PROGRAMME WISE LIST OF

POs, PSOs AND COs

YEAR: 2018-19

Office of the Controller of Examinations & Admissions

UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA

Techno-City, 9th Mile, Baridua, Ri-Bhoi, Meghalaya-793101

B. SC. BIOTECHNOLOGY

1.PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1. The objective of the Bachelor's Programme in Biotechnology is to increase the understanding of Biological Sciences with the implementation of technology on different living systems like plants, animals and microbes.
PSO2. It provides the opportunity in the field of research and engineering sectors such as food technology, nutrition, medicines, health care, forensic sciences etc.
PSO3. It increases the understanding of the Cytological, Biochemical and Physiological aspects of living organisms as well as the different technical aspects required for their study.
PSO4. It helps in understanding the technical aspects related to the improvement of crop plants and live-stocks and their by finding a solution at the time of population explosion.
PSO5. It helps in understanding the potential of biological agents in obtaining product of human interest and how some of the microbes are industrially exploited for obtaining such products

2.COURSE OUTCOMES (COs)

BBT 101	**Biochemistry and Metabolism**	CO1. To understand the chemical basis of cellular life as well as the internal chemistry of biological systems of animals and plants. (0.15)
		CO2. To get foundational knowledge for higher concepts in the fields of research related to cell biology, molecular biology, genetics, material sciences, regenerative sciences, neuroscience, psychology, kinesiology, etc. (0.25)
		CO3. To understand the actual chemical concepts of biology through the functioning of various body processes and physiology using bio-molecules. (0.30)
		CO4. To understand the concept of enzymes, its kinetics and importance in metabolism and other physiological reactions inside the cell. (0.15)
		CO5. To understand the underlying concept of metabolism of carbohydrates and its importance in animal physiology. (0.15)
BBT 102	**Cell Biology**	CO1. To have the concept of cell theory; structural organization and functions of prokaryotic and eukaryotic cells as well as their comparative account. (0.15)
		CO2. To get an insight into the structural organization and functional roles of important cell organelles including plasma membrane, endoplasmic reticulum, golgi complex, lysosome, peroxisome, vacuoles and mitochondria. (0.25)
		CO3. To understand the structural organization and functional roles nucleus, the controlling centre of a cell. (0.15)
		CO4. To understand the structural organization and functional roles of cytoskeleton that gives specific shape and structure to a cell. (0.15)
		CO5. To get an insight into various stages of cell cycle that regulates proper organization in cellular organisms.
		CO06. It also deals with the abnormalities during cell division process leading to cancer like problem. (0.3)
BBT 104	**Communicative English**	CO1. To enhance reading and writing abilities mainly focusing academic and day to day uses. (0.1)
		CO2. To develop the idea of grammar usage (determiners, tenses, voice, direct and indirect speech, punctuation, word formation idioms and phrases) in developing communicating skills. (0.25)
		CO3. To get an insight into the format of official correspondence, Letter (formal and informal), Circular and Notice. (0.2)

		CO4. To develop the skill in writing Cvs/Resume, Essay, e-mail, Blog, Story and Paragraph which act as a source of communication at different platforms. (0.2)
		CO5. To develop the skill in writing comprehension and precis that enables the students to understand a particular passage and express opinions in their own language. (0.25)
BBT 105	**Biotechnology and Human Welfare**	CO1. To understand biotechnological application in deriving products from plant and animal sources as well as the challenges of extracting compounds in a Comprehensive Product Development Plan. (0.25)
		CO2. To get an insight in to the Biotechnological application in the field of agricultural including developing genetically modified organism (GMO) and transgenic plants. (0.25)
		CO3. To understand the biotechnological in understanding and protecting the environment mainly through the development of biodegradable polymer. (0.15)
		CO4. To get the basics of forensic science in solving crimes, paternity testing using DNA finger printing technique. (0.20)
		CO5. To explore the scope and role of Medical Biotechnology in healthcare industry such as multiple uses of antibodies and vaccines. (0.15)
BBT 106	**Practical on Biochemistry and Metabolism, Cell Biology and Biotechnology and Human Welfare**	CO1. To get the idea of preparing of biochemical solution of different strength including Stock Solution, PPM, Per cent, Normal, Molar and Millimolar solutions.
		CO2. To get an insight into the biochemical methods for the estimation of carbohydrates, proteins and amino acids- both quantitatively and qualitatively.
		It also helps students to develop the idea of separation of plant pigments and amino acids using chromatographic methods of TLC/ Paper chromatography.
		CO3. To understand the different stages of cell division process of mitosis and meiosis– chromosome staining in root tip and flower bud. It also deals with the various other cellular processes like plasmolysis, dialysis etc.
		CO4. To understand the mechanism of fermentaion through the production of ethanol using Baker's yeast as a part of industrial application of microbes.
		CO5. To learn the molecular methods of isolation and analysis of DNA from biological samples using agarose gel electrophoresis.
BBT 201	**Mammalian Physiology**	CO1. To understand the mechanism of digestion and respiration in human. (0.15)
		CO2. To understand the composition and circulation mechanism of blood and the working mechanism of heart in this process. (0.15)
		CO3. To understand the structure of muscles and their contraction and relaxation mechanism. It also gives an insight in to the underlying principle of osmoregulation and modes of excretion. (0.25)
		CO4. To understand the mechanism of nerve impulse and synaptic conduction associated with the process. (0.20)
		CO5. To get an insight in to different endocrine glands, their structure and function as well as the types of hormones released by such glands that control various biological activities in human. (0.25)
BBT 202	**Microbial and Plant Physiology**	CO1. To explore the different groups of microbes like chemolithotrophs, hydrogen oxidizers, methanogens etc. based on their environmental adoptation. (0.25)
		CO2. To understand the different groups of microbes based on their nutritional requirement and mode of nutrition. (0.15)

		CO3. To understand the stages of photosynthesis mechanism like dark and light reactions in plants and microbes. (0.20)
		CO4. The course deals with the study of different metabolic processes in plants and microbial growth and development. (0.15)
		CO5. (0.25) The principle and mechanism of Nitrogen metabolism and fixation is dealt in this course. Along with this different phytohormones and their functions, and mechanism photoperiodism and also explained.
BBT 203	**Environmental Studies**	CO1. To get an insight in to the multidisciplinary nature of environmental studies and its importance in other branches of sciences mainly to create public awareness regarding environment.
		It highlights the natural resources and associated problems in terms of non-renewable sources describing the role of an individual in conservation of natural resources. (0.2)
		CO2. To have the concept of an ecosystem, it's structure and function with special emphasis on energy flow and ecological succession process. (0.2)
		CO3. To have an idea about the concept of biodiversity at global, national and local levels; threats to biodiversity and conservation strategies. (0.2)
		CO4. To get an insight in to the burning issue of environmental pollution describing the concept of pollutants, cause, effects and control measures of air, water, soil, noise, thermal and nuclear pollution. (0.25)
		CO5. To understand the social issues related to the environment describing human role in biodiversity destruction and its conservation as well as the ethical and legal (Environment Protection Acts) issues related to the environment. (0.15)
BBT 204	**Developmental Biology**	CO1.To understand the basics of the process by which the living organisms grow and develop from a single cell. (0.20)
		CO2.To acquaint on how continuity of life is maintained from one generation to another which involves genetic control of cell growth and development leading to cell differentiation and morphogenesis. (0.25)
		CO3. To understand the technical aspects related to artificial insemination and in vitro fertilization. (0.15)
		CO4. To get an insight in to the process of crop development using breeding approaches that can contribute to the efforts of achieving sustainable food security in times of over population. (0.25)
		CO5. To have the concept of embryology that can be helpful in early diagnosis and treating diseases at embryonic level. (0.15)
BBT 205	**Practical on Mammalian Physiology and Microbial & Plant Physiology**	CO1. To understand the principle and mechanism of blood group determination following slide agglutination.
		CO2. To develop the concept related to estimating RBC count in mammalian blood as well as the normal level of haemoglobin which is a part of common diagnostic system.
		CO3. To learn the principle and procedure of separating photosynthetic pigments by paper chromatography method.
		CO4. To understand the mechanism of symbiosis between rhizobacteria and leguminous plant with the help of root nodules.
		CO5. To study the different phases of growth in microbes as well as the effect of physical factors like pH and temperature on their growth.
BBT 301	**Genetics**	CO1. To understand the concept of gene (basic unit of genetic character) and the basic principle of genetics (inheritance of characters) as well as the concept of how mutation in gene can alter characters in an individual. (0.2)

		CO2. To familiarize with concept of inheritance of characters from parental line to the offspring following both Mendelian and non-Mendelian pattern. (0.2)
		CO3. To explore the multifactorial pattern of inheritance including the concept of chromosome structure and variation in chromatin organization. (0.2)
		CO4. To develop the concepts of linkage, sex determination and sex linked inheritance that helps to understand the different sex influenced diseases in man and their pattern of inheritance. (0.25)
		CO5. (0.25) To understand the phenomenon of organellar inheritance, genome evolution and mutation and their influence in hereditary diseases. (0.15)
BBT 302	**General Microbiology**	CO1. To explore the fascinating world of microorganism and their role (both beneficial and harmful) in day to day life. It imparts knowledge on the various phases and contribution of different Scientists how Microbiology established itself as a separate branch of Science. (0.15)
		CO2. To understand the different categories of microbes and sub-microbial groups with their position in the tree of life (classification), their characteristic features and importance. (0.25)
		CO3. To become familiarize with the different technical aspects [isolation, cultivation, observation (microscopy), and identification] of studying microbes. (0.2)
		CO4. To get an insight on the existence of microbes in different spheres of the environment and how the microbes are affected/induced in these environments or *vice versa*. (0.25)
		CO5. To get the basic idea about the industrial application of different microbes for the production of single cell protein, beverages, industrial enzymes and genetically modified (GM) foods. (0.15)
BBT 303	**Chemistry-1**	CO1. To understand the concept of Stereochemistry with the help of Fischer, Newmann and Sawhorse projection and Wedge formulae.
		CO2. To acquaint with various conformations of ethane, butane, ethane-1,2-diol and cyclohexane with reference to relative stability of different conformations in terms of energy difference.
		CO3. To understand the mechanism of addition reactions with the help of hydrogenation, hydrohalogenation, hydroxylation and ozonolysis in alkenes, alkynes, aldehydes and ketones.
		It also help in understanding the mechanism of substitution and elimination reactions among organic compounds.
		CO4. To understand the mechanism of oxidation reactions occurring in aromatic side chain compounds, alcohols, aldehydes and ketones and the rules governing such mechanisms.
		CO5. To understand the mechanism of catalytic hydrogenation, electrolytic and other reduction reactions occurring in aldeydes, ketones, carboxylic acids and their derivatives and nitro compounds.
BBT 304	**Molecular Diagnostics**	CO1. To explore the various immunoassays techniques for molecular level diagnosis of diseases and disorders. (0.15)
		CO2. To understand the different molecular approach for proper diagnosis of different diseases in man. (0.20)
		CO3. To understand the resistance mechanisms developed in different microbes against chemotherapeutic agents and their resistance profile. (0.25)
		CO4. To develop the concept on antimicrobial susceptibility testing methods and to check the antibiotic susceptibility profile of pathogenic microbes. (0.25)
		CO5. To have the concept on application of latest automated instruments for proper identification of pathogenic microbes. (0.15)

BBT 305	**Bioethics and Biosafety**	CO1. To understand the fundamentals of bioethics and ethical issues related to molecular technologies. (0.20)
		CO2. To have the concept on the ethical issues concerned with clinical trials, medical errors, negligence etc. (0.25)
		CO3. To understand the safety issues and ethical use of animals in the laboratory. (0.15)
		CO4. To get an insight into the good laboratory practices in different biological laboratories. (0.25)
		CO5. To get an insight in to the guidelines and precautions on using radioisotopes in laboratory practices. (0.15)
BBT 306	**Practical on Genetics, General Microbiology and Chemistry-1**	CO1. To understand the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, hot air oven, light microscope, pH meter) used in the microbiology laboratory.
		Students also learn the basics of preparing common microbial media used for isolation and maintenance of microbial isolates.
		CO2. To get an insight into the laboratory techniques for the isolation and enumeration of microorganisms from fro different environmental spheres like soil, water and air.
		Students also learn the basics of isolating bacteria in pure cultures by streaking method and determination of bacterial growth curve.
		CO3. To understand the basis of Mendelian principle of inheritance as well as the stages of division in vegetative and reproductive cells.
		CO4. To determine purity of organic compounds by crystallization using polar and non-polar solvents and estimating their optical activity by using polarimeter
		CO5. To learn the use of Kjeldahl apparatus for estimating the melting points of organic compounds.
BBT 401	**Molecular Biology**	CO1. To get an insight in to the molecular basis of biological activity between biomolecules in the various systems of a cell. (0.15)
		CO2. To have the basics of DNA, RNA, and proteins; their structure and interactions within the cell to promote growth, division and development. (0.25)
		CO3. To understand the different mechanism DNA replication adopted in prokaryotic and eukaryotic system.
		It also highlights the factors inducing and inhibiting replication. (0.20)
		CO4. To get an insight in to the wide range of mechanisms required for the regulation of transcription, translation and expression of gene in prokaryotic and eukaryotic system. (0.15)
		CO5. To understand the responses to environmental or physiological changes or alterations of cell function brought about by mutation. It also highlights the molecular basis for cancer and other related abnormalities and the molecular tools and techniques to study such abnormalities. (0.25)
BBT 402	**Immunology**	CO1. To familiarize with the concept of non-specific (innate) and specific (acquired) resistance mechanism developed in man against pathogens and other non-self factors which is the basis of this course. (0.1)
		CO2. To get an insight into the formation, types, organization and functional specificity of different cellular and organ level components conferring resistance in man. (0.25)
		CO3.To familiarize with the nature, types and function of antigens that induce immunological response in man and how the product of this response (antibody, B and T cells) help in neutralizing them (agglutination and precipitation reactions).
		It also deals with the different diagnostic and serological approaches for the study of interaction between an antigen and its specific antibody including Widal Test, immunodiffusion, Immuno-

		electrophoresis, ELISA, RIA etc. (0.25)
		CO4. To have the concept of different mediators/cell signaling molecules (complement, cytokines: interferons, Interleukins, heamatopoetins and chemokines) associated with immunological responses as well as their biological consequences. (0.25)
		CO5. To understand the immune disorders (hypersensitivity, autoimmune disorders, oncogenesis etc.) and induced immunity (vaccination) to overcome such abnormalities. (0.15)
BBT 403	**Chemistry-2**	CO1. To understand the structure of molecule following valence bond approach as well as the concept of resonance in various organic and inorganic compounds. It also gives an idea VSEPR model for predicting shapes of molecules and ions containing lone pairs, sigma and pi bonds.
		CO2. To get an idea on various intermolecular forces like van der Waals forces, Hydrogen bonding and their effects on melting point, boiling point and solubility of compounds.
		CO3. To have the concept on transition elements specifically their electronic configuration, variable valency, color, magnetic and catalytic properties, ability to form complexes and stability of various oxidation states (Latimer diagrams) for with special reference to Mn, Fe and Cu.
		CO4. To understand the concept of Valence Bond Theory with reference to inner and outer orbital complexes of Cr, Fe, Co, Ni and Cu; their structural and stereoisomerism with coordination numbers 4 and 6.
		CO5. To understand the concept of Crystal Field Theory with reference to crystal field effect for weak and strong fields and crystal field stabilization energy.
BBT 404	**Enzymology**	CO1. To have the concept of different terminologies in understanding enzymes as well as their historical perspective. (0.15)
		CO2. To familiarize with basics of enzymes, their kinetics, inhibition and their applications in various fields. (0.25)
		CO3. The course provides the basic understanding of enzyme classification, nomenclature and synthesis. (0.15)
		CO4. The course highlights the concepts of Enzyme kinetics and mechanism of inhibition, units and underlying principle of measurement of enzyme activity. (0.25)
		CO5. The students can earn the knowledge of different applications of enzymes in various industry and medical field. (0.20)
BBT 405	**Entrepreneurship Development and IPR**	CO1. To have the basic concepts on entrepreneurship that can guide the students for becoming a good entrepreneur as they are ushered to know market, excise and other development processes. (0.25)
		CO2. To understand of importance of market concept in entrepreneurship. (0.15)
		CO3. To have knowledge on Intellectual Property in protecting one's idea, concept or a product. (0.15)
		CO4. To have an understanding on Patent, Geographical indication, Copyright, Trademark, and Trade secret to become aware of protecting innovations and noble work. (0.25)
		CO5. To gain knowledge on Indian Patent Law, World Trade Organization and its related Intellectual Property provisions. (0.20)
BBT 406	**Practical on Mol. Biology, Immunology, Chemistry-2 and Enzymology**	CO1. To learn the molecular methods of isolation of DNA/RNA from plant animal and microbial sources and their quantification using UV-VIS spectrophotometric analysis.
		It also helps in learning the method of separating of DNA bands by agarose gel electrophoresis on the basis of their molecular weight.
		CO2. To understand the principle and process of blood group

		determination following slide agglutination test, blood cell count following blood film preparation and immune-diagnostic methods like Radial immunoassay and ELISA.
		CO3. To understand the process of preparations of standard solutions using the concept of primary and secondary standards as well as different units of concentration like molarity, molality, and normality.
		CO4. To familiarize with the process of titrimetric analysis involving Acids-Bases, Redox reactions and Complexometric Titrations.
		CO5. To learn the laboratory method of Isolation and purification of an extracellular enzyme and etermination of Km and Vmax value for that enzyme.
BBT 501	**Industrial Fermentations**	CO1. To have a comparative account on old and recent techniques for screening industrially important microorganisms. (0.15)
		CO2. To understand the principle and types of bioreactor and their industrial application. (0.15)
		CO3. To explore the different production approaches for industrial products like organic acid, alcohol, enzymes, single cell protein etc. (0.20)
		CO4. To understand the principles of food preservation using fermentation processes. Students get acquainted to different kinds of Bioreactors and fermenters used for the purpose. (0.25)
		CO5. To develop the concept for genetic improvement of industrially useful microbes as well as the process and role of enzyme immobilization in food industries. (0.25)
BBT 502	**Recombinant DNA Technology**	CO1. To have the basic concept of rDNA technology as the basis of genetic modification of cellular organisms. (0.15)
		CO2. To understand the types, nature and functions of restriction enzymes that act as the mediators of DNA modification during genetic manipulation process.
		It also gives an insight into the concept of different vectors (plasmids, cosmids, phagemids, and artificial chromosome vectors) that act as carrier of DNA fragment between cellular organisms during genetic modification. (0.25)
		CO3. To understand the methods in molecular cloning process for transformation and delivery of gene with special emphasis on different blotting techniques (Southern, Northern and Western) in hybridization process. (0.20)
		CO4. To get an insight in to one of the most versatile molecular technique of Polymerized Chain Reaction (PCR); principle, types, applications and different PCR based and PCR independent marker (RAPD, RFLP, AFLP) methods in Molecular Biology.
		It also describes the construction and screening genomic and cDNA libraries. (0.25)
		CO5. To understand the application of rDNA technology for the production of human therapeutic agents (insulin, HGH, recombinant vaccines) and transgenic crops. (0.15)
BBT 503	**Plant Biotechnology**	CO1. To familiarize with the techniques of plant tissue culture, mechanisms of gene transfer and various molecular markers. (0.20)
		CO2. To deals with different media preparation methods and study the role of micro- and macronutrients, hormones, vitamins, etc. in plant tissue culture. (0.25)
		CO3. To have the basic understanding of plant tissue culture and its maintenance, callus culture and suspension culture. (0.15)
		CO4. To understand the various vectorless and vector mediated gene transfer methods in plants improvement. (0.15)

		CO5. To learn the principle and use of molecular markers, and their applications in Plant Biotechnology as well as to get the insight in to the concept of somaclonal variation, callus cultur, totpotency, hybrid and cybrids. (0.25)
BBT 504	**Bioinformatics and Biostatistics**	CO1. To understand the contents and properties of bioinformatics databases; perform text- and sequence-based searches, and analyze and discuss the results in light of molecular biological knowledge. (0.25)
		CO2. To learn about the major steps in pair wise and multiple sequence alignment, and execute pair wise sequence alignment by dynamic programming. (0.25)
		CO3. To learn the techniques of predicting the secondary and tertiary structures of protein sequences. (0.15)
		CO4. To become familiar with the use of a wide variety of internet applications, biological database that can be applied in solving research problems. (0.15)
		CO5. To understand the theoretical and practical development of useful tools for automation of complex computer jobs, and making these tools accessible on the network from a Web browser. (0.20)
BBT 505	**Practical on Industrial Fermentation, Recombinant DNA Technology, Plant Biotechnology and Bioinformatics & Biostatistics**	CO1. To understand the design and working principle of a fermenter and its use in the industrial production of solvent, enzymes etc.)
		CO2. To acquaint with methods for the isolation of chromosomal DNA from plant and microbial cells, their qualitative and quantitative analysis as well as to become familiar with the technical process of PCR.
		CO3. To learn the preparation of medium used in plant tissue culture and carry out the process like micropropagation and artificial seed preparation.
		CO4. To learn the methods of statistical analysis (like t, f, z and Chi-square test) of different paired and unpaired data
		CO5. To understand the practical aspects of Bioinformatics including a. operating systems like UNIX, LINUX and Windows; b. bioinformatics databases systems like NCBI/ PDB/ DDBJ, Uniprot, PDB; c. sequence retrieval using BLAST and sequence alignment & phylogenetic analysis using clustalW & phylip; d. protein structure prediction using psipred, homology modeling using Swissmodel, and molecular visualization using jmol.
BBT 601	**Bio Analytical Tools**	CO1. To familiarize with the important techniques necessary for the study and prediction of different processes occurring in microbes and other cellular organisms. (0.20)
		CO2. To understand the importance, principle and types of chromatography techniques and their role in the study of biological system. (0.15)
		CO3. To develop the concept on principle and types of electrophoretic techniques and their role in the study of biological system. (0.15)
		CO4. To get an insight in to the principle and types of centrifugation techniques and their role in the study of biological system.
		It also gives the concept of radioactivity and its application in biochemical and immunological processes. (0.25)
		CO5. To familiarize with a*dvanced techniques* -Protein Crystallization, MALDI-TOF, Mass Spectrometry, Enzyme and Cell Immobilization which are extensively used in Industrial and R & D sectors. (0.25)
BBT 602	**Genomics and Proteomics**	CO1. To have the basic concept of Genomics and proteomics. (0.15)
		CO2. To learn different DNA sequencing methods used in sequencing of genome like manual & automated: Maxam & Gilbert and Sangers method. (0.25)
		CO3. To understand the process of Managing and Distributing

		Genome Data such as Web based servers and softwares for genome analysis: ENSEMBL, VISTA, UCSC Genome Browser, NCBI genome. (0.20)
		CO4. To develop the knowledge of protein structure, function and different methods of analizing proteins using molecular tools and techniques. (0.25)
		CO5. To get the basics of analytical Proteomics and its application. (0.15)
BBT 603	**Environmental Biotechnology**	CO1. To understand the environment around us and the organisms living in normal and extreme conditions of the environment. (0.20)
		CO2. To learn the utilization of the unique properties microorganisms living in the extreme habitats to remediate degraded environment: such as solid and liquid waste management. (0.25)
		CO3. To have the concept of bioremediation with special reference to the remediation of heavy metals and oil spills. (0.25)
		CO4. To get the information on the ethical and safety issues concerned with Biotechnological experiments. (0.15)
		CO5. To know about intellectual property right (IPR), in protecting one's innovations and unique works. (0.15)
BBT 604	**Animal Biotechnology**	CO1. To familiarize with the techniques of animal cell culture, mechanisms of gene transfer and various molecular marker assisted methods in improvement of live-stocks. (0.25)
		CO2. To have knowledge on different cell culture media and their preparation methods. (0.15)
		CO3. To explore the biomedical research involving tissue engineering that aims to grow and replace tissue *in-vitro* using stem cell technology. (0.25)
		CO4. To understand the various vectorless and vector mediated gene transfer methods used in animal cell cloning. (0.15)
		CO5. To get the basics of artificial insemination and embryo transfer techniques for the improvement of live-stocks. (0.20)
		This practical course gives the idea of analytical methods used in biological laboratories, application such methods in solving issues related to the environment as well as the approaches for improving live-stock using technology. After successful completion, this course enables students
BBT 605	**Practical on Bio-Analytical Tools, Genomics and Proteomics, Environmental and Animal Biotechnology**	CO1. To learn the method of protein analysis under reducing conditions using SDS-polyacrylamide slab gel electrophoresis.
		It also helps in understanding the principle and application of chromatography methods for the identification of amino acids and lipids.
		CO2. To acquaint with the use of SNP databases at NCBI and other sites and OMIM database for the genomics level study.
		CO3. To understand the quality/potability of water through bacteriological analysis of water samples.
		It also deals with the laboratory methods for the estimation of Dissolved Oxygen (DO), Chemical Oxygen Demand (COD) and Biochemical Oxygen Demand (BOD) through which the condition of a water body can be determined.
		CO4. To learn the laboratory conditions and the concept of minimal essential growth medium required during animal cell culture.
		CO5. To learn the molecular method for the isolation and quantification of DNA from animal tissue using Agarose Gel Electrophoresis.

M. SC. BIOTECHNOLOGY

1. **PROGRAMME SPECIFIC OUTCOMES (PSO)**

PSO1.The objective of the Master's Programme in Biotechnology is to equip the students to apply knowledge of living organisms and their cellular processes, classification and interaction among themselves, with physical and chemical agents and higher order organisms.

PSO2.The laboratory training in addition to theory is included to prepare them for careers in the industry, agriculture, and applied research where biological system is increasingly employed.

PSO3.Basics and current molecular updates in the areas of Industrial Biotechnology, Fermentation Technology, Agriculture and Environmental Biotechnology are included to train the students and also sensitize them to scope for research.

PSO4.The Masters in Biotechnology Programme will address the increasing need for skilled scientific manpower with an understanding of research ethics involving living organisms to contribute to application, advancement and impartment of knowledge in the field of Biotechnology.

PO5. The study of Master of Biotechnology will impart in-depth understanding of basic aspects of Biotechnology pertaining to industrial applications that will make the students ready to contribute to:

- Better awareness of the major issues at the forefront of the discipline.
- Will possess an in-depth understanding of the area of Biotechnology chosen for research emphasis.
- Awareness of ethical issues in Medical, clinical and animal research and careers options.
- Develop inclination towards own professional goals over a wide range of carrier options expanding from R & D, industrial or Govt. Sector or as an Entrepreneur.

2. COURSE OUTCOMES (COs)

MBT 102	**Cell and Developmental Biology**	CO1. To get the historical basis and concept of cell and developmental Biology. (0.15)
		CO2. To understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles.
		It also gives an idea how these cellular components are used to generate and utilize energy in cells. (0.25)
		CO3. To find answer to the question "how continuity of life is maintained from one generation to another?" (0.15)
		CO4. To explore the biomedical research involving tissue engineering that aims to grow and replace tissue *in-vitro* using stem cell technology. (0.20)
		CO5. To understand the mechanism of plant development/improvement using breeding processes that contribute to the efforts of achieving sustainable food security in times of over population. (0.25)

MBT 102	**Biochemistry**	CO1. To understand the actual chemical concepts of biology through the functioning of various body processes and physiology using bio-molecules. (0.15)
		CO2. To understand the chemical basis of cellular life as well as the internal chemistry of biological systems of animals and plants. (0.20)
		CO3. (0.15) The study of biochemistry helps one to understand the actual chemical concepts of biology. That is the functioning of various body processes and physiology by uses of bio-molecules.
		CO4. To understand the concept of enzymes, its kinetics and importance in metabolism and other physiological reactions inside the cell. (0.25)
		CO5. To understand the underlying concept of physiological processes occuring in plants and animals and their regulations. It also deals with the regulation and synthesis of plant and animals and animal hormones. (0.25)
MBT 103	**Microbiology**	CO1. To explore the fascinating world of microorganism and their role (both beneficial and harmful) in day to day life.
		It imparts knowledge on the various phases and contribution of different Scientists how Microbiology established itself as a separate branch of Science. (0.20)
		CO2. To understand the different categories of microbes and sub-microbial groups with their position in the tree of life (classification), their characteristic features and importance. (0.15)
		CO3. To become familiarize with the different technical aspects [isolation, cultivation, observation (microscopy), and identification] of studying microbes. (0.25)
		CO4. To get an insight on the existence of microbes in different spheres of the environment and how the microbes are affected/induced in these environments or *vice versa*. (0.15)
		CO5. To get the basic idea about the food substrate, microorganisms involved in food spoilage and food preservation methods. It also deals with the basic concept on food borne diseases in humans. (0.25)
MBT 104	**Bioinstrumentation**	CO1.To develop concept on the important techniques necessary for the study and prediction of different processes occurring in microbes and other cellular organisms.
		CO2.To familiarize with the importance, principle and types of chromatography and centrifugation techniques and their role in the study of biological system.
		CO3.To familiarize with the importance, principle and types of electrophoretic techniques and their role in the study of biological system.
		CO4. To get an insight into the concept of radioactivity and its application in biochemical and immunological processes.
		CO5. To familiarize with a*dvanced techniques like* Protein Crystallization, MALDI-TOF, Mass Spectrometry, Enzyme and Cell Immobilization which are extensively used in Industrial and R & D sectors.
MBT 105	**Practical on**	CO1. To understand the different phases of cell-cycle during mitosic and meiosic cell division.
		CO2. To learn the principle and process for quantitative estimation (spectrophotometry) of DNA using (Diphenylamine method), RNA (Orcinol method) and protein analysis (vertical slab gel electrophoresis).
		CO3. To get an insight into the laboratory techniques for the isolation and enumeration of microorganisms from fro different environmental spheres like soil, water and air with special reference to 1.antibiotic producing microbes from soil 2.the effect of physical factors (temperature and pH) on growth

		CO4. To learn the principle and the process concerned with the study of bacteria including: 1. 1. Isolating bacteria in pure cultures by streaking method 2.Determination of growth-phases in bacteria with the help of growth curve 3. Identification of unknown bacteria with the help of specific biochemical activity and staining techniques (Gram's, capsule and flagella staining) 4.determination of sensitivity/resistance in bacteria against different antibiotic substances
		CO5. To get an insight into the biochemical methods for the estimation of carbohydrates, proteins and amino acids- both quantitatively and qualitatively. It also helps students to develop the idea of separation of plant pigments and amino acids using chromatographic methods of TLC/ Paper chromatography.
MBT 201	**Molecular Biology**	CO1. To understand the molecular basis of biological activity between biomolecules in the various systems of a cell.
		CO2. To familiarize with the basics of DNA, RNA, and proteins structure and their interactions within the cell to promote growth, division and development.
		CO3. To have the concept on the responses to environmental or physiological changes, or alterations of cell function brought about by mutation.
		CO4. To get an insight in to the wide range of mechanisms required for gene regulation in different organisms.
		CO5. To understand the molecular basis of cancer and other diseases and the pattern of interaction of animal cells with micro-organisms and viruses. It also deals with the application of recombinant DNA techniques to problems in basic science and biotechnology.
MBT 202	**Immunology**	CO1. To familiarize with the concept of non-specific (innate) and specific (acquired) resistance mechanism developed in man against pathogens and other non-self factors which is the basis of this course.
		CO2. To get an insight into the formation, types, organization and functional specificity of different cellular and organ level components conferring resistance in man.
		CO3. To understand the nature, types and function of antigens that induce immunological response in man and how the product of this response (antibody, B and T cells) help in neutralizing them (agglutination and precipitation reactions).
		CO4. To have the concept of different mediators/cell signaling molecules (complement, cytokines: interferons, Interleukins, heamatopoetins and chemokines) associated with immunological responses as well as their biological consequences.
		CO5. To deal with the different diagnostic and serological approaches for the study of interaction between an antigen and its specific antibody including Widal Test, immunodiffusion, Immuno-electrophoresis, ELISA and RIA. It also gives an idea on immune-disorders (hypersensitivity, autoimmune disorders, oncogenesis etc.) and induced immunity (vaccination) to overcome such abnormalities.
MBT 203	**Genetics**	CO1. To understand basic principles of Mendelian inheritance. (0.15)
		CO2. To study cell division and chromosome segregation during the process. (0.15)
		CO3. To explore the multifactorial inheritance and understand the chromosome structure, chromatin organization and variation. (0.20)
		CO4. To learn the concepts of Linkage, concept of sex determination and sex linked inheritance which help to understand about different sex

		influenced human diseases. (0.25)
		CO5. To gain knowledge about the organellar inheritance, genome evolution, mutation and basis of several hereditary diseases. (0.25)
MBT 204	**Biostatistics, Bioethics and IPR**	CO1. To understand the ethical and safety issues concerned with Biotechnological experiments. (0.15)
		CO2. To understand the basics of intellectual property rights including the concept, types, importance and legal issues related to patents, trademarks, copyright, industrial design and rights, traditional knowledge and geographical indicators. (0.25)
		CO3. To get the idea about the process of granting patent by patenting authorities with reference to types of patent applications, patent filing procedures, patent licensing and agreement and rights and duties of patent owner. (0.20)
		CO4. To have knowledge on the agreements, treaties and international recognition in connection to protect innovations and novel works; It also gives an idea on Indian Patent Act (1970) and recent amendments. (0.25)
		CO5. To understand the guidelines in using radioisotopes in laboratories, safety measures and disposal mechanism. (0.15)
MBT 205	**Practical on Molecular Biology**	CO1. To understand the principle and process of -blood group determination following slide agglutination test, -blood cell count and identification following blood film preparation and -immuno-diagnostic methods like Radial immunoassay and ELISA
		CO2. To acquaint with the principle and process of the immunodiffusion techniques like ODD, SRID, Immuno-electrophoresis and counter-current electrophoresis.
		CO3. To learn the principle and process for the isolation DNA from bacterial, plant and animal sources and their quantification using agarose gel electrophoresis
		CO4. To learn the principle and process of restriction digestion analysis by agarose and polyacrylamide gel electrophoresis (over-expression of proteins by SDS-PAGE.
		CO5. To learn the principle and process for the isolation and cloning of plasmid DNA and their amplification by PCR (RAPD analysis).
MBT 301	**Genetic Engineering**	CO1. To have the basic concept of genetic engineering and r-DNA technology laying the basis of genetic modification of cellular organisms.
		CO2. To develop the concept about the types, nature and functions of restriction enzymes that act as the mediators of DNA modification during genetic manipulation process.
		CO3. To get an insight into the concept of different vectors (plasmids, cosmids, phagemids, artificial chromosome vectors) that act as carrier of DNA fragment between cellular organisms during genetic modification.
		CO4. To understand the different blotting techniques (Southern, Northern and Western) hybridization process as well as the construction and screening genomic and c DNA libraries.
		CO5. To have concept about the most versatile molecular technique of Polymerized Chain Reaction (PCR); its types, applications and different PCR based and PCR independent marker (RAPD, RFLP, AFLP) methods in Molecular Biology.
MBT 303	**Plant and Animal Biotechnology**	CO1. To familiarize with the techniques of plant and animal cell culture, mechanisms of gene transfer and various molecular marker assisted methods in improvement of live-stocks and crop plants. (0.25)

		CO2. To have knowledge on different tissue and cell culture media and their preparation methods. (0.15)
		CO3. To explore the biomedical research involving tissue engineering that aims to grow and replace tissue *in-vitro* using stem cell technology. (0.15)
		CO4. To understand the various vectorless and vector mediated gene transfer methods used in plant and animal cell cloning. (0.20)
		CO5. To have the basic understanding of plant and animal tissue culture and its maintenance as well as to get the insight in to the concept of callus and suspension culture, somaclonal variation, callus cultur, totpotency, hybrid and cybrids. (0.25)
MBT 303	**Omics and Bioinformatics**	CO1. To understand the contents and properties of bioinformatics databases; perform text- and sequence-based searches, and analyze and discuss the results in light of molecular biological knowledge. (0.25)
		CO2. To learn about the major steps in pair wise and multiple sequence alignment, and execute pair wise sequence alignment by dynamic programming. (0.15)
		CO3. To learn the techniques of predicting the secondary and tertiary structures of protein sequences. (0.15)
		CO4. To become familiar with the use of a wide variety of internet applications, biological database that can be applied in solving research problems. (0.20)
		CO5. To understand the theoretical and practical development of useful tools for automation of complex computer jobs, and making these tools accessible on the network from a Web browser. (0.25)
MBT 304	**Food and Industrial Biotechnology**	CO1. To understand the role of biotechnology in food production, food processing, and food security. (0.15)
		CO2. To learn about the conditions under which the organisms responsible for the deterioration of food can be inactivated, killed or made harmless. (0.15)
		CO3. To understand the principles involving food preservation via fermentation processes.
		CO4. To have knowledge for improving the industrially useful microorganisms genetically and to understand the process and role of enzyme immobilization in food industries. (0.20)
		CO5. To get an insight in to the principles and current practices of processing techniques and the effects of processing parameters on product quality. It also deals with the pre- and probiotic microorganisms and their importance. (0.25)
MBT 305	**Practical on Genetic Engineering, Plant, Food and Industrial Biotechnology**	CO1. To acquaint with methods for the isolation of chromosomal DNA from plant and microbial cells, their qualitative and quantitative analysis as well as to become familiar with the technical process of PCR. It also helps in learning the technique of restriction digestion of DNA and its separation by Gel Electrophoresis and Protein profiling using SDS PAGE.
		CO2. To learn the preparation of medium used in plant tissue culture and carry out the process like micropropagation and artificial seed preparation.
		CO3. To understand the design and working principle of a fermenter and its use in the industrial production of solvent, enzymes etc.).
		CO4. To learn the different laboratory methods to determine quality of food products (MBRT and Alkaline phosphatase test to check the efficiency of pasteurization of milk).

		CO5. To understand the practical aspects of Bioinformatics including a. operating systems like UNIX, LINUX and Windows; b. bioinformatics databases systems like NCBI/ PDB/ DDBJ, Uniprot, PDB; c. sequence retrieval using BLAST and sequence alignment & phylogenetic analysis using clustalW & phylip; d. protein structure prediction using psipred, homology modeling using Swissmodel, and molecular visualization using jmol.
MBT 401	**Environmental Biotechnology**	CO1. To understand the environment around us and the organisms living in normal and extreme conditions of the environment. (0.20)
		CO2. To learn the utilization of the unique properties microorganisms living in the extreme habitats to remediate degraded environment: such as solid and liquid waste management. (0.25)
		CO3. To get the information on the ethical and safety issues concerned with Biotechnological experiments. (0.15)
		CO4. To get an insight into how microbes affecting aquatic health and what are the different approaches for monitoring and maintaining potability of water.
		CO5. To familiarize with the important environmental roles played by microbes specifically in the light of sewage treatment, litter decomposition, maintenance of soil health and at the same time in metal recovery process (bioleaching).
MBT 402	**Research Methodology**	CO1. To understand the concept, types and criteria of research, addressing the identification of a research problem, objectives, designs and methodology to carry out a research work. (0.20)
		CO2. To get the basic knowledge on qualitative research techniques and on the collection and analysis quantitative data. (0.15)
		CO3. To get an insight in to formulating a hypothesis, data analysis for hypothesis-testing as well as formulation of research synopsis and report. (0.25)
		CO4. To have adequate knowledge on measurement and scaling techniques for analyzing research outcomes thereby enabling them in justifying their findings. (0.15)
		CO5. To develop data analytics skills and meaningful interpretation to the data sets so as to solve the business/Research problem. (0.25)
MBT 405	**Practical on Environmental Biotechnology**	CO1. To understand the quality/potability of water through bacteriological analysis of water samples.
		CO2. To learn the laboratory methods for the estimation of Dissolved Oxygen (DO), Chemical Oxygen Demand (COD) and Biochemical Oxygen Demand (BOD) through which the condition of a water body can be determined.
		CO3. To learn the estimation of nitrate/phosphate/silicate content of waste water which can make an aquatic system eutrophic.
		CO4.To study of different physico-chemical parameters (pH, water holding capacity, soil moisture content, soil organic carbon, soil organic matter) of soil thereby to assess the nature of a particular soil.
		CO5. To study different enzymatic processes carried out by microbes in soil including amylase and cellulase activity during decomposition of litter.

B.SC. BOTANY

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

2. COURSE OUTCOMES (COs)

BSB-101	**Phycology and Lichen(Theory)**	CO1. (0.25)To get knowledge about different classes of algae, their habitat, habit, reproduction and life history.
		CO2. (0.25) To learn about the proper documentation of algae of N.E. India
		CO3.(0.15) Understand the role of algae in the environment biotechnology and industry
		CO4. (0.15)Blue green algae are used as bio fertilizer. The student will learn how to identify and culture the algae and also their practical aspects.
		CO5. (0.2)To learn the basic knowledge of various classes of lichen, their habit, habitat, classification, reproduction and ecological significance
BSB-102	**Archegoniate and Palaeobotany (Theory)**	CO1. (0.25) To give the students some basic idea about the origin, evolution, classification of the group of Bryophyta, its comparative morphological, anatomical and reproductive differences within the group.
		CO2. (0.125) Deals with the basic understandings of the origin and evolution of pteridophytes.
		CO3. (0.125)The students will have a understandings of classification of vascular cryptogams, morphological, anatomical and reproductive diversity of pteridophytes.
		CO4. (0.25) To give students some basic understandings of classification and salient features of major taxa of Gymnosperm,its characteristics, affinities and relationships among different taxa and finally the economic importance of Gymnosperms.
		CO5. (0.25) It was designed to give an understanding of fossilization process. General account, anatomy and reproduction of Psilophyta (*Rhynia*), Lepidodendrales (*Lepidodendron*) and Sphenophyllaes (*Sphenophyllum*), Cycadofilicales (*Lyginopteris*), Bennettitales(*Williamsonia*) and Cordaitales (*Cordaites*)
BSB-103	**Phycology and Lichen(Practical)**	
BSB-104	**Archegoniate and Palaeobotany(Practical)**	
BSB-201	**Anatomy, Palynology and Embryology (Theory)**	CO1. (0.2)Study of anatomy will help students to understand the structural adaptations of plants with respect to diverse environmental conditions. It also helps them to distinguish between monocots, dicots and

		gymnosperms. Such a study is linked to plant physiology. Hence, it helps in the improvement of food crops.
		CO2. (0.2) By studying plant tissues and cells they will learn how the plants constructed and how they work. These studies are very important because they lead to be a better understanding of how to take care for plants and fight plant diseases.
		CO3. (0.2)Study of embryology will help students to understand the growth and development of a species and it will help to know how it evolved and how various species are related. In various field of research work embryology will help to link various species on the phylogenetic tree of life. It also helps to understand other branches of biology like genetics, cytology, physiology, evolution, etc.
		CO4. (0.2) By studying palynology students will learn about the past vegetation (land plants) and marine and freshwater phytoplankton communities, and so infer palaeoenviromental and palaeoclimatic conditions.
		CO5. (0.2)Forensic palynology is a branch where palynology is beneficial to criminal investigators in revealing the history of evidence based on pollen and spore traces. Palynology has several unique uses in the modern world. Thus study of palynology ha a plethora of potential career opportunities.
BSB-202	**Instrumentation and laboratory techniques (Theory)**	CO1. (0.25)To get the knowledge of different instrument used in the laboratory .
		CO2. (0.2)To know about the chromatography.
		CO3. (0.15)It will provide the knowledge of sterilization, fixative and staining technique and different concept of solution
		CO4. (0.2) Students can learn about the process of herbarium technique and future preservation of the species as many of the species are becoming rare day by day due to deforestation, over-collection of the lay people, building activities etc.
		CO5. (0.2)They can make different types of hebarium sheets particularly for medicinal plants locally available on their area, keeping them in safe, further they can deliver their lectures in schools and colleges and can teach them about the dry specimens keeping in the herbarium sheet to prevent any damage and also for their further need.
BSB-203	**Anatomy, embryology and palynology(Practical)**	
BSB-204	**Instrumentation and laboratory techniques(Practical)**	
BSB-301	**Angiosperm Taxonomy (Theory)**	CO1. (0.2) Understand the basic idea of flowering plants and their systematic position or classification.

		CO2. (0.2)Students may visit the forest area for collection of plants and identify with upto their knowledge learnt at the class
		CO3. (0.2)Students may know the uses of unknown plants used by the tribal people of the society with ethnobotanical uses.
		CO4. (0.2) Students may visit some research organsaions like BSI, NBRI, FRI and can gather knowledge about the herbarium technique with up to date nomenclature of the plant
		CO5. (0.2)They can apply for Research fellowship for Ph. D and other higher Degree in Plant Taxonomy in Universities and Deem Universities for their future employment.
BSB-302	**Mycology and Plant Pathology (Theory)**	CO1. (0.2) Understand history of Mycology, Fungal cell structure and classification, reproduction, growth and nutrition. Economic importance of fungi.
		CO2. (0.2)Morphology and reproduction of few important fugal genera.
		CO3. (0.1)Understanding history of Plant pathology.
		CO4. (0.25)To get knowledge about Plant diseases caused by fungi and their control measures:
		CO5. (0.25)Plant disease: symptoms of Plant Diseases viral, fungal and bacterial.
BSB-303	**Cytology, Genetics and Plant Breeding (Theory)**	CO1. (0.2) Genetics is a branch of biology that is used for the study of the mechanism of heredity and variation
		CO2. (0.2) Genetics, in fact provides the modern paradigm (a prototype) for whole of biology.
		CO3. (0.2)Cytogenetic tests are often used in the diagnoses of genetic diseases and in parental diagnostics.
		CO4. (0.2)To produce a health forecast by analysing database of genetic and cell biology information.
		CO5. (0.2) It is also important for the researchers or biologists in generating vaccines, medicines etc.
BSB-304	**Angiosperm Taxonomy and Mycology (Practical)**	
BSB-305	**Plant Pathology, Cytology and Genetics (Practical)**	
BSB-306 (SEC-I)	**Biofertilizer (Theory)**	CO1. (0.25)To get the knowledge of different microorganism involve in improving soil health .
		CO2. (0.25) It will also give the knowledge of organic farming.
		CO3. (0.25) Students will learn different techniques to produce biofertilizer
		CO4. (0.25) Students will learn about the methods of isolation and inoculum production of VAM, and its influence on growth and yield of crop plants.
BSB-401	**Microbiology (Theory)**	CO1. (0.2)To get knowledge about the Introduction and different scopes of study in various microbial field
		CO2. (0.2)To attain knowledge about the Germ theory of disease and koch's postulates. Control of microorganisms, Microbial nutrition, different culture media, isolation of microorganisms, pure culture concept, methods of preservation.
		CO3. (0.2) Basic knowledge about soil microbiology, air microbiology and water microbiology
		CO4. (0.2)Understand the basic concept of food microbiology, microbes responsible for spoilage and poisoning of food and precautions for preservation of food.

		CO5. (0.2)To get knowledge about utilization of microorganisms in dairy industries and ethanol production.
BSB-402	**Plant physiology (Theory)**	CO1. (0.2)Understand the basic physiological relationship of Plant, water and soil and translocation of organic solutes
		CO2. (0.2) Understand the basic biochemical and physiological knowledge about the utility of different minerals present in the soil for the growth and development of plants and the deficiency symptoms of micro and macro nutrients to plants
		CO3. (0.2)Understand the basic knowledge about the Physiology and biochemistry of photosynthesis, chemosynthesis and respiration i.e., breakdown of sugar
		CO4. (0.2)Understand detail knowledge about the physiology of flowering, scenescens and abscission in plants and dormancy of seed
		CO5. (0.2)Basic knowledge about the physiological role of phytohormones in the growth and development of plants
		CO6. Basic knowledge about the Biochemistry of enzymes
BSB-403	**Ecology and Phytogeography (Theory)**	CO1. (0.2)To highlight the students with some basic understandings of plant ecology and ecosystem, food chain and its types, food webs, energy flow in an ecosystem. Understanding on habitat and niche, types of niche.
		CO2. (0.2)Deals with the understanding of plant population and community ecology, various attributes of population and community. The students will have an understanding on coexistence, intra-specific interactions, and interspecific interactions among various population, ecological succession and its significance
		CO3. (0.2)Deals with the understanding of phyto-geographical regions of India, detail idea about the floras of North-East India. Understanding on mechanism of migration and barrier of plant distribution and also about biodiversity hotspots and endemism, the unit also give the preliminary understanding on pollution its cause and remedies.
		CO4. (0.2)Deals with the understanding of biodiversity, its concept and status in India. It will give an understanding of loss of biodiversity, its causes and management and also various strategies involved in the conservation of biodiversity.
		CO5. (0.2)To give an understanding on protected area regime, acts and legislations.
BSB-404	**Microbiology and Water relations(Practical)**	
BSB-405	**Plant Physiology and Ecology (Practical)**	
BSB-307(SEC II)	**Nursery and Gardening (Theory)**	CO1. (0.25)It will provide the knowledge, how to open a nursery.
		CO2. (0.25)To know about the different method of gardening and land scaping.
		CO3. (0.25)To get the knowledge of cultivation, storage and marketing of various vegetable crops
		CO4. (0.25) To get knowledge about how to develop different types of garden and their management strategies.
BSB-501	**Pharmacognosy (Theory)**	CO1. (0.2)To get knowledge about the history and scope of pharmacognosy, traditional and alternative systems of medicine
		CO2. (0.1)To get knowledge about Tridosha concept, Nutraceuticals &Cosmeuticals
		CO3. (0.1)Basic knowledge about Drug adulteration, Methods of drug evaluation.

		CO4. (0.2)To get knowledge about occurrence, distribution cultivation, microscopic characters, constituents and uses of root rhizome drugs, stem, bark, leaf flower and fruit drugs.
		CO5. (0.2)Understand the various branches of Ethno-botany, Methodology, importance of Ethnobotany in research and conservation.
		CO6. (0.2) Basic knowledge about various ethnic Societies of North-East India and use of some plant by the tribes.
BSB-502	**Economic Botany (Theory)**	CO1. (0.2)Students may know the plant kingdom and economic importance of the various categories of plants such as cereals, beverages, pulses, timber, fibers and sugar yielding plants.
		CO2. (0.2)Now a days Ethnobotany is very important part of economic botany. Hence students may gather knowledge about the traditional knowledge of the plants used by the primitive people of the society
		CO3. (0.2)To gather knowledge about the major spices, condiments, narcotics, mastigatories and funmitories, beverages.
		CO4. (0.25)To gather knowledge about the different types of ornamental plants. Plants used as avenue trees for shade, pollution control and esthetics.
		CO5. (0.15)To gather knowledge about the plants used in Sericulture
BSB-503	**Pharmacognosy (Practical)**	
BSB-504	**Economic Botany (Practical)**	
DSE-I	**Stress Biology (Theory)**	CO1. (0.2)Understand the basic concept of stress physiology of plants
		CO2. (0.2)To learn about the physiological effect of various abiotic stress to plants such as Water stress; Salinity stress, High light stress; Temperature stress
		CO3. (0.2)To learn the physiological effect of various biotic stress
		CO4. (0.2)To understand the developmental and physiological mechanisms that protects plants against environmental stress. Adaptation in plant to various stress
		CO5. (0.2)Understand about reactive oxygen species: Production and scavenging mechanisms.
DSE-I	**Stress Biology (Practical)**	
DSE-II	**Plant Breeding (Theory)**	CO1. (0.2) The study of plant breeding is necessary for changing the traits of plants in order to produce desired characteristics.
		CO2. (0.2)The knowledge of how to improve the quality of nutritional crop products for humans and animals can be initiated by plant breeding techniques.
		CO3. (0.2)Plant breeding technique can be used for producing disease resistant plants.
		CO4. (0.2) New plant varieties can be produced by plant breeding.
		CO5. (0.2) International development agencies believe that breeding new crops is important for ensuring food security by developing new varieties that are higher yielding.
DSE-II	**Plant Breeding (Practical)**	
BSB 601	**Molecular Biology and Bioinformatics (Theory)**	CO1. (0.2) Molecular biology is the basic science that has as its goal an explanation of life processes at the subcellular and molecular level.
		CO2. (0.2) Molecular biology deals with nucleic acids and proteins and how these molecules interact within the cell to promote proper growth, division, and development.

