GOSWAMI GANESH DUTTA

SANATAN DHARMA COLLEGE

SECTOR 32 C, CHANDIGARH

Dr. Ajay Sharma
Principal

PROGRAMME OUTCOMES FOR DOCTORATE PROGRAMMES

Learning outcomes of the Doctorate programmes are perceived as:

- Wide career opportunities
- Highly specialized workforce for industry, research and education
- Professionalexpertise in specific field
- Application of knowledge to the development of industry and society

PSO – Ph.D in Biotechnology

- Research opportunities
- Job openings in Biotech sector
- Placements in R & D divisions of Industries
- Develop transferable skills/technologies for industry
- Critical thinking, reasoning and analytical skills

Course Outcomes - Candidates carry out one year course work which is a mandatory requirement of Ph.Dprogramme, during which they are acquainted with the latest developments in the subject

PSO – Ph.D in Chemistry

The Ph.D.Programme in the Department of Chemistry endows to its doctoral candidates, methodology and advanced scientific knowledge in Chemistry. It makes it feasible to carry out research with specialization depending on a particular research topic and to become integrated into scientific knowledge networks. This programme provides students advanced acquaintance in the field with research training and experience, in specific areas of Chemistry. This is done through a combination of; study of the current literature, coursework and a period of original research work, culminating in the Ph.D. thesis and oral defence of research thesis. The skills acquired during the research period, prepare the successful candidates for careers in academia, government, or industry.

- **Analytical and problem-solving** skills like compilation and interpretation of data
- **Proficiency in planning**, executing the experiments and undertaking project work
- **Scientific communication** by written and oral propagation of scientific knowledge and research
- **Technical skills** for the characterization of their synthetic work
- Comprehensive knowledge of the literature, applicable to their own research & interpretation of the knowledge relevant to he research problem
- **Critical analysis** of current research, research techniques and methodologies.
- Self-direction and **innovation** in tackling and solving problems, and act independently in the planning and accomplishment of research objectives
- Scientific aptitude towards developing opportunities to build up skills and attributes for their desired future career

Course Outcomes - Candidates carry out one year course work which is a mandatory requirement of Ph.Dprogramme, during which they are acquainted with the latest developments in the subject

PSO – Ph.D in Physics

- Sound knowledge base in Physics
- Formulate problems and conduct independent research
- Strong reasoning and analytical skills
- Innovations and explorations in physical science
- Research openings and better career opportunities in physical sciences
- **Course Outcomes -** Candidates carry out one year course work which is a mandatory requirement of Ph.Dprogramme, during which they are acquainted with the latest developments in the subject

PSO – Ph.D in Commerce*

- Gain a multitude of knowledge in the aspects of business and its fundamentals in management

- Competency in analyzing and evaluating the data at hand so as conduct research in a refined manner
- Promote growth and development of Commerce, Management, and related disciplines through the applicability of research
- Nurturing the skills, competency and the inquisitiveness amongst students by building problem solving skills
- **Af**ter the completion of the program , the scholars have plethora of opportunities in the field of Finance, Economics, Commerce, Management of Business

Course Outcomes - Candidates carry out one year course work which is a mandatory requirement of Ph.Dprogramme, during which they are acquainted with the latest developments in the subject

PROGRAMME OUTCOMES FOR MASTER'S PROGRAMMES

The learning outcomes after completion of Master's programme vary with each programme. The program outcomes are achieved through curriculum which is framed by the affiliating university for the mandatory courses as well as elective courses. The curriculum delivery methods are chosen appropriate to the programme to meet the Specific Outcomes. Further each course has defined course outcomes that meet the program outcomes.

PO – M.Com
- Comprehensive understanding of advanced concepts and practices of Commerce and make them industry ready
- Research opportunities to pursue Doctorate programme
- Targeted approach towards qualifying CSIR-NET/GATE & other competitive examinations
- Identifying opportunities, visualizing ideas and executing them into actions for the development of Individual, Business and Society
- Job opportunities in teaching, corporate world or progression towards research
- Trained professionals

PSO – M.Com.

- On completion of the Programme, students will be gaining domain specific knowledge and conceptual clarity of the various courses studied
- Use of various statistical tools for research analysis
- Prepare project in functional areas of commerce
- Practical training experience in the form of Internship in varied fields of business & commerce
- Understand the relevant functions of stock market, SEBI guidelines, etc., to take stock broking business as their career
- Adequate knowledge to venture as executives in corporate world

Code	Course Title	Course Outcomes - On completion of the course, students will be gaining a conceptual clarity of the various courses studied
MC 101	Managerial Economics	Know the concepts of micro–economic theory and their use in business decision making; using various concepts to deal with business problems in a global economic environment
MC. 102	Quantitative Methods For Business	Know the important statistical techniques for managerial decision making and apply them to business and economic situations
MC. 103	Modern Accounting Theory & Reporting Practices	Knowledge of International financial reporting standards and practices and a clear conceptual understanding of the IFRS and possess sufficient knowledge expected out of an expert in view of the convergence of the Indian Accounting Standards with the IFRS
MC. 104	Organisation Theory And Behaviour	Theoretical understanding about the structure and behavior of organization as it develops over time and realizing the competitiveness for firms
MC. 105	Marketing Management	Knowledge of basic concepts and principles of marketing and developing of conceptual and analytical skills to manage marketing operations of a business firm
MC. 106	Management Information System	A comprehensive overview of Management information systems (MIS) and exploring technical, strategic and tactical issues related to MIS; basic concepts involved in analyzing and designing information systems
MC. 107	Workshop – IT Applications In Commerce	Use of IT technologies to solve business problems regarding various functional areas of business
MC. 201	Business Environment	Concepts of macro economics and the macro environment in which a business

Code	Course Title	Course Outcome
		organization operates; understanding of macro-economic policies of the government and assessing their impact on business.
MC. 202	Research Methodology In Commerce	Knowledge about various stages of the research processes and their application in Commerce and Management education
MC. 203	Financial Management And Policy	Overview of basic and advanced analytical techniques and methods of financial management of business firms
MC. 204	Production And Materials Management	Knowledge regarding production and management techniques, process, tools, and the marketing functions, techniques and strategies
MC. 205	Operations Research	Understanding the concepts and techniques of Operations Research for business decision making and acquire required skills
MC. 206	Business Policy & Strategic Management	Understanding of the basic inputs in making and implementing corporate strategic decisions
MC. 301	Business Performance Measurement	Familiarity towards the performance measurement techniques for business
MC. 302	Tax Planning And Management	Knowledge of latest provisions of the Indian Tax Laws and related judicial pronouncements pertaining to corporate enterprises and the various aspects of Corporate planning so as to derive maximum possible tax benefits admissible under the law
MC. 309	Strategic Cost Management	Understanding of concepts and various aspects of cost management from strategic perspective
MC. 310	International Accounting	Conceptual knowledge and understanding of international accounting issues and tackling issues in prevailing regulatory environments
MC. 315	Workshop On Financial Markets & Instruments	Overview of the financial system in India and functioning of various segments of the financial markets and the financial instruments traded in those markets
MC. 401	Project Planning And Control	Skills necessary to create, plan and control a new Enterprise.
MC. 402	Knowledge Management	Understand knowledge management in the changing scenario and its significance in framing the business strategy
MC. 403	Business Ethics And Corporate Governance	Insight into Business Ethics, complexity of ethical issues, and details of Internal Corporate Governance Mechanism
MC.413	Advanced Corporate Accounting	Knowledge of advanced accounting in the field of corporate world as corporate accounting is becoming tougher with the pace of development in the emerging scenario
MC. 414	Security Analysis And Portfolio Management	Understanding of various techniques of analysis used in investment decisions, portfolio analysis and efficient portfolio management
MC. 415	Advanced Auditing	In-depth knowledge of the auditing contemporary issues particularly related to the company audit

PO – M.Com. (Entrepreneurship and Family Business)
- Targeted approach towards qualifying various competitive examinations
- A comprehensive understanding of advanced concepts and practices of Commerce & Management to be industry ready
- Students well equipped to accept challenging roles in business world & Society
- Opportunities as young entrepreneurs

PSO – M.Com. (Entrepreneurship and Family Business)
- In-depth knowledge on subject of specialization
- To comprehend and analyze the business problems and take concrete business decisions
- Lead the teams towards attainment of Individual and Organizational goals

Code	Course Title	Course Outcomes - On completion of the course, students will be gaining a conceptual clarity of the various courses studied
FB 101	Economics For Entrepreneurs	Knowledge of tools of economic analysis for application in policy making and decision making in SME
FB 102	Entrepreneurship Development-1	Take up entrepreneurship as a career option; the budding entrepreneurs will develop competencies and qualities to be successful entrepreneurs; ready to identify the project idea, develop it and polish it
FB 103	Business Management-1 (Marketing)	Budding entrepreneurs will be ready to take up Marketing Management issues & Consumer Behaviour relevant to SME
FB 104	Tools For Business	Use of statistical tools to simplify and organize complex mass of data; using

	Research	statistical methods to analyze the data interpretation; forecasting, policy making and decision taking
FB 105	Psychology For Entrepreneurs	Essential tools and concepts in psychology necessary for a budding entrepreneur and use the concepts in practical situations
FB 106	Accounting For Managerial Decisions	Knowledge of fundamentals of accounting, marginal costing, budgeting, standard costing, accounting plans and responsibility centers for the purpose of managerial decision making
FB 201	Business Environment	Ready to face challenges of external environment forces that effect the growth of the business.
FB 202	Entrepreneurship Development -Ii	Understanding of nature, challenges and opportunities for SME; various Govt. policies, institutional setup and support system for SME and EEDP
FB 203	Business Management- Iii (Finance)	Insight into the issues involved in financing and investment decisions and its applications to SME projects
FB 204	Business Law And Taxation	Know the legal framework for carrying out the business; know how about taxation, IPR, banking laws, etc.
FB 205	Technologies, Knowledge And Networks Management	Issues in Technologies, knowledge and Networks Management pertaining to SME
FB 301	Industrial Economics And Sociology	Able to understand the theory and principles of industrial economics and its application thereof to the SME; concepts of industrial structure, profitability and life cycle of products
FB 302	Family Business Management &Sucession Planning	Understand the family business and the problems and the prospects thereof dealing with the foundations of strong and thriving family business
FB 303	Business Management- Iv (Operations)	Knowing the tools in handling operations, materials, production planning and control issues in SME
FB 304	Family Business Management	Undestanding the family business, problems and prospects from aegal and cultural perspective; foundation of strong and thriving family business; apply the principles of management control system to the SME
FB 305	Computers In Family Business Management	Use of computers in the SME as a tool for management.
FB 306	Total Quality Management	Professional, theoretical and practical understanding of the increasingly important area of Total Quality Management (TQM) excellence
FB 401	International Trade & Documentation	Theoretical and practical aspects of international trade and to understand formalities and documentation required in international trade
FB 402	Strategy Management	Key issues in strategy formulation and implementation with special reference to SME; strategies for current problems facing family business and their possible solutions
FB 403	Business Management –Iv (Personnel)	Issues in Human Resource Management with special reference to SME
FB 404	A New Enterprise Creation	Application of theoretical knowledge to practical aspects of new entrepreneur; conceive, nurture, polish and develop a new business idea; understand the formalities required in setting up a new venture; identifying challenges and converting them into opportunities

PO – M.A in Economics

- Comprehensive knowledge of modern economics as an academic discipline
- Application of principles of Economics effectively in business organizations and in analysis of economic growth
- Research opportunities to pursue Doctorate programme
- Job opportunities

PSO – M.A in Economics

- Clarity of concepts, tools and principles of Economics
- Comprehensive knowledge of demand forecasting in sales management, price fixing, market competitors, and business management
- Use theoretical and empirical methods to analyse economic problems and to plan and carry out a research project
- In depth knowledge about economic theory regarding the utilisation and allocation of resources (including labour, natural resources) and capital

- Changing patterns in economy (factors - economic policy, technological advances and demographic conditions,etc.)
- Market analysis for goods and services function and generation & distribution of income with a national and international perspective
- Formulate mathematical economic models
- Use of econometric- and mathematical methods to study economic fluctuations and market analysis

On completion of the Programme, students will be gaining domain specific knowledge and conceptual clarity of the various courses studied

Code	Course Title	Course Outcomes - On completion of the course, students will be gaining a conceptual clarity of the various courses studied
CO-MAECO-101	Micro Economics- I	Comprehensive knowledge of theoretical concepts, methodology and process of reasoning involved in analyzing economic behavior of individuals, firms and markets using, in general, a static and partial equilibrium framework
MAECO-102	Macro Economics-I	Understanding of macroeconomic theoretical structure for the proper comprehension of the different issues and policies as Macroeconomics or aggregative economics analysis establishes the functional relationship between the large aggregates
MAECO-103	Quantitative Methods-I	Use of mathematical and statistical tools for data collection, presentation, analysis and drawing inferences about various statistical hypotheses in analyzing economic problems
MAECO-104	International Economics	In-depth understanding of principles and theories that govern the free flow of trade in goods, services and capital – both short-term and long-term – at the global level; examine the impact of the trade policies followed at the national and international levels, their welfare implications at macro level & the distribution of gains from trade
MAECO-201	Micro Economics-II	Clarity of theoretical concepts, methodology and process of reasoning involved in analyzing economic behavior of individuals, firms and markets using, in general, a static and partial equilibrium framework
MAECO-202	Macro Economics-II	Understanding of macroeconomic theoretical structure, issues & policies; functional relationship between the large aggregates leading to empirical economic knowledge
MAECO-203	Quantitative Methods-II	Use of mathematical and statistical tools in analyzing economic problems necessary for data collection, presentation, analysis and drawing inferences about various statistical hypotheses
MAECO-204	Public Finance	Knowledge of role and functions of the Government in an economy; understand the basic problems involved in use of resources, distribution of income etc. use of tax and expenditure measures in the budgetary policy; a thorough understanding of fiscal institutions with a careful analysis of the issues which under line budgetary policies in general and Indian experience in particular
MAECO-301	Macro Economics-I	Functional relationship between the large aggregates, understanding of macroeconomic theoretical structure for the proper comprehension of the different issues and policies
MAECO-302	Economics of Growth and Development-I	Theories of growth and development, importance of agriculture, and the rational and pattern of industrialization in developing countries; infrastructure-linkages, role of international trade, importance of economic policies and relevance of planning
MAECO-303 & 304 (2 options)	Economics of Agriculture-I	Importance of agricultural sector and the issues associated with agricultural transformation, agricultural production, and demand / supply for agricultural commodities with an emphasis on Indian agriculture
	Economics of Industry-I	In-depth knowledge of different long-run equilibrium outcome of firms under different conditions from the point of view of public policy, industrial development in a cogent and analytical manner, particularly in the Indian context
	Basic Econometrics	Application of economic theory for understanding of applied economic relationships and meaningful research in economics; theory of econometrics and relevant applications of the methods; problems faced in estimation of both single equations and simultaneous equation models
	Economics of Human Resource Development	Understanding of theoretical concepts, methodology and process of reasoning involved in analyzing economic behavior of individuals, firms and markets using, in general, a static and partial equilibrium framework
	History of Economic Thought	Knowledge of the historical evolution of economic ideas into the contemporary economics
MAECO-401	Macro Economics-II	Empirical economic knowledge
MAECO-	Economics of Growth and	Theories of growth & development, importance of agriculture, rational and pattern of

402	Development-II	industrialization in developing countries; important issues in the context of development - infrastructure-linkages, role of international trade, importance of economic policies and relevance of planning
MAECO-403 & 404 (2 options)	Economics of Agriculture-II	Importance of agricultural sector and the issues associated with agricultural transformation, agricultural production, and demand of and supply for agricultural commodities
	Economics of Industry-II	Knowledge of long-run equilibrium outcome of firms under different conditions from the point of view of public policy
	Advanced Econometrics	Theory of econometrics and relevant applications of the methods; problems faced in estimation of both single equations and simultaneous equations models
	Mathematical Economics	Mathematical techniques/methods/models related to the different parts of economic theory, consumer theory, theory of production, pricing, trade cycles, growth models etc.
	Economics of Money and Banking	Knowing the changing role of financial institutions in the process of growth and development; integration of monetary theory, banking and non-banking financial institutions in India

PO – M.Sc. Bioinformatics

- Advanced computational skills and programming languages
- Integration of knowledge of Molecular Biology in data mining
- Wide research opportunities
- Data mining experts and Bioinformaticians

PSO – M.Sc. Bioinformatics

- Domain-specific knowledge
- Biological and technical knowhow
- Highly specialised system biology expertise
- In-silico drug designing and data mining
- Structure prediction of biomolecules
- Use of on-line software tools & databases
- Problem solving skills
- **Research aptitude & Team building -** Ability to work effectively in team for project work
- **Computational skills** and use of Bioinformatics tools in Phylogenetic studies, Genomics & Proteomics, Drug design and discovery. Entrepreneurial skills relevant to Biotechnology business

On completion of the Programme, students will be gaining domain specific knowledge and conceptual clarity of the course

