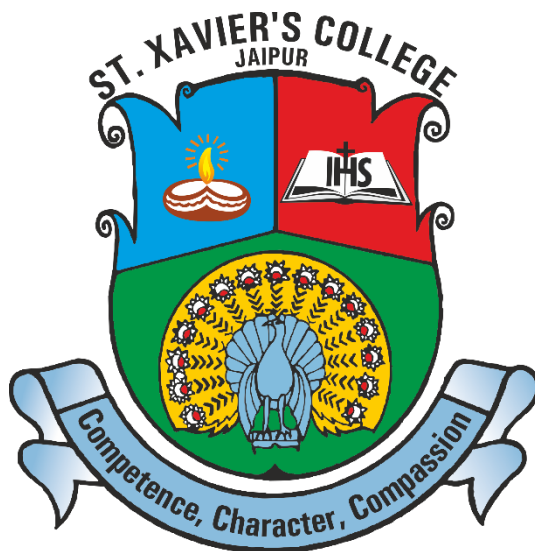


ST. XAVIER'S COLLEGE JAIPUR

Nevta - Mahapura Road, Jaipur - 302029, Rajasthan, India

Affiliated to the University of Rajasthan

Approved under Section 2(f) & 12(B) of the UGC Act, 1956



COURSE OUTCOMES

B.Sc.

(Bachelor of Science)

Department of Science

Course Outcomes (COs)

B.Sc. (Physics) Part-I

P-101: Mechanics & Oscillators

CO 1.	Introduction of Basics Mechanics and Oscillations
CO 2.	Concepts of measurement of motion
CO 3.	Detailed study of mechanical behaviour of real objects
CO 4.	Analyse the momentum, conservation and collision between two real-life objects
CO 5.	Understand the various kinds of oscillations and how different waves travel in space using their different modes of oscillation

P-102: Electromagnetism

CO 1.	Introduction to the basic theory of electric fields and magnetic field of Electromagnetism
CO 2.	Knowledge about magnetism, Maxwell equation and electromagnetism
CO 3.	Learning about the different types of interferences and diffraction processes
CO 4.	Understand the concepts of electricity and magnetism and have a clear picture of how current is generated in various arrangements
CO 5.	Understanding of the Maxwell equations

P-103: Optics

CO 1.	Understand the exchange between heat and work through various interactions
CO 2.	To have a deeper understanding of optics
CO 3.	Detailed knowledge of the concept of study about the holographical methods
CO 4.	Learn about Newton rings, Air wedge, and some interferometers of the lasers
CO 5.	Explain the latest technology-based devices such as laser, holography and fiber optics

PHY-104: Physics (Practical)

CO 1.	Develop skills in error analysis and graph techniques essential for scientific data interpretation and experimentation in mechanics
CO 2.	Enhance the ability to characterise and understand material properties such as coefficient of viscosity, surface tension, and specific heat capacity
CO 3.	Able to understand the practical grasp of optical phenomena
CO 4.	Enhance their skills in precision measurement techniques

Course Outcomes (COs)

B.Sc. (Physics) Part-II

P-201: Thermodynamics and Statistical Physics

CO 1.	Introduction of statistical and quantum mechanics
CO 2.	Detailed study of the three laws of thermodynamics
CO 3.	Learn how industrial level high temperatures are produced using different set-ups based on thermal laws
CO 4.	Analyse the exchange between heat and work through various interactions
CO 5.	Understand the collective behaviour of molecules and atoms in any medium via classical statistics and quantum statistics

P-202: Mathematical Physics and Special Theory of Relativity

CO 1.	Knowledge of Mathematical physics and how it is different from general physics
CO 2.	Techniques of Lorentz transformations, four-vector formulations
CO 3.	Introduction of differential equations and equations of first-order and second-order differential equations
CO 4.	Knowledge of homogeneous linear differential equations
CO 5.	Knowledge of the Boundary value problems, Laplace equations, and separation techniques

P-203: Electronics & Solid-State Devices

CO 1.	Understand the charge distribution and charge transfer process in semiconductors
CO 2.	Design and analyse electronic circuits. Calculating the parameters of the rectifiers, transistors, and De Morgan's laws
CO 3.	Understand amplification oscillator and amplifiers
CO 4.	Understand the band theory of solids and the carrier concentration in solids
CO 5.	Calculate parameters associated with semiconducting devices and analyse devices based on their applications

PHY-204: Physics (Practical)

CO 1.	Verify and design various logic gates, and construct adder and subtractor circuits, fostering proficiency in digital logic circuit design and analysis
CO 2.	Perform basic experiments in thermal physics to develop practical skills in thermal physics concepts
CO 3.	Determine values of inductance in LCR series/parallel circuits gaining hands-on experience in inductance measurement techniques
CO 4.	Conduct experiments focusing on rotational dynamics, particularly involving a flywheel, to deepen their understanding of rotational motion principles

Course Outcomes (COs)

B.Sc. (Physics) Part-III

P-301: Quantum Mechanics & Spectroscopy

CO 1.	Understand the basic concept of principles of quantum mechanics and its applications to simple systems like simple harmonic oscillations
CO 2.	Describe angular momentum and spin dynamics of quantum systems and solve the angular momentum using co-efficient
CO 3.	Will be able to find the energy and wave functions of quantum conservative systems
CO 4.	Can understand Schrodinger equations and how their solutions explain the internal phenomena of hydrogen atoms
CO 5.	Understand the molecular structure and various spectroscopic technique and their modern developments

P-302: Nuclear and Particle Physics

CO 1.	Describe basic properties of nuclei, nuclear interactions, nuclear structure and reactions
CO 2.	Identify the strengths and limitations of various models
CO 3.	Apply the knowledge of basic laws of conservation and momentum in the determination of particle properties of process in the subatomic world
CO 4.	Work on elementary particles in physics and related theoretical predictions and measurement results
CO 5.	Demonstrate the quark models based on nuclei in the subatomic molecules