		CO3. (0.2) This course will emphasize on the molecular mechanisms of DNA replication, repair, protein synthesis, mutation etc.
		CO4. (0.2)Developments in molecular biology have opened new areas of study and provided powerful techniques that are revolutionizing the pharmaceutical, health, and agricultural industries.
		CO5. (0.2) The knowledge of bioinformatics involves in analysis of plant and human genome, identification of targets for drug discovery, the study of structural and functional relationships and molecular evolution.
BSB 602	**Applied Botany (Theory)**	CO1. (0.2)To get basic knowledge on plant breeding
		CO2. (0.2)To get basic knowledge on mushroom cultivation
		CO3. (0.2)Understanding application of Biotechnology in conservation of plant generic resources
		CO4. (0.2)Importance of tissue culture and it's application
		CO5. (0.2) Understanding the role of plant growth regulators in Agriculture and Horticulture and mode of applications of plant growth regulators.
BSB 603	**Molecular Biology (Practical)**	
BSB 603	**Applied Botany (Practical)**	
DSE-III	**Plant Resourse Utilization (Theory)**	CO1. (0.2) By studying "Plant resource utilisation" students will learn about different dimensions of plant identification as a resource for self-sustenance, their domestication, commercialization based on the need and induction of modification using modern techniques.
		CO2. (0.2) They will learn about the utilization of wild plants as it is more limited and how to improve it for the new need and imperatives of mankind.
		CO3. (0.1) Study of medicinal plants would help them in research and development of newer organic drugs that would help to minimize adverse effect that are usually evident in synthetic and semi-synthetically processed drugs. Thereby proving to be a boon to medical science.
		CO4. (0.2)They will learn about the different conservation processes like in-situ and ex-situ conservation of plants that are going to be extinct very soon due to biotic, abiotic and anthropogenic causes.
		CO5. (0.2) Study of plant resource utilisation will enhance their specific knowledge and technological skills in converting the rich bio-resource into economic wealth.
		CO6. (0.1) Students can discover wild tea germplasm using genetic markers for developing better variety of tea with better quality, productivity and resistance to pests and stress conditions. India is major tea producer and Assam produces 13% tea in the world, hence of extreme economic importance.
DSE III	**Plant Resourse Utilization (Practical)**	
DSE IV	**Horticultural Practices and Post Harvest Technology (Theory)**	CO1. (0.2)It will give the knowledge , how to identify the different important plants.
		CO2. (0.2) To know about the production of different fruit and vegetable crops.
		CO3. (0.2)To know about the different horticultural technique of weed control and irrigation.
		CO4. (0.2)To know about the different method of propagation.
		CO5. (0.2) To get the knowledge of post harvest technology of fruits and vegetables.
DSE IV	**Horticultural Practices and Post Harvest Technology (Practical)**	

M.SC. BOTANY

1. **PROGRAMME SPECIFIC OUTCOMES (PSO)**

PSO1.

PSO2.

PSO3.

PSO4.

PSO5. Agents and interferons.

2. COURSE OUTCOMES (COs)

MSB-101	**Lower Cryptogams**	CO1. (0.2) To give the students some basic idea about algal classification, habit, habitat, morphology, reproduction and evolution of algae.
		CO2. (0.2)Role of algae in soil fertility, algae in industry, algal indicators, blooms, Eutrophication. Biological importance of phytoplanktons and water blooms.Algal culture.
		CO3. (0.2) Understand about introduction, classification of fungus. Salient features of different classes of fungi.Economic importance of Fungi
		CO4. (0.2) Introduction, classification of Bacteria, Ultrastructure, Reproduction and nutrition of bacteria. Harmful and Beneficial effect of Bacteria.
		CO5: (0.2)General account of Virus, ultra structure, Classification, structure and reproduction of Virus. Viral genomes- its type and structure; Viroids, virusoids and Prions. Antiviral agents and interferons.
MSB-102	**Higher cryptogams, Gymnosperms and Paleobotany**	CO1. (0.2) To give the students some basic idea about the origin, evolution, classification of the group, its comparative morphological, anatomical and reproductive differences within the group and finally the application of Bryophytes.

		CO2. (0.2) Deals with the basic understandings of the origin and evolution of pteridophytes, its steller evolution and its types, telome concept, origin of seed habit in pteridophytes.
		CO3. (0.2) The students will have a understandings of classification of vascular cryptogams, morphological, anatomical and reproductive diversity of pteridophytes.
		CO4. (0.2)To give students some basic understandings of classification and salient features of major taxa of Gymnosperm,its characteristics, affinities and relationships among different taxa and finally the economic importance of Gymnosperms.
		CO5. (0.2) It was designed to give an understanding of geological time scale, fossilization process, classification and nomenclature of fossil plants, techniques in studying fossils.
MSB-103	**Advanced Morphology, Anatomy and Taxonomy of Angiosperms**	CO1. (0.2) Studying plant morphology student will be benefitted to identify plants (visual identification) properly when they go for field work for collection of plants for different research works. Proper identification and classification is important in the fields like genetics, ecology, physiology, axonomy i and evolutionary biology.
		CO2. (0.2)Taxonomy helps to organize plants into similar groups. So it becomes easier to study and place a new species whenever it is discovered during any research work. It also allows us to identify, group and properly name an organism through a standardized classification system.
		CO3. (0.2) As Taxonomy is the "Mother of plant science", it helps them to study all the applied disciplines of plant sciences such as Agriculture, Horticulture, Forestry, Pharmacognosy, Biotechnology, etc.
		CO4. (0.2)By studying plant tissues and cells (anatomy) they will learn how the plants constructed and how they work. These studies are very important because they lead to be a better understanding of how to take care for plants and fight plant diseases
		CO5. (0.2) Plant morphology helps to know the different types and forms of leaves, flowers, fruits, seeds, etc., which is an identifying marker for closely related species.
MSB-201	**Molecular Cell Biology (FC)**	CO1. (0.2) Molecular biology plays important role in understanding formations, actions, and regulations of various parts of cells which can be used to efficiently target new drugs, diagnosis disease, and understand the physiology of the cell.
		CO2. (0.2)This branch use large-scale, systems-level, and high-throughput datasets to derive new biological insights not easily obtained by other approaches
		CO3. (0.2)It is used to analyze and help solve murders and assaults in forensic medicine.
		CO4. (0.2)DNA-based technology offers a wide variety of new diagnostic approaches to infectious disease.
		CO5. (0.2) Recombinant DNA technology offers many different new approaches to the development of vaccines.
MSB-202	**Biochemistry and Advanced Physiology**	CO1. (0.2)To get detail Biochemical knowledge about carbohydrate, protein, lipids, vitamins and enzymes as well as uses of various vitamins as coenzymes
		CO2. (0.1)Understand the basic physiological relationship of Plant, water and soil and translocation of organic solutes Mechanism of stomatal transpiration.
		CO3. (0.2) Understand the basic biochemical and physiological knowledge about the utility of different minerals present in the soil for the growth and development of plants and the deficiency symptoms of micro and macro nutrients to plants
		CO4. (0.2)Understand the detail knowledge about the biochemistry and physiology of photosynthesis, c and respiration i.e., breakdown of sugar: Glycolysis, Kreb's cycle, electron transport chain, ATP formation,

		photorespiration, gluconeogenesis.
		CO5. (0.2)To gather the detail knowledge about Nitrogen metabolism and physiological role of phytohormones in the growth and development of plants
		CO6. (0.1)Understand detail knowledge about the physiology of flowering, scenescens and abscission in plants and dormancy of seed, Phytochrome, Biological rhythm.
MSB-203	**Cytogenetics and Plant breeding**	CO1. (0.2) To understand basic principles of Mendelian inheritance.
		CO2. (0.2) To study cell division & chromosome segregation
		CO3. (0.1) To explore the multifactorial inheritance.
		CO4. (0.2)To acquire the chromosome structure, chromatin organization and variation.
		CO5. (0.2)To learn the concepts of Linkage concept of sex determination and sex linked inheritance.
MSB-301	**Plant Pathology and Microbiology**	CO1. (0.2)Understanding introduction to plant pathology, classification of diseases, process of infection and pathogenesis.
		CO2. (0.2)To get knowledge about host parasitic infection, defense mechanism in plants.
		CO3. (0.2)To get knowledge about biotechnological approaches to disease resistance and major diseases in plants.
		CO4. (0.1) Understanding the introduction, scope of microbiology, use of microbiology I human welfare.
		CO5. (0.1)Understanding control of microorganism, microbial techniques.
		CO6. (0.2) To get knowledge about Immuno and immune systems
: MSB-302	**Biophysical instrumentation, Biotechnology and Developmental Botany**	CO1. (0.2)The branch biophysical instrumentation seeks to explain biological function in terms of the molecular structures and properties of specific molecule.
		CO2. (0.2)Molecular biophysics typically addresses biological questions similar to those in biochemistry and molecular biology, seeking to find the physical underpinnings of biomolecular
		phenomena.
		CO3. (0.2) These instrumentsand techniques even can view and manipulate single molecules and measure their behavior.
		CO4. (0.2) Plant tissue culture can be used to genetically modify crops to produce high quality crops.
MSB-303	**Plant Ecology**	CO1. (0.2) Understanding the nature of ecosystem, food chain, food web, biosphere, biogeochemical cycles.
		CO2. (0.1)To get detail knowledge about population ecology
		CO3. (0.1)To get detail knowledge about concept of community, concept of climax, ecological succession.
		CO4. (0.2)Understanding the cause, effects of environmental pollution.
		CO5. (0.2)Detail knowledge about plant diversity, loss of diversity, indigenous medicinal system. Biosphere reserve, protected areas of India.
MSB-306	**Bio fertilizer and organic farming**	CO1. (0.2)To get the knowledge of different microorganism involve in improving soil health .
		CO2. (0.2) It will also give the knowledge of organic farming.
		CO3. (0.2) Students will learn different techniques to produce biofertilizer
		CO4. (0.2) Students will learn about the methods of isolation and inoculum production of VAM, and its influence on growth and yield of crop plants.
		CO5. (0.2) Students will get detail knowledge about organic farming, animal husbandry, homemade fertilizer.
MSB-401	**Biostatistics,**	CO1. (0.2) To understand the importance and scope of statistical methods in

	Computer application and Bioinformatics	experiments.
		CO2. (0.2)To learn various statistical methods, formulas to analyze different experiments as well as principles of designs of experiments.
		CO3. (0.1)To get the basic knowledge of types and components of computer
		CO4. (0.1)To learn about computer application for preparation of manuscripts, drawings, graphs, charts histograms.
		CO5. (0.2) Understand bioinformatics, biological database, Sequence analysis and comparison
		CO6. (0.2) Learn about Digital computer, Needle man – Wuncle and Smith-Wateman algorithm.
MSB-402A	**Genetics and plant breeding**	CO1. (0.2) To understand the gene expression and regulation in Prokaryotes & Eukaryotes.
		CO2. (0.2)To gain better knowledge in both Prokaryotes & Eukaryotes about the Gene Mutation, Repair Mechanisms, Nuclear Genome Organization, Genes and gene numbers.
		CO3. (0.2) Comprehensive and detailed analysis of fine structure of the gene.
		CO4. (0.2) Analyze the role of transposable elements in prokaryotes and eukaryotes.
		CO5. (0.2)Insight into the manipulation of genetic material for a wide variety of purposes and products via Recombinant DNA Technology.
MSB-402B	**Biochemistry and Plant Physiology**	CO1. (0.2)Understand the basic knowledge about atoms, molecules and bonds, various stabilizing reactions. Structure and properties of pH, buffers
		CO2. (0.2)Detail knowledge about bioenergetics, laws of thermodynamics.
		CO3. (0.2)Detail knowledge about carbohydrate metabolism and lipid metabolism.
		CO4. (0.2)Understanding the enzyme biochemistry
		CO5. (0.2) To learn about the physiological effects of various biotic and abiotic stress. Responses of plants to biotic (pathogen and insects) and abiotic (water, drought, salinity, temperature and global warming) stresses
MSB-402C	**Angiosperm Taxonomy**	CO1. (0.2) Understand the basic idea of flowering plants and their systematic position or classification.
		CO2. (0.2)Students may visit the forest area for collection of plants and identify with upto their knowledge learnt at the class
		CO3. (0.2)Students may know the uses of unknown plants used by the tribal people of the soeity with ethnobotanical uses.
		CO4. (0.2)Students may visit some research organsaions like BSI, NBRI, FRI and can gather knowledge about the herbarium technique with up to date nomenclature of the plant
		CO5. (0.2)They can apply for Research fellowship for Ph. D and other higher Degree in Plant Taxonomy in Universities and Deem Universities for their future employment.
MSB-402D	**Plant Ecology**	CO1. (0.2)Detail knowledge on the environment, its types, concept of habitat and niche.
		CO2. (0.2)Detail knowledge on population ecology
		CO3. (0.2)Detail knowledge on community ecology
		CO4. (0.2) Detail knowledge on ecosystem ecology and ecological succession.
		CO5. (0.2)Detail knowledge on mineral cycling
MSB-402E	**Microbiology**	CO1. (0.2) Understanding microbial taxonomy and diversity, classification, microbial photosysthesis, chemosynthesis, microbial respiration
		CO2. (0.2) Detail knowledge about soil, air and water microbiology
		CO3. (0.2)Genetic recombination in bacteria.
		CO4. (0.2)Detail knowledge on mutation in bacteria.

		CO5. (0.2)Detail knowledge on recombinant DNA technology
MSB-402F	**Mycology and Plant Pathology**	CO1. (0.2)Understand history of Mycology, Fungal cell structure and classification, phylogenetic relation.
		CO2. (0.2)Morphology and reproduction and diversity of spores of few important fugal genera.
		CO3. (0.2)Understanding fungal physiology, nutritional specialization, secondary metabolites in fungus, mycotoxins.
		CO4. (0.2) To get knowledge about fungal ecology.
		CO5. (0.2) To get knowledge about fungal biotechnology.
MSB-403A	**Genetics and plant breeding**	CO1. (0.2)Genetics has always been concerned with the problem of how the hereditary information in DNA controls what an organism looks like and how it works.
		CO2. (0.2) Scientists and doctors hope to use our genetic information to diagnose, treat, prevent and cure many illnesses
		CO3. (0.2)A number of graduate students can be involved in responsible positions with academic & research institutions.
		CO4. (0.2)Plant breeding is one of our most important weapons in this race by which one can create disease resistant varieties through selection and modern breeding methods.
		CO5. (0.2)A trained graduate teacher in molecular, genetics and plant tissue culture can be involved in government and private companies that are associated with molecular to cultivar development work.
MSB-403B	**Biochemistry and Plant Physiology**	CO1. (0.2) To get knowledge of water relation, ion uptake and transport mechanism of nutrient in plant.
		CO2. (0.2)To know the different mechanism of photosynthesis and respiration of plant.
		CO3. (0.2)To know about the plant growth regulator and nitrogen metabolism of plant.
		CO4. (0.2) To get the knowledge of physiology of flowering and growth and development mechanism of plant.
		CO5. (0.2)To get the knowledge of dormancy and germination of seed.
MSB-403C	**Angiosperm Taxonomy**	CO1. (0.2)Studying plant morphology student will be benefitted to identify plants (visual identification) properly when they go for field work for collection of plants for different research works. Proper identification and classification is important in the fields like genetics, ecology, physiology, systematics and evolutionary biology.
		CO2. (0.2)Taxonomy helps to organize plants into similar groups. So it becomes easier to study and place a new species whenever it is discovered during any research work. It also allows us to identify, group and properly name an organism through a standardized classification system.
		CO3. (0.2)As Taxonomy is the "Mother of plant science", it helps them to study all the applied disciplines of plant sciences such as Agriculture, Horticulture, Forestry, Pharmacognosy, Biotechnology, etc.
		CO4. (0.2)By studying plant tissues and cells (anatomy) they will learn how the plants constructed and how they work. These studies are very important because they lead to be a better understanding of how to take care for plants and fight plant diseases.
		CO5. (0.2) Plant morphology helps to know the different types and forms of leaves, flowers, fruits, seeds, etc., which is an identifying marker for closely related species.
MSB-403D	**Plant Ecology**	CO1. (0.2)To highlight the students with some basic understandings of conservation ecologyits principles, postulates and ethics. The students will also get an idea of protected area networks and their management, Biodiversity act and biodiversity action plan. Finally students will also learn about some practical case studies on conservation/management strategy in India.

		CO2. (0.2) Designed to give an understanding of, what is a natural resource, types of resources, natural resources degradation and its conservation. The students will also have an understanding on shifting cultivation, coal mining and also the various environmental problems of northeast India and its ecological implication and also about sustainable development.
		CO3. (0.2) It has been designed to impart an understanding on global environmental problems such as ozone depletion, global warming, greenhouse effect, different greenhouse gases, acid rain, climate change and its ecological consequences
		CO4. (0.2) It deals with the understanding of some modern technology used in landscape monitoring and environmental management such as remote sensing and GIS - it's Principles and concept, understanding on image processing techniques and various application of remote sensing and GIS
		CO5. (0.2) Deals with the understanding of phyto-geographical regions of India,detail idea about the floras of North-East India. Understanding on mechanism of migration and barrier of plant distribution and also about biodiversity hotspots and endemism
MSB-403E	**Microbiology**	CO1. (0.2)Understanding briefly about industrial microbiology
		CO2. (0.2) Detail knowledge about microbial fermentation and industrial fermentation
		CO3. (0.1)Uses of microbes in medicine, biofuel, biopolymer, alcoholic fermentation
		CO4. (0.2)To get knowledge about microbiology in stress environments
		CO5. (0.2)Basic knowledge about food microbiology
		CO6. (0.1)Uses of microbe sin petroleum microbiology
MSB-403F	**Mycology and Plant Pathology**	CO1. (0.2)Understanding symptoms of plant diseases caused by fungi, bacteria, viruses, mycoplasmas and Phytoplasmas
		CO2. (0.2) Diagnosis and identification of diseases, host pathogen interaction
		CO3. (0.2)Detail knowledge on epidenmiology and disease management
		CO4. (0.2)Genetics of plant diseases
		CO5. (0.2)To get knowledge about Biotechnology and plant diseases.
MSB-405 (DSE-2)	**Plant resource utilization and conservation**	CO1. (0.2) By studying "Plant resource utilisation" students will learn about different dimensions of plant identification as a resource for self- sustenance, their domestication, commercialization based on the need and induction of modification using modern techniques.
		CO2. (0.2) They will learn about the utilization of wild plants as it is more limited and how to improve it for the new need and imperatives of mankind.
		CO3. (0.1) Study of medicinal plants would help them in research and development of newer organic drugs that would help to minimize adverse effect that are usually evident in synthetic and semi-synthetically processed drugs. Thereby proving to be a boon to medical science.
		CO4. (0.2)They will learn about the different conservation processes like in-situ and ex-situ conservation of plants that are going to be extinct very soon due to biotic, abiotic and anthropogenic causes.
		CO5. (0.2) Study of plant resource utilisation will enhance their specific knowledge and technological skills in converting the rich bio-resource into economic wealth.

BACHELOR OF BUSINESS ADMINISTRATION

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1. It would develop the knowledge and skill related to Management, Finance, Marketing, HR, Business Law and IT.

PSO2. It will help develop the attitude for solving various problems faced in a business enterprise.

PSO3. It will enable them understand the different challenges and opportunities in the different disciplines of management.

PSO4. Development of attitude for teamwork, leadership and learning in a business enterprise

PSO5. It will develop the communication, presentation and business reporting skills.

PSO6. It will enable the students to learn the fundamental application on computers like MS Office, internet, ecommerce, etc.

2. COURSE OUTCOMES (COs)

BBA 101	**Business Communication**	CO1. Understand the basic principles and importance of business communication.
		CO2. Learn to classify the different types of communication
		CO3. Learn and write all the basic business communication formats
		CO4. Learn different oral communication skills and deliver in different business environment
		CO5.To stimulate the Critical thinking by designing and developing clean and lucid writing
BBA-102	**Principal Of Management**	CO1. To give students knowledge about basic concept of Management and its importance.
		CO2: Students will understand the importance of planning as a primary management function as well as the importance of MBO in today's world.
		CO3. Learn and write all the basic business communication formats
		CO4. Learn different oral communication skills and deliver in different business environment
		CO5. To stimulate the Critical thinking by designing and developing clean and lucid writing skills.
BBA-103	**Business Environment**	CO1. Discuss the supply and demand theory and its impact on business environment.
		CO2. Explain the effects of government policy on the economic environment.
		CO3. Outline how an entity operates in a business environment.

		CO4. Describe how financial information is utilized in business.
		CO5. Explain the legal framework that regulates the economic framework of an industry.
		CO6. The students will be able to demonstrate and develop conceptual framework of business environment and generate interest in international business.
BBA-104	**Business Economics**	CO1. Understand the basics of business economics
		CO2. Familiarise with the concept of supply and demand.
		CO3. Learn the different laws of production and different types of costs in business
		CO4. Aquainted with different types of market and its operation.
		CO5. Understand international and inter regional trade, identify and understand various trade theories, analyze the various types of restrictions of international trade.
BBA 105	**Computer Fundamentals**	CO1. Bridge the fundamental concepts of computers with the present level of knowledge of the students.
		CO2. Understand the concept of input and output devices of computers and how it works.
		CO3. Familiarize with operating systems, peripheral devices, networking, multimedia and internet.
		CO4. Understand binary, hexadecimal and octal number systems and their arithmetic.
		CO5. This will familiarize the students with the computer and its applications in the relevant fields and also to make them aware of other related papers of IT.
BBA-201	**Human Resource Management**	CO1. Acquire knowledge and skills in the field of human resource management and human relations and to comprehend applicability of human resource management principles to situation in global business world.
		CO2. Apply the entrepreneurial and management skills for effective business management and acquire employability skills through the practical awareness in the business
		CO3. Understand the concept and nature of human resource management and personnel management.
		CO4. Analyze the difference between recruitment and selection process
		CO5. To give them knowledge about advance concept of HRM strategies, HRM & its various models, Wage & salary administration etc.
		CO6. Understand the various training methods and techniques in the business for effective decision making.
BBA-202	**Marketing Management**	CO1. Understand the framework of the subject, its need and importance.
		CO2. Learn about the behavioral aspects of the consumers and understand the different bases of segmentation
		CO3. Understand and analyse the different strategies and decisions pertaining to product and price.
		CO4. Learn about the different distribution channel strategy and different aspects of physical distribution of products

		CO5. Analyse marketing caselets and provide solution to the problems in the case
		CO6. Apply contemporary marketing theories to the demands of business and management practice.
BBA-203	**Financial Accounting**	CO1. It explains the general purposes and functions of accounting.
		CO2. Helps in understanding the main elements of financial accounting information – assets, liabilities, revenue and expenses
		CO3. It helps the students in identifying the main financial statements and their purposes.
		CO4. Integrate theoretical and technical accounting knowledge in a business context.
		CO5. Exercise judgement under supervision to provide possible solutions to routine accounting problems in straightforward contexts using where appropriate social, ethical, economic, regulatory, sustainability, governance and global perspectives.
		CO6. Develop the ability to use accounting information to solve a variety of business problems
BBA-204	**Quantitative Techniques**	CO1. Understand statistical inference in relation to business decision-making.
		CO2. Analyse output from both specialist and general methods
		CO3. Produce quantitative analysis using specialist procedure.
		CO4. Convey the results of quantitative analysis.
		CO5. Solve a range of problems using the techniques covered
		CO6. Conduct basic statistical analysis of data.
EVS-711	**Environmental Studies**	
BBA-301	**Organization Behavior**	CO1. To make students understand the basic concept of organization.
		CO2. To familiarise students with the basic concept of Organizational Behaviour in general and how people must behave in the organization.
		CO3. To give them the knowledge about Contributing discipline and fundamental concept of OB and also about Challenges and Opportunities for OB in today's world.

		CO4. To explain students about the Attitude, Values, Perception and Personality which influence organizational behaviour.
		CO5. Students get the idea about Motivation and its various theories from this paper. Also about Leadership, functions of leader and its different styles, Leadership Theories
		CO6. To enable students to describe how people behave under different conditions and understand why people behave as they do.
BBA-302	**Cost and Management Accounting**	CO1. Express the place and role of cost accounting in the modern economic environment.
		CO2. Select the costs according to their impact on business.
		CO3. Differentiate methods of schedule costs per unit of production.
		CO4. Differentiate methods of calculating stock consumption.
		CO5. Interpret the impact of the selected costs method.
		CO6. Apply management accounting tools for cost allocation, budgetary control, Performance evaluation, pricing and cost management
BBA-303	**Business Law**	CO1. Acquire knowledge on different mercantile laws.
		CO2. Understand Sources and formation of laws.
		CO3. Describe the process of legislation of law
		CO4. Able to relate to the day to day business activity
		CO5. Understand the legal and fiscal structure of different forms of business organizations and their responsibilities as an employer
		CO6. Acquire problem solving techniques and to be able to present coherent, concise legal argument.
BBA-304	**Entrepreneurship and Small Business Management**	CO1. Understand the need and significance of entrepreneurship development.
		CO2. Will get familiarized with the dynamics of Entrepreneurship Development.
		CO3. Familiarize with government policies and procedures for setting up new enterprise.
		CO4. Understand myths and misconceptions about entrepreneurship.
		CO5. Get familiarized with the sources of funds, the documents required for raising funds, factors of site selection etc.
		CO6. Would be able to prepare proper business plan by analysing the market and demand - supply analysis
BBA-305	**Management Information System**	CO1. To understand the role of information systems in today's competitive business environment and assess the relationship between the digital firm, electronic commerce, electronic business and internet technology
		CO2. To understand about the different types of Management Information System, which are being used in different types of organization
		CO3. To know the overall process of an e-commerce website how they work, what are the payment methods.

		CO4. Give complete knowledge about scope, nature, benefits and limitation of E-Commerce.
		CO5. To understand the importance of Management Information System in each and every type of organization.
		CO6. Provide knowledge about Electronics payments and protocols and other various systems.
BBA-401	**Financial Management -1**	CO1. It helps the students to signify and evaluate the basic features of financial markets.
		CO2. The students will be able to Apply the net present value criterion to complex capital budgeting problems.
		CO3. Helps in Determining a firm's weighted average cost of capital.
		CO4. Evaluates alternative techniques for analysing opportunities and budgeting capital.
		CO5. Understanding the basics of the term structure of interest rates and the yield curve.
		CO6. The students would understand various issues involved in financial management of a firm and hone their skills for making sound financial decisions and policies.
BBA-402	**International Business**	CO1. Learn to distinguish different market enry strategy in international markets
		CO2. Understand the different product development and adaptation requirement
		CO3. Understand the different aspects of international marketing environment with special focus on the international bodies
		CO4. Learn the basic export finance modes
		CO5. Obtain the general idea about export & import procedures & documentation
		CO6. Distinguish the advantages and disadvantages of products and services possess in international marketing in both emerging markets and mature markets.
BBA-403	**Management of Services**	CO1. Explain the unique challenges of services marketing, including the elements of product, price, place, promotion, processes, physical evidence, and people.
		CO2. Explain service blueprinting, the integration of new technologies, and other key issues facing today's customer service providers and service managers.
		CO3. Understand Consumer Behaviour in Services, Customer Expectations and Perception of Service.
		CO4. Understand Service Quality and Productivity, Measures of Service Quality, SERVQUAL Scale.
		CO5. Understand Service Markerting Mix, Service Development and Design etc.
		CO6. Give complete knowledge on Customer Feedback and service recovery, Service Profit etc.
BBA-404	**Enterprise Resource Planning**	CO1. Impart knowledge regarding how a modern office operates
		CO2. Understand that due to advancement of scientific and technological devices how office works are performed today in comparison to old and conventional way earlier
		CO3. Understand that office work has been becoming sophisticated and there is no room to perform the same with leisurely attitude

		CO4. Understanding the need, benefits and role of ERP
		CO5. Understand the role of ERP in manufacturing, Retail Sector and CRM.
BBA-405	**Research Methods**	CO1. It will enable the students to have a thorough understanding about technicalities that are involved in a research work
		CO2. Better understanding of general definition of research design
		CO3. Students would be able to ascertain the overall process of designing a research study from its commencement to the report.
		CO4. Students will be familiarized with the various ethical concerns in educational research, including those issues that arise while using quantitative and qualitative research
		CO5. It will also enable the students to delineate the meaning of a variable, and to be able to identify independent, dependent, and mediating variables
		CO6. Students would be acquainted with the steps in the process of quantitative data collection.
BBA-501	**Fundamentals of Production & Operations Management**	CO1. To know about the Facility location selection and also the different layouts of plants for different types of products
		CO2. To know about the Inventory management, inventory control models, Material management as well as purchasing management and what are the importance of these topics in an organization
		CO3. To understand the concept of production planning and production control and also the quality standards
		CO4. To know the concept of Inventory management as well as Materials Management.
		CO5. Will be able to understand Production Planning, Quality Control and Quality Management.
		CO6. Will understand the concept of ABC analysis as well as HML Analysis.
BBA-502 (A)	**Retail Management (General Elective)**	CO1. General understanding of the business of retailing
		CO2. Understand the different types of retail with their advantages and disadvantages
		CO3. Explain the factors relating to visual merchandising, such as store layouts and presentation
		CO4. Compare the strategies that are used within the different stages of a product's life cycle
		CO5. Describe the flow of goods and services in a retail environment (e.g., inventory control, supply chain, and risk management)
BBA-502 (B)	**Knowledge Management (General Elective)**	CO1. The objective of the course is to provide the basics of the emerging area of Knowledge Management to students.
		CO2. To give students general idea about Knowledge management and its definition. Also about scope and significance of Knowledge Management.
		CO3. To explain students about various Techniques and principles of Knowledge Management along with difficulties in Knowledge Management.
		CO4. To familiarize students with various terms and understanding about Organizational knowledge, characteristics and components of organizational knowledge –Building knowledge societies- Measures for meeting the challenges of implementing KM programmes.

		CO5. This course through light on few important concepts as essential of Knowledge management as well as future knowledge management and industrial perspectives.
BBA-502 (C)	**Stock Market Operation (General Elective)**	CO1. Students will understand the characteristics of different financial assets such as money market instruments, bonds, and stocks, and how to buy and sell these assets in financial markets.
		CO2. Students will understand the benefit of diversification of holding a portfolio of assets, and the importance played by the market portfolio.
		CO3.Student should able tomake an informed judgement about whether or to what extent a financial market satisfies the conditions of an efficient market
		CO4. To understand the slot the equity market occupies in the financial system.
		CO5. Students will know how to apply different valuation models to evaluate fixed income securities, stocks, and how to use different derivative securities to manage their investment risks.
		CO6. It will provide knowledge about existence of equity derivative instruments and its buying-selling operation.
BBA-503A	**Advertising and Sales Promotion**	CO1. Analyze the expanding environment of media and communication techniques.
		CO2. Assess the strengths, weaknesses, opportunities and threats (SWOT) of different kinds of promotional campaigns.
		CO3. Develop creative strategies for advertising.
		CO4. Assess strategic uses of sales promotions.
		CO5. Plan media strategy, scheduling, and vehicle selection.
		CO6. Assess strategic uses of sales promotions.
BBA-504A	**Rural Marketing**	CO1. Understand the rural markets and the contemporary issues in rural marketing
		CO2. Understand rural market distribution
		CO3. Aware about consumer behavior and trends in rural marketing.
		CO4. Understand the concept and methodology for conducting the research in rural market
		CO5. Identify the challenges and opportunities in the field of rural marketing for the budding managers and also expose the students to the rural market environment and the emerging challenges in the globalization of the economies.
		CO6. Apply adaptations to the rural marketing mix (4 A's) to meet the needs of rural consumers.
BBA 503B	**Manpower Planning**	CO1. To acquaint students with the basic concept of Man power planning along with its need, importance, benefits etc. Also explain them the responsibilities of HR Department in Human Resource Planning function.
		CO2. To give them the knowledge about various Human resource policies usually adopted in organizations and give them basic ideas about Job Analysis and Job Evaluation along with- how they are related with man power planning.
		CO3. To make students aware of various strategies regarding man power planning; and methods and Tools for Strategic Human Resource Planning.
		CO4. To discuss about various functions related with HRP like Recruitment, Selection, Induction, Career Planning, Succession etc.

		CO5. Also explain about Emerging Trends related to Knowledge management, Innovativeness and Talent Management in HRP.
		CO6. The outcome of this paper is to give students a very good idea about various concept related to Man power planning and its application in today's competitive environment with the help of few case studies.
BBA-504B	**Compensation Benefits**	CO1. It discusses the Basic structure of compensation and its relation with employees' productivity.
		CO2. It helps in knowing the administration pattern and mechanism of employees' compensation and other benefits.
		CO3. It discusses the motivational components of compensation like incentives, ESOP.
		CO4. It discuss the different structure and components of Executive compensation which helps in giving a structure to organisation compensation.
		CO5. To learn some of the implications for strategic compensation and possible employer approaches to managing legally required benefits
		CO6. It discuss the different structure and components of Executive compensation which helps in giving a structure to organisation compensation.
BBA-503C	**Indian Financial System**	CO1. Demonstrate knowledge and understanding of the Indian Financial System.
		CO2. Develop an understanding of the meaning and characteristics of money market.
		CO3. Gain knowledge of the primary market and the secondary market.
		CO4. Comprehend and categories the relevance of various banking institutions.
		CO5. Develop communication and presentation skills for analysis of IFS
		CO6. Student will be able to understand about the financial intermediaries in India
BBA-504C	**Financial Management – II (Corporate Finance)**	CO1. The students would be able to develop knowledge about the various sources of finance for a corporate organisation.
		CO2. It would enable the students to understand the various uses for finance in a corporate organization .
		CO3. It would enable the students in familiarizing with the financial environment of business and financial markets
		CO4. It would enable the students in developing skills for analysis and interpretation business information.
		CO5. Will be able to apply financial theory in financing related decisions by using various tools and techniques of financial management.
		CO6. It would enable in developing skills for various techniques applied for appraisal of capital expenditure decisions in corporate investment decisions as well as working capital management.
BBA-601	**Strategic Technology Management**	CO1. Identifying and evaluating the impact of relevant changing technology and managing those changes and also to get along with the new technology in the market.
		CO2. Technology-enhanced approaches for such organizations where Technology is the main competitive advantage in their sectors.
		CO3. Role of technology in firm's competency as well as to do the competitive assessment for one organization's competitors.

		CO4. To know how to manage the market changes and to cope up with the changes and to do innovation.
		CO5. Critically assess and explain key current issues in our understanding of innovation as a field of study.
		CO6. To study about the Technology Road mapping i.e. how to plan for the future for different types of organization.
BBA 602 (A)	**Market Research (General Elective)**	CO1. Understand the importance and requirement of market research
		CO2. Conduct the market research and develop a business report.
		CO3. Familiar with the different aspects of marketing where research is required.
		CO4. Overview of Quantitative Decision Making tools and technique.
		CO5. Communicate research results in written report and oral presentation format
BBA 602 (B)	**Human Resource Information System (General Elective)**	CO1. This paper is completely a practical paper to give students the practical knowledge about many Human Resource Functions essential to carry out in an organization.
		CO2. To give students the practical knowledge about data management of HRIS
		CO3. Give students the understanding about HRIS Process especially on HRIS recruitment, selection and performance appraisal etc.
		CO4. To provide understanding related to HRIS - Organization Structure & Related Management Processes.
		CO5. The expected outcomes of this paper are like tracking personnel-related HR functions-as for example- employee database, staff planning, recruitment, development, attendance, payroll maintenance etc.
BBA 602 (C)	**Mutual Fund**	CO1. To acquaint with core banking services with use of ICT
		CO2. It will horn the skills of students to enter into the industry with ready knowledge
		CO3. Skill development for Mutual fund scheme selection
		CO4. It will enable students to interpret mutual fund fact sheet
		CO5. Give knowledge about taxation on different types of MF schemes
BBA-603	**Financial Institutions And Market**	CO1. Understand the Indian banking system and describe the role of regulatory bodies in regulating how banks manage their capital.
		CO2. Describe different theories of how interest rates are determined and explain the relationship between the term to maturity, risk, and interest rates.
		CO3. Understand the mechanics and conventions of the foreign exchange market and the motivation of different participants in trading foreign currencies.
		CO4. Understand the housing finance, lease financing, venture capital financing and to apply in real life scenario
		CO5. Possess the ability to discuss and write about the links between the theory of financial markets and the reports in the financial press
		CO6. Communicate and explain specialised technical advice, knowledge and ideas, to professionals and non experts involve with the financial services

		industry.
BBA-604A	**Service Marketing**	CO1. Explain the unique challenges of services marketing, including the elements of product, price, place, promotion, processes, physical evidence, and people.
		CO2. Explain service blueprinting, the integration of new technologies, and other key issues facing today's customer service providers and service managers.
		CO3. Understand Consumer Behaviour in Services, Customer Expectations and Perception of Service.
		CO4. Understand Service Quality and Productivity, Measures of Service Quality, SERVQUAL Scale.
		CO5. Discuss the influences of the multicultural marketplace, business ethics, and socially responsible marketing on services marketing.
		CO6. Integrate course concepts into individual performance to become better customer service representatives in the service environment.
BBA-605A	**E-Marketing**	CO1. Remember the definition and understand the objectives & features of E-Marketing.
		CO2. Analyze the problems in E-Marketing.
		CO3. Understand the types of e-market and e-customers.
		CO4. Understand the basic concepts of E-Commerce, Electronic Payment System and the security issues associated with it.
		CO5. Understand the concepts of Social Media Marketing, Pay-per-click advertising, SEO etc.
		CO6. Describe in detail the implementation of an e-marketing plan, including the management of necessary internal organisational change.
BBA-604B	**Change Management**	CO1. Explain the relevance of a range of change management approaches and models to a variety of situations where appropriate by identifying, apply a range of skills relevant to the change management process
		CO2. Understand and use negotiation tactics and also learn to resolve conflict inside the organization
		CO3. Use diagnostic tools and models to explore underlying organizational and behavioral issues that may affect the change process
		CO4. Display a clear understanding of the role of 'change agents' and its applicability in organizational settings
		CO5. Understanding cultural differences is critical for the success of an organization worldwide as there are roles played by culture that influences talent management strategies and practices at workplace
		CO6. Understanding cultural differences is critical for the success of an organization worldwide as there are roles played by culture that influences talent management strategies and practices at workplace
BBA-605B	**Industrial Relation**	CO1. It gives the idea on labour market of India more specifically about Indian labour, Employment trend of Indian Labour.
		CO2. It also facilitates in getting understanding that how worker's organisation and Employers' organisation can play role in establishing as well as in defining Industrial relations.
		CO3. It discusses why disputes arise in organisation and how these can be controlled.
		CO4. It helps in having a better understanding that how industrial disputes can be settled at different stages and why introduction of Labour welfare is important.

		CO5. It helps in knowing the different organisations who works as regulatory mechanism with workers.
		CO6. It gives the idea on different techniques that are practiced by different corporates in handling different labour issues.
BBA-604C	**Financial Services**	CO1. Exercise informed commercial judgment within a professional setting which emphasizes ethical and responsible decision making.
		CO2. A capacity to integrate technical and conceptual knowledge, and interpersonal skills to work effectively within the Financial Services Industry.
		CO3. Think critically and creatively to identify better solutions within business constraints allowing to acquire and synthesize information within a complex professional setting.
		CO4. Communicate and explain specialized technical advice, knowledge and ideas, to professionals and non-experts involved with the Financial Services Industry.
		CO5. Reflect upon work practices, conceptual frameworks and performance feedback and action ongoing professional development.
		CO6. Explain and define the nature of the financial services industry with respect to providing personal planning services.
BBA-605C	**Working Capital Management**	CO1. The course would enable the students to Identify and summarize the essential theories and concepts of modern working capital Management. Constitute a comprehensive introduction to basic concepts of working capital management.
		CO2. The course would enable the students to apply the theories learned to the real world and use them in short-term financial decision makings.
		CO3. This course would enable the students to apply corporate cash management, bank relations, Credit policy, credit appraisal and accounts receivable management into real life situations
		CO4. This course would enable the students to understand and apply inventory management techniques into real life situations of the enterprise.
		CO5. This course would enable the students to understand and apply cash management techniques into real life situations of the enterprise.
		CO6. Sources of financing working capital of business organization in today's context.
BBA-606	**Human Values & Professional Ethics**	CO1. The students identify the importance of human values and skills for sustained happiness.
		CO2. The students strike a balance between profession and personal happiness/ goals.
		CO3. The students realize/ explain the significance of trust, mutually satisfying human behavior and enriching interaction with nature.
		CO4. The students develop/ propose appropriate technologies and management patterns to create harmony in professional and personal life

MASTER OF BUSINESS ADMINISTRATION

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1. It would develop the knowledge and skill to apply the principles and practice of Management, Finance, Marketing, HR, Business Law and IT to solve various problems faced in a business enterprise

PSO2. It will develop the innovative and critical thinking ability to identify and analyse various business situation and problems and also provide possible solutions towards the identified problems

PSO3. It would enable in develop attitude for teamwork and leadership quality in managing and leading human resource in a problem in a business enterprise

PSO4. It will develop the fundamental knowledge in the understanding of contemporary business areas and forthcoming challenges

PSO5. It will enable the students to develop skills on fundamental application of computers like MS Office, internet, ecommerce, professional software along with effective reporting and presentation skills.

2. COURSE OUTCOMES (COs)

MBA-101	**Management Process and Organizational Behaviour**	CO1. To acquaint the students with the advance concept of Management.
		CO2. To give them the knowledge about different managerial functions and its application in practical world.
		CO3. To explain students about organization and organizational behaviour in general. Explain the fundamental forces and models of OB along with Challenges and Opportunities of OB.
		CO4. To make students understand the individual behaviour by giving them an idea about Personality development, Perception, Attitude, Value etc.
		CO5. This paper basically intends to have the outcome at understanding the relationship between individuals in an organisation and factors underlying organizational behaviour.
MBA-102	**Marketing Management-1**	CO1. Learn the fundamentals of marketing management
		CO2. Obtain in depth idea about consumer market and consumer behaviour
		CO3. Learn the STP in the context of domestic products and international products

		CO4. Understand the basic strategies of marketing mix
		CO5. Develop an analytical ability through solving caselets or other real life issues
MBA -103	**Human Resource Management-1**	CO1. It helps in getting the idea on past management and the changing trend of management along with different organisational design.
		CO2. It helps in knowing the importance of different policy in performing organisation's different functions both in Internal and External environment.
		CO3. It facilitates in creating diversified groups with the help of action and goal oriented leader and also helps in understanding the importance of Communication.
		CO4. It helps in getting better interpersonal relationship and also helps in knowing how the better interpersonal can be achieved by introducing different motivational components.
MBA 104	**Financial Accounting**	CO1. Enable the students in developing the ability to understand accounting language which would be helpful in resolving the problems in the corporate organization.
		CO2. The students would learn to apply techniques of accounting in real life situation.
		CO3. The students would develop skills to prepare financial statements of corporate organizations.
		CO4. The students would also develop skills how to analyse and interpret financial statements.
		CO5. The students would develop skills to take decisions using accounting information.
MBA-105	**Quantitative Techniques**	CO1. It would enable the students to understand the application of quantitative techniques in business world scenario.
		CO2. It would hone the skills of students for application of statistical tools for analysing various business data as well as make decisions on the basis of that.
		CO3. The students would be able to analyse output from various business problems.
		CO4. The students would be able to learn use of statistics in carrying out researches for various business as well as social issues.
		CO5. The students would be able to learn to interpret the results of quantitative analysis.
MBA-106	**Information Technology In Bussiness**	CO1. Explain the social impact of information technology, both locally and globally, and the need for security, privacy and ethical implications in information systems usage
		CO2. Demonstrate problem-solving skills by identifying and resolving issues relating to information technology systems and their components
		CO3. Demonstrate the application of online collaboration and website development tools to support productivity and communication in business contexts
		CO4. Describe current information and communication, how they are selected, developed and used by organisations to produce goods and services, and to cooperate and/or compete with other organisations
MBA-107	**Managerial Economics**	CO1.To know about the need of study of economics for the students of management. Demand forecasting for the entrepreneur and what will happen to the market demand when price got change is studied here through price elasticity of demand.

		CO2. Analyze the production function, which implies about how to bring all factors of production to make production possible. Law of variable proportion indicates that how in short run by changing the variable factor (labour) we can increase the production up to a certain limit. Similarly in long run how production got change by changing all factors production simultaneously and also the idea about the economies of scale.
		CO3.This unit provides the information about the cost of production. Cost analysis is most important part of the management study. It introduces different types of cost and how these are related with each other. It throws light over which cost influences in production in short run or in long run.
		CO4.After study of this unit students will come to know about the different forms of market their features and how they are different from each other.
		CO5. After the study students will be able to determine price at different market situations
MBA-108	**Business Environment**	CO1. Analyze the environment of a business from the legal & regulatory, macroeconomic, cultural, political, technological and natural perspectives.
		CO2. Familiarize the students with the nature of business environment and it components.
		CO3 The students will be able to demonstrate and develop conceptual framework of business environment and generate interest in international business.
		CO4. It helps the students to analyse political, social, economic, technological aspects that are related to cross border trade.
MBA -201	**Marketing Management -II**	CO1. To formulate a marketing plan including marketing objectives, marketing mix, strategies.
		CO2. Recommend profitable customer relationship management strategies that are consistent with organizational marketing objectives.
		CO3. To analyze the market based on segmentation, targeting and positioning.
		CO4. To communicate marketing information persuasively and accurately in oral, written and graphic formats.
MBA - 202	**Human Resource Management-II**	CO1. To formulate a marketing plan including marketing objectives, marketing mix, strategies.
		CO2. Recommend profitable customer relationship management strategies that are consistent with organizational marketing objectives.
		CO3. To analyze the market based on segmentation, targeting and positioning.
		CO4. To communicate marketing information persuasively and accurately in oral, written and graphic formats.
MBA-203	**Cost and Management Accounting**	CO1. To familiarise the students with various functions of Human Resource management usually adopted in an organization.
		CO2. To give students the basic knowledge about Human Resource Planning, Recruitment, Selection, Performance Appraisal, compensation, training & development etc.
		CO3. To give them knowledge about advance concept of HRMstrategies, HRM & its various models,Wage & salary administration etc.
		CO4. The outcome of this paper is to make students understand HRM in detail & its application in practical world.

MBA-204	**Financial Management**	CO1. The students would understand various issues involved in financial management of a firm and hone their skills for making sound financial decisions and policies.
		CO2. The students would be able to develop knowledge about the various sources of finance for a corporate organisation alongwith financial markets.
		CO3. It would enable the students in developing skills for analysis and interpretation business information and application of financial theory in financing related decisions by using various tools and techniques of financial management.
		CO4. It would enable in developing skills for various techniques applied for appraisal of capital expenditure decisions in corporate investment decisions.
		CO5. It would enable in developing skills for understanding the importance of working capital management, estimating the working capital requirement etc..
MBA-205	**Business Research Methods**	CO1. It would help the students to understand nature of research carrying out in business scenerio.
		CO2. It would enable the students to carry out maket research with hands on experience with the field study
		CO3. Identify and analyse the relevant literature pertaining to the research problem
		CO4. Conduct research on business problem in a scientific manner helping the students in application of statistics in business research for analysis of the data.
		CO5. Conduct research on business problem in a scientific manner and Formulate and present effective business report
MBA - 206	**Production and Operation Management**	CO1. To get familiar with the production & Operation management concerning planning, design & management of production & quality control of products i.e. the transformation process of resources, facilities into finished product.
		CO2. Decision making levels in different departments of an organization
		CO3. Perspective of Quality control tools, quality certification, quality management for any kind of organization and also the importance of these things.
		CO4. To know about the Facility location selection and also the different layouts of plants for different types of products
		CO5. To know about the Inventory management, inventory control models, Material management as well as purchasing management and what are the importance of these topics in an organization
MBA – 207A	**Strategic Technology Management And Intellectual Property Right (General Elective)**	CO1. Analyze how technology is related to economic goals of a country.
		CO2. Understand and utilize the concepts of technology forecasting and technology life cycle.
		CO3. Understand business process re-engineering concepts.
		CO4. Understand IPR and the processes to register for IPR
MBA-207B	**Social Marketing (General Elective)**	CO1. Describe and explain the meaning and nature of social marketing
		CO2. Analyse social marketing problems and suggest ways of solving these

		CO3. Recognise the range of stakeholders involved in social marketing programmes and their role as target markets
		CO4. Assess the role of branding, social advertising and other communications in achieving behavioural change.
MBA-208	**Legal Regulatory Framework**	CO1. Basic and practical knowledge regarding formation of company and the duties and responsibilities of managerial people ,
		CO2. How a company winds up, the legal aspects of forming a valid contract the consequences of breach of its breach
		CO3. How to file a complaint in a consumer forum, constitution and jurisdiction of the forum, etc.
		CO4. Get conversed with various sections of different laws and regulations and their impact in running a company, dealing with banks, customers and entering into contracts
MBA-209	**Soft Skill & Business Negotiation**	CO1. Able to more self aware and understand the perceptions and change them. It will also enable the student to be develop their EQ, and give them the skills when it comes to people management or situation management.
		CO2. The students will be able to manage their emotions and develop leadership qualities along with the ability to think critically and creatively.
		CO3. They will be able to develop Interpersonal relationships through effective communication and will be able to solve problems and take decisions and train their minds to success.
MBA-301	**Strategic Management**	CO1. Identify and recognize the various levels at which strategic decision making happens in an organization.
		CO2. Discuss and define the factors that shape the SWOT analysis of a firm.
		CO3. Develop a PESTEL analysis that will lead to formulation of strategic plans.
		CO4. Analyze the suitability of strategies that firms have developed in the real world scenario to achieve valuable outcomes.
		CO5. Devise strategic approaches to managing a business successfully in a global context
MBA-302	**Digital Business-I**	CO1. To know the business models of e-commerce, the overall process of an e-commerce website how they work, the payment methods and also the application of e-commerce
		CO2. To get the idea of different computer systems being used by organization for storing data, communications etc. To understand about the different types of Management Information System like Decision support System, Executive Information System.
		CO3. To understand the concept of digital marketing and also the difference in traditional and digital marketing
		CO4. To know about the Search Engine Optimization and how it works
MBA-303A	**Consumer Behaviour**	CO1. Identify and explain factors which influence consumer behavior.
		CO2. To analyse the principles and concepts of consume behavior and consumption theory and apply them in consumption setting
		CO3. Demonstrate how knowledge of consumer behaviour can be applied to marketing
		CO4. Work effectively to prepare a professional, logical and coherent report on consumer behaviour issues within a specific context

		CO5. Recognise social and ethical implications of marketing actions on consumer behaviour
MBA-304A	**International Marketing**	CO1. Apply the key terms, definitions, and concepts used in marketing with an international perspective.
		CO2. Compare the value of developing global awareness vs. a local perspective in marketing.
		CO3. Evaluate different cultural, political, and legal environments influencing international trade.
		CO4. Distinguish the advantages and disadvantages of products and services possess in international marketing in both emerging markets and mature markets.
		CO5. Explain the impact of global and regional influences on products and services for consumers and businesses.
MBA-305A	**Product And Brand Management**	CO1. Understand the product and brand operation from customer point of view
		CO2. Understand and analyse the challenges in the contemporary business using the different theories and models
		CO3. Ability to develop, interpret and evaluate different product and brand strategies
		CO4. Identify and develop the factors critical for the product or brand
		CO5. Knowledge about the competition in different sectors
MBA-303B	**Manpower Planning And Resourcing**	CO1. To disseminate students with the basic concept of Man power planning along with its need, importance, benefits etc.
		CO2. To give them knowledge about Human resource accounting and growing trends of HRA.
		CO3. To make students aware of various recent forecasting techniques to measure man power requirement and how those techniques can be adopted in an organization to do proper calculation regarding Man power planning.
		CO4. The outcome of this paper is to give students a very good idea about various strategies related to Man power planning and its application in today's competitive environment.
		CO5. To make students the knowledge about resourcing strategy
MBA-304B	**Employee Relationship Management and Labour Laws**	CO1. It gives the different bases to know of having relationships among the people of organisation as well as the benefits of having good industrial relation.
		CO2. It also helps in establishing very healthy industrial relationship with the help of Labour laws.
		CO3. It helps in knowing the role of Trade Union, the importance of presence of Ethical codes, Discipline, organisation's own grievance handling mechanism etc.
		CO4. It gives a better understanding why workers' participation in management and collective bargaining are important very much in organisation.
		CO5: It gives understanding on how social security can be ensured with the employees of organisation.
MBA-305B	**Management And Organization Development**	CO1. To define various terms relating to organizational development & change

		CO2. Apply theories and current research concerning individuals, groups, and organizations to the process of change
		CO3. Identify organizational situations that would benefit from OD interventions and understand OD diagnostic models
		CO4. Analyze/diagnose ongoing activities within an organization and design and plan the implementation of selected OD interventions.
		CO5. Understand multiple methods for collecting diagnostic data in organizations, and the benefits and shortfalls of each
MBA-303C	**Banking And Insurance**	CO1. To make the students understand the various services offered and various risks faced by banks.
		CO2. To make them aware of various banking innovations after nationalization
		CO3. To give them an overview about insurance industry and to make the students understand various principles, provisions that govern the Life General Insurance Contracts
		CO4. To give them an overview about insurance industry and to make the students understand various principles, provisions that govern the Life General Insurance Contracts
		CO5. To make students Understand the risks faced by banks and ways to overcome them.
		CO6. To make them Understand the difference between Life & Non-life Insurance.
MBA-304C	**Security Analysis And Portfolio Management**	CO1. Understand the basic concepts and fundamentals of Indian capital market, its operations, instruments, regulations etc.
		CO2. Acquire analytical skills in the market analysis in the context of raising medium and long term funds. Develop knowledge of h the operations of secondary market mechanism in Indian financial market
		CO3. Develop skills in making market analysis through Fundamental analysis and Technical analysis.
		CO4. Develop understanding of the underpinnings of important theories and frameworks in Financial Technical Analysis, Identify, interpret and analyze the varied financial technical patterns and indicators presented on the real-life stock charts.
		CO5. Measure volatility in market prices through various models. It would enable the students in statistically measure risk & analyze applications. Students would be able to learn Risk Management issues in investments
MBA-305 C	**International Finance**	CO1: Understand international capital, foreign exchange market, risk relating to exchange rate fluctuations and develop strategies to deal with themith them.
		CO2. Lead the students to understand the ways of operating of multinational corporation .as well as the international market environment. Which include international financial market and the political and economic environment in host countries, etc.
		CO3. Would be able to know about various strategies to deal with other types of country risks associated with foreign operations.
		CO4. to know about various strategies to deal with other types of country risks associated with foreign operations
		CO5. apply the theories and models covered to the issue of optimal currency areas, with specific reference to the design and operation of the euro.
MBA-303 D	**Entrepreneurship And Small Business**	CO1.Understand the nature of entrepreneurship

	Management	CO2. Understand the function of the entrepreneur in the successful, commercial application of innovations
		CO3. Confirm an entrepreneurial business idea
		CO4. Identify personal attributes that enable best use of entrepreneurial opportunities
		CO5. Explore entrepreneurial leadership and management style
MBA-304D	**Introduction To Industry Verticals**	CO1. Service sectors like hospitality, health care and the aspects of consultancy event management and also about various forms of industries
		CO2. The ecosystem of ITES
		CO3. The ecosystem of education and training
		CO4. Various facts of agribusiness
		CO5. Project formulation and reporting
MBA-305D	**Project Formulation And Reporting**	CO1. Would Possess creativity and innovative skills for entrepreneurs and lifelong learning in entrepreneurship.
		CO2. Able to identify business ideas and shape entrepreneurial opportunities and to evaluate their potential for business success
		CO3. Knowledge of importance of business plan and also about common pitfalls to be avoided in preparation of it.
		CO4.To understand and comprehend applicability of functional plans to situations in global business world
		CO5. Would be able to Undertake a mini project to practice the theoretical perspective learnt above.
MBA-303E	**Environment And Agri Business Management**	CO1. Economic Environment and role of agriculture
		CO2. Monetary and fiscal policies and regulatory rules
		CO3. Socio-Cultural Environment
		CO4. Political and Legal Environment
		CO5. Ecological Environment & Sustainable Development
MBA-304E	**Agri Business And Rural Marketing**	CO1. Principles and practices of marketing
		CO2. Marketing and market research
		CO3. Factor influencing consumer behavior

		CO4. Product management process and Promotion & Distribution Management
		CO5. Innovation and New Product Development
MBA-305E	**Agri Input Management**	CO1. Estimation of planning and Materials Planning
		CO2. Purchase process and Management
		CO3. Logistics and Warehousing
		CO4. Cost control techniques
		CO5. Learn the Markets and Market Structure
MBA-306 [MDC PAPER]	**Corporate Governance And Corporate Social Responsibility (CSR)**	CO1. Display a clear understanding of importance of corporate governance and corporate social responsibility and how it effects various decisions in the organization.
		CO2. Identify various concerns usually addressed by corporate governance structures and the other drivers of corporate governance, such as capital markets, shareholders and rating agencies.
		CO3. Practice appropriate business responses and management approaches for dealing with social, political, environmental, technological and global issues;
		CO4. Describe the ethical an current social responsibility issues and the influence of these issues on society, management decision making, behaviour, policies and practices;
		CO5. Define governance in business and recognize the legitimacy of business as an institution in a global society
MBA-401	**Supply Chain Management**	CO1. Develop a sound understanding of the important role of supply chain management in different organizations.
		CO2. To understand the supply chain theories, practices and concepts utilizing case problems and problem-based learning situations also the current supply chain management trends.
		CO3. To know what are the importance of planning & demand in supply chain and how information technology is related to supply chain management.
		CO4. To understand the recent trends adopted by the organizations and how they are implementing those.
		CO5. Plan Warehouse and Logistics operations for optimum utilization of resources
MBA-402A	**Digital Business – II (General Elective)**	CO1. To know the concept, classification of Cyber-crime, cyber security and also the punishment and residuary penalty for these.
		CO2. To understand the different types of payment methods used by e-commerce websites and the risk management options for these Electronic Payment Systems.
		CO3. To get familiar with the ERP systems for both manufacturing or service organizations, and implementation of this system.
		CO4. To know about the security risk in e-commerce and protection of these electronic assests and intellectual property.
MBA-402 B	**Corporate Governance And Corporate Social Responsibility (CSR)**	CO1. Display a clear understanding of importance of corporate governance and corporate social responsibility and how it effects various decisions in the organization.