Code	Course Title	Course Outcomes - On completion of the course, students will be gaining a conceptual clarity of the various courses studied
MBIN-8001	Basic Biology	Bridge course- Conceptual knowledge of biological sciences to Non-medical background students, which are integral understanding and application of Bioinformatics.
MBIN-8002	Mathematics	Undersatnding the basics of Mathematics including real members, set theory, Calculus, Matrices and Vectors, Differential Equations for solving Bioinformatics problems
MBIN-8003	Fundamentals of Modern Biology	Knowledge about fundamental of molecular biology and need-based application in recombinant DNA technology.
MBIN-8004	Macromolecular Biochemistry	Knowledge regarding bio-molecules i.e. carbohydrates, nucleic acids and proteins and their structure conformations
MBIN-8005	Comp. Programming & Concepts of Computing	Basic computer fundamentals, programming concepts based on 'C' Language, arrays, structure and Unions, pointers and file handling
MBIN-8006	Introduction to Database Systems	Introduction to Database System and Programming is necessary for better understanding of the architecture of databases.
MBIN-8007	Statistics and Probability	Data analysis & interpretation; concepts of Probability, distribution, correlation, regression, estimation and testing of parametric and non- parametric hypotheses
MBIN-8008	Sequence Bioinformatics and Software Tools	Sequence analysis of proteins and genes using various computational tools which are important to study conservation in different species and establish phylogeny &

		homology
MBIN-8009	Programming Languages in Bioinformatics-I	Computational programming that would help in developing databases and Bioinformatics tools for sequence and structure prediction
MBIN-8010	Immunology & Cell Biology	Cells & organs of immune system; interaction of various bio-molecules in normal functions & various patho-physiological conditions
MBIN-8011	Metabolic Pathway Analysis	Enzyme kinetics, metabolism, databases, its related flux of metabolites to students
MBIN-8012	Elements of System Biology	Principles, properties and concepts of System Biology and the various tools to analyze the systems
MBIN-8013	Programming Languages in Bioinformatics-II	PERL Programming and introducing the basics and details of XML
MBIN-8014	Structural Biology	Tools to study properties of molecules for r understanding their structure and functions
MBIN-8015	Genomics and Proteomics-I	Fundamentals of genomics and proteomics dealing with gene/protein structural elements and the forces responsible for their structure
MBIN-8016	Applications of Computational Biology	Use of computational biology in predicting patterns/structures of genomic and proteomic elements
MBIN-8017	Genomics and Proteomics-II	Proteomic and genomic sequence and structures in-silico tools and knowledge about various servers
MBIN-8018	Molecular Modeling &Pharmacoinformatics	The concepts of molecular modeling and drug design and aims in order to have a better understanding of the field of pharmaco-informatics.
MBIN-8019	Informatics in Biodiversity & Bioethics	Role of Bioinformatics in study of biodiversity and its importance and implications of bioethics
MBIN-8020	Expression Bioinformatics	Knowledge about microarray technology, its basic concepts and practical implications; role of biological databases and tools in microarray technology
MBIN-8021	Project Work	Report writing based on the project work carried out under the guidance of faculty, in the Bioinformatics or other related fields to inculcate research aptitude

PO – M.Sc Applied Chemistry (Pharmaceutical Chemistry)
- Gain discipline specific knowledge
- Practical understanding in pharmaceutical sciences
- Insight into basics of industrial applications (Pharmaceutical Industry)
- In pursuit of higher studies
- Understanding and implemention of basic and advanced concepts of the pharmaceutical chemistry.
- Application of statistical techniques in analysis & interpretation of experimental results
- Trained professionals to enter the market

PSO – M.Sc Applied Chemistry (Pharmaceutical Chemistry)

- Integration of different analytical techniques to facilitate the development of Bio Pharma products
- Testing of scientific hypothesis and critical evaluation of experimental data
- After completion of the program the students are well poised to pursue careers in academic, research and in pharmaceutical industries
- Pharmaceutical skills in drug design, drug development and in drug marketing
- Plan, perform experiments, examine and interpret data for investigating problems in Pharmaceuticals and related fields

Code	Course Title	Course Outcomes - On completion of the course, students will be gaining a conceptual clarity of the various courses studied
101	Organic Chemistry-I	Understanding of important name reactions in Organic Chemistry & utility of different reagents in Organic Synthesis; Aliphatic & Aromatic Substitution reactions
102	Inorganic Chemistry	Applications of the basic concepts of inorganic compounds for developing the reagents for industrial purposes; study of biological processes
103	Physical Chemistry	Applying the principles of chemical reaction equilibrium and phase equilibrium to the calculation of complex separation processes
104	Introduction to the Pharmaceutical Sciences	Knowledge of various kinds of dose forms, solids and liquids ; stability requirements of dose forms and organo-leptic characteristics; Various routes of drug administration, concept of dosage forms, unit operations involved in preparation of these dosage forms
105	Organic Chemistry	Hands-on practicals related to synthesis of different organic compounds studied in

	laboratory	theory thereby helping them to understand the organic reactions in a better way; procedure of analytical separation of organic mixtures and identification of components
106	Inorganic Chemistry laboratory	Practicals related to complexometric titrations and preparation and analysis of various industrial applications in lab scale
107	Physical Chemistry laboratory	Practical skills in physical chemistry
201	Organic Chemistry-II	Principles of Heterocyclic synthesis with emphasis on medicinal applications and other properties of small ring and Benzofusedheterocycles; preparation and properties of different Organometallics
202	Bioorganic Chemistry	Understanding of the biological processes using chemistry; structure, synthesis, kinetics and biochemical reactions of the human body; insight in the genetic engineering processes
203	Analytical Chemistry	Techniques used in the process of drug analysis; an insight into use of instruments and methods to separate, identify, and quantify materials
204	Biophysical Chemistry	Applying the principles of chemical reaction equilibrium and phase equilibrium to the calculation of complex separation processes
205	Organic Chemistry laboratory	Strengthening of experimental skills in organic chemistry
206	Bioorganic Chemistry laboratory	Estimation of different biomolecules by spectrophotometric and chromatographic methods
207	Analytical Chemistry laboratory	Use of various instruments and methods of separation, identification, and quantification of materials
301	Medicinal Chemistry	Synthesis, structure elucidation, structure activity relationship, mode of action & clinical application of various classes of drugs which is of use to students in Pharma industry
302	Physical Pharmacy	Basics of design, manufacture, and distribution of drug products along with stability analysis of manufactured drugs; solubility, pharmacokinetics and drug delivery
303	Unit Pharmaceutical Operations	Major operations followed in the process of drug manufacturing; insight into operations involving drying, evaporation, crystallization etc is used on industrial scale
304	Spectroscopic Instrumentation techniques	Sophisticated instrumentation techniques to have an overview of the overall quality of the synthesized drug product in terms of their structural modifications
305	Physical Pharmacy /Medicinal Chemistry laboratory	Experimental skill updation in medicinal chemistry; insight into extraction techniques and drug purity testing techniques
306	Unit Pharmaceutical Operations laboratory	Increasing the instrumentation skills for drug manufacturing and bulk processing
307	Spectroscopic Instrumentation techniques laboratory	Spectroscopic instrumentation techniques to determine overall quality of the synthesized drug product in terms of their structural modifications
401	Bioinorganic Chemistry	In this topic, the students study the role of metals in biology. They study the effect and phenomenon of natural and artificially introduced metals in medicine and their toxicology. Thus giving an insight into the metal-ion transport, storage etc.
402	Chemical Process Development	Importance of large scale reactions involved in the industries methods, protocols used during industrial engineering
403	Industrial Aspects and Management	Processes related to industrial environmental wastes and its management; an overview about the processes and techniques to manage and control the industrial aspects of pollution; managing appropriate working conditions of industrial laboratories
404	Quality Control & Quality Assurance	Developing the skills in management and documentation processes, maintaining the protocols related to industrial laboratories
405	Industrial Project	Internship in pharmaceutical industries to get hands on experience to various sophisticated instruments and get familiar with the documentation and working in the various departments in pharmaceutical companies

PO – M.Sc. Biotechnology

- Gain discipline specific knowledge
- Practical understanding of biosciences
- Insight into basics of biotechnological applications
- In pursuit of higher studies
- Understanding and implemention of basic and advanced concepts of Biotechnology
- Trained Biotechnology professionals for the Industry

PSO – M.Sc Biotechnology

- Integration of different analytical techniques to facilitate the development of Biotech products
- Critical analysis and evaluation of experimental data
- After completion of the program the students are well poised to pursue careers in academics, research and in biotech industries
- Plan, perform experiments, examine and interpret data for investigating problems in related fields of Biosciences

Course Code	Course title	Course Outcomes
MBIO 101	Cell biology	- Cell Biology is the most important basis of all the biological sciences. As Biotechnology is an interdisciplinary technology involving close collaboration of many different areas, Cell biology forms an important part of the course curriculum. - Starting from the basic cellular structure, function, growth, reproduction and differentiation of the cells, it deals with the finest details of the cells at sub-cellular level and as molecular level in terms of molecular organization, metabolic activities and their regulatory control at genetic level.It deals with all the aspects leading to development of a cell into an organism.
MBIO 102	Biomolecules	This course will introduce the postgraduate students to fundamental concept of structure and functions of carbohydrates, proteins, lipids and nucleic acids and their metabolic pathways and their integration. Being the core subject of life sciences this course has great significance for students who want to pursue their career in higher education related to discovery science and basic sciences.
MBIO 103	Microbial Diversity and metabolism	- The main objective of this course is to teach students about the areas related to microbiology, its methodology and contribution to humanity and scientific advancement. - The goal of this course is to offer history, methods in microbiology, pure culture techniques, sterilization, microbial systematic & taxonomy and microbial growth. - The course concentrates on the physiological aspects of the microorganisms and aims to explain the diversity of microbes and their metabolism. - It also teaches the students about the areas related to fungi, viruses, bacteria and archaebacteria. Emphasis has also been given on study of epidemiology and chemotherapy. - Various interactive activities and experiments teach students the basic concepts of microbiology. These topics stimulate student's interest in the learning material.
MBIO 104	Computer Applications	- Various biological databases of nucleic acid and protein sequences are being produced at a phenomenal rate. - In addition the data from number of projects involving gene expression study, protein structures, and detail interaction of these products with one another is accumulating. As a result of

			this massive increase in data, computers have become indispensable to biological research.
		•	Such an approach is very significant because of the ease with which computers can handle large quantities of data and probe the complex dynamics present in nature.
		•	The course has been designed to introduce the students with fundamentals of computer and various computer languages and their possible applications in biotechnology.
MBIO-105	Biostatistics	•	A large information data base is being generated by the rapid progress in the field of biotechnology, Biotechnology experiments and their results are often very complex and involves lot of inputs in terms of money, infrastructure, therefore, results have to be meaningful and experiments have to be designed such that the results can be interpreted in as useful manner.
		•	Statistics is a discipline that develops and utilizes tools for making decisions in the presence of uncertainty.
		•	Statistics is utilized in many fields. With the help of various statistical tools including statistical software biotechnologists can solve number of problems including defining research problems, formulating rational methods of inquiry, and gathering, analyzing, and interpreting data in the life sciences and medicine.
MBIO 201	Molecular Biology	•	Molecular biology is a fast-paced field which includes genetic engineering, genomics, and related areas.
		•	Biological function at the molecular level isparticularly emphasized and covers the structure and regulation of genes as well asthe structure and synthesis of proteins, how these molecules are integrated into cells, and how these cells are integrated into multicellular systems and organisms.
		•	The focus of the course is on the exploration of current research in cell biology, immunology, neurobiology, genomics, and molecular medicine
MBIO 202	Biology of Immune system	•	This subject occupies a vital position in life sciences, which is of importance in both basic and applied research.
		•	The course is designed to give a deep insight to the students through the pathogenesis of infectious diseases and the cells, molecules, and tissues of the immune system that provide protection. The course acquaints them with the role of the immune system, how both genetics and environment contribute in the development of immunity and to understand various approaches to manipulate immune system in terms of autoimmunity, transplantation and immunotherapy of tumors.
MBIO 203	Biophysical and Biochemical Techniques	•	Almost everything we know about biological chemistry comes from experiments on dilute samples of macromolecules (proteins, DNA, RNA, polysaccharides, etc.). So there is a need to know about all these macromolecules to successfully carry out research in biological sciences.
		•	This paper deals with the all the fundamental theoretical principles, capabilities, applications, and limitations of modern analytical instrumentation used for qualitative and quantitative analysis which include all present techniques which are used in research including Gas chromatography, mass spectrometry etc.
		•	Students are taught how to define the nature of an analytical problem and how to select and appropriate analytical method.
MBIO 204	Enzymology and Enzyme technology	•	The study and application of enzymes have assumed increasing importance both in medicine and in industry and a discussion of these aspects is therefore given prime importance.
		•	Kinetics, catalytic action and control of activity, immobilization methods and various applications of enzymes are important for industrial application. T
		•	he methods for isolation and characterization of enzymes are

		now well-established procedures, so the rate at which three dimensional structures and mechanisms are being determined is increasing dramatically.
		• Ultimately it is necessary to know the behaviour of enzymes in living cells. The study and application of enzymes have assumed increasing importance both in medicine and in industry and a discussion of these aspects is therefore given prime importance.
MBIO-205	Environmental Biotechnology	• This course examines current applications of biotechnology to environmental quality evaluation, monitoring, and remediation of contaminated environments.
		• Relevant topics of microbiology and plant biology are presented. These provide a foundation for subsequent discussions of microbial removal and degradation of organics, phytoremediation of soil and water contaminated with toxic metals and radionuclides, wetlands as treatment processes, biofilms/biofilters for vaporphase wastes, and composting.
		• Advantages and disadvantages of each application are compared.
MBIO 301	Animal cell science and technology	• Animal Cell Science and technology as a subject in M.Sc helps students learning about the cell culture and techniques to be used in laboratory.
		• It starts from structure and organization of cell in vivo to the products of animal cell culture containing media formulation, tissue isolation, its processing before and after culture, culture conditions, scale up, precautions, etc.
		• The subject also introduces students to techniques like hybridoma technology, transformation, transgenesis, and cloning, etc. So conclusively it comprises the basics of processes and their application to start a cell culture and generate the products.
MBIO 302	Genetic engineering	• Recombinant DNA Technology is a new and rapidly growing technology. The basic objective of the paper is to present the principles of gene manipulation and its associated technologies in sufficient detail.
		• The course is designed to acquaint the students with the developments in the genetic engineering. The student will be taught the key techniques and experiments involved to study the structure, behaviour and activity of genes and how developments in gene manipulation have revolutionized medicine, agriculture and health.
MBIO 303	Plant Biotechnology	• Plant tissue culture is an important technique in the field of Plant Biotechnology. Knowledge of tissue culture has contributed greatly to understanding the factors responsible for growth, differentiation and morphogenesis of plant cells, tissues & organs in vitro.
		• It has been applied for plant improvement, plant protection and also for large-scale production of industrially important compounds by manipulating not only the nutritional and environmental conditions but also the genetic makeup of the plants.
		• Besides clonal multiplication, we can have designer crops with agronomic traits of interest or go for molecular farming for production of therapeutic proteins, industrial enzymes, antibodies or vaccines. In recognition of the wide spread interest, Plant tissue culture and plant genetic manipulation and their applications needs to be a part of the curriculum.
MBIO 304	Bioprocess engineering and technology	• Bioprocess engineers are trained in the application of engineering sciences and problem solving techniques.
		• It requires knowledge of biological processes and application of chemical engineering methodology and strategy
		• . During the course the students are introduced to the fundamentals of processes such as enzymatic conversion, fermentation, bioconversion, cell cultivation and sterile

		techniques and are trained using examples from industry.
		• The lectures are supplemented by assignments and laboratory practical work, so that the students can receive comprehensive information for the diverse requirements of the modern biotechnology industry.
MBIO-305	Advances in Genomics and Proteomics	• This course has been specifically designed to meet the requirement of post graduate students of Biotechnology.
		• Genome is the blue print of life to understand its intricate nature; the gene analysis is must, therefore the entire topic such as, cDNA arrays, proteins arrays, next generation sequencing technologies search databases have been included.
		• The final product of gene expression is the proteins. These are the molecular horses of the biological system and virtually all the biological process is carried out by the proteins.
		• The modern methods of protein detection and sequencing have revolutionized the protein science and its new avatar, proteomics emerged in 36 last decade. Proteomics is the high throughput method of protein 33 analysis by electrophoresis, proteins arrays and mass spectroscopy and has role in the drug development
MBIO 401	Stem Cell and Regenerative Medicine	• The stem cell is the mother cell of all cell types and it can lead to the development of all cell and tissues.
		• The contents of this paper include basics of stem cell, types, and molecular markers.
		• The main objective is to introduce students with the signal transduction mechanisms involved in the development of the cell. The differentiation pattern of stem cell and application of stem cell therapy in the medicine and tissue engineering to overcome the fatal disease in human are also included.
MBIO 402	Drug Designing and Drug Delivery	• The overall objective of pharmaceutical biotechnology research is to deliver a drug substance at the biological target site. This involves study of both chemical and physicochemical characteristics of a drug substance and their relation, the pharmaceutical formulation, and the biological response.
		• A number of factors including specific biological barriers, unfavourable chemical or physico-chemical conditions and a suboptimal pharmaceutical formulation may result in low bioavailability of drug substance.
		• The course of Drug Design and delivery system provides the student an insight into fundamental and advanced principles for optimizing drug delivery, various aspects of drug designing including computer-aided drug design, drug discovery, biology of disease and effective strategies for drug delivery
MBIO 403	Intellectual Property Rights, Biosafety and Bioethics	• IP systems protect certain well-defined subject matter by giving limited entitlements to eligible right holders to exclude others from certain uses of the protected material.
		• However worldwide, some of biotechnology application has generated a number of human health, environment, economic and social concerns on the safety of the technology.
		• Many of these concerns have legal, policy and ethical aspects. In this course, safety concerns and ethical issues on application of biotechnology will be discussed under the current issues associated with the benefits and risk concerns on biotechnology.
		• This course has been designed to cover various aspects of IPR, Biosafety and bioethics.
MBIO 404	Seminar	• To make the students conversant with latest happening in the field of Biotechnology and to improve their communicational skill, seminars covering latest topics in Biotechnology have been included in the curriculum
MBIO-405	Research Project	• The aim of Research Projects (wet bench/investigatory) is to give the students sufficient experience and proficiency in the research methodology and to enable them to carry out independent

		research. Projects will be assigned as per individual's interest and availability of specialized faculty and to be carried out in labs of the Department /University/Industry. Students can also take up Institutional training programmes/Research projects of 6 to 8 weeks.