P-303: Solid State Physics

CO 1.	Different types of structure of solids and their characterisation of X-Ray technique
CO 2.	Understand Thermal and Electrical properties of solids, specifically heat, and some models for calculations
CO 3.	Explain the bonding crystal structure, crystallography, diffraction and band theory of solids
CO 4.	Characterise solid based on fermi level position in the semiconductors
CO 5.	Origin of magnetism, various types of magnitude materials and its use in modern technology

Course Outcomes (COs)

B.Sc. (Physics) Part-III

PHY-304: Physics (Practical)

CO 1.	Construct electronic circuits to foster proficiency in circuit design analysis
CO 2.	Acquire experimental skills to find the Hall coefficient to enhance their understanding of material properties and experimental techniques
CO 3.	Study the hydrogen spectrum to calculate wavelengths of various spectral lines and develop skills in spectral analysis and atomic physics
CO 4.	Learn the characteristics of GM counters, diodes, and transistors to develop skills in device characterisation and practical electronics
CO 5.	Determine focal lengths of lens combinations and calculate the refractive index of glass, developing proficiency in lens properties and their practical applications

Course Outcomes (COs)

B.Sc. (Mathematics) Part-I

M-101: Discrete Mathematics

CO 1.	Introduction to set theory and number theory
CO 2.	Boolean algebra and its significance to the theory of probability, geometry of sets, and information theory
CO 3.	Learn to use proposition in augmentation/argumentation so that it can be used to create new propositions
CO 4.	Introduction to Graph Theory and important terms of graph theory
CO 5.	Application of Graph Theory

M-102: Calculus

CO 1.	Knowledge about the Infinity Series
CO 2.	Introduction to Derivatives of Arcs
CO 3.	Understanding the concept of maxima minima function of two variables
CO 4.	A detailed study of Beta and Gamma Function
CO 5.	Get knowledge of Area Rectification.

M-103: Analytic Geometry and Optimization Theory

CO 1.	Understanding Polar Equations of Conic section
CO 2.	Introduction to Sphere and cone theory
CO 3.	Understanding Cylinder and Coincides
CO 4.	Knowledge of generating lines
CO 5.	Introduction to Linear Programming Problem

M-104: Mathematics (Practical)

CO 1.	Understanding the graphs of hyperbolic functions and inverse trigonometric functions
CO 2.	Analysing and plotting the graphs of polynomials
CO 3.	Learning the mathematical operations of complex functions through programming

Course Outcomes (COs)

B.Sc. (Mathematics) Part-II

M-201: Real Analysis

CO 1.	Introduction about real Analysis and its application
CO 2.	Introduction to Real Sequence and Convergence of sequence
CO 3.	Know the different properties of derivatives
CO 4.	Introduction to Riemann Integral
CO 5.	Knowledge about Sequence and Series of Functions

M-202: Differential Equations

CO 1.	Introduction to Differential Equations and Equations of first order and first degree
CO 2.	Understanding the concept of First order and of higher degree
CO 3.	Knowledge of Homogeneous linear differential equations
CO 4.	Introduction to the linear differential equation of second order
CO 5.	Introduction to Differential Equations and Equations of first order and first degree

M-203: Numerical Analysis

CO 1.	Acquire basic knowledge in solving interpolation with equal-interval problems by various numerical methods. Estimate the missing terms through interpolation methods
CO 2.	Develop skills in analysing the methods of interpolating a given data, properties of interpolation with unequal intervals and derive conclusions, approximate a function using an appropriate numerical method
CO 3.	Be able to derive and understand the Trapezoidal rule, Simpson's $1/3$ – rule, Simpson's $3/8$ rule, and Weddle's rules
CO 4.	Be able to find the solution of linear systems by using Direct methods, Matrix Inversion method, Gaussian elimination methods, Gauss-Jordan Method, and Method of factorisation
CO 5.	Be able to find the solution of ordinary differential equations of first order by the Euler Method

M-204: Mathematics (Practical)

CO 1.	Understanding and analysing the Fibonacci sequence
CO 2.	Learning Trapezoidal, Simpson ($1/3$ and $3/8$ rule) and Waddle method through programming
CO 3.	Understanding the concept of numerical integration

Course Outcomes (COs)

B.Sc. (Mathematics) Part-III

M-301: Abstract Algebra

CO 1.	Introduction to Group Theory
CO 2.	Usage and application of Morphism of the group
CO 3.	Analysis of simple properties of Ring and Subring
CO 4.	Knowledge about the Ideals and Quotient Ring
CO 5.	Understand Linear Combinations and Vector Space

M-302: Complex Analysis

CO 1.	Understand Complex Plane
CO 2.	Demonstrate Complex Integration
CO 3.	Knowledge about Taylor's Theorem
CO 4.	Understand the Singularities of an Analytic Function
CO 5.	Analysis of Conformal Mapping

M-303: Mechanics

CO 1.	Understand the radial and transverse velocity and acceleration
CO 2.	Understand Motion in resisting medium
CO 3.	Understand Central orbits
CO 4.	Knowledge about the Equilibrium of coplanar
CO 5.	Understand Virtual Work and Catenary

M-304: Mathematics (Practical)

CO 1.	Understanding the solution of transcendental equations using C programming
CO 2.	Understanding the concept of solving matrix by using different matrix operations through programming
CO 3.	Learning the concept of solving a differential equation by numerical analysis

Course Outcomes (COs)

B.Sc. (Chemistry) Part-I

CH-101: Inorganic Chemistry

CO 1.	Develop a thorough understanding of band theories, ionic structure, and defects, including the properties associated with them
CO 2.	Engage in the study of theories of bonding, exploring the geometry of inorganic molecules, and understand the ionic, dipolar, and electronegativity characteristics of bonds
CO 3.	Acquire knowledge about the periodic properties of the 's' and 'p' block elements within the periodic table
CO 4.	Delve into the study of the structure, formation, and properties of compounds involving 'p' block elements
CO 5.	Engage in the learning of laws, concepts, and kinetics related to radioactivity, particles, reactions, and the stability features of the nucleus

