PG PROGRAMMES
COURSE OUTCOME (CO)

M. A. BUSINESS ECONOMICS

SEMESTER	PAPER CODE	TITLE OF PAPER	CO	COURSE OUTCOME
Semester I	EC010101	Micro Economics	CO1	Able to analyse consumer behaviour under certain and uncertain situations, effect of network externalities in consumption and pragmatic approach to demand theories
			CO2	A thorough understanding of homogeneous and non-homogeneous Production functions, firm's production processes and decisions, traditional and modern cost functions
			CO3	Study about the theories relating to collusive and non-collusive oligopoly, game theory and its applications in analysing current economic problems and to develop the ability to synthesize knowledge.
			CO4	Equip the students about various aspects of the micro economic theory and the latest developments in the field.
			CO5	Will able to understand how the national product is distributed on personal and functional lines in the light of Macro theories of distribution
Semester I	EC010102	Macroeconomics-1	CO1	Help to familiarize the students with the contribution of various schools of thought in macroeconomics
			CO2	Understanding about the aggregate economy in both the short run and the long run.
			CO3	Able to make a comparison of classical, Keynesian and neo Keynesian models
			CO4	student will be able to identify major propositions of monetarism and know about the policy implications of monetary policy in counter attacking business cycles
			CO5	understand the theoretical approaches to the demand for and supply of money, financial intermediation and measures of money supply
Semester I	EC010103	Development Economics	CO1	Familiarize the basic indicators of economic development, issue of development gap and the concept of sustainable development
			CO2	Helps to understand the theoretical paradigms of economic development

			CO3	Familiarize the students with conceptual routes, theoretical dynamics and practical strategies to address the basic problems confronted by the society.
			CO4	Orient the students towards major themes of development, lead them towards more methodical probes and equip them with adequate analytical knowledge.
			CO5	Enable to understand the critical issues in development process –corruption, crime, social exclusion and climate change
Semester I	EC010104	Indian Economy	CO1	Offers an analytical introduction to the structure and growth of Indian economy and its performance in the post-independence period
			CO2	Know about performance of Indian agriculture in the light of technological advancement, commercialisation and diversification
			CO3	CO 3: A critical reasoning of policies and reforms in the Indian industrial sectors- trends and pattern
			CO4	Study about the growth and performance of social and economic infrastructures with its implications of inclusive growth
			CO5	understand external sector reforms and changing structure, composition and direction of India's foreign trade
Semester II	EC010201	Micro Economics-II	CO1	understand the theories relating to the emergence of firm and firm's hierarchical structures
			CO2	Equip the students with the ability to create new models to explain the behavior of individual firms and markets and to evaluate economic policies.
			CO3	Able to compare and contrast neo classical and alternative theories of firm and the new developments in the area of behavioral theories
			CO4	Acquaint the students with decision making in the context of market interdependence, complexity, uncertainty and informational asymmetry.
			CO5	Give insights into the developments in the areas of general equilibrium and welfare economics.

Semester II	EC010202	Macro Economics-II	CO1	Enrich the students with the propositions of new classical macroeconomics and the ineffectiveness of government intervention.
			CO2	Enable the student to get a clear understanding of real business cycle models and intertemporal substitution.
			CO3	Provide the students with intuitive understanding of new Keynesian and post Keynesian economics.
			CO4	Provides an insight into the strength and weaknesses of main macroeconomic tools and models used in modern macroeconomics.
			CO5	Helps to evaluate macro-economic theories of business cycles with multiplier accelerator interaction mechanism
Semester II	EC010203	Public Economics	CO1	understand the role of state and macroeconomic perspective of public finance and the interaction of fiscal and monetary policies
			CO2	Familiarize the students about the rationale for and role of government intervention in the provision of public goods and the choices involving externalities
			CO3	Develop the competence of the students to identify major issues in public finance and public governance with representative models of welfare promotion
			CO4	Enrich the students with the information of fiscal administration and management in the light of various theories of taxation and public expenditure
			CO5	Provide a better understanding of fiscal federalist issues in democracy, the case of vertical and horizontal imbalances and the central state financial relations in India
			CO1	Provide better understanding of the use of the most common statistical tools and techniques encountered in economics for analysis of data with valid logic and inferences.
			CO2	Enrich the students with statistical material required for entry into Econometrics and familiarize the students with some basic