PO – M.Sc. Physics
- Conceptual understanding of theoretical and experimental Physics
- Technically sound professionals to lead in development of society
- Job opportunities in academia and industry
- Progression towards Doctorate programme
- Targeted approach towards qualifying CSIR-NET/GATE & other competitive examinations
- Job opportunities in teaching, research and industry

PSO – M.Sc. Physics
- Competent physicists who can implement their scientific knowledge and mathematical skills in existing paradigm of industry, agriculture and healthcare
- Provide sustainable competitive edge to present needs of society such as renewable energy resources and improving the efficiency of present day technologies
- Use analytical, numerical, computational and experimental techniques for solving problems in physics and related fields
- Design and conduct experiments, analyze results and draw conclusions
- Sharp communicative and writing skills in communicating Physics related topics
- Proficiency in data acquisition using high-end instruments
- Data interpretation using statistical and computational methods

Code	Course Title	Course Outcomes - On completion of the course, students will be gaining the conceptual clarity of the various courses studied
PHY 8011	Mathematical Physics I	Theknowledgeofmathematicaltechniquesappliedinthetheoreticalphysicswillhelp the students pursue their career in theoretical physics. After completion of the course student will be ableto: • To evaluate various definiteintegrals. • To solve various differential equations including Laplace equation, Schrodinger equation, equations used in electronic circuits, electrical circuits, nuclear decaysetc. • Concepts of Complex analysis, Dirac Delta function, beta and gamma functions. • Special functions: Bessel, Legendre, Hermite, Laguerre functions for developing a strongbackground.
PHY 8012	Classical Mechanics	Understand Lagrangian and Hamiltonian formalism to use these approaches in other branches of physics such as Quantum Mechanics, Quantum field theory, Condensed Matter Physics and Astrophysics etc. After completion of the course, student will be able to: • Solve the mechanics problems using Lagrangian and Hamiltonian approaches. • Understand the connection between classical and quantum mechanics and get familiarized with Poisson brackets and Hamilton -Jacobiequation. • Understand canonical transformations and their use in other branches of physics. • KinematicsanddynamicsofrigidbodyindetailandideasregardingEuler's equations of motion, gyroscopeetc. • Understand the theory of small oscillations in detail along with basis offree vibrations.

PHY 8013	Quantum Mechanics I	Conceptual knowledge in quantum mechanics that will serve as basis for further study of quantum mechanics. After completion of the course student will be able to
		- Show an understanding of wave mechanics in three dimensions. - Describe the structure of the hydrogen atom and show an understanding of quantization of angular momentum. - Apply techniques such as Fourier methods and ladder operators for selected problems in quantum mechanics. - Use the tools, methodologies, language and conventions of physics to test and communicate ideas and explanations
PHY 8014	Electronics I	Basics of various electronic devices, physics of semiconductor materials, network analysis; Analogue computation using operational amplifier, comparator circuits, active and passive filters, instrumentation amplifier, IC-555 and its applications, basics of communication techniques. After completion of the course student will be able to: - Understand the working knowledge of electronic devices and their use in practical modern day technology. - To test the basic electronic circuits independently. - Gain the knowledge filtering using active and passive filter circuits. - Design simple projects using 555 IC - Understanding of the mobile and satellite communication systems.
PHY 8021	Mathematical Physics II	Develop expertise in mathematical techniques that are required in physics and enhance problem solving skills. After completion of the course student will be able to - Understand and apply the mathematical skills to solve quantitative problems in the field of physics. - Use the method of Laplace transforms to solve boundary-value problems for ordinary differential equations. - Formulate and express a physical law in terms of tensors and simplify it by use of coordinate transforms. - Apply group theory and integral transforms to solve mathematical problems of interest in physics. - Understand the theoretical and practical aspects of the use of numerical analysis.
PHY 8022	Statistical Mechanics	This course develops concepts in postulates of statistical mechanics and statistical interpretation of thermodynamical processes. The methods of statistical mechanics are used to develop the statistics for Bose-Einstein, Fermi-Dirac and photon gases. Selected topics from low temperature physics and electrical and thermal properties of matter are discussed. After completion of the course the student will be able to - Explain statistical physics and thermodynamics as logical consequences of the postulates of statistical mechanics. - Apply the principles of statistical mechanics to selected problems. - Use the tools, methodologies, language and conventions of physics to test and communicate ideas and explanations.
PHY 8023	Classical Electrodynamics I	Understanding the concepts of electrodynamics. After completion of the course student will be able to: - Understand electrostatics and magnetostatics in vacuum along with multipole expansions of potentials and energy. - Discuss electrostatics in dielectrics along with various types of polarization and their temperature dependence. - Solve problems related to induced charge distribution especially the ones using method of images. - Derive Maxwell equations in field as well as potential formulations, along with various gauge transformations. - Discuss the concept of EM field and its propagation and related properties in various media e.g. vacuum, conductors, dielectrics, ionosphere etc. - Use the concept of retarded potentials and centre fed linear antenna.

PHY 8024	Electronics II	The course covers basic logic gates. logic families DL, RTL, DTL and TTL, number systems, logic simplification and circuit design, Flip Flops, Registers, Analog to digital converters, digital to Analog converters, Multiplexer and demultiplexers, Semiconductor memory ,digital display devices, charged couple device memory and applications, basic knowledge of microprocessor 8085, 8086, and microcontroller. After completion of the course student will be able to:- • Understand the digital technology and working principle behind digital circuits. • Design and simplify the complex logic function using logic gates. • Understand the concept of digital memory. • Understand the working of digital communication techniques • Gain the practical knowledge of microprocessor and microcontroller.
PHY 8031	Nuclear Physics I	The course familiarize the students with the basic aspects of Nuclear Physics viz basic properties of nuclear forces, basic global properties, study of nuclear reactions, basic knowledge of radioactive decay processes, nuclear fission processes and neutron physics. After completion of the course the student will be able to • Learn detailed knowledge of the nuclear quantum and global properties. • Learn about the concept of radioactivity shown by unstable nuclei. • Understanding of the various concepts of two nucleon problems. • Knowledge of the neutron and reactor physics.
PHY 8032	Particle Physics I	The course familiarizes the students to present day fundamental particles and their interactions. After completion of the course the student will be able to: • Understand the various types of fundamental particles and their historical evolution. • Draw and understand Feynman diagrams for the four fundamental interactions along with their various properties. • Apply CPT theorem and conservation laws for various particle physics interactions. • Understand the concept of Relativistic Kinematics and Phase Space. • Understand the Static Quark Model. • Understand the Fermi theory for weak interactions along with theoretical and experimental description of CP violation and parity violation in beta decay.
PHY 8033	Condensed Matter Physics I	The objective of the course is to make the students familiar to the solid structure, lattice dynamics, energy band theory and transport theory so that they are prepared with the techniques used in investigating these aspects of the matter in condensed phase. After completion of the course student will be able to • Differentiate between different Lattice types and explain the concepts of reciprocal lattice and crystal diffraction. • Predict electrical and thermal properties of solids and explain their origin. • Explain the concept of energy bands and effect of the same on electrical properties • Describe the dielectric properties of insulators.
PHY 8034	Classical Electrodynamics II	This course enables the student to understand the concepts of relativistic electrodynamics and its applications in branches of Physical Sciences. After completion of the course student will be able to • Understand and apply the concept of special theory of relativity to solve physical problems. • Learn about the basis of relativistic electrodynamics and the concept of retarded time for charges undergoing acceleration. • Formulate physics laws in the form of four-vectors. • Understand invariant formulation of electromagnetic theory and a reformulation of Maxwell's equations.
PHY 8035	Quantum Mechanics II	Information about statistical quantum mechanics, nuclear and particle physics, and quantum field theory. After completion of the course the student will be able to • Ability to understand the concepts and to perform calculations of scattering of particles. • Demonstrate an understanding of the founding principles of relativistic quantum mechanics including second quantization • Demonstrate a working knowledge of Dirac gamma matrices and their role in the transformations of Dirac Spinors.

		• Use Dirac Hamiltonian to understand positive/negative energy solutions. • Demonstrate that electron spin is a natural consequence of Dirac theory
PHY 8041	Experimental Techniques in Physics	The aim and objective of the course on Experimental Techniques in Nuclear, Particle and Condensed Matter Physics is to expose the students of M.Sc. class to theoretical aspects of different equipment and methods used in the fields of Nuclear and Particle Physics. After completion of the course the student will be able to • Know about Interaction of radiations with matter, Radiation detectors and Statistics and treatment of experimental data • Gas-filled and solid state particle detectors and counters • Electronics associated with detectors, Transducers, LVDT, Lock-in-detector, Box car integrator • Preparation of Thin films and Characterization techniques, XRD, TEM, SEM, AFM, STM, DSC.
PHY 8042	Atomic and Molecular Physics	The aim and objective of the course on Atomic and Molecular Physics is to expose the students of M.Sc. class to theoretical aspects of hydrogen and alkali spectra, coupling schemes, atoms in magnetic fields, line broadening mechanisms, lasers and Molecular Physics, Microwave and Infrared spectroscopy, Raman and Electronic spectroscopy, and electron spectra, and related analytical techniques. After completion of the course student will be able to: • Vector model for one and two valance electron atoms; Spin-orbit interaction and fine structure of hydrogen, Lamb shift, Spectroscopic notations for L-S and J-J couplings • The Zeeman Effect, Paschen-Back effect; Stark effect. Lasers: He-Ne laser, Nitrogen laser, CO2 laser, Ruby laser • Molecular spectra, Rotational spectra of diatomic molecules, Vibrating diatomic molecule, the vibration-rotation spectrum, Rotational and Vibrational Raman spectra, Frank-Condon principle. Born-Oppenheimer approximation. • Analytical techniques: Spectrometers, UV-Vis Spectrometer, FTIR Spectrometer, Raman Spectrometer, ESR, NMR. X-ray fluorescence spectrometer.
PHY 8044	Nuclear Physics II	The main objective of the course is to expose the students with different nuclear models proposed for the stability of nucleus and theoretical knowledge of various nuclear reactions. After completion of the course the student will be able to • Learn the advanced topics related with the nuclear models which are helpful to pursue their career in theoretical and experimental nuclear physics • Detailed theoretical knowledge of the various nuclear reactions will be helpful in Astrophysics
PHY 8045	Particle Physics II	The course familiarizes the students to different types of fundamental interactions and unification schemes so that they are well resourced to pursue a career in high energy physics. After completion of the course the student will be able to • Understand the concept of symmetries and their relation to group theory. • Solve the irreducible representation of groups using Young's Table. • Understand the symmetry groups and their application to meson mixing and Okubo mass formula etc. • Understand the details of different types of EM, weak and strong interactions and unification schemes through different models.
PHY 8046	Condensed Matter Physics II	The objective of the course is to expose students with relatively advanced topics like optical properties, magnetism, superconductivity and disordered solids so that they are confident to use the relevant techniques in their later career in physics. After completion of the course student will be able to • About optical properties such as absorption and luminescence of isotropic and conducting media. • Magnetic properties of solid, Ferromagnetism, Heisenberg Hamiltonian, antiferomagnestim, ferrimagnetisms, and spin waves. • About general superconductivity, origin of energy gap, London penetration depth, coherence length, elements of BCS theory, flux quantization. • About surface imperfections and crystal defects in solid.

PSO – M.Sc IT (Information Technology)

PO –
- Research opportunities to pursue Doctorate programme
- Targeted approach towards qualifying CSIR-NET/GATE & other competitive examinations
- Job opportunities
- Trained professionals

PSO –
- Students to have in-depth knowledge of the basics and applied aspects of the subject
- Students should be able to apply their knowledge in their professional/social life
- Students become competent to pursue research or pursue a career in the subject.

On completion of the Programme, students will be gaining domain specific knowledge and conceptual clarity of the course

Code	Course Title	Course Outcomes - On completion of the course, students will be gaining a conceptual clarity of the various courses studied
MS - 66	Linux System Administration and Programming	To get familiar with Linux system, its commands, files & directories, system, shell programming, PERL programming and system administration. After the completion of this course, student will be able to: - Work in the Linux environment for Linux server administration - Write the shell programs, PERL programs and C-program with system calls
MS - 61	Software Engineering	Understand Software Configuration Managements, Tools and Techniques. After the completion of this paper, student will be able to: - Use principles, concepts, methods, and techniques of the software engineering approach to produce quality software - Apply software engineering principles and practices in the planning and development of an actual software product
MS - 62	Computer Algorithm	Creation of skills in students to design and analyze algorithms. After studying this subject students will be able to: - Understand algorithms and give theoretical estimates for the resources needed by any algorithm - Analyze Algorithms - Have an empirical approach to gauge the comparative performance of a given set of algorithms
MS - 42	Operating System Concepts	Understand the concepts of Operating System. After the completion of this paper, student will be able to: - Manage various processes and use the scheduling algorithms - Handle the deadlock conditions - Manage the files on the disk with effective outcome
MS - 45	Advance Java and Network Programming	Enhance the programming skills using object oriented programming approaches. After the completion of this paper, student will be able to: - To develop web applications with database support - To create enterprise and standard applications Java - To develop client server based applications
MS – 65	E-Commerce and Emerging Trends	Knowledge of Fundamentals of E-Commerce and Emerging Technologies such as Parallel Computing, Cloud Computing, Grid Computing, Mobile Computing, and Concept of Big Data
MS-60	Advanced Database Programming & MySQL	Insight on few DBMS principles and practices. Students will learn and implement the operations for making and using databases with help of SQL and PL/SQL
MS - 67	Artificial Intelligence	Understand Artificial Intelligence techniques and the language LISP. After the completion of this paper, student will be able to - Apply standard AI techniques to solve problems. - Characterize the Knowledge Acquisition - Differentiate various expert systems

		• Write programs of AI using LISP
MS - 32	Net Framework And C#	Making a student capable of developing console, windows and web applications using C# on .NET platform
MS - 69	Theory of Computation	Understanding of basic concepts of Theory of Computation
MS – 39	Computer Graphics	Understanding graphics hardware & various 2D & 3D algorithms. After the completion of the paper, student will be able to: • Implement the principles and commonly used paradigms and techniques of computer graphics • Use Open GL proficiently using C
MS – 14	Systems Approach to Management and Optimization Techniques	Knowledge of different types of Info systems, basics of DR and its practical problems

PO –P.G. DIPLOMA IN MARKETING MANAGEMENT
- Clarity of concepts of finance, general management, operations and marketing management
- Programme is designed to enhance managerial capabilities and value addition of students at workplace
- Application of contemporary management and business perspectives in interdisciplinary manner

PSO – P.G. DIPLOMA IN MARKETING MANAGEMENT
- Understanding of the current trends, practices, opportunities and challenges in the area of marketing
- Learning the practical aspects in the domain area
- Training the professionals in management concepts to meet the challenges of industry & society
- Apply the theoretical and practical aspects of management & marketing to formulate strategies.