CH-102: Organic Chemistry

CO 1.	Gain knowledge about the general reaction mechanisms, intermediates, energy pathways, and methods used to determine reaction mechanisms
CO 2.	Develop a deep understanding of stereochemistry in organic molecules, encompassing optical, geometrical, and conformational isomerism, as well as different types of isomers and their representation
CO 3.	Undertake a detailed study of the nomenclature, preparation, and properties of alkanes, cycloalkanes, alkenes, cycloalkenes, alkadienes, and alkynes
CO 4.	Learn about aromaticity, synthesis, reactions, and the directive influence on benzene in organic compounds
CO 5.	Engage in a comparative study of the formation and chemical properties of alkyl, aryl, benzyl, and vinyl halides

CH-103: Physical Chemistry

CO 1.	Practice the application of mathematical formulas commonly used in chemistry, along with gaining a qualitative understanding of liquid crystals
CO 2.	Learn about the ideal and non-ideal behaviour of gases, including different types of isotherms, velocity, and physical parameters in gaseous molecules
CO 3.	Acquire knowledge about crystal lattice, laws of crystallography, and diffraction patterns, enabling them to identify crystal structures
CO 4.	Engage in a broad study of the order of reactions, exploring physical and experimental methods for identifying them and understanding the terms and theories related to chemical kinetics
CO 5.	Practice the application of mathematical formulas commonly used in chemistry, along with gaining a qualitative understanding of liquid crystals

Course Outcomes (COs)

B.Sc. (Chemistry) Part-I

CH-104: Chemistry (Practical)

CO 1.	Learn to separate cations and anions from inorganic mixtures
CO 2.	Knowledge about elemental detection and functional group identification of organic mixture
CO 3.	Practical training in viscosity & surface tension measurements, calculation of composition of solution by it, and instrumental techniques to study the kinetics of reactions
CO 4.	Measurement of boiling point, melting point and purification by crystallisation of organic compounds

Course Outcomes (COs)

B.Sc. (Chemistry) Part-II

CH-201: Inorganic Chemistry

CO 1.	Learn about the characteristics of d-block elements, including the properties of compounds formed by these elements
CO 2.	Gain knowledge of nomenclature, isomerism, and concepts and theories related to coordination compounds
CO 3.	Explore the general features, chemistry, occurrence, and separation methods of lanthanides and actinides
CO 4.	Delve into redox chemistry through the analysis of Frost, Latimer, and Pourbaix diagrams
CO 5.	Understand different concepts of acidic and basic behaviour, along with the classification and characteristics of some aqueous and non-aqueous solvents

CH-202: Organic Chemistry

CO 1.	Learn about the electromagnetic spectrum, laws of UV & IR spectroscopy, the idea about λ_{\max} values, the reason for shifting, types of vibrations and regions of radiation lying in it
CO 2.	Engage in a detailed Study of nomenclature, synthesis, and physical and chemical properties of alcohol, phenols, ethers and epoxides
CO 3.	Gain knowledge of preparation and mechanistic pathways of reactions shown by aldehydes and ketones
CO 4.	Study the synthesis, physical properties and reaction mechanism of carboxylic acids, acid halides, anhydrides, esters and amides
CO 5.	Understand the nitro and amine derivatives of alkanes and arenes

CH-203: Physical Chemistry

CO 1.	Learn terms, systems, and processes involved in thermodynamics, calculations related to the first law and thermochemistry
CO 2.	Acquire knowledge of theorems related to the second and third laws of thermodynamics, derivations of functions related to it, and concepts of chemical equilibrium
CO 3.	Engage in the study of phase rule and terms related to it, phase diagram of phase systems and mixtures
CO 4.	Undertake a detailed study of terms, theories, experiments and applications related to conductivity
CO 5.	Gain information about types of electrodes and cell, emf and pH measurements by using by Conductometric titration

Course Outcomes (COs)

B.Sc. (Chemistry) Part-II

CH-204: Chemistry (Practical)

CO 1.	Learning of terms, systems, processes involved in thermodynamics, calculations related to first law and thermochemistry
CO 2.	Knowledge of theorems related to the second and third law of thermodynamics, derivations of functions related to it, and concepts of chemical equilibrium
CO 3.	Study of phase rule and terms related to it, phase diagram of phase systems and mixtures
CO 4.	Information about types of electrodes and cells, EMF and pH measurements by using these

Course Outcomes (COs)	
B.Sc. (Chemistry) Part-III	
CH-301: Inorganic Chemistry	
CO 1.	Understand acid-base behaviour based on hard and soft concepts and theories related to it
CO 2.	Be able to explain splitting of 'd' orbital, theories and factors affecting it, reasons for magnetic behaviour in metal complexes
CO 3.	Study of reactions and stability of metal complexes, types, and discussion of electronic transitions
CO 4.	Learn about the preparation, properties, bonding and applications of different organometallic compounds
CO 5.	Knowledge of different elements in biological processes, structure and bonding in some inorganic polymers

CH-302: Organic Chemistry	
CO 1.	Understand NMR spectroscopy for organic molecules and structural elucidation from it and the role of active methylene group in organic synthesis and related name reactions
CO 2.	A detailed study of preparation, properties, and chemical reactions of some benzo fused, five and six-membered heterocycles
CO 3.	Learning of classification, structure, stereochemistry, bonding pattern, and physical & and chemical properties of carbohydrates
CO 4.	Overview of structure, stereochemistry, and properties of amino acids, constitution, and bonding in proteins and nucleic acids
CO 5.	Study of organosulphur compounds having different functional groups, classification, formation and bonding in organic polymers and dyes

CH-303: Physical Chemistry	
CO 1.	Study of quantum mechanics - laws and principles, Schrödinger and sinusoidal wave equations and concepts related to it
CO 2.	Basic ideas of formation and physical characteristics of bonding, antibonding, and hybrid molecular orbitals
CO 3.	Learn the principle, energy, and selection rules in vibrational, rotational, Raman, and electronic spectrum
CO 4.	Understand the laws of photochemistry and process involved in, dipole moment and optical activity of molecules
CO 5.	Knowledge about concentration measurements in solution, colligative properties, and calculation of molecular weight by these