Semester II	EC010205	Statistical Methods for Economic Analysis		concepts and terminology that are fundamental to Inferential Statistics.
			CO3	Develop the notion of probability, probability distributions of discrete and continuous random variables and of joint distributions.
			CO4	Enable the students in sampling techniques used to collect survey data.
			CO5	Helps to provide a clear understanding of the inferential statistics as well as the interpretation of data.
Semester II	BE010204	Management Concepts and Organisatioal Behaviour	CO1	Illustrate the organizational behaviour, nature of management, its process, tasks and responsibilities of a manager as well as organizational behavioural dynamics governing an organization.
			CO2	Understand the principles and practices of management, the nature of management functions, roles and skills.
			CO3	Enable the students to equip tools that necessary to understand the dynamics of individual and group behaviour for efficient and effective utilization of human resources in the organizations
			CO4	Enable to demonstrate an understanding of various management models and frameworks, their relevant foundations, strengths and weaknesses.
Semester III	EC010301	International Economics	CO1	Study various theories of international trade and applies them to the analysis of current trade problems.
			CO2	Study the theories explaining trade patterns, the effect of trade on national welfare, the welfare of groups within a country, trade policy, international economic integration and so on.
			CO3	Understand broad principles and theories, which govern the free flow of international trade, with empirical evidence
			CO4	Provide an exposure to the theoretical underpinnings and empirical evidence of the major trade policies followed both at national and international level.

			CO5	Enable the students to become trade policy-makers and to apply key strategists on trade issues.
Semester III	EC010302	Econometrics -I	CO1	Enable the students to learn how to estimate a general class of parametric models or semi parametric models, how to conduct testing and inference, given the data.
			CO2	Cover (1) identification of model parameters; (2) consistency, asymptotic normality, and semi parametric efficiency of various estimators; (3) hypothesis testing and model selection.
			CO3	Cover the problems encountered in estimation and inference in the context of the single-equation linear regression model. Empirical applications include estimation and inference of some popular economic models in microeconomics and macroeconomics.
			CO4	Familiarize students with econometric techniques that are widely used in empirical work in Economics and other related disciplines. It is intended to expose students to the art of performing estimation, analyzing and interpretation of the estimated econometric model.
			CO5	Enable the students to: (i) demonstrate their understanding of the appropriate econometric methods for analyzing data; (ii) interpret computer output for the estimation and testing of econometric relationships; and (iii) interpret and discuss results.
Semester III	BE010303	Research Methodology in Business Economics	CO1	Provide wide-ranging outline of the main elements of research methodology, particularly in the business field.
			CO2	Familiarize the students with the basic concepts of research methodology
			CO3	It will enable the students to apply methodological aspect in their research work.
			CO1	Understand environmental issues and problems and policies designed to address them.
			CO2	Cover economic assessment of environmental impacts and the economics of policies and

Semester III	EC010304	Environmental Economics		institutions which have a significant bearing on the environment.
			CO3	Provide students with the tools to understand how market inefficiencies might arise in the presence of externalities like pollution and how market solutions can correct market failures.
			CO4	Equip students with analytical skills that would enable the evaluation of environmental and economic policy issues
Semester III	BE010305	Investment Analysis and Portfolio Management	CO1	Understand comprehensive conceptual and theoretical background upon which the student can expand his or her knowledge of the field of investments and portfolio management.
			CO2	Focus on developing the practical skills in investment management and also giving a foundation on major investment portfolio management strategies.
			CO3	Understand the investment process, scope and stages.
			CO4	Analyze how the market expectations are formed, how the strategic asset allocations are made and how an optimal investment strategy is selected.
Semester IV	EC010401	International Finance	CO1	Provide a theoretical exposition of different aspects of International finance and financial institutions
			CO2	Study the fundamental knowledge in international finance, financial institutions and their application in real life.
			CO3	Enable students to become policy makers and key strategists on issues related to international finance and related institutions.
Semester IV	EC010402	Econometrics – II	CO1	Understand the importance of human resource management.
			CO2	Know the elements of the HR function.
			CO3	Familiarize with application of the principles and techniques of human resource management.
Semester IV	BE810401	Marketing Management	CO1	Understand the concepts of marketing management.
			CO2	Study about marketing process for different types of products and services.

			CO3	Familiarize the tools used by marketing managers in decision making, pricing policies.
			CO4	Understand the global marketing environment and its emerging trends.
Semester IV	BE810403	Project Management and Entrepreneurial Development	CO1	Study about the project development cycle.
			CO2	Learn about institutional support system in project execution.
			CO3	Apply entrepreneurial skills in business life with a thorough backing of foundations of entrepreneurial development.
			CO4	Acquaint students with the special challenges of starting new ventures and introducing new product and service ideas.
			CO5	Provide the skill in executing various projects, starting from project identification till project termination.
Semester IV	EC010403	Project/Dissertation	CO1	Understand the various stages of project.
			CO2	Learn about techniques of project planning
			CO3	Undertake problem identification, formulation and solution
			CO4	Demonstrate the ability to collect, process, and interpret data, including statistical inference.
			CO5	Apply technical skills in data analysis using software.
Semester IV	EC010404	Comprehensive Viva-Voce	CO1	Prepare the students and acquire knowledge and skills to face the interview panel.
			CO2	Enable the students to do effective presentation before the panel.
			CO3	Help to assess the student's learning skills and knowledge in the field of Economics.