	(General Elective)	CO2. Identify various concerns usually addressed by corporate governance structures and the other drivers of corporate governance, such as capital markets, shareholders and rating agencies.
		CO3. Practice appropriate business responses and management approaches for dealing with social, political, environmental, technological and global issues;
		CO4. Describe the ethical an current social responsibility issues and the influence of these issues on society, management decision making, behaviour, policies and practices;
		CO5. Define governance in business and recognize the legitimacy of business as an institution in a global society
MBA-403A	**Service Marketing**	CO1. To know in detail about the service sector and apply the 7Ps of Service Marketing.
		CO2. To understand what quality means in service delivery and how perceptions of service quality are developed by customers.
		CO3. The students will be able to explain service blueprinting, the integration of new technologies and other key issues of today's customer service provider and service managers.
		CO4. The students will be able to identify critical issues in service design and service delivery including managing customer service.
		CO5. Identify critical issues in service design including nature of the service product and marketing.
MBA-404A	**Advertising And Sales Management**	CO1. Gather basic concepts of the trade of advertising and ability to understand client requirement for advertising
		CO2. Develop an advertising plan considering the strength, weakness opportunity and threat for the client
		CO3. Understand the criticality of different media and devising media strategy and media budget as per client requirement
		CO4. Understand the need for organising, training and motivating sales person
		CO5. Learn territory management for increasing effectiveness of sales
MBA-403B	**Compensation Management And Labour Welfare Laws**	CO1. It helps in having a better industrial relation and knowing the socio-economic emergence of labour laws in organisation.
		CO2. It gives the idea on how the employees can be given the social security just by introducing labour laws efficiently.
		CO3. It helps in creating the awareness among the employees about their right in the work place that may be related to the monetary issue.
		CO4. It helps in how to regulate and control misconduct which arises in organisation.
		CO5. Demonstrate a general knowledge framework and understanding of key functions in management as applied in practice. Students will be aware of different school of though and the theories given by different management thinkers
MBA-404B	**Talent Management**	CO1. To acquaint the students with the concept of Talent Management including growing trends of Talent Management and its objectives, need etc. in today's organisations.
		CO2. To discuss with the students about how Human Resource Management Department can identify the talented employees exist in their organization and how to motivate them to achieve better performance.

		CO3. Learning about Talent management system, Talent management process and various strategies related to it
		CO4. To discuss about procedure of Talent acquisition, Talent engagement and Talent Retention in an organization.
		CO5. The outcome of this paper is to make students learn about how employees can achieve and utilize their talents and its application in practical world
MBA-403C	**Advance Financial Services**	CO1. It would help the students to gain knowledge on existing and emerging areas of merchant banking.
		CO2. Communicate and explain specialised technical advice, knowledge and ideas, to professionals and non experts involve with the financial services industry.
		CO3. To know about the on Hire purchase and leasing system, and credit rating process adopted by the various institutions.
		CO4. A capacity to integrate technical and conceptual knowledge, and interpersonal skill to work effectively within the financial services industry.
		CO5. Help to analysis various financing strategies and financing decision
MBA-404C	**Management of Financial Derivatives**	CO1. It would enable the students to understand the basic concepts and fundamentals of Derivatives available in Indian Financial market, its operations, instruments, regulations etc
		CO2. The students would gain the knowledge of emergence of commodities markets and understand its future thus enabling the students to understand the dynamics of world commodities markets.
		CO3. It would acquaint the students with the trading, clearing and settlement mechanism in derivative market.
		CO4. It would equip the students with the knowledge of emerging commodities derivatives trading practices in India.
		CO5. It would also equip the students about valuation of derivatives, pricing strategies of derivatives and apply them in real life situations.
MBA-403D	**New Enterprise Finance And Appraisal**	CO1. Acquaint to prepare project proposal (DPR) for new enterprise
		CO2. To know about the technology management.
		CO3. To study about the emerging technologies.
		CO4. To infer the knowledge of quality control practices
		CO5. Will enable students the knowledge about crowd funding and financial appraisal
MBA-404D	**Business Opportunity And Modeling**	CO1. Study about the evolving markets and emerging trends in marketing
		CO2. To study about social entrepreneurship
		CO3. To prepare and develop business modeling.
		CO4. Applying simulation technique to have a better understanding of the new market ideas.
		CO5. Understand the diversity in platform thinking: platforms as technological systems, multi-sided markets, and organizations

MBA-403E	**Agri-Business Technology Management And Agri-Marketing Institutions**	CO1. To know about the technology management.
		CO2. To study about the emerging technologies.
		CO3. To infer the knowledge of quality control practices
		CO4. To study about the rules and regulations in Agri- Business.
		CO5. To know about the marketing institutions towards Boards and Directorates.
MBA-404E	**Agri Business Opportunities**	CO1. To know about the technology management.
		CO2. To study about the emerging technologies.
		CO3. To infer the knowledge of quality control practices
		CO4. To study about the rules and regulations in Agri- Business.
		CO5. To know about the marketing institutions towards Boards and Directorates.
MBA-407 [MDC Paper]	**Basics Of Management**	CO1: Understand the concepts related to Business.
		CO2: Demonstrate the roles, skills and functions of management.
		CO3: Analyze effective application of PPM knowledge to diagnose and solve organizational problems and develop optimal managerial decisions.
		CO4: Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities.
		CO5. To discuss about leader, followers as well as leadership process and also various styles and theories related to it.
MBA-408	**Human Values & Professional Ethics**	CO1. The students identify the importance of human values and skills for sustained happiness.
		CO2. The students strike a balance between profession and personal happiness/ goals.
		CO3. The students realize/ explain the significance of trust, mutually satisfying human behavior and enriching interaction with nature.
		CO4. The students develop/ propose appropriate technologies and management patterns to create harmony in professional and personal life

B.SC. CHEMISTRY

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

2. COURSE OUTCOMES (COs)

BSC 101	**INORGANIC CHEMISTRY-I**	CO1: To give the basic knowledge of Atomic Structure
		CO2: To give the basic knowledge of wave functions and quantum numbers
		CO3: To give the basic knowledge of Periodicity of Elements
		CO4: To give the basic knowledge of Chemical Bonding
		CO5: To give the basic knowledge of Oxidation-Reduction
BSC 102	**PHYSICAL CHEMISTRY I**	CO1: To give the basic knowledge of nature of forces within gas molecules, kinetics and laws.
		CO2: To give the basic knowledge of nature of forces within liquid state.
		CO3: To study the arrangement of atoms in the solid state and their determination.
		CO4: To give the basic knowledge of thermodynamics of electrolytes. salts, acid and bases and indicators.

		CO5: To give the basic knowledge of measurement of few properties associated with fluids
BSC 103	**INORGANIC CHEMISTRY I LAB**	CO1: Practical knowledge of acid-base titration
		CO2: Practical knowledge of oxidation-reduction
		CO3: calibration of laboratory apparatus
		CO4: Expertise in solution preparation
BSC: 104	**Physical Chemistry-I LAB**	CO1: Practical knowledge of handling viscosity and surface tension appartus.
		CO2: Analysis of surface tension and viscosity data
		CO3: analysis of acid-base reactions using pH metric titration
		CO4: to learns to prepare buffer solutions for various pratical uses.
BSC 201	**ORGANIC CHEMISTRY I**	CO1: To give basic knowledge on the organic compounds and some typical properties.
		CO2: To give basic knowledge on Hydrocarbons and properties.
		CO3: To give basic knowledge on structure of Atom and related parameters
		CO4: To give basic knowledge on the gasesous state and its thermodynamics
		CO5: To give basic knowledge on the liquid state and its thermodynamics
BSC: 712	**Organic Chemistry Practical Credit 2**	CO1: To give knowledge on the preliminary test for detection of organic compound
		CO2: To give knowledge on test for elemental detection
		CO3: To give knowledge on the detection of functional groups
		CO4: To give knowledge on the prepration of derivatives and characterization
BSC 201:	**ORGANIC CHEMISTRY I**	CO1: To give the basic knowledge of Organic Compounds
		CO2: To give the basic knowledge of Stereochemistry
		CO3: To give the basic knowledge of Aliphatic Hydrocarbons
		CO4: To give the basic knowledge of Aromatic Hydrocarbons
		CO5: To give the basic knowledge of types of organic reactions
BSC 202	**PHYSICAL CHEMISTRY II**	CO1: To give the basic knowledge of thermodynamics
		CO2: To give the basic knowledge of thermochemistry
		CO3: To give the basic knowledge of chemical equilibrium
		CO4: To give the basic knowledge of solutions and colligative properties
		CO5: To give the basic knowledge of thermodynamic systems of variable composition
BSC 203	**ORGANIC CHEMISTRY I LAB**	CO1: To determine the physical properties of organic compounds
		CO2: Separation of mixture of organic compounds by TLC and paper chromatography
		CO3: To learn purification techniques
		CO4: to handle melting point apparatus.
BSC 204	**Physical Chemistry II LAB**	CO1: To give the practical knowledge of determination of thermo-chemical properties
		CO2: To get the practical knowledge on the construction of a Caloriemeter
		CO3: To study the thermochemical properties using Caloriemeter
		CO4: To study the solubility of liquid in liquids
BSC 721	**Organic, Inorganic and Physical Chemistry II**	CO1: To give basic knowledge on nucleophillic and eletrophillic reactions
		CO2: To give basic knowledge on alcohols, phenols and their preparation routes
		CO3: To give basic knowledge on chemical bonding and acid-base concept
		CO4: To give basic knowledge on chemical thermodynamics and equilibrium
		CO5: To give basic knowledge on chemical kinetics

BSC 722	**Inorganic Practical**	CO1: To give knowledge on the qualitative analysis of single ion in a given compound
		CO2: To give knowledge on qualitative analysis of mixture of ions in a given compound
		CO3: To give knowledge on the quantitative estimation of metal ions
		CO4: To give knowledge quantitative estimation of metal ions using different quantitative methods
BSC 301	**INORGANIC CHEMISTRY-II**	CO1: To give the basic knowledge of Metallurgy
		CO2: To give the basic knowledge of Acids and Bases
		CO3: To give the basic knowledge of Chemistry of s and p Block Elements
		CO4: To give the basic knowledge of Inorganic Polymers
		CO5: To give the basic knowledge of Noble elements based compounds
BSC 302	**ORGANIC CHEMISTRY-II**	CO1: To give the basic knowledge of Halogenated Hydrocarbons
		CO2: To give the basic knowledge of Alcohols and Phenols.
		CO3: To give the basic knowledge of Aldehydes and ketones
		CO4: To give the basic knowledge of Sulphur compounds
		CO5: To give the basic knowledge on selected name reactions
BSC 303	**PHYSICAL CHEMISTRY-III**	CO1: To give the basic knowledge of phase diagram and their equilibrium study
		CO2: To give the basic knowledge of chemical kinetics
		CO3: To give the basic knowledge of catalysis
		CO4: To give the basic knowledge of adsorption
		CO5: To give the basic knowledge of thermodynamics of binary Solutions
BSC 304	**Inorganic Chemistry II LAB**	CO1: To give the practical knowledge of iodometric titration
		CO2: To give the practical knowledge of preparation of double salt
		CO3: estimation of toxic ions like Arsenic.
		CO4: estimation of halogens.
BSC 305	**Organic Chemistry II-LAB**	CO1: To detect elements other than carbon.
		CO2: Determination of functional groups of organic compounds.
		CO3: Preparation of derivative
		CO4: Measurement of melting points of organic compounds
BSC 306A	**SEC-I PHARMACEUTICAL CHEMISTRY**	CO1: To give the basic knowledge of drugs
		CO2: To give the basic knowledge of fermentation
		CO3: Synthesis of several common drugs
		CO4: Intoduction of several classes of drugs
BSC 306B	**SEC-I CHEMICAL TECHNOLOGY & SOCIETY**	CO1: To impart the basic knowledge of Chemical Technology
		CO2: To give the basic knowledge of effect of chemicals, plastic, nuclear materials, fossil fuel, genetic engineering on society.
		CO3: To impart training on extraction, leaching, adsorption and adsorption methods.
		CO4: To create knowledge about societal issues on chemical industry.
BSC-731	**Organic, Inorganic and Physical Chemistry I**	CO1: To give basic knowledge on the organic compounds and some typical properties.
		CO2: To give basic knowledge on Hydrocarbons and properties.
		CO3: To give basic knowledge on structure of Atom and related parameters
		CO4: To give basic knowledge on the gasesous state and its thermodynamics
		CO5: To give basic knowledge on the liquid state and its thermodynamics
BSC 732	**Organic Chemistry Practical**	CO1: To give knowledge on the preliminary test for detection of organic compound

		CO2: To give knowledge on test for elemental detection
		CO3: To give knowledge on the detection of functional groups
		CO4: To give knowledge on the preparation of derivatives and characterization
BSC 401	**INORGANIC CHEMISTRY-III**	CO1: To give the basic knowledge of complex compounds
		CO2: To give the basic knowledge of d- block elements
		CO3: To give the basic knowledge of f- block elements
		CO4: To give the basic knowledge of Lanthanides
		CO5: To give the basic knowledge of Bioinorganic Chemistry
BSC 402	**ORGANIC CHEMISTRY III**	CO1: synthetic approach for Nitrogen containing organic compounds
		CO2: synthetic approach for polynuclear hydrocarbons
		CO3: synthetic approach for Alkaloids
		CO4: synthetic approach for Terpenoids
		CO5: Medicinal importance of Alkaloids and Terpenoids
BSC 403	**PHYSICAL CHEMISTRY-IV**	CO1: Understand the basic concepts of electrochemistry.
		CO2: Understand the basic theories of electrical conductance
		CO3: Understand the basic concepts of electrochemistry.
		CO4: Application of conductance and emf measurements
		CO5: Understand the different types of magnetism and measurement.
BSC 404	**Inorganic Chemistry III-LAB**	CO1: Techniques of Gravimetric estimation.
		CO2: Gravimetric estimation of ions in metal complexes
		CO3: Separation of ions using Chromatography
		CO4: Preparation of some important metal complexes
BSC 405	**Organic Chemistry III-LAB**	CO1: To give the practical knowledge of organic preparations
		CO2: To give the practical knowledge of green chemistry in organic synthesis
		CO3: To perform selected name reactions
		CO4: To perform selected organic reaction using Green Methodology
BSC 406 A	**SEC-II Petroleum & Petrochemicals**	CO1: To give the basic knowledge of Petroleum & Petrochemicals
		CO2: To give the basic knowledge of Lubricants
		CO3: To give the basic knowledge of Coal Chemistry
		CO4: Purification of petroleum products
BSC 406 B	**SEC-II PESTICIDE CHEMISTRY**	CO1: To give knowledge on the qualitative analysis of single ion in a given compound.
		CO2: To give knowledge on qualitative analysis of mixture of ions in a given compound.
		CO3: To give knowledge on the quantitative estimation of metal ions.
		CO4: To give knowledge quantitative estimation of metal ions using different quantitative methods
BSC 501	**ORGANIC CHEMISTRY-IV**	CO1: To Study the classification, structures and properties of carbohydrates.
		CO2: To study the classification and synthetic methods of amino acids, peptides and proteins.
		CO3: To analyze the mechanisms of enzyme and drug actions and study the structure-activity relationships of some drug molecules.
		CO4: To classify the components of nucleic acids and lipids and understand the roles of DNA, RNA, triglycerides, phospholipids, glycolipids, and steroids in biological systems.
		CO5: To understand the concept of energy conversion in biological systems
BSC 502	**PHYSICAL CHEMISTRY V**	CO1: To understand the basic concept of quantum chemistry and its applications.
		CO2: To Apply the Schrodinger equation in simple model systems.

		CO3: To understand the basic knowledge of spectroscopy and its application.
		CO4: To Understand the principle, application of Electronic, NMR, ESR spectroscopy.
		CO5: To acquire knowledge about photochemistry and its applications.
BSC 503	**Organic Chemistry IV-LAB**	CO1: To give the basic knowledge of organic estimation
		CO2: To give the practical knowledge of saponification
		CO3: To give training in estimation of amino acids and proteins
		CO4: To determine action of salivary amylase
BSC 504	**Physical Chemistry-III LAB**	CO1: To give the practical knowledge of kinetic study
		CO2: To give the practical knowledge of adsorption study
		CO3: To give the practical knowledge of equilibrium study
		CO4: To give the practical knowledge of phase study
BSC 505A	**GREEN CHEMISTRY (DSE I)**	CO1: To give the knowledge of Introduction to Green Chemistry
		CO2: To Know the importance of employing green chemistry principles
		CO3: To know the Importance of catalyst to achieve the principles of green chemistry
		CO4: Acquiring knowledge of greener synthetic methods in real world cases
		CO5: To Ensuring the future trends and importance of greener synthetic methods
BSC 505B	**NOVEL INORGANIC SOLIDS (DSE I)**	CO1: To give the knowledge of Synthesis and modification of Inorganic solids.
		CO2: To give the knowledge of application of Inorganic solids.
		CO3: To give the knowledge of Introduction to Nanomaterials.
		CO4: To give the knowledge of alloys, composite materials and polymers.
		CO5: To give the knowledge on the application of engineering materials for construction purposes
BSC 506A	**(DSE I LAB) GREEN CHEMISTRY**	CO1: To give the practical knowledge of Green Synthesis
		CO2: To give the practical knowledge of solvent free synthesis
		CO3: To learn microwave based synthesis
		CO4: To prepare biodiesel in laboratory scale.
BSC 506B	**(DSE I LAB) NOVEL INORGANIC SOLIDS**	CO1: To give the practical knowledge of Determination of exchange capacity
		CO2: To give the practical knowledge of Synthesis of nanomaterials.
		CO3: To determine TDS
		CO4: To characterize Nanoparticles
BSC 507A	**DSE II: ANALYTICAL METHODS IN CHEMISTRY**	CO1: To give the knowledge of sampling, error, and statistical methods
		CO2: To give the knowledge of use of UV-Vis, IR, absorption and emission spectroscopy
		CO3: To give the knowledge of Thermal methods and Electroanalytical methods
		CO4: To give the knowledge of Separation techniques
		CO5: To analyze data obtained from different methods as mentioned.
BSC 507B	**DSE II INDUSTRIAL CHEMICALS AND ENVIRONMENT**	CO1: To give the knowledge of manufacture of inorganic chemicals and metals
		CO2: To give the knowledge of air pollution with reference to particles in air
		CO3: To give the knowledge of water pollution with special reference to effluents
		CO4: To give the knowledge of fossil and nuclear fuels and its hazards

		CO5: Understanding the industrial preparation and purification of metals
BSC 508A	**DSE II LAB: ANALYTICAL METHODS IN CHEMISTRY**	CO1: To give the practical knowledge of Separation technique
		CO2: To give the practical knowledge of spectroscopic technique
		CO3: To give the practical knowledge of Solvent Extractions
		CO4: To give the practice knowledge on the use of Ion exchange resins
BSC 508B	**DSE II LAB: INDUSTRIAL CHEMICALS & ENVIRONMENT**	CO1: To give the practical knowledge of Determination of DO, BOD and COD
		CO2: To give the practical knowledge of Determination of air pollutants
		CO3: To give the practical knowledge of Determination of water pollutants
		CO4: To measure the amount of dissolved gases.
BSC 601	**:INORGANIC CHEMISTRY-IV**	CO1: To give the knowledge of Theory of Qualitative Analysis
		CO2: To give the knowledge of Organometallic Compounds
		CO3: To give the knowledge on the structural features of organometallic compounds
		CO4: To give the knowledge of inorganic reaction mechanism
		CO5: To give the knowledge of Catalysis by Organometallic Compounds
BSC 602	**ORGANIC CHEMISTRY-V**	CO1: To give the knowledge of Application of spectroscopy – UV, IR, NMR in organic chemistry
		CO2: To give the knowledge of Application of Mass spectroscopy in organic compounds
		CO3: To analyze compounds using combined data
		CO4: To give the knowledge of organic dyes
		CO5: To give the knowledge of organic polymers
BSC: 603	**INORGANIC CHEMISTRY IV-LAB**	CO1: To give the practical knowledge of qualitative analysis of cations and anions
		CO2: To give the practical knowledge of qualitative analysis of cations and anions in mixtures
		CO3: To give the practical knowledge of preparations of inorganic compounds
		CO4: To give the hands on practice on the analysis by spectrophotometry
BSC 604	**Physical Chemistry IV-LAB**	CO1: To know the Calibration of Instruments viz., Conductance and pH meter.
		CO2: To know the handling of electrodes involved
		CO3: To analyse the acid-base reactions using conductance data
		CO4: To analyse the acid-base reactions using pH data
BSC 605A	**DSE III RESEARCH METHODOLOGY FOR CHEMISTRY**	CO1: To give the knowledge of Literature Survey
		CO2: To give the knowledge of Writing Scientific Papers
		CO3: To give the knowledge of Safety and Handling of Chemicals
		CO4: To give the knowledge of Data Analysis and fundamentals of electronics
		CO5: To give the knowledge on manuscript writting
BSC 605B	**DSE III INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS**	CO1: To give the knowledge of spectroscopic instrumentation viz., IR, UV etc.
		CO2: To give the knowledge of Separation technique
		CO3: To give the knowledge of Mass spectroscopy and instrumentation
		CO4: To give the knowledge of NMR and X-ray
		CO5: To give the knowledge of electoanalytical instruments and data interpretation
BSC: 606A	**DSE-IV: POLYMER CHEMISTRY**	CO1: To give the knowledge of polymeric materials
		CO2: To give the knowledge of Kinetics of Polymerization
		CO3: To give the knowledge of Structure of polymers
		CO4: To give the knowledge of molecular weights of polymers

		CO5: To give the knowledge of properties of polymer solution
BSC: 606B	**DSE-IV: INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE**	CO1: To give the knowledge of Glass and ceramics
		CO2: To give the knowledge of fertilizer
		CO3: To give the knowledge of pains and pigments, battery
		CO4: To give the knowledge of catalysis and explosives
		CO5: Acquiring knowledge on industrial application of silicate materials
BSC 607A	**IT FUNDAMENTALS (SEC III)**	CO1: To give the knowledge of computer system and hardware
		CO2: To give the knowledge of software
		CO3: To give the knowledge of Graphical based softwares and analysis
		CO4: To give the knowledge of WEB and Internet Services
BSC 607B	**IT SKILLS FOR CHEMISTS (SEC III)**	CO1: To give the knowledge of mathematics for chemistry
		CO2: Construction of simple programs using matrix
		CO3: Employing numerical methods in programming language
		CO4: Understanding of the simultaneous equations
BSC 608	**Dissertation**	CO1: To give the knowledge on the concept of literature survey
		CO2: To give the knowledge on the concept of Writing a problem for research
		CO3: To give the knowledge on the presentation of research data
		CO4: Finally the write-up and presentation of the data

M.SC. CHEMISTRY

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

2. COURSE OUTCOMES (COs)

MSC 101	**INORGANIC CHEMISTRY-I**	CO1: To give the knowledge of molecular structure and bonding of different molecules.
		CO2: To give the knowledge of metal-ligand bonding in d-block element.
		CO3: To give the knowledge of electronic spectra of d-block metal complexes.
		CO4: To give the knowledge of non-transition elements.
		CO5: To give the knowledge of Metal Clusters.
MSC 102	**ORGANIC CHEMISTRY-I**	CO1: To give the knowledge of organic reactive intermediates and their role in organic reactions.
		CO2: To give the knowledge of different reaction pathways for variation organic reactions.
		CO3: To give the knowledge of molecular orientation in space and its identification.
		CO4: To give the knowledge of symmetric synthesis and different rulings on identification of major products.
		CO5: To give the knowledge of Aromaticity in organic molecules
MSC 103	**PHYSICAL CHEMISTRY-I**	CO1: To give the knowledge of kinetics of different reaction and their mechanism.
		CO2: To give the knowledge of equilibrium and non-equilibrium thermodynamics.
		CO3: To give the knowledge of non-equilibrium thermodynamics.
		CO4: To give the knowledge of chemistry of polymerization and its applications.
		CO5: To give the knowledge of evaluation of analytical data.
MSC 104	**QUANTUM CHEMISTRY AND MOLECULAR SPECTROSCOPY -I**	CO1: To give the knowledge of principle of quantum mechanics.
		CO2: To give the knowledge of applications of quantum mechanics to model systems
		CO3: To give the knowledge of molecular spectroscopy related to electromagnetic radiations.
		CO4: To give the knowledge of rotational spectroscopy.
		CO5: To give the knowledge of vibrational spectroscopy
MSC 105	**ORGANIC CHEMISTRY LAB**	CO1: Practical knowledge of elemental constituents of organic molecules.
		CO2: Practical knowledge of identification of various functionalities of organic molecules.
		CO3: Practical knowledge of different separation techniques of organic mixtures.
		CO4: Practical knowledge of synthetic strategies of organic molecules.
		CO5: Practical knowledge of extraction of natural products
MSC 201	**INORGANIC CHEMISTRY-II**	CO1: To give the knowledge of symmetry of molecules and its application.
		CO2: To give the knowledge of various transition metal complexes and their magnetic properties.
		CO3: To give the knowledge of Magnetic properties of transition metal complexes.
		CO4: To give the knowledge of oxidation and reduction of different metal ions.
		CO5: To give the knowledge of properties and application of lanthanides and actinides

MSC 202	**ORGANIC CHEMISTRY-II**	CO1: To give the knowledge of organic name reactions and molecular rearrangement.
		CO2: To give the knowledge of Oxidising reagents.
		CO3: To give the knowledge of Reducing reagents.
		CO4: To give the knowledge of organometallic reagents.
		CO5: To give the knowledge of chemistry of enzyme and co-enzyme
MSC 203	**PHYSICAL CHEMISTRY-II**	CO1: To give the knowledge of structure and properties of solids.
		CO2: To give the knowledge of kinetic study of enzymatic and fast reactions.
		CO3: To give the knowledge of different distribution laws and their statistical thermodynamic studies.
		CO4: To give the knowledge of adsorption study and colloidal properties.
		CO5: To give the knowledge of chemistry of surfactants.
MSC 204	**QUANTUM CHEMISTRY AND MOLECULAR SPECTROSCOPY -II**	CO1: To give the knowledge of quantum chemistry of hydrogen and hydrogen like ions.
		CO2: To give the knowledge of different theories of quantum chemistry.
		CO3: To give the knowledge of electronic transitions and their application.
		CO4: To give the knowledge of ESR and Mossbauer spectroscopy.
		CO5: To give the knowledge of NMR Spectroscopy.
MSC 205	**INORGANIC CHEMISTRY LAB**	CO1: Practical knowledge of quantitative estimation.
		CO2: Practical knowledge of qualitative analysis.
		CO3: Practical knowledge of synthesis of various complexes.
		CO 4: Practical knowledge of analysis of Ores.
		CO5: Practical knowledge of characterization and analysis of synthesized complexes.
MSC 301:	**INORGANIC CHEMISTRY-III**	CO1: To give the knowledge of kinetics and reaction mechanisms of transition metal complexes.
		CO2: To give the knowledge of organometallic compounds of transition metals.
		CO3: To give the knowledge of reaction mechanism of organometallic compounds.
		CO4: To give the knowledge of application of catalysis by organometallic compounds.
		CO5: To give the knowledge of application of catalysis by selected organometallic compounds
MSC 302	**ORGANIC CHEMISTRY-III**	CO1: To give the knowledge of structure and reactivity of heterocyclic compounds.
		CO2: To give the knowledge of preparations and reactions of bioorganic compounds.
		CO3: To give the knowledge of application of photochemistry in some organic compounds.
		CO4: To give the knowledge of pericyclic reactions and molecular rearrangements.
		CO5: To give the knowledge on metabolism processes involving living organisms
MSC 303	**PHYSICAL CHEMISTRY-III**	CO1: To give the knowledge of photophysical phenomena and its applications.
		CO2: To give the knowledge of dynamic electrochemical theory.
		CO3: To give the knowledge of theories of electrified interface.
		CO4: To give the knowledge of thermodynamics of electrified interface.
		CO5: To give the knowledge of classification of catalysis and their application
MSC 304	**APPLICATIONS OF SPECTROSCOPY**	CO1: To give the knowledge of characterization of organic molecules by Infra Red spectroscopy.
		CO2: To give the knowledge of fragmentation pattern and application by mass spectroscopy.
		CO3: To give the knowledge of nuclear magnetic resonance spectroscopy and its application.
		CO4: To give the knowledge on 2D NMR.
		CO5: To give the knowledge of spectroscopic technique structural elucidation

MSC 305	**PHYSICAL CHEMISTRY LAB**	CO1: Practical knowledge of study of kinetics.
		CO2: Practical knowledge on equilibrium reactions and phase studies
		CO3: Practical knowledge of viscosity and surface tension study.
		CO4: Practical knowledge of conductometric and pH metric titration of mixture of component.
		CO5: Practical knowledge of spectroscopic analysis.
MSC 306 A	**ENVIRONMENTAL POLLUTION AND MANAGEMENT (MDC)**	CO1: To give the knowledge of scope of environmental chemistry.
		CO2: To give the knowledge of chemistry of organic and inorganic toxic materials.
		CO3: To give the knowledge of water and air pollution.
		CO4: To give the knowledge of soil pollution
		CO5: To give the knowledge of waste management and recycling
MSC 306 B	**GREEN CHEMISTRY (MDC)**	CO1: To give the knowledge of introduction to green chemistry.
		CO2: To give the knowledge of waste management.
		CO3: To give the knowledge of catalysis and its application.
		CO4: To give the knowledge of environmental pollution control.
		CO5: To give the knowledge of prevention of waste
MSC 401 A	**NATURAL PRODUCT CHEMISTRY**	CO1: To give the knowledge of introduction of natural products.
		CO2: To give the knowledge of introduction to steroids and their synthetic route. alkaloids and terpenoids - their synthetic route.
		CO3: To give the knowledge of introduction to alkaloids and terpenoids - their synthetic route.
		CO4: To give the knowledge of classification of vitamins and its chemistry.
		CO5: To give the knowledge of structure, synthesis and chemistry of nucleic acid.
MSC 402 A	**DRUG CHEMISTRY**	CO1: To give the knowledge of introduction of drug, structure activity relationship and their mode of action.
		CO2: To give the knowledge of introduction, classification and mode of action of antibiotics.
		CO3: To give the knowledge of introduction, synthesis and mode of action of anesthetics, anti depressants.
		CO4: To give the knowledge of synthetic route of some important drugs.
		CO5: To give the knowledge of mode of action of some important drugs.
MSC 401 B	**BIOINORGANIC AND INORGANIC PHOTOCHEMISTRY**	CO1: To give the knowledge of concept of electron transfer mechanism.
		CO2: To give the knowledge of introduction and mechanism of different catalysis and inorganic photochemistry.
		CO3: To give the knowledge of Biological cycles, Sensors and Biominerals.
		CO4: To give the knowledge of toxicity of metals and their complexes in therapeutic applications.
		CO5: To give the knowledge of Inorganic Photochemistry.
MSC 402 B	**MATERIALS CHEMISTRY AND NANOMATERIALS**	CO1: To give the knowledge of material synthesis.
		CO2: To give the knowledge of properties of hydrides and hydrogen storage material.
		CO3: To give the knowledge on the synthesis of nanomaterials.
		CO4: To give the knowledge of the structure and properties of nanomaterials
		CO5: To give the knowledge of inorganic polymer and their application.
MSC 401 C	**CHEMICAL DYNAMICS AND ELECTROCHEMISTRY**	CO1: To give the knowledge of introduction to different theories use in reaction in solution.
		CO2: To give the knowledge of molecular reaction dynamic and its application to quantum mechanical treatment.
		CO3: To give the knowledge of electrode kinetic reactions.
		CO4: To give the knowledge of electroanalytical and spectroelectrochemical technique.
		CO5: To give the knowledge of introduction and classification of fuel cells and

		their applications.
MSC 402 C	**SOLID STATE AND POLYMER CHEMISTRY**	CO1: To give the knowledge of properties and application of solid.
		CO2: To give the knowledge of classification of phase transition in solid.
		CO3: To give the knowledge of mechanical behavior of polymers and thermodynamics of polymer solution.
		CO4: To give the knowledge on thermodynamics of polymer solution.
		CO5: To give the knowledge of structure property relationship and the stability of macromolecules.
MSC 403	**PHYSICAL METHODS OF ANALYSIS**	CO1: To give the knowledge of instrumentation and applications of X-ray diffraction technique and thermal methods towards the characterization of the solid.
		CO2: To give the knowledge on the thermal methods of analysis of materials
		CO3: To give the knowledge of surface study of solid catalyst.
		CO4: To give the knowledge of high performance separation techniques.
		CO5: To give the knowledge of different analytical spectroscopic methods.
MSC 404	**PROJECT DISSERTATION / ADVANCED PRACTICALS**	CO1. To give the practical knowledge of multistep synthesis.
		CO2. To give the practical knowledge of separation.
		CO3. To give the practical knowledge of purification.
		CO4. To give the practical knowledge of characterization by different spectroscopic techniques.
		CO5. To give the knowledge of literature survey.
		CO6. To give the knowledge of scientific writing
		CO7. To give the knowledge of use of software like chem. Draw, origin etc.
		CO8. To give the knowledge of application and uses of synthesized compounds or materials.

BACHELOR OF COMMERCE

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1. Understanding of basic concepts, structure and processes of business organizations, their products and services

PSO2. Impart knowledge on accounts keeping, preparation of financial statements, understanding and managing human resources, selecting marketing channels and distribution mechanism of products and services

PSO3. Realizing business laws, rules, regulations

PSO4. Realizing how to comply with all regulatory requirements

PSO5. Be responsive and responsible towards utilization of local resources for achieving social goals to the best advantage of all

PSO6. Improve aptitude for quantitative analysis and data management with IT

PSO7. Giving exposure to a real life situation through identification of a project work relating to a business entity and its functions

PSO8. Sensitising the students about international, national, regional and local business avenues

PSO9. Promoting entrepreneurship and risk taking aptitude

2. COURSE OUTCOMES (COs)

BCM-101	**COMMUNICATIVE ENGLISH**	
BCM-102	**FINANCIAL ACCOUNTING**	CO1: It helps the students to acquire conceptual knowledge of the financial accounting.
		CO2: Enable the students to recognize commonly use financial statements, their components and how information from business transactions flows into these statements.
		CO3: Students learn about the maintenance of final accounts of sole traders, accounts treatment under hire purchase and installment system.
		CO4: Students also learn relevant financial accounting career skills, applying both quantitative and qualitative knowledge to their future career in business.
		CO5: Provide the knowledge of preparation of accounts for branch, department and dissolution of partnership.
BCM-103	**BUSINESS LAW**	CO1: To inculcate knowledge of law of Contract, Special Contracts and law of Agency
		CO2: Learn to analyse the laws relating to Sale of Goods Act,
		CO3: Learn to analyse the laws relating to Partnership Act, 1932, Limited Liability Partnership Act, 2008
		CO4: Learn to analyse the laws relating to Consumer Protection Act, 1986, Competition Commission Act, 2002 and the Insolvency and Bankruptcy Code, 2016, Arbitration and Conciliation Act,1996
		CO5: To enable the students to apply the provisions of business laws in business activities.
BCM-104	**BUSINESS ORGANISATION AND RETAIL TRADE**	CO1: Creates awareness among the students about the functioning of organization, develop students' capability to establish various forms of organization.
		CO2: Creates consciousness among the students about the various traders association or business associations in India.

	MANAGEMENT	CO3: Help students in attaining the understanding the basics of production. Productivity and Rationalization.
		CO4: Students will get insight about the Retailing in India and abroad, students will get acquainted with the management of retail enterprise
		CO5: The information provided in this course will help the students in establishing and running retail business
BCM-105	**MICRO ECONOMICS**	CO1: It tries to capture the basic concepts of microeconomics and students will be able to understand why economic problem arise in micro level and how can we address the problem with efficient allocation of resource.
		CO2: By end of this, student will be able to understand the different types of commodities and importance of income effect, substitution effect and price effect for identifying Giffen goods and inferior goods.
		CO3: Students will be able to understand how cost of production could be minimized to produce a certain level of output. Different cost minimization techniques have been captured so that students can apply these in their future endeavor.
		CO4: It tries to capture the technique and tools to maximize the output given a certain outlay. By end of this, students will be able to learn how profit can be maximized either by maximizing sales or by minimizing cost.
		CO5: By end of this, students will have a clear idea about different kinds of cost and its calculation.
BCM 201	**ENVIRONMENTAL STUDIES**	
BCM 202	**CORPORATE ACCOUNTING**	CO1: This paper helps the students to acquire the conceptual knowledge of corporate accounting and to learn the techniques of preparing the financial statements.
		CO2: Develop an understanding about issue and redemption of Shares and Debenture.
		CO3: It gives an exposure to the company final accounts as per the companies Act 2013 and final accounts of banking companies company as per the banking regulation Act 1949.
		CO4: provide knowledge on valuation of goodwill and shares.
		CO5: Students can get an idea about internal reconstruction, external reconstruction, holding companies and its accounting treatments.
BCM 203	**BUSINESS MATHEMATICS**	CO1. Learn about arithmetic and geometric progression, logarithm analysis.
		CO2. Learn about the properties of determinants and matrices, method of computation on linear equations, application of matrices.
		CO3. Learn about the use of and functions of calculus.
		CO4. Learn about application of mathematics n finance functions, rate of interest, rate f depreciation.
		CO5. Learn about annuities and computation of value of annuities, learn about linear programming, formulation of LPP, graphical method of solution, learn about simplex method, transportation problem.
BCM 204	**MANAGEMENT PRINCIPLES AND APPLICATIONS**	CO1: Students will get aware about the contribution of various management thinkers in the development of management thought; provide insight in the evolution of management.
		CO2: The course will enhance the students' capability in making plan systematically, students will also get to know about the nuances of decision making in the organizational context.
		CO3: The course will instill the capability of establishing Authority and Responsibility structure in the organization, students will get aware about the various aspects and theories of motivation. This will help students in self motivation and motivating a team.

		CO4: Students will get aware about the various aspects and theories of leadership. This will help students in leading a team in different situation.
		CO5: This course will also help students in making their communication efficient & effective. Students will get acquainted with the concept of controlling and can use the tool of control more effectively. The course will also help students in learning modern tools of controlling. The course provides a insight about the emerging issues in management.
BCM 205	**MACRO ECONOMICS**	CO1: To give an idea about national income and related aggregates and different methods of calculating national income. To understand the real and money market and their interdependence
		CO2: To understand the concept of inflation, different types of inflation and causes and remedy measure of inflation.
		CO3: To understand the concept of unemployment, different types of unemployment and causes and remedy measure of unemployment.
		CO4: Students will be able to understand the concept of exchange rate, its determination and its importance in international trade and an open economy.
		CO5: By end of this, students will be able to understand the Government budget and different types of budget and other aspects of public finance.
BCM 301	**HUMAN RESOURCE MANAGEMENT**	CO1. Acquaint students with the techniques and principles to manage human resource of an organization.
		CO2. Provide insight into the subject importance in business organizations
		CO3. Impart knowledge on recruitment, selection of employees and its processes
		CO4. Determine how training needs are identified for its employees, and planning for the same. Understand the concept, techniques of performance appraisal. Understand concepts of wages, determination of compensation and performance linked compensation
		CO5. Study the maintenance factors such as employee health & safety, welfare, social security, grievance handling of employees
BCM 302	**INCOME TAX LAW AND PRACTICES**	CO1: This paper provides basic knowledge and equips students with application of principles and provisions of Income-tax Act, 1961 and the relevant Rules.
		CO2: It enables the students in computing the taxable income of assesses.
		CO3: In order to familiarize the different heads of income with its component's
		CO 4: It helps to build an idea about income from house property and income from business or profession as a concept
		CO5: It provides knowledge to the Students about the tax Planning and management and also helps in acquiring practical skills to work as tax consultant-regarding e-filing of tax etc.
BCM 303	**BANKING AND INSURANCE**	CO1. Impart knowledge about the basic principles of the banking and insurance.
		CO2. Learn different types of cheques and liability of paying banker, use of debit card and credit card
		CO3. Understand the risk of business, assessment and transfer of risk, insurance as a tool for addressing business risk
		CO4. Understand the role of regulating agencies for banking and insurance
		CO5. Acquire knowledge on different types of deposits offered by commercial banks and norms of lending by a banker
BCM 304	**BUSINESS STATISTICS**	CO1. To familiarize the students with statistical tools and techniques and to apply them in solving business problems
		CO2. Enable understanding on theorem of probability distribution, normal distribution
		CO3. Learner will understand construction and uses of index numbers and to construct indices over several economic parameters
		CO4. To understand different kinds of averages and measures of central tendency
		CO5. Learn about determination of the size of universe, selection of sample units from a given universe

BCM 305	**E-COMMERCE**	CO1. To enable the student to become familiar with the mechanism for conducting business transactions through electronic means
		CO2. To understand the operational mechanism of the distribution through the use of online digital portal
		CO3. To understand the mode of payment and settlement obligations through online system and encryption
		CO4. To acquire familiarity with the mode of online services
		CO5. To be familiar with IT Act, digital signature and cyber crime
BCM-401	**COST ACCOUNTING**	CO1: Impart basic concepts used in cost accounting, and alsohelps to gather knowledge on preparation of cost sheet in its practical point of view.
		CO2: It facilitates the idea and meaning of material control with pricing methods and alsodevelop the knowledge about remuneration and incentives schemes and its methods of calculation.
		CO3: It provides the concept of overhead cost.
		CO4:Make them aware aboutvarious methods involved in cost ascertainment and cost accounting book keeping systems
		CO5: make student understand the books and record keeping under cost accounting system
BCM-402	**CORPORATE LAW**	CO1: To impart basic knowledge of the provisions of the Companies Act 2013. To understand how the companies are formed; what are the various kinds of Companies; to understand the term "prospectus" and purpose of issuing prospectus
		CO2: To study the various provisions related to Directors, Managers, Meeting under Companies Act 2013. How Directors and Managers are being appointed and how they can be removed
		CO3: To study the various provisions related to maintenance of Accounts and Audit. How a company can declare dividend; who can inspect the accounts of the company etc
		CO4: To understand the various provisions related to Depositories Act 1996; what are the rights and obligations of depositories etc.
		CO5: To provide an understanding regarding the administration and management of corporate form of business and to give a firsthand
BCM-403	**COMPUTER APPLICATIONS IN BUSINESS**	CO1. Provide computer skills and knowledge for commerce students
		CO2. Enhance the student understanding of usefulness of information technology tools for business operations.
		CO3. Learn about the very nature of various software system applicable for business transactions. Learn about use of ICT in e-commerce, online commerce, digital transactions
		CO4. Learn about digital signature, cyber security. Learn about application of software in filing of returns by the business entities
		CO5. Learn about use of technology in investment decision and resource control
BCM-404	**INDIAN ECONOMY**	CO1. To enable the student to grasp the major economic problems in India and their solution
		CO2. It will enable to learn the difference between development, under development and alternative tools for measuring development with human development indices, happiness indices
		CO3. It will enable to learn computation of national income generated from different sectors of the economy. It will enable to learn fiscal policy, monetary policy framed from time to time and its relevance for economic development of the nation
		CO4. Enable to learn the reforms introduced in agriculture, in industry, in population growth, labour laws and institutional changes brought in
		CO5. It will enable to learn mechanism of public distribution system, food security, cost and pricing policy, role of foreign capital. It will enable to learn the intricacies of international trade and regulation thereof enforced by WTO from time to time

BCM-405	**ENTREPRENEURSHIP**	CO1. Orient the learner toward entrepreneurship as a career option and creative thinking and behavior.
		CO2. Learn about different theories of entrepreneurship developed by prominent authors
		CO3. Understand the spirit of entrepreneurship journey. To identify different forms of entrepreneurship- intrapreneur, edupreneur, social entrepreneur
		CO5. Understand the essence of entrepreneurship, risk bearing ability, innovation, creativity
		CO6. Analyse the implications of different training programmes and their effectiveness
BCM-501	**PRINCIPLES OF MARKETING**	CO1. Learn basic knowledge of concepts, principles, tools and techniques of marketing as well as marketing environment and elements of marketing mix,
		CO2. Understand about the consumer buying behavior, market segmentation, target market and market segmentation
		CO3. Know the decisions to be taken under product mix, processes in new product development
		CO4. Understand the decisions to be taken by marketers under price mix and the channel of distribution issues
		CO5. Understand the concept and tools of communication mix and te digital and green marketing concepts under emerging issues of marketing
BCM 502	**FUNDAMENTALS OF FINANCIAL MANAGEMENT**	CO1. Evaluate the financial objectives of various types of organization, risk return framework and analyze bonds and equities in terms of valuation.
		CO2. Evaluate capital projects under different circumstances using appropriate capital budgeting methods.
		CO3. Determine cost of capital of different sources of finance for taking financing decisions and examine various theories of capital structure and determine optimal capital structure.
		CO4. Critically examine various polices and theories of dividend.
		CO5. Estimate working capital requirements of an organization and effectively manage working capital.
BCM 503	**MANAGEMENT ACCOUNTING**	CO1. To impart the students, knowledge about the use of financial, cost and other data for the purpose of managerial plans, control and decision making.
		CO2. To understand the application of accounting tools and techniques for solving decision making problems
		CO3. To understand the management accounting, cost management, cost control techniques
		CO4. To acquire ability to apply cost accounting tools in predicting the future financial behavior
		CO5. To enhance the ability to predict corporate sickness, forecast its insolvency
BCM-504 A	**CORPORATE TAX PLANNING**	CO1. Understand the concept of tax planning, tax management, tax avoidance, tax evasion and tax liability of a company.
		CO2. Consider tax implications while taking business and financial management decisions.
		CO3. Consider tax implications while taking specific management decisions.
		CO4. Understand the concept and tax provisions relating to double taxation relief, advance ruling and transfer pricing.
		CO5. Consider tax implications while taking decisions relating to business restructuring.
BCM-504 B	**MICRO FINANCE**	CO1. Learn about how micro finance is different from large institutional finance.
		CO2. Learn about the intermediaries involved in disbursal of micro finance
		CO3. Learn about the linkage between MFIs, banks and micro borrowers
		CO4. Learn about the role played by SHGs, joint liability groups and other similar intermediaries
		CO5. Learn about the manner of monitoring of the use of micro credit for income

		generation
BCM-504 C	**SALES MANAGEMENT**	CO1. Understand the concept and process of selling and sales management
		CO2. Understand the concept of sales planning and various selling objectives
		CO3. Gain knowledge about establishing sales territory and importance of sales quota
		CO4. Understand about the sales force management
		CO5. Know about the various structure of sales organization and importance of ethics in selling
BCM-505 A	**FINANCIAL MARKETS AND INSTITUTIONS**	CO1. Learn about the composition of financial market, various instruments traded in it
		CO2. The nature and characteristics of various instruments
		CO3. Learn about the risk associated with running a business entity
		CO4. Learn about the role of marine insurance, fire insurance, and life insurance to mitigate the risk
		CO5. Learn about the role of regulatory agency like RBI over money market and SEBI over capital market operation
BCM-505 B	**ADVERTISING MANAGEMENT**	CO1: The course familiarizes the students with the basic concepts of advertising. The course will also create awareness among students regarding various advertising media.
		CO2: The course will enhance the decision making ability of students with regards to selection of advertising media.
		CO3: Students will get acquainted with the nuances of preparing advertising copy by integrating advertising appeal. This will increase their understanding regarding preparing advertisement.
		CO4: The course will familiarize students with ways and means of measuring the effectiveness of advertising.
		CO5: The course will create awareness about the role and types of advertising agencies. This will help them in choosing the most suitable advertising agency. The course will also throw light on social, ethical and legal aspects of advertising in India.
BCM-505 C	**HUMAN RESOURCE DEVELOPMENT**	CO1. Acquaint the students with the fundamentals of human resource development. Sensitize the students with the theories, techniques and applicability of such HRD interventions in dealing with human resources in organizations.
		CO2. Understand the instruments to be adopted for human resource development. Learn about HRD mechanism, processes, outcome for effective implementation of HRD strategies
		CO3. Identify HRD training needs in order to equip its employees with up to date job skills
		CO4. Understand and determine the developmental needs of executives, their overall development programmes
		CO5. Study the HRD trend in Indian industry
BCM 601	**AUDITING AND CORPORATE GOVERNANCE**	CO1. Learn about the relationship between financial accounting and auditing and need for auditing
		CO2. Learn about the need for preservation of vouchers, documents, cash transactions and other transactions subjected to audit
		CO3. Learn about various regulatory requirements for auditing and manner of valuation of assets and settlement of liabilities
		CO4. Learn about the audit of corporate entities, other business entities as well as nonprofit business organizations
		CO5. Learn about the distinction between audit services from non-audit services
BCM-602	**INDIRECT TAX LAW**	CO1. To gain advanced knowledge of the principles of the laws relating to Indian custom act, Custom tariff Act and GST
		Co2. Acquire the ability to apply the knowledge of the provisions of the above-mentioned laws to various situations in actual practice
		CO3. To understand the difference between direct and indirect taxes

		CO4. To analyse the extent of revenue derived from imposition and levy of indirect taxes on goods and services
		CO5. To understand the implications of online invoice and e-way bill and GST on e-commerce related transactions
BCM 603	**BUSINESS RESEARCH METHODS AND PROJECT WORK**	CO1 Equip the students with the concept and methods of Business Research and learn about the skill of formulating an original fundamental research proposal and design
		CO2 Learn about the techniques for primary data collection secondary data collection. Learn about framing of research questions and schedule to elicits primary information form field survey. To learn about conducting census and sample survey. Learn about data analysis with the help of statistical tools and technique
		CO3. Learn about report writing preparation of dissertation and learn about ethics and moral standard in research. Learn about skill of report writing and power point presentation and oral presentation.
		CO4. Learn about conducting review of past literature, ascertain gap in literature and established research as an academic tool to create new stock of knowledge.
		CO5. Learn about adherence to high moral, ethical standard while conducting research enquiry and prepare a report on it. Learn about the soft skill need for presentation of a report in audio visual form, defending the findings of a research enquiry.
BCM-604 A	**BUSINESS TAX PROCEDURE AND MANAGEMENT**	CO1. Enable to learn intricacies of the provisions of Income Tax Act relating to payment of advance tax, tax deduction at source, tax returns and tax compliance certificate
		CO2. Enable to learn procedure of assessment, re-assessment and rectification of mistake
		CO3. Learn to know the filing of appeals and revisions
		CO4. Enables to learn provisions relating to levy of penalties and prosecution, function of settlement commission
		CO5. Enable to learn income tax, surge, seizure and survey
BCM-604 B	**FUNDAMENTALS OF INVESTMENT**	
		CO1. Understand the concept of investment and familiar with different investment alternatives and Indian Securities Market.
		CO2. Understand bonds and Analyze bonds in terms of valuation.
		CO3. Analyze equity shares with different approaches and valuation model.
		CO4. Understand basics of portfolio, portfolio risk and return and financial derivatives.
		CO5. Know the role of SEBI, stock exchanges, grievances and their redressal system for investor protection.
BCM-604 C	**CONSUMER AFFAIRS AND CUSTOMER CARE**	CO1. Learn about the concept of consumer price, market, retail and wholesale, MRP, labeling and packaging
		CO2. Learn about consumer behavior, their grievances and grievance redressal mechanism. Learn about the provisions of Consumer Protection Act and its application in protecting the interest of consumers
		CO3. Learn about fair trade practice, unfair trade practice, the adverse impact of unfair trade practice
		CO4. Learn about the mechanism of protecting consumer interest against negligence of service and the consequences arising there from
		CO5. Learn about adherence to high standard of quality, morality and standardization in production and distribution of goods and services
BCM-605 A	**COMPUTERISED ACCOUNTING SYSTEM**	CO1. Enables to learn application of ICT in the area of administration of direct and indirect taxes with the use of generic software
		CO2. Enables to learn audit of entities with ICT environment and use of computer software for statutory audit, verification of voucher, verification of related party transaction

		CO3. Enables to learn designing an accounting system with the help of DBMS package
		CO4. Enables to learn preparing a trial balance with SQL and a report
		CO5. Enables to learn designing payroll system for query module and report
BCM-605 B	**INTERNATIONAL BUSINESS**	CO1. Familiarise the concepts, importance and dynamics of international business.
		CO2. Provide theoretical foundations of international business to the extent these are relevant to the global business operations and developments.
		CO3. Focus on the various issues related to business in international trade.
		Co4. Understand the impact of social, political, legal environment on international business.
		CO5. Knowledge of the global business environment
BCM-605 C	**INDUSTRIAL RELATIONS AND LABOUR LAWS**	CO1: Instills general awareness about the Industrial Relation and its evolution in India. The course will also enhance consciousness about the existence and role of ILO and about the international dimensions of Industrial Relation.
		CO2: Acquaint students with the knowledge require for the establishment of Trade Union with reference to Trade Union Act 1926. Will help students to know about the trade union movement in India before and after independence of India. This course will also highlight the factors influencing the growth of Trade Union.
		CO3: The course will help students in understanding the process of collecting bargaining and the role of trad union in this process. Students will gain the knowledge about Workers' Participation in Management India.
		CO4: The course will make students aware about grievance handling procedure in industry. The course will famialarize students with the concept of Discipline, its causes and preventive measures and, about labour turnover, and absenteeism.
		CO5: Students will get acquainted with important provisions of Industrial Dispute Act, 1948, like important definitions, Strikes and lockouts, Lay-off and retrenchment, and closure etc. Students will get aware about the important provisions of The Factories Act, 1948, like Provisions relating to Health, Safety, Welfare facilities, working hours, Employment of young persons, Annual Leave with wages etc.