Course Outcomes (COs)

B.Sc. (Chemistry) Part-III

CH-304: Chemistry (Practical)

CO 1.	Able to synthesis and analysis of coordination compounds
CO 2.	Learn to separate ions/compounds by solvent extraction, ion exchange and steam distillation methods
CO 3.	Practical training in separation of compounds of mixture and identification by functional group identification, melting/boiling point measurements and derivative preparation
CO 4.	Laboratory synthesis of organic compounds
CO 5.	Experiments and applications related to conductivity

Course Outcomes (COs)

B.Sc. (Botany) Part-I

B-101: Algae Lichens & Bryophytes

CO 1.	General characters & classification of Algae
CO 2.	Reproduction, life cycle & economic importance of Algae
CO 3.	Lifecycle of Oscillatoria, Nostoc, Volvox & Chara
CO 4.	Lifecycle of Vaucheria, Ectocarpus, Polysiphonia
CO 5.	General characters, origin & evolution of bryophytes
CO 6.	Lifecycle of Riccia, Marchantia & Anthoceros
CO 7.	Lifecycle of Funaria & Lichens

B102: Cell Biology & Genetics

CO 1.	Introduction to cells and cell membranes
CO 2.	Study of cell organelles like Nucleus, Mitochondria, ER, Chloroplast, Plasma Membranes etc.
CO 3.	Study of chromosomes, chromosomal aberrations, lamp brush, polytene & sex chromosomes
CO 4.	Knowledge of Mendel's laws of inheritance
CO 5.	Study of Monohybrid Cross, Dihybrid Cross, Test Cross & Back Cross
CO 6.	Concept of gene, operon concept, one gene-one enzyme theory
CO 7.	Introduction to plan breeding, techniques of plant breeding
CO 8.	Study of applications of plant breeding.

Course Outcomes (COs)

B.Sc. (Botany) Part-I

B-103: Microbiology, Mycology and Plant Pathology

CO 1.	General introduction to Microbiology
CO 2.	Describe the structure & reproduction of bacteria
CO 3.	Classification & economic importance of bacteria
CO 4.	To study the lifecycle of Mycoplasma & virus
CO 5.	Detailed study of general characteristics of fungi, their classification & economic importance
CO 6.	To study the general account of plant pathology
CO 7.	Describe the diseases caused in plants like white rust, green ear, black rust, smut & early blight

BOT-104: Botany (Practical)

CO 1.	Laboratory Exercises related to the genera of Algae & Bryophytes, including identification, slide preparation & section cuttings
CO 2.	Laboratory exercises related to permanent specimens of Lichens.
CO 3.	Laboratory exercises on Mitosis & Meiosis
CO 4.	Permanent specimens of special chromosomes, study of permanent slides & solving of problems of genetics
CO 5.	Laboratory exercises on staining & preparation of slides of genera of Fungi
CO 6.	Gram Staining of bacteria, study of micrographs & permanent specimens

Course Outcomes (COs)

B.Sc. (Botany) Part-II

B-201: Pteridophyte, Gymnosperm, & Paleobotany

CO 1.	To study the general characters of gymnosperms
CO 2.	To study the life cycle of Cycas, Pinus & Ephedra
CO 3.	To study the classification & economic importance of gymnosperms
CO 4.	To study the classification & economic importance of Pteridophytes
CO 5.	Describe in detail about Paleobotany
CO 6.	Study the life cycle of Fossil plants

B-202: Molecular Biology & Biotechnology

CO 1.	Describe the biological, physical & chemical nature of hereditary material DNA & RNA
CO 2.	Explain the function of DNA replication & preliminary account of DNA damage & repair
CO 3.	Give the idea on central dogma of life
CO 4.	Explain the genetic code, initiation, elongation & termination
CO 5.	Study the regulation of gene expression in prokaryotes & eukaryotes
CO 6.	Describe in detail the basic aspects of Biotechnology, the concept of culture techniques, plant tissue culture & their applications
CO 7.	Describe in detail recombinant DNA technology

Course Outcomes (COs)

B.Sc. (Botany) Part-II

B-203: Plant Physiology & Biochemistry

CO 1.	To study the physicochemical properties of water, transpiration, guttation, & their factors
CO 2.	Describe in detail about mineral nutrition in plants
CO 3.	Describe in detail about transport of organic substances in plants
CO 4.	Explain the theoretical & practical aspects of photosynthesis
CO 5.	Explain the theoretical & practical aspects of respiration
CO 6.	Explain in detail carbohydrates, proteins & lipids
CO 7.	Study about enzymes, growth, and plant hormones

BOT-204: Botany (Practical)

CO 1.	Laboratory exercises on section cutting, slide preparation of vegetative & reproductive parts of pteridophytes & gymnosperms
CO 2.	Laboratory exercises on study of permanent specimens of fossil plants
CO 3.	Laboratory exercises on media preparation, culture techniques, identification & working of equipment
CO 4.	Laboratory exercises on demonstration & performance of processes like photosynthesis, respiration, growth, transpiration etc.

Course Outcomes (COs)

B.Sc. (Botany) Part-III

B-301: Plant Morphology & Anatomy

CO 1.	Study the basic body plan of flowering plants
CO 2.	Study the diversity of plant forms
CO 3.	Describe the branching pattern & canopy architecture in plants
CO 4.	Explain the tissue, tissue system, and shoot apical meristem in detail
CO 5.	Explain the primary structure of the stem, leaf & root
CO 6.	To study the secondary growth in plants
CO 7.	To study the structure & ecological adaptation in seed

B-302: Taxonomy & Embryology

CO 1.	To classify the plant families
CO 2.	To study the general characteristics of different flowering plants
CO 3.	To demonstrate the floral aspect of families in the curriculum
CO 4.	Study ovules in detail, including the types of ovules, endosperm, ovary, etc.
CO 5.	To go for field visits to Botanical gardens, herbaria, and research institutes