M. Sc. FAMILY AND COMMUNITY SCIENCE

SEMESTER	PAPER CODE	TITLE OF PAPER	CO	COURSE OUTCOME
Semester I	HS020101	Environment and Human Resource Management	CO1	Describe the process and principles of resource management.
			CO2	Identify the importance of decision making and communication trends in management process.
			CO3	Analyze the need of leadership and motivation for betterment of the society.
			CO4	Examine the different sources, devices and techniques of energy conservation and management.
			CO5	Discuss the environmental issues and the ways to achieve a sustainable environment.
Semester I	HS020102	Clinical Nutrition and Dietetics	CO1	Identify the concept of Diet therapy and Nutrient-Drug Interaction
			CO2	Apply the dietary knowledge in non-communicable diseases
			CO3	Discuss the diet in special conditions.
			CO4	Explain the diet for Gastro intestinal disorders
			CO5	Describe the diet for diseases of Liver and Kidney.
Semester I	HS020103	Pattern Making and Grading	CO1	Describe different pattern making and grading techniques and explain the principles of pattern making
			CO2	Develop different types of sleeve patterns
			CO3	Develop different types of collar patterns
			CO4	Develop different types of skirt and collar patterns
			CO5	Carry out the common pattern alteration methods and evaluate and solve fitting problems in a garment.
Semester I	HS020104	Early Childhood Education	CO1	Discuss the significance and objectives of Early Childhood Education and the contributions of Philosophers to ECE
			CO2	Describe the perspectives and policies in ECE
			CO3	Identify the organization and management of pre-schools
			CO4	Examine the curriculum for pre-school education
			CO5	Analyze the different approaches and effective methods of curriculum transaction in ECE

Semester I	HS020105	Kindergarten Training /Ecce/ Special Education (Practical and Internship)	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	Describe the functions, principles and factors in planning interiors.
			CO2	Identify the emerging techniques in house construction.
			CO3	Discuss the fundamentals of interior design.
			CO4	Analyze the decoration treatments for interiors and interior backgrounds.
			CO5	Apply the ergonomic principles and methods in interior space designing.
Semester II	HS020202	Public Health Nutrition	CO1	Identify the basic concepts of public nutrition.
			CO2	Discuss the details of health care service.
			CO3	Analyse the Public health problems in India.
			CO4	Describe the National and International Nutrition Programmes.
			CO5	Assess the approaches or strategies for improving Nutrition and Health Status of community, Food and Nutrition Security.
Semester II	HS500203	Research Methods and Statistics	CO1	Discuss the fundamental and ethics of research.
			CO2	Identify the types, tools and methods of research.
			CO3	Apply appropriate statistical techniques to analyze numerical data and draw inferences.
			CO4	Develop the concepts of probability, random variable and sampling distribution in data analysis.
			CO5	Recognize the methods and techniques for scientific writing.

Semester II	HS020204	Early Intervention for Infants and Exceptional Children	CO1	Identify the developmental delays among children
			CO2	Recognize the tools and techniques used for developmental assessment
			CO3	Describe early stimulation and intervention programmes for developmental delays in children
			CO4	Discuss the characteristics, causes and educational provisions and interventions needed for exceptional children
			CO5	Determine the characteristics, causes and educational provisions and interventions needed for children with learning disabilities, ADHD and Autism.
Semester II	HS020205	Fashion Illustration and Design (Practical)	CO1	Experiment with different effects using rendering techniques and different mediums.
			CO2	Analyze fashion figures and fashion poses.
			CO3	Create fashion illustrations with fashion details suitable for different occasions.
			CO4	Create samples for surface embellishment techniques.
			CO5	Develop a fashion portfolio based on a theme.
Semester III	HS020301	Housekeeping	CO1	Discuss the set up and functions of Front Office.
			CO2	Describe the functions of housekeeping.
			CO3	Identify the management of linen room and laundry.
			CO4	Analyze the sanitation and safety aspects to be followed in housekeeping.
			CO5	Identify the selection and care of aesthetic treatments in commercial or hospitality areas.
Semester III	HS020302	Food Service Management	CO1	Develop awareness about food service systems.
			CO2	Explain the role of hospitality and tourism in nation’s economy stability.
			CO3	Discuss the operations and management in Food Service Systems.
			CO4	Identify the principles of food production and types of cuisines.
			CO5	Classify the tools of management.
			CO1	Describe and discuss the testing of fibres and yarn.