On completion of the Programme, students will be gaining domain specific knowledge and conceptual clarity of the courses studied

Code	Course Title	Outcomes
DMM 101	Fundamentals of Economics & Management	Knowledge about fundamentals of economics and the facets of organization and management with special reference to Indian scenario
DMM 102	Marketing Management	Understand the conceptual framework of marketing management
DMM 103	Sales Management	Acquaint the students with the fundamentals of sales management; relationship between sales function and distribution
DMM 104	Managerial Accounting	Application of accounting techniques for management
DMM 105	Workshop On I.T. & Its Applications In Business	Use of computer technology and its business uses, particularly accounting applications; develop proficiency in the use of internet as a business and research tool
DMM 106	Advertising And Consumer Behaviour	Understanding various factors affecting consumer behavior and to understand the process of consumer buying. Based on the understanding of Consumer behavior, the students are expected to design the advertising, strategy
DMM 107	Marketing Research	Clarity of concepts and skills necessary to commission marketing research projects, to evaluate marketing research projects and reports
DMM 108	Logistics Management	Basics of corporate physical distribution activities, as an integrated system with the help of analytic and quantitative techniques
DMM 109	International Marketing & Services	Conceptual knowledge of fundamentals and practicalities of International marketing with particular emphasis on export marketing; develop the skills of marketing of services, importance and role of services as per the marketing concept and the issues relevant to services marketing

PSO –P.G. DIPLOMA IN PERSONNEL MANAGEMENT & LABOUR WELFARE

On completion of the Programme, students will be gaining domain specific knowledge and conceptual clarity of the courses studied

Code	Course Title	Course Outcomes
DPM 301	Fundamentals of Labour Economics &Management	Knowledge about issues involved in the labour market and the conditions of working class and the facets of organization management with special reference to Indian perspective

DPM 302	Industrial Sociology & Psychology	Understanding the role of Industrial sociology & Psychology in management of human resources with an emphasis to apply aspects with reference to Indian industry
DPM 303	OrgnizationalBehaviour	An insight about the foundation of individual and group working in an organization
DPM 304	Human Resource Management	Orient the future managers to the concept of HRM, functions of HR manger and the practices followed in India and abroad
DPM 305	Workshop on I.T. & its Applications in Business	Basics of computer technology and its business usage, particularly accounting applications; develop proficiency in the use of internet as a business and research tool
DPM 306	Labour Legislation	Understanding of Indian legal environment relevant to labour laws relating to emoluments and welfare emphasizing the basic provision and cases, law of various relevant Acts
DPM 307	Management of Disciplinary Procedures & Practices	Understanding of maintaining and handling disciplinary proceedings and the working of various procedures and mechanism available for the purpose
DPM 308	Social Security And Labour Welfare	Understanding the role and need of social security system in society; Labour Welfare Activities undertaken and their need
DPM 309	Industrial Relations And Labour Policy	Conceptual understanding of laws on Industrial relations and dynamics of lbour relations

PSO –P.G. DIPLOMA IN COMPUTER APPLICATIONS

On completion of the Programme, students will be gaining domain specific knowledge and conceptual clarity of the courses studied

Code	Course Title	Course Outcomes
PGD - 1101	Computer Fundamentals	Knowledge of basic concepts related to Computers, DOS, Windows, Linux and application software's like Word-processing, Spreadsheet Software and Presentation Software
PGD - 1102	Computer Programming Using C	Basics of programming concepts of 'C' including functions, Arrays, strings etc.
PGD - 1103	Data Base Management System	Understand the Database concepts and SQL
PGD - 1104	Data Communications and Networks	Understanding of Layered structure of Networks and working of different Layered
PGD - 2101	Object Oriented Concepts Using JAVA	Knowledge of Object Oriented concepts including inheritance, visibility control etc. using JAVA programming language
PGD - 2102	Web Technologies	Concepts of HTML, CSS, JAVA Scripts and PHP
PGD - 2103	Software Engineering	Understanding the concepts related to Software Engineering including process model, project management, design and testing
PGD - 2104	Computer Based Accounting	Knowledge of accounting principle and computerized accounting

PSO –P.G. DIPLOMA IN MASS COMMUNICATION

On completion of the Programme, students will be gaining domain specific knowledge and conceptual clarity of the courses studied

Code	Course Title	Course Outcomes
PGD - 101	Introduction to Mass Communication	The course objective is to sensitize the students to the field of communication by exposing them to its different forms; To understands the basic concepts and terminology specific to communication and media; To sensitize them to the practical importance of Interpersonal, interpersonal, group and mass communication; To enable them to analyze and assess communication in the media and everyday life. Students would have an understanding of meaning, modern and classical functions of communication; Process, elements and forms of communication; Theories and

		models of communication
PGD - 102	Print media	**The candidate will be able to demonstrate an understanding of:** The concept and structure of news; concept and types of beats in journalism; various news sources; roles and responsibilities of a journalist; organizational structure of a news room; principles and ethics in photojournalism; various press laws **The candidate will be able to perform the following tasks:** Write a feature article; Cover events and report the news; Edit news stories; Take interviews; Design a newspaper dummy
PGD - 103	Electronic media	Understanding of the basic concepts and terminology specific to the media of radio and television; to understand the organizational structure of both AIR & DD; concepts of writing and scripting of Radio as well as TV programmes Understanding of - Career Prospects in Electronic Media as Field Reporter; Writer; Editor; Research Analyst; Field and In-house Correspondent; News / Program Anchor; Presenter; News Analyst; Public Relations Officer; Cinema Projectionist; Media Marketing Executive; Content Writer and editor; Audiovisual Production Specialist; Advertising Executive
PGD - 104	Advertising and public relations	**The candidate will be able to demonstrate an understanding of:** Overall role and scope of advertising in the marketing process; Advertising media and types; structure and functions of an advertising agency; nature and scope of public relations; role of communication within an organization; tools employed in PR; PR process; code of ethics in advertising and public relations **The candidate will be able to perform the following tasks:** Write a press release; Design newsletters and brochures; Write an ad copy based on various appeals; Create a story board for an advertisement

PROGRAMME OUTCOMES FOR UNDER-GRADUATE PROGRAMMES

Bachelors of Computer Applications (BCA)

PO – Bachelors of Computer Applications (BCA)
- Clarity of concepts of Computer Programming and data
- Ability and competence to work as an IT professional upon graduation

PSO – Bachelors of Computer Applications (BCA)
- Explore technical know how in varied areas of Computer Applications
- Comprehend and build up computer programs in the allied areas -Algorithms, System Software, Multimedia, Web Design, etc.

On completion of the Programme, students will be gaining domain specific knowledge and conceptual clarity of the courses studied

Code	Course Title	Outcomes
BCA-16-102	Fundamentals of Mathematical Statistics	Understanding of the basic techniques of Statistical Methods. After completing this course students will be able to solve various Financial, Scientific and Engineering fields' problems.
BCA-16-103	Computer Fundamentals and Computing Software	To familiarize students with complete Fundamentals and the packages commonly used in computing software.
BCA-16-104	Problem Solving Through C	Understanding programming language concepts, mainly control structures, reading a set of data, stepwise refinement, function and arrays. After completion of this course, the student is expected to analyzethe real life problem and write programs in 'C' language to solve problems. The main emphasis of the course is on problem solving aspect.

BCA-16-202	Computer Organization	Understanding the basic organization of computer system and system maintenance.
BCA-16-203	Fundamentals of Web Programming	This course will enable the student to build and publish web sites using HTML, DHTML, CSS, JavaScript and Dreamweaver.
BCA-16-204	Object Oriented Programming using C++:	To make the students competent to write C++ programs using the more esoteric language features, utilize Object Oriented techniques to design C++ programs, use the standard C++ library, and explore advanced C++ techniques
BCA-16-303	**Information System Design and Implementation**	Undersatnding the various aspects of Information Systems to be developed their analysis and design. The motive is to aware the learners about pre requisite of software development and associated paradigms. After completing this course students will be able to be analyse and design information systems.
BCA-16-303	Computer Oriented Numerical Methods	Learning the essential techniques of Numerical Methods. After completing this course students will be able to solve various Scientific and Engineering fields' problems.
BCA-16-303	Data Structures	Learning various data structures and the basic operations performed using them. At the end of course the student will have complete knowledge of data structures, thus will be able to use them for solving real world problems
: **BCA-16-403**	**Software Project Management**	Learning important concepts, terms related to various phases during the development of a software project. At the end of the course the student will be able to apply software project management techniques to manage a software project.
: **BCA-16-404**	**Operating System Concepts and Linux**	The objective of the module is to create skills of students in operating systems concepts and Linux commands
: **BCA-16-405**	Database Management System	Understanding the insight of the underlying concepts of database management system and **implement them using Database software.**
BCA-16-501	**Computer Networks:**	Gaining knowledge about computer network related hardware and software using a layered architecture. Provide good understanding of the concepts of network security, wireless and various emerging network technologies.
BCA-16-502	**Discrete Mathematical Structure**	Acquiring the knowledge of Logic, Relations and Functions. Algebric Functions and Graph Theory will also be discussed in this paper.
BCA-16-503	**Java Programming**	Acquiring knowledge about all the programming concepts of JAVA programming language.
BCA-16-504	**Web Application Development using PHP**	Able to do web programming using PHP and MySQL. It would enable them to develop websites and other web based applications.
BCA-16-601	**E-Commerce:**	Understanding the process of electronic commerce and familiarizes students with the technology involved in it.
BCA-16-602	**Application Development using VB.Net**	Enabling the students to develop applications using event driven programming with VB.net and accessing database at back end.
BCA-16-603	**Computer Graphics and Multimedia Applications**	Understanding basic computer graphic concepts and algorithms. The student will also learn about essential concepts used in developing multimedia applications.

PSO −B.Sc. (Hons) Bioinformatics

Code	Course Title	Course Outcomes
BIN-1001	English – I	**Business Communication & Writing Skills:** An exposure of different aspects of communication in general and business communication in particular, communication within organizations, types of communication, and significance of positive attitude in improving communication; all kinds of letters, tender notices, auction notices, public notices; and memos
BIN-1002	Punjabi-I	
BIN-1003	HCP-I	
BIN-1004	Life Sciences	Introducing the students of Non-medical background to the concepts of biological sciences for better understanding of Bioinformatics
BIN-1005	Mathematics	Basic Mathematics – introduction to real members, functions, complex numbers, Trigonometric, Matrices and Determinates, Calculus, Differential Equations and Linear Programming to solve Bioinformatics Problems
BIN-1006	Chemistry-I	Application of basic concepts of Chemistry with application in biological Sciences
BIN-1007	Introduction to Biochemistry	Introduction to Biochemistry to study chemistry of biomolecules.
BIN-1008	Physics	Introduction to basic course of Physics to enhance the grasping of subject.
BIN-2001	English-II	**Business Communication:** It shall focus on different aspects of communication in general and business communication in particular, communication within organizations, types of communication, and significance of positive attitude in improving communication. **Writing Skills:** This section shall focus on letters of all kinds, tender notices, auction notices, public notices; and memos.
BIN-2002	Punjabi-II	
BIN-2003	HCP-II	
BIN-2004	Statistics and Computer Fundamentals	Basic concepts of Biostatistics including Distributions and Probability and also Introduction to computers and their Systems/Storage
BIN-2005	Chemistry-II	
BIN-2006	Introduction to Bioinformatics	Introduction to Bioinformatics exposes the students to study biomolecules and their integration in information technology which is the basis of Bioinformatics.
BIN-2007	C-Language and programming	To introduce basic concepts of "C" Language, which is required to do programming and solve problems related to Bioinformatics.
BIN-3001	Fundamentals of Molecular Biology	The Contents are related to the fundamental of molecular biology and their application in recombinant DNA technology.
BIN-3002	Computational Methods in Biomolecular Sequence and Phylogenetic Analysis	In this paper, sequence and phylogenetic analysis of proteins and nucleotides using various computational tools which are important to study conservation in different species is covered
BIN-3003	Computer Operational System and Organization	Knowledge of basics of Computers, Organization of Computers, Concepts of Assembly language and System maintenance
BIN-3004	Statistical Methods	Concepts of correlation, Regression, Estimation and Testing of parametric and nonparametric Hypotheses.
BIN 3005	Object Oriented Programming In C++	Concept of object oriented programming in C++ which is helpful in writing programs to solve the problems in Bioinformatics.
BIN-4001	rDNA technology and Biochemical techniques	Knowledge of important tools and techniques based on biochemical principles, protocols/methodology with their application in applied science.
BIN-4002	Computational Methods in Biomolecular Sequence and Structure Analysis	Understanding of structure analysis of proteins and nucleotides using various computational tools
BIN-4003	Cell Biology and Microbiology	Students are exposed to the underlying concepts and phenomena of Cell Biology
BIN 4004	Introduction to Database Management System	To implement an entity relationship diagrams (ERD) to express requirements and demonstrates skills to model data requirements and create data models in to normalized designs • To develop understanding of database systems theory in order to apply that knowledge to any particular database implementation using SQL • To learn and understand various Database Architectures
BIN-4055	Project Work	Every student will submit a project report based on the work carried out under the guidance of Department faculty, pertaining to the syllabi. The report will be evaluated in terms of quality of written work, experimental and performance in the viva-voce by internal and/or external examiner(s)
BIN-5001	Internet Programming	To explain Internet Programming concepts and related programming and scripting

		languages. To describe basic Internet Protocols. Explain JAVA and HTML tools for Internet programming. Describe scripting languages – Java Script. Explain dynamic HTML programming.
BIN-5002	Fundamentals of Genomics	The fundamentals of genomics dealing with gene structures and elements are covered.
BIN-5003	Biosafety and IPR	
BIN-5004	Genetics and Evolution	Introduction to the Principles of genetics will help students to acknowledge the phenomena which results in gene diversity and evolution.
BIN 5005	Molecular Modeling and Computer Aided Drug Design	To understand the basic concepts of molecular modeling and computational approaches of drug design.
BIN-6001	Introduction to Perl Programming	Since Bioinformatics relies highly on Biological database and introduction to PERL Programming is necessary for better understanding the architecture of databases.
BIN-6002	Proteins and Proteomics	Sequence Analysis of proteins is integral to Bioinformatics and therefore introduction to the proteins and the concepts will help students to apply bioinformatics tools on biological data.
BIN-6003	Immunology	This course will introduce students to the principles of modern immunology, both at the molecular and cellular levels. Further the course presents the importance of interactions between many of these molecular and cellular entities involved in immunity.
BIN-6054	Project Work	Every student will submit a project report based on the work carried out under the guidance of Department / Allied Department faculty, pertaining to the syllabi of Bioinformatics. The report will be evaluated in terms of quality of written work, experimental and performance in the viva-voce by internal and/or external examiner(

PSO –B.COM

- **Understanding of individual and company accounting system**
- Understand the functions and operations of bank, **technological development in banking and insurance companies**
- Adequate knowledge on income tax provision and implication
- **Application of accounting in professional courses**
- Acquiring human resources managerial skills, aptitude skills, interview skills and over all personality skills **to be** corporate ready
- Take up **entrepreneurship as a career,** adequate knowledge on proposal writing, procurement of financial assistance from MSMEs
- Effective communication skills

Code	Course Title	Outcomes
BCM 101 B	History and Culture of Punjab – I	To introduce the students to the history of the Punjab region
BCM103	Psychology For Managers	To provide broad understanding about basic concepts and techniques of human behaviour to the students
BCM 104	Business Economics-I	To study the basic concepts of microeconomics relevant for Business decision making and helping the students to understand the application of economic principles in business management
BCM 105	Principles Of Financial Acounting	To help students to acquire conceptual knowledge of financial accounting and to impart skills for recording various kinds of business transactions
BCM 106	Commercial Law	To acquaint the students with general Commercial Laws
BCM 107	Principles And Practices Of Management	To help the students in understanding the process of business management and its functions
BCM201 B	History And Culture Of Punjab In The Colonial And Post Independence Times	To introduce the students to the history of Punjab region in modern times

BCM 203	E- Commerce	To provide fundamental knowledge to the students about E-Commerce so that they can better perform in any area of operation and can excel in the field of commerce with IT specialization.
BCM 204	Business Economics-Ii	To provide the knowledge of basic concepts of the distribution and modern tools of macro-economic analysis
BCM 205	Corporate Accounting	To provide knowledge about basic corporate accounting with the relevant accounting standards
BCM 206	Business Laws	To acquaint the students about Business Laws
BCM 207	Human Resource Management	To familiarize the students with the different aspects of managing human resource in the organization
BCM 301	Issues In Indian Commerce	To enable the students to acquire basic knowledge of different issues faced in progress and prospects of commerce in India
BCM 302	Cost Accounting	To acquire conceptual knowledge of cost accounting and elements of cost.
BCM 303	Company Law	To give an understanding of various provisions of Companies Act 2013.
BCM 304	Business Mathematics And Statistics	To help the students in understanding mathematical and statistical tools in business decisions
BCM 305	Banking And Insurance	To acquaint the students with Indian Banking and Insurance industry
BCM-306	Goods And Service Tax	Understanding of Basics of GST
BCH 307	Accounting Theory And Reporting Practices	To provide broad understanding to the students about the basic concepts, theories and policies regarding accounting theory
BCH 308	Development Economics	To give an insight about about the basic concepts, theories and policies regarding economic development and growth
BCH 309	Advertising And Brand Management	Understanding of the principles of advertising and brand management.
BCH 310	Bank Management	Acquainting the students, the concepts of Bank Management and relevant aspects
BCM 401	Security Analysis And Portfolio Management	A comprehensive knowledge about security analysis and portfolio management and equipping for taking profitable investment decisions
BCM 402	Advanced Accounting	Knowledge about advanced accounting problems with the relevant Indian Accounting Standards
BCM403	Auditing And Secretarial Practice	Understanding concepts and issues in Auditing and Secretarial Practice.
BCM 404	Cost Management	Acquainting students with the various methods of cost determination and tools and techniques of cost control
BCM 405	Marketing Management	Understanding the basic concepts, philosophies, process and techniques of marketing
BCM 406	Quantitative Techniques And Methods	Study of various quantitative techniques and methods used in managerial decisions
BCH407	Contemporary Issues In Accounting	Acquainting students with the contemporary issues in accounting
BCH 408	Industrial Economics	Basic knowledge about concepts, theories and policies regarding industrial structure and growth.
BCH 409	Consumer Behaviour	Undersatnding of the process of consumer behaviour, the various external and internal factors that influence consumer behaviour and to apply the concept to the development of marketing strategy
BCH 410	Bank Legislation	To acquire knowledge about the legal & regulatory framework of the banking system and the various laws and enactments
BCM 501	Income Tax Law	To impart basic knowledge of the provisions of Income tax laws in India.
BCM 502	Management Accounting	Basic information about concepts of Management Accounting relevant in Business and helping the students to understand the usage of Accounting in Financial Management
BCM 504	Production And Operation Management	To enable the students to understand the concepts of production and operations management of an industrial undertaking

BCM 505	Entrepreneurship And Small Business	To make the learners understand various issues involved in setting up a private enterprise and develop required entrepreneurial skills in economic development; motivate students to opt for entrepreneurship and self-employment as alternate career options
BCM 506	Financial Markets And Services	To familiarize the students with the traditional and modern financial services.
BCH 507	Strategic Financial Management	This Course aims at enabling the students to understand various financial management concepts and to apply financial management theories and techniques for strategic decision making and informed analysis
BCH 508	Money and Banking	This course exposes students to the theory and functioning of the monetary and banking sectors of the economy
BCH 509	Compensation Management	To enable the students to design and administer a compensation system that rewards employees fairly while satisfying customer demands and permitting the organization to operate profitably
BCH 510	Electronic Banking and Risk Management	To provide an understanding and an appreciation of Electronic Banking and of Risk Management in order to enable the optimum strategy for the handling of risk in banks
BCM 601	Direct Tax Laws	To impart basic knowledge of the provisions of Income tax laws in India
BCM 602	Financial Management	To familiarize the students with Principles and Practices of Financial Management
BCM 603	Issues In Financial Reporting	To provide knowledge to the students about developments in financial reporting, and understanding of reporting issues at the national and international level
BCM604	Social And Business Ethics	To educate about adoption of Business Ethics by organizations to acheive corporate excellence
BCM 605	Operational Research	To understand the concepts and techniques of Operations Research for business decision making and to acquire required skills to solve various problems in OR
BCM 606	Sectoral Aspects of Indian Economy	This course will provide insight into the various sectoral aspects of Indian economy
BCH607	Investment Management	It aims at enabling the students to get theoretical and practical background in the field of investments, financial markets, valuation of investment and different investment strategies
BCH 608	International Economics	To provide basic knowledge to the students about International Economics
BCH 609	Training & Development	This Course aims at educating students regarding the concept of training and development in an organization
BCH 610	Bank Marketing	Acquainting the students of marketing functions in banks, being directed at providing services to satisfy customers financial needs and wants effectively and efficiently