B-303: Ecology & Economic Botany

CO 1.	Describe in detail about plant ecology
CO 2.	Study the climatic, edaphic & biotic factors affecting plants
CO 3.	Describe in detail population ecology & community ecology
CO 4.	Study about the plant succession & ecosystem
CO 5.	Describe in detail the vegetation of India
CO 6.	Explain the general introduction of economic botany with reference to cereals, starch, sugar plants, vegetables, fruits, spices, beverage plants, fibre plants, wood, rubber, oil leading plants & medicinal plants
CO 7.	Give an account of Ethnobotany

Course Outcomes (COs)

B.Sc. (Botany) Part-III

BOT-304: Botany (Practical)

CO 1.	Laboratory exercises on the study of root, stem, leaf, flower, section cutting, staining, slide preparation
CO 2.	Field visits to Botanical gardens, herbaria, and research institutes
CO 3.	Laboratory exercises on the study of anatomical and morphological characters of flowering plants of different families
CO 4.	Perform quadrat exercises
CO 5.	Identify the economic importance of cereals, beverages, tea, rubber, wood, oil-yielding plants, spices, fruits, vegetables and medicinal plants

Course Outcomes (COs)

B.Sc. (Zoology) Part-I

Z-101: Diversity of Animals

CO 1.	Students gain knowledge about taxonomy, cladistics, nomenclature
CO 2.	Know about the concepts of organisation levels, Protozoa and Metazoa
CO 3.	Learn about the classification of chordates and Non-chordates: Concepts on symmetry, coelom, segmentation and embryogeny
CO 4.	In-depth knowledge of Non-chordates and Chordates
CO 5.	Learn in detail about Phylum - their habitats, habits, morphology, structure, and physiological system along with affinities and adaptations
CO 6.	Learn in detail about Phylum Ctenophora, Platyhelminthes, Aschelminths, and Annelida

Z-102: Cell Biology and Genetics

CO 1.	Study on structural and functional aspects of Prokaryotic and Eukaryotic animal cell
CO 2.	Understand the cell membrane, its structure and the concept of the unit membrane
CO 3.	Understand Transport across the cell membrane, osmosis, facilitated diffusion and active transport
CO 4.	Study about organelles, their structure and function
CO 5.	Imparting in-depth knowledge of the function and Physiological process of the cell
CO 6.	Understand Nuclear organisations with a detailed account of chromosomes and their organisation
CO 7.	Study about Nucleic acids: DNA structure & RNA structure and its type
CO 8.	Gain knowledge on Replication, Transcription & Translation
CO 9.	Students get to know about Genetic code & Cell reproduction: Mitosis, Meiosis & Cell Cycle
CO 10.	Study detailed concepts of Genetics: Mendel's Law of Inheritance, Chromosomal mutations, Linkage, Genetic Interaction, Multiple Gene Inheritance, Cytoplasm inheritance

Course Outcomes (COs)

B.Sc. (Zoology) Part-I

Z-103: Gamete and Developmental Biology

CO 1.	Study the concepts of developmental processes and stages
CO 2.	Study the concepts of Gametogenesis, Fertilization & Parthenogenesis
CO 3.	Detailed account of the patterns and processes: Cleavage, Fate maps, Embryonic Induction
CO 4.	Understand the development of chick up to the 96-hour stage
CO 5.	Knowledge of extra embryonic membranes in chicks their development & function
CO 6.	Students get introduced to Paedogenesis and Neoteny
CO 7.	Students will be able to explicate the concepts of Regeneration.
CO 8.	Students learn about the concepts of stem cells, their application, and the cloning of animals through different techniques
CO 9.	Students gain knowledge about teratogenesis, the biology of ageing & cell death

Z-104: Zoology (Practical)

CO 1.	Understanding of microscopes, slide preparation & general idea of composition, preparation and use of Fixatives, stains, common reagents
CO 2.	Detailed concepts on collection and culture methods: such as <i>Amoeba</i> , <i>Paramecium</i> , <i>Euglena</i> , <i>Daphnia</i> etc.
CO 3.	Study of Microscopic slides of Phylum Protozoa, Porifera, Coelenterata, Platyhelminthes, Aschelminthes etc.
CO 4.	Study of Anatomical features of Earthworm & Leech
CO 5.	Study of Permanent slide preparation
CO 6.	Exercises in Cell Biology: Study of Mitosis, Meiosis & Giant Chromosomes
CO 7.	Study of <i>Drosophila</i> : Life cycle Sex comb etc.
CO 8.	Study of developmental of frog/Toad and chick with the help of slides/Models
CO 9.	Identification of Blood Group

Course Outcomes (COs)

B.Sc. (Zoology) Part-II

Z-201: Structure and Function of Invertebrate Types

CO 1.	Detailed account of detailed features, organs and systems, affinities & adaptations of Arthropoda, Onychophora, Mollusca, Echinoderms, and Hemichordata
CO 2.	Detailed account of Palaemon, Scorpion, Periplaneta, Apis, Peripatus, Pila, Unio, Sepia, Ascaris, Echinus etc.
CO 3.	Salient Features of Hemichordata
CO 4.	Introduction to canal system of sponges & parasitic adaptations in Helminthes
CO 5.	Social organisation in termites and honeybees; direct & indirect development in insects
CO 6.	Understanding of the water vascular system of starfish
CO 7.	Introduction to Parasitism in Crustacea, Crustacean larvae & mouth parts in insects

Z-202: Animal Physiology and Biochemistry

CO 1.	Detailed account of Animal Physiology with special reference to mammals
CO 2.	Understand the physiology of digestion, blood circulation, respiration, and excretion
CO 3.	Concepts on the physiology of nerve impulse and reflex action, physiology of muscle contraction, reproduction & preliminary idea of neurosecretion, hypothalamic control of pituitary function
CO 4.	Detailed concepts of biochemistry
CO 5.	Develop an understanding of carbohydrates
CO 6.	Understand proteins: structure, function and significance
CO 7.	Understand lipids: structure, function and significance, pathways, and biosynthesis of biomolecules