Semester III	HS020303	Textile Testing and Eco-Friendly Textiles	CO2	Explain the test suitable for assessing properties of textile fabrics.
			CO3	Describe the methods of assessing colour fastness and fabric strength.
			CO4	Classify eco-textiles and explain eco-friendly processing and eco-regulations.
			CO5	Comprehend the newer trends in textiles.
Semester III	HS020304	Entrepreneurship Development	CO1	Discuss the growth of Entrepreneurship in India and role of women in entrepreneurship.
			CO2	Identify the importance of enterprise.
			CO3	Recognize various entrepreneurship development programmes for setting small scale unit.
			CO4	Discuss the various features and functions of finance planning.
			CO5	Analyze the recent trends in Product development and management.
Semester III	HS020305	Diet Therapy and Programme Planning in Public Health Nutrition (Practical and Internship)	CO1	Develop higher proficiency in selected area of expertise though placement/internship for pursuing a professional career in the same field.
			CO2	Understand and experience ground realities/program structures in nutrition.
			CO3	Develop skills in analyzing nutritional assessment data.
			CO4	Plan and prepare suitable therapeutic diets based on patient needs for various diseases/disorders.
			CO5	Prepare communication aids for different age groups.
Semester IV	HS800401	Developmental Psychology and Counselling Skills	CO1	Recognize the nature, scope and branches of psychology.
			CO2	Describe the various cognitive processes.
			CO3	Identify the theories and assessment of intelligence
			CO4	Generalize the importance, process and types of guidance and counseling.
			CO5	Explain the approaches and areas of counseling.
			CO1	Explain the history and development of Food microbiology.
			CO2	Apply the principles of Food Biotechnology in food sector.

Semester IV	HS800402	Food Microbiology and Food Safety	CO3	Discuss the procedure adopted in various food operations to prevent food borne disorders and legal aspects involved in these areas.
			CO4	Apply the principles and methods of food preservation.
			CO5	Discuss the importance of Food Laws and standards.
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	Explain the concepts related to fashion and fashion cycle and elaborate on marketing and merchandising.
			CO4	Classify products and explain the product development process.
			CO5	Describe the pricing policies and strategies and explain the costing methods in apparel industries.
Semester IV	HS020401	Residential Interior Designing and Event Management (Practical)	CO1	Practice the techniques and strategies required to plan successful event management.
			CO2	Develop the knowledge and competencies required to promote, implement and conduct various events.
			CO3	Appreciate the aesthetic elements involved in the art process.
			CO4	Apply ergonomics for work effectiveness and efficiency.
			CO5	Create and plan interiors
Semester IV	HS020402 HS020403	Dissertation Comprehensive Viva-Voce & Paper presentation	CO1	Identify problems and formulate solutions in different areas of Family and Community Science

M. Sc. ZOOLOGY

SEMESTER	PAPER CODE	TITLE OF PAPER	CO	COURSE OUTCOME
Semester I	ZL010101	Animal Diversity: Phylogenetic and Taxonomic Approaches	CO1	Understand the origin, diversification, modifications and phylogenetic relationships among invertebrates.
			CO2	Analyzing vertebrate phylogenetic relationships
			CO3	Understand the phylogenetic relationship among the different groups of animals
			CO4	Understand biological classification and modern methods in taxonomy
			CO5	Construct taxonomical keys for identification of taxa and understand taxonomic publications
Semester I	ZL010102	Evolutionary Biology and Ethology	CO1	Create curiosity for learning the scientific way of the origin of life
			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 analyze concept of relatedness and its connection to biological evolution
			CO4	Generate an interest in the subject in order to understand the complexities of studying animal behavior on every level of the biological hierarchy
			CO5	Create curiosity for learning the scientific way of analyzing behavioural patterns of organism
Semester I	ZL010103	Biochemistry	CO1	To understand the chemical nature of life and life process
			CO2	Analyze structure of biomolecules, abnormal metabolism and resultant diseases.
			CO3	To provide an idea on structure and functioning of biologically important molecules
			CO4	To understand the importance of metabolism of bio macromolecules in normal physiology of a man
			CO5	Explain classification, the specificity of enzymes, and the chemistry involved in enzyme action
			CO1	To help students improve analytical and critical thinking skills through problem solving
			CO2	Apply analytical and critical thinking skills

