M.Sc. FAMILY AND COMMUNITY SCIENCE - PROGRAMME SPECIFIC OUTCOMES (PSO)

Program Outcome	Programme Specific Outcomes (PSO)
PSO1	Comprehending fundamental concepts in Environment and Human Resource Management, Housing and Interior Space Design.
PSO2	Acquire skills in diet formulation, food service and entrepreneurship.
PSO3	Apply the skill based knowledge of Early Childhood Education, Developmental assessment, Developmental psychology and Counselling to real time situation.
PSO4	Gain proficiency in fashion designing and understand concepts of garment production, fashion marketing and textile testing.
PSO5	Develop competency in public health nutrition and food safety.

M.Sc. FAMILY AND COMMUNITY SCIENCE- COURSE OUTCOMES

SEMESTER	PAPER CODE	TITLE OF PAPER	CO	COURSE OUTCOME
Semester I	HS020101	Environment And Human Resource Management	CO1	Understand the significance of resource management
			CO2	To create awareness and application of management process
			CO3	Identify the environmental resources and its utilization
			CO4	Realize the need of leadership for betterment of the society.
Semester I	HS020102	Clinical Nutrition And Dietetics	CO1	Describe the competency and the role of nutrition in different therapeutic conditions.
			CO2	Explain the role of dietitian.
			CO3	Describe the principles of diet therapy and planning therapeutic diets.
			CO4	Develop aptitude for taking up dietetics as a profession
Semester I	HS020103	Pattern Making And Grading	CO1	Describe different pattern making and grading techniques
			CO2	Explain the principles of pattern making
			CO3	Experiment with different layout techniques
			CO1	Apply the drafting technique to prepare patterns for garment parts
			CO2	Design garments incorporating different features

			CO3	Carry out the common pattern alteration methods
Semester I	HS020104	Early Childhood Education	CO1	Discuss the contributions of Philosophers and National agencies to ECCE
			CO2	Identify the organization and management of pre-schools
			CO3	Examine the pre-school curriculum
			CO4	Analyse the different approaches and effective methods in curriculum transaction
Semester I	HS020105	Kindergarten Training/Ecce/ Special Education (Practical and Intership)	CO1	Develop the skill in Planning, organizing and implementing programmes in different preschools
			CO2	Identify the task and responsibilities of persons involved in educating children with special needs
			CO3	Organize community and parental awareness programmes in rural and urban areas relating to early childhood.
			CO4	Appraise the importance of celebrating days of National importance in pre-schools.
			CO5	Develop higher proficiency in their selected area of expertise by placement / internship in their pursuing a professional career in the same field
Semester II	HS020201	Fundamentals Of Housing And Interior Space Design	CO1	Create an understanding about the changes in trend in the field of housing
			CO2	Create knowledge of materials used for the construction
			CO3	Examine and familiarize the areas of interior designing
			CO4	Apply the aspects of ergonomics for space utilization
Semester II	HS020202	Public Health Nutrition	CO1	Describe the basic concepts public nutrition.
			CO2	Analyze the nutritional disorders prevalent in India.
			CO3	Apply the knowledge of mass media for nutrition education.
			CO4	Explain the National Nutritional programmes.
			CO5	Describe the Health Care service in India
Semester II	HS500203	Research Methods And Statistics	CO1	Understand the significance of research methods and statistics in Home Science research.
			CO2	Classify the types, tools and methods of research and develop the ability to

				construct data gathering instruments appropriate to the research design.	
			CO3	Recognize the appropriate statistical techniques to analyze numerical data and draw inferences.	
			CO4	Identify the ethics in research to aid in scientific writing.	
Semester II	HS020204	Early Intervention For Infants And Exceptional Children	CO1	Identify developmental delays among children	
			CO2	Recognize the tools and techniques in developmental assessment	
			CO3	Describe early stimulation and intervention programmes	
			CO4	Classify exceptional children and identify the educational provisions and interventions need	
Semester II	HS020205	Fashion Illustration And Design (Practical)	CO1	Experiment with different lines and shading techniques	
			CO2	Create effects using rendering techniques and different mediums	
			CO3	Create designs applying the elements and principles of design	
			CO4	Illustrate fashion figures and garment details	
			CO5	Develop dress styles suitable for different occasions	
			CO6	Create samples for surface embellishment techniques	
			CO7	Develop a fashion portfolio based on a theme	
Semester III	HS020301	Housekeeping	CO1	Outline aspects of hospitality for guest satisfaction.	
			CO2	Justify effective communication in dealing with guest in different hospitality industry.	
			CO3	To understand the functions of housekeeping department	
			CO4	To develop skill in creating aesthetics environment	
Semester III	HS020302	Food Service Management	CO1	Provide in-depth awareness about food service systems.	
			CO2	Explain the role of hospitality and tourism in nation's economy stability.	
			CO3	Summarize the organization, its operations and its management.	
			CO4	Describe the role of basic measures adopted in food service institutions.	