Course Outcomes (COs)

B.Sc. (Zoology) Part-II

Z-203: Immunology, Microbiology and Biotechnology

CO 1.	Detailed knowledge of the immune system
CO 2.	Detailed concepts on Antigen-Antibody reactions, immunity regulating cells, mechanism of humoral or antibody-mediated immunity and cell-mediated immunity
CO 3.	Introduction to microbes
CO 4.	Detailed concept of structural organisation: Prokaryota (Bacteria) Size, Shapes, Structural organisation
CO 5.	Introduction to Genetic Material of Bacteria
CO 6.	Understand Reproduction in Bacteria: asexual, binary fission, budding, sexual reproduction etc.
CO 7.	Concepts of microbial nutrition & bacterial of medical importance
CO 8.	Introduction to detailed concepts, scope and application of biotechnology
CO 9.	Understanding of animal cells, tissue organs and embryo cultures
CO 10.	Detailed concepts of recombinant DNA technology, monoclonal antibodies and cloning

Z-204: Zoology (Practical)

CO 1.	Study of Specimens of Phylum: Onychophora, Arthropoda, Mollusca, Echinodermata, Hemichordata
CO 2.	Study of microscopic slides of Arthropoda, Mollusca and Echinodermata
CO 3.	Detailed Anatomy of <i>Prawn/Squilla</i> , <i>Pila</i>
CO 4.	Study of microbes in food materials, Antigen-Antibody reactions -Precipitation, agglutination
CO 5.	Understanding & hands-on-experience in counting of RBC & WBC, Estimation of haemoglobin, Haematocrit value
CO 6.	Study of histological structure of Endocrine glands
CO 7.	Detection of Protein, Carbohydrate and Lipid in animal tissue/food samples
CO 8.	Identification of different kinds of mono-, di- and polysaccharides in the given food samples
CO 9.	Understanding of chromatography of dyes/amino acids

Course Outcomes (COs)

B.Sc. (Zoology) Part-III

Z-301: Structure and Function of Chordate Types

CO 1.	Detailed description of chordates with special reference to Herdmania and Branchiostoma
CO 2.	Affinities of Hemichordata, Urochordata and Cephalochordata
CO 3.	Ascidian tadpole larva and its metamorphosis
CO 4.	Detailed account of structure, organ systems of Pisces, Amphibia, Reptilia, Aves, mammal
CO 5.	Introduction to chordate adaptation
CO 6.	Introduction to parental care with reference to Amphibia
CO 7.	Introduction to flight adaptations, types of feathers, bird migration for Aves
CO 8.	Adaptive radiation & dentition in Mammals

Z-302: Ecology, Environmental Biology and Evolution

CO 1.	Introduction to concepts of ecology, concepts of limiting factors and ecosystem: biotic and abiotic factors
CO 2.	Detailed account of the ecosystem: production, consumption & decomposition in the ecosystem
CO 3.	Introduction to Biogeochemical cycles of O ₂ , CO ₂ , H ₂ O, N, P.
CO 4.	Detailed account of ecosystem, population ecology, community ecology, habitat ecology & ecological succession
CO 5.	Introduction to environment and its concepts, hydrosphere, lithosphere and atmosphere
CO 6.	Detailed concepts of natural resources, environmental pollution, greenhouse effect, ozone layer depletion
CO 7.	Concepts of bioaccumulation, biomagnification, impact of urbanisation.
CO 8.	Introduction to Darwinism, variations, isolations, mutations, concept of species and speciation
CO 9.	Detailed account of adaptations, polymorphism and evolution of man
CO 10.	Understand Zoogeography, zoogeographical realms and faunal peculiarities

Course Outcomes (COs)

B.Sc. (Zoology) Part-III

Z-303: Applied Zoology, Ethology and Biostatistics

CO 1.	Detailed account of Vermiculture, Sericulture, Lac culture, Apiculture, Prawn culture, and Poultry keeping
CO 2.	Introduction to economic importance of Protozoa, Corals & Coral Reefs, Helminthes, Arthropods, Molluscs
CO 3.	Concepts of insects and their management
CO 4.	Understanding of behaviour through Ethology
CO 5.	Concepts of Pheromones, Societies, Biological Rhythms & Biological Clocks
CO 6.	Detailed concepts of biostatistics

Z-304: Zoology (Practical)

CO 1.	A detailed account of Anatomical features of Wallago/Labeo
CO 2.	Permanent slide preparation & Study of microscopic slides
CO 3.	Study of Museum specimens
CO 4.	Detailed account of osteology
CO 5.	Analysis of Soil pH, water, Qualitative estimation of zooplankton
CO 6.	Study of insect pest, antennal grooming in cockroach & study of chemical communication: Ants/Earthworm
CO 7.	Visit a zoo/museum/wildlife sanctuary to study local faunal biodiversity

Course Outcomes (COs)

B.A. Economics Part-I

P1: Microeconomic Theory

CO 1.	Introduction to the Nature and Scope of Economics
CO 2.	Analysis of Consumer Behaviour Theory
CO 3.	Knowledge about theory of production
CO 4.	Knowledge about Analysis of Cost and Revenue concepts
CO 5.	Introduction to the different types of markets
CO 6.	Knowledge about the determination of Factor pricing
CO 7.	Application of the Theories of Rent, Interest, and Profit

P2: Indian Economy I

CO 1.	Demonstrate the study of basic features and issues of Indian Economy, like Population and demographic features, major trends, and Human Resource Development
CO 2.	Demonstrate the study of national income concepts composition and trends in India
CO 3.	Understanding about natural resources, land reforms, and growth of modern inputs in agriculture
CO 4.	Demonstrate the concepts & terminologies, and development of the agriculture sector in India
CO 5.	Knowledge about the industrial sector in India, public-private sector relevance, and disinvestment in India
CO 6.	Understanding of foreign capital movement in India
CO 7.	Examine the role of globalisation in the economic development of India
CO 8.	Knowledge about labour issues and labour reforms

Course Outcomes (COs)