Semester I	ZL010104	Biostatistics and Research Methodology		through suitable statistical methods in different areas of biostatistics
			CO3	Effectively apply suitable statistical tests in research.
			CO4	Sensitize the ethics involved in research and enable to come up with innovative research designs
			CO5	Equip to prepare research papers and project proposals through scientific methods
Semester I	ZL010105	PRACTICAL 1 Animal Diversity: Evolutionary, Ethological and Biochemical methods &Approaches	CO1	Apply the knowledge of diverse category of animals, through observation and identify and classify accordingly
			CO2	Analyse structure of biomolecules and estimate their levels in tissues
			CO3	Analyse and compute various biostatistical methods and techniques and apply them in research methodology
Semester II	ZL010201	Field Ecology	CO1	Understand structure and function of ecosystem and various methods for its monitoring
			CO2	Understand the different attributes of population ecology
			CO3	Learn the different aspects of population and its interactions
			CO4	Apply the ecological aspects in life
			CO5	Understand the natural resources and manmade issues on environment and its management
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	Analyse the molecular basis of development in Amphibia
			CO4	Provide adequate information regarding the genetic pathway and cellular interactions involved in development
			CO5	To expose the learner to the new developments in embryology and its relevance to Man
			CO1	understand the principles and mechanism of inheritance

Semester II	ZL010203	Genetics and Bioinformatics	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 and the role of genetics in evolution
			CO4	Understand the concepts of epigenetics, quantitative and population genetics, Advanced Human Genetics
			CO5	Explore the applications of the emerging field of bioinformatics and effectively use the existing software and extract information from large databases soas to use this information in computermodeling
Semester II	ZL010204	Microbiology and Biotechnology	CO1	understand the microbial world, its structure and function
			CO2	Understand the fundamental aspects of the basic biology of bacteria and viruses
			CO3	Analyse in-depth the field of Biotechnology
			CO4	Understand and familiarise with emerging field of biotechnology and the modern biotechnology practices and approaches with an emphasis in technology application, medical, industrial, environmental and agricultural areas and nano medicine
			CO5	Understand with the public policy, biosafety, and intellectual property rights issues related to biotechnology
Semester II	ZL010205	PRACTICAL 2 Diversity of Life: Ecological, Embryological, Hereditary and Microbial Methods and Approaches	CO1	Estimate the levels of various abiotic factors using ecological parameters and acquire knowledge through field study
			CO2	Apply the knowledge of genetics to analyse sexing of different organismsand genetic based problems
			CO3	Analyse different developmental stages of various organisms
Semester III	ZL010301	Animal Physiology	CO1	Understand the functioning of organ systems across the animal world
			CO2	Compare the functioning of circulatory and respiratory systems in different animals.
			CO3	Compare the physiology of sensory, nervous and muscle systems in different organisms.
			CO4	Analyse the importance of osmo-regulation

				and thermoregulation in maintaining homeostasis in animals living in different habitats
			CO5	Analyse the coordination of body functions by chemical messengers and disorders of hormonal imbalance in man and physiology of reproduction.
Semester III	ZL010302	Cell and Molecular Biology	CO1	Analyze the structural and functional aspects of the basic unit of life at 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 mechanisms of gene expression involved- in both prokaryotes and eukaryotes at molecular level
			CO4	Analyze the mechanisms of gene regulation and various regulatory pathways involved- in both prokaryotes and eukaryotes at the molecular level
			CO5	Understand mechanisms involved in cell growth and the properties and genetic basis of cancer at the molecular level and the new developments in molecular biology and its implications in human welfare
Semester III	ZL010303	Biophysics, Instrumentation and Biological Techniques	CO1	Understand the biological system and processes based on physical 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	Acquire an intensive and in-depth knowledge 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 Histo Compatibility Complex
			CO4	Create intensive and in-depth knowledge in immunological pathways like, complement system, inflammations,hypersensitivity etc.
			CO5	Understand the role of immunology in human health and well-being and the advanced techniques in immunological diagnosis and other immunological techniques
Semester III	ZL010305	Practical 3 Molecular, Physiological and Immunological Methods and Approaches in Biosciences	CO1	Analyse and identify different stages of cell cycle
			CO2	Apply principles and biological techniques of various microscopic instruments for analysis of biological materials
			CO3	Analyse and apply various immunological methods and techniques
Semester IV	ZL820401	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	Encourage research aptitude among students by familiarizing frontier areas of entomology
Semester IV	ZL820402	Anatomy and Physiology	CO1	Understand anatomy and histology, Physical and chemical properties of insects
			CO2	Evaluate the organization and structure of circulatory and respiratory systems in insects
			CO3	Analyze the unique metabolic pathways through which insects maintain structural and functional integrity.
			CO4	Analyze and integrate the physiology of nervous coordination and excretion in insects
			CO5	Analyse the physiology and mechanism of