- **BBA (BACHELOR OF BUSINESS ADMINISTRATION)**

BBA101 B	History And Culture Of Punjab – I	To introduce the students to the history of the Punjab region
BBAS102	Business Statistics	To impart the students about the basic knowledge of statistics
BBAS103	Fundamentals Of Information Technology	To provide fundamental knowledge about IT so that student can better perform in any area of operation and can even do excel in the field of commerce with IT specialization
BBAS104	Management Concepts And Practices	To help the students understand the process of business management
BBAS105	Financial Accounting	Teach basic accounting principles and techniques of preparing and presenting the accounts for user of accounting information.
BBAS106	Essentials Of Business Economics – I	Impart knowledge of basic concepts of micro and macroeconomics relevant for Business decision making and helping them to understand the application of economic principles in business management
BBA 201	English And Business Communication Skills	Inculcate the basic Business Communication & Writing Skills including business letters, tender notices, auction notices, public notices; memos and advertisements relating to sales/marketing
BBA 202	Operation Research	Understanding of operations Research and its applications in managerial decisions
BBA 203	Marketing Management	Knowledge of basic concepts, philosophies, process and techniques of marketing
BBA 204	Economics Of Money &	Understanding basic concepts of economics of money and banking

	Banking	
BBA 205	Regulatory Framework For Companies	Impart basic knowledge of the provisions of the Companies Act 2013 with relevant case laws
BBA 206	Direct Tax Laws	Provide basic knowledge of the provisions of direct tax laws in India
BBA 221	English And Business Communication Skills	Improvise Writing Skills on business précis-writing, curriculum vitae & short formal reports and modern Forms of Communication
BBA 222	Project Management	Enable to acquire basic knowledge of different facets of Project Management
BBA 223	Research Methodology	To provide knowledge to the students about fundamentals of business research
BBA 224	Human Resource Management	To familiarize the students with the different aspects of managing human resource in the organization
BBA-225	Goods And Service Tax	Understanding of basics of GST
BBA 226	Database Management System	Basic knowledge of data base management systems
BBA 301	Insurance And Risk Management	The principles and practices followed in the insurance sector; risk management process and applications
BBA 302	International Business	To familiarize students with the concepts, importance and dynamics of international business; mechanics of global business operations and development
BBA 303	Business Environment	To acquaint the students with various environmental factors that create a profound impact on the business organization; analysis and understanding the implications of different macroeconomic policies implemented by the Government.
BBA 304	Entrepreneurship And Small Business Management	To familiarize the budding entrepreneurs with the competencies and qualities of successful entrepreneurs and to help learners understand various issues involved in setting up a private enterprise and develop required entrepreneurial skills in economic development
BBA 305	Consumer Behaviour	The course aims at enabling students to understand the process of consumer behaviour, issues and dimensions, factors that influence consumer behaviour and to apply this understanding to the development of marketing strategy
BBA 306	Sales And Distribution Management	To acquaint the student with the concepts which are helpful in developing a sound sales and distribution policy and in organizing and managing sales force and marketing channels
BBA 307	Financial Markets And Services	To advance the understanding of fundamental concepts of financial markets, financial instruments in various markets and important financial services
BBA 308	Investment Management	To advance the understanding of fundamental concepts of security analyses, and working knowledge of portfolio management and evaluation
BBA 309	Social Security &Labour Welfare	Acquaint the students with the two important aspects of Industrial Relations - Social Security and Labour Welfare
BBA 310	Industrial Relations And Labour Legislations	Acquaint the students with the different aspects of Industrial Relations and the relating labour laws
BBA 321	Business Policy And Strategy	Insight into the strategic planning process in an organizations
BBA 322	Production And Operations Management	Knowledge regarding production and operation management tools, techniques and processes and familiarize students; taking managerial decisions with respect to production function
BBA 323	Social And Ethical Issues In Business	Importance of ethics in business and understanding of issues related to corporate social responsibility and corporate governance
BBA 324	Project Report And Viva Voce	Carrying out short-term projects and report writing followed by evaluation by external examiners
BBA 325	Advertising And Brand Management	An understanding of the basic principles of advertising management & complex constructions in the planning and execution of a successful advertising program; issues and challenges of branding
BBA 326	Marketing Of Services	Enabling students to apply marketing concepts and principles to the unique challenges and opportunities of services marketing to create customer value
BBA 327	Cost Analysis And Control	Provide knowledge to the students about the various components of the cost and techniques of cost control
BBA 328	Accounting For Management	Learning of concepts of cost and management accounting and their application in managerial decision making
BBA 329	Human Resource Planning And Performance Management	Help the students gain conceptual understanding of Human resource planning and performance management within an organization
BBA 330	Compensation Management	Basics of managing compensation systems of an organization and understand its application

PROGRAMME OUTCOMES B.A/B.Sc (General) PROGRAMME

The UG curriculum offers the following outcomes:
- Comprehensive knowledge and understanding of the specific elective subject chosen by the student
- Life-long learning
- Enhancing Intellectual skills
- Imparting practical skills & instrumentation use in practical-based subjects
- Problem analysis
- Technology usage
- Need based computer/mathematical basics (specific to few)
- Enabling the students to prepare themselves for higher education leading to M.A/M.Sc./MCA degree courses
- Environmental ethics
- Team work & leadership skills
- Inculcating communication skills
- Competency to qualify competitive examinations conducted by PPSC/UPSC/SSC

B.Sc with ZOOLOGY as an elective subject		
PO-		• Understand major concepts in all disciplines of Zoology • Solve the problem and think methodically, independently and draw logical conclusions • Understanding of evolutionary & phylogenetic history of various Phyla • Able to study the impact of Zoology on the habitat &environment, society, and development outside the scientific community • inculcate the scientific temperament in the students and outside the scientific community Use of modern tools & techniques, equipments
PSO-		• Gain comprehensive theoretical & practical knowledge of the subject • Understand the DNA Recombinant technology • Testing of hypothesis. PSO-4 • Useof modern Zoological tools, Models, Charts and Equipments • Understand good laboratory practices and safety • Develop research oriented skills • Handling of sophisticated instruments/equipments.
Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
ZOO 101	Biodiversity and Cell Biology I	Basic knowledge about invertebrates, protozoan parasite; biodiversity from Protozoans to Coelentrates and also structure of animal cell and cell organelles
ZOO 102	Biodiversity and Cell Biology II	Knowledge about animal biodiversity from Platyhelminthes to Annelida; connecting link and further know about animal cell organelles, their structure and function
ZOO 201	Biodiversity and Ecology I	Clear and vivid understanding of Non Chordate phyla -.Arthropoda; parasitic forms and insects of economic value like honey bees etc. They also understand about various Ecosystem, their importance, food chain, food web
ZOO 202	Biodiversity and Ecology II	Non-Chordates from Phylum Mollusca to Hemichordata*i.e.* aquatic life, their economic importance; biotic communities, natural resources, environment degradation and basic concepts of wildlife conservation
ZOO 301	Biodiversity and Evolution I	Aquatic vertebrates & amphibious vertebrates; their importance; evolution of animals from preexisting animals
ZOO 302	Biochemistry and Physiology I	Physiology of digestion, respiration, working of heart in human systems
ZOO 401	Biodiversity and Evolution II	Chordates from Class Reptilia to Class Mammalia; poisonous and non poisonous snakes, flight adaptations of birds; biological concept of species, fossils and evolution of man
ZOO 402	Biochemistry and Physiology II	Metabolism of different components of balanced diet *i.e.* Lipids, Proteins; excretory, muscular, nervous and endocrine systems

ZOO 501	Developmental Biology	Process of reproduction and propagation of species; embryogenesis in invertebrates & vertebrates
ZOO 502A	Applied Zoology I - Medical Zoology and Medical Laboratory Technology-I	Knowledge of parasitic diseases & their life cycle; arthropod vectors, their life cycle, and the control measures
ZOO 601	Genetics	Laws, concept of gene, gene modifications, genetic code, genetic defects
ZOO 602A	Applied Zoology II - Medical Zoology and Medical Laboratory Technology-II	Introduction to human defense mechanisms; Antigen, Antibody and various Ag-Ab interactions; sterilization methods, laboratory techniques, staining techniques in a clinical lab or hospital

B.Sc with BIOCHEMISTRY as an elective subject

PO-	
	• Understanding of fundamental biochemical principles • Knowledge of structure and functions of biomolecules and metabolic pathways • Knowledge of structure and functions of various organs of human body • Practical skills in analysis and quantitative estimations of biomolecules, enzyme kinetics • Handling and safe disposal of hazardous chemicals/acids • Use of modern tools & techniques, equipments for gaining practical knowledge
PSO-	• Able to pursue careers in pharmaceutical and biotechnology industry • Practical skills in clinical biochemistry, laboratory management, hospital and community services
Course Outcomes	On completion of the course, students know the scope and importance of the discipline and its objectives

Paper-A (Sem-I)	Carbohydrates and Lipids	Structure, and functional significance of carbohydrates, lipids, proteins, and nucleic acids are major building blocks which constitute all biological systems
Paper-B (Sem-I)	Nitrogen containing Biomolecules	
Paper-A (Sem-II)	Biochemical Techniques	Use of various biochemical techniques to investigate the nature and structure biomolecules
Paper-B (Sem-II)	Enzymes and Bioenergetics	Principles of thermodynamics, nature of enzymes, their mode of action and enzyme kinetics
Paper-A (Sem-III)	Carbohydrate & Lipid metabolism	Learning of digestion and absorption of carbohydrates and lipids and major metabolic pathways
Paper-B (Sem-III)	Protein & Nucleic acid metabolism	Digestion and absorption of protein & nucleic acid and major metabolic pathways pertaining to them
Paper-A (Sem-IV)	Advanced Biochemical Techniques	Principles and applications of cell biology techniques, spectroscopic, radioisotopic& spectrometry techniques
Paper-B (Sem-IV)	Membrane Biochemistry	Structural and functional aspects of membranes; significance of their compositional heterogeneity and various cell functions
Paper-A (Sem-V)	Molecular Biology – I	Storage and expression of genetic information. Membrane structure and function
Paper-B (Sem-V)	Applied Biochemistry – I	General aspects of vitamins, hormones, nutrition, immunology, blood coagulation, muscle contraction and nerve impulse transmission
Paper-A (Sem-VI)	Molecular Biology – II	Storage, expression, and regulation of genetic information that determine life of biological systems
Paper-B (Sem-VI)	Applied Biochemistry – II	Comprehensive knowledge of physiology with emphasis on immune system and techniques in use; blood, muscle, and nerve; demonstrate important techniques being used for analysis of blood

B.Sc with BOTANY as an elective subject

PO-		• Comprehensive knowledge of lower & higher plants and their evolution from algae to angiosperm
		• Economic importance and ecological adaptations of various plant groups
		• Insight into biomolecules & Molecular biology
		• Knowledge about laws of inheritance, genetic interactions & chromosomal aberrations
		• Plant systematic and study of morphological & reproductive characters of plants
		• Vegetative propagation methods & tissue culture practices
		• Using modern Botanical techniques and equipments
		• Inculcate scientific temperament in students
PSO-		• Theoretical & practical knowledge of Botany as a subject
		• Basis of plant life, reproduction(asexual & sexual methods)
		• Knowledge of fossils, process of fossilization
		• Awareness about cultivation, conservation and sustenance of plant biodiversity
		• Knowledge of advance techniques in plant biology like tissue culture, hydroponics, plant disease management, mushroom cultivation, biofertilizer production and horticultural practices
		• Handling of sophisticated instruments/equipments.
Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Paper-A (Sem-I)	Plant Diversity-I	Understand the diversity among Algae & Fungi; Know the systematic, morphology and structure; life cycle pattern ; economic importance of Algae & Fungi
Paper-B (Sem-I)	Cell Biology	Gain knowledge about Cell & its organelles; understand cell division; chromosomal aberrations; DNA types, replication, transcriptin, translation and gene regulation
Paper-A (Sem-II)	Plant Diversity-II	Understand the morphological diversity of Bryophytes &Pteridophytes; economic importance; taxonomic position, occurrence, thallus structure, reproduction of Bryophytes &Pteridophytes
Paper-B (Sem-II)	Genetics	Mendel's laws, mendelian& non-mendelian inheritance, cytoplasmic inheritance, variations, types & their importance, mutations; DNA damage & repair mechanisms
Paper-A (Sem-III)	Diversity of Seed Plants and their Systematics-I	Knowledge of general features, economic importance and study of fossil as well as living gymnosperms of today
Paper-B (Sem-III)	Structure, Development and Reproduction in Flowering Plants-I	Basic body plan and diversity in flowering plants; plant forms; reproductive morphology of plants
Paper-A (Sem-IV)	Diversity of Seed Plants and their Systematics-II	Gradual transition from seedless to seed plants; identification, nomenclature and classification of seed plants – their systematics
Paper-B (Sem-IV)	Structure, Development and Reproduction in Flowering Plants-II	Development and reproduction in flowering plants; secondary growth patterns and abnormalities in structural development; micropropagation techniques
Paper-A (Sem-V)	Plant Physiology-I	Functions and metabolism of plants; diversity of various plant forms with functional differentiation and its biological aspects including biological nitrogen fixation and mineral nutrition
Paper-B (Sem-V)	Plant Ecology	Basic concepts of ecology and the role of environment in causing structural and functional variation in plants
Paper-A (Sem-VI)	Plant Physiology-II	PGRs; details of growth and metabolic processes of the plants; plant development, differentiation and their regulatory mechanism
Paper-B (Sem-VI)	Economic Botany	Insight into plant wealth - medicinal plants, crops, beverages, spices, condiments, sugar, fiber, pulp & oil yielding plants of commercial & economic importance

B.Sc with CHEMISTRY as an elective subject	
PO-	• Comprehensive understanding about the fundamentals of chemistry
	• Exposure to diversified aspects of chemistry so as to acquire a broader outlook of the subject.
	• Stepwise advancement of the subject knowledge

		• Preparation of different laboratory reagents • Skills of handling corrosive, explosive and carcinogenic chemicals • Potential hazards of obnoxious chemicals and the first aid treatment requirements
PSO-		• Understand the existence and structure of matter in universe & different states of matter (solids, liquids, and gases) at molecular, atomic and sub-atomic level • Qualitatively and quantitatively analysis of salt mixtures • Volumetric &titerimetric estimations of compounds • Use & handling of equipments
Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Paper-I (Sem-I)	Inorganic chemistry-A	Principles of structure, bonding, and chemical reactivity with application to compounds of the main group; bonding fundamentals of ionic and covalent compounds, including electro negativities, bond distances and bond energies using MO diagrams
Paper-II (Sem-I)	Organic Chemistry-A	Basic concepts of bonding & mechanism of Organic Reaction; Stereochemistry of Organic Compounds that gives better understanding of organic reactions
Paper-III (Sem-I)	Physical Chemistry-A	Basic concepts and methods of physical chemistry; concept of Ideal and non-ideal behaviour of gases, Maxwell's distribution, joule Thomson effect and chemical kinetics
Paper-IV (Sem-I)	Laboratory Practical	Experimental exposure of how the solutions are prepared and to calculate variables like normality, strength and purity etc.; various parameters like viscosity, surface tension and refractive index of solutions are calculated with the help of instruments
Paper V (Sem-II)	Inorganic chemistry-B	Gain insight in to valance bond theory molecular orbital theory and the concept of hybridization; understand the importance of the elements in the periodic table including their physical and chemical nature and role in the daily life
Paper VI (Sem-II)	Organic Chemistry-B	Basic concepts of some of the important class of hydrocarbons ranging from Alkenes chemistry to Arenes chemistry
Paper VII (Sem-II)	Physical Chemistry-B	Make the concepts & methods of physical chemistry clear and interesting; study thermodynamic process and concept of heat and work
Paper VIII (Sem-II)	Laboratory Practical	Experimental skills to be strengthened relevant to composition of salts or mixtures with the help of chemical reactions are examined to give a real idea of the theoretical chemistry
Paper IX (Sem-III)	Inorganic Chemistry-A	Clarity about the basic concepts of inorganic chemistry such as bonding, oxidation-reduction processes and acid-base properties in inorganic compounds; relating chemistry with typical biological processes and everyday life / industrial processes
Paper X (Sem-III)	Organic Chemistry-A	Training on mechanistic details of Organic reactions of different classes of Organic Compounds during their preparation & Chemical reactions; insight to Heterocyclic Chemistry
Paper XI (Sem-III)	Physical Chemistry-A	At the end of the course students will be able to analyze and evaluate various thermodynamics cycles for energy production and also help us for making the processes more non-polluting and environmental friendly; study on alternative energy sources & transformation methods
Paper XII(Sem-III)	Laboratory Practical	Preparation of solutions of various molar concentrations; concept of the mole; converting moles to grams; converting grams to moles; defining concentration; dilution of solutions
Paper XIII (Sem-IV)	Inorganic chemistry-B	Understanding the general characteristics of the f block elements, to learn the concepts of acids and bases and to study the reactions in non-aqueous media
Paper XIV (Sem-IV)	Organic Chemistry-B	Indepth knowledge about the basic organic chemistry including various named reactions and their mechanisms; phenomenon and mechanistic aspects of the their methods of formation and chemical reactions
Paper XV (Sem-IV)	Physical Chemistry-B	At the end of the course students will be able to analyze and evaluate various thermodynamics cycles for energy production and making the processes more non-polluting and environmental friendly
Paper XVI (Sem-IV)	Laboratory Practical	Experiments to predict the outcome and mechanism of some simple organic reactions, using a basic understanding of the relative reactivity of functional groups