B.A. Economics Part-II

P3: Macroeconomic Theory

CO 1.	Demonstrate the nature & scope of macroeconomics, circular flow of income, and concepts of national income
CO 2.	Demonstration of Classical & Keynesian model of income & employment determination
CO 3.	Knowledge about the Income-Consumption relationship and different consumption hypotheses and laws
CO 4.	Understanding of the simple Keynesian model of income determination and the concept of Multiplier
CO 5.	Demonstrate the Classical, Keynesian, and Post-Keynesian quantity theory of money and the theory of money supply
CO 6.	Analysis of the Phillips curve and Inflation theory
CO 7.	Knowledge about the IS-LM Model of income and rate of interest determination
CO 8.	Knowledge about Trade Cycle: Meaning, Types, and Theories

P4: History of Economic Thought

CO 1.	Knowledge about the study of economic thoughts of Mercantilism and Physiocracy
CO 2.	Understanding of thoughts of classical economists: Adam Smith, Ricardo, and Malthus and their critics
CO 3.	A detailed study of economics thoughts of J S Mill, Utopian Socialists and the critic of classicism and socialism
CO 4.	Understanding economic thoughts of Karl Marx, German School and Mathematical School
CO 5.	Demonstrate knowledge about the thoughts of Neo-Classical Economist
CO 6.	Understanding Keynesian economics concepts of Underemployment Equilibrium, Effective Demand, and the Role of Fiscal Policy
CO 7.	Demonstrate the study of Indian economic thought

Course Outcomes (COs)

B.A. Economics Part-III

P5: Introduction to International Trade, Public Finance, and Development

CO	Study of International Trade: Need and Importance
CO	Knowledge about the Trade Theories (Classical, Modern Theories and Factor Price Equalization Theorem)
CO	Understanding the theories of economic growth and development and the concepts of poverty and inequality
CO	Knowledge of international institutions such as IMF, ADB, and WTO
CO	Meaning and Measurement of Development – GDP and PCI as indicators of development, HDI - Structural Changes in the Development Process, and Obstacles to Development
CO	Understand the meaning of public finance, its nature, subject matter, the differences between public finance and private finance, and differentiate between the public and private goods

P6: Environmental Economics

CO 1.	Study about the Relationship between Environment and Economy
CO 2.	Analysis of Market Failure: Externalities, Non-Exclusion, Non-Rivalry, Non-Convexities, Asymmetric Information
CO 3.	Environment and Development: Natural Resources, Sustainable Development, Green GDP
CO 4.	Knowledge about Environmental Legislation
CO 5.	Understand the nature and scope of environmental economics, Interaction of the Economy and the environment.
CO 6.	Analyse Market failure, externality, public good environment as a public good, Tragedy of Commons
CO 7.	Understand Environmental Kuznets's Curve, Pollution Control Policies: Command and Control Approach, Incentive-based approach: Taxes, Liability Law and tradable permits
CO 8.	Understanding Global Environmental Issues: Climate Change – Implications and mitigation and understanding Environmental Valuation Methods

Course Outcomes (COs)

B.A. Statistics Part-I

P1: Probability Theory

CO 1.	To provide a clear definition of probability and its basic properties
CO 2.	To develop the skills to calculate probability for various types of events
CO 3.	To develop problem-solving skills
CO 4.	Identify the type of statistical situation to which different distributions can be applied

P2: Descriptive Statistics

CO 1.	To learn to summarise data through statistical measures
CO 2.	To develop the ability to visually present data through graphs, charts, and tables
CO 3.	To have the ability to organise data in a meaningful way
CO 4.	To understand various characteristics within data, viz. shape, spread, and central values, make comparisons, draw conclusions, and comment on findings
CO 5.	To explore the relationship between variables
CO 6.	To understand the concept of Interpolation and Extrapolation of data
CO 7.	To enhance students' analytical reasoning with decision-making skills after analysing and evaluating statistical data

Course Outcomes (COs)

B.A. Statistics Part-II

P3: Statistical Inference

CO 1.	To understand sampling in various distributions, that is Binomial, Poisson, and Normal Distribution
CO 2.	Gain statistical knowledge to make informed decisions in research, data analysis, and hypothesis testing
CO 3.	To understand the concepts of the Theory of Estimation and distinguish various types of estimation, know the properties of estimators and the construction of point and interval estimators
CO 4.	Develop practical proficiency in both parametric and non-parametric statistical techniques for drawing meaningful inferences from data

P4: Statistical Application in Society and Industry

CO 1.	Learn to collect, interpret, and analyse demographic data to measure and compare mortality and fertility rates using life tables
CO 2.	Understand and compute different types of index numbers using various methods for price, quantity, and value comparisons
CO 3.	Gain skills in identifying trends and seasonal fluctuations in data, employing different models to predict future patterns
CO 4.	Understand the principles of statistical quality control and construct control charts for maintaining product and process quality
CO 5.	Apply statistical knowledge across diverse fields such as demographics, economics, and quality control to support data-driven decisions

Course Outcomes (COs)

B.A. Statistics Part-III

P5: Sample Survey

CO 1.	Understand how to design and conduct effective surveys, including selecting samples and creating good survey questions
CO 2.	Learn different ways to select samples, like simple random sampling, stratified sampling, and cluster sampling
CO 3.	Understand how to estimate population parameters using survey data and different estimation methods
CO 4.	Identify and minimise errors and biases in surveys to improve data quality and the accuracy of results
CO 5.	Apply survey methods to real-world problems in various fields such as market research, social science, and public policy

P6: Design of Experiment and Computational Techniques

CO 1.	Learn how to plan and conduct experiments with control and randomisation to obtain reliable results
CO 2.	Gain knowledge to analyse data using statistical methods like ANOVA, regression, and hypothesis testing
CO 3.	Interpret results from experiments and effectively report findings, through data visualisation and interpretation
CO 4.	Use statistical software and computational techniques to manage, analyse, and interpret experimental data efficiently
CO 5.	Apply experimental design and computation techniques in real-world scenarios like scientific research, industry, and product testing

Course Outcomes (COs)

