Course Outcome

PHYSICS

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
PHY/ S1	B. Sc. I Sem I	Co1	Discuss the basic concepts of rotational dynamics.
		Co2	Examine the phenomenon of simple harmonic motion and distinction between undamped, damped and force oscillations and the concept of resonance.
		Co3	Explain the superposition of simple harmonic motion and acquire the knowledge of Ultrasonic waves, their production, detection and applications in different field.
		Co4	Determine the constants of elasticity and relate it with appropriate things
		Co5	Interpret the postulates of special theory of relativity.
		Co6	Know the concept of Global positioning system (GPS)
		Co7	Apply the principles of measurement and error analysis.
		Co7	Develop the skills to handle various instruments with precision.

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
PHY-S2	B. Sc. I Sem II	Co1	Discuss the concept of scalars & vectors and their properties.
		Co2	Develop an understanding of Gauss law and its applications to obtain electric filed in different cases.
		Co3	Formulate the relationship between electric displacement vector, electric polarization and dielectric constant.
		Co4	Distinguish between the magnetic effect of electric current, electromagnetic induction and the related laws in appropriate circumstances.
		Co5	Simplify electrical circuits by applying various network theorems.
		Co6	Make use of Multimeter for the measurement of electrical parameters and get the knowledge of electronic components and their applications.
		Co7	Estimate the power consumption of domestic appliances and carry out energy audit.

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
PHY-S3	B. Sc. II Sem III	Co1	Understand about gradient, vector and curl with different fields of Mathematical background of electrostatics.
		Co2	In Magnetostatics and Maxwell's Equations students will get the idea of magnetic field due to steady current and Amperes law.
		Co3	Student will understand the basics of the solid State Electronics Devices: Semiconductor and its study.
		Co4	Will know about the detailed idea of Solid State Electronics Devices which is used in electronic circuits.
		Co5	Students will get the detailed understanding different points of special theory of relativity
		Co6	Understand the different atmospheric processes, physical processes and geological structure of earth.

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
PHY-S4	B. Sc. II Sem IV	Co1	Produce the ability of learning the laws of geometrical optics and interference phenomenon.
		Co2	To know the fundamentals of optics and different diffraction phenomenon.
		Co3	Understand the phenomenon of Polarization, interference and diffraction of light and its application.
		Co4	To know the detailed information about Construction, working and application of LASER.
		Co5	Produces the ability about Construction, working and application of Fiber optics.
		Co6	Different renewable energy sources and its properties, working principle.

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
PHY-S5	B. Sc. III Sem V	Co1	To know Origin of Quantum Mechanics
		Co2	To know the Schrodinger equation and its applications
		Co3	To know atomic and Molecular Spectroscopy and effects.
		Co4	To know nuclear physics: counters for the detection of charged particles.
		Co5	To know Hybrid parameters: Amplifiers and electric circuits.
		Co6	To study of the Feedbacks in amplifiers and Multivibrators

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
PHY-S6	B. Sc. III Sem VI	Co1	Students will understand the laws and concepts of Statistical Mechanics.
		Co2	Students will get the idea about Bose – Einstein statistics and Fermi- Dirac distribution of particles.
		Co3	To study about the crystallography of solids in detailed manner.
		Co4	Students will know about the Electronic properties of Materials.
		Co5	Students will know about Magnetic properties of Materials deeply manner.
		Co6	Students will know about the phenomenon of superconductivity and nanotechnology.

CHEMISTRY

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
CHE	**B.Sc. I Sem-I Chemistry**	CO1	Solve the conceptual questions using the knowledge gained by studying periodicity in atomic radii, ionic radii, ionization energy and electron affinity of elements.
		CO2	Apply concepts of acids and bases as well as non-aqueous solvents and their industrial usage.
		CO3	Compare different reaction intermediates, functional group chemistry through the study of methods of preparation, properties and chemical reactions with underlying mechanism.
		CO4	Choose correct synthetic approach to prepare derivatives of industrially important molecules
		CO5	Solve different numerical problem of varying difficulty associated with gaseous and liquid state.
		CO6	Apply the concepts from advanced mathematics to solve the derivation of different chemical formulae.
		CO7	Synthesise different types of organic compounds. Perform the process of filtration, crystallization, melting point, waste management.
		CO8	Understand the effect of orientation effect of a group, Skilfully determine the surface tension, viscosity of liquid.
CHE	**B.Sc. I Sem-II Chemistry**	CO1	Apply the knowledge gained by studying types of bonding, solvation, hybridization and molecular geometries.
		CO2	Draw the correct molecular structures, bond order and bond length.
		CO3	Synthesize commercially important compounds of varying carbon backbone.
		CO4	Choose correct synthetic approach to prepare derivatives of industrially important molecules.
		CO5	Solve numerical problems related to crystalline state.
		CO6	Acquire skills to use chemical kinetics to develop mechanism of chemical reactions.
		CO7	Analyse the given organic compound qualitatively by different tests. Prepare the derivative of the provided substance.
		CO8	Illustrate the practical skills in volumetric analysis. Differentiate types of titrations e.g. acid-base, redox, etc.
		CO9	Comprehend the kinetics of reactions and interpret the experimental data. Calculate, communicate and analyse the result.
CHE	**B.Sc. II Sem-III**	CO1	The student will give Knowledge about MOT, concept of bond order, MO structure of homo nuclear diatomic molecules of namely He_2, H_2,

	Chemistry		N_2 and O_2, stability sequence of species of O_2 i.e. O_2, O_2^+, $O2^{2+}$, $O2^-$,$O2^{-2}$, Paramagnetic nature of O_2, Metallic bonding , VSEPR Theory.
		CO2	Introduction to volumetric analysis, titrant, titrate, end point equivalence point, indicator. Definition of standard solution, molarity normality molality mole fraction. Acid base titrations redox titrations, gravimetric analysis
		CO3	Knowledge about preparation of acetaldehyde from ethanol, ethylidene chloride and acetylene. Preparation of benzaldehyde from benzene (Gattermann-Koch reaction). Preparation of acetone from isopropyl alcohol isopropylidne chloride and propyne. Preparation of carboxylic acids.
		CO4	Knowledge about optical isomerism, element of symmetry chirality asymetric carbon atom enantiomers diastereoisomers, RS nomenclature, geometrical isomerism, conformational isomerism.
		CO5	Knowledge about Gibb's and Helmholtz's free energy function physical significance of Gibb's free energy, change in free energy derivation of vant Hoff 's equation and its application, phase equilibrium.
		CO6	Knowledge about liquid state, surface tension, determination and its SI unit. Effect of temperature on surface tension, Drop number method, application of surface tension, viscosity, electrochemistry.
		CO7	In students, develop the skill of practical and overall performance of student's life.
CHE	**B.Sc. II Sem-IV Chemistry**	CO1	Definition and classification of transition metal, general characteristics of d-block elements, extraction of elements.
		CO2	Knowledge about , inner transition elements, definition comparative study of lanthanides elements, effect on lanthanide, effect on post lanthanides, actinides, comparative study of actinides, application of lanthanides and actinides, general principles of metallurgy.
		CO3	Knowledge about polynuclar, naphthalene, reactive methylene compounds, carbohydrates.
		CO4	Knowledge about aromatic nitro compounds, nitration, nitrating agents, amino compounds, diagonium salt, amino acids and proteins.
		CO5	Knowledge about colligative properties of dilute solutions, importance of colligative properties, elevation of boiling point of ebullioscopy, depression of freezing point of cryoscopy .
		CO6	Knowledge about crystalline state or crystal, Amorphous solid, crystallography, law of crystallography, Bravais lattices and crystal systems, Number of constituent unit in the cubic unit cell, Bragg's equation and experimental methods.
		CO7	In students, develop the skill of practical and overall performance of student's life.