Semester III	HS020303	Textile Testing And Eco-Friendly Textiles	CO1	Explain textile testing and state the objectives
			CO2	Describe the selection of samples for textile testing
			CO3	Describe and discuss the testing of fibre, yarn and fabric
			CO4	Determine the tests suitable for assessing properties of textile fabric
			CO5	Classify eco-textiles and explain eco-friendly fibres.
			CO6	List and discuss on eco-friendly processing.
Semester III	HS020304	Entrepreneurship Development	CO1	Understanding the importance of enterprise
			CO2	Recognize various entrepreneurship development programmes
			CO3	Outline the various infrastructures for employment and income generation.
			CO4	Acquire skills to start a venture.
Semester III	HS020305	Diet Therapy And Programme Planning In Public Health Nutrition (Practical And Internship)	CO1	Provide hands on experience for higher proficiency in their selected area of expertise by placement/internship in pursuing a professional career in the same field .
			CO2	Provide opportunities to understand and experience ground realities/program structures.
			CO3	Develop skills in analyzing of nutritional assessment data.
			CO4	Analyze, Plan and prepare suitable therapeutic diets based on patient needs for various diseases/disorders
Semester IV	HS800401	Developmental Psychology And Counselling Skills	CO1	Recognize the nature and scope of psychology
			CO2	Describe the various cognitive processes
			CO3	Identify the theories of intelligence
			CO4	Classify and apply the intelligence tests
			CO5	Generalize the importance of guidance and counseling
			CO6	Explain the approaches and areas of counseling
Semester IV	HS800402	Food Microbiology And Food Safety	CO1	Identify the importance of microorganisms in food spoilage.
			CO2	Apply the advanced techniques used in food preservation.
			CO3	Discuss the procedure adopted in various food operations to prevent food borne disorders and legal aspects involved in these areas.

			CO4	Show the importance of Food Laws and standards.
			CO5	Analyze the tests and standards for quality assessment and food safety.
Semester IV	HS800403	Garment Production Technology And Fashion Marketing	CO1	Describe the structure of garment industry and summarize the functions of different departments in garment industry
			CO2	Enlist and explain the activities in garment industry
			CO3	Examine the equipment and machines used in garment industry
			CO4	Define and explain the principles, standards and stages of quality control
			CO5	Explain fashion terminologies, factors influencing fashion and analyse fashion cycle.
			CO6	Define marketing, examine its functions and importance and discuss the components of marketing mix
Semester IV	HS800404	Residential Interior Designing And Event Management (Practical)	CO1	Understand the techniques and strategies required to plan successful event management.
			CO2	Understand the knowledge and competencies required to promote, implement and conduct various events
			CO3	Appreciate the aesthetic elements involved in the art process
			CO4	Become aware of ergonomics in work effectiveness and efficiency.
			CO5	Create and plan interiors

M.SC ZOOLOGY PROGRAMME SPECIFIC OUTCOMES (PSO)

Programme Outcome	Programme Specific Outcomes (PSO)
PSO1	Understand recent developments in the principles and practices of systematics and taxonomy, analyze link between the origin, evolution, phylogeny of invertebrates and vertebrates.
PSO2	Understand and analyze the advanced concepts in cell biology, biochemistry, developmental biology, genetics, evolution, microbiology, immunology, research methodology, statistics and physiology.
PSO3	Understand and apply, advanced tools and techniques related to biological sciences such as biophysics, bioenergetics, Instrumentation, Microbiology, Immunology, Biochemistry, Biotechnology and their potential applications in Animal Biology.

PSO4	Developing deeper understanding of key concepts of biology at biochemical, molecular and cellular level, physiology and reproduction at organismal level, and ecological impact on animal behavior.
PSO5	Understand functional aspects of ecosystem thereby enabling the learner to understand threats to biodiversity and importance of conserving natural resources, ecosystem restoration and equip the students to use various tools and techniques to coordinate and participate in field activities.
PSO6	Generate an awareness about the biology of insects for its diversity, application in agricultural pest management, sericulture, apiculture, lac culture , vermicomposting, fish farming and forensic science thereby impart skill as well a source of self-employment.
PSO7	Elucidation of animal-animal, animal-plant, animal-microbe interactions and their consequences to animals, humans and the environment Develops empathy and love towards the animals and plants.
PSO8	Imbibe and present varied knowledge applicationsby means of written, verbal, graphical/ virtualcommunications and interact effectively with people from differentbackgrounds

M.SC ZOOLOGY COURSE OUTCOMES

SEMESTER	PAPER CODE	TITLE OF PAPER	CO	COURSE OUTCOME
Semester I	Zl010101	Animal Diversity, Phylogenetic Taxonomic approach	CO1	Understand the origin, diversification, modifications and evolutionary relationships among invertebrates and the vertebrates.
			CO2	Evaluate adaptive radiations of different major phyla that helped them to evolve into their present form.
			CO3	Understand the phylogenetic relationship among the different groups of animals.
			CO4	To provide classical, modern methods and molecular techniques employed in systematics and apply these methods for construction of Phylocode, Barcode, and phylogenetic trees.
			CO5	Evaluate the phylogenetic relationshipamond protostome lineage and Deuterostome lineage.
			CO6	Evaluate taxonomic characters of different kinds and analysis of variation.
			CO7	Apply the various taxonomic procedure for collection,preservation and curation of living things.