MASTER OF COMMERCE

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1. In-depth understanding of cross sections of industry, trade, retail and services
PSO2. Giving exposure to complexities of international business, international marketing, strategic HRM
PSO3. Giving exposure to various investment avenues, stock market, bond, debt, currency market
PSO4. Improve the analytical skill and problem solving aptitude
PSO5. Improving soft skill and communication through ICT
PSO6. Selection of a researchable topic to enhance aptitude for survey, report writing and power pouint presentation

PSO7. Sensitising the students about international, national, regional and local business avenues
PSO8. Enabling them to take up NET, JRF, SET and other job related selection test
PSO9. Promoting entrepreneurship and risk taking aptitude

2. COURSE OUTCOMES (COs)

MCM-101	**BUSINESS ECONOMICS**	CO1. It will enable to learn the techniques of profit maximization and wealth maximization, demand supply analysis indifference curve and utility analysis
		CO2. It will enable to learn theories of rent, interest, profit and wages and its bearing on capital maintenance and profit measurement
		CO3. It will enable to learn measurement of GDP growth, inflation management, trade cycle theories and their impact on business decisions
		CO4. It will enable to learn e-commerce, online business transactions, PPP model and payment and settlement obligations
		CO5. It will enable to learn the impact of monetary policy and fiscal policy and its application in relation to business decision making process
MCM-102	**BUSINESS ENVIRONMENT**	CO1. Understand the various components of environment and their interdependence. To know the necessity of environmental scanning and its techniques
		CO2. Assess the likely impact of economic environment such as monetary policy, fiscal policy, GDP, union budget etc on business decisions. Also to know about other economic parameters like human development, industrial policies, universal basic income, ease of doing business etc.
		CO3. Learn the impact of political, legal and socio cultural environment on business. Learners will be able to understand about regulatory bodies like SEBI, RBI and different Acts like Consumer Protection Act, Competition Act, etc. Also the leaners will have an understanding on society, culture and its impact on businesses
		CO4. Determine the impact of technological agreements and state of technology on businesses. To know the international business environment involving operations of MNCs, World Bank, WTO, IMF and their role in India. Exchange rate and its determination and the processes related to IPR
		CO5. Determine the emerging trends and its impact on business decision making. To study about sustainable practices, digital practices, new payment apps and its influence on business environment. Students will also be able to know about industrial environment in North Eastern Region (NER)
MCM-103	**FINANCIAL ACCOUNTING & REPORTING**	CO1. Learn regulation of accounting through accounting standards IFRS
		CO2. Learn use of ICT in financial reporting through XBRL
		CO3. Learn about convergence of national accounting standards with international accounting standards
		CO4. Learn about the analysis and interpretation of financial statements for decision making purpose
		CO5. Learn about measurement of earnings and reporting and computation of cash flow statements and its managerial use
MCM-104	**MARKETING MANAGEMENT AND CONSUMER BEHAVIOUR**	CO1. Understand the terms and concepts of marketing
		CO2. Know the important elements and issues of marketing
		CO3. Understand the marketing strategies and emerging trends to compete in the market
		C04. Understand the concept of consumer behavior and the various factors influencing consumer decision process
		CO5. Learn the various consumer behavior models and the impact of technology in consumer behaviour
MCM-105	**HUMAN RESOURCE**	CO1: The course will create awareness among the student regarding fundamentals of Human Resource Management and contemporary issues associated with it.

	MANAGEMENT	CO2: Students will understand the nuances of Human Resource Planning including Job Analysis, Job Design, Job Evaluation, and Performance Appraisal.
		CO3: The course will acquaint students with the knowledge required for Career & Succession Planning, Training & Development, and Performance Management.
		CO4: The course will enhance capability of students' in the area of Compensation Management, Human Resource Audit and Accounting
		CO5: Students will develop understanding of the concepts of Lay-off, Retrenchment and provisions related to it as per the provisions of Industrial Disputes Act, 1947 along with the other issues related with employee separation and retention
MCM-201	**BUSINESS STATISTICS AND OPERATIONS RESEARCH**	CO1. Students who successfully complete this course should be comfortable with basic statistics and probability. Students learn to understand different data types and their organization, management and presentation and to analyze statistical data graphically using frequency distributions and cumulative frequency distributions.
		CO2. Analyze and apply statistical data using various measures of central tendency and dispersion.
		CO3. Use and apply the basic probability rules, including additive and multiplicative laws, using the terms, independent and mutually exclusive events
		CO4. Student learns to calculate and interpret the correlation between two variables, to calculate simple linear regression equation for a set of data and to evaluate the properties of estimators.
		CO5. Given a problem situation be able to state appropriate null and alternative hypotheses and appropriate means that whether it should be one or two sided and be able to calculate a p-value and be able to interpret a p-value and perform a hypothesis test and state the conclusion with a sentence.
MCM-202	**ORGANISATIONAL THEORY AND BEHAVIOUR**	CO1. Acquaint the determinants of Inter-personal and Inter- Group behavior in organisational setting
		CO2. Equip with behavioural skills for managing people at work at individual and group level
		CO3. Determine why and how people behave in an organisation, understand human complicacies at workplace
		CO4. Understand work ethics and need for whistle blowing, study conflict management techniques to be followed at workplace
		CO5. Develop leadership skills for managing organisational dynamics
MCM 203	**FINANCIAL MANAGEMENT & CONTROL**	CO1. Evaluate the financial objectives of various types of organization and understand the organization of finance function.
		CO2. Evaluate capital projects under different circumstances using appropriate capital budgeting methods.
		CO3. Determine cost of capital of different sources of finance for taking financing decisions and critically examine various theories and determine optimal capital structure.
		CO4. Critically examine various policies and theories of dividend and determine optimal dividend payout policy.
		CO5. Estimate working capital requirements of an organization and effectively manage working capital.
MCM-204	**COST AND MANAGEMENT ACCOUNTING**	CO1. Learn about application of standard costing and budgetary control, computation of variants and variance analysis.
		CO2. Learn about application of marginal costing, differential costing, incremental costing and their application in resource management.
		CO3. Learn about cost control, cost reduction, cost management, value analysis and value engineering.
		CO4. Learn about value added statement, economic value added, shareholder's value added.
		CO5.Learn about emerging concept, activity based costing, lifecycle costing, cost strategies and applications and learn about enterprise resource planning, total quality management, value chain analysis, transfer pricing.
MCM	**FINANCIAL**	CO1: provides the idea about Financial market and intermediaries Institutions.

205	**MARKETS AND INSTITUTIONS**	CO2: Understand the financial system and distinctive functions of each components of financial system.
		CO3: Provide an understanding of the structure, operations in the Capital Market, Money Market Forex market.
		CO4: Have an overview of derivatives market and the role played by financial institutions in these markets.
		CO5: Understand the conceptual framework of Insurance business in India and their importance
MCM-301	**STRATEGIC MANAGEMENT**	
		CO1. Understand the concept and principles of strategic management.
		CO2. Learn the various strategies adopted by the organizations for dynamic business environment.
		CO3. Understand the competitive tactics and social responsibility of business organisations
		CO4. Learn the various strategic approaches for the global market
		CO5. Know the various functional and strategic issues and impact of strategy implementation in global business environment
MCM-302	**BUSINESS RESEARCH METHODS**	CO1 Equip the students with the concept and methods of Business Research and learn about the skill of formulating an original fundamental research proposal and design
		CO2 Learn about the techniques for primary data collection secondary data collection
		CO3 Learn about framing of research questions and schedule to elicits primary information form field survey
		CO4 To learn about conducting census and sample survey
		CO5 Learn about the techniques of data mining data management, data analysis with the help of statistical tools and technique and learn about report writing preparation of dissertation
		and learn about ethics and moral standard in research
MCM-303	**CORPORATE GOVERNANCE AND BUSINESS ETHICS**	CO1. Learn about the corporate governance tactics
		CO2. Learn about the theories of corporate governance followed by other countries of the world and then assimilate with India
		CO3. Learn about various regulatory requirements with regard to corporate governance enforced by various agencies
		CO4. Learn about the best ethical practices expected by management
		CO5 Learn about the role played by the audit committee, remuneration committee, independent directors to uphold the interest of investors in the equity stock
MCM-304A	**TAX PLANNING AND MANAGEMENT**	CO1. Identify the difference between tax evasion, tax avoidance, tax management and tax planning.
		CO2. Consider tax implications while taking business decisions, understand the provisions of the Income Tax Act, 1961 for tax planning in regard to salary income, house property income and capital gains of an individual.
		CO3. Understand the concept of Tax Deduction at Source (TDS) and Advance Payment of Tax, consider tax implications while taking financial management decisions.
		CO4. Understand tax provisions relating to free trade zone Free Trade Zones, Export Processing Zones, Special Economic Zones and for creation of Infrastructure Sector and Backward Areas development
		CO5. Understand the concept, salient features and benefits of Goods and Services Tax and meaning of the different terms defined in the provisions of the Goods and Services Tax (GST) Act.
MCM-305A	**INTERNATIONAL FINANCIAL MANAGEMENT**	CO1: It provides the students with a deep understanding of financial management issues in a multi-national enterprise.
		CO2: It makes aware the students about the international monetary system
		CO3: It makes student understand about international financial market
		CO4: provides the idea about various exchange rate regimes.

		CO5: Make aware about international accounting and taxation environment and also gives idea about nature and measurement of exposure and risk
MCM-304B	**ADVERTISING AND SALES MANAGEMENT**	CO1: The course will create understanding among the students regarding the fundamentals of advertising and different socio-legal and ethical issues. This will also help them in identifying and understanding the role of Advertising with respect to Integrated Marketing Communication.
		CO2: The course will enhance the capacity of the student in drawing Message Strategy. They will learn about the various concepts associated with message strategy like' copywriting, headlines, sub-headlines, slogans, logo, illustration, layout, and appeal. The course will help the students in the situation of decision making regarding the selection of appropriate media or combination of different media for achieving marketing communication goals.
		CO3: The course will acquaint students about the function, role and importance of Advertising Agency. The course will help the students to imbibe with the knowledge required for making advertising budget, evaluating advertising effectiveness and knowledge regarding various contemporary issues influencing advertising.
		CO4: The course will also help students in getting insight about the important theories of theories of selling like, AIDAS theory, and Right set of circumstances theory along with other fundamentals in sales management and personnel selling. Student will also get acquainted with the sales planning and territory management.
		CO5: Student will acquire the capacity of managing sales force in organizational context. They will gain competency in the area of determination of sales force size, recruitment, selection, training &development, evaluation, motivation, competency & leadership. The course will also increase the students' comprehension regarding structuring sales organization. The course will also familiarize students about the concept of Business Ethic.
MCM-305 B	**STRATEGIC HUMAN RESOURCE MANAGEMENT**	CO1. Provide theoretical as well as strategic insight into the management of human resources. To learn about the models of strategic HRM, development of strategies, WTO and labour standards
		CO2. Helpful in understanding the complexities of managing HR through HR planning, outsourcing and the practices followed in different sectors like IT, Retail and so on
		CO3. Understand the strategies with respect to management of HRs in recruitment, selection, training and development, performance evaluation. Identify Key Result Areas (KRAs) to deploy human resource management strategies. To learn about development of HR portals, impact of technology on HR.
		CO4. Learn about compensation, pay revision, executive compensation. Study the process of HRP and outsourcing adopted by global corporate. Know ILO and WTO regulations with respect to HRs.
		CO5. Provide theoretical as well as strategic insight into the management of human resources at domestic and international level. Study the international issues in HRM including expatriate management, repatriation process, and development of international teams and so on
MCM-401	**ENTREPRENEURSHIP DEVELOPMENT & PROJECT MANAGEMENT**	CO1. Learn about various theories of entrepreneurship developed in different countries of the world
		CO2. Learn about the assimilation of entrepreneurship in Indian context
		CO3. Learn about the family controlled business and the family entrepreneurs setting up the business entities
		CO4. Learn about the different types of entrepreneurs
		CO5. Learn about the regulatory norms to be complied with in setting up the enterprise

MCM-402	**INTERNATIONAL BUSINESS**	CO1. Familiarise the concepts, importance and dynamics of international business.
		CO2. Provide theoretical foundations of international business to the extent these are relevant to the global business operations and developments.
		CO3. Knowledge about impact of political, economic, legal, and social policies of different countries on international business.
		Co4. Understand the various strategies adopted in International Business
		CO5.Understand the concept of foreign direct investment, foreign exchange, MNCs in international business
MCM-403	**DISSERTATION**	CO1. Learn about the development of new idea and its application in the shape of project formulation for research work.
		CO2. Learn about skill of report writing and power point presentation and oral presentation.
		CO3. Learn about conducting review of past literature, ascertain gap in literature and established research as an academic tool to create new stock of knowledge.
		CO4. Learn about technique of referencing
		CO5. Acquire skill of academic report writing.
MCM-404 A	**ADVANCED ACCOUNTING**	CO 1: Get depth knowledge of the professional standards, principles and procedures regarding preparation of financial accounting of corporate entity as per the Company Act 2013.
		CO 2: Have an idea on theoretical background that has been created by the academic research and the in-house business research of the corporate entities are given as a background for learning.
		CO 3: Have an exposure to theoretical background with ability to collate with real life situation.
		CO 4: Students can get an idea about internal reconstruction, external reconstruction and accounts treatments for internal, External reconstruction.
		CO 5: Make them aware about accounting of banking and insurance companies and develop knowledge of holding companies accounts.
MCM-405A	**SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT**	CO1. Understand the environment of investment and risk return framework, fundamental analysis and technical analysis for taking investment decisions in securities.
		CO2. Analyze the concept of market efficiency, bonds and shares in terms of valuation.
		CO3. Analyze and select portfolios and understanding of capital asset pricing model and other associated model
		CO4.Construct, evaluate performance of portfolios and learn techniques of portfolios revision.
		CO5.Understand the various types of financial derivatives and their use in portfolio management.
MCM-404B	**INTERNATIONAL MARKETING**	CO1. Familiarize the students with the concept and issues of international marketing, domestic marketing
		CO2. Analyze the foreign market environment and develop international marketing strategies for a business firm.
		CO3. Study the International marketing mix elements including 4Ps, channels used by international firms
		CO4. Determine role of legal environment in international marketing for counterfeiting, gray marketing
		CO5. Understand the mechanism of international firms along with transfer pricing, BEPS tactics of global companies and know the marketing communication mix, media planning and media control to enhance promotion of international

MCM-405 B	**INDUSTRIAL RELATIONS AND LABOUR LAWS**	CO1: The course will create awareness among the students regarding the involvement and role of different parties to industrial relation, students will get acquainted with various perspectives on Industrial Relations. The course will also enhance consciousness about the existence and role of ILO and about the international dimensions of Industrial Relation. The students will also come to know about the influence of ILO on Indian Labour Legislation.
		CO2: The course will acquaint students with the knowledge require for the establishment of Trade Union with reference to Trade Union Act 1926. The course will also create understanding among the students about trade union movement in India, theories of trade union and de-unionization.
		CO3: The course will help students in understanding the causes and types of industrial disputes. The students will get familiarize the important provisions of Industrial Dispute Act, 1948, like Preventive Machineries and Settlement Machineries, Grievance handing procedure; Lay off and retrenchment; forms of punishment-suspension and dismissal
		CO4: Students will get aware about industrial democracy, and industrial discipline. Students will also gain the knowledge about Workers' Participation in Management India and strategies. Students will become conversant to the concept of Labour welfare in Indian context. The students will learn different types of labour welfare activities being carried out in India. Students will get acquainted with the provisions related to Health, Safety and Welfare of the Factories Act, 1948 and the Plantation Labour Act, 1951.
		CO5: Students will get familiarize with the important provisions of Important provisions of Payment of Wages Act 1936, Workmen Compensation Act 1923, Minimum Wages Act 1948, Employees' Provident Funds and Miscellaneous Provisions Act, 1952, Industrial Employment (Standing Orders) Act, 1946
MCM-406	**BUSINESS STUDIES**	CO1. Familiarize the students from non-commerce background with the concepts and management of business.
		CO2. Know the forms of business organization as a basis to decide when starting own business
		CO3. The course equips students with the tools and techniques of management that are required for operating business.
		CO4. Familiarize with legal aspects related to business set-up for sole trading, partnership, cooperatives and joint stock companies
		CO5. Understand the functional areas of management and provide insight into emerging issues in business

PH.D COMMERCE

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

Programme name: Ph.D

PSO1. To encourage creative thinking on a societal problems
PSO2. To prepare a thesis embedding the findings of a research investigation in the shape of a report
PSO3. To prepare an effective research proposal to stimulate advancement of learning and knowledge creation
PSO4. To inculcate the intellectual curiosity of taking up a research enquiry into a given discipline
PSO5. To encourage independent, original thinking, research aptitude and undertaking a fundamental research enquiry
PSO6. To adhere to a high standard of ethical and moral practices in undertaking a research enquiry
PSO7. To develop analytical skill, communication skill and the skill of defending a thesis with strong fundamental inferences drawn out of a research
PSO8. To preserve all documentations, papers, monographs as a proof of individual self contribution in original research work.

BACHELOR OF COMPUTER APPLICATION

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1: Focuses on preparing student for roles pertaining to computer applications and IT industry.

PSO2: Develop programming skills, networking skills, learn applications, packages, programming languages and modern techniques of IT.

PSO3:Get skill and info not only about computer and information technology but also in common, organization and management.

PSO4: Bachelor in computer applications (BCA) gives a number of opportunities to individuals to go ahead and shine in their lives. A few of them being like software programmer, system and network Administrator, web designer faculty for computer science and computer applications .

2. COURSE OUTCOMES (COs)

BEN711	**General English**	CO1. To impart basic communication skills among students.
		CO2. It will help the students to foster a taste for literary prose pieces.
		CO3. To provide throughout knowledge on English grammar.
		CO4. To able to understand the techniques on Literary Texts (Poetry).
		CO5. To provide throughout knowledge on Writing Skills.
BCA101	**Fundamentals of Computer Science**	CO1. To make students well familiar with computer architecture, its application and uses.
		CO2. To make students well familiar with networking fundamentals.
		CO3. To make students well familiar with Internet.
		CO4. To practically train students in MS-Office.
		CO5. To make students well familiar with Number System.
BCA102	**Programming Methodology and C Programming**	CO1. Prepare students to acquire knowledge of programming using C.
		CO2. It is the precursor and inspiration for almost all of the most popular high-level languages available today.
		CO3. Able to implement the programming in different platform.
		CO4. To prepare student for basic Programming Methodology.

		CO5. To practically trains students in C programming language.
BCA103.1	**Digital Logic & Design**	CO1. To make students well familiar with Analog and Digital System.
		CO2. To make students well familiar with Number System.
		CO3. Able to understand the concept of Combination Circuits.
		CO4.To understand and analyze Sequential logic- Flip-Flops and its different types.
		CO5. To make students well familiar with Registers, Counters and the memory unit.
BCA103.2	**Applied Physics**	CO1. To make students well familiar with general properties of matter.
		CO2. To make students well familiar with waves and sound.
		CO3. To make students well familiar with modern Physics I which include de Broglie's hypothesis of matter, waves.
		CO4. To make students well familiar with modern Physics II which include band theory, conductors and insulators.
		CO5. To give brief description of fiber optics.
BCA201	**Data Structure through C**	CO1. Have a comprehensive knowledge of the data structures and algorithms on which file structures and data bases are based.
		CO2.Understand the importance of data and be able to identify the data requirements for an application.
		CO3. Have an understanding and practical experience of algorithmic design and implementation.
		CO4. Understand the issues involved in algorithm complexity and performance.
		CO5. Understand the concept of graph & application of graphs.
BCA 202.1	**Computer Organization& Architecture**	CO1. Understanding the introduction to digital computer and their fundamental architectures.
		CO2. Input and Output peripheral devices and their communication with the rest of the computer components.
		CO3. Functionalities and organization of processor units and their types.
		CO4. Include the interrupts and direct memory access and clasp the standard I/O devices.
		CO5. Memory organization, hierarchy and organization. Able to aware of RAM, ROM, COST, SIZE, CACHE and virtual memory.

BCA 202.2	**Basic Electronics**	CO1. Identify the unique vocabulary associated with electronics and explain the basic concepts of Semiconductor diodes such as p¬n junction diode, characteristics and ammeters, DC load-line, Zener diode. To apply the basics of diode to describe the working of rectifier circuits such as Full and half wave rectifiers. To solve examples on rectifiers for parameters such as Capacitance, load and source effect, line and load regulations, and circuit current
		CO2. Draw and explain the structure of bipolar junction transistor. Explain the operation of each device in terms of junction bias voltage and charge carrier movement. Identify and explain the various current components in a transistor.
		CO3. Describe the application of transistors for Current and voltage amplification. Also to describe the characteristics of different configurations of the transistor. Describe DC load line and bias point. List, explain, and design and analyze the different biasing circuits.
		CO4. Sketch, explain and design the amplifier circuit for given specification and analyze them discuss oscillator principles, oscillator types, and frequency stability as it relates to its operation. Analyze and Design the different types of Oscillators. Discuss ideal and practical operational amplifier (op amp) their electrical parameters, need for op amp. Explain and design different application circuits using op amp.
		CO5. Sketch and explain the basic block of communication system. State the principles of modulation and explain the different modulation techniques. Describe the theory and operation of radio systems and super - heterodyne receivers. Solve simple examples.
BCA203	**Discrete Mathematics**	CO1. Apply knowledge of computing and mathematics appropriate to the discipline.
		CO2. Analyze a problem and identify and define the computing requirements to solution.
		CO3. Apply knowledge of computing, mathematics, science, and engineering appropriate to the modeling and design of software.
		CO4. Implement the numerical methods using computer software and apply them in example.
		CO5. Understand the concepts of algorithms.
BEV 720	**Environmental Studies**	CO1.Acquire skills to understand environment and its various components, related issues and problems, identifying and solving them.
		CO2.Participate and be actively involved at all levels in working towards the benefits of environment.
		CO3. Gain a variety of experiences and acquire knowledge to save the environment for future generations.
		CO4. Acquire an awareness of the environment as a whole, its allied problems and sensitivity.
		CO5. Understand social issues with environment.
BCA 301	**Object Oriented Programming with C++**	CO1. Know the principles of OOPs concept and structure.
		CO2. Analyze the concept of classes and object, array, functions, constructor and destructor.
		CO3. Come to know the concept of inheritance and classification, pointers, virtual function and polymorphism.

		CO4. Able to work with file, file pointers and manipulators.
		CO5. Understand the concept of templates and exception handling.
BCA 302.1	**Software Engineering**	CO1. Learn developing methodology of software project.
		CO2. Acquire skill to know how to develop software project.
		CO3. Understand tools and techniques of software engineering.
		CO4.Maintain the quality of software project.
		CO5. Verify and validate the problem of software programming
BCA 302.2	**Management Information System**	CO1. To understand the managerial level management in organizations.
		CO2. To learn about different management tools, level of decision making.
		CO3. Coordination with DSS.
		CO4. To develop team management skills.
		CO5. To understand about the Security and Ethical Challenges.
BCA 303	**Operating System**	CO1. Analyze the structure and basic architecture components involved in OS.
		CO2. Demonstrate competence in recognizing and using system features.
		CO3. Understand and analyze the theory and implementation of different OS aspect.
		CO4.Understand the different types of scheduling algorithms.
		CO5.Understand about the physical and logical address and concept of pages.
BCA 304	**Relational Database Management System**	CO1. Give an introduction to about DBMS, data model, schema and benefit of database.
		CO2.Able to design a good database using normalization, decomposition.
		CO3. Understand the concepts of database architecture, parallelism concept and distributed database concept.
		CO4. Understand about the indexes, sequences, data integrity, creating and maintaining tables.
		CO5. Understand the concept of different query languages, cursors, triggers.
BCA 401	**Programming with Java**	CO1. To have oops concept.
		CO2. Ability to solve real world problems.

		CO3. Understand the basic principles of creating java application with Graphical User Interface (GUI).
		CO4. To be able to develop rich user interface using modern API's such as JAVAFX.
		CO5. Understands the basic approaches to design software applications
BCA 402.1	**Computer Networks**	CO1. Have basic concepts and terminology in computer network.
		CO2.Acquire knowledge of different types of topologies and protocols.
		CO3. Understand different models of networking.
		CO4. Have knowledge regarding different issues associated with layers.
		CO5. Have knowledge about network security.
BCA 402.2	**Positive Psychology**	CO1.Critically evaluate the theories, techniques and evidence-base of positive psychology.
		CO2. Demonstrate an in-depth understanding of the range of positive psychology interventions to strengthen optimism, resilience and self-esteem.
		CO3. Actively apply positive psychology techniques to enhance the wellbeing of individuals, groups, workplaces, communities and institutions.
		CO4. Get the idea of Hope, Optimism, Self and related concepts, and Resilience.
		CO5. Able to know Flow, Mindfulness, Spirituality and Interpersonal Character Strengths.
BCA 403	**Net Technology**	CO1. Able to develop application software using .NET framework.
		CO2. Understanding the use of main features of the integrated development environment (IDE).
		CO3. Able to develop windows applications.
		CO4. Able to work with XML documents.
		CO5. Able to develop crystal report.
BCA 501	**Linux & Shell Programming**	CO1. Perform installation, package management and process monitoring.
		CO2. Able to perform file system security and management.
		CO3. Learn Shell scripting.
		CO4. Learn advanced security and network concepts.
		CO5. Perform User administration.
BCA 502	**Web Programming**	CO1. Create PHP scripts that use object-oriented PHP.

		CO2. Use stored procedures and triggers.
		CO3. Create CSS and HTML script.
		CO4. Create and deploy a portable web-based system.
		CO5. Test and debug object-oriented PHP scripts.
BCA 503.1	**E-Commerce & Digital Marketing**	CO1. Define various types of E-commerce.
		CO2. Describe hardware and software technologies for E-commerce.
		CO3. Explain payment systems for E-commerce.
		CO4. Describe the process of buying and selling on the web.
		CO5. Describe various E-business strategies.
BCA 503.2	**Artificial Intelligence**	CO1. Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents.
		CO2. Analyze and form the problem as a state space, graph, design heuristics and select among different search or game based techniques to solve them.
		CO3. Develop intelligent algorithms for constraint satisfaction problems.
		CO4. Design intelligent systems for game playing.
		CO5. Apply concepts of NLP to problems leading to understanding of cognitive computing
BCA 503.3	**Python**	CO1. Create scripts in Python.
		CO2. Demonstrate the ability to solve problems using system approaches, critical and innovative thinking, and technology to create solutions.
		CO3. Understand the purpose and the process of code reviews.
		CO4. Design and develop applications using Python.
		CO5.To make students well familiar with Python Modules.
BCA 504.1	**Financial Accounting**	CO1. To give the practical knowledge of accounting to the students.
		CO2. To make the students competent in preparation of Accounts for the Business Entities.
		CO3. Learn about Management Accounting and Cost Accounting.
		CO4. To make students well familiar with Computerized Accounting Packages.
		CO5. Able to implement voucher Entry in Tally, Making Print out of the financial statements.

BCA 504.2	**Automata Theory**	CO1. Design automata, regular expressions and context-free grammars accepting or generating a certain language.
		CO2.Transform between equivalent deterministic and non-deterministic finite automata, and regular expressions.
		CO3. Prove properties of languages, grammars and automata with rigorously formal mathematical methods.
		CO4. Determine if a certain word belongs to a language.
		CO5. Define Turing machines performing simple tasks.
BCA601	**Major Project**	CO1. Student will get exposure to implement practical knowledge in real life applications.
		CO2. Students will get exposure to enhance skills in problem solving, fault analysis and debugging.
		CO3. Students will be able to discover potential research areas in the field of IT.
		CO4. Demonstrate an ability to work in a team.
		CO5. Compare and contrast the existing solutions for the research challenge.
		CO6. Formulate and propose a plan for creating a solution for the research plan identified.
		CO7. Report and present the findings of the study conducted in the preferred domain.
		CO8. Establish a good repo with external organization and get employability skills.

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

2. COURSE OUTCOMES (COs)

MCA 101	**Introductory Programming with C**	CO1. To have knowledge about C language
		CO2. Have knowledge about different program structure.
		CO3. Able to apply pointer concept.
		CO4. To be able to develop logic by which it will be possible to create program/applications.
		CO5. After learning C language students can easily switch to other programming languages.
MCA 102	**Digital Logic & Design**	CO1. To have the basic concept of logic gates,
		CO2. Understand different number system.
		CO3. Have knowledge about basic component of combinational and sequential circuits.
		CO4. To be able to design small-scale combinational and synchronous sequential digital circuit using Boolean algebra and K-maps.
		CO5. After learning this paper students can easily understand Computer Organization & Architecture.
MCA 103	**Mathematical Foundation of Computer Science Part-I**	CO1. To be able apply mathematical logic to solve problem.
		CO2. To have the concept of relations and sets.
		CO3. Understand functions and discrete structure.
		CO4. To be able to formulate problem and to solve recurrence problems.
		CO5. Understand different operation on matrix.
MCA 104	**Accounting and financial management**	CO1. To have a conceptual knowledge of basics of accounting.
		CO2. To develop a skill for recording financial transaction and to generate a financial report.
		CO3. To be familiar with accounting process and preparation of final accounts of any organization.
		CO4. To be able to handle cash book.
		CO5. Apply management accounting tools for cost allocation, budgetary control, performance evaluation, pricing and cost

		management.
MCA 105	**Fundamental of Computer**	CO1. Have knowledge about generation of computer.
		CO2. Become familiar with operating system, programming languages, peripheral devices, networking, multimedia & internet.
		CO3. Understand different components of a computer.
		CO4. Understand different language translators.
		CO5. Able to handle application software -Word, Excel and Power point.
MCA 201	**Data structure and Algorithms**	CO1. Use different kind of data structures which are suited for different applications.
		CO2. Understand the space and time complexity and according to the complexity can select appropriate data structure.
		CO3. Able to use efficient data structures which are keys of designing efficient algorithm.
		CO4. Understand the use of linear and non-linear data structures.
		CO5. Store and retrieve data from main and secondary memory
MCA 202	**Computer Organisation & Architecture**	CO1. Understand the theory of digital design and computer organization to provide an insight of how basic computer components are specified.
		CO2. Come to know about the functions of various hardware component and their building blocks.
		CO3. Able to understand Boolean algebraic expression to digital design.
		CO4. Able to understand the realization of different combinational/ sequential circuits.
		CO5. Acquire the knowledge of memory hierarchy and primary memory.
MCA 203	**Mathematical Foundation of Computer Science Part-II**	CO1. Able to understand different types of graph and its practical applications.
		CO2. Able to learn different principles of discrete mathematics, algebraic structure and graph theory to solve some practical problem.
		CO3. Come to know about the thickness and crossing and represent different graph in matrix format.
		CO4. Able to understand chromatic number and colour problems.
		CO5. Apply the principles of various numerical techniques, statistics and probability to solve different problems.
MCA 204	**Object Oriented Programming with C++**	CO1. Know the principles of OOPs concept and structure.
		CO2. Analyze the concept of classes and object, array, functions, constructor and destructor.

		CO3. Come to know the concept of inheritance and classification, pointers, virtual function and polymorphism.
		CO4. Able to work with file, file pointers and manipulators.
		CO5. Understand the concept of templates and exception handling.
MCA 205	**Database Management Systems**	CO1. To analyze the database design methodology.
		CO2. Acquire the knowledge in fundamental of database management system.
		CO3. Be able to analyze the difference between traditional file system and DBMS.
		CO4. Draw various data models for database and can write different queries.
		CO5. Be able to handle different database languages.
MCA 301	**Computer Oriented Numerical Methods**	CO1. To provide the basic concept on Interpolation and its different types.
		CO2. Able to understand Numerical Differentiation, Methods of Interpolation (Linear and Quadratic),
		CO3. To understand the concept on General Quadrature Formula.
		CO4. To provide basic concept on Solution of Polynomial and Transcendental Equations
		CO5. Basic knowledge on Convergence Analysis for Iterative Methods.
MCA 302.1	**Design and Analysis of Algorithms**	CO1. To understand and analyze space and time complexity of various algorithms
		CO2. To implement various operations on arrays and linked list.
		CO3. To understand and analyze Divide -and –Conquer, Dynamic Programming and Greedy Methods
		CO4. To design tree data structure and apply it in data compression algorithms
		CO5. To understand and implement sorting and searching algorithms and evaluate the Complexities of these algorithms.
MCA 302.2	**Microprocessor**	CO1. Students should be able to solve basic binary math operations using the microprocessor.
		Students should be able to demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor.
		CO2.Students should be able to program using the capabilities of the stack, the program counter, and the status register and show how these are used to execute a machine code program.
		CO3.Students should be able to apply knowledge of the microprocessor’s internal registers and operations by use of a PC based microprocessor simulator.
		CO4. Students should be able to design electrical circuitry to the Microprocessor I/O ports in order to interface the processor to

		external devices.
		CO5. Students should be able to write assembly language programs and download the machine code that will provide solutions real-world control problems such as fluid level control, temperature control, and batch processes.
MCA 303	**Operating Systems**	CO1. To understand the underlying principles, techniques and approaches which constitute a coherent body of knowledge in operating system.
		CO2. To classify about the communication and concurrency control among the concurrent processes in operating system.
		CO3. To analyze the concept of process and its management which includes process scheduling, process synchronization, deadlock, communication.
		CO4. To provide basic knowledge on how memory management is implemented by the operating system, including concepts of paging, segmentation, paged segmentation etc.
		CO5. To gain insight on file management, disk management etc. and to become familiar with the protection and security mechanisms taken by operating system.
MCA 304	**Computer Networks**	CO1. To be able to understand the basic concepts and principles in Networking.
		CO2. To be able to understand the concept of Wireless LANs, PAN, Mobile network.
		CO3. To understand and analyze different Network Layer Routing, Congestion and deadlock control algorithms
		CO4. To provide throughout knowledge on Network security-issues and threats
		CO5. To understand and analyze the concept of Cryptography
MCA 305	**Programming with JAVA**	CO1. To impart the knowledge of object oriented programming.
		CO2. To able to understand the concept of basic java language.
		CO3. To provide basic concept of Network programming using Java.
		CO4. To understand the underlying principles on GUI programming using Java.
		CO5. To provide the core concept on Applet Programming.
MCA 401	**Formal Languages and Automata Theory**	CO1.Design automata, regular expressions and context-free grammars accepting or generating a certain language
		CO2.Transform between equivalent deterministic and non-deterministic finite automata, and regular expressions.
		CO3.Prove properties of languages, grammars and automata with rigorously formal mathematical methods.
		CO4.Determine if a certain word belongs to a language.
		CO5.Define Turing machines performing simple tasks.

MCA 402	**Software Engineering**	CO1. To know how to develop the software project
		CO2. To learn developing methodology of software project
		CO3. Understanding tools and techniques of software engineering
		CO4. Verify and validate the problems of software programming & perform software testing
		CO5. Maintaining the quality of software project.
MCA 403	**Net Technology**	CO1. Understand .NET Framework and describe some of the major enhancements to the new version of C#
		CO2. Learn to create applications using Microsoft Windows Forms
		CO3. Learn to create applications with the use of ADO. NET
		CO4. Learn how to work with ASP.Net & XML Documents
		CO5. Use Crystal Reports that may help in creating reports related to the project.
MCA 404	**Web Technology**	CO1. Understand the various protocols used for Web Technology
		CO2. Understand the various steps in designing Creative and dynamic website
		CO3. Write HTML, JavaScript, CSS & DTD
		CO4. Understand PHP, working with files, forms & Database.
		CO5. Understand Web Security & Services.
MCA 405.1	**Computer Graphics**	CO1. Understand the real graphics programming
		CO2. Understand the API OpenGL
		CO3. Understand the mathematics basics, mainly linear algebra and implemented by OpenGL and programming language like C
		CO4. Recognize a number of problems and topics drawn from computer graphics, and explores them through the lens of dynamic geometry software
		CO5. Understand the 2D and 3D computer graphics.
MCA 405.2	**Introduction to Machine Learning**	CO1. Develop an appreciation for what is involved in learning from data
		CO2. Understand a wide variety of learning algorithms
		CO3. Understand how to apply a variety of learning algorithms to data
		CO4. Understand how to perform evaluation of learning algorithms and model selection

		CO5. To provide students with an in-depth introduction to the areas of Machine Learning mainly the Algorithms, Credibility & Implementations.
MCA 501	**Cryptography and Network Security**	CO1. To provide basic knowledge about different methods of conventional encryption
		CO2. To provide knowledge about public and private key security, concept of keys and number theory
		CO3. To learn about authentication functions, hash functions, message authentications, modes and different h algorithms
		CO4. To provide knowledge about network security tools.
MCA 502	**Management Information System**	CO1. To understand the managerial level management in organizations
		CO2. To learn about different management tools, level of decision making
		CO3. Coordination with DSS.
		CO4. To develop team management skills.
		CO5. Describe how technology facilitates and enhances both operational and strategic decision making in an organization.
MCA 503.1	**Open Source Software**	CO1. To learn the concept of open source software.
		CO2. To develop system development skills.
		CO3. To providing concept of Python programming.
		CO4. To learn programming technique with Python.
		CO5. Comparison with Python and other OSS.
MCA 503.2	**Software Testing and Quality Assurance**	CO1. Deliver successful software projects that support organization's strategic goals.
		CO2. Match organizational needs to the most effective software development model
		CO3. Plan and manage projects at each stage of the software development life cycle (SDLC)
		CO4. Create project plans that address real-world management challenges
		CO5. Develop the skills for tracking and controlling software deliverables
MCA 504.1	**Pattern Recognition & Image Processing**	CO1. Students can learn the concept of image processing, image recognitions, quantization etc.
		CO2. To provide the knowledge of digitization
		CO3. To learn security aspect and how pattern reorganizations are used in security
		CO4. To provide the knowledge of Fourier transform, Laplace transform and domain conversion.

MCA 504.2	**Computer Based Optimisation Techniques**	CO1. To provide the basic concept of computer simulation and optimization
		CO2. Application of maximizing benefit/minimizing product costs in various manufacturing and construction processes
		CO3. To understand and apply queuing theory, replacement theory, inventory theory etc. in business applications
		CO4. To learn Critical path and network analysis using PERT.
		CO5. To learn how to calculate and solve sequencing problem through machines.
MCA 504.3	**Wireless Networks**	CO1. To provide the concept of wireless vs. Wired communication
		CO2. To learn about mobile communication technology
		CO3. To learn different multiplexing techniques, coding techniques
		CO4. To understanding the Interface of a mobile computing system to hardware and networks
		CO5. To design applications on a mobile computing system interacting with servers and database
MCA 504.4	**Artificial Intelligence**	CO1. To understand basic concepts of Artificial intelligence, developments in this field, basic knowledge representation techniques, problem solving, and learning methods of Artificial Intelligence
		CO2. To learn the applicability, strengths, and weaknesses of the basic knowledge representation
		CO3. Learn about problem solving and learning methods in solving particular problems, game playing as problem solving
		CO4. To learn knowledge representation technique and game theory
		CO5. To understand Natural language processing, expert system, modern developments in the field of AI, Soft Computing, Image processing, Robotics etc.
MCA 504.5	**Data Mining and Warehousing**	CO1. To understand the concept of data warehousing and its related technologies
		CO2. Learn about data warehouse architecture, data mining
		CO3. Comparison of RDBMS, OLPA, MOLAP, OLTP etc.
		CO4. To know about the techniques of clustering, classification, association used real world data
		CO5. To provide a comprehensive knowledge of different data mining algorithms.
MCA 504.6	**Distributed System**	CO1. To provide the concept of distributed system and the distinction with traditional database system
		CO2. To review the limitation of DBMS and needs of distributed system
		CO3. To learn interprocess communication techniques and knowledge of segmentation

		CO4. To understand various distributed algorithms, such as logical clocks and leader election
		CO5. To acquire knowledge about the application of distributed system in organizations specially in banking and telecommunications
MCA 505	**Seminar**	
MCA 506	**Minor Project**	
MCA 507	**Computer Organization**	CO1. To learn how to design and analyze digital logic circuits
		CO2. To know how to implement standard Combinational and Sequential circuits
		CO3. Learn about addressing modes and instructions sets of different Microprocessor
		CO4. To learn about the components of computer including microprocessor, registers and pin configuration
		CO5. To learn the concept of multiprogramming, parallel processing and interrupts.
MCA 601	**Major Project**	CO1. Student will get exposure to implement practical knowledge in real life applications.
		CO2. Students will get exposure to enhance skills in problem solving, fault analysis and debugging
		CO3. Students will be able to discover potential research areas in the field of IT.
		CO4. Demonstrate an ability to work in a team.
		CO5. Compare and contrast the existing solutions for the research challenge.
		CO6. Formulate and propose a plan for creating a solution for the research plan identified.
		CO7. Report and present the findings of the study conducted in the preferred domain.
		CO8. Establish a good repo with external organization and get employability skills.

M.SC. ELECTRONICS

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

2. COURSE OUTCOMES (COs)

MSE-101	**Applied Mathematics**	1. To critically evaluate the strengths and weakness of study designs which is appropriate for addressing a specific research question;
		2.Be familiar with a variety of examples where mathematics or statistics helps accurately explain abstract or physical phenomena;
		3.Recognize and appreciate the connections between theory and applications;
		4. To be able apply mathematical logic to solve problem
		5. To able to understand the techniques of various mathematical transforms
MSE-102	**Programming & Applications**	1.To acquire knowledge of programming using C;
		2.It is the precursor and inspiration for almost all of the most popular high-level languages available today;
		3. Able to implement the programming in different platform;
		4. To prepare student for basic Programming Methodology;
		5.To practically trains students in C programming language.
MSE-103	**Semiconductor Physics & Devices**	1. Prepare students to acquire knowledge of basic electronic devices;
		2.Analyze and evaluate the performance of basic electronic devices;
		3.To understand the basic materials and properties of semiconductors with application to the pn junction and diode circuits;

		4.To understand the application of Field-Effect Transistor with the application of the design of amplifier;
		5. To understand the application of Bipolar Junction Transistor with the application of the design of amplifier.
MSE-201	**Digital Electronics System & Design**	1.To make students well familiar with Analog and Digital System;
		2.To make students well familiar with Number System;
		3.Able to understand the concept of Combinational & Sequential Circuits;
		4.To understand and analyze Sequential logic- Flip-Flops and different interface circuits;
		5.To make students well familiar with Registers, Counters and the memory unit.
MSE-202	**Network Theory and Analysis**	1. Prepare students to acquire knowledge of Network elements;
		2. To be well familiar with Analysis of Network elements and with the design of practical circuits;
		3. .To be well familiar with RLC circuits and their response;
		4. .To be well familiar with two port network and their parameters;
		5. .To be well familiar with concept of Filters, basic relations in Filters with their practical analysis.
MSE-203	**Analog Electronic Circuits & IC Technology**	1. .To be well familiar with Integrated circuits, Scale of Integration through fabrication of BJT, FET and MOSFET ICs;
		2. To acquire knowledge of Thin Film ICs with electrical and mechanical characterization;
		3. To be well familiar with Transistor modeling and FET biasing;
		4. To acquire knowledge of BJT amplifier; FET amplifier and MOSFET amplifier;
		5. To acquire knowledge of Feedback and Oscillators with the application of practical circuits
MSE-204	**Digital Electronics Lab-I**	1. Design and Study of NOT, AND and OR gates using IC
		2. Design and Study of Exclusive-OR and Exclusive-NOR gates using IC
		3. Design and Study of NAND and NOR gates using IC.
		4. Design and Study of Half Adder using IC.
		5. Design and Study of Full Adders using IC.
		6. Design and Study of Subtractor using IC.
		7. Design and Study of Comparator using IC.
		8. Design and Study of 4:1 Multiplexers using common gates.
		9. Design and Study of 8:1 Multiplexers using IC.
		10. Design and Study of 1:4 Demultiplexer using IC.
		11. Design and Study of 3:8 Decoders using IC 74138.
		12. Design and Study of Octal to Binary Encoder.
		13. Design and Study of Seven Segment Displays
		14. Design of A/D converter using IC
		15. Design of D/A converter using IC
MSE-205	**Electronic circuit lab-II**	1. Verification of voltage division rules
		2. Verification of current division rules
		3. Verification of Thevenin's Theorem
		4. Verification of Norton's Theorem
		5. Verification of maximum power transfer Theorem
		6. Measurement of phase angle of waves by Lissajous figure and unknown frequency
		7. Simulation of an inductance using OP-AMP 741

		8. Study Bistable Multivibrator circuit
		9. Study the loss of Transmission line using Trainer.
		10. Realization of Summer, Unity follower, PLL using OP-AMP.
MSE-301	**Microprocessor & Microcontroller**	1. Prepare students to acquire knowledge of architecture and organization of Microprocessor and Microcontroller;
		2. To make students well familiar with Instruction Set of Intel Microprocessors, interrupts of microprocessors and memory and I/O interfacing;
		3. To acquire knowledge of ICs- 8255, 8251, 8237 and 8279 architecture and organization;
		4. To acquire knowledge of assembly language programming;
		5. To make students well familiar with Microcontroller architecture and organization.
MSE-302	**Electronic Communication System**	1. To make students well familiar with Communication system with the concept of modulation, demodulation and channels;
		2. . To make students well familiar with Transmitter, Receiver and to understand the knowledge of frequency spectrum analysis;
		3. Prepare students to acquire knowledge of Sampling theorem with types and analysis;
		4. Prepare students to acquire knowledge of sources of Noise and its effects in electronics circuit;
		5. To make students well familiar with Television transmitter and Receiver.
MSE-303	**Project Phase-I**	1. To implement practical knowledge in real life applications.
		2. To enhance skills in problem solving, fault analysis.
		3. To discover potential research areas in the field of electronics.
		4. Demonstrate the ability to work in a team.
		5. Compare and contrast the existing solutions for the research challenge.
		6. Formulate and propose a plan for creating a solution for the research plan identified.
		7. Report and present the findings of the study conducted in the preferred domain.
MSE-304	**Microprocessor & Microcontroller Lab**	1. Write programme for Addition of 8 bit and 16 bit number.
		2. Write programme for Subtraction of 8 bit and 16 bit number.
		3. Write programme for Multiplication of two numbers.
		4. Write programme to find sum and average of a given series of numbers (8-bit).
		5. Write programme for Array addition (multibyte).
		6. Write programme for Logical operators – AND, OR and NOT logic gates.
		7. Write programme for Decimal to ASCII and ASCII to Decimal conversion.
		8. Write programme for Decimal to Hexa and Hexa to Decimal conversion.
		9. Write programme to arrange a series of numbers (8-bit) in ascending/descending order.
		10. Write programme move a block of data.
MSE-305 A	**Electromagnetic Theory & Microwave Technology-I**	1. To acquire knowledge of Electrostatics and Magnetostatics and their relations;
		2. To acquire knowledge of wave propagation through different media;
		3. To acquire knowledge of Fundamentals of Transmission lines and its parameters;
		4. To make students well familiar with Microwave Semiconductor devices and their characteristics;

		5. To make students well familiar with Microwave Amplifiers and Microwave Tubes.
MSE-305 B	**Digital Signal Processing-I**	1. To make students well familiar with Digital Signal Processing system;
		2. To make students well familiar with Linear Time- Invariant system;
		3. . To acquire knowledge of Z transform with applications;
		4. . To acquire knowledge of realization of Digital Filters ;
		5. . To acquire knowledge of Signal Flow Graph representation
MSE-305 C	**Introduction to Nanoscience and Nanotechnology**	1. . To acquire knowledge of Synthesis of Nano-materials;
		2. . To acquire knowledge of Characterization Tools of nano-materials;
		3. To make students well familiar with Quantum particles and their dimensional structures;
		4. To make students well familiar with carbon Nano-tubes and graphenes;
		5. To make students well familiar with VLSI design.
MSE-306 (MDC)	**Electronic Devices and Circuits**	1. To make students well familiar with semiconductor materials.
		2. To acquire knowledge of Transistor and Operational Amplifiers;
		3. To acquire knowledge of Integrated circuits and Digital logic circuits;
		4.To understand and analyze Sequential logic- Flip-Flops and different interface circuits
MSE-401	**Power Electronics & Control System**	1. . To make students well familiar with Power generation, stations and sources of electronic power;
		2. To understand and analyze Power devices and their practical applications;
		3. To make students well familiar with Power Inverters with practical applications;
		4. To make students well familiar with transducers with the practical knowledge of day to day life applications;
		5. To make students well familiar with Control System concept
MSE-402	**Optoelectronics and Optical Fiber Communication**	1. To make students well familiar with Dielectric materials, Optical materials;
		2. To acquire knowledge of different types of Fluorescent materials, LCD materials and their fabrication techniques;
		3. To acquire knowledge of Continuous and discrete time signals and their properties;
		4. To acquire knowledge of Laplace Transform, inverse Laplace Transform of different signals;
		5. To acquire knowledge of Fourier Transform on different signals and their properties
MSE-403	**Project Phase-II**	1. To implement practical knowledge in real life applications.
		2. To enhance skills in problem solving, fault analysis.
		3. To discover potential research areas in the field of electronics.
		4. Demonstrate the ability to work in a team.
		5. Compare and contrast the existing solutions for the research challenge.
		6. Formulate and propose a plan for creating a solution for the research plan identified.
		7. Report and present the findings of the study conducted in the preferred domain.
MSE-404 A	**Electromagnetic Theory & Microwave Technology-II**	1. Prepare students to acquire knowledge of Antenna radiation and basics of Radar in Electronic Communication;
		2. To make students well familiar with Impedance matching network, amplifier and oscillators;
		3.To make students well familiar with microwave filters and their practical applications;

		4. To make students well familiar with Microwave measurement techniques based on Transmission and Reflections.
MSE-404 B	**Digital Signal Processing-II**	1. Prepare students to acquire knowledge of Discrete Time Fourier Transform Of Signal;
		2. To make students well familiar with IIR Filter design;
		3. To make students well familiar with Basic Low-pass Analog Filter Approximation;
		4.To make students well familiar with FIR Filter Design;
		5.Prepare students to acquire knowledge of FFT and DTFT algorithm.
MSE-404 C	**Introduction to Nanoelectronics**	1.. Prepare students to acquire knowledge of Synthesis of Nano-materials;
		2. . Prepare students to acquire knowledge of Characterization Tools of nano-materials;
		3. To make students well familiar with Quantum particles and their dimensional structures;
		4. To make students well familiar with carbon Nano-tubes and graphenes;
		5. To make students well familiar with VLSI design.
MDC-407	**Principles Of IT & Programming Methodology**	1. Understand the concept of computer's input/output devices, the concept of dynamic memory.
		2. Design program logic.
		3. Perform computer arithmetic operation.
		4. Design computer memory organization that can be used for various computer.
		5. Applying programming concepts to compile and debug c programs to find solution.