CHE	**B.Sc. III Sem-V Chemistry**	CO1	To understand the coordination compounds on the basis of various theories and on the basis of electronic structure and magnetic properties.
		CO2	To understand colour of coordination compounds on the basis of CFT and their applications in qualitative analysis.
		CO3	To understand concept of heterocyclic compound and design new mode of synthesis. To study the role of organometallic compound in organic synthesis.
		CO4	Know method of synthesis & their application of Dyes, Drugs and Pesticides in industry purpose.
		CO5	To study concept of photochemistry and apply this knowledge in research field.
		CO6	To understand the molecular spectroscopy concept to identify the structure of newly synthesize molecule.
		CO7	This course enables the students to acquire knowledge on synthesis of coordination compound.
		CO8	To understand the conductometric and potentiometric titration for acidic & basic substances, Colligative properties are useful to determine molar mass of unknown compound.
Course Code	**Name of the course**	**Cos**	**On successful completion of this course, the students would be able to**
CHE	**B.Sc. III Sem-VI Chemistry**	CO1	To understand concept of kinetic aspects of metal complexes, use of spectrophotometry, colorimetry, and paper chromatography technique in analytical chemistry.
		CO2	This course deals with organometallic chemistry, inorganic polymer and bioinorganic chemistry which help students to understand the role of coordination compounds in polymer chemistry and biological process.
		CO3	To understand electronic transition in electronic spectroscopy and use of IR spectroscopy for functional group determination.
		CO4	To understand the structure elucidation of organic compound using NMR and Mass spectroscopy.
		CO5	Quantum mechanics is very important branch of physical chemistry. Students utilized their knowledge to study the shapes of orbital and to find out probability and probability density.
		CO6	Students learn various concept in electrochemistry and nuclear chemistry and apply this knowledge in research field.
		CO7	To quantitatively separate organic compounds (Glycine, Phenol, Aniline, Urea from unknown sample) and to separate and identify the organic compounds using chromatographic techniques
		CO8	Explain the principle behind the physical chemistry experiments performed in the laboratory and interpret experimental results.

ZOOLOGY

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
B.Sc.	B.Sc. SEM I Zoology	CO 1	Develop a deeper sense with respect to phylum Protozoa to Echinodermata relation to taxonomy, classification, body organization and general characteristics this strengthens students' capability in basic zoology.
		CO 2	Grasp various the Systematic positions from Protozoa to Echinodermata their pathogenicity and its epidemiology
		CO 3	Describe unique characters and recognize life functions of Protozoa, Porifera, Coelenterate, Helminthes, Arthropoda, Annelida, Mollusca and Echinodermata.
		CO 4	Improve ability and apply Knowledge of Non-chordates for its execution in Agriculture especially with the phylum Arthropoda.
		CO 5	Implement an extensive idea about economic and ecological significance of various non-chordates phylum's in human life.

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
	B.Sc. SEM II Zoology	CO1	Know what the chordates are
		CO2	Learn about the different phylum of chordates.
		CO3	Confidently explain the general characters and classification of Protochordates upto class Mammalia.
		CO5	Explain the origin and evolutionary relationship in different subphylums of chordates.
		CO6	Describe specific features of Protochordates upto class Mammalia.
		CO7	Recognize and differentiate life functions of Protochordates upto class Mammalia.
		CO8	Understand Migration in fishes and birds , parental care in Amphibians and Poisonous and non-poisonous snakes.
		CO9	Explain the adaptations in Birds and Mammals.

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
B. Sc.	B.Sc. SEM III Zoology	CO1	Describe the structure and function of cellular organelles.
		CO2	Describe various mode of cellular transport..
		CO3	Compare active transport with passive transport.
		CO4	Describe structure of chromosomes.
		CO5	Differentiate between various types of chromosomes.
		CO6	Define the basic concept of developmental biology, cell division, embryogenesis and emergence of adult organisms.
		CO7	Describe zygote formation and different stages of embryonic development in frog and chick.

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
B.Sc.	B.Sc. SEM IV Zoology	CO1	Describe Mendel's Laws of Inheritance.
		CO2	Differentiate between a monohybrid and a dihybrid cross.
		CO3	Deduce the type of gene interaction from ratio of offspring.
		CO4	Describe linkage and crossing over.
		CO5	Describe various modes of sex determination.
		CO6	Identify the type of syndrome from karyotype.
		CO7	Describe various prenatal diagnostic techniques.
		CO8	Describe effects of water, temperature and light as ecological factors.
		CO9	Identify the type of biotic interaction from given example.
		CO10	Describe components of ecosystem and structure of terrestrial and marine ecosystem.

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
B.Sc.	B.Sc. SEM V Zoology	CO1	Structure of Respiratory Organs: Gills, Lungs. Transport, Exchange of Gases. Neurophysiologic Control of Respiration. Circulation: Blood-Coagulation factors, Blood Group, Rh - factor.
		CO2	Muscle Physiology: Types, E.M. Structure, Chemical Composition. Muscle Contraction.
		CO3	Nerve Physiology: Neuron E. M. Structure and Types. Conduction of Nerve Impulse, Resting, Action Potential, Neurotransmitters, Synapse and Synaptic Transmission. Chemical Co-ordination: Endocrine System, Hormone and their Physiological Role. Hormonal Disorders.
		CO4	Reproductive Physiology: Estrous and Menstrual Cycle, hormonal control of reproduction in male and female. Structure and physiology of Mammalian Placenta. Homeostasis and Conservative regulation.
		CO5	Agricultural Zoology: Economic Importance of Insects. Beneficial Insects. Harmful Insects.
		CO6	Aquaculture: Scope, Importance and present status in India. Fresh water fish culture. Fish Products and byproducts

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
	B.Sc. SEM VI Zoology	CO1	Explain Genetic Material (DNA And RNA).Experiments to prove DNA as genetic material, Types of DNA and RNA.
		CO2	DNA Replication, Concept of Genes. Genetic Diseases.
		CO3	Genetic Code, Protein Synthesis and Gene Regulation.
		CO4	Mutation: Types, Theory, Molecular Basics of Mutation. Blotting Techniques, PCR. DNA fingerprinting.
		CO5	Biotechnology: Genetic Engineering, Recombinant DNA Technology. Gene Cloning.
		CO6	Immunology: Types, Immunological Techniques.