Paper XVII (Sem-V)	Inorganic Chemistry-A	Focus on transition metal group chemistry, different types of bonding involved and the theories explaining the nature of bonding in these transition metal complexes
Paper XVIII (Sem-V)	Organic Chemistry-A	Learning the data interpretation for the structure determination of organic compounds using UV-vis, FTIR, NMR spectroscopy along with the basics of spectroscopy; elucidate the structure of a compound prepared in lab on the basis of spectral data
Paper XIX (Sem-V)	Physical Chemistry-A	Using the principles of quantum theory to measure time; monitor the specific radiation frequency needed to make electrons jump between energy levels
Paper XX (Sem-V)	Laboratory Practical	Learning the synthesis of various inorganic metal ion complexes; application of conductometric measurements, molecular mass determination using colligative properties
Paper XXI (Sem-VI)	Inorganic chemistry-B	Understanding the classification of inorganic compounds and the electronic spectra and magnetic properties of inorganic compounds
Paper XXII (Sem-VI)	Organic Chemistry-B	Use of organic chemistry with metals in organometallic compounds, organic polymers, basic amino acids etc.
Paper XXIII (Sem-VI)	Physical Chemistry-B	Using principles of quantum theory to measure time; monitoring the specific radiation frequency needed to make electrons jump between energy levels
Paper XXIV (Sem-VI)	Laboratory Practical	Experimental learning of various preparations based on different organic reaction like electrophillic substitution, chromatographic separations, etc.
B.Sc with PHYSICS as an elective subject		
PO-		- PO1.**Higher Order Thinking Skills:** Take conscious action after identifying the assumptions that underlie our thoughts and actions, testing the accuracy and validity of those assumptions, and considering our ideas and decisions (intellectual, organizational, and personal) from multiple perspectives. - PO2.Communication **Skills:** Communicating to the world by speaking, reading, writing, listening, and connecting people, ideas, books, media and technology clearly through electronic media directly in English and one of the Indian languages - PO3**. Synergy With Society:** Graduates will seek input from others, resolve differences, and help draw conclusions in a group setting. - PO4. **States person:** Demonstrate sensitive societal concerns, equity-oriented national development, and the ability to act with an informed understanding of issues and participate in community life through volunteering. - PO5**. Ethics:** Graduates will learn to recognize value systems, including their own, to understand the ethical aspects of their decisions and accept responsibility for them. - PO6. **Environment and Sustainability**: Graduates will understand the challenges of the environmental and sustainable development landscape. - PO7. **Self-directed and Life-long Learning:** Graduates will gain the ability to engage in lifelong independent learning in the broadest context of social and technological change. - PO8.Prospective job Opportunities: **Graduates will improve and apply new skills for future employment in diverse areas such as teaching and research through active participation in seminars and internships.** - PO9.Individual and Collaborative-work: **Graduates will be productive as individuals or membership and leadership in diverse multidisciplinary teams and environments.** - PO10. Ability to use Modern Tools: **Graduates will acquire skills for handling sophisticated lab equipment's like telescope, microscope, spectrometer.**
PSO-		- Develop the coherence between theoretical and experimental aspects of physical phenomena. - Understand the existence and structure of matter in universe & different

		states of matter (solids, liquids, and gases) at molecular, atomic and sub-atomiclevel
		• Qualitatively and quantitatively analysis of physical measurements.
		• Numerical analysis of errors and their propagation in measurements; Usage and handling of scientific equipments.
Course Outcomes		Oncompletionofthecourse,studentsknowthescopeandimportanceofthediscipline and itsobjectives
Paper-A (Sem-I)	Mechanics-I	The students would develop an understanding of both Cartesian and Spherical polar co-ordinate systems as well as the dynamics in these systems, Center of mass of a system of particles, Various forces in nature, Motion under central forces, Kepler's Laws, Elastic collision in Lab. and C.M. systems
Paper-B (Sem-I)	Vibrations, waves and EM theory-I	The course comprises of the analytical study of topics such as simple harmonic motion of mechanical and Electrical Oscillations, Damped mechanical and electrical Oscillators, types of damping, determination of damping co-efficient, forced mechanical and electrical oscillators, Normal co-ordinates and normal modes of vibration.
Paper-C (Sem-I)	Electricity and Magnetism-I	The course gives an opportunity to students to understand one of the fundamental interactions of electricity and magnetism, both in terms of separate phenomena as well as an electromagnetic force. The course includes learning of Vector Calculus, physical significance of Gradient, Divergence, curl in Cartesian coordinates ,Stoke's theorem, Gauss's divergence theorem, Coulomb's Law for point charges and continuous. distribution of charges. Concept of electrical images. Calculation of electric potential and field due to a point charge
Paper-A (Sem-II)	Mechanics-II	The course is intended to provide in-depth knowledge of Rigid Body motion, Euler's equations, Galilean transformations and In-variance, Non-Inertial frames. Foucault's pendulum. Michelson-Morley experiment and its results. special theory of relativity, Lorentz transformations, four vector formulation.
Paper-B (Sem-II)	Vibrations, waves and EM theory-II	This course is intended to develop intrinsic interest of students in Wave equation and its solution, Reflection and transmission of waves through physical media. Maxwell's equations, E.M. waves and wave equation in a medium having finite permeability, Energy flow due to EM wave - Poynting vector, Reflection and transmission of EM waves for normal and oblique incidence.
Paper-C (Sem-II)	Electricity and Magnetism-II	The course will provide students knowledge about behavior of various substances in electric and magnetic field. Microscopic form of Ohm's Law, Biot Savart's Law and Faraday's Law of EM induction.
Paper-A (Sem-III)	Statistical Physics and Thermodynamics -I	The course makes the students able to gain comprehensive knowledge of Basics ideas of statistical physics of static and dynamics system, Types of Statistics, Maxwell-Boltzmann, Bose-Einstein, Fermi-Dirac and their distributions laws
Paper-B (Sem-III)	Optics and Lasers-I	The course comprises of the study of the concepts of Interference by wavefront division and amplitude division, Diffraction : Huygen-Fresnal theory and Fraunhofer diffraction, production and analysis of polarized light.
Paper-C (Sem-III)	Quantum mechanics-I	Quantum mechanics provides a platform for the physicists to describe the behavior of matter and energy at atomic and subatomic level. The students in this course will gain knowledge about Fundamentals of wave-mechanics, de-Broglie hypotheses, Uncertainty principle, Quantum mechanical Problems in One and Three Dimensions.
Paper-A (Sem-IV)	Statistical Physics and Thermodynamics -II	This course will introduce students to advanced topics such as Entropy, Brief review of the terms and Laws of Thermodynamics, Maxwell's thermodynamical relations and applications, Joule-Thomson effect
Paper-B (Sem-IV)	Optics and Lasers-II	In this course student will be introduced to fundamentals of Laser systems and applications, Types of lasers, Ruby and Nd : YAG lasers. He–Ne, Dye and CO_2 lasers, Optical fibre based communication system and their Medical applications.
Paper-C (Sem-IV)	Quantum mechanics-II	The course provides students knowledge of Radiative transitions, selection rules Anomalous Zeeman effect, Paschen-Back Effect, Stark Effect. Spin-Orbit coupling, , Franck Condon principle, Raman Effect, spectra in simple and complex system.
Paper-A (Sem-V)	Condensed Matter Physics –I	This course introduces students to topics of Crystal structure: Crystal planes and Miller indices, Bragg's Law, Direct and Reciprocal lattices of SC, BCC and FCC, Brillouin zones, Band theory of solids and free electron theory.
Paper-B (Sem-V)	Electronics-I	The course gives student detailed description to topics Thevenin's theorem, Norton's theorem,. CRO, Classification of materials in terms of band gap, p-n junction diodes, Zener diode, LED, Photo-diode and solar cell, clipping circuits, BJT working and Characteristics.

Paper-C (Sem-V)	Nuclear and Particle Physics-I	This course provides students with detailed description to General properties of Nuclei, Nuclear Models, Radioactive decay, Nuclear Reactions.
Paper-A (Sem-VI)	Condensed Matter Physics –II	This course provide students opportunity to learn advanced topics such as Lattice Dynamics, Magnetic classification of materials (Dia, para, ferro, ferri, antiferro), Dielectric materials, Liquid crystals, Superconductivity.
Paper-B (Sem-VI)	Electronics-II	This course provide students understanding of functioning of devices such as JFET, MOSFET, operational amplifiers and oscillators, Analog and digital circuits.
Paper-C (Sem-VI)	Nuclear and Particle Physics-II	This course discuss various processes describing the Interaction of nuclear radiation with matter, Detectors for nuclear radiation, Particle Physics and accelerators.

B.A./B.Sc with STATISTICS as an elective subject	
PO-	• Understanding of basic concepts of probability and statistics embedded in the course • Application of statistics to a wide range of topics • Using Statistics as a tool for data collection, interpretation and analysis
PSO-	• Knowledge of statistical distributions and Statistical modeling • Techniques of sample surveys • Apply experimental design techniques in real problems • Explain the concepts of Statistical Quality Control and associated techniques. • Construct appropriate Quality Control Charts and Forecasting models useful in monitoring a process.
Course Outcomes	On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I	Probability Theory and Descriptive Statistics-I	Introduction to the basic notations and results of probability theory; various techniques used in summarization and analysis of data;analyseunivariate and bivariate data, discrete and continuous random variables. The focus is on theoretical as well as practical approach. On completion of this course students will be able to: • Explain the concepts of probability. • Understand the concepts of random variables, sigma-fields generated by random variables, probability distributions and independence of random variables. • Calculate probabilities and derive the marginal and conditional distributions of bivariate random variables. • Understand the significance of statistics and probability in the real world. • Calculate and apply measures of location and measures of dispersion grouped and ungrouped data cases. • Understand the nature of statistical data. • Organize and display data by means of diagrams and charts. • Analyze and/or compare different sets of data using charts, diagrams and numerical measures.
Sem-II	Probability Theory and Descriptive Statistics-II	To develop intrinsic interest in statistical thinking; knowledge of foundation to probability theory and statistical modeling of outcomes of real life random experiments through various statistical distributions. On completion of this course students will be able to: • Understand the concepts of distribution theory. • Understand about the types of correlations for bivariate and multivariate data and their uses in real life problems. • Understand weak laws of large numbers and central limit theorem. • Understand the discrete and continuous distributions like Binomial, Poisson, Geometric, Negative binomial, Hypergeometric, Normal, Uniform, Exponential, Beta, Gamma distribution.

| Sem-III | Statistical Inference | To draw statistically valid conclusions about a population on the basis of a sample in a scientific manner; brief revision of basic topics in probability theory as well as single and multiple random variables. Define how to develop Null and Alternative Hypotheses and how Type I Error and Type II Error relate to a hypothesis test. To acknowledge students the use of testing hypotheses for different parameter(s). It provides knowledge to perform hypothesis tests on means and proportions for one or two populations for small as well as large sample. Be able to perform hypothesis tests on means and proportions for one or two populations

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

- Apply various discrete and continuous univariate and multivariate probability distributions in modeling statistical processes.
- Understand how sampling distributions are used in making statistical inferences by defining sampling distribution.
- Estimate unknown parameters of a given probability distribution using different estimation techniques.
- Understand (i) how probability is used to make statistical inferences, (ii) what inferential statistics are used for and (iii)know how to perform point and interval estimation.
- Familiar with the fundamental concepts of random variables as they apply to statistical inferences.
- Understand concepts of sample vs. population.
- Test the hypothesis using suitable statistical test.
- Conceptually map the theoretical basis of tests of simple and composite hypotheses.
- Define null and research hypothesis, test statistic, level of significance and decision rule.
- Distinguish between Type I and Type II errors and discuss the implications of each.
- Explain the difference between one-tailed and two-tailed statistical tests.
- Know the concepts of critical value, critical region, and region of rejection.
- Know the procedure based on type of outcome variable and number of samples.
- Analysis and also perform tests based on t, F, chi square and normal variate |
|---------|----------------------|---|
| Sem-IV | Sample Surveys, Design and Analysis of Experiments | (1) Sampling Theory to understand the advanced techniques of sample surveys and related issues which would be beneficial for the students for their further research

(2) Obtain optimum results about the characteristics of the population with the available sources at our disposal in terms of time, money and manpower by studying the sample values only.

(3) Obtain the best possible estimates of the population parameters.

(4) Provide orientation of statistics while designing statistical experiments. Exposure to various statistical designs leading to the analysis of variance, eliminating heterogeneity of the data and construction of designs will be provided.
On completion of this course students will be able to:

- Understand how data to be collected for related study
- Understand different methods of sample selection and analyzing data
- Understand to find more efficient results on the basis of sample selection.
- Compare the results obtained under different sampling designs.
- Argue the necessity of experimental design to the task of collecting valid and relevant data in order to draw the correct statistical evidence to support a hypothesis.
- Understand to design and conduct experiments, as well as analyze and interpret data. |

		• Understand to check the effects of different factors under study. • Understand different techniques for reducing the experimental error. • Understand the effects of independence or dependence of different factor under study
Sem-V	Demography and Economic Statistics	Understanding of events and phenomena that affect the size and composition of population; develop different measures to keep track of the phenomena that affect populations; provide theoretical as well as practical knowledge about time series, index numbers and laws of demand and supply. On completion of this course students will be able to: • Understand the basic concept of demographic transition. • Understand the consequences of current population trends for future well-being. • Understand how different factor affect mortality, fertility and migration. • Understand to estimate Trend and Seasonal components of time series. • Understand past and future behavior of phenomena under study. • Understand to formulate decisions and policies with the help of index numbers. • Understand to construct index numbers and to estimate the consumer price index numbers. • Understand about the laws of demand and supply and their applicability in economic Statistics.
Sem-VI	Statistical Quality Control and Computational Techniques	Knowledge about S.Q.C.'s skills for the applied scientist who needs to monitor and improve the quality of service or industrial processes; concepts and various techniques used in sampling and design in the context of quality control; knowledge of qualitative and analytical skills necessary to assist in planning, decision making and research within various institutions; applications of linear programming to optimize the utility of limited resources. On completion of this course students will be able to: • Apply various sampling inspection plans to real world problems for both theoretical and applied research • Assess the ability of a particular process to meet customer expectations. • Develop an appropriate quality assurance plan to assess the ability of the service to meet requisite national and international quality standards. • Understand to identify whether a process in statistical control or not. • Identify and develop linear programming models from the verbal description of the real system. • Understand the characteristics of different types of decision-making environments and the appropriate decision making approaches and tools to be used in each type. • Understand the mathematical tools that are needed to solve optimization problems. • Build and solve Transportation Models.
B.A./B.Sc with MATHEMATICS as an elective subject		
PO-		• Comprehensive knowledge in the subject of Mathematics • Qualifying competitive examinations conducted by SSC/UPSC/CAT, etc. • Progression towards higher education leading to M.Sc./MCA degree courses.
PSO-		• Understanding of mathematical structures • Increase in numerical aptitude • Application of qualitative and quantitative knowledge for their future career prospects • Knowledge of fuzzy mathematics for future research
Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives

Paper – I	Plane Geometry	• Transform the axis (shifting of origin and rotation of axis) in two dimensions.
		• Find joint equation of pair of straight line and angle between them and joint equation of angle bisector.
		• Understand the concepts of circle and co-axial family of circles.
		• Learn the concepts of parabola like its tangent, pole, polar and equations of chord of contact etc.
		• Identify the curves represented by second degree equation.
		• Understand the concepts of ellipse, hyperbola and rectangular hyperbola.
Paper – II	Calculus – I	• learn about the concept of inequalities.
		• get familiar with the concept of limits & continuity.
		• know about indeterminate form.
		• find nth order derivative of product of two function using Leibniz's theorem.
		• learn Rolle's theorem, Lagrange's Mean Value theorem, Cauchy's theorem.
Paper – III	Trigonometry and Matrices	• compute powers of complex numbers by using De Moivre`s theorem.
		• learn primitive nth root of unity.
		• understand exponential, logarithmic circular and hyperbolic functions of a complex variable.
		• find the sum of series in AP, GP, binomial series, exponential series with the expansion of sin x , cos x, sinh x or cosh x, logarithmic and Gregory`s series.
		• learnhermitian and skew hermitian matrices.
		• find rank of the Matrix.
		• recognize consistent and inconsistent system of linear equation by the row echelon form of the augmented matrix using rank.
		• learn the characteristic equation, eigen values and corresponding eigen vectors of a given matrix.
		• learndiagonalization of a matrix.
		• learnCayley Hamilton theorem and its use in finding inverse of matrix.
Paper – I	Solid Geometry	• transform the axis (shifting of origin and rotation of axis) in three dimensions.
		• understand the concepts of sphere and co-axial family of spheres.
		• express cylinder as a surface generated by a line moving parallel to a fixed line and through a fixed curve.
		• learn about different kind of cylinders such as right circular, elliptic, parabolic and hyperbolic cylinders in standard form.
		• express cone as a surface generated by a line passing through a fixed curve and a fixed point outside the plane of the curve.
		• learn about different kind of cones such as right circular, elliptic and enveloping cones.
		• understand the concepts of ellipsoid, hyperboloid and paraboloid.
		• identify the curves represented by second degree equation in three variables.
Paper – II	Calculus – II	• find nature of curve & position of double point with the concept of concavity & convexity & multiple point.
		• get familiar with Rectangular &oblique asymptotes.
		• get knowledge of different types of curve with curve tracing & to get familiar with curvature
		• get knowledge of integration of hyperbolic function & integration with numerical techniques.
		• find length of curve using rectification, area under the curve using quadrature & volume of solids of revolution.
		• get knowledge about the concept of summation series.
		• find solution of integral problem by reduction formulae.
Paper – III	Theory of Equations	• solve polynomials and finding g.c.d. of the polynomials.
		• understand Euclid's algorithm, synthetic division roots and their multiplicity.