EARTH SCIENCE

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PO1. To generate resourceful degree holders enabled with professional and research oriented knowledge and skills so as to explore and implement in diverse fields of applicability and employability that significantly helps in the process of planning, evaluation, decision making and management of sustainable environment, sound societal development and overall nation building.

PO2. To prepare students to became a role player/transformer/leader/entrepreneur in multiple aspects to address the challenges of environmental problems and finding solutions to meet the sustainable dimensions at local, national, regional and global context.

PO3. To transfer the contemporary skilful knowledge to students to address the real life issues with strong sense of ethical values, scientific intellectuality, social responsibility and national integrity.

Programme Specific Outcomes of M.Sc. Environmental Science(PSo):

PSO1. Students will be able to critically investigate, evaluate and synthesize complex information on various problems of environmental and allied disciplines.

PSO2. Students can conduct assessment and periodic monitoring of different ecosystems of the region and its complex interactions with the local communities, thereby can address the threats and can develop conservation strategies.

PSO3. Students can investigate and analyse the wildlife and biodiversity of the region and its complex interactions with the community.

PSO4. Students can use sophisticated tools like Geoinformatics/Geospatial Technologies for monitoring, modeling and analysis to address local environmental pollutions and natural resource management.

PSO5. Students will be able to disseminate environmental knowledge and awareness among local mass.

PSO6. Students will be able to pursue higher studies (M.Phil and Ph.D.) and can appear in various competitive examinations like CSIR-NET, UGC-NET, ICAR-NET, GATE, etc. through which they can join different scientific projects to build a promising career in the field of scientific research.

2. COURSE OUTCOMES (COs)

MEV 101	**Fundamentals of Ecology**	CO1. One objective is to give concept and understanding of ecology and environmental biology.
		CO2. Students will understand functions of different ecosystems.
		CO3. Students will be able to gain knowledge about components & structure of the earth.
		CO4. Students will understand topics of population ecology.
		CO5. Students will have knowledge on origin and evolution of life.
MEV 102	**Environmental Chemistry**	CO1. This course focuses to provide theoretical and conceptual knowledge on fundamentals of environmental chemistry.
		CO2. Students will be able to understand the chemical composition and important reactions of air.
		CO3. Students will understand water chemistry.
		CO4. Students will know physical and chemical properties of soil.
		CO5. Students will know different analytical methods.
MEV 103	**Environmental Pollution**	CO1. This course will enable students to learn and understand different environmental problems at local, national and global level.
		CO2. Students will learn types, sources, effects, control measures and treatment processes of water, air and soil pollution
		CO3. Students will know emerging water pollutants.
		CO4 Students will know causes and impacts of radioactive pollution
		CO5. One objective is to impart knowledge on noise control and abatement measures.
MEV 104	**Statistical Techniques and Computer Applications**	1. Students will learn basic concepts of statistics
		2. Students will know different methods of statistical analysis and testing
		3. Students will know how to use statistical tools.
		4. Introduction to computer system will be easy.
		5. Students will know data communication and networking.
MEV 105	**Laboratory I**	1.Students will be able to do basic practicals in Ecology.
		2. Identification and population estimation in a pond ecosystem
		3. Students will be able to estimate different water quality parameters
		4. Students will know hands on practicals on basic computer tools.
		5. Knowledge on identification and management options of solid waste.
MEV 201	**Natural Resources and**	1. Students will understand different natural resources, their utilization and management strategies

	Biodiversity	2. Students Will know conventional and non-conventional energy resources
		3. This course will provide concept and information on understanding of biodiversity, its importance, threats and conservation strategies.
		4. One objective is to make students familiar with different types of natural resources, their utilization and conservation.
		5. Students will know different conventions and policies of Biodiversity.
MEV 202	**Soil and Freshwater Ecology**	1. This course will provide concept and information on soil ecology. This includes knowledge about soil sciences, soil flora and fauna; and important soil processes.
		2. Students will understand soil ecosystems.
		3. Students will understand agroecosystems in India with reference to North East India
		4. Topics of freshwater ecology will be understood.
		5. The course will allow students to understand freshwater communities and ecosystems with knowledge of major river systems of the country.
MEV 203	**Environmental Biotechnology**	1. This course will help students to understand the development of biotechnological applications in the field of environmental science.
		2. Students will know microbial waste treatment processes.
		3. Students will understand concept, role and methods of Bioremediation.
		4. Students will know sources, half life and decay of radioactive wastes.
		5. Concept and applications of Biofuels and Environmental genomics will be understood.
MEV 204	**Environment and Society**	1. This course will make students able to understand the complex relationship between environment, society and economy.
		2. Students will understand role of traditional ecological knowledge in environmental conservation.
		3. This course provides the knowledge about the importance of environmental studies in education system
		4. Students will know about different environmental awareness programmes, movements, treaties and conventions.
		5. Students will understand environmental economics.
MEV 205	**Laboratory II**	1. This course allows students to enhance practical knowledge on Biodiversity in baseline study.
		2. Study of plant diversity and determination of dominant plant species in a forest ecosystem will be easy.
		3. Students will be able to determine different physic-chemical properties of soil.
		4. Study of zones of India from agroecological map and study of soil types in India will be easy.
		5. Students will learn practicals of environmental biotechnology.
MEV 301	**Research Methodology**	1. This course will allow students to create a basic knowledge and awareness about the nature of research process and inquiry.
		2. It also provides student an exposure to the methodological problems encountered and ways to deal in interdisciplinary research.
		3. This course will provide knowledge and foundation on different types of research options
		4. Students will learn sampling, data collection and data processing.
		5. The course will help students to know research process.
MEV 302	**Climate Change and**	1. This course will make students understand the phenomena of climate change

	Environmental Management	2. Students will understand climate change mitigation and global responses.
		3. The course also provides basic concepts on understanding the process of Environmental management.
		4. Concept of sustainable development will be understood.
		5. Environmental priorities in India for sustainable development and challenges will be understood.
MEV 303	**Fundamentals of Geoinformatics**	1. This course focuses to make students learn the basic concepts of remote sensing.
		2. Students will understand Aerial Photographs and image interpretation.
		3. Students will learn principles of Geographical Information System.
		4. Principles and methodologies in Global Positing System will be understood
		5. Students will learn Global Navigation Satellite System
MEV 304 (A)	**Wildlife Ecology: Wildlife Habitat and Population**	1. This course helps students to know the basic concept and information on wildlife habitat and population.
		2. It allows students to know about the wildlife of India with special reference to NE India.
		3. It will help draw the students more and more connected to the nature and wildlife and their importance in nature.
		4. Wildlife population and migration will be understood.
		5. Students will know wildlife census and conflict issues.
MEV 304 (B)	**Hazards and Disaster Management: Basic Concepts**	1. This course provides concepts related to hazard and disaster.
		2. Students will know disaster phenomena and events at global, national and regional levels.
		3. Students will know mechanism, causes and consequences of different geological hazards.
		4. Mechanism, causes and consequences of hydro-meteorological hazards will be understood.
		5. Students will know the contribution of human activities to the cause of various disasters.
MEV 304 (C)	**Geoinformatics: Principles and Techniques of Remote Sensing**	1. This course helps students to understand the principles and techniques of Remote Sensing.
		2. Students will know Digital Image Processing techniques.
		3. Students will know Digital Image classification techniques.
		4. Students will know post classification analysis.
		5. Students will know the various areas and application of remote sensing tools in solving environmental issues and crisis.
MEV 304 (D)	**Forest Ecology and Management: Basics of Forest Ecosystem**	1. This course is aimed to provide basic concepts and principles of forest ecosystem
		2. Students will learn topics of Forest regeneration processes
		3. Students will know forest management.
		4. Students will understand forest productivity.
		5. Concepts, dimensions and measures of forest diversity will be understood.
MEV 304 (E)	**Environmental Monitoring and Management:**	1. Students will know principles and methods of air quality monitoring.
		2. Water quality monitoring will be easy.
		3. Assessment of soil quality will be understood.

	Basic Concepts	4. Students will know topics of environmental toxicology.
		5. The course allows students to understand the hazardous and toxic substances affecting the environment and their health impacts.
MEV 305	**Laboratory III: Practical on Fundamentals of Geoinformatics (General)**	1. This course helps students to enhance capacity building in handling geoinformatics tools.
		2. This course makes students to understand and deal with geospatial data and identify their utility.
		3. Students will have knowledge on practical use ofGIS tools
		4. Use of geoinformatics in different fields will be understood.
		5. Students will know use of GPS/ DGPS.
MEV 306	**Northeast India: Land, People and Culture**	1. This course intends to make students to understand the biogeography, climate, agriculture, ethnicity, linguistics, economy and politicsof Northeast Region of India.
		2. Students will understand cultural diversity of Northeast Region of India.
		3. The course will also make students know the speciality and uniqueness of the NE region.
		4. Students will know industries and transportation of NE India
		5. Students will understand and have knowledge on the different environmental related problems prevailed in the region.
MEV 401	**Environmental Geosciences**	1. This course is designed to make students know about concepts of geomorphology
	and Meteorology	2. Students will learn concepts of geohydrology.
		3. Students will understand causes and mechanisms of different geological hazards.
		4. Students will know fundamentals of Meteorology.
		5. Students will understand basic topics of climatology
MEV 402 (A)	**Wildlife Ecology: Conservation and Management**	1. To provide information on the rich wildlife biodiversity in india with special reference to N.E. India.
		2. It will give detailed information and knowledge about various migratory behaviors and routes of migration of Indian wildlife.
		3. Knowledge on various census techniques of the wildlife in India.
		4. Students will know in-situ and ex-situ conservation of wild life
		5. Basic concept and information on wildlife threats, conservation and management strategies adopted locally, nationally and globally.
MEV 402 (B)	**Hazards and Disaster Management: Preparedness and Mitigation**	1. This course provides in-depth knowledge on various type natural and human induced disasters.
		2. Students can understand different tools and techniques for disaster preparedness and mitigation.
		3. Role of government and NGOs will be understood
		4. Technologies for disaster management will be known
		5. Information on various governmental and non-governmental organisations working on disaster management field.
MEV 402 (C)	**Geoinformatics: Principles and Techniques of GIS and GPS**	1. To teach the students the various principles of GIS and GPS technology.
		2. Students will learn fundamentals of Geodasy.
		3. Data management in Geoinformatics will be understood
		4. Students can understand the benefits of geoinformatics tools in environmental studies.
		5. Students are provided direction to take up research on thrust areas.
MEV 402 (D)	**Forest Ecology**	1. Students will understand concepts of Agroforestry system

	and Management: Agroforestry and Forest Hydrology	2. Students will know fundamentals of forest management
		3. Topics of forest hydrology will be known by students.
		4. Students will understand relationships between agroforesty and forest hydrology
		5. Students will understand hydrological processes affected by forest lands.
MEV 402 (E)	**Environmental Monitoring and Management: Principles**	1. Students will know water purification Processes in Natural Systems
		2. Students will understand meteorology and Natural Purification Processes
		3. Students will get knowledge on biological indicators in terrestrial and aquatic systems
		4. Students will know recent developments in environmental management.
MEV 403 (A)	**Wildlife Ecology: Wildlife Health and Wealth**	1. This course helps students to learn about wildlife behavior.
		2. Offers information on various health issues faced by Indian wildlife.
		3. Disease control mechanisms will be known
		4. To understand, in details, wildlife economy and trade related and associated with wildlife in India.
		5. To aware the students on various laws related to wildlife in India.
MEV 403 (B)	**Hazards and Disaster Management: Issues and Policies**	1. Students will be taught various issues related to natural hazards
		2. Students will learn man-made hazards and disaster in India.
		3. Students will learn different policies framed for disaster management.
		4. Students will learn various strategies adopted for disaster management.
		5. Students will get knowledge of different disasters occurred locally and globally.
MEV 403 (C)	**Geoinformatics: Applications in Major Areas**	1. This course will help students to gain knowledge on use of geoinformatics for natural resources monitoring and management
		2. Students will be able to apply geoinformatics in hazards and disaster management
		3. Students will know use of geoinformatics in planning and development
		4. Application of geoinformatics in drainage basin
		5. Application in hydrological analysis will be understood.
MEV 403 (D)	**Forest Ecology and Management: Economics and Regulations**	1. Students will know objectives and relationship of Silviculture with other branches of forestry
		2. Students will understand Forest Mensuration and Management
		3. Topics related to forest economics will be understood.
		4. Students will know different Forest Policies
		5. Forest Laws in India will be known
MEV 403 (E)	**Environmental Monitoring and Management: Analytical Methods**	1. Student will get knowledge on quantitative analysis
		2. Qualitative analysis will be understood
		3. Principles of wet-chemical and chromatographic methods of analysis will be known.
		4. Principles, Instrumentation and Applications of Spectrophotometry will be understood by students.
		5. Students will learn concepts and terminology of error estimation in environmental sampling and analysis.
MEV 404 (A)	**Laboratory IV: Practical on Wildlife Ecology**	1. This course will make students familiar with practical aspects of wildlife ecology.
		2. This course will enhance student's ability to work in field and collection of field data.
		3. Detailed information on how to process data and derive results will be known by students.

		4. Students will learn different techniques of wildlife census
		5. Students will know animal behavior, activity budgeting, nesting pattern of birds, etc.
MEV 404 (B)	**Laboratory IV: Practical on Hazards and Disaster Management**	1. This course will make students familiar with practical analysis and techniques of hazard and disaster management.
		2. Students will get knowledge on mapping of major crustal plates, earthquake zones
		3. Mapping of flood and landslide hazard zones will be known
		4. Understanding of risk mapping will be easy.
		5. Students will know what to do in emergency situation through mock-drill.
MEV 404 (C)	**Laboratory IV: Practical on Geoinformatics**	1. This course will enhance student's capacity in handling geo-informatics tools.
		2. This will help in learning on how to collect data using GIS technology
		3. This will provide knowledge on how to process data using GIS technology.
		4. Students will learn geoinformatics tools and can utilize in their project work.
		5. Practicals using GPS will be known
MEV 404 (D)	**Laboratory IV: Practical on Forest Ecology and Management**	1. This course will make students familiar with practical aspects of forest ecology
		2. The course will enhance student's ability to work in field
		3. Collection of forest data will be understood
		4. Students will be able to do practicals like measurement of girth increment of forest trees, reparation of herbarium, estimation of forest productivity etc.
		5. Students will know time series analysis of rainfall data.
MEV 404 (E)	**Laboratory IV: Practical on Environmental Monitoring and Management**	1. This course will enhance student's capacity in handling different analytical instruments
		2. This course will make students capable of particulate analysis of air samples.
		3. Physico-chemical analysis of water samples will be known.
		4. Students will be able to estimate basic soil physical properties.
		5. Estimation of soil chemical properties will be known
MEV 405	**Project work**	1. The course will help to think environmental aspects of any issue.
		2. This course will allow students to identify and design a research problem related to wildlife ecology / Forestry
		3. Topics related to Environmental monitoring can be identified
		4. Topics related to Hazards and disaster management will be taken for study
		5. It will help students to apply theoretical and practical knowledge to carry out a research work on local or regional topic with environmental significance.
		6. This course will allow students to utilize various tools and techniques to analyse the research problem.
		7. The course will impart training to students on how to present their research work and findings via presentation
		8. Students will learn presentation through write-ups.

M.A. ECONOMICS

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1. Provide instruction and rigorous training in economics and the relevant methods of mathematical economics and econometrics research in this area.

PSO2. Develop the powers of inquiry, critical analysis, logical thinking, and your ability to apply theoretical knowledge to current issues of policy and practice in economics.

PSO3. Encourage initiative, independent learning, awareness of analytical and theoretical approaches in the field of economics, exposure to recent research and state-of-the-art tools in applied work in economics;

PSO4. Research methods and core skills in microeconomics, macroeconomics, econometrics, mathematical economics, problem-solving, written and oral expression, communication and presentation skills;

PSO5.Equip the student with the intellectual apparatus and practical skills necessary for an economist working in private or public organizations

PSO6. Enable the students to apply advanced research skills to a relevant research area in economics, via course units and a dissertation

2. COURSE OUTCOMES (COs)

MEC- 102	**MACRO ECONOMIC ANALYSIS-I**	CO1. After study of this unit students will understand the flow of income in different macroeconomic sector of the nation i.e. flow of income from house hold to farm, from household to government or to foreign sector.It analysis how national income is calculate, i.e. what to include and exclude to determine the national income (GDP, GNP etc.). How to make the social accounting to get benefit of increase in national income.
		CO2. This unit include the famous "Keynes psychological law of consumption" indicating the relation between consumption and income.It also tries to make a relation between the consumption, income and investment through investment multiplier theory.
		CO3. This unit introduces the students about the sources and controller of money supply. The theory of high powered money shows, how the money supply can influence the economy and how the apex monetary authority measure the supply of money.
		CO4. This unit analysis the different classical and modern concept of demand for money. The land mark definitions of fisher and other Cambridge economist and Keynes also discussed here.
		CO5. Keynes liquidity preference theory of money, which shows in which motive people demand for money. How liquidity trap happens and how it destroys the economic growth.
MEC- 103	**ECONOMICS OF GROWTH AND DEVELOPMENT-I**	CO1. By end of this course, student willget essential concepts of growth as well as Development.
		CO2. By end of this course, student willunderstand the diverse dimension and measures of development.
		C03. By end of this course, student willlearn about the distributional issues of growth and development.
		C04. By end of this course, student willexplore the developmental theories that help to address the current challenges of development.
		CO5 : It will enable the applicability of various development theories and index in real life situation
MEC- 104	**MATHEMATICAL METHODS FOR ECONOMIC ANALYSIS**	CO1: Develop different tools and techniques of integration and its application in different areas of economics particularly in Consumer's surplus and producer's surplus.
		CO2: It gives an idea about different techniques of game theory and its use in different areas of practical life.
		CO3: To develop different technique and tools to address the long term dynamic variables.
		CO4. Develop linear programming (LP) models and solve the problems using graphic method and simplex method.
		CO5. The students gets an idea of applicability of mathematics in Economics, mathematical derivation of various economics theories.
MEC-105	**POLITICAL ECONOMY**	CO1. Enable to realize the context of Economic Theories and Ideas.

		CO2. Help to have a holistic understanding of history of Economic thoughts.
		CO3. Inculcate the sense of critical thinking about the economic ideas and find ways to build new.
		CO4. Realization of how economic system works under different political theories.
		CO5.The students will get idea on the present conflict of world relating them to various schools of thoughts of economics.
MEC- 201	**MICRO ECONOMIC ANALYSIS – II**	CO1 Students will be able to demonstrate knowledge of the laws of supply and demand and equilibrium; and apply the supply and demand model to analyze responses of markets to external events
		CO2 By the end of the course, students will be able to demonstrate an understanding of producer choice, including cost and break-even analysis
		CO3 By the end of the course, students will be able to compare and contrast common market structures, including perfect competition and monopoly
		CO4. By the end of the course, students will be able to apply microeconomic principles and models to define and address market failures; and to describe issues such as wage inequality, environmental protection or other policy matters.
		CO5. Gives a complete knowledge of various market concentration and competitive level
MEC-202	**MACRO ECONOMIC ANALYSIS-II**	CO1. This unit makes a comparative study between classical and modern thought about macroeconomic issues and how macroeconomics got change overtime.
		CO2. This unit discuss about the general equilibrium in the economy through product market and commodity market equilibrium. It also discusses how the general equilibrium get disturb by change in fiscal and monetary policy.
		CO3. This unit analyzes the demand for money in modern sense, where a number of economists has given a number of views regarding the demand for money. Majority of the followers of Keynes has interacted with new issues about the demand for money. It throws light on the prospects how demand for money got changed over time.
		CO4. This unit analyze about the inflation and general price level. Different theories of inflation, its causes and effects and remedies .the relations between the price rise and unemployment and how many times we have to compromise with the high price to ensure the unemployment level low.
MEC- 203	**STATISTICS**	CO1. Students who successfully complete this course should be comfortable with basic statistics and probability. Students learn to understand different data types and their organization, management and presentation.
		CO2. Analyze statistical data graphically using frequency distributions and cumulative frequency distributions. And to analyze and apply statistical data using various measures of central tendency and dispersion.
		CO3. Use and apply the basic probability rules, including additive and multiplicative laws, using the terms, independent and mutually exclusive events
		CO4. Student learns to calculate and interpret the correlation between two variables, to calculate simple linear regression equation for a set of data and to evaluate the properties of estimators.

		CO5. Given a problem situation be able to state appropriate null and alternative hypotheses and appropriate means that whether it should be one or two sided and be able to calculate a p-value and be able to interpret a p-value. Based on the results students will be able to state the relationship between population and statistics (one or two sided and perform a hypothesis test and state the conclusion with a sentence.
MEC- 204	**BASIC ECONOMETRICS**	CO1. Enables the skill to fill the gap between being "a student of economics" and being " a practicing economist"
		CO2. Develops the institution about how the systems work in real world.
		CO3.Generates the technique and skill of analyzing data and creating economic models for development and wellbeing.
		CO4. Technical and analytical knowledge to provide specialist advice to people from various disciplines of knowledge.
		CO5. To solve a variety of economic problems of day to day life. Understand the subject of econometrics and its applications.
MEC- 205	**WELFARE ECONOMICS**	CO1: It tries to give an idea about the labour market and how price of labour is determined in different forms of market has been captured. Student will be able to know easily why and to what extent labours are exploited in different market structure and its remedy measure.
		CO2: It focuses to understand the general equilibrium concept as well as critiques of welfare economics. It also tries to provide contribution of welfare economist for further development of welfare economics.
		CO3: It basically highlights the different views and approaches of welfare economics. Students will be able to understand how and to what extent the policy change in government level will affect the overall welfare of the society and how can we maximize social welfare through our activities.
		CO4: The end of the course the student will learn concept of new welfare economics. Student will be able to learn different economist about new welfare economics.
		CO5. Understand the concept of externality, type of externality and how to solve the problem of externality.
MEC- 301	**PUBLIC ECONOMICS**	CO1. To understand the role of government and the different ways in which government policies affect economy.
		CO2.Develops analytical framework that facilitates the evaluation of public policy and subsequently inform the public debate.
		CO3. Enables to understand the policy design on economy and their efficiency.
		CO4. Develop administrative skill with the knowledge of government taxation and expenditure mechanisms.
MEC- 302	**ECONOMICS OF SOCIAL SECTOR**	CO1. This course tries to understand the concept of Economics of education that will focus on importance of investment in education to increase human capital. It also gives lights on direct and indirect benefits of education in development of society.
		CO2. Student will understand the educational financing from the point of view of Economics
		CO3. Student will explore approaches of economic theory to health sector.
		CO4. Policy level understanding for improvement of health sector from economics prospective.

		CO5. Get an idea on various scopes to do research on education and health sector by applying the different economics theories.
MEC- 303	**ECONOMICS OF GROWTH AND DEVELOPMENT-II**	CO1. Understand and describe the important features of less developed economies and their development challenges.
		CO2. Understand and apply key development economic growth theories, international trade development theories, and related economic development theories.
		CO3. Analyze and comment significant policy options available to government and international organization to address economic development challenges.
		CO4. Develop analytical and critical thinking skills along with model building and use them to judge the appropriateness of economic development policy options.
MEC-304(A)	**LABOUR ECONOMICS**	CO1. Understand the basic concepts of demand and supply of labour, labour market, employment, unemployment, wages and migration.
		CO2. Be able to combine theoretical models and empirical results to address policy issues related to employment, unemployment, wages and migration and be able to advise on labour market policies from a position of knowledge.
		CO3. Be able to understand recent research works in empirical labour economics, to assess their relevance, contribution and reliability and to connect them with existing results and open policy questions.
		CO4. Model and analyze the structure of labour markets and its frictions; analyze the interactions between aggregate economic forces and identify the role of firms, workers and government in the economy especially in India.
		CO5. Apply advanced econometric tools to analyze labour market related processes and develop practical understanding of statistical inference issues
MEC-304B	**RESEARCH METHODOLOGYAND REPORT WRITING**	CO1.By end of the course student will be able to develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.
		CO2. Student will have basic knowledge on qualitative research techniques
		CO3.By end of the course student will have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis.
		CO4. It will provide basic awareness of data analysis-and hypothesis testing procedures.
		CO5.Develop research skills and skills in persuasive oral and written argument, including data collection, interpretation and demonstrated ability to support analysis through empirical evidence and draw critical conclusions and presentation skills.
MEC- 304-C	**INDUSTRIAL ECONOMICS**	CO1: perform supply and demand analysis in input factor markets with varying market structures.
		CO2: Define the structure of various organizations relating to trade, like private, public, joint stock company etc.
		CO3. calculate the minimal cost input factor quantities for a firm and optimal selling prices, supply quantities and resulting profits of firms in different market structures (including perfect competition and various forms of imperfect competition, like monopolies, oligopolies, and monopolistic competition)
		CO4: analyze the interaction between consumers and firms, apply the concept of market equilibrium. calculate welfare measures such as consumer surplus and social welfare; market concentration.

MEC-304(D)	**DEMOGRAPHY**	CO1: It tries to explore the relationship between development and population growth. Students will be able to know the different models, theories about the relationship between population growth and development
		CO2: It tries to explore the trend and growth of world population and different aspects of world population growth. It enriches the knowledge of changing components of world population.
		CO3: Fertility and Mortality are the two important factors for change in population in a particular region. It gives an idea about calculation of different rates of fertility and mortality.
		CO4: It demonstrates the international and internal migration of India. Students will be able to know the factors responsible for internal and international Migration.
		CO5. The students will be able to relate the changes in social and political economy due to demographical changes.
MEC-305 (MDC-I)	**ENVIRONMENTAL ECONOMICS**	CO1: Demonstrate a basic knowledge of the role of markets and market failure with regards tothe allocation of natural resources and environmental amenities.
		CO2: Understanding of the effects and relative merits of public environmental policy efforts, including cap-and-trade schemes, Pigovian taxes, regulation, and public ownership and/or management
		CO3: Population growth and the environment
		Global warming, Wilderness protection and related public lands issues, Air pollution and carbon bank.
		CO4: Concepts of Pareto optimality, efficiency, and equity, the role of property, property rights and common property resources.
		CO5. The students willable to understand the concept of carbon bank, and international trading with carbon.
MEC- 401	**INDIAN ECONOMY**	CO1.Wide and holistic understanding of India's Economic structure.
		CO2.Develops knowledge of India's economic potential and weakness.
		CO3. Develops sense of policy diversification and way forwards.
		CO4. Understand the country where we live and the ways to make it better place.
		CO5. Understand the role of India in different international organizations.
MEC- 402	**FINANCIALECONOMICS**	CO1. By end of course, student will understand the Indian financial system and its relationship with Economic growth.
		CO2. By end of course, student will learn the instruments of Money markets and intermediaries of money markets.
		CO3. By end of course, student will understand the capital market instruments.
		CO4. By end of course, student will learn different types of stock markets.
		CO5. By end of course, student will explore the valuation of financial assets and banking and capital market reforms.
MEC- 403	**INTERNATIONAL ECONOMICS**	CO1: Be familiar with the main economic theories and models of international trade,
		CO2:Have an elementary understanding of open-economy macroeconomics and the determinants of exchange rates and the balance of payments.
		CO3:Be aware of the likely distributional consequences of trade and thus of conflicting interests within an economy regarding trade liberalization,

		CO4:Understand economists' arguments concerning trade policy and its analysis, and to apply economic reasoning to issues of the day surrounding globalization,
		CO5. The students understand the working pattern of various international organizations to address specific global problems.
MEC-404	**ECONOMICS OF ENVIRONMENT**	CO1: Utilize economic principles and models to address private and public policy issues related to allocating natural resources and environmental amenities.
		CO2:The role of externalities, common property resources, and public goods, Concepts and measures of economic value including non-market valuation
		CO3: Gain a basic understanding of the effects and relative merits of public environmental policy efforts, including cap-and-trade schemes, Pigovian taxes, regulation, and public ownership and/or management
		CO4: Become knowledgeable about and be able to use economic principles and non-market valuation techniques to address a variety of continuing and contemporary natural resource and environmental issues.
		CO5. Understand the concept of climate change, pollutions, carbon bank, trading and environment etc.
MEC- 405 (A)	**AGRICULTURAL ECONOMICS**	CO1: It tries to explore the condition of agricultural labor in India and different aspects of agricultural labour in India.
		CO2: It focuses on need and importance of agricultural credit and different sources of agricultural credit and the problems faced by the farmers in India.
		CO3: It tries to give the idea about the present scenario of Agriculture markets of India and its related problems.
		CO4: It tries to explore the trend and pattern of agricultural growth of India. Attempt has been made to capture the public investment and technological change in India.
		CO5. Get an idea of various scheme of agriculture and methods of intensive agriculture and its impact.
MEC-405(B)	**ADVANCED ECONOMETRICS**	CO1. Enable to understand the new programs and tools invented in the field of Econometrics.
		CO2. Use the computer software's to analyze data.
		CO3. Interpretation and finding the solutions of complex economic problems.
		CO4. Much deeper understanding of econometrics and its dimensions.
		CO5: Enable the students in building model to address certain economics issues
MEC-405(C)	**ECONOMY OF NORTH EASTERN REGION**	CO1. By end of the course, student will learn about the overview of North East India.
		CO2. By end of the course, student will explore the available natural resources of North East India.
		CO3. Student will learn different sector of North east economy that will help to address the problem of north east economy and can develop research on North East Economy.
		CO4: Student can understand structural transformation of North East India. It will provide research scope for evaluation of recent policy in the North East India.
		CO5. Students get an idea of various scope of development in North East India, and what are the limitations of the area.

MEC- 405 (D)	**OPERATION RESEARCH**	CO1. Understand the basic concepts of operations research, its scope, methodology and limitations.
		CO2. Understand and know the various techniques of operations research and to translate a real word problem, given in words, into a mathematical formulation and to analyze the results and propose recommendations to the decision making processes.
		CO3. Develop linear programming (LP) models and solve the problems using graphic method and simplex method.
		CO4. Understand and formulate variety of problems such as assignment, transportation; solve this problems using north west corner method, dual transportation method etc. and apply in real life problems.
		CO5. Understand different queuing situations and find the optimal solutions using models for different situations; solve the problems using special solution algorithms;

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1. On the initial level when the UG honours course in English was introduced in U.S.T.M. ,The focus was on to create human resources adept in English literary study and enroll students with high aptitude towards language ,culture and literature.

PSO2. It was considered to be a kind of a preparatory platform for higher and broad based studies (Post Graduation, Higher research based studies etc) of English Literature.

PSO3. Focus of the programme is to target avenues in Civil Services after taking relevant examinations.

PSO 4. Along with the literary knowledge ,the programme also aims at creating young minds skilled in communication, linguistic and presentation skills.

2. COURSE OUTCOMES (COs)

BEN 711	**Communicative English**	CO1. To facilitate the students with the skills of communication
		CO2. To have broad based comprehension and as a follow up writing and composition skills
		CO3. The course is also intended to confer on the students appreciation of english prose and poetry pieces
		CO4. Specific and relevant use of grammatical units in paragraphs and passages etc
BEN 103	**History of English literature**	CO1. To provide the students an understanding of English literary history from the Anglo-Saxon period to The post Modernist period
		CO2. As a background to literary history , socio-cultural events and epochs are presented for thorough comprehension of the ages and literature
		CO3. To enable to develop a literary and critical insight
		Co4. IN Order that the students acquire concepts ,ideas and critical insights into the relevant history of English Literature
BEN 104	**Forms of literature**	CO1. To introduce the students with basic elements of various literary genres-poetry ,drama ,fiction-non-fiction including life writings etc
		CO2.Facilitating an understanding of prosody ,stylistic and rhetorical devices in various literary genres
		CO3. To introduce the students with various categorisations of poetry ,drama ,fiction etc. along with constitutive elements and forms
		CO4. Teachings the skills of identifying and interpreting the literary forms in literary texts
BEN 105	**Old and middle Engklish literature: literary texts**	CO1.familiarising the students with events and traits of old and middle english period of literary history
		CO2. Acquaint the students with the cultural practices of that time
		CO3.enabling the students to understand the process of growth and development of a society and culture in general and in specific
		CO4. To introduce the students with the changes and developments in the field of english language
BEN 202	**History of english language**	CO1. To introduce the students with origin and history of english language
		CO2. To introduce the students with the influences and outcome of other languages such as greek ,latin ,french etc over english
		CO3. Along with a diachronic study,a synchronic assessment of the language of few authors on el in general is incorporated
BEN 203	**The renaissance**	CO1. To introduce the students with the prose texts produced in the renaissance and the jacobean period england

	and the jacobean period (1500-1666): prose	CO2. Enabling the students to understand the pros and cons of socio-cultural conditions of the respective periods
		CO3. Enlighten the students about the impact of renaissance and humanism on human civilisation
		CO4. To introduce the students with the major literary characteristics, style of the respective literary ages
BEN 204	**The renaissance and the jacobean period (1500-1666): poetry**	CO1. To introduce the students with the poetic sensibility in contemporary poetry of great masters like spenser, milton, shakespeare etc.
		CO2. Enabling the understanding of the features of the respective periods
		CO3. To have a first hand experience of the impact of renaissance on the flourishing of poetry and poetic sensibilities
		CO4. To introduce the students with the major literary characteristics, style of the respective literary ages
BEN 205	**Inroduction to english linguistics**	CO1. Introduce the students with general linguistics and its components
		CO2. Familirise the students with speech mechanism morphology,phonetics etc
		CO3. To familirise the students with syntax and semiotics
BEN 301	**Renaissance drama**	CO1 to introduce the students with phases of the development of drama in renaissance greats –thomas kyd, marlow , shakespeare
		CO2. To introduce the students with great masters of english drama like marlow, kyd ,johnson etc
		CO3. To specifically introduce with the literary and technical characteristics of renaissance drama along with english tragedy and comedy
		CO4. To teach the students how to read a drama ,its theatrical technicalities and subsequently its interpretations
BEN 302	**Shakespeare**	CO1.introducing students with great dramatic works of shakespeare along with some poetry
		CO2. To enable the students to have textual interepretation of poetry and drama of shakespearee
		CO3. To enable the students to have ideas of dramatic performances through reading of soliloquies
		CO4. To enable the students to feel the craftsmanship of shakespeare over use of language ,technicalities of theater , theatre techniques like aside,soliloquy,interlude etc
BEN 303	**Womens' writing**	CO1. To enable the students to have ideas of general tendencies of feminist and womens movements with the help of textual representations
		CO2. To have ideas of the specific tendencies and theoritical patterns features of womens' writings
		CO3. To enable students to have comprehension and understanding of representative texts by pioneers of the movement
		CO4. To familiarise the students with major texts by prominent major writers of different ages and regions
BEN 305	**History of literary criticism and theory (from classical to victorian period)**	CO1.introduce the students with introductory features of criticism and theory
		CO2. To familirise students with critical texts from classical to victorian period
		CO3. To teach the skills of critical analysis of any literary text with the help of a literary theory
BEN 401	**The restoration and the augustan periods (1660-1780): prose and**	CO1. To introduce the students with the literary features of the respective periods
		CO2. To introduce the students with the writing of the representative figures of the period like dryden ,pope,swift ,dr. Johnson etc
		CO3. To specifically introduce the students with use of mock heroic techniques, irony, satire etc

	poetry	
BEN 402	**The restoration and the augustan periods (1660-1780) drama**	CO1. To introduce the students with the some of the dramatic works produced in these periods
		CO2. To introduce the students with the writing of the representative figures of the period
		CO3. To enable the students to have the socio-cultural tendencies reflected in the texts recommended
		CO4. To teach the age specific features like satire,irony,mock heroic techniques etc
BEN 403	**Pre-romantic and the romantic period (1778-1830): prose and poetry**	CO1. To introduce the students with the literary features of the respective periods
		CO2. To introduce the students with the writing of the representative figures of the period such as blake,wordsworth.coleridge ,shelly etc
		CO3. Familirising the students with the specific thematic appreciation of various elements like medievalism, magic,fantasy etc
		CO4. Acquint the students with the transition in the society at the advent of industrialisation of europe
BEN 404	**Indian writing in English**	CO1. To introduce the students with the features of indian writing in english
		CO2. To inform the historical and literary development of the new area
		CO3. To familirise the students with representative texts of the area such as tagore,r.k.narayan,rushdie ,arundhati roy etc
BEN 405	**American literature**	CO1. To introduce the students with the features of american literature
		CO2. To inform the historical and literary development of the new area (trancedentalism,slavery,harlem renaissance etc)
		CO3. To familirise the students with representative authors and texts of the area such as melville,miller,whitman ,poetry etc
		CO4. To give a comprehensive idea about american writings ,.their techniques etc
BEN 501	**The victorian period (1830-1900):prose**	CO1. To introduce the students with the literary and socio-cultural features reflected in the works of literary figures of the vicorian periods like hasrdy,dickens etc
		CO2. To enable the students to understand the sociological theories and concepts of the time like darwinism,feminism etc
		CO3. To teach the students how to analyse the stylistic and creative features of a prose text
BEN 502	**The victorian period (1830-1900):poetry**	CO1. To introduce the students with the literary features of the respective periods
		CO2. To introduce the students with the writing of the representative figures of the period
		CO3. To acquint students with the stylistic and technical features of poetry of the victorian period
BEN 503	**The modern period (prose):1900-2000**	CO1. To introduce the students with the concept of modernism and other cultural movements having impact on the literarary representations
		CO2. To introduce the students with the shifting tendencies of modernist novels incorporating stylistic innovation
		CO3. To introduce the students with the writing of the representative figures of the period
BEN 504	**The modern period (poetry):1900-2000**	CO1. To familiarise the students with the overall changes taking place in modernist english poetry
		CO2. To introduce the students with the innovative ,changing techniques and forms represented in poetry of the contemporary poets
		CO3. To introduce the students with the writing of the representative poets of the period
BEN 505	**The modern period (1900-2000): drama**	CO1. To introduce the students with the changes taking place in modernist drama by teaching selected texts of of masters like ibsen,brecht,beckett etc.
		CO2. To introduce the students with the theoritical concepts and technical innovations in modernist drama
		CO3. To introduce the students with understanding of literary movements like symbolism,brechtian philosophy,expressionism as reflected in dramatic writings

BEN 601	**20th century literary criticism and theory**	CO1. To introduce the students with the 20th century movements in the field of criticism and theory
		CO2. The trends and their impact on literature
		CO3. To introduce the students with the writing of the representative theoritical writings of the critics of the period
BEN 602	**Modern linguistics**	CO1. To introduce the students with historical linguistics
		CO2. To introduce the students with socio-linguistics
		CO3. To indrocude the students with the art of lexicography
		CO4. In regards to concepts of historical linguistics ,astudy of synchronic and dichronic tendencies are incorporated
BEN 603(A)	**Indian literature in English (optional)**	CO1. To introduce the students with the features of indian writing in english
		CO2. To inform the historical and literary development of the new area upto the modern period
		CO3. To familirise the students with representative texts of the area (poems,prose,drama,critical writings etc)
BEN 603 (B)	**American literature**	CO1. To introduce the students with the features of american literature
		CO2. To inform the historical and literary development of the new area (trancedentalism,slavery,harlem renaissance etc)
		CO3. To familirise the students with representative texts of the area(representing male,female,afro-amrican writers)
BEN 604 (B)	**African studies**	CO1. To introduce the students with the features of african literature
		CO2. To inform the political, historical and literary factors behind the emergence of the area
		CO3. To introduce the students with the linguistic and thematic variations of a new area of studies
		CO4. To familirise the students with representative texts of the area(representing authors from all major african countries)
BEN 605	**New literature in English**	CO1. To introduce the students with the very recent trends of english writings beyond geographical /political boundaries
		CO2. To acquaint students with the changes in the fields of form,theme,representation in the new world of literature
		CO3. To familirise the students with some very new,popular writers and their writings such as bapsi sidhwa, jhumpa lahiri,maerquesses, maya angelou

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1. PG Programme in the department of English, in USTM is intended to serve a purpose of higher studies with broad based interdisciplinary concerns.

PSO2. Besides serving careen oriented academic purposes, the programme is designed to acquaint the students with socio-historical and cultural and topical realities

PSO3. The PG aims to create queries about critical methods of interpretation and assessment of literature

PSO 4. The programme serves as an adequate platform for research oriented endeavours among the students.

2. COURSE OUTCOMES (COs)

MEN 101	**English social and literary history**	CO1. To acquaint the students with the detailed development and features of the social and literary hisory of english literature
		CO2. To explain the impact of socio –cultural phenomenon on the shape and development of literature and its different genres
		CO3. To introduce the students with specific socio-cultural traits ,events or changes to develop their understanding and analytical skills
MEN 102	**English poetry 1:chaucer to johnson**	CO1. To introduce the students with the socio-cultural forces behind the growth and shape of poetry of the period
		CO2. To introduce the students with literary and stylistic features of the english poetry of the age
		CO3. To introduce the students with the writing of the representative poets of the period
		CO4. To give a clear picture of the changes of form and content throughout the ages of literary history
MEN 103	**Ewnglish drama 1 : the age of shakespeare**	CO1. To introduce the students with the socio-cultural forces behind the growth and shape of the shakespearean age of english drama .
		CO2. To introduce the students with literary and technical features of english dramas of shakespeare and his contemporaries
		CO3. To acquaint the students with the textual analysis of the plays of the great masters like marlow,shakespeare ,jonson
MEN 104	**English prose 1 : bacon to lamb**	CO1. To introduce the students with the socio-poltical-cultural forces behind the growth and shape of prose of the age of bacon.
		CO2. To introduce the students with specific traits of english prose writings and to have a knowlegde of their stylistic features
		CO3. To introduce the students with prosaic features like aphorism, periodical writings,journalistic writings, narrative techniques etc.
MEN 105	**English fiction 1 : defoe to dickens**	CO1. To introduce the students with the socio-poltical-cultural factors behind the growth and shape of english novel during restoration ,romantic and victorian period
		CO2. To introduce the students with the specific types of english novel s like historical fiction ,realistic fiction,gothic fiction etc.
		CO3. To develop the skills of critical appreciation,character analysis,,representation techniques ,narrative techniques among students
		CO4. To enable the students to acquire the art of novel writing

MEN 201	**Indian literature in English**	CO1. To foster an understanding and appreciation of indian literature in english
		CO2.to enable students to identify a sensibility that is uniquely indian
		CO3. To familirise the chief traits of colonial,post-colonial and recent trends of indian literature in english
		CO4. An effort in giving the idea of area studies under the greater arena of literary studies
MEN 202	**Language and linguistics**	CO1. To enable the students to get insight into the scientific study of language
		CO2.to inform its socio-cultural variables
		CO3. Stress would be on the study of phonology,morphology,syntax and semiotics
MEN 203	**Gender and literature**	CO1. To acquaint the students with the emerging area of gender studies and its major features
		CO2.to develop a theoritical and research –oriented framework for critical studies of womens' writings and feminist discourse
		CO3.to familiarise with the ongoing issues in the field of genderstudies with the help of major texts and writers
MEN 204	**English poetry ii –blake to eliot**	CO1.to foster a critical understanding of british poetry from the romantic to the modern period
		CO2.to introduce the students with the major traits of romantism,modernism and emphsis is also put on the shifts that take place from the romantic to the modern
		CO3. To enable the students to develop the skills of crtical analysis and explanation of poetry as a literary form
		CO4. A effort to mould the students' critical understanding of the changes in the poetic form throughout the ages
MEN 205	**English drama ii:restoration to the modern period**	CO1. To foster a critical understanding of the growth and development of english drama of the restoration to modern period.
		CO2. To teach the art of critical understanding of theatrer and stage during that period with special reference to the texts recommended
		CO3. To know the factors and features that influenced the dramatic writings
MEN 301	**History of critical thought**	CO1. To give an overview of the major shifts in literary theory and criticism from the ancient tpo the modern
		CO2. To familirise the students with the major forms,waves ,terminologies in the field of theory and criticism
		CO3. To teach how to relate literature and theory
MEN 302 (A)	**Post colonial literature**	CO1. To introduce the students with the very influential field of post colonialism
		CO2. To develop an awareness of the socio-political,cultural,economic issues behind the growth and development of post colonialism
		CO3. To introduce the literary traits of pc with the help of some representative texts
		CO4. How to analyse a text with a new critical and theoretical outlook
MEN 302 (B)	**Society, polity and literature**	CO1. To familiarise the students with the relation between society ,polity and literature
		CO2. To gain insights for socio-political evaluation of literature
		CO3. To introduce the students with the writings regarding the colonial era ,socio-political; theories
		CO4. To familiarise student with the post –colonial developments in the field of literature
MEN 303	**Modern american**	CO1. To help the students to understand the literature of the u.s.a as an outcome of its traditions,culture and politics

	literature	CO2. To familiarise the students with the different critical, theoritical and philosophical trends emerging in various socio-historical times in u.s.a.
		CO3. To cover a wide area of american literature across genres ,ethnicities and historical times
		CO4. An effort to give a comprehensive understanding of the emergence of area studies under the wider literary arena
MEN 304	**Prose ii-milton-marshall**	CO1. To familirise the major features of prose writings of the specific period.
		CO2. To foster an appreciation of the genre of prose writings of authors like mill,lawrence,pater etc.
		CO3. To develop analytical skills in understanding and explaining prose texts
MEN 305	**English fiction ii- hardy to lessing**	CO1. To introduce the students with the changig nature of novel writing and their historical trajectory
		CO2. To enable the students to gain insights into new concepts and techniques like stream of consciousness,post colonialism,feminist perspectives, magic realism etc
		CO3. Stress is on the theoritical study of narratology and associated concepts like point of view,polyphony,hetroglossia etc
MEN 401	**European literature**	CO1. To familiarise the students with some of the great works of european literary
		CO2. Along with the study of the texts ,stress would be on the modernist aesthetic movements and the avantgard literature
		CO3. An effort to give a comprehensive idea about the major features of style and content in the wider field of european literature
MEN 402	**African literature**	CO1. To introduce the students with the strong emerging field of african literature
		CO2. To introduce them with the urgent socio-political,socio-cultural factors behind the growth and delopment of african studies
		CO3. To broaden and strengthen the understanding of english literature
MEN 403	**Contemporary critical theory**	CO1.to introduce the students with the recent trends of critical theory
		CO2.to help them inculcating a strong theoritical and analytical literary perspective
		CO3. To familiarise them with the major figures and texts of critical theories like russian formalism,structuralis/post-structuralism,eco-criticism etc
		CO4.to teach how to interprete a literary text with the help of different critical theories
MEN 404	**Writings from the Northeast**	CO1. To introduce the students with the emerging field of northeast writings in english
		CO2. To foster a good understanding of the issues,geo-political traits of the region
		CO3. To introduce the students with the rich cultural,literary and linguistic heritage of the locality
		CO4.to popularise the ne writings and to establish them in the wider literary canon
MEN 405 (A)	**Indian writings in English**	CO1. To familiarise the students with the history, development and contemporary state of indian literature in english.
		CO2. To help them understanding the unique features of indian literature ,its unique characteristics as an independent,separate trend of literature in english

		CO3. To foster a deep understanding of dominant areas like postcolonial expressions, nationalism in literature, subaltern studies etc.
MEN 405 (B)	**American literature**	CO1. To familiarise the students with the history ,development and features of american literature
		CO2. To help them understanding the unique features of american literature ,its unique characteristics as an independent, separate trend of literature in english
		CO3. To foster a deep understanding of dominant areas like transcendentalism, american dream of success, racism, power hierarchy etc

P.HD ENGLISH

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1. To produce a critically, analytically strong and introspective set of young researchers who can contribute in the field of new avenues of literary research
PSO2.To create a strong environment of scientific research in the field of language and literature
PSO3. With specific focus on literary and cultural topics of Northeast, efforts are made to create a strong knowledge centre about the region and its literary and cultural scenario
PSO4 . To create a good tradition of strong publication culture , with the publication of research based articles, research papers etc.

2.

P.hd	CO1.to produce a critically, analytically strong and introspective set of young researchers who can contribute in the field of new avenues of literary research
	CO2.to create a strong environment of scientific research in the field of language and literature
	CO3. With special focus on the literary and cultural areas of northeast india, the programme aims at creating a good knowledge base of the culture and literature of the region
	CO4. To initiate a good tradition of research based publication .

MASTER OF LIBRARY AND INFORMATION SCIENCE (MLISC)

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PO1. Preparing leaders for a diverse, highly technological, information-based global society; to engage in research and creative activities that generate new knowledge and applications for effective practice and that foster interdisciplinary approaches to address information challenges;

PO2. Understanding the social, political, ethical, and legal aspects of information creation, access, ownership, service, and communication; design and apply policies and procedures that support the selection and acquisition of information resources for particular communities of users & manage, evaluate, and preserve physical and virtual collections of information resources;

PO3. Programme specific outcomes also focuses developing professional approach to key technologies and development models of information resource organization, and the description of information resources;

PO4. Awareness of the ethics, values, and foundational principles of one of the information professions, and discuss the importance of intellectual freedom within the profession;

PO5. Educate users and potential users to locate, use, and evaluate information resources and tools & analyze and identify the information needs of diverse communities of users & perform basic managerial functions, including planning, budgeting, and performance evaluation of library and information centers.