BOTANY

CLASS	COURSE	COs	OUTCOME (STUDENTS WILL BE ABLE TO……)
B. Sc. I, 1S	**Diversity Of Microbes , Phycology, Mycology and Phytopathology**	CO 1	Understand microbial diversity, reproduction and economic importance.
		CO 2	Differentiate the microbes, algae and fungi on the basis of morphology, cellular organization, nutrition and metabolic activities.
		CO 3	Classify and identify the various algal genera.
		CO 4	Classify and identify the various fungal genera.
		CO 5	Systematize the plant diseases and their pathogens
		CO 6	Apply understanding of microbial diversity, phycology and mycology for teaching primary to high school students

CLASS	COURSE	COs	OUTCOME (STUDENTS WILL BE ABLE TO……)
B. Sc. **I, 2S**	**Bryophytes, Pteridophytes, Gymnosperms And Morphology Of Angiosperms**	CO 1	Demonstrate on understanding of Archegoniate, Bryophytes, Pteridophytes and Gymnosperms.
		CO 2	Identify and classify plants from Bryophytes, Pteridophytes and Gymnosperms.
		CO 3	Develop critical thinking on morphology, anatomy and reproduction of Bryophytes, Pteridophytes and Gymnosperms.
		CO 4	Acquire skill of collection and preservation of Bryophytes, Pteridophytes and Gymnosperms

CLASS	COURSE	COs	OUTCOME (STUDENTS WILL BE ABLE TO……)
B. Sc. II, 3S	**Angiosperm Systematics, Anatomy And Embryology**	CO 1	Understand the basic principles involved in identifying, naming and classifying flowering plants.
		CO 2	Know the systematic study and economic importance of plants belonging to the various families.
		CO 3	Differentiate various tissue systems.
		CO 4	Understand the normal and anomalous secondary growth in plants and their causes.
		CO 5	Apply understanding this knowledge to explain the taxonomic diversity of plants and Imply the embryological and anatomical knowledge to differentiate the plant taxa.

CLASS	COURSE	COs	OUTCOME (STUDENTS WILL BE ABLE TO……)
B. Sc. II, 4S	Cell Biology, Genetics And Plant Breeding	CO 1	Understand the structure and purpose of the basic components of prokaryotic and eukaryotic cells.
		CO 2	Identify the concept that explains the chemical composition and structure of cell wall and membrane
		CO 3	Differentiate cell organelles based on structure and function
		CO 4	Comprehend the effect of chromosomal abnormalities in numerical and structural changes.
		CO5	Have a conceptual understanding of laws of inheritance, the genetic basis of loci, alleles, their linkage and crossing over.
		CO6	Understand the basic concepts of plant breeding.
		CO7	Analyse the different selection and breeding methods applied in crop improvement.

CLASS	COURSE	COs	OUTCOME (STUDENTS WILL BE ABLE TO……)
B. Sc. III, 5S	Plant Physiology And Ecology	CO 1	Understand Fundamental Plant Processes Upon completion of this course, students will be able to describe and explain the fundamental physiological processes in plants, including water relations, mineral uptake, photosynthesis, respiration, and plant growth and development, demonstrating knowledge of basic concepts and terminology..
		CO 2	Analyze Biochemical and Molecular Mechanisms Students will be able to analyze and articulate the biochemical and molecular mechanisms underlying plant physiology, including enzyme action, biomolecule functions, and the intricacies of photosynthesis and respiration pathways.
		CO 3	Apply Knowledge to Environmental and Ecological Contexts Learners will apply their understanding of plant physiology and biochemistry to environmental and ecological contexts, assessing the impacts of environmental factors on plant processes and evaluating plant adaptations to various ecosystems.
		CO 4	Evaluate Plant Responses and Adaptations Students will evaluate and critically assess plant responses to biotic and abiotic stresses, including mechanisms of senescence, abscission, and stress physiology, and propose strategies for mitigating adverse environmental impacts
		CO 5	Synthesize Concepts Across Disciplines Participants will synthesize concepts from plant physiology, biochemistry, ecology, and environmental science to develop integrated approaches to studying plant life, demonstrating the ability to draw connections

			between theory and practice in Botany.
		CO6	Design and Conduct Experiments Upon course completion, students will be competent in designing and conducting experiments related to plant water relations, metabolism, growth, responses to environmental stimuli, and ecological interactions, reflecting an ability to create new knowledge or solutions in the field of Botany

CLASS	COURSE	COs	OUTCOME (STUDENTS WILL BE ABLE TO……)
B. Sc. III, 6S	Molecular Biology And Plant Biotechnology	CO 1	: Understanding the Molecular Foundation of Life Students will demonstrate foundational knowledge of DNA as the genetic material, including its discovery, structure, and the key historical experiments that established its role in heredity. They will understand the basic concepts of gene structure, expression, and regulation in both prokaryotes and eukaryotes.
		CO 2	Mastering Gene Expression and Regulation Students will apply their understanding of DNA replication, packaging, and the central dogma of molecular biology to explain gene expression and regulation. They will demonstrate the ability to use this knowledge in understanding the mechanisms of transcription and translation in eukaryotes.
		CO 3	: Proficiency in Recombinant DNA Technology Students will analyze the processes involved in recombinant DNA technology, including the use of restriction enzymes, cloning vectors, and gene transfer techniques. They will be able to dissect the steps of PCR and explain the significance of each step in gene amplification.
		CO 4	Exploring Plant Tissue Culture Students will develop practical skills in plant tissue culture and recombinant DNA technology. They will apply aseptic techniques, media preparation, and understand the importance of cellular totipotency, differentiation, and morphogenesis in micropropagation.
		CO 5	Applying Biotechnology in Agriculture and Industry Students will evaluate the regulatory mechanisms of gene expression, including the operon concept and gene expression in eukaryotes. They will critically assess the techniques and applications of plant biotechnology in agriculture, including the development and use of transgenic plants and synthetic seeds.
		CO 6	Ethical, Environmental, and Social Implications Students will synthesize their knowledge and skills to propose innovative applications of plant biotechnology in agriculture, industry, health care, and conservation. They will debate the pros and cons of genetically modified organisms, considering ethical, ecological, and societal impacts.

MATHEMATICS

Course Code	Name of the Course	COs	On successful completion of this course, the students would be able to
DSC-I	B.Sc. I SEM I MATH Paper I : Algebra and Trigonometry	CO1	Find inverse and normal form of matrices.
		CO2	Evaluate the characteristic equation, Eigen value and corresponding Eigen vector of a given matrix
		CO3	Evaluate relation between the roots and coefficients of equations.
		CO4	To study application of De Moivre's theorem.
		CO5	Compute summation of trigonometric series.
DSC-II	B.Sc. I SEM I MATH Paper II: Differential and integral Calculus	CO1	Define limit and study the basic properties.
		CO2	Classify continuity and discontinuity of the functions.
		CO3	Solve the differentiability and L'Hospital rule with their applications.
		CO4	Describe the geometrical applications of mean value theorems.
		CO5	Evaluate the reduction formulae for integration.
DSC-III	B.Sc. I SEM II MATH Paper III: Ordinary Differential Equations	CO1	Solve first order differential equations using different techniques.
		CO2	Solve higher order differential equations and orthogonal trajectories.
		CO3	Calculate complementary function and particular integral of the second order differentialEquation.
		CO4	Describe the different methods to solve second order differential equations.
		CO5	Illustrate applications of differential equations.
DSC – IV	B.Sc. I SEM II MATH Paper IV: Vector Analysis and Geometry	CO1	Interpret the vectors, their products, differentiation and integration.
		CO2	Determine curvature and torsion.
		CO3	Apply the concepts of divergence, curls which are useful in physics.
		CO4	Describe the different forms of sphere and properties.
		CO5	Discuss the equations of cone and cylinder
GIC	B.Sc. I SEM II : Numerical Ability-I	CO1	Restate the ideas and concept of HCF & LCM of number and also find square root &cube roots.
		CO2	Illustrate the problem on numbers, ages, percentage, and profit and loss.
		CO3	Analyze ratio and proportion, time, work and distance.
		CO4	Outline the problems on train, simple interest, compound