				hormones and the anatomy of reproductive system in insects
Semester IV	ZL820403	Applied entomology	CO1	Classifies different kinds of insect pests and understand pest outbreak and levels of damage caused by pests
			CO2	Analyse and evaluate different types of crop pests, their biology, damage to crops and their control measures
			CO3	Understand and apply different methods of insect pest control
			CO4	Understand the chemical composition, toxicology
			CO5	Understand various insecticide application technologies and develop attitude towards the impact of insecticides on environment
Semester IV	ZL820404	Practical IV	CO1	Analyse morphological and anatomical features of different insects
			CO2	Analyse and apply different techniques of insect collection and identification techniques and insect pest management.
Semester IV	ZL010401	Project	CO1	Apply the acquired knowledge of various fields of life science in real life
			CO2	Acquire knowledge through learning by doing different science projects.

M. Sc. CHEMISTRY

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 know common ligand classes in organic chemistry, their effects on organomettalic compounds and influence on reactivity and catalysis.
			CO3	To learn about the catalysis by organometallic compounds.
			CO4	To study about bioinorganic compounds and their roles in biological systems
			CO5	To provide an insight on nuclear chemistry and their applications.
Semester I	CH500102	Structural And Molecular Organic Chemistry	CO1	To understand about the basic concept in organic chemistry and appreciates the fundamentals of aromaticity in organic chemistry.
			CO2	To provide basic idea about linear free energy relationships, HSAB concept and applications.
			CO3	To learn about various Photochemical reactions and physical aspect of organic chemistry
			CO4	Students are enabled to understand about the stereochemistry of organic compounds and its various Conformers
			CO5	Acquires the 3-D aspects of organic molecules.
Semester I	CH500103	Quantum Chemistry and Group Theory	CO1	To provide a basic understanding on group theory, symmetry of molecules and its applications

			CO2	To study about the various postulates of quantum mechanics and its applications. To understand about the quantum mechanics of hydrogen like atoms. Approximations based on variational method and time independent perturbation theory. Application to harmonic oscillator, rigid rotor, one- electron and many-electron atoms, and homo-and hetero- nuclear diatomic molecules.
Semester I	CH500104	Thermodynamics, Kinetic Theory and statistical Thermodynamics	CO1	To understand about the basic concepts of classical thermodynamics.
			CO2	To be familiar with the properties and theories of gases.
			CO3	Explain statistical physics and thermodynamics as logical consequences of the postulates of statistical mechanics 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.
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 learn about the chemistry of carbocations
			CO4	To provide basic idea about carbenes, carbenoids, Nitrenes and Arynes.
			CO5	To give an insight to the radical reactions.
			CO6	To provide basic concept of carbonyl compounds.
			CO7	To study about the concerted reactions and apply knowledge for solving problems.
Semester II	CH500203	Chemical Bonding and Computational Chemistry	CO1	The learners should be able to apply, analyze and evaluate group theoretical concepts in spectroscopy
			CO2	Extent the ideas of quantum mechanics from one electron system to many electron systems.
			CO3	To provide basic idea of various theories of chemical bonding.
			CO4	To expose the students to the field of computational chemistry, this is emerged as a powerful tool in chemistry To calculate certain quantities which are difficult by other experimental method To familiarize with programs like Gamess.
Semester II	CH500204	Molecular Spectroscopy	CO1	Modern theoretical and experimental methods used to study problems of molecular structure and bonding; emphasis on spectroscopic techniques.
			CO2	To learn basic principles and theory of Microwave spectroscopy.
			CO3	Provide basic idea about Infrared and Raman spectroscopy
			CO4	To provide an idea about electronic spectroscopy.
			CO5	The student performs rigouous characterization of their compound using NMR techniques and to lay a foundation on spectroscopic techniques and resonance spectroscopy.
			CO6	Detailed study of other resonance techniques such as EPR, NQR and Mossbauer Spectroscopy.

Semester I & II	CH500205	Inorganic Chemistry Practical - 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	CH500206	Organic Chemistry Practical - I	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 Practical	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.
			CO2	To understand about electrical, magnetic and optical properties of solids.
			CO3	To study about inorganic chains and rings
			CO4	To study about inorganic cages and metal clusters.
			CO5	To study about the organometallic polymers
			CO6	Detailed study of magnetic nanoparticles and synthesis of solids.
			CO2	To understand about electrical, magnetic and optical properties of solids.
Semester III	CH500302	Organic Synthesis	CO1	To understand the various organic reactions
			CO2	To learn about the modern synthetic methods
			CO3	To familiarize with synthetic reagents.