2. COURSE OUTCOMES (COs)

MLS 101	**Foundations of Library & Information Science**	CO1.This course enables students to understand and appreciate the Library and Information Profession.
		CO2.To acquaint the students with the basic philosophy of Library and Information Science
		CO3.To understand the role and evolution of Library as a social institution
		CO4.To familiarise the basic concepts of information and communication, to create awareness about legal, political & ethical aspects of information & its use

MLS 102	**Organization of Knowledge**	CO1. To introduce the structure and attributes of Universe of Knowledge,
		CO2. To understand the principles and practices of document description including electronic documents,
		CO3. To develop skills in subject analysis and proficiency in using standard schemes of classification and subject cataloguing,
		CO4. To familiarise with advanced information processing techniques.
MLS 103	**Foundations of Computer & Information Technology (Theory)**	CO1. To acquaint the students with basic concepts of computers and networks
		CO2. To develop skills in using computers and communication technologies
		CO3. To identify major issues in the development of new technology in libraries such as digital and virtual libraries and discuss their implications
MLS 104	**Foundations of Computer & Information Technology (Practical)**	CO1. To give students practical knowledge of computer and information technology to develop e-library and digital library
		CO2. To get students familiarise with different operating systems, Power point presentations, PDF creation, Photoshop techniques
MLS 105	**Organization of Knowledge (Practical)**	CO1. To give students practical knowledge of classifying and cataloguing library documents using Dewey Decimal Classification, Colon Classification and AACR2 & SLSH
MLS 201	**Management of Library and Information Centre**	CO1. To provide an understanding of current trends and practices in management and various techniques and principles of Human Relations Problem Solving
		CO2. To introduce a variety of Leadership and Management styles
		CO3. Use of practical management techniques to achieve organizational effectiveness and efficiency.
MLS 202-	**Information Source & Services**	CO1. To introduce different categories of Reference and Information sources
		CO2. To familiarise with Standard Reference and Information sources in Print, Non-print and electronic media,
		CO3. To acquire skills for providing Reference and Information Services,

MLS 203	**Library Systems**	CO1. To make students familiar with different types of libraries, professional associations,
		CO2.To provide knolwdge about Library Buildings and proper planning in today's context.
		CO3. To give knowledge of law and legislations relating to public library and other laws and acts.
		CO4.To give knowledge of preservation and conservation of library materials.
MLS 204-	**Information & Communication and Information System**	CO1. To provide in depth concept of data and information, information communication, information explosion, economics of information and its impact in modern society
		CO2. To enable the students to design and develop information system new/emerging areas/disciplines
		CO3. To explore feasibility of application of Information Technology and related aspects in their implementation.
MLS 205	**Organization of Knowledge (Practice + Project)**	CO1. To give students practical knowledge of classifying library documents using UDC and DDC DDC, Documentation Project is aimed to equip students preparing customised library and information services.
		CO2. Documentation Project is aimed to equip students preparing customised library and information services
MLS 301-	**Information Retrieval**	CO1.To provide in-depth knowledge of Information Retrieval,
		CO2. To familiarise with different tools, Vocabulary control and its practical usage in information handling and dissemination,
MLS 302	**Marketing of Library and Information Products and Services**	CO1.To give knowledge of concept of information in the context of global scenario, the concept of marketing and particularly marketing of information products and services
MLS 303	**Research Methodology**	CO1. To introduce the different methods and techniques of research
		CO2. To understand and articulate the role and importance of research in library and information Science, to introduce the different methods and techniques of research
MLS 304	**Bibliometrics Studies and Job Diary and**	CO1. To give students knowledge of different methods to quantitatively analyze scientific and technological literature

	Library Visit Report	CO2. To make students familiar with commonly used Bibliometrics methods, Wide applications in the field of library and information Science
MLS 305	**MLS 305-Web Technologies (Theory and Practical)**	CO1. Students can understand history and basic concepts of web technologies;
		CO2. Students will be able to know commonly used software packages for web designing.
MLS 401	**Library System Analysis and Library and Users**	CO1. To give students knowledge of interacting entities, including computer systems analysis and library as a system
		CO2. To train in different tools and techniques of analysis, To give students knowledge of information repackaging, information analysis
MLS 402	**Library Automation & Networking**	CO1. To give in-depth knowledge of library automation
		CO2. To provide introduction of Digital Library
		CO3. To aware students from content creation and its management, Knowledge of consortia, Know-how of hardware and software of Digital Library
MLS 403	**Computer Application to Library Work and Library Software Packages (Theory)**	CO1. To understand and get familiar with applications of Computer and Information Technology in Library and Information Centers.
		CO2. To give the basic concepts of library software packages, software used in Indian libraries, to give basic concepts on open source library software.
MLS 404	**MLS 404-Library Software Packages (Practical)**	CO1.To give hand on knowledge of library software packages like CDS/ISIS, SOUL etc
MLS 405	**Dissertation**	CO1. The aim of a dissertation work is to equip the students with practical knowledge and technical steps to carry out a research project.

M.Sc. MATHS.

1. PROGRAMME SPECIFIC OUTCOMES (PSO):

PSO1.

Understand notion and concepts of set, function, real and complex number system.

PSO2. Understand the concepts of continuous function, limit, continuity, vector space, metric space, normed space, inner product space, topology, group theory, system of linear equation etc.

PSO3. Understand the concept of ordinary and partial differential equation and can solve both ODE and PDE by using different methods.

PSO4. Increase problem solving technique by using the concept of numerical analysis, complex analysis, graph theory, number theory, fluid dynamics, mathematical methods.

PSO5. Understand the recent development in universe and cosmology by using the concepts of theory of relativity.

PSO6. Programming in C and Mathematica helps in building technical, computing web services, including numerical, symbolic, and graphical applications that solve technical problems quickly and easily

2. COURSE OUTCOMES (COs)

MSM 101	**Real Analysis**	CO1. Introduction to the notion of set and functions
		CO2. Understand the properties of real number system
		CO3. Introduction to the concept of sequence and limit, cantor set, Metric space.
		CO4.Understand the concepts of continuous and discontinuous function.
		CO5.Introduction and applications of Mean value theorem.
		CO5. Understand the properties of Heine-Borel theorem, Cantors theorem
MSM 102	**Differential**	CO1.Concept of Differential Equation

	Equations I	CO2. Classification of differential equation according to linearity and order.
		CO3. Solution of Differential equation interpretation.
		CO4. Using integrating factor, Separable and Homogeneous equations can be convert to exact differential Equation.
MSM 103	**Abstract Algebra**	CO1.Understand definition and example of group, some special groups, subgroups, normal subgroup and their properties, center and normalizer of a group, cyclic group, class equation of a group, Sylow's theorems and their applications and classification of groups.
		CO2. They will learn about Simple group, separable and non-separable group.
		CO3. They will learn Definition and example of Ring, Ideal, prime and maximal ideal, integral domain, Euclidian domain, PID, UFD, reducibility of polynomial ring etc.
		CO4. They will learn the basic concept and properties of finite field.
MSM 104	**Numerical Analysis**	CO1. Problem solving using numerical methods
		CO2. Graphical representation of complex problems to solve accurately
		CO3.Simulation with the help of numerical analysis can be done accurately and easily
		CO4. Helps in multidisciplinary fields like electronics and electrical engineering to design complex circuits using finite difference equations.
MSM 105	**Linear Algebra**	CO1. Introduction to basic concepts of system of linear Equations.
		CO2. Understand the concepts of vector space, basis and dimension.
		CO3. Study of linear transformation, representation of linear transformation by matrices.
		CO4. Introduction to canonical product, Diagonalization, orthogonality , inner product space etc.
		CO5. Increase problem solving technique like finding eigen value, eigen vectors, linear dependence, independence, rank and nullity etc.
MSM 201	**Topology**	CO1.They will learn about countable and uncountable sets, Cantor's theorem and continuum hypothesis, Zorn's lemma and well ordering theorem and definition and examples of topology.
		CO2. They will learn about base and sub base of topology, ordered, product and subspace topology and their relation.
		CO3. They will learn about the closed set, closure, derive set, limit point and boundary of a set.
		CO4. They will learn the countable and separation axioms of topology.
		CO5. Understand about the basic properties of compactness.
		CO6. Learn about connected space and component.
MSM 202	**Differential Equations II**	CO1. We can solve Boundary value problem. With this study we have discussed about wave problem, Heat problem etc.
		CO2. Using Monge's method we will solve special type of non linear partial differential equation.
		CO3. Calculus of variations helps to understand what functional are and their application.
		CO4. Study Euler-Lagrange equation to find differential equation for stationary paths.
MSM 203	**Complex Analysis**	CO1. Introduction to the basic concept and properties of complex numbers.
		CO2. Study of differentiability, limit, continuity of a complex number.
		CO3. Introduction to analytic function, C-R equation, harmonic function, harmonic conjugate etc.
		CO4. Study of complex Integration, Cauchy Integral theorem, Lioville's theorem power series etc.

		CO5. Understand the concept of singularity
		CO6. Increase problem solving method.
MSM 204	**Mechanics and Tensor**	CO1. Understand motion in three dimension and motion in spherical and conical surface.
		CO2. Study of motion of a rigid body in 2-D, compound pendulum, D'Alembert's Principle, motion under impulsive forces.
		CO3. Understand the application of principle of virtual work in impulsive forces, Carnot's theorem, Kelvin's theorem and Bertrand's theorem.
		CO4. Study of generalized coordinates and Lagrange's equation of motion for finite and impulsive forces in holonomic systems.
		CO5. Understand the concepts of Transformation of coordinates, Kronecker delta, outer and inner product of tensors, Christoffel's three-index symbols etc.
MSM 205	**Programming with C& Mathematica**	CO1.As a middle level language ,C program combines both high level and low level languages.
		CO2.It can be used for scripting for drivers and software applications and kernels.
		CO3. Companies like Facebook, Google, etc use C for operating systems, games, embedded technology, etc.
		CO4. Mathematica helps in building technical, computing web services, including numerical, symbolic, and graphical applications that solve technical problems quickly and easily
MSM 301	**Number Theory**	CO1. Will learn about division, division algorithm, Euclidian algorithm, gcd, lcm etc.
		CO2. Understand about the congruence and its properties and applications, order of an element, primitive element etc.
		CO3. Understand about quadratic residues, Legendre and Jacobi symbols, higher power residues, Fermat's Little theorem, Euler theorem, necessary and sufficient condition for the existence of primitive root.
		CO4. They will learn about Fibonacci sequence and its properties, Continued fraction and its properties etc
MSM 302	**Functional Analysis**	Co1.Understand the basic principles of functional analysis
		Co2. Understand the concept of Banach spaces, linear operators and continuous linear functional.
		Co3. Introduction to Hilbert space, operators on Hilbert space.
		Co4. Understand the concept of Representation Theorems and Hahn – Banach extension theorem.
		Co5.Understand the principles of Spectral theory.
MSM 303	**Mathematical Methods**	CO1. Understand the concepts of convolution theorem, inverse Laplace transform, laplace transform with application to the solution of differential equations
		CO2. Understand the concept of Fourier transform and its applications.
		CO3. Introduction to integral equation and finding solution.
		CO5. Maline Transform and Hankel Transforms and their application
		CO4. Increase problem solving technique.
MSM 304	**Continuum Mechanics & Hydrodynamics**	CO1. The theory of continuum is useful to geometrical deformation analysis obtained from repeated positional survey in geodesy.
		CO2. It serves as a technological and scientific communication basis in different areas like geophysics, etc.
		CO3. Hydrodynamics help in the smooth running of cooler fans because there is less friction and mainly viscous loss to the oil.

		CO4. Helps in the lowering of wear between metal bearings and race components giving them longer life to sustain.
MSM 305A(Optional)	**Special Theory of Relativity**	CO1.Study about failure of Galilean Transformation
		CO2.Understand Lorentz Transformation
		CO3. Understand Space and Time in Relativity
		CO4.Study about momentum and energy in Relativity
MSM 305B (Optional)	**Operations Research**	
MSM 401	**Graph theory**	CO1. Student will learn the definition and example of graphs, various operation on graphs, homomorphism and isomorphism of graphs.
		CO2.They will learn about graph connectivity and complete graph.
		CO3. They will learn various properties of Tree, types of tree and some algorithms. And also cycle and co-cycle space.
		CO4. They will learn basic concept and properties of Eulerian, Hamiltonian and Planer graph.
		CO5. They will learn the basic concept of coloring and covering of graphs and their applications
MSM 402	**Advanced Partial Differential Equation**	CO1. Partial differential equations have a remarkable ability to predict the world around us.
		CO2. They can describe exponential growth and decay.
		CO3. Partial differential equation helps in calculating the population growth of a species or the change in investment return over time.
		CO4.They are also used in medicine estimation for modeling cancer cells growth
MSM 403A (Optional)	**Fluid Dynamics**	CO1. Bernoulli's principle in Fluid Dynamics helps in the design of airplane's wings, which helps in maintaining the pressure over the plane.
		CO2.Fluid Dynamics is used in turbines for the generation of power from hydroelectric dams.
		CO3. Fluid dynamics help in the design of pumps, compressors, and piping used in air conditioning system of homes.
		CO4. The fundamental principles of fluid dynamics are used to explain the mechanisms of biological flows and their interrelationships with physiological processes in health and disease disorder
MSM 403B (Optional)	**Space Dynamics**	
MSM-404A (Optional)	**Dynamical Systems**	
MSM-404B (Optional)	**General Theory of Relativity and Cosmology**	CO1.Study about fundamental principles of the General Theory of Relativity
		CO2. How gravity is main cause of a curved space time
		CO3. Study about Gravitational Waves
		CO4. Understand Cosmological models and cosmological principle
MSM 404C (Optional)	**Advanced algebra**	
MSM-405	**Project**	CO1.The students take up research work applying the knowledge and experience acquired during the course.
		CO2. Increase problem solving technique and get the idea to write a research paper or article.
		CO3.Will help in their future research work.
		CO4. Introduce to new dimension of knowledge with better understanding of the subject.

PH.D MATHS.

1. PROGRAMME SPECIFIC OUTCOMES (PSO):

PSO1. The study of Relativity became a significant and necessary tool for theorists in the field of Physics, Mathematics and Astronomy. It gives a few ideas that are powerful enough to shape our entire picture of the universe and gravitation concept.

PSO2. The study of cosmology gives people the idea of anthropological cosmologies, drawing in scientific theories in order to construct models for activities in disciplines such as politics and psychology

PSO3. Multivariate cryptography is a public key cryptography which is based on multivariate polynomial over a finite field. Solving systems of multivariate polynomial equations is proven to be NP hard or NP complete and because of this it is useful to build a cryptosystem which is more efficient and secure than the public key cryptosystem based on number theory. We will try to find the multivariate polynomials which are good for a cryptosystem.

PS04. Research on application of cryptography in real life.

Ph.D in MATHS.	**Ph.D in MATHS.**

B.SC IN PHYSICS

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

2. COURSE OUTCOMES (COs)

BSP-101	**MATHEMATICAL PHYSICS-I**	CO1. Know about 1st and 2nd order differential equation and then method of finding complementary functions and particular integrals.
		CO2. Understand vector algebra. Scalar and vector fields.
		CO3. Learn the differentiation and integration of vectors.
		CO4. Understand different vector operations such as Del, gradient and curl.
		CO5. Know about the Orthogonal Curvilinear Coordinates
BSP-102	**MECHANICS**	CO1. Learn about various aspects of dynamics
		CO2. Learn about work and energy
		CO3. Learn about collisions
		CO4. Learn about rotational dynamics
		CO5. Learn about gravitational physics
BSP-103	**MATHEMATICAL PHYSICS-I PRACTICAL**	CO1. Understand the basics of scientific computing.
		CO2. Know and compute different types of errors.
		CO3. Know the basics of various programming languages such as C and C^{++}
		CO4. Apply the programming language to calculate sum, average, and area.
BSP-104	**MECHANICS PRACTICAL**	CO1. Learn about motion of spring
		CO2. Learn about determination of moment of inertia by various methods
		CO3. Learn about calculation of acceleration due to gravity by various methods
		CO4. Learn to measure Young's modulus and modulus of rigidity
BSP-201	**ELECTRICITY AND MAGNETISM**	CO1. Know the basic concept of Electric field and Potential.
		CO2. Understand polarization and dielectric properties of matter.
		CO3. Understand magnetic force, magnetic field and be able to calculate the same in current carrying conductors of different shapes.
		CO4. Know about the magnetic properties of matter.
		CO5. Have a clear picture of charge and energy conservation and the phenomena of electromagnetic induction.
BSP-202	**WAVE AND OPTICS**	CO1. Have a deep concept of waves, harmonic motions etc..
		CO2. Acquire knowledge on different type of vibration like free,

		damped, force vibrations etc.
		CO3. Get the knowledge of wave optics as well as ray optics.
		CO4. Get the idea of defects in image formation through lenses.
		CO5. Have deep knowledge on the concept of interference, diffraction, polarisation
BSP-203	**ELECTRICITY AND MAGNETISM PRACTICAL**	CO1. Have the experience of potentiometer and its practical applications.
		CO2. Acquire knowledge of Carey Foster's bridge and its practical applications.
		CO3. Have the idea of self induction and its application in real problems.
		CO4.Have deep knowledge on LCR circuits and applications.
BSP-204	**WAVE AND OPTICS PRACTICAL**	CO1. Know the experiments of Michelson interferometer, Newton rings, wavelength of Sodium light.
		CO2. Acquire knowledge the experiments of wavelength measurements different sources like Na ,Hg etc.
		CO3. Acquire knowledge the experiments of Fresnal Bi-prism.
		CO4. Know the experiments of thin film, and know the experiments of measurement of dispersive power and resolving power of diffraction grating.
BSP-301	**MATHEMATICAL PHYSICS-II**	CO1. Learn about the matrices and their properties.
		CO2. Get the knowledge of Forbenius method and special functions
		CO3. Have the knowledge of different polynomials.
		CO4. Acquire knowledge on special integrals (beta and gamma functions).
		CO5. Know the partial differential equations and their methods of solutions
BSP-302	**THERMAL PHYSICS**	CO1. Learn about basics of thermodynamics
		CO2. Learn about various quantities related to thermodynamics, such as entropy and thermodynamic potentials
		CO3. Learn about Maxwell's thermodynamic relations
		CO4. Learn about kinetic theory of gases and molecular collisions
		CO5.Learn about real gases
BSP-303	**DIGITAL SYSTEMS AND APPLICATIONS**	CO1. Understand various number systems and their importance in digital design.
		CO2. Understand and design different logic families.
		CO3. Have fundamental concepts of sequential and combinational circuits.
		CO4. Analyze and design clocked sequential circuits.
		CO5. Understand active and passive components, integrated circuits and their importance in microprocessors.
BSP-304	**MATHEMATICAL PHYSICS-II PRACTICAL**	CO1. Learn the basic of Numerical computation software such as Scilab/MATLAB.
		CO2. Learn Numerical methods and develop the skills of writing a program.
		CO3. Learn different techniques such as Curve fitting, Least square fit, Goodness of fit, standard deviation using Scilab/MATLAB.
		CO4. Find the solution of differential equations

BSP-305	**THERMAL PHYSICS PRACTICAL**	CO1. Learn to determine mechanical equivalent of heat
		CO2. Learn to determine thermal conductivity coefficient by various methods
		CO3. Learn to determine temperature coefficient of resistance of platinum resistance thermometer
		CO4.Learn to measure characteristics and various quantities related to a thermocouple
BSP-306	**BASIC INSTRUMENTATION SKILLS**	CO1. Gain the concept of accuracy, precision, sensitivity and resolution of basic electronic instruments.
		CO2. Have the advantage of multimeters over conventional voltmeter and ammeter.
		CO3. Know in details of operation and working of CROs
		CO4. Have an idea of different signal generators and their applications
BSP-401	**NUCLEAR AND PARTICLE PHYSICS**	CO1. Understand the constituents and general properties of nuclei, and learn about different nuclear models and the condition for Nuclear Stability.
		CO2. Know about the different types of radiation such as alpha, beta and gamma and their properties.
		CO3. Know the different types of nuclear reaction and calculate the Q value of reaction.
		CO4. Have a basic concept of different types of detection mechanism of nuclear radiations.
		CO5. Know the basic of particle physics, types of particles and conservation laws.
BSP-402	**ELEMENTS OF MODERN PHYSICS**	CO1. Learn basics of quantum mechanics
		CO2. Learn about quantum mechanical wave equations
		CO3. Learn about special theory of relativity
		CO4. Learn about atomic physics
		CO5.Learn about radioactivity
BSP-403	**ANALOG SYSTEMS AND APPLICATIONS**	CO1. Understand the basic process in the formation and fabrication of PN junction devices.
		CO2. Analyze BJT as amplifiers and bias circuits for CB, CC and CE configurations.
		CO3. Understand the importance of feedback (both positive as well as negative) in amplifiers and their frequency response.
		CO4. Understand versatile integrated circuits such as Op-Amp and its applications.
		CO5. Analyze different oscillator circuits and the criteria for self sustained oscillations.
BSP-404	**NUCLEAR PHYSICS AND ELECTRONICS PRACTICAL**	CO1. Carry out experiments using a GM counter and calculate the operating voltage of the counter.
		CO2. Know the experimental procedure to detect alpha and gamma radiations, and know about the different radio-active sources and their hazards.
		CO3. Gain the characteristics of PNP/NPN transistors.
		CO4.Gain the knowledge of half-wave and full-wave rectifiers.
BSP-405	**ELEMENTS OF MODERN PHYSICS**	CO1. Learn to study photoelectric effect and calculate Planck's constant,

	PRACTICAL	CO2. Learn to determine e/m value by different methods,
		CO3. Learn to measure I-V characteristics of a tunnel diode,
		CO4.Learn to determine wavelength of a laser source by diffraction with single and double slits.
BSP-406	**APPLIED OPTICS**	CO1. Deep understanding of the properties of lenses and mirrors.
		CO2. Characteristics of LASERs and working of different LASER systems
		CO3. Idea of Holography and their construction techniques and applications
		CO4. Understanding of few spectroscopic instrumentations and the communication through Fiber Optics
BSP-501	**QUANTUM MECHANICS & APPLICATION**	CO1. Evolution of quantum mechanics as a new realm of nature
		CO2. Theories and discoveries leading to the development of quantum mechanics
		CO3. Solution of two-body problems through quantum mechanics (H-atom treatment),
		CO4. Principles for determination of the shape and size of the atoms
		CO5. Spectra of hydrogen and alkali elements and their usefulness
BSP-502	**SOLID STATE PHYSICS**	CO1. Learn about crystal structure and phonons
		CO2. Learn about magnetic properties of matter
		CO3. Learn about dielectric properties of materials
		CO4. Learn about electrical properties of materials
		CO5. Learn about superconductivity
BSP-503 (A)	**CLASSICAL DYNAMICS**	CO1. The concept of generalize theories of classical mechanics.
		CO2. The concept of Lagrangian as well as Hamiltonian dynamics.
		CO3. The concept of canonical transformations and bracket operators.
		CO4. The concept of central force problem.
		CO5. Understand the Special Theory of Relativity
BSP-503 (B)	**APPLIED DYNAMICS**	CO1. Know about the dynamical systems, the idea of phase space, trajectories and flows.
		CO2. Compute and visualize trajectories on the computer using a software packages.
		CO3. Understand Chaos in nonlinear finite-difference equations.
		CO4. Learn the Nonlinear time series analysis and chaos characterization.
		CO5.Understand Fluid Dynamics: the theoretical approach, experimental fluid dynamics, computational fluid dynamics.
BSP-504 (A)	**NANO MATERIALS AND APPLICATIONS**	CO1. Learn about nanoscale systems
		CO2. Learn about synthesis of nanostructured materials
		CO3. Learn about various characterization methods of nanomaterials
		CO4. Learn about properties of nanomaterials
		CO5. Learn about applications of nanomaterials
BSP-504 (B)	**ADVANCED MATHEMATICAL PHYSICS**	CO1. Know about the vector spaces and sub spaces.
		CO2. Analyze the basis and Dimensions of a Vector Space.
		CO3. Calculate the Eigen-values and Eigen-vectors.

		CO4. Learn about Euler's Equation, Variational Principle and its application to simple problems.
		CO5. Understand the basics of Tensors and the algebra associated with it.
BSP-505	**QUANTUM MECHANICS & APPLICATIONS PRACTICAL**	CO1. Understand the simulation techniques for solving simple differentiation and integration problems,
		CO2. Learn the analytical tool for solving differential equations arising in quantum mechanics,
		CO3. Understand the simulation techniques for solving ordinary quantum mechanical problems,
		CO4. Developing of software codes for solving real quantum mechanics problems
BSP-506	**SOLID STATEPHYSICS PRACTICAL**	CO1. Learn to measure magnetic susceptibility of solids
		CO2. Learn to measure coupling coefficient of piezoelectric crystals
		CO3. Learn to determine plasma frequency and complex dielectric constant of a metal by surface plasmon resonance technique
		CO4. Learn to determine PE hysteresis loop of a ferroelectric crystal
		CO5. Learn to measure resistivity and Hall coefficient of a semiconductor sample.
BSP-507 (A)	**INTRODUCTION TO BIOPHYSICS**	CO1. Understand the types of bonds in bio-molecules and molecular system.
		CO2. Know the energy production mechanism in bio-systems
		CO3. Understand different types of forces and flows governing the Intracellular and Intercellular cargo transport.
		CO4.Have a clear concept of the electrical properties of membrane and gain the knowledge about fluid properties and its movement in biological systems.
BSP-507 (B)	**APPLIED DYNAMICS PRACTICAL**	CO1. Compute and visualize trajectories using software (Scilab/MATLAB/Maple/Octave/XPPAUT) based on Applied Dynamics problems.
		CO2. Compute coupling coefficients of pendulum and oscillators.
		CO3. Compute visualization of trajectories, visualization of fractal formations, and Flow visualization.
		CO4.To investigate rate equations for chemical reactions and study game theory
BSP-508 (A)	**NANOMATERIALS AND APPLICATIONS PRACTICAL**	CO1. Learn to synthesize metal and semiconductor nanoparticles
		CO2. Learn to study surface plasmon resonance of metal nanoparticles by UV-visible absorption method
		CO3. Learn to fabricate nanoparticle thin films by spin coating
		CO4.Learn to study the effect of size on colour of nanomaterials
BSP-508 (B)	**ADVANCED MATHEMATICAL PHYSICS PRACTICAL**	CO1. Perform Scilab/C++ based simulations experiments based on Mathematical Physics.
		CO2. Able to calculate Eigen value and Eigen vectors of dynamical systems.
		CO3. Able to understand classical constraints and determination of moment of inertia of moving bodies
		CO4. Estimate the ground state energy and wave function of a quantum system.
BSP-601	**ELECTROMAGNETIC**	CO1. Will gain a clear understanding of Maxwell's equations and

	THEORY	electromagnetic boundary conditions.
		CO2. Know that laws of reflection, refraction are outcomes of electromagnetic boundary conditions.
		CO3. Students will grasp the idea of electromagnetic wave propagation in free space.
		CO4. Able to describe and analyze transmission lines, wave guide, and understand the basic of fiber optics.
		CO5. Students will extend their understanding of special theory of relativity by including the relativistic electrodynamics.
BSP-602	**STATISTICAL MECHANICS**	CO1. Converse with correct concepts of thermodynamics and statistical mechanics.
		CO2. Understand the need to use statistics to describe systems containing huge numbers of particles.
		CO3. Know the 3 Laws of Thermodynamics & understand their statistical foundations and applications.
		CO4. Have a basic understanding of the phase transitions.
		CO5. Understand the quantum statistical physics of Fermions & Bosons.
BSP-603 (A)	**MATHEMATICAL PHYSICS-III**	CO1. Apply the concept of complex function to solve Integrals.
		CO2. Learn the expansion of periodic functions.
		CO3. Learn to expand a function in Fourier series
		CO4. Learn Laplace transformation of elementary function.
		CO5.Solve heat flow equation using Laplace transformation.
BSP-603 (B)	**INTRODUCTION TO EARTH SCIENCE**	CO1. Understand the basic concepts of our dynamic planet through Astronomy, Geology, Meteorology and Oceanography.
		CO2. Know about The solid earth: dimensions, shape and topography, internal structure, magnetic field, geothermal energy.
		CO3. Understand the basic of Plate tectonic theory and the origin of earthquake and earthquake belts.
		CO4. Knowing a wide range of earth surface processes.
		CO5. Understand the scope of geomorphology from landform to landscape to mega geomorphology
BSP-604 (A)	**ASTRONOMY AND ASTROPHYSICS**	CO1. Know about the astronomical scale of distance, mass and time,
		CO2. Get the idea of astronomical coordinates and measurements of astronomical distances
		CO3. Know the ideas of brightness and temperature of the stars, also the astronomical telescopes
		CO4. Learn the process of evolution of the universe, galaxies and stars,
		CO5.Get the details of the solar family and its origin.
BSP-604 (B)	**PHYSICS OF DEVICES AND INSTRUMENTATION**	CO1. The qualitative and quantitative aspects of analysis, and evolution of analytical data
		CO2. The idea of different detectors viz. PMT, CMOS, CCD etc. and their associated electronic circuitry.
		CO3. The knowledge of transducer and sensors, and signal transformation techniques
		CO4. The spectroscopic instrumentation and microscopic imaging techniques.
		CO5. The knowledge of instruments for optical and structural

		investigations
BSP-605	**ELECTROMAGNETIC THEORY PRACTICAL**	CO1. Learn the concept of Law of Malus and to verify it for Plane Polarized Light.
		CO2. Learn the technique to determine the Specific Rotation of cane sugar using Polarimeter.
		CO3. Understand the method to verify the Brewster's law and to find the Brewster's angle.
		CO4.Will have a basic concept of optical fibers and learn to measure the acceptance angle and Numerical Aperture of an Optical Fibre.
BSP-606	**STATISTICAL MECHANICS PRACTICAL**	CO1. Use numerical simulation for solving different problems in Statistical mechanics
		CO2. Compute physical quantities at large and small temperature
		CO3. Compute velocity distribution of particles.
		CO4. Plot different function viz., Maxwell-Boltzmann distribution, Fermi-Dirac distribution and Bose-Einstein distribution with energy.
BSP-607 (A)	**MATHEMATICAL PHYSICS III PRACTICAL**	CO1. Able to perform Scilab/C++ /MATLAB based simulations experiments based on Mathematical Physics.
		CO2. Able to solve differential equations.
		CO3. Able to solve integral problems.
		CO4. Able to evaluate the Fourier coefficients of a given periodic function.
BSP-607 (B)	**BASIC ATMOSPHERIC PHYSICS**	CO1. Know the structures and composition of the earth's atmosphere.
		CO2. Understand the instruments for meteorological observations.
		CO3. Understand the dynamics of the earth's atmosphere which includes the fundamental forces, conservation laws and atmospheric oscillations etc.
		CO4.Know various types of atmospheric radars and its applications, and know several types of aerosols, its production and removal.
BSP-608 (A)	**ASTRONOMY AND ASTROPHYSICS PRACTICAL**	CO1. Know how different types of telescope works,
		CO2. Gain the knowledge of lunar craters
		CO3. Gain the knowledge of magnitudes of the stars
		CO4. Knowledge of Stellarium software
BSP-608 (B)	**PHYSICS OF DEVICES AND INSTRUMENTATION PRACTICAL**	CO1. Know how zener diode can be applied as a voltage regulator.
		CO2. Gain the knowledge of low pass and high pass filters
		CO3. Gain the knowledge of amplitudes and frequency modulations
		CO4. Have the knowledge of Linear Variable Differential Transformer
BSP-609	**DISSERTATION**	CO1. To develop skills in research and methods available, towards addressing specific project objectives.
		CO2. To identify noble research area and carry out literature survey.
		CO3. Able to analyze research literatures, and able to learn different software packages depending upon the nature of project.
		CO4. Would be able to design the methods and carry out the

		procedure as per the project.
		CO5.To produce clear and concise written dissertation and present a research-level seminar

M.SC IN PHYSICS

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

2. COURSE OUTCOMES (COs)

MSP-101	**Mathematics Physics-I**	CO1. Understand and apply the mathematical skills to solve quantitative problems in the study of physics.
		CO2. Learn about special type of matrices that are relevant in physics.
		CO3. Will enable students to apply integral transform to solve mathematical problems of interest in physics.
		CO4. Learn the fundamentals and applications of Fourier series, Fourier and Laplace transforms, their inverse transforms etc as an aid for analyzing experimental data.
		CO5.Formulate and express a physical law in terms of tensors, and simplify it by use of coordinate transforms.
MSP-102	**Classical Mechanics**	CO1. Know the concept of classical mechanics.
		CO2. Understand the foundations of chaotic motion.
		CO3. Have deep knowledge on Lagrangian & Hamiltonian dynamics.
		CO4. Know the theory of small oscillation.
		CO5. Have brief knowledge on fluid motion.
MSP-103	**Quantum Mechanics-I**	CO1. Gain the aspects of historical developments of quantum mechanics and interpretation of wave particle duality
		CO2. Gain the idea of development of central concept and principles of quantum mechanics such as Schrödinger equation, wave functions, and its statistical interpretation
		CO3. Have the solution of Schrödinger equation for simple systems in one

		and three dimensions
		CO4. The ideas of probability, evolution of time, expectation values, and uncertainty of quantum systems.
		CO5. Gain the knowledge of angular momentum, spin and their rules for quantization
MSP-104	**ElectronicS**	CO1. Understand the basic knowledge of various semiconductor devices such as BJT, FET and MOSFET.
		CO2. Acquire knowledge on Operational Amplifier and its applications.
		CO3. Know the building blocks of digital systems and the logic families.
		CO4. Analyze the transmission of multiple signals through different modulation techniques.
		CO5. Develop knowledge on signal transmission through different antenna types.
MSP-105	**PHYSicS LABORATORY-I**	CO1. Semiconductor and their properties.
		CO2. The magnetrons and its applications.
		CO3. Physics of propagation of ultrasonic through liquid, ideas of ultrasonography used in medical science.
		CO4. Working of LASERs and determination of LASER wavelength, applications of LASERs in different domains of engineering and technology.
		CO5. Knowledge of rectifiers and amplifiers and their fabrication for operations etc.
MSP-201	**ElectroMAGNETICS & Plasma PHYSICS**	CO1. Gain a clear understanding of Maxwell's equations and electromagnetic boundary conditions.
		CO2. Know that laws of reflection, refraction are outcomes of electromagnetic boundary conditions.
		CO3. Grasp the idea of electromagnetic wave propagation through wave guides and transmission lines.
		CO4. Extend their understanding of special theory of relativity by including the relativistic electrodynamics.
		CO5. Understand the rather complex physical phenomena observed in plasma
MSP-202	**Computational Physics**	CO1. Have deep knowledge on C programming.
		CO2. Have introductory knowledge of MATLAB.
		CO3. Learn various numerical methods to solve mathematical problems.
		CO4.Find solutions of numerical problems through computational software.
MSP-203	**Condensed Matter Physics**	1. Learn about crystalline state of solids and X-ray diffraction
		2. Learn about various types of crystal bonding and lattice dynamics
		3. Learn about dielectric properties of solids
		4. Learn about energy bands in solids and free electron theory of metals
		Learn about magnetic properties and various aspects of semiconductors
MSP-204	**Atomic & Molecular Physics, Physics of Laser**	CO1. Know about the emission and absorption spectra of the atoms.
		CO2. Know about the different energy levels in atoms and various coupling schemes.
		CO3. Understand about the spectra of molecules
		CO4. Know the Born-Oppenheimer approximation and its application on molecular spectroscopy.
		CO5.Understand laser and its properties, different types of Lasers, applications of Lasers.
MSP-205	**Physics Laboratory-II**	CO1. Learn the skill to measure the wavelength of a given laser by using Michelson's Interferometer and able to verify Heisenberg's uncertainty principle using a plane transmission grating and He-Ne Laser.

		CO2. Will get the knowledge to find the value of Plank's constant and photoelectric wave function of the material of the cathode using photoelectric cell.
		CO3. Will be able to analyze the B-H curve for a given ferromagnetic material using CRO and determine the loss of energy due to hysteresis and understand the concept of dielectric constant and hence able to estimate the value of dielectric constants of different dielectric materials.
		CO4. Learn to measure the numerical aperture and propagation loss in an optical fiber using He-Ne laser source.
		Learn the technique to measure the wavelength separation of sodium D-lines using a diffraction grating and able to study the I-V characteristics of a solar cell.
MSP-206	**Computational Physics PRACTICAL**	CO1. Students will be able to execute the computer programming (C, C^{++}),
		CO2. Use conditional statements for simple programming with loop, array etc.,
		CO3. Solve differential as well as numerical integrations through C or C++ programming,
		CO4. Solve numerical problems of nonlinear equations through C or C++ programming.
MSP-301	**MATHEMATICAL PHYSICS - II**	CO1. Understand the basics of group theory and its applications.
		CO2. Have a detail understanding of Special functions and polynomials.
		CO3. Learn the mathematical technique to solve integral equations.
		CO4. Learn to apply Path integral method to various physics problems.
		CO5. Understand the basic concept of Linear Algebra.
MSP-302	**QUANTUM MECHANICS-II**	CO1. Describe model physical system using common approximation approaches for dynamical calculations.
		CO2. Explain the relativistic quantum mechanical equations, namely, Klein-Gordon equation and Dirac equation.
		CO3. Describe second quantization and related concepts.
		CO4. Explain the formalism of relativistic quantum field theory.
		CO5.Draw and explain Feynman graphs for different interactions.
MSP-303	**NUCLEAR PHYSICS**	CO1. Have knowledge of nuclear size, shape, binding energy etc. and also the characteristics of nuclear force in detail.
		CO2. Have an understanding of the nuclear decay modes, radioactive decay, and the interaction of nuclear radiation with matter; and develop an insight into the building block of matter along with the fundamental interactions of nature.
		CO3. Gain knowledge about various nuclear models and potentials associated, grab knowledge about nuclear reactions, fission and fusion and their characteristics.
		CO4. Have broad understanding of basic experimental nuclear-detection techniques,
		CO5.Understand the basic forces in nature and classification of particles and study in detail conservations laws and quark models in detail.
MSP-304 (A)	**CONDENSED MATTER PHYSICS-I**	CO1. Learn about advanced electrical properties of solids.
		CO2. Learn about advanced magnetic properties of solids.
		CO3. Learn about advanced optical properties of solids.
		CO4. Learn about superconductivity.
		CO5.Learn about critical phenomena of solids.

MSP-304 (B)	**ELECTRONICS AND COMMUNICATION TECHNOLOGY-I**	CO1. Understand the basics and principles of analog signal transmissions.
		CO2. Analyze the conversion of analog to digital transmission of signals through different digital modulation technique.
		CO3. Know the important parameters of transmission lines at radio frequencies.
		CO4.Have knowledge on microwave generation and amplification through microwave devices.
MSP-304 (C)	**HIGH ENERGY PHYSICS**	CO1. Understand the basic forces in nature and classification of particles and study in detail conservations laws and quark models in detail.
		CO2. Understand conceptually the content of the Standard Model and the idea of symmetries (electroweak unification and the Higgs boson only mentioned).
		CO3. Use basic Feynman diagrams to illustrate the electromagnetic, weak and strong forces, understand conceptually cross section, helicity/handedness, width and branching ratio and be able to perform calculations of simple particle interactions using the above and basic relativistic energy momentum formulae.
		CO4. Understand and use the concept of universality, understand conceptually the key aspects of the electromagnetic force, illustrating the idea with basic calculations of electron-electron scattering and electron-positron annihilation.
		CO5.Understand conceptually the key aspects of the strong force, including asymptotic freedom and quark confinement, illustrating the ideas with basic calculations of the meson masses and electron-positron annihilation to quarks
Msp-304 (D)	**LASER AND NONLINEAR OPTICS-I**	CO1. Concept of properties of LASERs and understanding of their designing parameters.
		CO2. Idea of different types of LASERs, their working principles and applications.
		CO3. Development of nonlinear optics and its advantages over linear counterpart.
		CO4. Knowledge of different nonlinear optical effects or phenomena and their applications.
		CO5.Spectroscopic aspects of nonlinear optics and its applications in advanced communications.
MSP-305	**PHYSICS LABORATORY-III**	CO1. Learn the characteristic of a G. M. counter and develop the skill to determine its operating voltage, hence verify the inverse square law for the given radioactive sample.
		CO2. Learn the determination of end point energy of beta particles by half thickness method by GM Counter.
		CO3. Learn the estimation of efficiency of the G.M. detector for (a) Gamma source & (b) Beta Source.
		CO4. Develop the knowledge to examine the statistical properties of radiation detection and to show that for
		CO5. Develop a knowledge to determine the spot size and angle of divergence of a given laser source.
		CO6. Get the concept of determination of magnetic susceptibility of ferromagnetic substance by Quinck's method.
		CO7. Acquire the knowledge of determination of Boltzmann constant by using Boltzmann kit.
		CO8.Get detail ideas of determination of the Lande g-factor using Electron Spin Resonance.

MSP-306	**ELEMENTS OF MODERN PHYSICS**	CO1. Attain the knowledge on Special Theory of Relativity.
		CO2. Have preliminary ideas on Quantum Mechanics.
		CO3. Have knowledge of LASER Spectroscopy.
		CO4. Have knowledge on Solid State Physics
		CO5.Gain knowledge on Nuclear Physics
MSP-401	**STATISTICAL PHYSICS**	CO1. Understand the basic concept of statisticical mechanics to describe systems containing huge numbers of particles.
		CO2. Know & understand the fundamental postulate of equilibrium statistical mechanics.
		CO3. Understand & be able to apply Classical Thermodynamics to simple problems.
		CO4. Understand & be able to apply the Micro-Canonical, Canonical, & Grand Canonical Ensembles to appropriate physical systems.
		CO5.Understand the quantum statistical physics of fermions & bosons, also be able to apply Fermi & Bose Statistics to various many particle systems.
MSP-402	**GENERAL THEORY OF RELATIVITY AND ASTROPHYSICS**	CO1. Development of fundamental principles of the general theory of relativity.
		CO2. Meaning of basic concepts like the equivalence principles, inertial frames and how gravity is understood as a manifestation of a curved space-time.
		CO3. Knowledge on motion in the gravitational field, time dilation and frequency shifts, bending of light, gravitational waves and cosmological models with expanding space.
		CO4. Idea of stellar distances and celestial coordinates, Idea of different magnitudes of the stars and their calculations
		CO5.Evolution of the whole universe, formation of galaxies and stars, Hertzsprung Russell diagram and stellar demise, the Big Bang cosmological model, and the evidence to support it.
MSP-403 (A)	**CONDENSED MATTER PHYSICS-II**	CO1. Learn about advanced semiconductor physics.
		CO2. Learn about p-n junction based devices.
		CO3. Learn about physics of thin films.
		CO4. Learn about soft matter physics.
		CO5.Learn about different experimental techniques in condensed matter physics
MSP-403 (B)	**ELECTRONICS AND COMMUNICATION TECHNOLOGY-II**	CO1. Understand the basic concepts of electromagnetic waves and its propagation in free space.
		CO2. Know the different parameters, patterns and the types of antennas used in communication system.
		CO3. Understand different types of linear beam tubes for microwave generation.
		CO4. Analyze and calculate the range, angle or velocity of objects using the RADAR detection technique.
		CO5.Know the different optoelectronic devices and fiber optics for optical communication.
MSP-403 (C)	**ADVANCED HIGH ENERGY PHYSICS**	CO1. Be familiar with the limiting procedure of Quantum Field Theory and be able to perform simple calculations for these phenomena, also have a deep understanding of the concept of Quantum Chromodynamics in including calculation of scattering amplitudes of electron-proton inelastic scattering.

		CO2. Understand concept of electro-weak interaction in detail, also learn about the qualitative as well as quantitative study of neutrino-nucleon scattering.
		CO3. Understand conceptually the key aspects of the weak force, illustrating the ideas with basic calculations of muon decay and two family neutrino mixing, also understand qualitatively the CKM matrix and its consequences.
		CO4. Know about the questions that the Standard Model does not answer or explain, current ideas on possible physics beyond the Standard Model, and current constraints from searches for new physics.
		CO5.Get idea of neutrino oscillation and neutrino mass, also understand the basics concepts of Higgs Mechanism, Grand Unified theory and String theory, and know about the current experimental status of High Energy Physics.
MSP-403(D)	**Laser and nonlinear optics-II**	CO1. Idea of LASER induced phenomena like pair excitation, LASER cooling etc.
		CO2. Fundamental importance of LASERs in different domains like plasmas, nuclear fusions, atmospheric optics, biology, medical etc.
		CO3. Knowledge of quantum mechanical treatment of nonlinear optics
		CO4. Third order nonlinearity in different materials and applicability of those materials
		CO5.Developments of nonlinear fiber optics that revolutionalize the communication techniques.
MSP-404	**M.Sc. Final Project**	CO1. To develop skills in research and methods available, towards addressing specific project objectives, and to identify noble research area and carry out literature survey.
		CO2. Able to analyze research literatures, and able to learn different software packages depending upon the nature of project.
		CO3. Would be able to design the methods and carry out the procedure as per the project.
		CO4. Able to prepare and present a Research Seminar.
		CO5.Able to produce clear and concise written dissertation
MSP-405	**CONCEPTS OF PHYSICS**	CO1. Know how the nature works under its governed theories
		CO2. Have concepts of heat and thermodynamics.
		CO3. Brief knowledge on electricity and magnetism.
		CO4. Brief knowledge of Geometrical optics.
		CO5.Have a preliminary idea about Quantum Mechanics

B.A. POLITICAL SCIENCE

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

2. COURSE OUTCOMES (COs)

BPS 101	**Introduction to Political Science**	CO1: To make the student understand about political Science, its nature and scope and its relation with other social sciences.
		CO2: To acquaint the students with basic idea about how traditional approaches of political Science was introduced and why modern political thinkers criticized the approaches
		CO3: To provide awareness about the Rights and duties of one's mother country
		CO4: To understand the political institutions such as Legislature, executives, judiciary, political parties and pressure groups etc.
		CO5: To study and analyse the running government system and its functions
BPS 102	**Understanding Political Theory**	CO1: To understand about political theory, its nature and scope and its relation with other social sciences to analyse political science as interdisciplinary subject.
		CO2: To acquaint the students with basic idea about different trends and approaches of political theory with highlighting the changing nature of political theory and emergence of new school of thought in the discipline.
		CO3: To provide guidance to understand the concept of democracy and its application in reality by looking into from different perspective.
		CO4: To have idea on concept of power, its different forms and exercises.
		CO5: To connect the concept like power, authority and legitimacy to understand the pattern of execution of power, its validity and rationality.
BPS 103	**Indian National Movement**	CO1: In tracing the social dimension and legacies in the Indian national movement
		CO2: To familiarize the various types of demand put forth by the various movement by the Indian towards the British government
		CO3: The values, ideals and ideology around which the people were mobilized during the Indian national movement are important topic of study
		CO4: To carefully promote and nurture the feelings of Indian nationhood
		CO5: To acquaint the student the upsurge of the concepts of nationalism and the right to self determination.
BPS 202	**Political theory: Concept and debate**	CO1: Understanding the concept of Freedom and its contemporary relevance
		CO2: To know what is Equality having different facets
		CO3: To get the basic idea on Right and Justice with different practical forms
		CO4: To understand significance of State n contemporary world
		CO5: Exploring the importance of human rights and multiculturalism
BPS 203	**Public Administration (I)**	CO1: To acquaint the students with the basic concept of administration
		CO2: To understand the foundation, philosophy and historical background of Public Administration as a discipline.
		CO3: To get the knowledge of various principles of Organization.
		CO4: To familiarize the theoretical foundations of administration by various classical social scientists' views

		CO5: To acquaint the knowledge on new approaches of Public Administration
BPS 204	**Social movements in India**	CO1. Introducing different attributes of social movements viz. meaning, characteristics, kinds, etc
		CO2. Impact of social movements on distribution of power in society
		CO3. Understanding theories of social movements
		CO4. Knowing traditional social movements in India
		CO5. Exploring new social movements in India
BPS 301	**Indian Political Thought**	CO1: To know the thoughts and philosophy of ancient political thinkers.
		CO2: Exploring the influence of Brahmanism and Islam on Indian society
		CO3: To know the thoughts of leading political thinkers at the time of Indian Renaissance.
		CO4: To know the thoughts of political thinkers to Indian Nationalism.
		CO5: To know and understand the thoughts of political thinkers of modern India specially the contributions and sacrifices of M.K. Gandhi and Jawaharlal Nehru in particular.
BPS 302	**Public Administration (II)**	CO1: To get the knowledge on the theoretical foundations of administration by various contemporary thinker's views.
		CO2: To understand the concept of Personnel Administration and its various processes
		CO3: To get the knowledge of financial administration and the budgetary process
		CO4: To familiarize with the controlling mechanisms of administrative system in India
		CO5: To acquaint the knowledge on bureaucracy and its challenges in India
BPS 303	**Basic Concepts of International Relation**	CO1: To understand the meaning of international relations and its nature and scope by highlighting its differences with international politics.
		CO2: To analyse new issues in international relations and its impact on International order..
		CO3: To have basic idea about different approaches to the study of international relation and tries to analyse the present order from the perspective of those approaches.
		CO4: To analyse and explain the history of international politics and its current form.
		CO5: To have conceptual clarity of basic concepts of international relations, its usages and relevance
BPS 304	**Social Administration**	CO1: To impart knowledge about Social Administration
		CO2: To acquaint the students about the status of social administration in India
		CO3: To probe into the issues and challenges of social administration
		CO4: To study how globalisation has affected our traditions and its effects on our present scenario
		CO5: To bring out alternative solutions to the problems face by the society through different schemes and programmes
BPS 401	**Administrative Thought**	CO1: To understand the basic ideas and opinions of administrative systems and processes
		CO2: To understand the Administrative systems in Indian perspectives by different social scientist opinion.
		CO3: To acquaint the students with more applied knowledge about organisations and its functions through different social scientist's views
		CO4: To get the broader knowledge on administration given by modern theorists
		CO5: To familiarize the contemporary social scientist's views on administrative processes

BPS 402	**Constitution of India**	CO1: Introduction to the Constitution of India, its preamble and features
		CO2: To explore Rights and Duties of the Indian citizens
		CO3: To understand Parliamentary Government and Federalism
		CO4: Role and power of President, Prime Minister, and Council of Ministers
		CO5: To understand the State Government and its administration
BPS 403	**Western political thought**	CO1: Exploring the natural-rational tradition of Greeks
		CO2: Foundation of Greek political thought: Plato and Aristotle
		CO3: Understanding medieval-Christian tradition
		CO4: Knowing the social Contractualists
		CO5: Acquainted with the prominent among utilitarianism
BPS 404	**International relations since 1919**	CO1: To understand what is international relations and how it functions.
		CO2: To make aware the students about the trends of World Wars.
		CO3: The course will provide an outlook on the issue of Cold War and phases.
		CO4: It will emphasis on relations of the present world with the world before 1990s.
		CO5: The course also makes students to understand the present world affairs.
BPS 405	**Comparative government and politics**	CO1: Introduction to different government structures
		CO2: Explore political dynamics and political system
		CO3: Importance of political parties on decision making and policy formation
		CO4: Classification of Political System
		CO5: To understand historical context of modern government
BPS 501	**Women and Politics**	CO1: To understand the concepts of sex and gender as used in the feminist works.
		CO2: To acquaint students with feminism and their struggle for equality.
		CO3: To bring awareness the historical perspective of women's struggle for the development of women.
		CO4: To understand the issues of women role and participation and the constitutional provision for women in India.
		CO5: To examine the social and cultural construct of Gender.
BPS 502	**Introductions to human rights**	CO1: Understanding the concept of human rights
		CO2: Exploring the non-Western perspectives on human rights
		CO3: Impact of Indian tradition of human rights: Hindu-Buddhist and Islamic
		CO4: Knowing the impact of globalization of human rights
		CO5: Indian constitution and human rights
BPS 503	**Politics in northeast India**	CO1: The course enables the students to have knowledge of Northeast India.
		CO2: It will enrich the knowledge of the students to understand colonial policy and people's resistance against that.
		CO3: It reaches the students the post-colonial development of India.
		CO4: This course helps understanding the changing political structure in Northeast India.
		CO5: The course will enable the students to have proper understanding and knowledge on different issues and problems of Northeast India.
BPS 504	**World Constitutions**	CO1: To familiarize the student with the constitutions of the world
		CO2: To analyse the constitution of other nations and its political institutions
		CO3: To evaluate the working of world constitution by emphasizing on the role of political parties of different nations such as USA, U.K, France and Japan.
		CO4: To acquaint the students with different forms and practices of

		government in other countries
		CO5: To critically evaluate the constitution of India in compare with other constitutions of world
BPS 505	**Local government in india**	CO1: To understand the concept, scope and importance of local government
		CO2: To acquaint the students with historical background of local government in India
		CO3: To impart knowledge about the types of local government in India
		CO4: To get the knowledge of constitutional amendments on local government in India
		CO5: To probe into the issues and challenges of local government in India
BPS 601	**Theoretical framework of international relations**	CO1: To understand the different theories of Classical schools
		CO2: To Understand Liberalism
		CO3: To explore the Radical theories
		CO4: To understand the Contemporary theories
		CO5: To understand the relevance of theories of international relations in contemporary world
BPS 602	**Politics in India**	CO1: To understand different issues of Politics in India
		CO2: To understand the importance of election commission of India
		CO3: To look into different values such as Democracy, Socialism and Secularism
		CO4: To understand Social base such as Caste, Class and Gender
		CO5: To explore the Institutional mechanism
BPS 603	**Indian administration: areas and issues**	CO1: To understand the roles and structures of Central Administration of India
		CO2: To acquaint the students with various Administrative Agencies
		CO3: To aware the student with the working of good governance of Indian administrative system
		CO4: To familiarize the concept of citizen participation in administration
		CO5: To understand the emerging issues and challenges of local governance in India
BPS 504	**Nationalism and Constitutional Development in India**	CO1: To know the socio-religious reform movements and rise of national awakening during British rule.
		CO2: To know the constitutional development from 1858 to1919.
		CO3: To explore the circumstances leading to the enactment of Government of India Act, 1935.
		CO4: To know the resolutions and plans leading to the partition of India and Pakistan.
		CO5: To know the most important Act, that is India Independence Act-1947 and role of Constituent Assembly in framing the constitution of India.
BPS 605	**Welfare state: issues and challenges**	CO1: Introducing the concept of Welfare State
		CO2: Understanding the status of welfare state in India
		CO3: Explore welfare state in third world countries
		CO4: Understand the international perspectives on welfare state
		CO5: Practical values of welfare states in our society

M.A. POLITICAL SCIENCE

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

Objective: This course enables students to understand and have conceptual clarity about political theory. The students will be enabled to grasp the value of democracy and its exercise in the larger society. The syllabus also focuses over the legitimacy of power and authority in relation to State

2. COURSE OUTCOMES (COs)

MPS 101	**Political Theory**	CO1: To understand about political theory and its approaches and try to

		analyze its different phases.
		CO2: To acquaint the students with concept of state and its different perspective with emphasizing its changing role and status in globalized world.
		CO3: To have idea on concepts like equality, liberty and justice and analyzing these concepts from different perspective.
		CO4: To evaluate the concept of Democracy and different theories associated with it to make proper and effective analysis of the concept and prescribe new constructive thinking for better execution of democratic norms and values in realty.
		CO5: To understand the relation of these concepts and their significance in theoretical as well as practical aspects.
MPS 102	**Public Administration: Principles and Approaches**	CO1: To know the concept, scope and significance of Public Administration
		CO2: To gain the knowledge on the historical background as the discipline and its relations with other social sciences
		CO3: To know the various principles and agencies of Public administration
		CO4: To understand the concept of theoretical perspective of administrative system
		CO5: To familiarize with the administrative problems and challenges of an organization
MPS 103	**International Relations**	CO1: To know what is really international relations and its difference with international politics.
		CO2: To understand the approaches to study international relations.
		CO3: To know the meaning and importance of balance of power, collective security and disarmaments in present day world politics.
		CO4: To know the impacts of First world war and Second world war in international relations including human life and properties.
		CO5: To know what is Cold war and its impact on World politics.
MPS 104	**Indian Government and Politics**	CO1: The course traces the embodiment of the conflicts in constitutional provisions
		CO2: To understand and study the contemporary challenges in the national integrity
		CO3: To familiarize and encourage the study of state institutions in their mutual interaction with the larger extra constitutional environment
		CO4: The strength of the course lies in its focused to analyze the political happenings in India
		CO5: Understand the structure, power and functions of the Indian government and enlighten the students to understand basic rights and duties of the citizen
MPS/MHR 105	**Social movements in India**	CO1: Understanding the concept of social movements
		CO2: Impact of social movement on power and human rights in society
		CO3: Exploring the theories of social movements
		CO4: Knowing the social movements and social Change in India
		CO5: Changing characteristic of new social movements in India
MPS 201	**Western Political Thought**	CO1. The course focus on the emergence of political thought which help the students to have a historical understanding of the political thought.
		CO2. The course encompasses the Greek political thought to enlighten the emergence of political structures.
		CO3. It explores the changing trends of political thought along with the time and emergence of new political theories.
		CO4. It tries to understand the classical and positive liberalism along with Marxian thinkers and Marxian perspective.