			interest, area measurement.
		CO5	Create the Bar graphs, Pie charts and Line graphs
	B.Sc. II SEM III MATH Paper V: Advanced Calculus	CO1	Students learn about sequence and their convergence using different test
		CO2	They have the knowledge of calculating the sum of infinite number of terms
		CO3	Students know that how to work on functions of two or more variables.
		CO4	Students aware about the application of extremum value problem to solve industrial, society problems.
		CO5	To solve the double and triple integrations.
	B.Sc. II SEM III MATH Paper VI: Elementary Number Theory	CO1	Students learn about divisibility, prime numbers, congruence, quadratic reciprocity, Diophantine.
		CO2	Learn methods and techniques used in number theory.
		CO3	Write programs / functions to compute number theoretic functions.
		CO4	Use mathematical induction and other types of proof writing techniques.
		CO5	Students are able to effectively communicate mathematics.
	B.Sc. II SEM IV MATH Paper VII: Modern Algebra: Group and rings	CO1	Have knowledge of algebraic structures groups, rings.
		CO2	Know definition of homomorphism, isomorphism, and natural homomorphism.
		CO3	Algebra of ideals, prime ideal, principal ideal, and quotient rings.
		CO4	Knowledge of ring, integral domain, field.
		CO5	Extend group structure to finite permutation group.
	B.Sc. II SEM IV MATH Paper VIII: Classical Mechanics	CO1	CO1 Knowledge of degree of freedom generalized coordinates and constraints.
		CO2	CO2 Knowledge of solving the problems of motion of a system of particles.
		CO3	CO3 Kepler's problem to know the universe.
		CO4	CO4 Variation techniques for extremum.
		CO5	CO5 Different principles to study motion of particles.
		CO6	CO6 To study motion of a rigid body.
	B.Sc. III SEM V MATH. Paper IX: Mathematical Analysis	CO1	To solve examples of improper integral.
		CO2	Students will be introduced to the concept of continuity of complex functions
		CO3	Students will have a working knowledge of differentiability for complex functions and be familiar with the Cauchy - Riemann

			equations.
		CO4	Students will be introduced to metric spaces, cauchy sequences.
		CO5	Understand purpose and functions of the gamma and beta functions.
	B.Sc. III SEM V MATH Paper X: Mathematical Methods	CO1	Students will have full knowledge of Legendre's equation.
		CO2	The students are expected to learn Bessel's equation, generating function for Jn (x), Sturm Lowville boundary value problem.
		CO3	Understand Fourier series.
		CO4	Apply Laplace transform to solve ordinary and partial differential equation.
		CO5	To understand Fourier transform
	B.Sc. SEM VI MATH Paper XI: Linear Algebra	CO1	Identify and construct linear transformations of a matrix.
		CO2	Characterize linear transformations as onto, one-to-one.
		CO3	Solve linear systems represented as linear transforms.
		CO4	Express linear transforms in other forms, such as matrix equations, and vector equations.
		CO5	Characterize a set of vectors and linear systems using the concept of linear independence
	B.Sc. SEM VI MATH Paper XII: Special Theory of	CO1	To understand the concept of space and time in Minkoskian geometry and be able to calculate metric coefficient.
		CO2	Introduced to the concept of time dialation and length contraction.
		CO3	To understand the concept of the velocity and acceleration of particle.
		CO4	Knowledge of covariant and contravariant vector.
		CO5	To calculate Fij

M.Sc.: CHEMISTRY

Course Code	Name of the Course	Cos	On successful completion of this course, the students would be able to
CHE 100	M.Sc. I (Sem-I) **Research Methodology and IPR in Chemsitry (FSC)**	CO1	1. Formulate research problem
		CO2	2. Test the research hypothesis, understand the data collection and prepare the scientific research paper.
		CO3	3. Identify various meta data sources for literature survey
		CO4	4. Communicate research effectively using various online tools
		CO5	5. Explore on various IPR components and patent writing
		CO6	6. Apply electronic spreadsheets for chemical calculations, data visualization, and plotting.
		CO7	7. Apply probability theorem and probability curves in statistical analysis.
		CO8	8. Perform tests for rejection of data, including T-test, F-test, and Q-test.
		CO9	9. Utilize the least squares method for deriving calibration graphs in chemical analysis.
CHE 101	M.Sc. I (Sem-I) Structural Inorganic Chemistry (DSC–I.1)	CO1	1. predict the nature of bond and its properties through various electronic structural methods; bonding models
		CO2	2. recognize and assign symmetry characteristics to molecules and objects,
		CO3	3. understand and analyze structure-property correlation of carbonyls, clusters boron hydrides
		CO4	4. design new metal carbonyls based on a fundamental understanding of their electronic properties
		CO5	5. calculate EAN of carbonyls and nitrosyls.
		CO6	6. appreciate specialized and advanced topics in inorganic and coordination chemistry
		CO7	7. corelate structure and bonding with reactivity of boron clusters
CHE 102	M.Sc I (Sem-I) General	CO1	1. Implement rules of aromaticity to organic molecules

	Organic Chemistry (DSC–II.1)	CO2	2. Evaluate the organic reactions based on the influence of the substituents on substrate molecules
		CO3	3. Design organic reactions based on free radical chemistry in order to achieve the
		CO4	4. Sketch organic molecules in different projection formula and assign its configuration.
		CO5	5. Compare the stability of different conformers
		CO6	6. Apply their understanding about the organic reactions of industrial significance with respect to the chemo- selectivity, regioselectivity and enantioselectivity.
		CO7	Analyze the product distribution and the stereochemistry of various organic products.
CHE 103	Msc I (Sem-I) Physical Chemistry - I (DSC–III.1)	CO1	1. Understand basic and advanced level statistical thermodynamics, and reaction kinetics, electrolytic conductance
		CO2	2. Apply the concepts of statistical thermodynamics and reaction kinetics to solve complex problems.
		CO3	3. Demonstrate the ability to use chemical dynamics to solve problems associated with enzyme kinetics, and complex reactions
		CO4	4. Implement and build theoretical models for reaction rates, thermodynamics, conductometric and potentiometric titration
		CO5	5. Solve numerical problems associated with statistical thermodynamics, reaction kinetics.
CHE 104 (iv)	Msc I (Sem-I) Optical Methods of Analysis (DSE–I (iv)	CO1	1. comprehend of various spectroscopic techniques and their applications in analytical chemistry
		CO2	2. apply Beer's Law and verify its deviations, interpret fluorescence and phosphorescence spectra using Jablonski Diagram, and analyze complex compositions using Job's and mole ratio method
		CO3	3. demonstrate proficiency in operating single and double-beam spectrophotometers, evaluating sensitivity and significance of molar extinction coefficients, and employing derivative spectrophotometry for enhanced spectral analysis
		CO4	4. comprehend the principles and instrumentation involved in atomic absorption, emission, and fluorescence spectrometry, as well as X-ray fluorescence and emission spectroscopy.
		CO5	5. apply optical methods of analysis in various analytical applications.
CHE 201	M.Sc. I (Sem-II) Physical Chemistry-II (DSC–II.2)	CO1	1. Understand basic concepts and theories for quantum mechanics, surface chemistry, and thermodynamics
		CO2	2. Apply the concepts of quantum mechanics to solve higher order problems associated with shapes, size and energy of atomic entities.
		CO3	3. Develop the methodologies to identify and use colloidal substances and micelles.
		CO4	4. Implement and build theoretical and experimental processes using thermodynamics and electrochemical concepts