			CO8	Construct taxonomical keys for identification of taxa and understand taxonomic publications.
			CO9	Apply the rules and ethics of ICZN for the scientific naming and designation of types.
			CO10	To understand importance of molecular phylogeny and nuclecicacid phylogeny.
Semester I	Zl010102	Evolutionary Biology And Ethology	CO1	To analyze concept of relatedness and its connection to biological evolution
			CO2	To apply knowledge to new information and data, as well as the capacity to effectively communicate the principles of evolution and its application to human biology
			CO3	To expose students to the basics and advances in ethology, and generate an interest in the subject in order to understand the complexities of studying animal behavior on every level of the biological hierarchy
			CO4	Understand the basics of prehistoric time periods and events, fossils and extinction
			CO5	Create curiosity for learning the scientific way of the origin of life, first cell and eukaryotic- prokaryotic origin
			CO6	Create scientific attitudes and rational thoughts by observing the evidences for evolution
			CO7	Understand molecular evolution and nucleotide ,protein analysis
Semester I	Zl010103	Biochemistry	CO1	To understand the chemical nature of life and life process
			CO2	Understand the basic chemistry and biophysical chemistry of molecules, interactions and body fluids
			CO3	To provide an idea on structure and functioning of biologically important molecules
			CO4	Develop awareness on the importance of vitamins, minerals free radicals and antioxidants
			CO5	To generate an interest in the subject and help students explore the new developments in Biochemistry
			CO6	Explain classification, the specificity of enzymes, and the chemistry involved in enzyme action

			CO7	To understand the importance of metabolism of bio macromolecules in normal physiology of a man
			CO8	To understand the abnormal metabolism of biomolecules and the resultant diseases
Semester I	Zl010104	Biostatistics, Computer Application And Research Methodology	CO1	To enable learners to effectively apply suitable statistical tests in research
			CO2	To impart concepts of statistics and research methodology, and create awareness about the gadgets, tools and accessories of biological research.
			CO3	To sensitize students about the ethics involved in research and enable them to come up with innovative research design
			CO4	To equip learners to prepare research papers and project proposals
			CO5	Identify the fundamental idea and ethical approach to carry out original research in biology
			CO6	To help students improve analytical and critical thinking skills through problem solving
Semester I	Zl010105	Practical I: Animal Diversity, Evolutionary Ethological And Biochemical Methods And Approaches.	CO1	Identify invertebrates and vertebrates in relation to their systematic position and unique features
			CO2	Identify larval forms based on morphological features
			CO3	Analyze the systematic position and evolutionary relationships of different taxa through the construction of cladogram and taxonomic key
			CO4	Analyze hardy Weinberg law for calculation of gene frequency
			CO5	Identify the behavioural patterns of organisms
			CO6	Understand structure of biomolecules (carbohydrate , aminoacids , cholesterol), using ball and stick models and Protein and Nucleic acid using software tools
			CO7	Analyze preparation of standard curve for protein glucose, cholesterol and/or creatinine and estimation of unknown concentration
			CO8	Apply statistical measures both manual and computeraided for execution of biological research

Semester II	Zl010201	Ecology-Principles And Practices	CO1	Understand structure and function of ecosystem and various methods for its monitoring
			CO2	To provide the knowledge of animal adaptations to a variety of environment
			CO3	To learn the different aspects of population and its interactions
			CO4	Understand the natural resources and manmade issues on environment and its management
			CO5	Understand basic theories and principles of ecology
			CO6	Apply the basics of diversity indices in taxonomical research areas.
			CO7	Acquire critical understanding on anthropogenic activities on environment and knowledge of ecology is vital in taking conservation measures
			CO8	Apply the knowledge of environmental biotechnology for mitigating emerging environmental issues
Semester II	Zl010202	Developmental Biology	CO1	To introduce the concepts and process in developmental biology
			CO2	To help students understand and appreciate the genetic mechanisms and the unfolding of the same during development
			CO3	To expose the learner to the new developments in embryology and its relevance to Man
			CO4	Develop detailed understanding of the events that lead up to and comprise the process of fertilization and the events after fertilization
			CO5	Be familiar with Early Development of Model organisms like *Caenorhabditis elegans*, *Drosophila and frog*
			CO6	Analyse the molecular basis of development
			CO7	Provide adequate information regarding the genetic pathway and cellular interactions involved in development
			CO8	Students get adequate information regarding metamorphosis and regeneration.
Semester II	Zl010203	Genetics and Bioinformatics	CO1	Understand the principles and mechanism of inheritance
			CO2	Analyze the fine structure of genetic material and molecular basis of hereditary transmission

			CO3	understand the significance of Genetics in Principle in heritance of traits in Man
			CO4	understand the role of genetics in evolution
			CO5	Effectively use the existing software and extract information from large databases so as to use this information in computer modeling
			CO6	Explore the applications of the emerging field of bioinformatics
			CO7	Understand the concepts of epigenetics, quantitative and population genetics, Advanced Human Genetics
Semester II	ZL010204	Micro Biology and Bio-Technology	CO1	Understand the mechanism of microbial metabolism, interaction and ecology
			CO2	To provide an over view of the microbial world, its structure and function
			CO3	To understand the fundamental aspects of the basic biology of bacteria and viruses.
			CO4	To give students an intensive and in-depth learning in the field of biotechnology
			CO5	To familiarize the student with emerging field of biotechnology
			CO6	Understand the modern biotechnology practices and approaches with an emphasis in technology application, medical, industrial, environmental and agricultural areas and nanomedicine
			C08	Familiarize the students with public policy, biosafety, and intellectual property rights issues related to biotechnology
			C09	Analyze the strategies involved in recombinant DNA technology and environmental biotechnology
Semester II	ZL0101205	Diversity of Life:Ecological,Embroyological,Heriditary and Microbial Methods and Approaches	CO1	Understand and identify adaptations, feeding habit of interactions, diversity etc
			CO2	Analyze and determine the amount water and soil parameters
			CO3	Understand technological and modern advancements in ecological monitoring , imaging etc
			CO4	Observe and understand sexual dimorphism , Mutation and development in Drosophila
			CO5	Apply Mendelian principles of genetics to solve problems in genetics