		CO5. The course will enable the students to have proper idea on political thought which will help them to build their moral behavior and in long run help in all competitive examinations.
MPS 202	**State Politics in India**	CO1: To understand the theoretical framework for the study of state politics
		CO2: To aware the citizens with the constitutions status of states in Indian political system
		CO3: To familiarize the student with the relationship between state and centre
		CO4: The acquaint the students with the trends and impact of state politics
		CO5: To critically examine the problem and issues face by the state politics
MPS 203	**Comparative Politics**	CO1: To know the meaning of comparative politics and its difference with comparative government.
		CO2: To know and understand the approaches to study comparative politics, traditional and modern.
		CO3: To know the political institutions of leading countries of the world in modern times.
		CO4: To know political parties, pressure groups and political participations in democratic countries
		CO5: To know and explore the political modernization, political socialization and political culture.
MPS 204	**International politics**	CO1: Understanding the concept of International Organizations
		CO2: Familiarity with UN: Structure, function, and reforms
		CO3: Exploring the Regional Organizations
		CO4: Knowing the concept of diplomacy
		CO5: Impact of Contemporary Issues in International Politics
MPS 205	**Comparative Political System**	CO1: To know the constitution, constitutionalism and its nature and scope
		CO2: To understand the types of government particularly two major countries of the world UK, USA
		CO3: To know the socio-economic foundations of UK constitution and its connections and traditions
		CO4: To know and understand the political and judicial institutions of US constitution
		CO5: To know the socio-economic foundations, political institution including role of communist party of People's Republic of China
MPS 301	**Indian Political Thought**	CO1: The course focus on the emergence of political thought which help the students to have a historical understanding of the Indian political thought.
		CO2: The course encompasses the Indian political thought to enlighten the emergence of political structures and its political history.
		CO3: It explores the changing trends of political thought along with the time and emergence of new political theories.
		CO4: It tries to understand the emergence of Indian renaissance and thinking of the heroes of Indian nationalism.
		CO5: The course will enable the students to have proper idea on Indian political thought to understand the structure of Indian political history which will help them to build their moral behavior and in long run help in all competitive examinations.
MPS 302	**Decentralization and local government in India**	CO1: To acquaint with the concept of grass root level democracy in the form of decentralization and its stages
		CO2: To explore the concept and historical perspective of local government in India
		CO3: To get the knowledge about the 73rd Amendment Act of 1992 and the Panchayati Raj Institutions
		CO4: To know about the 74th Amendment Act of 1992 and the Urban Local

		Institutions
		CO5: To probe into the role, problems and challenges of local government.
MPS/MHR 303	**Research methodology and statistics in social sciences**	CO1: Introducing the Research in Social Science
		CO2: Importance of objectivity, research design, and hypothesis in research
		CO3: Understanding the sampling procedure and tools of research
		CO4: Knowing the various Measures of data analysis
		CO5: To develop the idea about how to write research proposal and report
MPS 304	**India's Foreign Policy**	CO1: The course enable the students to have an idea how India develop its foreign policy.
		CO2: It will enable to understand the structural setting and how policies are made.
		CO3: It explores the Indian Foreign relations with neighbours and developed countries.
		CO4: The course focuses on different International Organizations and how they are related to India.
		CO5: The course will enable the students to have idea on India's Foreign Policy and will be fruitful for all the competitive examinations.
MPS 305 (A)	**Socio- Political Institutions in North East India**	CO1: To know the socio-political profile of North-East India as an important region of India.
		CO2: To know the traditional political institutions of North-East India and their relevance today.
		CO3: To know and understand the traditional democratic and theoretical institutions of NE region and its importance today.
		CO4: To know the leadership pattern of traditional socio-political institutions of North- East India region.
		CO5: To know the status of women in North-East India before and after independence.
MPS 305 (B)	**Social Exclusion: Theory and Practice**	CO1: To understand definitions, concepts and themes of social exclusion.
		CO2: To acquaint the students with different aspects of social exclusion and its impact on individual as well as society.
		CO3: To have idea about processes, actors and agents of social exclusion.
		CO4: To conceptualize importance of inclusiveness with highlighting different inclusive policies.
		CO5: To evaluate the social reality of India with the concept of social exclusion and inclusion.
MPS 305 (C)	**Principles of Management**	CO1: To familiarize the students with managerial process and elements
		CO2: To probe into the essentials of socio-economic factors of management
		CO3: To get the deep understanding of theoretical perspective of management by the views of behaviourlists
		CO4: To encourage the students with broader views of management by inducing them certain techniques and skills of management
		CO5: To acquaint the students with the principles and qualities of leadership in management field
MPS 306 (A)	**Indian Political System**	CO1: To introduce the idea of political system and the account of making and working of constitutional institutions
		CO2: To allows the students to understand the provisions of the Indian constitutions and how these have played out in political practice
		CO3: To familiarized the students with the functions and role in the Indian administrative system
		CO4: To evaluate the changing natures of Indian party system and its relevance.

		CO5: To look at the problems of nation building and the working of political economy in national integration
MPA 306 (B)	**Public Administration in India**	CO1: To introduce the concept, scope and historical evolution of Public administration
		CO2: To familiarized with the administrative structures and processes of India
		CO3: To understand about the concept of grass root level democracy in the form of decentralization ad local government in India
		CO4: To probe into the issues and challenges of Indian administration
		CO5: To gain the knowledge on the concept of social welfare administration and impact of globalization in Public Administration
MPS 401	**Contemporary Political Thought**	CO1: The course tries to give an understanding on the contemporary political thought which developed in the 20th century.
		CO2: The course enables the students to get knowledge on contemporary Marxist, Neo Liberal and Neo Marxist thoughts.
		CO3: The course is structured to provide new understanding to the old political thought and is now applicable in the contemporary world.
		CO4: The course focuses on different contemporary political philosopher and argues how philosophy in important.
		CO5: The course will enable the students to grab knowledge on contemporary issues with relevance to contemporary political thoughts which helps in formulating argument and in further higher studies.
MPS 402	**Human rights in India**	CO1: Introducing the concepts of human rights
		CO2: Understanding the concept of universalism and cultural relativism of human rights
		CO3: Indian constitution and human rights
		CO4: Knowing the institutional arrangements and human rights
		CO5: Human rights of vulnerable groups in India
MPS 403	**Introduction to Public Policy**	CO1: To understand the concept of public policy, its scope and significance
		CO2: To get the knowledge on the techniques and mechanism of policy implementations
		CO3: To analyze the policy evaluation by means of case studies
		CO4: To aware the students with various roles of policy making agencies
		CO5: To encourage alternative solutions and remedies to the problems and challenges of policy making process
MPS 404	**Dissertation**	
MPS 405 (B)	**Urban Administration and Governance in India**	CO1: To know about urban administration and governance process in India.
		CO2: To understand the linkages of Urban bodies and state government.
		CO3: To know about financial status of urban local government.
		CO4: To have idea about problems and needs of urban local government highlighting some new constructive suggestive measures for assuring better solution of those problems.
		CO5: To have information about government's scheme and programmes and constitutional recognition to urban local government.
MPS 405 (B)	**Rural Administration and Governance in India**	CO1: To know about rural administration and governance process in India highlighting needs and problems in this sphere.
		CO2: To understand the relevance of rural administration in India.

		CO3: To know about evolution of PRIs in India.
		CO4: To have idea about the relationship between local government agencies and state government.
		CO5: To have information about government's scheme and programmes and constitutional recognition to rural local government.
MPS 405 (C)	**Diplomacy: Theory and Practice**	CO1: To know the concept of diplomacy, its scope and nature.
		CO2: To explore the development of diplomacy from ancient time to modern time.
		CO3: To know the structure of diplomatic practices.
		CO4: To know the different types of diplomacy.
		CO5: To know the aims and objectives of diplomacy and its functions.

B.ED

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1. Be a skilled teacher

PSO2. Develop honesty and dedication towards teaching profession

PSO3. Be the role model for the society

PSO4. Develop moral ethics

PSO5. Be a committed teacher

2. COURSE OUTCOMES (COs)

B.Ed. 101	**Gender, School and Society**	CO1. Understand the nature and basic concepts of educaton
		CO2. Understand the meaning and nature of Educational Philosophy.
		CO3. Acquaint with Sociological bases of Education.
		CO4. Acquire knowledge about the Psychological bases of Education
		CO5. Understand the Economic bases of Education
B.Ed. 102	**Growth and**	After studying this course the student teacher will be able to:

	Development during Childhood and Adolescence	CO1.Develop the knowledge of different stages of development
		CO2. Develop the understanding of different characteristics of development
		CO3. Aware of contemporary social issues which effect the development of children
		CO4 . Identify and understand the different personal as well as social issues responsible for affecting and effecting the growth and development of the adolescents.
B.Ed. 103	**Contemporary India and Education**	CO1. Understand the importance of education in contemporary India.
		CO2. Earn knowledge about different provisions in the constitution of India relating to education.
		CO3. Be aware about the fundamental rights and Directive Principles of State Policy.
		CO3. Earn in-depth knowledge about the vision of education of great Indian philosophers.
		CO4. Earn knowledge about recent policies, acts, and its provisions concerning education.
		CO4. Gather an in depth knowledge about equality provision of Indian constitution.
		CO5. Have knowledge about recommendations of various education commissions during post-independence period.
B.Ed. 104	**Understanding Discipline and Subjects**	After completion of the course the student teachers will be able to-
		CO1. Acquire proper knowledge and understanding of nature and characteristics of discipline and inter disciplinary subjects study.
		CO2. develop proper concept of education as inter disciplinary field of study.
		CO3. learn to make interrelation and interdependence between various school subjects.
		CO4. develop proper knowledge, understanding , nature and history of science as well as scientific method.
		CO5.learn to correlate science with other social sciences
		CO6. gain proper understanding of new trends in science
		teaching.
		CO7. understand the importance of language in curriculum transaction and intellectual development of the learners.
		CO8.realise the importance of mathematics in daily life.
B.Ed. 105	**Language across the Curriculum**	CO1. Understand the nature of language
		CO2. Understand the functions of language
		CO3.Understand the importance language in social context
		CO4. Aware about the constitutional provisions of teaching mother tongue.
		CO5.Understand the process of language acquisition
B.Ed. 106	**Critical Understanding of ICT**	After studying this course the student teacher will be able to:
		CO1. Understand the meaning, nature and scope of ICT in education
		CO2. Understand the concept of E-Learning and Blended earning
		CO3.Acquaint with the use of internet
		CO4 Understand about the Techno-Pedagogic Skills
		CO5. Understand about the modes of transaction .
B.Ed.202	**Gender, School and Society**	CO1.Understand the meaning of gender and sex.
		CO2. Understand about the socialization process of girl child.
		CO3. Aware about gender inequality
		CO4. Understand the concept of patriarchy and matriarchy
		CO5. Aware about the laws related to women.

B.Ed. 203	**Knowledge and Curriculum**	CO1.Acquaint with the concept, types and sources of knowledge.
		CO2. Develop a positive attitude of child centered education
		CO3. Construct curriculum and apply different effective strategies in the process of transaction.
		CO4. Understand about curriculum transaction and evaluation
B.Ed. 203	**Teaching and Learning**	After studying this course the student teacher will be able to:
		CO1. Develop the proper understanding of concept and factors of learning
		CO2. Learn different theories of learning and apply effective strategies in teaching.
		CO3. Understand the importance of attention, motivation and reinforcement in teaching learning process.
		CO4. Understand the concept of intelligence and creativity
		CO5.Understand the maxims of teaching.
B.Ed. 205	**Assessment for learning**	CO1. Develop knowledge of assessment and evaluation
		CO2. Apply the knowledge of evaluation and assessment in their future life.
		CO3. Develop the knowledge of different tools of assessment and their characteristics.
		CO4 Apply the knowledge of Statistics for analyzing and interpreting data.
B.Ed. 206	**Understanding the Self**	CO1.acquire proper knowledge and understanding of self concept along with the factors that affect the development of self concept as well as impact of positive and negative of self concept in individual life.
		CO2.develop concept of self esteem and know the different types of self esteem and apply different strategies for positive behaviour.
		CO3.develop proper concept of personality and analyse the factors affective personality and strategies for development of personality.
		CO4.realize the needs and importance of interpersonal behaviour and apply different strategies for maintaining for interpersonal relationship.
		CO5.develop proper concept of emotional intelligent and its relation with general intelligent and its impact on personal as well as professional development.
B.Ed. 206(A)	**Health and Physical Education**	CO1.aquaiant with concept of holistic health.
		CO2.understand the dimensions and determent of heaith.
		CO3. learn how to conduct school health programme.
		CO4.realise the importance of physical fitness and guide, learners to maintain physical fitness.
		CO5. Realise the importance of yoga and ashtang and encourage the learners to make a regular of doing yoga and ashtang.
B.Ed. 206(B)	**Peace Education and Human Rights**	
		Co1. Develop a healthy self image
		CO2. Develop the skill of stress management
		CO3. Develop the skill of critical thinking
		CO4. Foster mutual understanding , tolerance and peace in the society
		CO5. Learn to apply different strategies for promoting Human Rights Education among the children
B.Ed. 206(C)	**Guidance and Counseling**	CO1. Understand the foundation of guidance
		CO2. Understand about different types of guidance
		CO3. Acquaint with different types of guidance services
		CO4. Organise guidance services
		CO5. Understand the concept of counseling
		CO6.Understand about the qualities of a counselor

B.Ed. 206(D)	**Environmental Education**	CO1 Develop the importance of environmental education in different stages of school education.
		CO2. Get the idea of environmental hazard
		CO3. Develop attitude to conserve wildlife , natural resources .
		CO4. Develop the thinking of alternative sources of energy and to waste management.
B.Ed.301(A)	**Teaching of General Science**	CO1.develop proper concept, meaning, nature, needs and importance of science.
		CO2.realise the importance of inclusion of science in secondary school and try to enable to children to achieve the objective of teaching science.
		CO3.learn to correlate the teaching science with other subjects.
		CO4.gain proper knowledge of planning and evaluating performance students in science.
		CO5. acquaint with an apply different methods and devices in teaching science,
		CO6.make positive effort to develop a scientific attitude among the learners.
B.Ed.301(B)	**Teaching of Social Science**	CO1. Acquire the qualities of good social citizenship
		CO2. Learn to make the teaching learning more purposeful by applying different methods of teaching
		CO3. Learn to prepare effective lesson plan
		CO4. Realize the importance of teaching learning material .
		CO5. Gain expertise of assessment and evaluation of learner's performance.
B.Ed.302(A)	**Teaching of Mathematics**	CO1. Develop the knowledge of objectives of teaching Mathematics at different stages of school education
		CO2. Develop the idea f contents of Mathematics at secondary stage.
		CO3.Develop the idea of different methods and techniques of teaching Mathematics.
		CO4. Prepare lesson plan ,unit plan and different test.
B.Ed.302(B)	**Teaching of English**	CO1. Understand the objectives of teaching English
		CO2. Acquire knowledge about different aspects of teaching English
		CO3. Understand about different methods of teaching English
		CO4. Prepare effective lesson plan
		CO5. Construct objective based test items I English
B.Ed.302(C)	**Teaching of Assamese (MIL)**	CO1Undrstand the role of mother tongue in development of the child
		CO2 Understand the nature of language
		CO3 Assamese as a standard language
		CO4 methods and techniques of teaching Assamese
		CO5 Evaluation in learning Assamese
B.Ed.304	**Teacher Education**	CO1. Understand the meaning, nature and scope of teacher education
		CO2. Understand the different aims and objectives of teacher education
		CO3. Earn knowledge of National Curriculum Framework 2005, and National Curriculum Framework for Teacher Education 2009
		CO4. Realize the importance of organizing teacher education programme at different levels
		CO5. Have a clear idea about the professional ethics of teacher.
B.Ed.305	**Inclusive Education**	CO1. Understand and know elaborately about the concept, meaning and definitions of inclusive education in the context of Education for all.
		CO2. Understand about the Early identification of special needs children, establishing s school of philosophy Enrollment drive and Measurement for retention.
		CO3. Understand about the Rehabilitation council of India Act 1992 (RCI Act, 1992), Understand about the Persons with Disabilities Act, 1995 (PWD

		Act, 1995)
		CO4. Understand about the Barriers- Labeling, Attitude of teachers, Lack of supports from the parents and society
		CO5. Understand about the teacher, family and community
B.Ed.402	**Drama and Art in Education**	CO1. Understand about visual and performing art
		CO2. Understand the concept of drama and art
		CO3. Understand the use of drama and art in education
		CO4. Acquaint with the contributions of contemporary thinkers on Art and education.
B.Ed.403	**School Management**	CO1. Have an understanding on how to maintain discipline in the school
		CO2. Earn knowledge about the qualities and responsibilities of the head of the institution
		CO3. Have knowledge about the leadership qualities of the head of the institution
		CO4. Acquire the qualities and skills of able leadership
		CO5. Learn to encourage the students to be self controlled
B.Ed.404	**School Internship**	CO1. Conduct different activities of school
		CO2. Solving different problems faced by the learners
		CO3. Organize scholastic activities effectively.
		CO4. Organize non-scholastic activities effectively.
		CO5. Maintain record of data ,information about different activities and achievements of students properly
		CO6. Solve problems through action research
		CO6. Take classes effectively with scientific lesson plan and unit plan
		CO7. Use teaching learning material properly in the teaching learning process
		CO8. Conduct different project works effectively.

M.A. RURAL DEVELOPMENT

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1. To understand the multidimensional process that involves the reorgansiation and reorientation of economic and social system.

PSO2. To build capacity among the students community to understand and solve the problems pertaining to the rural lives.

PSO3. To guide the villagers through counselling and awareness gereneration camp.

PSO4. To help the villagers so that they can help themselves by raising the living standard.

2. COURSE OUTCOMES (COs)

MRD-101	**Rural Development: Concepts and**	CO1. To develop the knowledge on theories of Rural Development.
		CO2. To understand the scope of Rural Development.

	Theories	CO3. To know the problems of developing countires in the context of Rural Development.
		CO4. To know the various model of rural development
		CO5. To study the determinants of Rural Development.
MRD-102	**Rural Sociology**	CO1. To understand the fundamentals of rural sociology.
		CO2. To study the rural social institutions and social change.
		CO3. To find the rural problems
		CO4. To make the students aware of changed perspective of rural society in India.
		CO5. To comprehend the Indigenous Technology of NE India.
MRD-103	**Aspects of Agricultural Development**	CO1. To enable the students to identify various problems and prospects of agriculture.
		CO2. To understand the strategies of rural marketing.
		CO3. To know the technological change in Indian agriculture.
		CO4. To study the agricultural prodution and productivity
		CO5. To understand the concept of agricultural finance.
MRD-104	**Natural Resource Management**	CO1. To develop the skills to make use of rural resources.
		CO2. To understand the theoretical framework of natural resources.
		CO3. To study the natural resoureces and the role
		CO4. To know the ecology and ecosystem.
		CO5. To understand the Common Poperty Resource.
MRD-105	**Rural Entrepreneurship Development**	CO1. To enable the students to know entrepreneurial skills.
		CO2. To understand the theories of entrepreneurship.
		CO3. To know the appropriate technology for rural industry
		CO4. To know the challenges and opportunities of rural entrepreneurship
		CO5. To comprehend the impact of globalization and rural industries.
MRD-201	**Rural Development Programmes**	CO1. To aware the students about the earlier experiments.
		CO2. To understand the welfare programmes of Rural Development.
		CO3. To study critically the current RD Programmes.
		CO4. To study the Administrative structure of the panchyat and their activities
		CO5. To know the agencies related to rural development.
MRD-202	**Rural Administration and Community Organisation**	CO1. To understand the principle and administration of rural organization.
		CO2. To study the Acts related to Panchayati Raj.
		CO3. To study the theory of public administration
		CO4. To understand the concept of community organization.
		CO5. To skilled on the use of Participatory Rural Appraisal.
MRD-203	**Rural Health Management**	CO1. To study the health related problems in rural India.
		CO2. To evaluate the patterns of health facilities
		CO3. To study the community health
		CO4. To understand the health services in rural areas.
		CO5. To know the health programmes and National Health Policy of India.
MRD-204	**NGOs and Microfinance**	CO1. To understand the significance of micro finance as the base of rural economy
		CO2. To know the concept of NGO and dynamics of Voluntary agency.
		CO3. To study the function and development of coopertaive sector in India
		CO4. To comprehend the concept and formation of Self Help Group.
		CO5. To study the institutional structure for rural financing.
MRD-205	**Economic Policies and Planning in**	CO1. To understand the objectives of economic planning.
		CO2. To study the planning experience in India.

	India	CO3. To study the model of econmic development
		CO4. To Tcomprehend the poverty issues.
		CO5. To know the balanced regional development and food security.
MRD-301	**Research Methods**	CO1. To understand social science research.
		CO2. To impart skills to undertake empirical studies.
		CO3. To study the research design
		CO4. To study the methods of data collection.
		CO5. To interpret the statistical data.
MRD-302	**Introduction to Crop Production**	CO1. To introduce the fundamentals of crops and production.
		CO2. To study the principles of crop production.
		CO3. To understand the types of farming.
		CO4. To dentify the seeds and prepare organic farming.
		CO5. To study the activities of Krishi Vigyan kendra, agricultural farm, ATMA etc.
MRD-303 (a)	**Population and Development**	CO1. To understand the concept of demography.
		CO2. To study the theories of demography.
		CO3. To study the measures of population
		CO4. To comprehend the population and resource.
		CO5. To construct the life table.
MRD-303 (b)	**Land Resource Management**	CO1. To enable the students to understand the management of land.
		CO2. To study soil and its erosion and its management.
		CO3. To study the Bio diversity
		CO4. To understand the programmes and policies of Land management.
		CO5. To comprehend the CPR and sustainable land management.
MRD-304	**Rural Technology**	CO1. To use of appropriate technology for rural areas.
		CO2. To comprehend the livelihood improvement and rural technologies.
		CO3. to study the rural technology for livelihood improvement
		CO4. To study the research and development of rural technology.
		CO5. To know the advancement in Rural Energy Resources.
MRD-305	**Dissertation**	CO1. To prepare students to make individual project.
		CO2. To identify the social problems in rural areas.
		CO3. To identify the cultural issues in rural areas.
		CO4. To identify the economic challenges in rural areas.
		CO5. To identify the problems related to communication and infrastructure
MRD-306	**MDC**	CO1. To study critically the current RD Programmes.
		CO2. To study the Acts related to Panchayati Raj.
		CO3. To study the moels and strategies of Community organizations
		CO4. To understand the concept of community organization.
		CO5. Skilled on the use of Participatory Rural Appraisal.
MRD-401	**Extension Education and Development Communication**	CO1. To develop skills in communication methods.
		CO2. To understand the extension education and the teaching -learning process
		CO3. To study the Farming system research and extension
		CO4. To study the approach of extension education.
		CO5. To identify the needs of the farmers.
MRD-402	**Rural Project Planning, Monitoring and Evaluation**	CO1. To impart knowledge in formulation of rural project.
		CO2. To impart knowledge in planning.
		CO3. To study the moitoring and evaluation process
		CO4. To understand the project management

		CO5. To prepare a project proposal
MRD-403 (a)	**Equity and Gender Issues in Rural Development**	CO1. To understand the concept of gender.
		CO2. To know the UN Conventions related to Women and child.
		CO3. To study the gender justice
		CO4. To study the womens' Movement.
		CO5. To comprehend the Acts/Laws pertaining to women.
MRD-403 (b)	**Rural Marketing and Infrastructure**	CO1. To study the present infrastructure of rural marketing.
		CO2. To know the cooperative farming.
		CO3. To study the marketed and marketable surplus
		CO4. To understand the agribusiness and marketing.
		CO5. To identify the challenges of rural marketing.
MRD-404	**Institutional Placement**	CO1. To orient the student to know the functions of Go and NGO
		CO2. To understand the structure of GO and NGO
		CO3. To understand the activities of respective GO and NGO
		CO4. To prepare the report of field.
		CO5. To identify the problems and prospects of various institutes.
MRD-405	**Rural Exposure and Field Visit**	CO1. To select the villages
		CO2.To identify the issues of villages.
		CO3. To collect data from the villagers.
		CO4. To implement the methods to analyse the issues.
		CO5. To prepare the report.

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

2. COURSE OUTCOMES (COs)

BSW 102	**Introduction to Social Work**	CO1: To develop a all-inclusive understanding of social work practice
		CO2: To advance the understanding of the concepts, goals, principles, programmes as well as methods and approaches of professional social work
		CO3: To develop the concept of value, principle, ethics and model of social work
		CO4: To understand the endorse different roles for bringing change in social work practice
		CO5: To develop an understanding of the approaches of social work profession
BSW 103	**Society in India**	CO1: To understand basic sociological concepts
		CO2: To understand the basic concepts related to Indian Society
		CO3: To understand the relevance of Indian society in the context of social work profession
		CO4: To understand the social phenomenon
		CO5: To build critical reflection and analysis about the different society
BSW 104	**Introduction to Social Psychology**	CO1: To understand the fundamentals of social psychology
		CO2: To understand the interpersonal issues
		CO3: To understand the societal issues
		CO4: To gain the theoretical knowledge of relationship of individual to society
		CO5: To understand interpersonal and intrapersonal relations with society
BSW 105	**Field Work Practicum**	CO1: To develop an understanding of the functioning of fieldwork in social work practice
		CO2: To develop an understanding of socio-economic and cultural realities
		CO3: To develop professional attitudes, values and commitment
		CO4: To develop communication and documentation skills.
		CO5: To undertake learning within the reality of life
BEV 720	**Environmental Studies (Common paper)**	
BSW 202	**Social Case Work**	CO1: To practice social case work in a diverse range of contexts
		CO2: To advance the appropriate skills and attitude need for working with individuals facing various problems
		CO3: To develop within the students' ability to critically analyses problems of individual and factors affecting them by applying the different tools, techniques of case work
		CO4: To understand the basic concepts in social Case Work
		CO5: To acquaint the fields of social work case practice, including child and family, health and mental health
BSW 203	**Community and Family Health**	CO1: To understand the concept of Health, its status and significance in Northeast India

		CO2: To understand the dimension and perspectives of health in India and others policies related to health.
		CO3: To develop an understanding the mode of operation.
		CO4: To understand the types of family system and intervention strategy with respect to social work
		CO5: To understand the organizational services and welfare
BSW 204	**Non Formal Education and Social Work Practice**	CO1: To develop understanding alternative teaching learning method
		CO2: To facilitate the knowledge base for field implementation
		CO3: To gain knowledge and implement it in the field accordingly
		CO4: To understand the intervention of government and non-government agencies
		CO5: To have a clear understanding about the concept of non-formal education
BSW 205	**Field Work Practicum**	CO1: To develop the capacity to integrate knowledge and practice theory by participating in interventions
		CO2: To develop an understanding of resource management in the community
		CO3: To develop professional attitudes, values and commitment
		CO4: To develop the capacity for self-directions, growth and change through self awareness
		CO5: To develop the ability to observe and analyze social realities
BSW 301	**Development Communication and Social Work Practice**	CO1: To understand and appreciate the role of communication in development
		CO2: To acquire knowledge of different forms of communication and their use n the process of social change
		CO3: To review the utilization of communication media by the government and non-government sectors in the process of development.
		CO4: To have a clear idea about the roles of media in the process of social change
		CO5: To be aware of communication media use by different sectors in government and non-government in the process of development
BSW 302	**Social Group Work**	CO1: To develop awareness about the specific characteristics of group work and its contributions as a method of social work intervention.
		CO2: To develop understanding of concepts, dynamics and small group theory in relation to all types of groups, e.g. family, staff, committee, long-term client groups.
		CO3: To develop knowledge of the skills and techniques to be used by the social worker in groups.
		CO4: To assess Individuals, Families, Groups, Organizations, and Communities
		CO5: To intervene with Individuals, Families, Groups, Organizations, and Communities
BSW 303	**Social Work Research**	CO1: To develop scientific approach to human inquiry
		CO2: To develop understanding of social research and its importance
		CO3: To carry out a small research study
		CO4: To understanding scientific approach to human inquiry
		CO5: To apply research tools and techniques
BSW 304	**Social Problems in India**	CO1: To develop an insight about present social problems and their magnitude.
		CO2: To understand the impact of social problems on social life.
		CO3: To develop the clarity about social issues and challenges in the social work field.
		CO4: To understand the nature of Social problems.
		CO5: To understand the various measures in solving the various social issues

		in India
BSW 305	**Field Work Practicum**	CO1: To develop an understanding of organizational structure, resource management and day to day administration for human service programs, developmental and welfare programmes
		CO2: To engaged diversity and difference in practice
		CO3: To demonstrate ethical and professional behavior
		CO4: To engaged in collaborative learning and attitude with the other communities at large
		CO5: To develop the ability to observe and analyze social realities
BSW 401	**Community Organizations and Community Development**	CO1: To understand the concept of Community
		CO2: To understand the Community Dynamics
		CO3: To develop a strategy to work in the Community
		CO4: To understand the difference between community organisation and community development
		CO5: To understand the concept, needs, principles, process and strategies of community work
BSW 402	**Social Policy, Planning and Development**	CO1: To develop a conceptual and theoretical understanding of Social Policy and Planning.
		CO2: To understand the various issues of Social Policy formulation and implementation.
		CO3: To understand various dimensions of development
		CO4: To understand the different models of social development
		CO5: To understand the nature and sources of social policy
BSW 403	**Social Welfare Administration**	CO1: To develop insight into the concept and process of social welfare administration
		CO2: To understand the structure & functions of social welfare administration organization
		CO3: To understand the basic administrative processes and practices in India
		CO4: To understand the management of Non-Governmental Organization
		CO5: To develop Project proposal writing skills
BSW 404	**Human Growth and Psychology**	CO1: To understand the Concept of developmental Psychology
		CO2: To understand the developmental stages human life
		CO3: To understand the basic concept of human behavior
		CO4: To understand the biological influences on human growth and behaviors
		CO5: To understand basic concepts and theories related to human behaviour
BSW 405	**Field Work Practicum**	CO1: To actively engaged in learning process and capacity to reflect on the theories and fieldwork practice
		CO2: To gather relevant factual information about the client system and the problem concern
		CO3: To demonstrate ethical and professional behavior
		CO4: To engaged in collaborative learning and attitude with the other communities at large
		CO5: To develop self help skills for personal enhancement and awareness development
BSW 501	**Integrated Social Work Practice**	CO1: To understand the basic concepts and theories related to integrated social work practice
		CO2: To understand the different phases of integrated social work practice
		CO3: To understand the models of intervention in integrated social work practice
		CO4: To understand the various theories of integrated social work practice
		CO5: to understand the themes and issues in social work intervention
BSW 502	**Introduction to Political Economy**	CO1: To understand the political economy
		CO2: To understand development and its impact

	of India	CO3: To develop analytical understanding
		CO4: To understand economic development and its related concepts
		CO5: To understand about planning process and economic reforms of India
BSW 503	**Counseling and Social Work Practice**	CO1: To understand the importance of counseling in social work practice
		CO2: To make use of the process and skills of counseling
		CO3: To find out the different ways of problem-solving skills through counseling
		CO4: To be acquainted with the different stages of counseling
		CO5: To understand the role of counsellors
BSW 504	**Law and Social Work Practice**	CO1: To develop the understanding of law and legal system of India
		CO2: To develop the understanding of human right and social justice
		CO3: To understand the different legislative provisions
		CO4: To understand the relationship between Law and social work practice
		CO5: To understand the legal services and legal intervention
BSW 505	**Field Work Practicum**	CO1: To apply theories and skills in Social Work practice
		CO2: To develop counseling skills
		CO3: To demonstrate ethical and professional behavior
		CO4: To engaged in collaborative learning and attitude with the other communities at large
		CO5: To make conscious use of professional values and ethics
BSW 601	**Personal & Professional Development for Social Work Practice**	CO1: To understand the process of self-awareness and relevance of self-awareness for personal and professional development.
		CO2: To develop practice based skills and positive life skills for competence in personal life and professional practice.
		CO3: To understand and uphold professional values and ethics.
		CO4: To develop interpersonal and intrapersonal communication skills
		CO5: To understand the importance of Self
BSW 602	**Management of Non-Governmental Organization**	CO1: To draw an understanding of NGO Sector
		CO2: To develop basic legal and managerial skills for NGO management
		CO3: To understand the concept of project management
		CO4: To be able to develop a project proposal
		CO5: To understand the legal procedures for establishment of NGO
BSW 603	**Disaster Management**	Course Outcomes: The Successful completion of this course shall enable the student:
		CO1: To understand the process of disaster management
		CO2: To develop the capacity to respond appropriately to disasters and its implications to communities
		CO3: To develop skills to develop in disaster management
		CO4: To develop the capacity to understand disaster
		CO5: To understand the national and international initiatives for disaster management
BSW 604	**Social Action and Social Advocacy**	CO1: To develop analytical and professional skills relevant to professional social workers working in social action and advocacy
		CO2: To understand how to effectively advocate for services, rights, social justice, and equal protection for and with individuals, groups, and communities
		CO3: To formulate macro interventions, advocate for, and work collaboratively in change and capacity building processes
		CO4: To develop an understanding on how to effectively advocate for services, rights, social justice, and equal protection for and with individuals, groups and with individuals, groups and communities

		CO5: To Understand the concept of social action and its relation with other methods of social work
BSW 605	**Field Work Practicum**	CO1: To understand the roles of social worker and its relevance to address the specific problem of social exclusion
		CO2: To develop personality build-up for volunteerism
		CO3: To enhance appropriate attitude and professional development at work
		CO4: To engaged in collaborative learning and attitude with the other communities at large
		CO5: To develop problem solving skills

Master of Social Work

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

2.

MSW 101	**Social Work Profession: History**	CO1: To become a professional practitioner of communication development tools

	and Ideology	CO2: To advance the understanding of the concepts, goals, principles, programmes as well as methods and approaches of professional social work
		CO3: To develop the concept of value, principle, ethics and model of social work
		CO4: To understand the endorse different roles for bringing change in social work practice
		CO5: To acquaint the basic concepts of Social Work
MSW 102	**Human Growth & Psychological Development**	CO1: To understand human behaviour and its dynamics in the context of self and others
		CO2: To understand basic concepts and theories related to human behaviour
		CO3: To have a basic understanding on mental health
		CO4: To develop the practical related knowledge, skills and attitudes of Social Work through application of theories and concepts of human behaviour
		CO5: To understand the biological influences on human growth and behaviors
MSW 103	**Basic Sociological Concepts**	CO1: To understand the basic components of society
		CO2: To understand the social phenomenon
		CO3: To build critical reflection and analysis about the different society
		CO4: To capacitate and build skills for social work intervention at different levels
		CO5: To acquaint the basic sociological concepts
MSW 104	**Working with Individuals**	CO1: To understand the values, Principles and scope of Social Case Work and to develop the capacity to practice them
		CO2: To understand and apply the approaches & models of Social Case Work practice in different settings
		CO3: To develop an understanding of and an ability to adopt a multi-dimensional approach in assessment and interventions
		CO4: To develop a holistic understanding of counseling as a tool for help
		CO5: To develop a holistic understanding of counseling as a tool for help
MSW 105	**Development Communications and Professional Skills for Social Work**	CO1: To understand the concept of Personality Development
		CO2: To understand and develop the skill of Time Management
		CO3: To understand the concept of Communication in the context of Development
		CO4: To gain expertise in the area of communication development
		CO5: To become a professional practitioner of communication development tools
MSW 106	**Field Work**	CO1: To acquire theoretical knowledge and develop the capacity to translate theory into practice
		CO2: To understand of community situations using skills of observation, interaction and situation analysis
		CO3: To develop of social work intervention skills
		CO4: To acquire skills of systematic observation and develop a spirit of enquiry
		CO5: To undertake learning within the reality of life
MSW 201	**Working with Groups**	CO1: To engage with Individuals, Families, Groups, Organizations, and Communities
		CO2: To substantively and affectively prepare for action with individuals, families, groups, organizations, and communities
		CO3: To assess Individuals, Families, Groups, Organizations, and Communities
		CO4: To intervene with Individuals, Families, Groups, Organizations, and Communities
		CO5: To develop awareness about the specific characteristics of Group Work and its contributions as a method of social work intervention

MSW 202	**Community Organization and Social Action**	CO1: To understand the concept of community organization and social action
		CO2: To understand the concept need principles process and strategies of community work
		CO3: To develop understanding of the different approaches and various models of community organization and social action with a special reference to Indian situation
		CO4: To formulate macro interventions, advocate for and work collaboratively in change and capacity building processes
		CO5: To understand the difference between community organisation and community development
MSW 203	**Working with Vulnerable Groups**	CO1: To students will be sensitized about different vulnerable groups
		CO2: To students will be aware of the different programmes and policies for the vulnerable groups
		CO3: To develop analytical skills while working with vulnerable groups
		CO4: To build capacity for critical reflection and analysis of the issues pertaining to vulnerable groups of society
		CO5: To develop skills for intervention at different levels
MSW 204	**Human Rights, Para Legal education and Social Work Practice**	CO1: To develop the understanding of law and legal system of India
		CO2: To develop the understanding of human right and social justice
		CO3: To get knowledge of constitutional and statutory provisions for different section of society
		CO4: To understand the importance of human rights in social work
		CO5: To develop awareness of how human rights can be translated into social and political reality
MSW 205	**Social Policy, Planning and Development**	CO1: To develop a critical understanding of the nature and sources of social policy
		CO2: To understand the major ideologies which influence social policy, planning and development
		CO3: To understand the different models of social development
		CO4: To develop the ability to conceptualize the different approaches of development
		CO5: To be aware different approaches of development
MSW 206	**Field Work**	CO1: To acquire theoretical knowledge and develop the capacity to translate theory into practice
		CO2: To understand the practical implication of the methods of social work
		CO3: To capture the complex issues of social exclusion at the grass root level
		CO4: To develop appropriate strategies for Social Work interventions at different levels
		CO5: To develop problem solving skills
MSW 301	**Social Work Research**	
MSW 302	**Social Welfare Administration**	CO1: To develop insight into the concept and process of social welfare administration
		CO2: To understand the structure & functions of social welfare administration organization
		CO3: To understand the basic administrative processes and practices in India
		CO4: To understand the management of Non Governmental Organization
		CO5: To develop Project proposal writing skills
MSW 303 (A)	**Environment, Livelihoods and Sustainable Development**	CO1: To understand concepts of community development, ecology and environment
		CO2: To advance the understanding of sustainable community development, its dimensions and sustainable livelihoods

		CO3: To understand the inter-relationships among ecology, environment, livelihoods and sustainable development
		CO4: To identify the social work intervention strategies for various environmental issues
		CO5: To formulate intervention strategies for sustainable development
MSW 303 (B)	**Family Dynamics and Welfare**	CO1: To understand the nature, functions, roles and changing pattern of the family system
		CO2: To advance the understanding and knowledge on developmental tasks and family dynamics
		CO3: To understand the theories and methods of social work practice
		CO4: To develop a broad understanding of the various family welfare services and Social work Interventions
		CO5: To use appropriate interventions in family settings
MSW 303 (C)	**Human Resource Management and Occupational Social Work**	CO1: To understand the concept of human resource management and occupational social work
		CO2: To gain knowledge on social work orientation on corporate culture, particularly as it relates to social issues in the workplace
		CO3: To acquire the skills of comprehending a multi-stakeholder perspective in viewing workplace issues
		CO4: To formulate Social Work intervention strategies in HRM
		CO5: To understand policies and procedures involved in establishing and maintaining human service organizations
MSW 304(A)	**Rural Community Development**	CO1: To understand the socio economic condition of rural community
		CO2: To understand the approaches to rural development
		CO3: To develop skills in working with rural communities and development agencies
		CO4: To identify Social work Intervention strategies in rural community development
		CO5: To develop the knowledge and practice of distributive justice and equalization of opportunities in the rural community
MSW 303 (B)	**Child and Childhood in India: Theories, Perspectives and Issues**	CO1: To understand the psychological definitions of child and childhood.
		CO2: To understand the different factors that influence development and behavior of children
		CO3: To understand the different issues children face in society
		CO4: To understand the different approaches to child rights
		CO5: To develop an ability to critically analyse the programmes and policies for children
MSW 304 (C)	**Labour Legislations and Welfare**	CO1: To become a professional practitioner of communication development tools
		CO2: To advance the understanding of the laws relating to Industrial Relations, Social Security, Employment exchange and trainees
		CO3: To understand grievance and the procedures of handing grievances
		CO4: To understand laws relating to protection, regulation and welfare of labours
		CO5: To understand the development and the judicial setup of Labour law
MSW 305	**Dissertation**	CO1: To understanding the basic concept of Social Work Research
		CO2: To have an in-depth understanding on research methods
		CO3: To identify the issues that must be addressed
		CO4: To develop written and oral presentation skills
		CO5: To develop a research proposal
MSW 306	**Field Work Practicum**	CO1: To enhance skills for practice in specific situations, specific problems and issues

		CO2: To have a broad understanding on the organisational behaviour and functioning in administrative as well as in the field
		CO3: To identify issues of the society and develop self awareness and skills in the learning process
		CO4: To understand the role of agency in addressing current social realities
		CO5: To gain knowledge and skills for working in corporate sectors
MSW 307(MDC)	**Management of Non-Governmental Organization**	CO1: To draw an understanding of NGO Sector
		CO2: To develop basic legal and managerial skills for NGO management
		CO3: To understand the concept of project management
		CO4: To be able to develop a project proposal
		CO5: To understand the concept of CSR
MSW 401	**Introduction to Disabilities**	CO1: To understand the conceptual differences between the terms 'impairment', 'disability' , 'handicap' and 'challenged' and understand the concept of classification and labeling
		CO2: To analyze the factors that influence prevalence of disabilities
		CO3: To develop knowledge about the various disabling conditions associated with the challenged.
		CO4: To understand the social work intervention mechanisms for the challenged
		CO5: To formulate intervention strategies while working with the challenged
MSW 402	**Community Health and Social Work Practice**	CO1: To understand the concept of health and its importance
		CO2: To develop an understanding on health care, public health and community
		CO3: To understand the importance of health in the development context
		CO4: To understand the concept of health system, programmes and policies in India
		CO5: To know the various Intervention strategies in delivering care towards the community
MSW 403(A)	**Tribal Community Development**	CO1: To acquire an understanding of the social science perspective available for the study of Tribal Community
		CO2: To develop respect and recognition for tribal as equal contributors in development
		CO3: To acquire knowledge about tribal problems
		CO4: To develop understanding of governmental initiatives towards upliftment of tribal's in India
		CO5: To acquire knowledge on various approaches to tribal community development
MSW 403(B)	**Women Centric Social Work Practice**	CO1: To develop a critical understanding of 'Women' as a vulnerable group
		CO2: To develop an understanding of social systems that affects women's position
		CO3: To understand the struggle to restore women's position in the society
		CO4: To develop skills and understanding of social work intervention pertinent to Women's welfare and development
		CO5: understanding feminism and its relevance in contemporary era
MSW 403(C)	**Organizational Behaviour**	CO1: To understand the knowledge and skills in dealing with human behaviours in the workplace
		CO2: To develop an understanding of Organizational Behaviour
		CO3: To develop appropriate skills and competencies in managing human resources
		CO4: To understand the Processes and concerns of Employee Development
		CO5: To develop the understanding of workforce diversity, Personality differences and to manage diversity
MSW 404 (A)	**Urban Community Development**	CO1: To acquire an understanding of the social science perspective available for the study urban communities

		CO2: To develop analytical skills in assessing problems associated with communities and understanding the steps in problem solving
		CO3: To acquire knowledge and impact of various approaches to Urban community development
		CO4: To understand Social work Intervention strategies in urban community development
		CO5: To develop analytical skills in assessing problems associated with communities and understanding the steps in problem solving
MSW 404(B)	**Working with Families: Children, Youth and Aged**	CO1: To understanding issues pertaining to children, youth and aged in India and Northeast India.
		CO2: To know the national and international rights of children, youth and aged.
		CO3: To understand the different laws and various government programmes related to children, youth and aged.
		CO4: To understand the different laws and programmes for the vulnerable groups.
		CO5: To acquire skills for working with families
MSW 404 (C)	**Industrial Relations and Corporate Social Responsibility**	CO1: To understand about Industrial relations
		CO2: To understand the concept of Corporate Social Responsibilities
		CO3: To know about the labour unions and welfare measures
		CO4: To know about the social work intervention for IR and CSR activities
		CO5: To develop entrepreneurial approach and skill sets to contribute for socio-economic development

B.A. SOCIOLOGY

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

Sociology seeks to understand all aspects of human social behavior, which includes the behavior of individuals as well as the social dynamics of groups, organizations, communities, institutions, and entire societies. The course typically motivates a student of sociology to both inculcate the desire to better understand the principles of social life and to develop the conviction that understand these principles which may aid in the formulation of enlightened and effective social policy. Sociology provides an intellectual background for students considering careers in the professions. A bachelor of Sociology should be able to develop:

PSO 1. The sociological knowledge and skills that will enable them to think critically and imaginatively about society and social issues.

PSO 2. The ability to demonstrate sociological understandings of phenomena, for example, how individual biographies are shaped by social structures, institutions, cultural practices, etc.

PSO 3. The ability to formulate effective and convincing written and oral arguments.

PSO 4. Field survey and preparation of project paper is an inseparable part of Sociology so that qualitative

and quantitative analytical skills are enhanced.

PSO 5. To learn about institutions, folkways, mores, culture, social control, social inequality, population composition, population policy, society and culture of India and to have a sense of ethical and social responsibility.

PSO 6. Sociology provides an intellectual background and lays foundation for further study in Sociology, Social work, Rural Development, Social Welfare and in other allied subjects to enable students to join professional careers in Sociology and allied fields.

PSO 7. After graduation, a student can go for any job which requires a bachelor degree in any subject, especially for central and state civil services.

2. COURSE OUTCOMES (COs)

BSO – 101	**Introduction to Sociology -I**	CO1. To acquaint the students with Sociology as a social science and the distinctiveness of its approach among social sciences.
		CO2. To introduce students to the basic concepts that defines the discipline of Sociology.
		CO3. To understand the process of social change in different societies and cultures.
		CO4. To understand social stratification and social mobility.
		CO5. To introduce students on social deviance, control and Agencies of social control.
BSO – 102	**Sociology of India – I**	CO1. To study Indian society in a comprehensive, integrated and empirically-based profile.
		CO2. It aims at giving a perspective on Indian society for better understanding of situation and region.
		CO3. To highlight the various institution of Indian Society, its structure and change.
		CO4. To understand and various dimensions of diversity as well as unity in India.
BSO – 103	**Society in North East India**	CO1. To have an understanding on North-eastern part of India exclusively.
		CO2. It studies diverse aspects like race, religion, caste, tribe, language, etc. of the region.
		CO3. To provide knowledge regarding social problems of the region.
		CO4. To study the socio-economic and political relationship within the different communities.
BEN – 711	**Communicative English**	
BSO – 101	**Generic Elective**	CO1. To acquaint the students with Sociology as a social science and the distinctiveness of its approach among social sciences.
		CO2. To introduce students to the basic concepts that defines the discipline of Sociology.
		CO3. To understand the process of social change in different societies and cultures.
		CO4. To understand social stratification and social mobility.
		CO5. To introduce students on social deviance, control and Agencies of social control.
BSO 201	**Introduction to**	CO1. To introduce students to the factors for the emergence of sociological

	Sociology -II	perspectives.
		CO2. To provide understanding about developments of different Classical Sociological Perspectives.
		CO3. To provide understanding about developments of different Modern Sociological Perspectives.
		CO4. To provide understanding about developments of different Contemporary Sociological Perspectives.
BSO 202	**Sociology of India – II**	CO1. To study the various ideas and debate on Indian society
		CO2. To understand various ideologies to understand Indian society
		CO3. To understand the various social movements organized in Indian society
		CO4. To study the interrelationship between mobility and change in Indian society
		CO5. To understand the diverse challenges to Indian society
BSO 203	**Environmental Studies**	
BSO 204	**Science, Technology and Society in India**	CO1. To understand the relationship and importance of science and technology in society.
		CO2. Understand the history and the existing status of Indian science, scientists and the infrastructure of science in India.
		CO3. To study the evolution of science education in India and have an understanding on Social organization of science in India and the scientific laboratories.
		CO4. Understand the impact of globalization and liberalization in Indian science and Technology.
BSO	**Introduction to Sociology -II**	CO1. To introduce students to the factors for the emergence of sociological perspectives.
		CO2. To provide understanding about developments of different Classical Sociological Perspectives.
		CO3. To provide understanding about developments of different Modern Sociological Perspectives.
		CO4. To provide understanding about developments of different Contemporary Sociological Perspectives.
BSO 301	**Polity and Society**	CO1. To study the nature and scope of political sociology.
		CO2. To examine the relationship between society and polity
		CO3. To study basic concepts of political sociology.
		CO4. To understand different political system.
		CO5. To understand the everyday state and local structures of power.
BSO 302	**Sociology of Religion**	CO1. To understand the different concepts related to religion.
		CO2. To appreciate the contribution of different religion in society.
		CO3. To understand the different elements of the institution of religion.
		CO4. To comprehend the relation between state and religion, and the impact of religion and magic on community life.
BSO 303	**Sociology of Gender**	CO1. To make the students understand the diversity in Gender studies
		CO2. To understand the gender relationship and the Social Construction of Gender
		CO3. To study the problems faced by the gender minorities and various women's movement in India
		CO4. To study the changes in gender relationship.

BSO 304	**Society Through Visuals**	CO1. To bring into the classroom direct depictions of the concepts being discussed through visuals
		CO2. To train the students in the specialized techniques of conducting visual research and analysis of visual data
		CO3. To focus on the broad fields of photography, film, multimedia as significant tools, used in contemporary analysis of social issues and research practices
		CO4. To use visual data together with other forms of data to explain social issues in the society
BSO 301	**Generic Elective**	CO1. To study the nature and scope of political sociology.
		CO2. To examine the relationship between society and polity
		CO3. To study basic concepts of political sociology.
		CO4. To understand different political system.
BSO 401	**Economic Sociology**	CO1. To provide an understanding of the social and cultural bases of economic activity.
		CO2. To give the understanding that how economy enables the individuals and groups to cater for their needs.
		CO3. To provide understanding for the mode of survival process and the changing nature of necessities.
		CO4. To study the cultural and anthropological outlook for people's livelihood.
		CO5. To offer contemporary socio-economic issues like development, globalization, etc.
		CO6. To understand the new economic situation in society and the gradual change in mode of production and people's orientation for it
BSO 402	**Social Stratification**	CO1. To understand the diverse concepts and different bases of social stratification in India and outside.
		CO2. To understand different forms of inequalities and differentiations practiced in society.
		CO3. To understand the different factors affecting social stratification and the impact of social stratification in society.
		CO4. To understand the different causes and determines of social stratification and the contemporary developments in the field of social stratification
		CO5. To understand different theories related to social stratification
BSO 403	**Social Anthropology**	CO1.To study the concept and primary aim of social anthropology
		CO2. To study the processes and results of cultural contacts.
		CO3. To know the history and the current issues in anthropology
		CO4. To study how an individuals' life experiences are shaped by social structures and categories
BSO 404	**Reading & Writing for Sociology**	CO1. To enhance the communication skills of students
		CO2. To enhance reading and writing academic write- ups
		CO3. To develop reading and writing habits among students on important sociological issues.
		CO4. To enable students to tackle text-related tasks with confidence
BSO 402	**Generic Elective**	CO1. To understand the diverse concepts and different bases of social stratification in India and outside.
		CO2. To understand different forms of inequalities and differentiations practiced in society.
		CO3. To understand the different factors affecting social stratification and the impact of social stratification in society.