		CO5	5. Solve numerical problems associated with quantum mechanics, and thermodynamics.
CHE 202	M.Sc. I (Sem-II) **Coordination Chemistry (DSC–II.2)**	CO1	1. recollect the principles of electronic structure, bonding and reactivity of coordination complexes
		CO2	2. understand the concept of synthesis and stability of transition metal organometallic complexes
		CO3	3. develop the possible catalytic pathways leading to desired products
		CO4	4. unravel and interpret the magnetic properties of coordination complexes
		CO5	5. Apply principles of metal-ligand bonding in predicting the electronic and structural properties of complexes.
		CO6	6. Analyze the splitting of d orbitals in different coordination geometries (octahedral, square planar, tetrahedral, square-pyramidal, and trigonal bipyramidal complexes) using crystal field theory, considering the Jahn-Teller distortion and spectrochemical series.
		CO7	7. Evaluate the stability of different oxidation states and ionization energies of transition metal ions based on crystal field effects and variation of lattice energy and heats of hydration.
		CO8	8. Compare and contrast the limitations of crystal field theory with the adjusted crystal field theory (LFT or ACFT) and molecular orbital theory (MOT) to better describe metal-ligand interactions in transition metal complexes.
CHE 203	M.Sc. I (Sem-II) **Basic Analytical Chemistry (DSC–II.2)**	CO1	1. demonstrate a comprehensive understanding of analytical chemistry principles and techniques
		CO2	2. recognize and classify different analytical methods and sampling techniques, evaluating their applicability in various scenarios
		CO3	3. analyze and interpret titration curves and thermograms, applying theoretical concepts to predict behaviour.
		CO4	4. determine equilibrium constants and pH values accurately
		CO5	5. comprehend polarography principles and use them to quantitate metal ions and organic compounds
CHE 204 (iv)	MSc II (Sem-II) **Thermal and Electro-Analytical Techniques (DSE–II (iv))**	CO1	
		CO2	
		CO3	
		CO4	
		CO5	1. Define and explain the key terms and concepts in advanced analytical techniques, including thermogravimetry, voltammetry, ion-selective electrodes, and coulometry. 2. demonstrate proficiency in operating sophisticated

			instruments, interpreting complex data, and performing thermogravimetric titrations 3. analyze electrochemical data and apply it for quantitative analysis of metals and anions 4. develop skills in minimizing polarization effects in electrogravimetric measurements and utilizing electrochemical microscopy for nanoscale analysis 5. gain the expertise to solve intricate analytical problems across diverse fields
Course Code	Name of the Course	Cos	On successful completion of this course, the students would be able to
2121	MSc II (Sem-III) Spectroscopy-I	CO1	Introduction and detail study of important spectroscopic techniques such as UV and visible spectroscopy, IR, Mass and NMR spectroscopy.
		CO2	From UV and visible spectroscopy, students are able to identify conjugations in organic compounds & IR spectroscopy enables the students to identify various functional groups present in a molecule
		CO3	Fragmentation pattern of organic compounds using Mass spectroscopy helps the students to solve the structure of simple molecules.
		CO4	^{1}HNMR & ^{13}CNMR helps the students to identify number of hydrogen and carbon atoms and their connectivity
		CO5	Combining data of all above techniques helps the students to solve the structure of unknown compound
2122	MSc II (Sem-III) Analytical Chemistry (Thermal & Electroanalytical Chemistry)	CO1	To introduce instrumentation of various techniques
		CO2	To know the various analysis methods
		CO3	Separation of single/binary/ternary systems quantitative analysis
		CO4	Discovery of new chemical compounds
		CO5	To know different chemical reactions & Different titration methods for analysis
2125	MSc II (Sem-III) Organic Chemistry (Organic	CO1	Students get exposed to oxidation/reduction reactions and different types of oxidizing and reducing agents.
		CO2	Students get familiar with the synthesis and reactivity of polynuclear hydrocarbons, preparation of different ring system and non-aromatic compounds

	Synthesis -I)	CO3	Constructions of carbon-carbon bonds using name reactions are discussed
		CO4	Several important name reactions useful for various organic transformations are discussed with mechanism
		CO5	Students are able to understand the mechanisms of important name reactions
2126	MSc II (Sem-III) Organic Chemistry (Natural Product -I)	CO1	This paper helps the students to gain knowledge about the important organic compounds present in nature
		CO2	Detailed study of carbohydrates and lipids
		CO3	Classification, chemical properties, isolation, synthesis and structure determination of alkaloids and terpenoids
		CO4	Occurrence, nomenclature, synthesis and structure determination of steroids and hormones
		CO5	Classification, occurrence and chemistry of vitamins and natural pigments are discussed
2141	MSc II (Sem-IV) Spectroscopy-II	CO1	Students would be able to understand various spectroscopic techniques
		CO2	Principles of various spectroscopic techniques such as Raman, Photoelectron, X-ray, Electron diffraction, Neutron diffraction, Electron spin resonance and Mossbauer spectroscopy can help the students for understanding the subject well.
		CO3	Applications of the above spectroscopic techniques can help the students to implement them in industries
		CO4	Fragmentation pattern of organic compounds using Mass spectroscopy helps the students to solve the structure of simple molecules.
		CO5	Implementation of various spectroscopic methods like UV and visible spectroscopy, IR, Mass and NMR spectroscopy for structure elucidation of organic compounds & the students would be able to solve the structures of simple organic molecules
2142	MSc II (Sem-IV) General Analytical Chemistry	CO1	Students would be able to understand different instrumental techniques used in chemistry
		CO2	Students get information how to analyze and measure trace quantities of organic and inorganic components from a given complex mixture
		CO3	Students can determine composition of moisture, fats, carbohydrates, vitamins, anti-oxidants, toxins, preservatives, etc in food samples

		CO4	Topic on food analysis helps the students to get jobs in food industries
		CO5	Students get knowledge on fuel analysis and also how poisonous material such as lead, mercury, arsenic can be estimated in biological samples
2145	MSc II (Sem-III) Organic Chemistry (Organic Synthesis -II)	CO1	Students get exposed to different type of reagents used in various name reactions
		CO2	Applications of organometallics in organic synthesis help the students to understand various carbon-carbon bond forming reactions
		CO3	Students get familiar with important heterocyclic structures, their reactivity and chemistry involved
		CO4	The topic on retro synthesis helps the students to design the synthetic pathway of important organic molecules
		CO5	Protection and deprotection techniques are important for designing the synthesis of organic compounds
2146	MSc II (Sem-III) Organic Chemistry (Natural Product -II)	CO1	Students get information about various aspects of drugs, general terminology related to medicinal chemistry
		CO2	Students can understand important types of biological targets and their interactions with drugs
		CO3	Detailed procedures involved in drug discovery program especially designing of drugs can be understood
		CO4	Students get exposed to the synthesis of important biologically active compounds available in the market
		CO5	Apart from drugs, students get information on synthesis and application of other organic products such as polymers, dyes and agrochemicals

M. Sc. ZOOLOGY

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
	M.Sc. SEM -I 1ZOO(RM)	CO1	Fundamental knowledge and skills required to conduct effective research in the field.
		CO2	Covers various research methodologies, experimental design, analysis , interpretation,scientific communication and ethics in research.
		CO3	Understand the role of research methodology in Science/Zoology.
		CO4	Understand literature review process and formulation of a research problem.
		CO5	Understand data collection methods and basic instrumentation.
		CO6	Learn various statistical tools for data analysis.
		CO7	Learn technical writing and communication skills required for research.
		CO8	IPR aims to equip students with a comprehensive understanding of intellectual property laws,principles and practices.
		CO9	Create awareness about intellectual property rights and patents.
	M.Sc. SEM -I 1ZOO1	CO1	Describe various methods of taxonomy.
		CO2	Differentiate between different methods of taxonomy.
		CO3	Identify different types of feeding in invertebrates.
		CO4	Describe mechanisms of chemoreception and photoreception in invertebrates.
		CO5	Conjecture the stage of metamorphosis in insects from concentrations of different hormones.
		CO6	Differentiate between different modes of reproduction.