			CO6	Understand and apply the tools in Bioinformatics
			CO7	Understand and apply the knowledge involved in sterilization techniques and culture techniques, media preparation
			CO8	Understand the methods to identify and enumerate Microorganisms
Semester III	ZL010301	Animal Physiology	CO1	To develop detailed understanding of the organization of the human body and the major functional systems
			CO2	Understand homeostatic mechanism of the major functional systems in invertebrates and vertebrates
			CO3	Provide adequate knowledge about osmo-regulation in animals living in different habitats
			CO4	Analyse the coordination of body functions by chemical messengers and disorders of hormonal imbalance in man
			CO5	Students get adequate information regarding sensory system and physiology of different senses
			CO6	Take students to higher levels of learning about the human reproductive cycles, different aspects related to child birth and reproduction
			CO7	Take students to higher levels of learning about the human reproductive cycles, different aspects related to child birth and reproduction
Semester III	ZL010302	Cell And Molecular Biology	CO1	Analyze the structural and functional aspects of the basic unit of life at the molecular level
			CO2	Evaluate how the cell to cell communications are established and the impacts of signaling in biological systems at molecular level
			CO3	Analyze the regulated sequence of events involved in cell cycle at the molecular level
			CO4	Analyze the mechanisms of gene expression and various regulatory pathways involved- in both prokaryotes and eukaryotes at the molecular level
			CO5	Understand the properties and genetic basis of cancer at the molecular level
			CO6	Identify the new developments in molecular biology and its implications in human welfare

Semester III	Zl010303	Biophysics, Instrumentation And Biological Techniques	CO1	Understand the basic biophysical principles
			CO2	Analyze biophysical properties and functioning of living system
			CO3	Understand the doctrines of thermodynamics and bioenergetics to assess the flow of energy in the living system.
			CO4	Understand the principle, functioning and applications of the tools and techniques available for studying biochemical and biophysical nature of life
			CO5	Accustom the learner to use tools and techniques for research in biology
Semester III	ZL010304	Immunology	CO1	To provide an intensive and in-depth knowledge to the students in immunology
			CO2	Examine the advanced molecular-theoretical approach in Antigen and antibodies and the interactions between them.
			CO3	Understand the organisation, expression and regulation of Major Histocompatibility Complex
			CO4	Create intensive and in-depth knowledge in immunological pathways like, complement system, inflammations, hypersensitivity etc.
			CO5	To help the learner to understand the role of immunology in human health and well-being
Semester III	ZY3CP03	Molecular, Physiological And Immunological Methods & Approaches In Biosciences	CO1	Understand the advanced techniques in immunological diagnosis and other immunological techniques
			CO2	Analyse and identify the various meiotic and mitotic stages
			CO3	Calculate mitotic index in normal cell and observe the effect of drugs on cell division
			CO4	Identify the salivary gland chromosomes
			CO5	Understand and apply the various histochemical staining techniques for the identification of biomolecules
			CO6	Isolate genomic DNA and plasmid DNA
			CO7	To understand the basics of Instrumentation
			CO8	Analyze effect of different pH and

				temperature on salivary amylase activity &Calculation of Q10
			CO9	To understandVirtual Practicals in Physiology
			CO10	To demonstrateWIDAL Test and Western Blotting –ELISA , Rocket Immuno electrophoresis
			CO11	Identification of absorption maxima of the given sample by colorimetry
Semester IV	ZL820401	Entomology: Morphology And Taxonomy	CO1	To introduce the insect diversity and its significance
			CO2	Understand the morphology of the insects, and taxonomic characters of important insects
			CO3	To study the economical and medical importance of insects
			CO4	To learn about the insect pest , vectors and their control measures
			CO5	To provide skills for scientific study of insects
			CO6	Encourage research aptitude among students by familiarizing frontier areas of entomology
Semester IV	ZL820402	Entomology: Anatomy And Physiology	CO1	Understand anatomy and histology, Physical and chemical propertiesof insects.
			CO2	Evaluate the role of hormones and pheromones in the anatomy and physiology of insects.
			CO3	Analyze and integrate the physiology of nervous coordination, digestion, circulation, respiration, excretion and reproduction in insects.
			CO4	Analyze the unique metabolic pathways through which insects maintain structural and functional integrity.
			CO5	Understand Chemistry of the Cuticle.
Semester IV	ZL820403	Applied Entomology	CO1	Envisages an insight on economically important pests of various foods, fiber and household
			CO2	Understand insects encountered in agricultural fields
			CO3	Manage and Practice Apiculture, Sericulture and lac culture units and understand the economically important insects
			CO4	Discuss the evolutionary significance of insect plant interaction and insect animal interaction