		• find the relation between roots and coefficient of an equation. • transform an equation into another equation. • solve cubic equations by Cardan`s method. • solve biquadratic equations using Descartes's and Ferrari method. • learn Descartes's rule of signs. • understand Newton`s method to approximate the real root.
Semester – 3 Paper – I	Advanced Calculus – I	• compute limit and continuity of functions of two and three variables. • understand the concept of partial differentiation. • interchange the order of differentiation with the help of Schwarz's theorem and Young's theorem. • solveJacobian of n-functions, Jacobian of function of 'n' variables, Jacobian of composite functions and functional dependence. • find the maxima and minima for the functions of two and three variables. • understand the concept of envelopes and evolutes. • compute vector differentiation, gradient, divergence and curl with their properties and applications.
Paper – II	Differential Equations – I	• solve exact differential equation. • learn first order and higher degree differential equations solvable for x , y , p and Clairaut's form. • understand singular solution as an envelope of general solution. • geometrical meaning of a differential equation and orthogonal trajectories. • solve linear differential equations with constant coefficients and variable coefficients. • solve linear differential equations of second order by changing the dependent variable/ the independent variable. • solve linear differential equations of second order by methods of variation of parameters and reduction of order. • solve simultaneous differential equations.
Paper – III	Statics	• learn about composition and resolution of concurrent forces. • learn equilibrium conditions for coplanar concurrent forces. • learn about like and unlike parallel forces. • reduce a system of coplanar forces to a force and a couple. • learn equilibrium conditions for any number of coplanar non-concurrent forces. • understand the laws of friction and equilibrium of a particle on a rough plane.
Sem– IV Paper – I	Advanced Calculus – II	• understand the concept of sequences and their convergence & divergence, subsequence, Cauchy sequence. • understand the convergence of sequence through Cauchy's first and second theorem on limits, Cauchy-Stolze theorem, Cesaro's theorem. • interpret the concept of a series as the sum of a sequence, and use the sequence of partial sums to determine convergence of a series. • decide whether an infinite geometric series and alternating series converge. • use various convergence tests (geometric series test, divergence test, integral test, comparison tests, alternating series tests, ratio test, and root test) to determine convergence or divergence of series • understand the concept of conditionally convergent series and rearrangement of terms. • decide whether the function is uniformly continuous or not
Sem– IV Paper – II	Differential Equations – II	• find solution of differential equations in Series. • understand Bessel's function and its properties. • understand Legendre's function and its properties. • solve Partial Differential Equations of first order. • learn Laplace Transforms, Inverse Laplace Transforms and Convolution Theorem. • apply Laplace Transforms to solve Integral and Differential Equations.
Sem– IV Paper – III	Dynamics	• Discuss the motion of the particles under constant and variable acceleration • understand the laws of motion; concept of SHM in a straight line while

		•	discussing the periodic motion; curvilinear motion of a particle in a plane
		•	Problems of projectile and motion in a circle; concepts related to work, power and energy; relative motion and velocity of two particles; concepts of linear and angular momentum and impulse of constant and variable forces
Sem – V Paper - I	Analysis — I	•	Identify sets as countable or uncountable; construct a definite integral as the limit of a Riemann sum
		•	Compute definite integrals with the help of fundamental theorem of integral calculus and mean value theorems of integral calculus; beta & gamma functions
		•	Interpret the absolute and conditional convergence of improper integrals; concept of Frullani's integral and integral as a function of parameter
Sem – V Paper - II	Modern Algebra	•	Perform basic computations in group and ring theory; different types of subgroups such as normal subgroups, cyclic subgroups and understand the structure and characteristics of these subgroups
		•	Mathematical concepts studied in abstract algebra – permutation groups, factor groups and abelian groups; homomorphism of groups and rings
		•	Analyze examples of subrings, ideals and quotient rings; prime ideal, maximal ideal and principal ideal
Sem – V Paper -III	Probability Theory	•	Understanding of laws of probability; key concepts of probability theory including Random variables, Probability Density Function and Distribution Functions; apply methods from calculus to derive Mean and Variance for different probability distributions
		•	Methods to find Moment Generating Function, Skewness and Kurtosis; understand the concept of Bivariate Probability Distributions and applications to solve problems
Sem – VI Paper – I	Analysis — II	•	Compute double integrals over a rectangle and bounded non rectangular regions; calculate double integrals by using polar co-ordinates; use the statement of the change of variable theorem for double integrals and illustrate its geometric meaning
		•	Compute triple integrals in rectangular, cylindrical and spherical coordinates; find line, surface and volume integration of vector functions with the help of Gauss divergence theorem, Stokes' theorem and Green's theorem; interpret the concept of pointwise and uniform convergence of sequence and series of functions
		•	Perform Weierstrass M-test, Abel's and Dirichlet's test for uniform convergence; find the interval and radius of convergence of power series; construct fourier series for piecewise monotonic function and odd & even functions.
Sem – VI Paper – II	Linear Algebra	•	Learning vector space, subspace, their basis & dimension; linear transformation, rank & nullity of a linear transformation and algebra of linear transformation
		•	Finding matrix corresponding to linear transformation; eigen values &eigen vectors of matrix; knowledge about Cayley-Hamilton theorem and its applications
Sem – VI Paper – III	Numerical Analysis	•	Solving Analytic problems using numerical approximation
		•	Derive numerical methods for Interpolation, Differentiation, Integration, Ordinary Differential Equations and Matrices; analyses the accuracy of the methods and compare the numerical results with analytic solutions
		•	Solving Transcendental Equations with numerical methods and investigate the convergence of various methods.

B.A with FASHION DESIGNING as an elective subject

Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I	Fundamentals of Clothing	Knowledge about- tools used in garment construction; how to take correct body measurements; garment construction techniques; traditional embroideries of India; drafting and construction of garments
Sem-II	Fabric study and Design concept	Kowledge about cloth fibers and their properties; yarn size and properties; principles and elements of art; different dyes and printing techniques; various seams & seam finishes; fancy and traditional embroidery stitches; figure sketching
Sem-III	Traditional Textiles of India	Acquaint the student with- different types of traditional Indian textiles; knowledge about fashion illustration; drafting of basic blocks; drafting and adaptation of collars and sleeves; designing of garments
Sem-IV	History of Indian and World Costumes	Knowledge about traditional costumes of India; western costumes; different aspects of pattern making; dart manipulation; garment construction
Sem-V	Fashion Designing and Merchandising	Knowledge about different aspects of fashion; different aspects of merchandising; Indian and western designers; sourcing and sales promotion techniques; practicals related to designing and advance construction techniques
Sem-VI	Apparel Industry and Entrepreneurship Development	To acquaint the students about – Entrepreneurship; Quality control, labeling and packaging; Main centers of trade; Special purpose machine in Apparel marketing; practicals related to draping techniques, fashion illustrations, Computer aided designing

B.A with SOCIOLOGY as an elective subject

Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I (003)	Fundamentals of Sociology	Fundamental concepts of Sociology to the beginners of the subject; various terms, concepts, processes that help students to develop sociological imagination, critical thinking and equip them to think imaginatively about society and social issues
Sem-II (0141)	Social Stratification	Understanding social stratification and its functions, basis and significance; comprehensive knowledge about various forms of stratification
Sem-III (0239)	Social Structure and Social Change	Conceptual and theoretical understanding of social structure and social change; equip the students to understand the characteristics and elements of social structure and also the meaning, process and factors of social change
Sem-IV (0339)	Social Institutions	Knowledge about various institutions found in society; meaning and functions of social institutions, their various types and also their significance for individuals and society
Sem-V (0428)	Society in India	Understanding Indian society; introduction to tribal, rural & urban societies; social structure and social institutions in these segments of Indian society; exposing students to the problems of underprivileged in Indian society in this paper
Sem-VI (0537)	Social Disorganisation and Emerging Problems	Social disorganisation and current social problems; understanding the reality of social conditions and also equip them to utilize their knowledge in various theoretical and practical exercises

B.A with PSYCHOLOGY as an elective subject

Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I0037	General Psychology-I	Concepts and historical viewpoints in general psychology; brief understanding of the principles and theories in different areas like nature of psychology which includes goals and branches of psychology, methods of psychology and emotions etc. The course would apprise them of the concept of development of psychology in India and sampling techniques used in psychology.
Sem-II 0138	General Psychology-II	Understanding the principles and theories of personality, motivation, intelligence, etc. The course will apprise them of the concept of growth and development and also introduces them to the elementary statistics
Sem-III 0237	Experimental Psychology -I	General concepts of physiological psychology; understanding the structure and functioning of Nervous System; methods of Psychophysics, types of learning. This course will also gain an insight into experimental and cognitive aspects of Psychology.

Sem-IV 0337	Experimental Psychology -II	General concepts related to Experimental Psychology; understanding the principles and theories of memory, perception, attention and thinking. The Course also introduces the elementary statistics such as Normal probability curve and Chi-square.
Sem-V 0431	Clinical Psychology	Introductory knowledge about Clinical Psychology with emphasis on the nature and criteria of abnormality, viewpoints and causes of abnormal behavior; knowledge about stress and coping; and will get acquainted with elementary inferential statistics.
Sem-VI 0536	Behavioural disorders	Dynamics of some Behavioural disorders and therapies; students will gain an insight regarding Anxiety Based disorders, Mood disorders & Psychotherapies for treating these disorders
	PSYCHOLOGY (Hons.)	**Course Outcomes**
Sem- III 0626	Social Psychology	Understandingrelationship between society & individuals; understanding group dynamics, role of attitudes and leadership behaviour in the society, application of social psychology in day to day life
Sem–IV 0685	Recent Perspectives of Psychology	Basic assumptions, principles and historical roots of modern scientific psychology; theoretical perspective in positive psychology such as Emotional Intelligence, Spirituality and well being, concept of Positive emotions
Sem–V 0723-	Psychological Testing	Psychological Testing, importance and classification of psychological tests and provide them with knowledge and procedure of test construction and standardization. Students also learn about calculating the Reliability, Validity and Norms of psychological tests
Sem–VI 0774	Counseling &Organizational Psychology	Knowledge of concept and approaches of counseling; different aspects of psychology, organizational and educational psychology

B.A with JOURNALISM as an elective subject

Course Outcomes	On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I & II	Journalism	Pedagogy of the Course Work: 80 % Lectures (including expert lectures). 20 % assignments, discussion and seminars so as to provide exposure to students • Introduce the general concepts and historical viewpoint of communication and media to students • Understanding of models of communication; current status and scenario of media industry; definitions, meaning, types and process and elements of communication; models of communication - SR MODEL, Schramm's Model, Mathematical – Shannon and Weaver Model and Lasse well Model ; overview of early press in India, Role of newspaper in freedom struggle, Laws to curb Press Freedom before independence, Press during Emergency and Press in modern times
Sem-III & IV	Print Journalism	This course will introduce students to the basic techniques of sourcing news stairs and features. They will also be trained in the art and science of writing and presenting print media content. Future job options after completing the course: Chief Editor; Senior Editor; Editor; Associate Editor; Assistant Editor; Sub-Editors; Columnist; Reporter; Correspondent; Photographer; Artist; Cartoonist
Sem-V & VI	Media Management , Ethics and Law	The course will introduce the students to the basic structure of media organizations and the regulatory framework and laws of the journalist profession; types of ownership patterns such as Sole Proprietorship, Partnership, Joint Stock Company,Conglomerate, Chain, Trust/ Societies/ Associations,Cross Media Ownerships; Basic principles of management given by Henry Fayol and their applications in media organizational structure of Large Daily Newspaper, Radio and TV Station; Freedom of Speech and Expression, Article 19(1)(a) and Article 19 (2) , Press Council of India , guidelines and ethical code of conduct ;Overview of Right to Information, Contempt of Court, Defamation, Copyright Act, Law of Obscenity, Contempt of Legislature

B.A/B.Sc with INFORMATION TECHNOLOGY as an elective subject

Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I	Paper – A : Computer Fundamentals	The objective of module is to familiarize the students w i t h developments in information Technology and use of computer systems at operating system level and application level.
Sem-II	Paper – B : Computer Programming using C	This course enables the students to familiarize them with problem solving on computers using programming language 'C'.

Sem-III	Paper – A : C o m p u t e r Programming using C++	The objective of the paper is to familiarize the students with steps in problem solving on computers and create skills in programming using C++.
Sem-IV	Paper – B : Data Networks and Web Based Applications	The objective of the module is to familiarize the students with fundamentals of Web-based applications
Sem-V	Paper – A : Database System and VB .NET	The objective of the paper is to create skills in RDBMS and visual Basic. The students should be able to independently develop database projects.
Sem-VI	Paper - B: Linux Administration	The objective of the paper is to familiarize the students with Linux Operating System.

B.A with GEOGRAPHY as an elective subject

Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I	Paper I: Physical Geography – I: Geomorphology	The course aims to familiarize the students with the fundamental concepts in physical geography, essentially geomorphology.
	Paper II: Cartography – I	Introduction to concept of maps and relevance of maps in Geography; elements of Map (Scale and Orientation) and steps in Map making; relief representation.
Sem-II	Paper-III: Physical Geography-II: Climatology & Oceanography	To acquaint the students with the elements and attributes of climatology and oceanography; underscore the role of climate in human life; emphasize the significance of oceans within the global environmental system.
	Paper-IV: Cartography-II	Introduction to the concept of maps and relevance of maps in Geography; elements of Map (Scale and Orientation) and steps in Map making; relief representation and weather symbolization on maps.
Sem-III	PAPER – V: Geography of India	To foster an understanding of the physical and cultural landscape of India and its spatial diversity
	PAPER – VI: Cartography-III	To apprise the students with symbolization of different types of geographical data and depiction of various spatial data; provide training in application of various graphical methods of depicting geographic data; interpret the topographical sheets at different scales.
Sem-IV	Paper-VII: Geography Of Punjab	Understanding of the regional setting of Punjab state in detail through physical and political maps; cultural patterns of the regions; distribution of major crops, industries and transport links in the state; intra-regional variations in select aspects.
	Paper-VIII: Cartography-IV	To apprise the students with symbolization of different types of geographical data and depiction of various spatial data; training in application of various graphical methods of depicting geographic data; train the students to interpret the topographical sheets at different scales.
Sem-V	Paper-IX: World Regional Geography- I	Understanding of the concept of world regions with respect to Land, People, Polity and Economy; the physical and human resource base and their interface with economic development; development problems and prospects.
	Paper - X: Map Projections	Understanding of use of common map projections.
Sem-VI	Paper-XI: World Regional Geography- II	Understanding of the concept of world regions with respect to Land, People, Polity and Economy; the physical and human resource base and their interface with economic development; development problems and prospects.
	Paper - XII: Field Survey Based Report	To acquaint the students with the importance of field work as one of the methodologies in geography; To familiarise the students about pre-field work and post-field work i.e. data processing and analysis.

B.A with SOCIOLOGY as an elective subject

Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I	Fundamentals of Sociology	Introducing the fundamental concepts of Sociology to the beginners of the subject. Study of various terms, concepts, processes will help students to develop sociological imagination, critical thinking and will equip them to think imaginatively about society and social issues.
Sem-II	Social Stratification	Understanding the concept of social stratification and its functions, basis and significance. It also provides comprehensive knowledge about various forms of stratification.
Sem-III	Social Structure and Social Change	Conceptual and some theoretical understanding of social structure and social change. This paper equips the students to understand the characteristics and elements of social structure and also the meaning, process and factors of social change.
Sem-IV	Social Institutions	Understand various institutions found in society. It helps them to understand the meaning and functions of social institutions, their various types and also their significance for individuals and society.
Sem-V	Society in India	Have a detailed view of Indian society. Students are introduced to the tribal, rural and urban societies and they are made aware of the social structure and social institutions in these segments of Indian society.
Sem-VI	Social Disorganisation and Emerging Problems	Gaining knowledge of social disorganisation and current social problems. It also helps the students to understand reality of social conditions and also equips them to utilize their knowledge in various theoretical and practical exercises.