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to

	M.Sc. SEM -I 1ZOO2	CO1	To develop a deep understanding of enzymes, hormones, respiratory pigments and neurotransmitters.
		CO2	To understand the concept of Thermoregulation, osmoregulation, chemiluminescence and camouflage with suitable examples.
		CO3	To understand the various functional components of an organism.
		CO4	To explore the complex network of these functional components.
		CO5	To comprehend the regulatory mechanism for maintenance of function in the body.
		CO6	To understand the concept of special senses.
	M.Sc. SEM -I 1ZOO3	CO1	Study spermatogenesis and oogenesis in eukaryotes.
		CO2	Determine different events and their mechanisms during fertilization and its consequent changes
		CO3	Learn assisted reproduction techniques to overcome infertility.
		CO4	Understand Ex vivo and In vivo gene therapy etc
		CO5	Learn about contraception and methods
	M.Sc. SEM -I 1ZOO4 (TB)	CO1	Student will develop real time problem solving skills using techniques like electrophoresis, chromatography based applications based questions and projects.
		CO2	The course will help to understand the principles and applications of different biophysical techniques.
		CO3	The Course will able to differentiate in between structure, size, shape, dynamics, polarity, and modes of interaction of biological molecules.
		CO4	To get acquainted with Cytological and histological techniques.
Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
	M.Sc. SEM -I 1ZOO4 (WCM)	CO1	Define and Explain Wildlife Conservation: Students will articulate the definition and significance of wildlife conservation, discussing its role in preserving biodiversity and ecological balance.
		CO2	Examine Wildlife Management Techniques: Students will demonstrate the ability to apply

			wildlife management techniques, including assessing wildlife populations, habitat management, and the establishment of wildlife corridors.
		CO3	Analyze Legal and Policy Frameworks: Students will analyze the legal and policy frameworks governing wildlife conservation, with an understanding of international conventions and the roles of governmental and non-governmental organizations.
		CO4	Evaluate Human-Wildlife Interactions: Students will evaluate the interactions between humans and wildlife, identifying potential conflicts and proposing strategies for mitigation.
		CO5	Design Sustainable Wildlife Tourism Practices: Students will design and justify sustainable wildlife tourism practices, considering economic benefits and ethical considerations.
		CO6	Promote Conservation Awareness through Education: Students will design educational initiatives to raise conservation awareness, emphasizing responsible wildlife viewing Ipractices and ethical wildlife management.

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
	M.Sc. Sem -Ii 2zoo1	CO1	Describe merits and demerits of different types of taxonomic keys.
		CO2	Differentiate between binomial and trinomial nomenclature.
		CO3	Describe rules of International Code of Zoological Nomenclature (ICZN).
		CO4	Identify various derivatives of integument in vertebrates.
		CO5	Describe characteristic features of Agnatha.
		CO6	Differentiate between different types of kidneys.
		CO7	Justify position of protochordates among chordates
	M.Sc. Sem -Ii 2zoo2	CO1	At the end of the course, the student has a strong foundation on the functions of the cell.
		CO2	This course imparts students the knowledge about how cell to cell communication occurs tocarry out different functions of the cell.

		CO3	**The course will help to understand the basic principles of signal transduction mechanisms, in particular the concepts of response specificity, signal amplitude and duration, signal integration and intracellular location.**
		CO4	It will help the students to provide knowledge about cytoskeleton of the cells and how it gives strength , shape and motility to the cell.
		CO5	Have an overview of the different intracellular transport pathways in the eukaryotic cell, and understand how proteins and lipids affect these processes.
	M.Sc. Sem -Ii 2zoo3	CO1	Understand the concepts and principles of ecology.
		CO2	Understand the structural and functional aspects of biodiversity and the need for its conservation.
		CO3	Be aware of the suitable use of field techniques, data collection, mapping, analysis and interpretation.
		CO4	Be able to take up interdisciplinary research and teaching in ecology and environment.
		CO5	Making the people and the society aware towards better understandings of the environmental ethics, issues and challenges before the vast growing population of the state and the country as well.
	M.Sc. Sem -Ii 2ZOO4 Elective	CO1	Here students are taught to deal with different tools and techniques applicable in biological
		CO2	research including various types of microscopes, spectrophotometer and bioinformaticssoftware. etc.
		CO3	The theory session mainly focuses on understanding the principles and working mechanisms of different instruments.
		CO4	Learning of Principle and applications of different radioactive material.
		CO5	Learning phylogeny construction by using bioinformatics software.
		CO6	Develop skills of advanced instrumentation.
	M.Sc. Sem -Ii 2zoo4 Elective	CO1	Understand the significance of ecosystem services and biodiversity in wildlife conservation,recognizing their importance in supporting human well-being and ecosystem health.
		CO2	. Analyse the role of biodiversity in ecosystem functions and comprehend the potential threats posed to wildlife and habitats.
		CO3	Describe the principles of wildlife ecology and population dynamics,

			including factors influencing wildlife populations and their growth.
		CO4	Recognize migratory patterns and behavioural adaptations in wildlife and understand their ecological significance
		CO5	Apply the core principles of conservation biology to design effective strategies for wildlife protection.
		CO6	Explore conservation approaches outside protected areas, considering community-based conservation and conservation breeding for endangered species.
		CO7	Demonstrate the ability to engage local communities as partners in wildlife conservation, understanding their perspectives and involving them in decision-making processes.
		CO8	Facilitate stakeholder dialogue and conflict resolution to address human-wildlife conflicts and promote coexistence.
	Sem III Paper IX Molecular Cytogenetics- I	CO 1	Molecular Cytogenetics gives the knowledge of biological mechanisms of variations and heredity.
		CO 2	It also gives an elementary idea about different hereditary diseases and syndromes and their inheritance.
		CO 3	It trains the students to perform laboratory exercises in cytogenetic.
		CO1	Animal physiology gives the knowledge of biological processes through the investigation of physiological processes.
	Paper-XI & XII(Elective Paper-I) Animal Physiology –I & II	CO2	It enables to understand the chemical and molecular processes that occur in and between cells.
		CO2	CO12 Ultra Structure of neuromuscular junction (motor end plate), Muscular disorders.
		CO3	It also provides knowledge about the theoretical processes related to hormonal action.
		CO4	Trains the students to perform laboratory exercises in Animal physiology that is applicable to Pathology laboratory, medicine, forensics and pharmaceutical industry.
	Theory Paper-XIII (Biochemistry) and Related Practical	CO1	Biochemistry gives the knowledge of biomolecule and the biochemical processes occurring inside the cell and the body as a whole.
	Practica	CO2	It trains the students to carry out laboratory exercises in biochemistry and

	l		biochemical investigations.
	Theory Paper XIV (Enzymology and Biostatistics) and Related Practical	CO 1	Enzymology enables to understand the role and activities of various enzymes functioning in the body.
		CO 2	It also gives some idea about clinical and pharmaceutical applications of enzymes.
		CO 3	It trains the students to carry out laboratory exercises related to enzyme activity and estimations of enzymes.
		CO 4	Biostatistics trains the students in handling and analyzing the biological clinical data.