			CO5	Learn to apply various agricultural equipment and understand the effect of chemicals and its dosages in agricultural pest management
			CO6	Insecticide Application Technology
			CO7	Introduction to Forensic entomologyInsects used in forensic entomology
Semester IV	ZL820404	Entomology: Morphology, Anatomy And Taxonomy, Insect Physiology, Applied Entomology	CO1	Understand in details about the various morphological parts of insects
			CO2	Analyse the anatomy of different orders of insect
			CO3	Familiarize the use and preparation of taxonomic keys for the identification insects
			CO4	Understand of sexual dimorphism in insects
			CO5	Understand collection, preservation and identification of insects
			CO6	Analyze morphological studies of different castes of social insects
			CO7	Evaluate and compare the physiology of digestion in herbivorous, carnivorous and omnivorous insect Groups. Learns to link the digestive enzymes of insects withthe feeding habits
			CO8	Analyze the haemolymph for cytologic study and for free amino acid
			CO9	Create an insect collection box with economically important pests of various foods, fibre and household
			CO10	Identify the pests of crops, and vegetables and also. identify vectors, life cycle and disease caused by them

M.SC PHYSICS - PROGRAMME SPECIFIC OUTCOMES (PSO)

Programme Outcome	Programme Specific Outcomes (PSO)
PSO1	Understand theoretical aspects in classical mechanics, Quantum mechanics, Statistical mechanics, and thermodynamics
PSO2	Understand the basic concepts of applied physics such as Nuclear physics, Condensed matter Physics and Electronics
PSO3	Gain hands on experience in various optical and electronics experiments
PSO4	Develop skills in coding and executing different programming languages
PSO5	Build insight and foundation to theoretical and experimental physics

PSO6	Learn different numerical techniques in problem solving and basics of computational physics
PSO7	Understand about microprocessors and microcontrollers and practical skills in microprocessor programming
PSO8	Learn about digital signal processing and various instrumentation in applied physics
PSO9	Understand basic concepts on non-linear dynamics

M.Sc PHYSICS COURSE OUTCOMES

SEMESTER	PAPER CODE	TITLE OF PAPER	CO	COURSE OUTCOME
Semester I	PH010101	Mathematical Methods In Physics - I	CO1	Students will demonstrate competence with the basic ideas of linear algebra including concepts of linear system, linear transformations, independence, theory of matrices
			CO2	Will enable to perform integral transform to solve mathematical problems of interests in physics.
			CO3	The students should be able to formulate and express a physical law in terms of tensors,and simplfy it use of coodinates
			CO4	The students will be able to understand and apply the mathematic skills to solve quantitative problems in the study of physics
			CO5	Have practiced formulating good questions and explaining to others.
			CO6	Differential equations and special functions will help students to study states of the physical systems
			CO7	Variable and separable methods are used to solve problems in Quatum mechanics
			CO8	Linear vector space is applied to understand system behaviour in different coordinate systsm.
			CO9	Use statistical method to analyse data
			CO10	Describe and understand the differential equatins and other advanced mathematics in the solution of problems of mechanical systems.
Semester I	PH010102	Classical Mechanics	CO1	Define and understand basic mechanical concepts related to advanced problems involving the dynamic motion of classical mechanical systems.

			CO2	Have a deep understanding of Newton's law.
			CO3	Describe the motion of a mechanical system using Lagrange - Hamiltonian formalism
			CO4	Use of d'Alembert principle and calculus of variationsto derive the Lagrarangian equations of motion.
			CO5	Understand essential features of classical problem like (motion under central force, periodic motion), use them to set up and solve the appropriate physics problem.
			CO6	Understand the theory of rigid body motion which is important in several areas of physics .
			CO7	Reduction of problem of two body to one body problem and classication of orbits.
			CO8	Illustrate the Hamilton - Jacobi equation and characteristics functions.
			CO9	Describe and understand the differential equations and other advanced mathematics in the solution of problems of mechanical systems.
			CO10	Understand the necessity of Action, Lagrangian and Hamiltonian formalism.
Semester I	PH010103	Electrodynamics	CO1	After this course students are able to appreciate the need and necessity of four vector model
			CO2	Have gained a clear understanding of Maxwell's equations
			CO3	Know that laws of reflection, refraction are outcomes of electromagnetic boundary conditions
			CO4	One of the main advantage is that it is very much related to the real life where the ionosphere plays important part
			CO5	Have grasped the idea of electromagnetic wave propagation through wave guides
			CO6	Extended the idea of special theory of relativity by including relativistic electrodynamics.
			CO7	The students will able to analyze radiation systems in which the electric dipole magnetic diploe dominate
			CO8	Simplify charged particle dynamics and radiation from localized time varying electromagnetic field.
			CO9	Explain about formal solutions of boundary value problems.

			CO10	Discuss about Faraday's law of induction, displacement current.
Semester I	PH010104	Electronics	CO1	After this course students will get the idea of flow of charges through various materials and device like semiconductors resistors, inductors, capacitors, nanostructures etc.
			CO2	Students will get the detailed application of electronics involve in the transmission of power and possible information.
			CO3	Understands the fundamentals of converting from one number system into another.
			CO4	Understand the basic elements of converts, registers and be able to use integrated circuit packages.
			CO5	Students shall learn about the significance of communication process which are very useful in daily life.
			CO6	Significance of various devices which are beneficial to understand how they will operate and use.
			CO7	Due to circuit analysis of IC and OPMAP, it will help in performing the mathematical operation.
			CO8	The modern world is digital, it is very useful in this time
			CO9	To impart knowledge of Electronics in a broader content
			CO10	To learn the basics of transistor actions and deep study.
Semester I	PH010105	General Physics Practical Lab	CO1	To develop intellectual communication skills and discuss the basic principles of scientific concepts in a group.
			CO2	Evaluate the process and outcomes of an experiment qualitatively and quantitatively
			CO3	Extend the scope of investigation whether or not results come ous as expected.
			CO4	Learn various experimental and computational tools thereby developing analytical abilities to address real world problems.
			CO5	Adopt skills related to research education, and industry, academia.
			CO6	Understand the mechanical properties of various materials.