			CO4	To learn about the construction of carbocyclic and heterocyclic ring system.
			CO5	To develop a knowledge in protecting group chemistry.
			CO6	To introduce basic concept to retrosynthetic analysis.
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 and application of various isotherms in surface catalyzed reactions.
			CO3	To study about crystallography, symmetries of crystal point groups and types of examples of liquid crystals.
Semester III	CH500304	Spectroscopic Methods in chemistry	CO1	A better understanding on various spectroscopic techniques like ultraviolet-visible and chiro optical spectroscopy.
			CO2	To learn about ideas of Infrared spectroscopy
			CO3	A better understanding on NMR spectroscopy techniques and student performs rigorous characterization of their compound using 2-D NMR techniques and could solve problems based on it.
			CO4	To lay foundations on Mass Specrometry and solve problems based on it.
			CO5	To learn about the structural elucidation using spectroscopic techniques
Semester IV	CH800401	Advanced Inorganic Chemistry	CO1	To provide a better knowledge on applications of Group Theory to metal complexes.
			CO2	With perception of providing better knowledge on inorganic spectroscopic methods.
			CO3	To learn about the concept of inorganic photochemistry.
			CO4	A general introduction to nanomaterials.

			CO5	To have a knowledge about chemistry of materials, properties and applications.
			CO6	Detailed idea about metal organic frameworks.
			CO7	o learn about the concepts of inorganic supramolecular chemistry
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 analyse and interpret the method of biosynthesis and biomimetic synthesis.
			CO4	To understand more about the stereoselective transformations
			CO5	To introduce about the chemistry of natural products, and biomolecules.
			CO6	To introduce about the medicinal chemistry and drug designing.
			CO7	To learn the importance of different categories of polymers.
			CO8	To understand basic principles of research and how to write a scientific report.
Semester IV	CH800403	Advanced Physical Chemistry	CO1	To know the excited states involved in a photochemical reaction.
			CO2	To lay a foundation on fluorescence spectroscopy
			CO3	To analyse and apply diffraction methods and atomic absorption techniques.
			CO4	The students should be able to apply theories in electrochemistry to analyse the kinetics of electrode reactions.
			CO5	To provide a better understanding on electroanalytical techniques.
			CO6	The students should be able to learn about advanced thermodynamics with special reference to irreversible processes and bioenergetics.
Semester III and IV	CH010405	Inorganic Practical-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 practical 2	CO1	Learning for the preparation of organic compounds by two step synthetic sequence
			CO2	They are capable of applying green alternative methods of synthesis
Semester III and IV	CH010401	Physical Chemistry Practical 2	CO1	To analyze and apply the theoretical principles of various branches of physical chemistry like chemical kinetics, Polarimetry, Refractometry, Viscosity, Conductance, Potentiometry
Semester IV	CH010404	Project and Viva	CO1	Collaborate effectively on team oriented projects in the field of chemistry.
			CO2	Communicate scientific information in a clear and concise manner both orally and in writing.
			CO3	Enhance the scientific temper among the student so as to develop a research culture.

M. Sc. PHYSICS

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 transformations, vector analysis, probability, theory of matrices
			CO2	Will enable students to perform integral transforms to solve mathematical problems of interest in physics.
			CO3	The students should be able to formulate and express a physical law in terms of tensors, and simplify it use of coordinates
			CO4	The students will be able to understand and apply the mathematical skills to solve quantitative problems in the study of physics
			CO5	Linear vector space is applied to understand system behavior in different coordinate 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	Describe the motion of a mechanical system using Lagrange - Hamiltonian formalism.
			CO3	Understand essential features of classical problems like (motion under central force, periodic motion), use them to set up and solve the appropriate physics problem.
			CO4	Understand the theory of rigid body motion and small oscillations.
			CO5	Explain the classical mechanics of relativity.

			CO6	To learn the canonical transformation and illustrate the Hamilton - Jacobi equation and characteristics functions.
Semester I	PH010103	Electrodynamics	CO1	To enhance the basic knowledge of electrostatics, magneto statics and electrodynamics.
			CO2	To have a clear understanding of Maxwell's equations and electromagnetic boundary conditions.
			CO3	Have grasped the idea of electromagnetic waves and their propagation.
			CO4	To learn about potential formulation of electrodynamics, electric dipole and magnetic dipole radiations.
			CO5	Extended the idea of special theory of relativity by including relativistic electrodynamics.
Semester I	PH010104	Electronics	CO1	Students learn about the significance of communication processes which are very useful in daily life.
			CO2	Get practical concepts about filter designing and oscillators.
			CO3	Theoretical and practical concepts of OP-Amp and its applications.
			CO4	Adopt skills in designing electronic circuits.
			CO5	To gain knowledge of IC 555 and its applications.
Semester I	PH010105	General Physics Practical Lab	CO1	Evaluate the process and outcomes of an experiment qualitatively and quantitatively
			CO2	Understand the mechanical properties of various materials.
			CO3	Get practical knowledge of thermal and optical properties of materials and their applications.