M. Sc. Mathematics

Course Code	Name of the Course	COs	On successful completion of this course, the students would be able to
DSC-I	**M.Sc I (Sem-I): Real Analysis**	CO1	Restate the ideas and concept of Riemann – Stieltjes integral with some of its properties and apply the fundamental theorem of integration.
		CO2	Apply the Weierstrass M-test, Abel's and Dirichlet's tests for uniform convergence of sequences.
		CO3	Differentiate between uniqueness theorem for power series, Abel's limit theorem and Tauber's first theorem.
		CO4	Recognize the functions of several variables, linear transformation, partial and higher order derivatives in an open subset of R.
		CO5	Demonstrate the inverse function theorem, implicit function theorem and solve problems on maxima and minima of a function
DSC-II	**M.Sc. I (Sem-I): Advanced Abstract Algebra**	CO1	Recall the concepts of cosset and normal subgroup and to prove elementary propositions involving these concepts.
		CO2	Recognize different types of subgroups such as normal subgroups, cyclic subgroups and understand the structure and characteristics of these subgroups.
		CO3	Demonstrate the homomorphism, Sum and direct sum of ideals, maximal and prime ideals, nilpotent and nil ideals.
		CO4	Translate the transition of important concepts of homomorphism's and isomorphisms from discrete Mathematics to advanced abstract Mathematics.
		CO5	Interpret the Definition and examples of modules and Sub modules, quotient modules, completely reducible modules and free modules.
DSC-III	**M.Sc. I (Sem-I):Complex Analysis**	CO1	Identify Cauchy integral formula apply to find the value of function at inside point of the region.
		CO2	Express the function in series of positive and negative power of variable in a given region.
		CO3	Record the concept of singularities to find integral of complex valued function on some simple connected region and multi connected region.
		CO4	Apply the residue theorem to compute several kinds of real integrals.
		CO5	Recognize about everywhere differentiable function and they will learn how it helps them to decide analyticity of function
DSC-IV	**M.Sc. I (Sem-I):**	CO1	Identify the cardinal and ordinal numbers and their role in building up the topology.

	Topology – I	CO2	Demonstrate the concepts such as topological spaces, open and closed sets, interior, closure and boundary.
		CO3	Categories some important concepts like continuity, compactness, connectedness, projection mapping etc and prove related theorems.
		CO4	Relates the basic concepts of countability axiom, separation axioms and convergence in topological spaces.
		CO5	Distinguish between the regular, normal and completely regular spaces.
DSE-V	**M.Sc. I (Sem-I): Advanced Discrete Mathematics-I (Optional)**	CO1	Design the graphs, paths, circuits, cycles and subgraphs.
		CO2	Determine Circuit, Fundamental Circuit, cut sets, fundamental cut sets of the graph.
		CO3	Illustrate chromatic number
		CO4	Describe introductory computability theory its techniques.
		CO5	Apply graph theory to grammars and languages.
DSE-V	**M.Sc. I (Sem-I): Differential Geometry (Optional)**	CO1	Discuss the local intrinsic properties of a surface, curves on a surface, surfaces of revolution.
		CO2	Design arguments in the geometric description of family of curves and surfaces in order to establish basic properties of geodesics.
		CO3	Apply Geodesics theorem and restate the Gaussian Curvature, Surface of constant curvature, conformal and Geodesic mappings.
		CO4	Recognize the tensor calculus, tensor product of vector spaces, transformation formulae, contraction special tensors, and inner product.
		CO5	Apply covariant differentiation, of tensors and use absolute derivation of tensorial forms and tensor connexion
DSC-I	**M.Sc. I (Sem-II): Measure And Integration Theory**	CO1	Analysis Lebesgue outer measure, regularity and Lebesgue measurability
		CO2	Explain integration and non-negative function, the general integral, Riemann and Lebesgue integrals
		CO3	Demonstrate the concepts of four derivatives, differentiation and integration
		CO4	Discuss the measure and outer measure
		CO5	Express completion of measure, measure spaces, Holder and Minkowski inequality
DSC-II	**M.Sc. I (Sem-II): Advanced**	CO1	Recall the concepts of Eigen values, Eigen vectors and polynomials.
		CO2	Explain quadratic form, linear transformation, canonical and normal form.

	Linear Algebra and Field Theory	CO3	Describe the concepts of algebraic extension of fields.
		CO4	Discuss normal and separable extension of Group.
		CO5	Understand the concepts of Galois theory and its application.
DSC-III	**M.Sc. I (Sem-II): Integral Equations**	CO1	Understand the type of integral equations.
		CO2	Categorize Volterra integral equations of first and second kinds.
		CO3	Determine the solution of Fredholm integral equations of the second kinds.
		CO4	Define the concepts of iterated kernels and reciprocals kernels.
		CO5	Explain solution of Volterra integral equations of second kinds
DSC-IV	**M.Sc. I (Sem-II): Topology–II**	CO1	Categorize some important concepts of metric spaces.
		CO2	Restate the ideas and concepts of complete metric spaces.
		CO3	Interpret the definition and examples of product spaces.
		CO4	Express the function and quotient spaces.
		CO5	Discuss the metrization and paracompactness.
DSE-V	**M.Sc. I (Sem-II): Advanced Discrete Mathematics-II (Optional)**	CO1	Develop the logical tools among the students.
		CO2	Interpret the concepts of Semigroups and Monoids.
		CO3	Categorize the concepts of Lattice and sublattice.
		CO4	Apply the Boolean algebra to switching circuits
DSE-V	**M.Sc. I (Sem-II): Riemannian Geometry (Optional)**	CO1	Discuss the properties of Christoffel symbols, divergence, gradient and Laplacian.
		CO2	Demonstrate the concepts of parallel vector field.
		CO3	Interpret the concepts of curvature tensor.
		CO4	Categorize some concepts like Ricci tensor, curvature invariant and Einstein tensor.
		CO5	Summarize the concepts of Riemannian curvature , space of constant curvature, intrinsic symmetric and killing vectors
Paper-XI (301)	**M.Sc.-II (Sem-III): Functional Analysis-I**	CO1	Appreciate how functional analysis uses and unifies ideas from vector spaces, the theory of metrics, and complex analysis.
		CO2	Understand and apply fundamental theorems from the theory of normed and Banach spaces, including the Hahn-Banach theorem, the open mapping theorem and the closed graph theorem.