			CO7	Get the practical knowledge of thermal properties materials and their applications.
			CO8	Get the practical knowledge of optical properties of various materials and their applications
			CO9	To gain practical knowledge by applying the experimental methods to correlate with the Physics theory.
			CO10	Apply the analytical techniques and graphical analysis to the experimental data
Semester II	PH010201	Mathematical Methods In Physics - II	CO1	Evaluate the concept of laplace transform and fourier transform.
			CO2	Explain the fourier series and its applications to the solutions of partial differential equations
			CO3	Learn different methods of solving partial differential equations
			CO4	Explain special functions like Gamma functions ,Beta functions and their relations.
			CO5	Apply the Knowledge of Green's equation in scattering problem.
			CO6	Generate an idea about function of complex variable and able to understand Cauchy-Reimane equation ,Cauchy theorem,Cauchy's integral formula and Cauchy residue theorem.
Semester II	PH010202	Quantum Mechanics– I	CO1	Understand the fundamental concepts of the Dirac formalism
			CO2	Evaluate how quantum system evolve in time
			CO3	Explain the basics of quantum theory of angular momentum
			CO4	Able to solve Hydrogen atom problem which is prelude to more complicated problems in quantum Mechanics
			CO5	Understand the role of uncertainty in quantum physics and use the commutation relations of operators to determine whether two physical properties can be simultaneously measure
			CO6	Relate matrix formalism to the use of basic states and solve problems in that formalism.
Semester II	PH010203	Statistical Mechanics	CO1	Explain Statistical physics and Thermodynamics as a logical consequence of the postulates of Quantum mechanics.

			CO2	Understand the relevant quantities used to describe macroscopic systems , thermodynamic potentials, and ensembles
			CO3	Construct the knowledge of the statistical mechanics and the approximations making a statistical description possible.
			CO4	Apply the theory to understand gases and metals and in addition to be able to construct microscopic models and from these derive thermodynamic observables.
			CO5	Describe the importance and consequences of quantum mechanics for macroscopic particle systems.
			CO6	Show an analytic ability to solve problem relevant to statistical mechanics.
			CO7	Apply techniques from statistical mechanics to a range of situations
Semester II	PH010204	Condensed Matter Physics	CO1	Differentiate between different lattice types and explain the concepts of reciprocal lattice and crystal diffraction.
			CO2	Classify condensed matter upon its degree of order ,with empasis pon scattering experiment.
			CO3	Understand the role of quantum effects in microscopic and macroscopic systems and acquire a fundamental understanding of a range of physical phenomena in condensed matter systems .
			CO4	Develop a deep understanding of how condensed matter is described in atomic scale.
			CO5	Explain the magnetic properties of solids, crystal vibrations and thermal properties.
			CO6	Apply the obtained concepts to challenges in condensed matter physics.
			CO7	Analyse how condensed matter physics integrates into the discipline of physics overall
Semester II	PH010205	Electronics practicals	CO1	Design,development and testing of electronic circuit with OP amps,descrete electronic components and integrated circuit chips.
			CO2	Understand the designing of amplifiers,oscillator and wave generators for defined specification.
			CO3	Constructing filters and understanding frequency response.

			CO4	Able to circuit analysis of IC and OP amp,it will help in performing the mathematical operations .
			CO5	Capable of handling electronic circuits bsides learning the fundamentls behind analog and digital devices.
Semester III	PH010301	Quantum Mechanics II	CO1	Understand the different stationary state approximation methods.
			CO2	Ideas of Quantum theory of scattering.
			CO3	Formulation of theory of identical particles and its application to helium.
			CO4	Will be able to analyze how tunneling effect can be applied to alpha decay.
			CO5	Ideas of perturbation theory and it's applications.
			CO6	Will get basic concepts of relativistic quantum mechanics.
			CO7	The candidate will get the background and experience required to model, analyze and solve advanced problem in Quantum Mechanics.
Semester III	PH010302	Computational Physics	CO1	Will get skill to develop algorithms.
			CO2	Learn problem solving techniques with the help of computers.
			CO3	Will get knowledge and concepts of programming languages.
			CO4	Basic knowledge of various numerical techniques and its applications.
			CO5	Analyze various numerical differentiation and integration techniques.
			CO6	Introduction to computer oriented numerical methods to solve even complex problems.
			CO7	Idea about various interpolation techniques.
Semester III	PH010303	Atomic and Molecular Physics	CO1	Outline the differences between Bohr's view of the hydrogen atom and quantum mechanical view.
			CO2	Have basic knowledge of various spectroscopic methods like IR and Raman will be helpful for projects of students.
			CO3	Will get basic ideas of different types of spectrophotometers.
			CO4	Knowledge of microwave, infra-red, electronic, raman, NMR and ESR Spectroscopy
			CO5	Students are introduced to basics of Mossbauer spectroscopy