B.A with ENGLISH as an elective subject

Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I	Fluency in English	Introducing literary terms/concepts; Fluency in English; Understanding passages from the anthology Fluency in English for the comprehension, critical acumen and the presentation skills; Learning Letter Writing (Official); Understanding Applied Grammar; Learning Vocabulary
Sem-II	A Collection of Essays, Short Stories & One Act Plays	Understanding Literary terms/concepts; LearningShort Stories and One Act Plays; Learning how to writeparagraphs; Understanding Applied Grammar; Translation from Vernacular into English
Sem-III	William Shakespeare: The Merchant of Venice	Critically sensitive and analytical understanding of literary terms, concepts and genres to the students to develop their ability to appreciate and analyze different lliterary texts; enhancingstudents ability to use grammatical conventions appropriately.; sharpening writing skills; To empower an average student in such a way that English learning becomes a pleasurable endeavour.
Sem-IV	An Anthology of English Verse	To empower the students to read, analyze and write about a text in an independent manner; sharpen their writing skills to write clearly, coherently and cohesively; to explore, discuss and express their views on various topics; to develop basic tools of analyzing a variety of literary texts.
Sem-V	Modern Indian Literature: Poems and Short Stories	To enable them to approach a wide variety of literary texts and genres with critically sensitive and analytical understanding; introducing the basic concepts of literature and empower them to read, analyze and write about a poem, prose essay or drama in an independent manner; finer nuances of literature and language through an integrated approach.
Sem-VI	R.K. Narayan's Novel: The Guide	To introduce the students to the basic concepts of literature and empower them to read, analyze and write about a poem; to develop basic tools of analyzing a variety of literary texts/genres.

B.A with HINDI as an elective subject

Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I	-	Understanding Hindi Poems and Stories; History of Hindi Literature; Studying Hindi Grammar; Learning Hindi Vocabulary
Sem-II	-	Learning Hindi poems; Studying of Hindi literature; Writing letter, essays and paragraphs in Hindi; idioms and phrases; Bhaktikaal- Kabir, Tulsi, Surdaas
Sem-III		To create an interest among the students in the language and literature and also to master the art of communication; Understanding the communication process and method.
Sem-IV		Develop Reading, Writing & Communication skills; Develop knowledge of literary forms Hindi poetry; Develop interest in literature; Use literature to develop their social and moral sense in

		life.
Sem-V	Hindi Literature	Understanding of Hindi literature and idioms and phrases used in Hindi; Acquaint the students to the paragraph writing, essay writing and historical events.
Sem-VI	Hindi script and History of Literature	Understanding of history of Hindi literature; Acquaint the students to Hindi grammar, essay writing and Hindi script.

B.A./B.Sc. with PUNJABI as an elective subject

Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I	-	Study of contemporary Punjabi poems; Understanding Punjabi Ekkangi; Learning Punjabi literature (1901-2000); its types.
Sem-II	-	Study of contemporary Punjabi poems II; Punjabi Novel; Learning Punjabi literature II (1901-200); Learning Punjabi Alochana
Sem-III		To make students familiar with the knowledge about Modern Punjabi poetry and Punjabi Literature; provide knowledge about concept of Punjabi Novels and Safarnama.
Sem-IV		To make students familiar with the ideas about the topic of history of Punjabi Literature; provide knowledge about Punjabi stories of Prominent writers
Sem-V	Punjabi Literature	Understanding of historical development and types of Punjabi literature; Acquaint the students to the historic Punjabi poets and their association, and practice of Punjabi dramatic art.
Sem-VI	Punjabi Science and Literature	Understanding of history of Punjabi (1700 A.D.) and western Punjabi literature; Acquaint the students to the Punjabi language science, Punjabi essays, and contributions of historic Punjabi poets.

B.A with SANSKRIT as an elective subject

Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I	Katha, Niti and Vyakaran-I	Understanding Sanskrit scope, literature and vocabulary, Kahanis, shalokas, sankhyavaachishabad, varana
Sem-II	Katha, Niti and Vyakaran-II	Studying Sanskrit Letter writing; Learning translation; Knowledge of Sanskrit Vyakaran
Sem-III	Shri Bhagwat Geeta and Vyakaran	An increased ability to read and understand Sanskrit texts; familiarity of Sanskrit culture and religious background; Establish literary, cultural, moral and sacramental importance of Sanskrit in the present social context.
Sem-IV	Natak and Vyakaran	A basic familiarity of the history of Sanskrit literature; An increased knowledge and understanding of Sanskrit grammar
Sem-V	Upnishads, Ramayan, Shabdavali, and Vyakaran	The purpose of this paper is to serve as an introduction to the Sanskrit upnishads, Ramayan, grammar, Sanskrit thesaurus, and religious stories.
Sem-VI	Laukik Kavya, Itihaas and Vyakaran	The idea is to introduce the students to the history, grammar, and Laukik kavya in Sanskrit.

B.A./B.Sc. PHYSICAL EDUCATIONas an elective subject

Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I	History of Physical Education and Games;National Institutions of Sports and National and International Governing Bodies of Olympic Games; Basics of Handball	Understanding importance of Physical Education in the Modern Society and its relationship with other subjects; Studying Pre and Post-Independence Development of Physical Education in India; Ancient Olympic Games, Modern Olympic Games, Asian Games; Common Wealth Games. - Learning different sports schemes such as Raj Kumari Amrit Kaur Coaching Scheme,etc. - Understanding fundamentals of Handballs, Marking/layout of court, Rules and regulations, Tournaments and Arjuna Awardees of the game
Sem-II	Cell; Skeletal System; Muscular System; Warming up, Cooling down and Physical Fitness; Health education and first aid; Biological Basis of Physical Education	- Studying Anatomy, Physiology, Structure and Functions of a cell; studying skeletal system, types and names of Bones of the body; muscular system - Understanding warming up and cooling down in sports and physical Fitness - Learning Kho-kho; Studying Health Education and Personal hygiene - Learning First Aid with special reference to Drowning, Dislocation of a joint, Fracture of bone, Sprain and Strain; Studying growth, development.
Sem-III	Psychological Basis of Physical Education;	Develop motor abilities like strength, speed, endurance, coordination, flexibility, agility and balance, as they are important aspects for good performance in different games and sports;

	Motivation; Transfer of Training; Personality; Sports and Socialization; Politics, Economy, Media and Sports Performance; Softball;	techniques and tactics involved in organised physical activities, games and sports. • Providing opportunities to grow and develop as adults to be useful for the society; physical efficiency, mental alertness, leadership and obedience
Sem-IV	Respiratory System; Digestive System; Circulatory System; Blood; Communicable Diseases; Yoga; Basics of Tennis; Sports Injuries	• Acquire knowledge about human body as its functioning is influenced by physical activities; Understand the process of growth and development as participation in physical activities has positive relationship with it. • Develop socio-psychological aspects like control of emotions, balanced behaviour, development of leadership and team spirit through participation in games and sports.
Sem-V	Methods in Physical Education, Athletic Training and Physical Fitness, Kinesiology –	Learning the fundamentals of cricket, types of massage, effect of physical trainings/activities on human health, types of recreation and recreational activities, types of tournaments and various theories of play; importance/significance of an athletic meet, camp, massage, recreation in the modern society and play in physical education and sports.
Sem-VI	The Physiological Basis of Physical Education & Athletics, Effects of Physical Exercise / Training on body systems, Career aspects in Physical Education	• The main aim of teaching Physical education to students is to enable them to approach a wide variety of characteristics and principles of sports training, physiological concepts with critically sensitive and analytical understanding; the effects of physical exercise/training on muscular, respiratory, and circulatory systems of the body and different avenues in Physical Education.

B.A POLITICAL SCIENCE as an elective subject

Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I	Scope of political science and Sovereignty	Understanding scope and relationship of Political Science; Learning The State and its Distinction from Government and Society; Theories of the Origin of State: Social Contract, Historical/Evolutionary • State: Liberal, Marxian and Gandhian View; Welfare State: Liberal and Socialist Perspective; Sovereignty • Studying Political systema) Meaning & Characteristics. Political System
Sem-II	Political culture and Democracy	Understanding Power, Authority, Legitimacy; Studying Political Culture and Political Socialisation • Understanding Rights, Duties and Universal Declaration of Human Rights; Liberty, Equality and Justice; • Understanding Social Change, Democracy and Theories of Democracy
Sem-III	Indian Government and Politics	Basic knowledge of the fundamental elements and institutions of government, politics and processes in India at both the centre and state levels.
Sem-IV	Indian Politics	Understanding of the working of the Indian political system; political parties, party system, elections and voting behaviour.
Sem-V	Comparative political systems (UK and USA)	Introduction to the field of comparative politics; origins and working of two political systems, the UK and the USA with critically sensitive and analytical understanding; concepts of comparative politics.
Sem-VI	International politics: theory and practice	Understandoing meaning, nature, and scope of international politics, meaning, feature and difference between balance of power & collective security; nature of emerging World order, regional Organisations: SAARC and EU and New International Economic Order (NIEO).

B.APUBLIC ADMINISTRATION as an elective subject

Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I	Administrative theory	• Understanding scope of Public and Private Administration; Studying relationship of Public Administration with other Social Sciences; Leaning formal and Informal Organization; principles of Organization: Hierarchy, Span of Control, Unity of Command, Authority and Responsibility • Learning Chief Executive- Types, functions and Role Line, Staff and Auxiliary Agencies
Sem-II	Indian administration	• Understanding Features of Indian Administration, Union Executive (President; Prime

		Minister, and Council of Ministers) and Union Legislature; Studying state Executive; State-Legislature and Centre-State Relations • Learning Union and State Judiciary, Control over Administration and Delegated Legislation • Understanding Cabinet and State Secretariat– Composition, Functions and Role
Sem-III	Personnel Administration (With Special Reference to India)	Understanding of various aspects of public personnel administration, recruitment, training and promotion. Contemporary issues like grievance redressal machinery, corruption, morale etc. concerning administration of human resources in government will also be examined.
Sem-IV	Financial Administration (With Special Reference to India)	Knowledge of various aspects of financial administration like budgeting, auditing, centre-state financial relations etc; awareness on institutions like ministry of finance, union finance commission, parliamentary committees; concept of direct, indirect taxes, deficit financing, public debt.
Sem-V	Local government (with special reference to Punjab).	Understanding of the concept, significance, and evolution of local government in India; Acquaint the students to the pattern and working of divisional and district administration; concept of state control over local bodies, provincialisation and rural-urban relationship of Punjab.
Sem-VI	Development administration (with special reference to Punjab)	Understanding the concept & significance of development administration, features of developed & developing countries, planning machinery at Centre & State level and the emergence of India as a welfare state; understanding the concept, forms, role, and problems of public enterprises; working of select Union Ministries and agencies in Welfare and Development Administration.

B.A HISTORY as an elective subject

Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I	History of India upto 1200 A.D.	• UnderstandingArchaeological findings; inscriptions; coins and monuments. • Studying Harappan Civilization • Understanding life in Vedic Age: Political and Economic; social and religious. • Studying Republics and Kingdom, 600-321 B.C., Jainism and Buddhism Life and teachings • Studying the Mauryan Empire and Ashoka's Dhamma • Understanding Post Mauryan Period • Studying The Gupta Empire • Understanding the Rise of Southern Kingdoms: Administration under Pallavas; Rashtrakutas; Chalukyas • Studying Regional Kingdoms in the North and South Indian States
Sem-II	History of India 1200-1750 A.D.	• Understanding theEstablishment of Turkish rule, The Khaljis and the Tughlaqs: administration • Studying Vijaynagar KingdomEstablishment • Learning Formation of the Mughal Empire and The Afghans: • Studying conquests of Shivaji; Bhakti movement; Sufism.
Sem-III	History of India, 1750-1964 A.D.	To introduce the students to the broad developments in the history of India in Modern times. • To understand the contribution of the Moderates, Extremists and revolutionaries in the struggle for India's independence. • To understand the important movements and Acts passed during the period from 1857 to 1947. Also learnt about the Important Historical Places in India.
Sem-IV	History of The Punjab, 1469-1966 A.D.	To introduce the students to the broad developments in the history of the Punjab from the mid 15th to the mid 19th century i.e. the medieval period • The student is expected to learn the historical significance of the religion, its social background and cultural significance. Also learnt about the important historical places in Punjab which will be able to grasp the ideas of ancient sites and human landscapes in a much meaningful manner.
Sem-V	World history (1500-1870 A.D.)	• The objective of the paper is to introduce the students to the history of the Modern World. To teach rise of parliamentary government: the glorious revolution and its effects, the American revolution: its social, political, and economic causes; its consequences and the Industrial Revolution (1750-1850); causes for its origins in England; new inventions; spread to Europe.
Sem-VI	World history (1871 to 1991 A.D.)	• The paper would also give an understanding of the modern World in the period of European domination. To teach new imperialism 1871-1914: main features; partition of Africa – causes,

		colonization and impact, diplomatic developments in Europe, World War I, Paris peace conference, Russian revolution 1917, nationalism and communism in China, modernization of Japan, Fascism and Nazism and World War II, the great depression of 1929 and post war foundations and the rise of unipolar World.
B.A MUSIC INSTRUMENTAL as an elective subject		
Course Outcomes		On completion of the course, students know the scope and importance of the discipline and its objectives
Sem-I	Knowledge of Ragas and Talas	• Knowledge of Raga, Sangeet and Different Jaties of Ragas of North Indian Music • Elementary knowledge Swara, Saptak, Alankar, Aron, Avroh, Pakad, Thaa • Knowledge of Bhatkhande Notation System • Learning the types of Gat (Razakhani and Maseetkhani) and your own instruments • Understanding Ragas and Talas: Rag Bhopali, Alankars, notation of Tala with dugunlayakaries
Sem-II	History of Indian Music and their contributors	• Learning history of Indian Music of Modern Period • Knowledge of Bhatkhande That Paddhati; Study of Nada • Understanding Matra, Avartan, Sam, Tali, Khali and Vibhag • Studying bols of Mizrab,Tora , Jhala • Knowledge of Laya and Taal in Music • Brief life sketches and their contributions to Indian Music of great masters :- (i) Pt. Ravi Shanker (ii) Pt. V.N. Bhatkhande • Understanding Ragas and Tala :- Yaman , Kafi
Sem-III		• To learnt the Historical development of North Indian Music from 13th to 15th Century • Learns about the elements of Music mentioned in the ancient treatises • To acknowledge the Gharana of Instrumental Music; Appreciate the contribution of Indian musicians to the world of music
Sem-IV		• To understand the Murchhana system and the Classification of Indian Musical Instruments • Understands the structure and notation of the following Ragas - Maseetkhani Gat, Razakhani/Drut Gat, Sultal and Dhamar. • Appreciates the implementation of these ragas in folk songs, film songs, prayer songs; To acknowledge the great masters of music and their contributions in Indian music
Sem-V	Folk Instruments of Punjab, History of sangeet kala and contributions of Indian musicians.	• The objective of the paper is to give the student an understanding of historical development of Indian musical scale and explain & define the different VadanShaillies (Styles) of your own instrument. Acquaint the students to the importance of Laya and Tala in Music, folk instruments of Punjab, scope of instrumental music, notations and description of ragas and Talas, and life sketches and contributions of the great musicians (Ustad Bismillah Khan, Ustad Hafiz Ali Khan and Pt. Nikhil Banerji).
Sem-VI	History of sangeet kala and contributions of Indian musicians.	• The objective of the paper is to give the student an understanding of historical development of Indian Music i.e., from 4th to 13th Century and origin and development of notational system. Acquaint the students to the notation and description of the prescribed ragas and talas, role of the Akashvani and Doordarshan in popularizing instrumental music, and life sketches and contributions of the great musicians (Dr. Lal Mani Mishra, Dr. Panna Lal Ghosh and Smt. Sharan Rani).

INTENDED OUTCOMES OF B.Voc Fashion Technology and Apparel Design

*GEN 101 - Communication Skills
To develop communication skills, discover what business communication is all about and learn how to adapt the communication experiences in life and to the business world.
* GEN 102 - Fundamentals of Information Technology
The students get familiarized with developments in Information Technology, Internet and use of computer systems at operating system level and application level.

Semester-1
FTD 103- Basic Elements of Design
Knowledge of fundamentals of design which are basics for embroideries, prints for interiors and fashion; Various aspects of colour in everyday life; interpretation of the given design with basic style names and the type of surface embellishment.
FTD 104- Basic Sewing Techniques
Understanding of appropriate tool of stitching; Difference between stitching with machine and hand and knowledge of threads and their classification.
FTD 105 - Surface Ornamentation Techniques
Students learn about traditional embroideries of India and understand the practical aspect of hand embroideries and various surface ornamentation techniques.

INTENDED OUTCOMES OF ADD-ONCOURSES

- **Guidance and Counseling**

This course enables the students to understand the meaning, principals, needs and types of guidance and counseling, also helps in gaming a detailed knowledge about various guidance and counseling services.

- **Child Psychology**

Its aim is to introduce the foundations of child development and it also includes guiding the students in understanding various stages of child development, types of development and to gain an inside into various patterns of child psychopathology and childhood disorders.

- **Fashion Designing**

This course enables the students to understand Fundamentals of clothing; Fabric study and design concept; Textile and costume appreciation; Pattern making and advance construction techniques; Fashion desigining and merchandising; Apparel industry and entrepreneurship development

- **Journalism**

The candidate will be able to demonstrate an understanding of: structure and working of news organisationsin Print, Electronic and New media; newspapers and magazines; types of news and feature content in various media; news gathering process; current status of the media industry. **The candidate will be able to perform the following tasks:** Gather and write news; Write feature articles and editorials; Take interviews

- **Video Reporting**

The purpose of the course is to acquaint students to detailed knowledge of camera work, vision mixing and lighting. By the end of the course the students will be fully conversant with the basics of preproduction, production and post-production.

- **HUMAN RIGHTS FOUNDATION COURSE**

The course has an objective of developing a basic understanding and Knowledge of the major historical developments of human rights, major conventions, infringements of human rights, basic conceptions of human rights, different commissions for the protection of human rights and above all to develop tolerance for the rights of others. The students learn about the nature of human rights, the core concepts like dignity, liberty, equality, justice and unity and diversity followed brief introduction about UDHR, major human rights conventions and the importance of right to self determination; violation of human rights; different commission for the protection of human rights