		CO3	Appreciate the role of Inner product space.
		CO4	Understand and apply ideas from the theory of Hilbert spaces to other areas.
		CO5	Understand the fundamentals of spectral theory, and appreciate some of its power.
Paper-XII (302)	**M.Sc.-II (Sem-III): Advanced Mechanics**	CO1	Derived the Lagrange's equation and Hamilton principle.
		CO2	Understand the concept of Legendre's transformation and apply to derive the Hamilton's Equation.
		CO3	Understand the concept of canonical transformation and apply to derived Poisson's Identity.
		CO4	Demonstrate knowledge and understanding of Perturbation Theory.
Paper-XIII (303)	**M.Sc.-II (Sem-III): Operations Research**	CO1	Solve many financial decision making problems by using linear programming technique.
		CO2	Explain the graphical solution of linear programming problem by different method.
		CO3	Develop all skill and technique of problem solving.
		CO4	Acquire the knowledge and understanding of Queuing system.
		CO5	Define and illustrate Game and strategies.
Paper-XIV (304)	**M.Sc.-II (Sem-III): Fluid Dynamics –I (Optional)**	CO1	Develop appreciation properties of fluids.
		CO2	Derived Euler's equation, Bernoulli's equation and Discuss the case of steady motions under conservative body forces.
		CO3	Apply concepts of mass, momentum and energy conservation to flows,
		CO4	Prove Milne- Thomson Circle theorem and derived some application.
		CO5	Understand the concept of elements of thermodynamics and explain Entropy-Maxwell's Thermodynamics relation.
(305)	**M.Sc.-II (Sem-III) (305): General Relativity (Optional)**	CO1	Familiar with the fundamental principles of the general theory of relativity. They shall know the meaning of basic concepts like the equivalence principles, inertial frames and time dilation.
		CO2	Understand the concept of constant relative motion of different bodies in different frames of reference.
		CO3	Solve Einstein's field equations for static spherically symmetric problems and for isotropic and homogeneous cosmological models.
		CO4	Find out the Schwarzschild Exterior and Schwarzschild Interior solutions.

		CO5	Give a mathematical description of gravitational waves in context of Einstein's relativity.
(306)	**M.Sc.-II (Sem-III): Difference Equation-I (Optional)**	CO1	Invert z-transforms using partial fractions or residues where appropriate
		CO2	Solve constant coefficient linear difference equations using z-transforms
		CO3	Understand the key aspect in the inversion of the z-transform as well as demonstrating the use of partial fractions.
		CO4	Find out the solution of first order difference equation by successive calculation.
		CO5	Understand the concept of Asymptotic methods, apply into linear and nonlinear equation.
(307)	**M.Sc.-II (Sem-III) :(Advanced Complex Analysis (Optional)**	CO1	Explain Riemann mapping theorem and derived Weierstrass factorization theorem.
		CO2	Understand Gamma and Zeta functions, their properties and relationships.
		CO3	Understand the Harmonic functions on a disc and concerned results.
		CO4	Explain the relationship between Poisson-Jensen's formula and Derived Hadamard's factorization theorem.
		CO5	Acquire the knowledge of range of analytic function and derived theorems.
(308)	**M.Sc.-II (Sem-III): Banach Algebra-I (Optional)**	CO1	Understand and illustrate the concept of Banach algebra.
		CO2	Define Spectral radius and derived Spectral mapping theorems.
		CO3	Understand and illustrate C* - algebra.
		CO4	Described the C* - algebra and its properties.
Paper-XVI (401)	**M.Sc.-II (Sem-IV): Functional Analysis-II**	CO1	Define and illustrate the concept of reflexivity of Hilbert space.
		CO2	Understand the fundamentals of spectral theory, and appreciate some of its theorems.
		CO3	Understand the statement and proofs of important theorems and be able to explain the key steps in proofs, sometimes with variation.
		CO4	Define and illustrate the projection operators.
Paper-XVII (402)	**M.Sc.-II (Sem-III): Partial Differential Equation**	CO1	Find solutions of partial differential equations and determine the existence, uniqueness of solution of partial differential equation.
		CO2	Find out the complete integral by Charpits method and also find the particular integral, singular integral
		CO3	Solve simple eigenvalue problems of Sturm-Liouville type.

		CO4	Classify partial differential equations into Linear equation, Semi linear, Quasi-linear and nonlinear equations.
		CO5	Understand the Dirichlet problem, Neumann problem and apply to solve problem for half plane.
		CO6	Derived the Heat conduction problem and prove Kelvin's inversion theorem.
Paper-XVIII (403)	**M.Sc.-II (Sem-IV): Numerical Analysis**	CO1	Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.
		CO2	Apply numerical methods to obtain approximate solutions to mathematical problems.
		CO3	Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations.
		CO4	Analyze and solve several errors and approximation in numerical methods.
		CO5	Apply several methods to solve Curve Fitting and Interpolation questions and its related techniques
Paper-XIX (404)	**M.Sc.-II (Sem-IV): Fluid Dynamics-II**	CO1	Apply scientific method strategies to fluid mechanics to analyses qualitatively and quantitatively the problem situation, propose hypotheses and solutions.
		CO2	Understand the compressibility effects in real fluids and derived the one, two, three dimensional wave equation.
		CO3	Define and illustrate Viscous Flow, apply to solve problems.
		CO4	Understand concept of Magneto hydrodynamics and derived Maxwell's electromagnetic field equation.
		CO5	Acquire the knowledge of boundary layer and apply to solve problems.
(405)	**M.Sc.-II (Sem-IV): Relativistic Cosmology (Optional)**	CO1	Derived De-sitter model and Explain Einstein Field equation with cosmological term.
		CO2	Understand De-sitter model, there derivatives, properties and comparison with the actual universe.
		CO3	Explains the cosmological principle, Hubble's law, Weyls Postulate and Steady State Cosmological Models.
		CO4	Study the motion of particle and light rays in R-W model.
		CO5	Understand and apply the knowledge of gravitational waves in curved space time.

		CO6	Show how the Friedman-Robertson-Walker metric is an exact solution to the Einstein equations.
		CO7	Describe the key ideas behind cosmology and the expanding universe.
(406)	**M.Sc.-II (Sem-IV): Difference Equation-II (Optional)**	CO1	Know the important theorems and their application.
		CO2	Successfully obtain the series solution of various types of linear and nonlinear differential equations
		CO3	Find out the solution of second order difference equation by successive calculation.
		CO4	Explain the boundary value problem for linear and nonlinear equation.
		CO5	Find out the solution of partial differential equation.
(407)	**M.Sc.-II (Sem-IV): Lie Groups (Optional**	CO1	Study the structure theory of Lie group and prove the theorem.
		CO2	Define and illustrate the concept of Topological groups.
		CO3	Understand the knowledge of transformation of Lie groups.
		CO4	Explain the Taylor's theorem for Lie groups.
		CO5	Explain the relationship of Maurer-Chartan forms and prove the converse of Lie first and second theorems.
(408)	**M.Sc.-II (Sem-IV): Banach Algrebra-II (Optional)**	CO1	Derived spectral theorems and apply concept of C* - algebra.
		CO2	Understand and acquire the knowledge of strong, weak operator topologies.
		CO3	Prove Kaplansky Density theorems and understand the concept of commutant.
		CO4	Apply Kaplansky's formula and explains various types of projections

HOME ECONOMICS

Course Code	Name of the course	Cos	On successful completion of this course, the students would be able to
	B.A.I sem-I	CO1	Formulate a plan of activities/programs managing & saving resources
	B.A.I sem-II	CO1	Make carrier In the field Interior Decoration and designing
	B.A.II sem-III	CO1	Describe food groups & food functions
	B.A.II sem-IV	CO1	Make diet plans for various diseases skilfully guide too
	B.A.III sem-V	CO1	To Inspire the Students for Skill Based Activity.
	B.A.III sem-VI	CO1	➢ To aware the Role of Heredity & Environment in Development ➢ To State the Role of Parent & Teacher in Child Development