			CO6	Introduced to ideas of calculating bond length, atomic mass, molecular structure etc.
			CO7	Introduced to experimental arrangement and applications of spectroscopic methods.
Semester III	PH800301	Digital Signal Processing	CO1	Study the design techniques for FIR and IIR digital filters.
			CO2	Concepts of z-transforms and it's properties.
			CO3	Ideas of Fourier analysis of signals and systems and Fourier transform of signals.
			CO4	Learn about discrete time systems and FFT algorithms.
			CO5	Problem solving methods based on z-transform, ROC and it's properties.
Semester III	PH800301	Advanced Practical's in Electronics	CO1	Develop experimental and data analysis skills through various experiments.
			CO2	Simple programs using microprocessors.
			CO3	Practical experimentation of communication electronics.
			CO4	Laboratory explorations for some electronic instrumentation methods.
			CO5	Overview of optoelectronics and optics by various experiments.
Semester IV	PH010401	Nuclear And Particle Physics	CO1	Build up fundamental idea about nuclear and particle physics
			CO2	Understand properties of nuclear force and nucleus
			CO3	Understand different nuclear models
			CO4	Study the theory behind nuclear deca process
			CO5	Understand theory behind nuclear reaction
			CO6	Learn about interaction
Semester IV	PH800403	Communication Systems	CO1	Build up fundamental idea about digital communication
			CO2	Understand about mobile communication
			CO3	Understand about satellite communication
			CO4	Learn about optical communication and avdancements
			CO5	Understand about radar communication
Semester IV	PH800402	Microelectronics And Semiconductor Devices	CO1	Build up fundamental idea about microprocessor
			CO2	Introduce 8085 and 8086 microprocessors
			CO3	Understand about microcontrollers
			CO4	Learn about architecture of microprocessor and microcontrollers

			CO5	Understand about semiconductors and their processing
Semester IV	PH 010402	Computational Physics Practical	CO1	Develop algorithm
			CO2	Use different programming languages
			CO3	Verify results of numerical problems
			CO4	Plot graph using different programming languages
			CO5	Understand about syntax and operations of different programming languages

M.Sc CHEMISTRY   PROGRAMME SPECIFIC OUTCOMES (PSO)

Programme Outcome	Programme Specific Outcomes (PSO)
PSO1	To understand the basic facts and concepts in chemistry.
PSO2	To develop the ability to apply the principles of chemistry
PSO3	To appreciate the achievements in chemistry.
PSO4	To know the role of chemistry in nature and in society.
PSO5	To develop problem solving skills
PSO6	To be familiarized with the emerging areas of chemistry and their applications in various spheres of chemical sciences and to apprise the students of its relevance in future studies
PSO7	To develop skills in proper handling of apparatus and chemicals Students are enabled to prepare accurate stocks solutions
PSO8	To publish various articles and documents in chemistry related books.Develop hands-on experience
PSO9	Perform experiments and interpret results obtained

M.Sc CHEMISTRY COURSE OUTCOMES

SEMESTER	PAPER CODE	TITLE OF PAPER	CO	COURSE OUTCOME
Semester I	CH500101	Organometallics And Nuclear Chemistry	CO1	To understand about various organometallic compounds, their structure, synthesis, bonding and reactions
			CO2	To learn about the catalysis by organometallic compounds
			CO3	To study about bioinorganic compounds and their roles in biological systems
			CO4	To provide an insight on nuclear chemistry and their applications

			CO5	Students will measure the rate of nuclear decay of a short-lived isotope to determine a number of statistical and physical properties
			CO6	To know common ligand classes in organometallic chemistry, their effects on organometallic compounds, and influence on reactivity and catalysis
Semester I	CH500102	Structural And Molecular Organic Chemistry	CO1	To understand about the basic concept in organic chemistry
			CO2	To learn about various Photochemical reactions and physical aspect of organic chemistry
			CO3	Students are enabled to understand about the stereochemistry of organic compounds and its various conformers
			CO4	Appreciates the fundamentals of aromaticity in organic chemistry
			CO5	Acquires the 3-D aspects of organic molecules.
Semester I	CH500103	Quantum Chemistry And Group Theory	CO1	To study about the various postulates of quantum mechanics and its applications
			CO2	To understand about the quantum mechanics of hydrogen like atoms
			CO3	Approximations based on variational method and time independent perturbation theory
			CO4	Application to harmonic oscillator, rigid rotor, one-electron and many-electron atoms, and homo-and hetero-nuclear diatomic molecules
			CO5	To provide a basic understanding on group theory, symmetry of molecules and its applications
Semester I	CH500104	Classical And Statistical Thermodynamics	CO1	To understand about the basic concepts of classical thermodynamics
			CO2	Explain statistical physics and thermodynamics as logical consequences of the postulates of statistical mechanics
			CO3	To introduce statistical thermodynamics
			CO4	Apply the principles of statistical mechanics to selected problems
Semester II	CH500201	Coordination Chemistry	CO1	Bonding and isomerism in coordination compounds, crystal field theory, and electronic properties of ligands. Covered also are metal bonding in clusters, the HSAB concept, chelate effect, and complex stability. Reactions of complexes are analyzed, and the role of transition metal