B.A. Geography Part-I

P1: Physical Geography

CO 1.	Identify and recall and key physical geography concepts, including landforms, climate types, and geological processes
CO 2.	Demonstrates an understanding of the cause-and-effect relationships in physical geography, explaining how various processes contribute to the formation of landscapes and climate patterns
CO 3.	Comprehensive understanding of the fundamental principles and processes governing oceanography, including the dynamics of ocean currents, the role of oceanography in climate regulation, and the interactions between marine ecosystems
CO 4.	Apply physical geography principles to analyse real-world scenarios, such as the impact of natural disasters on human settlements or the influence of physical geography on biodiversity
CO 5.	Analyse geographic data, maps, and satellite imagery to interpret spatial patterns and draw conclusions about the interactions between physical and human phenomena
CO 6.	Critically evaluate the environmental impact of human activities on different physical landscapes and propose sustainable solutions based on their understanding of physical geography

P2: Rajasthan Geography

CO 1.	An understanding of geographical features of Rajasthan, including its geological structure, rivers and drainage system, deserts, and prominent landmarks
CO 2.	An understanding of the climatic conditions and natural resources of Rajasthan, explaining how these factors influence the state's agriculture, economy, and culture
CO 3.	Analyse the impact of water scarcity on different regions of Rajasthan, check desertification and propose sustainable solutions for water management
CO 4.	Analyse the historical evolution of settlement patterns in Rajasthan, examining how geography has influenced the distribution of cities, towns, and rural areas
CO 5.	Critically evaluate the environmental conservation policies, special development programmes and initiatives in Rajasthan, considering their effectiveness in preserving the state's unique biodiversity

Course Outcomes (COs)

B.A. Geography Part-I

Practical

CO 1.	Apply basic cartographic skills, including map reading, scale interpretation, and understanding the legend
CO 2.	Skillfully interpret and create insightful one-dimensional graphs, enhancing data representation
CO 3.	Proficiently depict atmospheric features, refining meteorological analysis for comprehensive understanding
CO 4.	Demonstrate mastery in representing relief, with a focus on interpreting contours
CO 5.	Demonstrate expertise in generating profiles using serial, projected, and superimposed techniques

Course Outcomes (COs)

B.A. Geography Part-II

P3: Resource Geography

CO 1.	Identify key natural resources, including minerals, energy sources, water bodies, and agricultural lands, along with their distribution across different regions
CO 2.	Demonstrate an understanding of the factors influencing the distribution and utilisation of natural resources, including geological processes, climate, and human activities
CO 3.	Apply principles of resource management to analyse case studies related to sustainable development, exploring ways to balance resource utilisation with environmental conservation
CO 4.	Analyse the impact of resource extraction and utilisation on local and global economies, ecosystems, and communities, considering both positive and negative effects
CO 5.	Critically evaluate policies and strategies for resource conservation and sustainable development, assessing their effectiveness and proposing improvements
CO 6.	Identify key natural resources, including minerals, energy sources, water bodies, and agricultural lands, along with their distribution across different regions

P4: Human Geography

CO 7.	Understand key concepts in human geography, including population dynamics, migration patterns, cultural landscapes, and urbanisation
CO 8.	Demonstrate an understanding of the theories and models that explain human spatial patterns, such as the demographic transition model, urban models, and cultural diffusion
CO 9.	Apply demographic analysis techniques to interpret population pyramids, migration trends, and other demographic data, making connections to real-world scenarios
CO 10.	Analyse the impact of globalisation on cultural, economic, and social processes, examining how it has influenced cultural identities, trade patterns, and urbanisation
CO 11.	Critically evaluate the role of human geography in addressing contemporary global challenges, such as environmental sustainability, social inequality, and geopolitical conflicts

Course Outcomes (COs)

B.A. Geography Part-II

Practical

CO 1.	Explore cartography's definition and principles for comprehensive spatial mapping insights
CO 2.	Understand two-dimensional diagrams for effective representation and spatial communication insights
CO 3.	Analyse traffic flow diagrams for efficient urban transportation planning insights
CO 4.	Explore isochronic charts for analysing travel time and transportation planning
CO 5.	Understand thematic maps for insights into spatial patterns and relationships

Course Outcomes (COs)

B.A. Geography Part-III

P5: World Geography

CO 1.	Identify the locations of continents, major countries, capitals, and geographic features across the world
CO 2.	Demonstrate an understanding of global patterns and trends in population distribution, cultural diversity, and economic development
CO 3.	Analyse the impacts of global issues such as climate change, migration, and geopolitical conflicts on different regions
CO 4.	Analyse the spatial organisation of global trade, migration patterns, and geopolitical events, examining the interconnections of regions and countries
CO 5.	Critically evaluate the role of international organisations and policies in addressing global issues, considering their impact on social, economic, and environmental aspects

P6: Geography of India

CO 1.	Identify the major physical features of India, including mountain ranges, rivers, and climate zones
CO 2.	Demonstrate an understanding of the cultural diversity in India, including language, religious practices, and traditional customs
CO 3.	Apply geographical knowledge to analyse the regional variations in economic development, agriculture, and urbanisation within India
CO 4.	Analyse the impact of human activities on the environment in different regions of India, examining issues such as deforestation, water scarcity, and pollution
CO 5.	Critically evaluate the effectiveness of government policies and initiatives in addressing geographical challenges in India, considering their impact on social, economic, and environmental aspects

Course Outcomes (COs)

B.A. Geography Part-III

Practical

CO 1.	Explore definition and principles of cartography for comprehensive spatial mapping insights
CO 2.	Understand three-dimensional diagrams for effective representation and spatial communication insights
CO 3.	Demonstrate an understanding of different map projections, their characteristics, and the distortions inherent in each type
CO 4.	Apply map projection techniques to create maps that effectively represent specific geographical regions, considering the purpose and audience of the map
CO 5.	Demonstrate an understanding of the principles and techniques of plane table surveying and clinometer surveying, including the use of the instrument, basic surveying calculations, and the importance of accurate field notes