			CO4	To gain practical knowledge by applying the experimental methods to correlate with the Physics theory.
			CO5	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	Learn different methods of solving partial differential equations and apply the knowledge of Green's equation in scattering problems.
			CO3	Explain special functions like Gamma functions, Beta functions and their relations
			CO4	Generate an idea about the function of a complex variable and be able to understand Cauchy-Riemann equation, Cauchy's theorem, Cauchy's integral formula and Cauchy's residue theorem.
			CO5	Explain about the Fourier series and its applications.
Semester II	PH 010202	Quantum Mechanics – I	CO1	Understand the basic formulation of Quantum mechanics
			CO2	Evaluate Schrodinger and Heisenberg pictures.
			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 measured.

			CO6	Relate matrix formalism to the use of basic states and solve problems in that formalism.
Semester II	PH 010203	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 thermodynamics potentials and ensembles
			CO3	Apply the theory to understand gases and metals and in addition to be able to construct microscopic models and from these derive thermodynamic observables.
			CO4	Describe the importance and consequences of quantum mechanics for macroscopic particle systems.
			CO5	Show an analytic ability to solve problems relevant to statistical mechanics.
			CO6	Apply techniques from statistical mechanics to a range of situations
Semester II	PH 010204	Condensed Matter Physics	CO1	Differentiate between different lattice types and explain the concepts of reciprocal lattice and crystal diffraction.
			CO2	Acquire a fundamental understanding of a range of physical phenomena in condensed matter systems.
			CO3	Develop a deep understanding about semiconductors and its applications.
			CO4	Explain the magnetic properties of solids, crystal vibrations and thermal properties.
			CO5	Apply the obtained concepts to challenges in condensed matter physics.
			CO6	Analyze how condensed matter physics integrates into the discipline of physics overall

Semester II	PH 010205	Electronics practical	CO1	Design, development and testing of electronic circuits with OP amps, discrete electronic components and integrated circuit chips.
			CO2	Understand the designing of amplifiers, oscillators and wave generators for defined specification.
			CO3	Constructing filters and understanding frequency response.
			CO4	Able to analyze the circuits of IC and OP amp, which will help in performing the mathematical operation.
			CO5	Capable of handling electronic circuits besides learning the fundamentals behind analog and digital devices.
Semester III	PH 010301	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 the tunneling effect can be applied to alpha decay.
			CO5	Will get basic concepts of relativistic quantum mechanics.
			CO6	The candidate will get the background and experience required to model, analyze and solve advanced problems in Quantum Mechanics.
Semester III	PH 010302	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.
Semester III	PH 010303	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, Mossbauer spectroscopy
			CO5	Introduced to ideas of calculating bond length, atomic mass, molecular structure etc.
			CO6	Introduced to experimental arrangement and applications of spectroscopic methods.
Semester III	PH 800301	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.
			CO1	Develop experimental and data analysis skills through various experiments.

Semester III	PH 800301	Advanced Practical in Electronics	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	PH 010401	Nuclear and Particle Physics	CO1	Build up fundamental ideas about nuclear and particle physics.
			CO2	Understand properties of nuclear force and nucleus.
			CO3	Understand different nuclear models.
			CO4	Study the theory behind the nuclear decay process.
			CO5	Understand the theory behind nuclear reaction.
			CO6	Learn about interactions.
Semester IV	PH 800403	Communication Systems	CO1	Build up fundamental idea about digital communication
			CO2	Understanding mobile communication.
			CO3	Understanding about satellite communication.
			CO4	Learn about optical communication and advancements
			CO5	Understand about radar communication
Semester IV	PH 800402	Microelectronics and Semiconductor Devices	CO1	Build up fundamental ideas about microprocessors.
			CO2	Introducing 8085 and 8086 microprocessors.
			CO3	Understanding about microprocessor and microcontrollers
			CO4	Learning of 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
Semester IV	PH010403	Project	CO1	The student gains experience in research.
			CO2	They will acquire concepts of the research methodology, literature review etc.
			CO3	Get one's hand on sampling, synthesis, analysis etc.
			CO4	Gain knowledge in both experimental and theoretical research.
			CO5	All the above concepts gained will help the students in their future research career.
Semester IV		Viva	CO1	To enhance the students' knowledge in the subject and also their communication skills.
			CO2	To diagnose students' weaknesses and limitations and help them to develop skills for their career growth.