				compounds in catalysis is described with examples
			CO2	To learn about the structural aspects, bonding in coordination complexes
			CO3	To give an insight on kinetics, spectral and magnetic properties of metal complexes
			CO4	To learn about the stereochemistry of coordination compounds
			CO5	To study about the coordination chemistry of lanthanides and actinides
			CO6	To qualitatively analyze various rare cations
Semester II	CH500202	Organic Reaction Mechanism	CO1	To learn about the various organic reaction mechanism
			CO2	To understand about the chemistry of carbanions, carbocations, carbenes, arynes, nitrenes and carbonyl compounds
			CO3	To study about the radical reactions and concerted reactions
Semester II	CH500203	Chemical Bonding And Computational Chemistry	CO1	To expose the students to the field of computational chemistry, this is emerged as a powerful tool in chemistry
			CO2	To calculate certain quantities which are difficult by other experimental methods
			CO3	To familiarize with programs like games
Semester II	CH500204	Molecular Spectroscoy	CO1	Modern theoretical and experimental methods used to study problems of molecular structure and bonding; emphasis on spectroscopic techniques
			CO2	The student performs rigorous characterization of their compound using 1- and 2-dimensional NMR techniques (1 H and 13C), mass spectrometry, Infrared spectroscopy
			CO3	To lay a foundation on spectroscopic techniques and resonance spectroscopy.
Semester I &II	CH500205	Inorganic Chemistry Practicals-I	CO1	To study the principles of qualitative and quantitative analytical techniques
			CO2	To study about the separation and identification of mixture of cations and preparation and characterization of inorganic complexes
			CO3	Ability to find out intensity of colour using colorimetric methods
Semester I &II	CH5002O6	Organic Chemistry Practicals-l	CO1	To quantitatively analyze various organic compounds
			CO2	They should able to use computational tools to draw the reaction schemes and spectral data to various organic reactions

			CO3	Ability to find out the melting and boiling points of the compounds
			CO4	Students will study the purification of organic mixture by column and TLC.
Semester I& II	CH500207	Physical Chemistry Practicals I	CO1	To apply the conceptual understanding acquired from the theory classes
			CO2	To well know practical knowledge about modern computational chemistry
Semester III	CH500301	Structural Inorganic Chemistry	CO1	To understand about the various solid state properties, electrical, magnetic and optical properties
			CO2	To study about the inorganic chains, rings, cages and metal clusters
			CO3	To learn about the chemistry of materials
			CO4	To study about the organometallic polymers and magnetic nanoparticles
Semester III	CH500302	Organic Synthesis	CO1	To understand the various organic reactions
			CO2	To learn about the modern synthetic method and reagent
			CO3	To introduce the basic concept to retrosynthetic analysis, protecting group chemistry, biosynthesis and biomimetic synthesis
			CO4	To learn about the construction of carbocyclic and heterocyclic ring system
Semester III	CH010303	Chemical Kinetics, Surface Chemistry and Crystallography	CO1	To develop a deeper knowledge in chemical kinetics, mechanism of heterogeneous catalysis, enzyme catalysis and its mechanisms.
			CO2	To provide an insight into the topics surface chemistry, photochemistry
			CO3	To study about crystallography
Semester III	CH500304	Spectroscopic Methods In Chemistry	CO1	A better understanding on various spectroscopic techniques like ultraviolet-visible and chirooptical spectroscopy, infrared spectroscopy, NMR spectroscopy, Mass spectroscopy
			CO2	To learn about the structural elucidation using spectroscopic techniques
Semester IV Elective Courses	CH800401	Advanced Inorganic Chemistry	CO1	With perception of providing better knowledge on inorganic spectroscopic methods, inorganic photochemistry and application of group theory
			CO2	A general introduction to nanomaterials
			CO3	To understand in depth about various analytical methods.
			CO4	To gravimetrically analyze concentration of various ions

Semester IV	CH800402	Advanced Organic Chemistry	CO1	To apprehend more about supramolecular chemistry
			CO2	To grasp a better knowledge on green alternatives to organic chemistry
			CO3	To learn more about principles of Nano chemistry
			CO4	To understand more about the sterioselective transformations
			CO5	To introduce about the chemistry of natural products, biomolecules, medicinal chemistry and drug designing
			CO6	To introduce a basic concept on research methodology
			CO7	To prepare various organic compounds
Semester IV	CH800403	Advanced Physical Chemistry	CO1	To lay a foundation on fluorescence spectroscopy
			CO2	To understand in depth about crystallography, gaseous state, electrochemistry and electromotive force
			CO3	To provide a better understanding on diffraction methods, atomic spectroscopic techniques and electroanalytical techniques
			CO4	To gain hands-on experience on various analytical techniques
Semester III And IV	CH010405	Inorganic Practicals-2	CO1	To study to separate simple binary mixture of metallic ions in solution by using volumetric and gravimetric method
			CO2	To study the analysis of alloys and application of paper chromatography to separate a mixture of three cations
Semester III And IV	CH010406	Organic Chemistry Practicals -2	CO1	Learning for the preparation of organic compounds by two step synthetic sequences
			CO2	They are capable of applying green alternative methods of synthesis
Semester III And IV	CH010407	Physical Chemistry Practicals-2	CO1	To analyze and apply the theoretical principles of various branches of physical chemistry like chemical kinetics Polarimetry, Refractometry, Viscosity, Conductance, Potentiometry