		CO4. To understand the different causes and determines of social stratification and the contemporary developments in the field of social stratification
		CO5. To understand different theories related to social stratification
BSO 501	**Sociological Thinkers - I**	CO1. To understand the emergence and perspectives of classical of sociological thinkers
		CO2. To understand the theories of founding fathers of sociology
		CO3. To understand positivistic school of thought, Functionalist and conflict theory
		CO4. To understand the theoretical perspective of Emile Durkheim, Max Weber and Karl Marx.
BSO 502	**Research Methodology**	CO1. The course seeks to enhance the research dimension to the students associated with the discipline.
		CO2. To make the students aware of the techniques and the processes associated with social-science research.
		CO3. They are made aware of the benefits of doing research and establish a career in the field of research
		CO4. The course attempts at elaborating the fact the research is a useful mechanism to get hold of the truth in reality.
BSO 503	**Social Demography**	CO1. To understand the relationship between population and society.
		CO2. To comprehend the different forms of measurement of population trends and different theories of population
		CO3. To understand the causes and consequences of population growth.
		CO4. To understand the different policies related to population studies, including methods of population control
BSO 504 A (Elective Papers)	**Rural Sociology**	CO1. To understand the Agrarian Societies and Agrarian Studies
		CO2. To explore the traditions of enquiry and key substantive issues in rural sociology
		CO3. To have a comparative understanding on the different agrarian societies, Labour and Agrarian Class Structure in India.
		CO4. To understand Agrarian Markets, system of Land Reforms, Agrarian Crisis and various Agrarian Movements in India.
BSO 504 B (Elective Papers)	**Urban Sociology**	CO1. To understand the concept, nature and scope of urban sociology.
		CO2. To study the various trends of urbanization and impacts of urbanization in India and other parts of the world.
		CO3. To understand the classical urban sociological theories to contemporary theories.
		CO4. To create awareness about urban problems and policies adopted to solve such problems.
BSO 505 A (Elective Papers)	**Health & Society**	CO1. To understand the social dynamics of health, illness and health care.
		CO2. To comprehend, compare and contrast a variety of theoretical perspectives in the sociology of health.
		CO3. To develop an understanding of the various health care services in India.
		CO4. To understand the diverse policies related to health.
BSO 505 B (Elective Papers)	**Social Problems in India**	CO1. To introduce basic concepts related to social problems.
		CO2. To understand Social and structural problems and also the newly emerging social problems in India.
		CO3. To understand Developmental and Disorganizational problems
		CO4. To comprehend the governmental policies related to social problems.
BSO 601	**Sociological Thinkers -**	CO1. To introduce modern sociological theories.

(Elective Papers)	**II**	CO2. To understand social interactions from modern sociological perspectives
		CO3. To understand the new theoretical developments in the field of Marxism
		CO4. To understand the new theoretical developments in the field of Structuralism and Functionalism
		CO5. To understand industrial society from modern sociological perspectives
BSO 602 (Elective Papers)	**Indian Sociology**	CO1. To introduce the emergence and development of sociology of India
		CO2. To understand trends of major sociological studies on Indian society
		CO3. To study different sociological perspectives used to understand Indian society.
BSO 603 (Elective Papers)	**Rethinking Development**	CO1. To introduce basic concepts on sociology of development.
		CO2. To introduce different theories on sociology of development.
		CO3. To comprehend planning and policies related to development
		CO4. To understand development issues and concerns of India.
BSO 604 A	**Crime & Society**	CO1. To understand the basic concepts of crime in society.
		CO2. To provide an understanding of the prevailing correctional administration in India.
		CO3. To provide better understanding for different forms of crime.
		CO4. To provide knowledge about prison system and national policies on prisons
BSO 604 B	**Education and Society**	CO1. To introduce the basic concepts of education as a social institution.
		CO2. To understand School as a system
		CO3. To study the educational system in India
		CO4. To study the relationship between education and society in India.
BSO 605 A	**Project Work**	CO1. To inculcate research culture among undergraduate students and to enable the students to look at the scope and importance of sociology beyond the classroom.
		CO2. To get basic exposure on the field studies by applying different tools and techniques of Sociology.
		CO3. Students are introduced to fundamentals of analyzing the data
		CO4. Students are introduced to fundamentals of report writing.
BSO 605 B	**Ethnographic Film Making**	CO1. To understand the history of anthropological film making
		CO2. To understand the different modes and ethics of filmmaking
		CO3. To explore the use of camera in ethnographic studies and capturing different ways of interviews and interactions with camera
		CO4. To have a practical exposure of film making projects and different tools of film editing.

M.A. SOCIOLOGY

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1. The programme is aimed to make the students efficient in understanding the various fields of sociology.

PSO2. The programme has the objective of developing critical thinking and understanding of human society

PSO3. The programme is designed to develop the applicability of sociological theories in understanding society

PSO4. To make the students competent of developing the idea of empirical research and study the human society

PSO5. The course has the objective of developing ground for the further persuasion in the field of sociology

2. COURSE OUTCOMES (COs)

MSO-101	**Principles of Sociology**	CO1. To acquaint the students with sociology and the distinctiveness of its approach among the social sciences.
		CO2. To understand the basic concepts and their applications in Sociology
		CO3. To understand various dimensions of Social Change and Social Control
		CO4. To introduce various sociological perspectives in sociology

MSO-102	**Classical Sociological Theories**	CO1. To introduce the background of emergence of sociology
		CO2. To highlight the major classical contributions on Positivism & Functionalism
		CO3. The course highlights the contributions of Anthropological Traditions in classical sociology.
		CO4. To understand the Structural functionalisms of Durkheim, Parsons and Merton.
		CO5. To understand the contributions of Weber and Marx in the development of sociological theories.
MSO-103	**Perspectives on Indian Society**	CO1. This paper particularly attempts to examine the structure of Indian society.
		CO2. To introduce evolution of different Schools of thoughts in Indian sociology.
		CO3. To understand Indian society from Indological /Textual, Structural-functional and
		Marxian perspectives.
		CO4. To understand Indian society from Subaltern, Stratification and Cultural perspectives.
MSO-104	**Rural Society and Indigenous Technology**	CO1. To introduce the Fundamentals of Rural Sociology as a branch ofsociology.
		CO2. To understand various Rural Social Institutions in Indian context.
		CO3. To understand the role of Indigenous technology in the continuity and development of rural societies.
		CO4. To have a Sociological understanding of rural social structure, change and development in India
MSO-105	**Sociology of North East India**	CO1. To understand the brief history and structure of North-eastern part of India.
		CO2. To study the social composition of the region.
		CO3. To understand the social institutions of the region.
		CO4. To study the nature of social problems in the region.
MSO-201	**Modern Sociological Theories**	CO1. To have a comprehensive understanding of the concepts of modern, modernity and modernization
		CO2. To understand the emergence of modern sociological theories
		CO3. To understand major contributions on Modern Conflict Theories
		CO4. To understand major contributions on Interactionist perspective in Sociology
		CO5. To understand major contributions on Phenomenology and Ethnomethodology
MSO-202	**Social Stratification**	CO1. To understand various concepts of social stratification
		CO2. To understand different theories on social stratification
		CO3. To understand social stratification in Indian society
		CO4. To understand social stratification in global context.
MSO-203	**Family, Kinship and Marriage**	CO1. To introduce the Theoretical Perspectives on Family, Kinship and Marriage
		CO2. To understand family as a social institution, including its concept, structure and changes.
		CO3. To understand concept, structure and changes in the institution of marriage.
		CO4. To understand kinship as a social institution, its concept, structure and changes.
MSO-204	**Science, Technology and Society**	CO1. To enable the students to understand the relationship between science and society, and the importance of studying it.
		CO2. To introduce the student to the conceptual and theoretical issues in the study of sociology of science.

		CO3. To understand the issues relating to science, technology and society in Indian context
		CO4. To understand the issues relating to science, technology and society in the context of globalization.
MSO-205	**Political Sociology**	CO1. To study the major themes and debates in political sociology
		CO2. To understand the relationships between political institutions and other social institutions and society
		CO3. To understand various processes of polity.
		CO4. To understand the relationships between polity and society in India.
MSO-301	**Research Methodology**	CO1. To introduce Philosophical Roots of Social Research and Nature of Social Reality.
		CO2. To introduce various methodological perspectives in social research.
		CO3. To give the students an all-round idea related to practice of various research methods.
		CO4. To introduce on Macro data and Data Analysis
MSO-302	**Urban and Industrial Society**	CO1. To study the basic concepts of urban and industrial sociology
		CO2. To introduce major theoretical perspectives on urban and industrial sociology
		CO3. To understand the processes of urbanization and industrial in Indian society.
		CO4. To understand the policies and programmes relating to urbanization and industrialization in India.
MSO-303	**Internship**	CO1. To inculcate research culture among students
		CO2. To develop among students the sense of working together in a team
		CO3. To equip students to acquire the skills of applications of theoretical knowledge to fields.
MSO-304 A	**Sociology of Health**	CO1. To introduce basic concepts of health, illness and health care.
		CO2. To comprehend, compare and contrast a variety of theoretical perspectives in the sociology of health.
		CO3. To understand the dynamics of health status among Indian population.
		CO4. To develop an understanding of the various health care policies and programmes in India.
		CO5. To understand the diverse related to health.
MSO-304 B	**Social Demography**	CO1. To understand the key concepts of Social Demography.
		CO2. To relate theories of population with the present society.
		CO3. To understand the dynamics of population, i.e., fertility, mortality and migration.
		CO4. To understand the dynamics of population growth in India and related policies.
MSO-304 C	**Human Resource Development**	CO1. To help students learn the basic concepts of Human Resource Development;
		CO2. To introduce Personnel Management, Human Resource Management and HR Planning to students.
		CO3. To understand Recruitment and Selection process.
		CO4. To understand various aspects of Job Evaluation.
MSO-304 D	**Social Movements**	CO1. To introduce key concepts of Social Movements
		CO2. To understand social movements leading to social changes.
		CO3. To understand various theories of social movements
		CO4. To study Social movements in India
MSO-305 A	**Sociology of Gender**	CO1. To make the students understand the diversity in Gender studies
		CO2. To understand the gender relationship and the Social Construction of Gender

		CO3. To study the problems faced by the gender minorities and various women's movement in India.
		CO4. To study the changes in gender relationship.
MSO-305 B	**Sociology of Education**	CO1. To explain the basic concepts in Sociology of Education
		CO2. To introduce important Theories and Perspectives in the sociology of education
		CO3. To understand various Dimensions of education
		CO4. To illustrate the relationships between Education and Society in India.
MSO-305 C	**Sociology of Mass Communication**	CO1.To study the basic concepts and theories of Mass Communication
		CO2. To understand the relationship of mass media, culture and Development of identity.
		CO3. To understand impacts of Globalization on mass media
		CO4. To study the social uses, abuses and impact of the media on society
		CO5. Understanding of popular culture as reflected in different media
MSO-305D	**Sociology of Development**	CO1. To provide conceptual and theoretical understanding of development as it has emerged in sociological literature;
		CO2. To offer an insight into the ways in which social structure impinges on development and development on social structure
		CO3. To address in particular the Indian experience of development, with special focus on NE India; and
		CO4. To prepare the students for professional careers in the field of development planning, including governmental, non-governmental and international agencies engaged in development.
MSO- 306 (MDC)	**Sociology of North East India**	CO1. To understand the brief history and structure of North-eastern part of India.
		CO2. To study the social composition of the region.
		CO3. To understand the social institutions of the region.
		CO4. To study the nature of social problems in the region.
MSO-401	**Contemporary Sociological Theory**	CO1. To introduce the evolution and emergence of contemporary sociological theories
		CO2. To understand major contributions on Neo-Marxism, Neo Functionalism & Theories of Development in sociology
		CO3. To understand major contributions on Post Structuralism and Multiculturalism
		CO4. To understand major contributions on Modern and Post-Modern social theories.
MSO-402	**Statistical Analysis & Computer Application**	CO1. To introduce basic concepts associated with social statistics.
		CO2. To understand data analysis and observation and certain integral parts of research through application of social statistics.
		CO3. The technical knowledge of computer and its application is attempted to be delivered.
MSO- 403	**Dissertation**	CO1. To develop a clear sense of direction early on in the project and to create an interest in research work
		CO2. To engage the students with their area of interest in a more critical manner
		CO3. To create an opportunity to contribute new knowledge in their field of interest
		CO4. To engage students in and conduct original research
MSO-404 A (Elective Paper)	**Sociology of Environment**	CO1. To introduce the emergence and major theories on Sociology of environment
		CO2. To Understand the relationships between Environment and Society
		CO3. To understand the environmental issues in global context.

		CO4. To understand the environmental issues in Indian context.
MSO-404 B (Elective Paper)	**Sociology of Marginalized Communities**	CO1. To study Marginalization and its socio-economic indices.
		CO2. To understand the social structure and culture of marginalized communities.
		CO3. To understand various Perspectives on marginalization
		CO4. To comprehend Social movements among marginalized communities.
MSO-404 C (Elective Paper)	**Sociology of Childhood in India**	CO1. To introduce the Sociological Understandings of Children and Childhood
		CO2. To look into the status of the children in India
		CO3. To understand National Mechanisms on Child Protection and Child Rights
		CO4. To understand International Mechanisms on Child Protection and Child Rights
MSO-404 D (Elective Paper)	**Project Planning & Programme Implementation**	CO1. To introduce basic concepts associated with Project and project cycle.
		CO2. To understand Project Formulation, Implementation, Evaluation and Monitoring Planning.
		CO3. To understand the steps and guidelines of Project Proposal preparation.
		CO4. To train students on preparing Project Proposals through Case studies.
MSO-405 A (Elective Paper)	**Counseling and Guidance**	CO1. To introduce the basic concepts and the importances of Counseling and Guidance
		CO2. To understand the types of Counseling and guidance
		CO3. To understand the Tools and techniques of Counseling and guidance
		C04. To understand the Modern Trends in Counselling and guidance
MSO-405 B (Elective Paper)	**Sociology of Religion**	CO1. To introduce the Approaches to the study of religion
		CO2. To understand the Structures of Religion.
		CO3. To understand the various Religious reform movements in Indian context.
		CO4. To understand the relationships between Religion, Institution and Identity
MSO-405 C (Elective Paper)	**Criminology & Penology**	CO1. To sensitize students the basic concepts of Criminology and Penology.
		CO2. To understand various Perspectives and Trends on Criminology and Penology
		CO3. To provide better understanding for different forms of crime.
		CO4. To provide knowledge about prison system and national policy on prisons.
		CO5. To provide an understanding of the prevailing correctional administration in India.
MSO-405 D (Elective Paper)	**Sociology of Tribal Society**	CO1. To introduce the Approaches to the study of Tribal Society, basic concepts and major classifications of tribal people among Indian tribes.
		CO2. To understand Demographic and Socio-cultural profile of Indian tribes.
		CO3. To study Social mobility and change among Indian tribes.
		CO4. To understand major Problems of Indian Tribes and Tribal development.
MSO- 406 (Elective Paper)	**Viva- Voce**	CO1. To assist in authenticating that students' knowledge in the subject matter.
		CO2. To help determine the students' learning and understanding of the different topics or papers taught throughout their post graduate programme
		CO3. To enable the students to effectively and confidently communicate verbally and also to prepare them to face interviews at the academic and industrial sector.

B.SC. ZOOLOZY

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1: Demonstrated a broad understood of animal diversity, including knowledge of the scientific classification and evolutionary relationships of major groups of animals. PSO2: Recognized the relationships between structure and functions at different levels of biological organization (e.g., molecules, cells, organs, organisms, populations, and species) for the major groups of animals.

PSO3: Characterized the biological, chemical, and physical features of environments (e.g., terrestrial, freshwater, marine, host) that animals inhabit. Explained how animals function and interact with respect to biological, chemical and physical processes in natural and impacted environments.

PSO4: Explained how organisms function at the level of the gene, genome, cell, tissue, organ and organ-system. Drawing upon this knowledge, they are able to give specific examples of the physiological adaptations, development, reproduction and behavior of different forms of life.

PSO-5: Understood the applied biological sciences or economic Zoology such as sericulture, Apiculture, aquaculture, Industrial microbiology, rDNA technology and medicine for their career opportunities.

2. COURSE OUTCOMES (COs)

BSZ-101	**Invertebrate-I: Non-Chordates (Protista to Pseudocoelomates)**	CO1: To know the basic concept of biosystematics and procedure in taxonomy.
		CO2: Identified the taxonomic status of the entire non-chordates up to annalids and discuss the evolutionary model of the group
		CO3: To Know about some of the important and common protozoans, helminthes of parasitic nature causing diseases in human beings.
		CO4: To Understood the importance of metamerism in annelids.
BSZ-102	**Ecology**	CO1: To know the distribution of fauna in different realms interaction.
		CO2: To understand Animal behaviour and response of animals to different instincts CO3: To know the interaction of biotic and abiotic system.
		CO4: To understand the various ecosystem of different animals.
		CO5: To acquired the knowledge of various kinds of Animal adaptations

BSZ-103	**Practical: Non-Chordates: Protista to Pseudocoelomates**	CO1: To familiar with the different types of invertebrate with the help of the preserved animals available in the laboratory.
		CO2: To learn the techniques how to prepare the permanent slides.
		CO3: To learn the procedure of culture of *Paramecium* and the observation.
		CO4: To understand the symmetry of of some invertebrate in the laboratory.
BSZ-104	**Practical:**	CO1: To learn the procedure of determination of pH, DO and CO_2 in pond water.
		CO2: To learn how to how to determine the air temperature and humidity.
		CO3: To learn the estimation of Primary productivity in ecosystem, estimation of Chloride of water sample and estimation of total alkalinity and hardness.
		CO4. Study of Zooplanktons and its role in pond ecosystem.
BSZ-201	**Non-Chordates: Annelida to Echinodermeta**	CO1: To understand the General characters and classification up to Orders in Annelids with coelom and metamerism.
		CO2: To understand the General characters and classification up to Orders in Arthropoda. Also to understand the different larval forms of crustacia and different types of mouth parts in insect.
		CO3: To understand the General characters and classification up to Orders in Mollusca and to understand the gastrovascular system, torsion and detorsion.
		CO4: To understand the General characters and classification up to Orders in Echinodermata and their water vascular system.
BSZ-202		CO1: To understand the Cell, cell diversity- shape and size. Cell structure-prokaryotes and eukaryotes.
		CO3: the understand the different cell components like Mitochondria, Golgi Complex, Endoplasmic reticulum, Ribsome, Lysosomes and Nucleus.
		CO4. Describe cellular membrane structure and function, fine structure and function of cell organelles.
		CO-5. Understand the Scope of cell biology, because cell is the basic unit of life.
BSZ-203	**Practical: Invertebrate-II**	CO1: To visualised the different types of invertebrate with the help of different Museum specimen.
		CO2: To observe the life cycle of Muga silk worm or Eri Silk worm at laboratory and also in the field.
		CO3: To observe and understand the differences of mouth parts of different types of Mosquitoes.
		CO4. To understand the salivary apparatus of insect with the help of dissecting the the Cockroach.
		CO5. To know the system of mounting vy the preparation of permanent slides of Euglena, Hydra, Obelia, etc.
BSZ-204	**Practical: Cell Biology**	CO1: To aware and understand the different types of cells with the help of observing the different types of Histological slides of liver, intestine, kidney, testis ovary and lungs.
		CO2: To understand the mitotic stages with the help of onion root tip.
		CO3. To make aware about the different types of instruments for the study of different types of cells. Example- Different types of Microscope, Autoclave, Centrifuge machine, Micropipette, etc.
		CO4: To make aware in the laboratory about the Sex chromatin from buccal epithelium, basic fixatives and stains, culture of Protozoa, etc.
BSZ-301	**Diversity of Chordates**	CO1: To understand the General Characteristics and Classification of different types of Chordates and to differentiate between Chordates and

		Non-chordates.
		CO2. To understand the affinities of Urochordata, Cephalochordata and Vertebrata.
		CO3: To understand the Biological significance of Cyclostomata, Ostracodermi and Placodermi.
		CO4: To understand the significance of air bladder of Pisces and the migration pattern of Pisces.
		CO5: To understand the skull types of Reptiles and biting mechanism of poisonous snakes.
		CO6: To understand the Flight adaptation, Mechanism of flights and the migration of Birds.
		CO7: To understand about the egg laying mammals, pouched mammals and primates.
BSZ-302	**Physiology: Controlling and Coordinating Systems**	CO1: Understand the Importance of physiology and branches of it.
		CO2: To understand the General characteristics of Endocrine system and classification of Hormones.
		CO3: To understand the structure of different endocrine glands like pituitary gland, Thyroid gland, pancreas, Adrenal and the functions of their different hormones.
		CO4: To understand the different functions of steroid and peptide hormones.
		CO5: To understand the structure and function of Testis and Ovary.
BSZ-303	**Fundamentals of Biochemistry**	CO1: To understand the Chemical foundation of Biology, i.e., pH, Buffers, pK, Isomeristaion, etc.
		CO2: To understand the Classification and Biological Significance of amino acids, carbohydrates, peptides, protein, lipids and nucleic acid.
		CO3: To understand the metabolism of carbohydrates, protein and Lipids.
		CO4:. Understand about the agencies responsible for Production of various products using biochemistry.
		CO5: To understand the mechanism of Oxidation with special reference to mitochondrial electron transport system.
		CO6: To understand the ATP in metabolism and in free energy production.
BSZ-304	**Practical: Vertebrates**	
BSZ-305	**Practical: Physiology**	CO1: To aware the knowledge of different cellular structure of different endocrine glands (Pituitary, Thyroid, pancreas, adrenal, Ovary and Testis) with the help of permanent slides.
		CO2: To understand the structure and position of pituitary gland with the help of dissecting the pituitary gland of fishes.
		O3: To understand the Quantative detection of Carbohydrates, Protein and Lipid.
		CO4: To understand the Enzyme activities with the help of Salivary amylase.
BSZ-401	**Comparative Anatomy of vertebrates**	CO1: To understand the integumentary and skeletal system of different vertebrates.
		CO2: To understand the Alimentary canal of different vertebrates and associated glands, dentition, etc.

		CO3: To understand the Respiratory System of different terrestrial and aquatic animals and different structure of respiratory organs in different animals.
		CO4. To understand the digestive system of lower to higher animals and their accessory organs.
		CO5. To understand the General plan of circulation, evolution of heart and aortic arches.
		CO6: To understand the Comparative account of brain, Autonomic nervous system, spinal cord, cranial nerves in mammals
BSZ-402	**Physiology: Life Sustaining Systems**	CO1: Understand the function of various systems
		CO2: Apply the knowledge to lead a healthy life
		CO3: Seeks to understand the mechanisms that work to keep the human body alive and functioning.
		CO4: Physiological and biochemical understanding through scientific enquiry into the nature of mechanical, physical, and biochemical functions of humans, their organs, and the cells of which they are composed.
		CO5: Students gain fundamental knowledge of physiology and endocrine systems
		CO6: Students gain fundamental knowledge ofphysiology of homeostasis.
BSZ-403	**Biochemistry of Metabolic Process**	CO1: Interactions and interdependence of physiological and biochemical processes.
		CO1. Understand the chemical nature of life and life process.
		CO2. Get an idea on structure and functioning of biologically important molecules.
		CO3. Help to explore new developments in biochemistry.
		CO4. Enable the students to illustrate various Biochemical pathways.
		CO5. Develop an interest in the debates and discussions associated with Lifestyle Diseases.
BSZ-404	**Practical: Comparative Anatomy**	CO1. Students would be able to know and compare the different anatomical aspect of various organisms.
		CO2. Students will acquire the knowledge of functioning of different body parts.
BSZ-405	**Practical: Biochemistry**	CO1. Demonstrate basic principles in physiology Objectives of the course.
		CO2. Learn clinical procedures for blood & urine analysis.
		CO3.Develop skill in simple biochemical laboratory procedures.
		CO4.Recognise the importance of various databases
		CO5.Skill in observing and to some extent in analysing various Biological Data.
BSZ-406	**Skills Enhancement Course –II: Fish and Poultry Farming, and Nature photography**	CO1. To understand the definition of endemic fish species. Types of endemism, Endemic fish species of India Conservation measures.
		CO2. To understand the definition of exotic fish species, Rules of introduction of exotic species, Preventive measures, Exotic fish species of India.
		CO3. To understand the types of commercial layers and broilers, Selection of commercial layers.
		CO4. To understand the Construction of poultry farm, Rearing of broilers and layers by visiting the commercial farms.
		CO5. To understand the Poultry waste management.
		CO6. To understand the basics about the camera, types of still camera, components of the camera (lens, aperture and other accessories), Good framing of the nature and wildlife photography and basic role of nature photography.

BSZ-501	**Molecular Biology**	CO1. Develop deeper understanding of what life is and how it functions at cellular level.
		CO2. Describe cellular membrane structure and function, fine structure and function of cell organelles.
		CO3.Perform a variety of molecular and cellular biology techniques.
		CO4. To understand about the Knowledge of genetics, developmental biology and organogenesis.
		CO5.To understand the Application of DNA technology and molecular biology for research
BSZ-502	**Principles of Genetics**	CO1. Understanding of basic concepts of genetics, laws of inheritance and central dogma of biology.
		CO2. Gains knowledge about gametogenesis, cleavage mechanisms, gastrulation and role of hormones in metamorphosis and regeneration.
		CO3. Understood the theories of classical genetics and blood group inheritance in man.
		CO4. To understand the genetic variation through linkage and crossing over, chromosomal aberrations and sex determination.
		CO5. Understood the genetic defects and inborn errors of metabolism and genetic counseling and role of inbreeding and outbreeding.
BSZ-503	**Discipline Specific Elective-I: Fish and Fishery**	CO1. To understand the fisheries and fishery industries.
		CO2. Understood the various types and methods of aquaculture practices.
		CO3. Understood the physiology and reproductive mechanisms of important fishes.
		CO4. Understood the modern techniques and methods of fishery industries.
		CO5. Attained knowledge about important cultivable fin fishes, shell fishes and importance of value added fishery products.
BSZ-504	**Discipline Specific Elective-II: Parasitology**	CO1. To understand the introduction to parasitology: Types of parasites, types of host, Host-parasite relationship, Zoonosis, Source of Infections and mode of infections.
		CO2. To understand the concept of Hemoflagelates taking the example of Leishmania and their prophylaxis.
		CO3. To understand the insect vectors diseases, by taking example of Malaria disease: types of malaria, Life cycle.
		CO4. To understand the general features of Helminthes and Platyhelminthes.
		CO5: To study the different parasites like Tap worm, hook worm and liver flukes.
BSZ-505	**Practical: Molecular Biology**	CO1. Acquired knowledge of principles and working mechanisms of different microscopes.
		CO2. Understood the mechanism of mitosis and meiosis.
		CO3. Gained slide preparation to observe of Giant chromosome, epithelial and blood cells.
		CO4.Understood the concept of chromatography.
BSZ-506	**Practical: Principles of Genetics**	CO1. Understood the inheritance of mendelian traits by direct observation among students.
		CO2. Acquired knowledge skill development and observation of blood group identification and pedigree chart preparations.
		CO3. Understood of the mechanism of phenotypic expression in Drosophila.
		CO4. Gained genetic knowledge on the observation of specimens and models.
BSZ-507	**Practical: Discipline Specific Elective-I:**	CO1. To identify the different species of Indegenous Indian Major Carps and Exotic Carps.

	Fish and Fishery.	CO2. To identify the commercial fish species in the lab and as well as in the field.
		CO3. To understand the knowledge of fish industry by visiting the major fish market.
		CO4. To understand the knowledge of fish farming by visiting the Fish farmers.
BSZ-508	**Practical: Discipline Specific Elective-II: Parasitology**	CO1. To identify the different species of parasites present in the Laboratory.
		CO2. To identify the insect vectors causing the disease like malaria, filarial, etc.
		CO3. To impart the knowledge of infection of parasites by visiting the slaughter house.
BSZ-601	**Developmental Biology**	CO1. Understood the process of development of animals.
		CO2. Understood the process of organogenesis of selected organs, development of extra embryonic membrane and the nature and physiology of placenta.
		CO3. Came to know the inducer and inductor role in embryogenesis and knowledge about metamorphosis and the process of regeneration.
		CO4.Familiar with various stages involved in the developing embryo CO5.Apply the knowledge to collect various Biological data CO3.Understand the initial development al procedures involved in Amphioxus, frog and chick CO6.Familiar with types of placenta CO7. Familiarise with the principle of developmental biology.
		CO8.Familiarise with various Techniques and tools of Embryology
BSZ-602	**Evolutionary Biology**	CO1. Understood the theories of evolution and highlighted the role of evidences in support of evolution.
		CO2. Described the evolutionary knowledge through the concepts of coloration and mimicry.
		CO3. Identify the contributions of various evolutionists.
		CO4.Identify different zoogeographical realms with fauna.
		CO5. To understand the knowledge of eras and evolution of species.
BSZ-603	**Discipline Specific Elective-III: Reproductive biology**	CO1. To understand the fundamentals of the structure and function of the male and female reproductive tracts, gametogenesis, fertilization, early embryogenesis, fetal development and preparation for birth, and maternal adaptations to pregnanc.
		CO2. To understand the male and female reproductive hormones and their functions.
		CO3. To impart the knowledge of IVF and GIFT.
		CO4. To understand the important foundation to consider sexual differentiation and development, contraception, infertility and current reproductive technologies.
		CO5.To understand the process of human implantation and decidualization of the endometrium.
		CO6. Understand the major hormonal signals controlling breast development and lactation.
BSZ-604	**Discipline Specific Elective-III: Wildlife Conservation and Management**	CO1. To understand the different types of Threatened species or Endangered species specially to North East india.
		CO2. To impart the knowledge of Indian Wildlife protection Act and Indian Forest Act.
		CO3. To impart the knowledge of different National Park and Wildlife Sanctuaries of North east.
		CO4. Students will have a greater knowledge of how wildlife conservation and management relates to the economy and environment, both currently and in the future.

		CO5. Students will be able to find detailed information on a topic from print as well as online information sources.
		CO6. Students will be able to critically evaluate current events and public information related to wildlife conservation and management as being scientifically-based or opinion-based and contribute to the knowledge base of information.
BSZ-605	**Practical: Developmental Biology**	CO1. Demonstrate various types of Eggs CO2. To impart the knowledge of difference between the male and female reproductive system by dissecting cockroach.
		CO3. To understand the different developmental stages of animal by collecting the eggs of Frog from the field and rearing in the laboratory and then identify the different stages.
		CO4. Expose to concepts and process in developmental biology.
BSZ-606	**Practical: Evolutionary Biology**	CO1. To understand the different evolutionary process of human with the help of chart and PPT.
		CO2. To understand the Palaentology with the demonstration of different fossil record with the help of PPT.
		CO3. To make aware about the different types of era with the help of demonstration through PPT.
		CO4. Student will learn about the sedimentation by visiting the national museum.
BSZ-607	**Practical: Reproductive Biology**	CO1. To impart the knowledge of difference between the male and female reproductive system by dissecting cockroach.
		CO2. To understand the different types of estrouse cycle with help of laboratory work in mice.
		CO.3 Student will learn the Reproductive cycle in the laboratory by observing the mice.
BSZ-608	**Practical: Wildlife conservation and management.**	CO1. To understand the insitu and exsitu conservation, student visit Wildlife Sanctuary or National Park and any Wild ConservationCentre (eg. Pigmy Hog Conservation Centre).
		CO2. Student learn the Forest management system by visiting Wildlife Sanctuary or National Park.
		CO3. To understand the different species of different animals, field survey is guided.
		CO4. To understand the species diversity, diversity index is applied at different field level.

M.SC. ZOOLOZY

1. PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1: Developing deeper understanding of key concepts of biology at biochemical, molecular and cellular level, physiology and reproduction at organismal level, and ecological impact on animal behavior.
PSO2: Elucidation of animal-animal, animal-plant, animal-microbe interactions and their consequences to animals, humans and the environment.

PSO3: Strengthening of genetics and cytogenetics principle in light of advancements in understanding human genome and genomes of other model organisms.

PSO4: Description of expression of genome revealing multiple levels of regulation and strategies to manipulate the same in the benefit of the mankind.

PSO5: Understanding relationships of variations in phenotypic expression of genomes and their genomewide interaction with other organisms.

PSO6: Development of an understanding of zoological science for its application in medical entomology, apiculture, aquaculture, agriculture and modern medicine.

PSO7: Development of theoretical and practical knowledge in handling the animals and using them as model organism

2. COURSE OUTCOMES (COs)

MSZ-101	**Taxonomy, Biosystematics and Biostatistics**	CO1. Thorough understanding in the principles and practice of systematics.
		CO2. Acquire an in-depth knowledge on the diversity and relationships in animal world.
		CO3. Develop a holistic appreciation on the phylogeny and adaptations in animals.
		CO4: Understanding of the universal common ancestor and tree of life, three domain concept of living kingdom CO5: Illustration of the molecular phylogeny, construction of phylogenetic trees using molecular data, construction of phylogenetic trees by using 16S rRNA gene sequences and concept of speciation in bacteria. CO6: Description of molecular divergence and molecular clocks and molecular drive, complication in inferring phylogenetic trees.
		CO7. To understand development and application of statistical methods to a wide range of topics in biology.
		CO8. To understand the data collection methods which is considered in research planning, because it highly
		influences the sample size and experimental design.
		CO9. To understand the basic concept of qualitative and quantitative analysis of a given sample.
MSZ-102	**Bioinstrumentation and Cell Biology**	CO1. Study various microscopic, spectroscopic,
		Colorimetric and electrophoretic techniques and its instrumentation.
		CO2. To study the principles of histochemistry and microbiological techniques.
		CO3. To study the In situ hybridization techniques and polymerase chain reaction.
		CO4. To study the complexity and organization of cell
		CO5. To understand the moleculer structure of the biomembranes and cytoskeletons.
		CO6. To understand the cellular reproduction,cell-cell adhesion and cell-cell signaling..
MSZ-103	**Animal Physiology and Endocrinology**	CO1. Seeks to understand the mechanisms that work to keep the human body alive and functioning.
		CO2. Physiological and biochemical understanding through scientific enquiry into the nature of mechanical, physical, and biochemical functions of humans, their organs, and the cells of which they are composed.

		CO3. Interactions and interdependence of physiological and biochemical processes ANIMAL PHYSIOLOGY.
		CO4. Students are taught the detailed concepts of digestion respiration excretion the functioning of nerves and muscles.
		CO5.Students gain fundamental knowledge of animal physiology
		CO6. Students will gain skill to execute the roles of a biology teacher or medical lab technicians with training as they have basic fundamentals
		CO7. The structure and function of mammalian endocrine tissues the manner in which the regulatory control and actions of individual endocrine tissues are integrated to maintain appropriate physiological and metabolic responses to changes in the internal and external environment.
		CO8. The objectives of this course are to introduce the basic principles, organs and systems in mammalian (human) endocrinology. Students will be able to identify the organs involved in endocrine function, will know the major hormones that are produced by these organs and will know the physiological effect of these hormones.
		CO9. Students will be introduced to the molecular mechanisms of action of many of these mediators and will start to appreciate biochemical and signalling events at the cellular and whole animal level.
MSZ-104	**Taxonomy, Biosystematics and Biostatistics-Practical**	CO1. To understand the Measure of central tendency Mean (Definition & simple problems) Median, Quartiles (Definition, Graphical calculation) Box Plot Mode (Definition, graphical calculation)Situations where one is preferred over others.
		CO2. To understand the Measures of dispersion: Variance (Definition, simple problems) Standard deviation Coefficient of variance.
		CO3. To understand the ANOVA Test (Mathematical and graphical representation, no formula, and real life example).
		CO4. To understand the Chi-Square Test (Field work, graphical representation and real life example) Testing of hypothesis (two tailed only) a)For mean (one population).
		CO5. To understand the preparation of Taxonomic Key for the taxonomic identification atleast upto genus level.
		CO6. To understand the method of collection and preservation of invertebrates.
		CO7. To understand the concept of different type of taxonomy like Cytotaxonomy, Chemotaxonomy and Molecular taxonomy.
MSZ-105	**Bioinstrumentation and Cell Biology - Practical**	CO 1. To study the structural arrangement of cell membrane through model.
		CO 2. To study the mitotic & meiotic cell division through permanent mounting.
		CO 3. To analyze the temporary preparation of mitotic & meiotic stages.
		CO 4. To understand the preparation & loading of Gel for Electrophoresis.
		CO 5. To understand the estimation process for protein samples.
		CO 6. To understand the preparation techniques for various fixatives & stains.
MSZ-201	**Developmental Reproductive Biology**	CO1: Information about history and basic concepts of developmental biology.
		CO2: To understand the spontaneous and induced mutation, mutant screening, developmental mutations in Drosophila. CO3: To understand the Elucidation of early embryonic development of invertebrates and vertebrates.
		CO4: To understand the concepts of organogenesis in invertebrates and

		vertebrates.
		CO5. To understand the different functions of peptide and Steroid hormones.
		CO6.Understand the Sexual cycles: puberty, oestrous and menstrual cycles. Ovarian event: follicular phase, cycling of non-pregnant uterus and vagina.
		CO7..To understands Pregnancy: conception and blastocyst formation, implantation and delayed implantation, placenta: formation, types and functions, hormones in pregnancy
MSZ-202	**Molecular Biology & Biochemistry**	CO1.Understand the biochemical organization of cell at molecular level.
		CO2.To study structure and function of genetic material
		CO3.To study the mechanism of DNA replication,transcription and translation.
		CO4.Understand the biochemistry of metabolic process..
		CO5.Understand the bioenergetics of the cell.
		CO6.To understand the classification and general properties of enzyme
MSZ-203	**Ecology & Environmental Science**	CO1: Students will understand the structures of ecosystems and its functions.
		CO2: They will be able to understand the Ecological energetics, energy flows and Population and monitor the environmental systems.
		CO3: They will understand and be proficient in environmental degradations and the Biogeochemical cycle., biodiversity assessment, monitoring of ecological systems.
		CO4: To understand the Biodegradation, Bioremediation and Ecosystem management of Waste and Environmental Toxicology.
		CO5: To understand the values of conservation of Wildlife.
		CO6: To understand the Forest Act and Wildlife Protection Act of India and Criterias of IUCN.
MSZ-204	**Ecology & Environmental Science and Reproductive & Developemental Biology**	CO1: To understand and be expertise to perform water analysis in different water source.
		CO2: Students being able to Identify different types of Phytoplanktons and Zooplanktons.
		CO3: Students will be expertise to test different parameters of Soil.
		CO4: To understand preparation of Chick embryo whole mount and observation of chick embryo development.
		CO5: Understanding of Estrous cycle in mice, reproductive system of male & female cockroach.
		CO6: Field visit to National Park are the part of Educational tour to grow interest of research and practical ability of students in different fields.
MSZ-205	**Molecular Biology & Biochemistry**	CO 1. To understand the isolation of genomic DNA & protein.
		CO 2. To understand the design of tissue culture Lab.
		CO 3. To understand the quantitative estimation of DNA, RNA, amino acid & total protein.
		CO 4 To understand the action of salivary amylase on carbohydrate.
		CO 5. To understand the preparation of different buffers.
		CO 6. To understand the mechanism of hybridoma technology.
MSZ-301	**Genetics & Evolution**	Students will be able to understand
		CO1.Comprehensive, detailed understanding of the chemical basis of heredity
		CO2.Comprehensive and detailed understanding of genetic methodology and how quantification of heritable traits in families and populations

		provides insight into cellular and molecular mechanisms.
		CO3.Genetic concepts affect broad societal issues including health and disease, food and natural resources, environmental sustainability, etc.
		CO4. The role of genetic mechanisms in evolution.
		CO5. Natural selection as key to understanding the natural world; how natural selection produces adaptation; the origins of genetic variation; fitness, adaptive genetic change
		CO6. Population genetic consequences of selection, mutation, migration (gene flow), inbreeding; genetic drift, an important evolutionary force. Evolution of social behavior and kin selection; sexual selection; evolution of life history characters.
		CO7: the results of natural or artificial selection on quantitative characters: the interplay between heritability and the environment. Evolutionary biology and Human evolution
		CO8: How new species arise; the major species concepts. The history of life; the evolution of humans and understanding evolution and development
MSZ-302	**Parasitology, Economic Entomology and Aquatic Biology**	CO1: An overview to the parasitology, animal associations and host – parasite relationship.
		CO2. To aware the students for various parasites and diseases which spreads in human with the help of study of host-parasite relationship.
		CO3. . Understand the various disease causing vectors like Mosquitoes-Malaria, Japanese encephalitis and Dengue.
		CO4. To understand the diseases caused by Helminthes and Platyhelminthes- Hookworm, Tapeworm, Liverfluke etc.
		CO5. To understand the concept of Hemoflagelates and the diseases caused by Leishmania.
		CO6: Description of parasites of insects and their significance, nematode parasites of and host parasite interactions.
		CO7. To understand the Aquaculture concept, Culture systems: Freshwater aquaculture systems: Freshwater prawn culture, fish culture in paddy fields, Brackish water culture, Mariculture: Oyster culture, Crab culture, Lobster culture, mussel culture, culture of Eels, Culture of aquatic weeds.
		CO8. To understand the Composite fish culture and Preparation and management of fish culture ponds. CO9. Transport of fish seed and Brood fish and Harvesting: Fishing techniques, preservation & processing of fish and Fish pathology.
		CO10 To understand Fresh water prawn culture and Pearl culture, Pearl producing mollusks, pearl formation, collection of oysters, rearing of oysters, insertion of nucleus, harvesting of pearls, composition & quality of pearl.
MSZ-303A	**Cell and Molecular Biology-I**	CO 1.To understand the moleculer composition of the cell membrane.
		CO 2. To understand the membrane transport mechanisms and the role of cytomembrane in health and diseases.
		CO 3.To understand the ultrastructurs of the nucleus.
		CO 4. To understand the Genomics and genome mapping
		CO 5.TO study the different genome sequencing techniques.
		CO 6.To analyse genome sequences using Bioinformatics software.
MSZ-303B	**Animal Ecology & Wildlife Biology-I**	CO1. To understand the distribution of fauna in different realms interaction (Habitat, Fundamental and Realized Niche)
		CO2. To Understand Animal behaviour and response of animals to different instincts & Interaction of biota and abiota

		CO3. To understand the Ecosystem cybernetics and Energy flow in Environment. Description of nature of ecosystem, production, food webs, energy flow, biogeochemical cycles, resilience of ecosystem and ecosystem management.
		CO4. Understanding of competition and coexistence, intra-specific and inter-specific interactions, scramble and contest competition model, mutualism and commensalism, prey-predator interactions.
		CO5. To understand the management practice of rare and endangered species and captive breeding of wildlife and special management of wildlife.
		CO6. Understanding the forest types in Northeast, Wetland habitat, Ramsar convention, community reserves.
		CO7. To understand the wildlife legislation, National Forest policy, National wildlife action plan, National and state biodiversity plan.
MSZ-303C	**Fish & Fishery Biology-I**	CO 1. To understand the anatomical system viz., skeletal, respiratory, excretory & digestive systems of teleost fishes.
		CO 2. To understand the fish diversity & classification of fishes from Northeast India..
		CO 3. To know the diversity of endangered fishes of NE India.
		CO 4. To understand the various relationship between morphometric parameters & fish diversity.
		CO 5. To understand the various factors associated with Inland capture fisheries.
		CO 6. To understand the different components of fish nutrition.
		CO7. To understand the biochemical composition of Fish.
MSZ-303D	**Entomology-I, Insect Structure and Functions**	CO1. To understand the General Characterstics and Classification of Insects.
		CO2. To understand the different segmentation of Insect body and their functions. Students will understand the Head, Thorax and Abdomen and related appendages.
		CO3. Student will understand the different types of Mouth parts of insects and the food habit according to the mouth parts.
		CO4. To understand the integument system, chemical composition chitin, cuticular protein, moulting etc.
		CO5. To understand the muscular system of insect and the application of different muscles in different activities.
		CO6. To understand the insect's visual organ, sense organ and effector organs.
		CO7. To understand the Endocrine system and Functions, different hormones and functions, diapause, etc.
MSZ-303E	**Animal Physiology and Biochemistry-I**	CO1. The students will learn about the free energy involved in the biological systems, its generation and utilization.
		CO2. To understand the modern concept of various structural pattern of protein molecules and their processing in the cell.
		CO3. To understand the mathematical approach (Kinetics) of enzyme actions and about the factors.
		CO4. The course will also deal with various pathway of metabolism of complex molecules in the body.
		CO5. To learn physiological mechanism by which different system like digestion, respiration, excretion, circulation etc., work in the body and their regulations.
		CO6. To understand the Neuromuscular and sensory system which are very important component in animal body.

MSZ-304	**Genetics and Evolution, Parasitology, Economic Entomology And Aquatic Biology.**	CO1. Study of origin and diversification of eukaryotes, early fossilized cells, evolution of eukaryotic cell from prokaryotes- a case of symbiosis, evolution of eukaryotic genomes; gene duplication and divergence.
		CO2: Conceptualization of mode of speciation, evolution, systematics, biological classification, origination, extinction, and causes of differential rates of diversification.
		CO3: Illustration of current status and future of biodiversity, human evolution.
		CO4. A detailed understanding of parasites of veterinary importance and their management and description of parasites of insects and their significance, nematode parasites of plants and host parasite interactions.
		CO5. An overview of identification, seasonal history, biology, nature of damage and control measures of pests, of cereals, pulse crops, cotton, vegetables, oil seeds, fruit crops, sugarcane and stored grains.
		CO6. Learning aquaculture technology for fresh and marine fishes.
		CO7. Culturing of fish food organisms like algae; Artemia; zooplankton for improving nutritive quality.
		CO8: Management of water quality requirements for aquaculture.
MSZ-305A	**Practical: Cell and Molecular Biology-I**	CO 1.To understand the preparation of culture medium for Protozoa & Drosophila
		CO 2. To understand the classification, types of Protozoa & Drosophila found locally.
		CO 3.To understand the different stages of cell division of mitosis & study the effect of Colchicines in mitosis.
		CO 4. To understand the isolation & separation of DNA from tissue samples.
		CO 5.To study the isolation of protein samples from tissue sample.
		CO 6.To analyze the separation of protein.
MSZ-305B	**Practical: Animal Ecology & Wildlife Biology-I**	CO1.Students will gain insight into the wild food plant diversity.
		CO2. To Identify the Invertebrate and Vertebrate fauna.
		CO3. To understand the morphological characters of Birds, Lizards, Frogs and Turtles.
		CO4. To be capable of using Diversity Index like Shannon-Wienner, Community Dominance, Similarity and Dissimilarity Index. Concept of the niche; introduction and definition of niche, parameters of niche and factors affecting it. Niche separation and overlap. Measures of niche width.
		CO5: To understand and be able to do wildlife practicals on Activity budgeting, Line and Point transects.
		CO6: To understand the use of Ecological Instruments like GPS, Altimeter, Luxometer, Radio collar, Camera
MSZ-305C	**Practical: Fish & Fishery Biology-I**	CO 1. To understand the identification & classification of common local fresh water fishes.
		CO 2.To understand the accessory respiratory organs of fishes through dissection.
		CO 3. To understand the location & significance of Weberian ossicle of teleost fishes
		CO 4. To understand the haematological parameters of fishes.
		CO 5. To understand the qualitative & quantitative aspect of food intake in fishes.
		CO 6. To study the local fishing gears used by fish farmers using traditional methods for fish harvesting.

MSZ-305D	**Practical: Entomology-I: Insect Structure and Functions.**	CO1. To demonstrate the different mouth parts of insects, so that students will understand the food habit of inscts.
		CO2. To demonstrate the different types legs, antennae, wings so that students will understand the morphological characters which is helping in identification.
		CO3. To understand the preparation of permanent slide of stored grain pest and sting apparatus of honey bee.
		CO4. Preparation of arolium, empodium and pollen basket to understand the specific functions of leg.
		CO5. To understand the Preparation and Identification of Haemocytes.
		CO6. To understand the detection of Uriase and Chitin.
		CO7. To understand the insect collecting devices, methods of insect collection and preservation.
		CO8. To understand the Collection and Identification of Stored grain pest, Paddy pest, pest of vegetables, Pest of pulses and Tea pest.
MSZ-305E	**Practical: Animal Physiology and Biochemistry-I**	CO1. The students will learn how to determine the physical properties and chemical constituents of mammalian urine and to prepare a test report.
		CO2. To give practical knowledge on the determination of hepatic enzymes level in blood serum.
		CO3. To understand practically how the enzymes activity is effected by the Physiochemical factors like temperature, pH, activators and inhibition.
		CO4. To learn the laboratory technique to estimate protein in animal tissue using Lowary and Brandford Method.
		CO5. To learn the method of glucose tolerance test in mice to understand the hypoglycemic and hyperglycemic condition.
		CO6
MSZ-401	**Immunology, Bioinformatics and Research Methodology**	CO1. Understanding of types of immunity.
		CO2. Interactions of antigens, antibodies, complements and other immune components.
		CO3. Understanding of immune mechanisms in disease control, vaccination, process of immune interactions.
		CO4. Outline the key components of the innate and adaptive immune responses.
		CO5. Described about cell types and organs which are involved in an immune response.
		CO6. Described the Infectious diseases, hypersensitivity, autoimmune disorders, immunodeficiency diseases.
		CO7: An introduction to Genbank, UCSC, ENSEMBL, EMBL, DDBJ, protein sequence databases: Swissprot, PDB, BLAST, PSI- BLAST (steps involved in use and interpretation of results) and HMMER, BLAST vs FASTA, file formats- FASTA, GCG and ClustalW.
		CO8: An overview of databank search- data mining, data management and interpretation, multiple sequence alignment, genes, primer designing; Protein modeling, protein structure analysis, docking, ligplot interactions, phylogenetic analysis with the program PHYLIP, DISTANCES, GROWTREE etc.
		CO9: An introduction and learning of computational genomics and proteomics, designing a microarray, image analysis and normalization, annotations, protein prediction tools- protein secondary structure, molecular modeling, identification and characterization of protein mass fingerprint, world- wide biological databases.

		CO10. To understand the different types of Research.
		CO11. demonstrate knowledge of research processes (reading, evaluating, and developing);
		CO12. Perform literature reviews using print and online databases;
		CO13. Identify, explain, compare, and prepare the key elements of a research proposal/report;
		CO14. Compare and contrast quantitative and qualitative research
MSZ-402A	**Cell and Molecular Biology-I**	CO 1. To understand the action mechanism of primary receptors in cell system.
		CO 2. To understand the signaling pathway of different types of 2nd messenger.
		CO 3. To understand the structure & dynamics of cytoskeletal structures and cell motility
		CO 4. To understand the difference between cancer cells & normal cell.
		CO 5. To understand the intrinsic & extrinsic mechanism of programmed cell death.
		CO 6. To understand the various Molecular Cytogenetic Technique.
		CO 7. To understand the different cloning methodologies with their scope & significance.
MSZ-402B	**Animal Ecology & Wildlife Biology-II**	CO1: To understand the Ecology of Island Biogeography Relation of Island factor, Gap Dynamics, Gap formation in Forest.
		CO2. To understand the Environmental monitoring and and management. Restoration of Ecology.
		CO3 To understand the Habitat selection in animals, Kin Selection, Predator–prey interactions, Social system of Mammals.
		CO4: To understand the Man and wildlife issues , Eco development, Community participation in wildlife management, man-animal conflict cases, Wildlife diseases, Wildlife trade and its preventive measures.
		CO5: To understand the importance of wildlife monitoring, Habitat assessment, Canopy coverage, Association Index, Foliage Height Diversity, Similarity & Dissimilarity Index.
		CO6: To understand the Wildlife behaviour- Migration among animals, Communication and Signaling, Home range and territoriality.
		CO7: To understand the Wildlife tools, Techniques and Practices. Wildlife Census and its various methods.
MSZ-402C	**Fish & Fishery Biology-II**	CO1. To understand the different system of freshwater aquaculture–monoculture, composite pisciculture, sewage fed fish culture, raft, raceway, pen and cage culture, and paddy cum fish culture; extensive, intensive, semi-intensive and traditional system of fish farmings.
		CO2. To understand the management aspect of fish ponds (Nursery, rearing and stocking ponds). Pre and post stocking management of nursery pond.
		CO3. To understand the importance of Air breathing fish and its importance in fishery.
		CO4. To understand the different Fisher Technology in north east India.
		CO5. To understand the Economic importance of fish and fishery in relation to human health.
		CO6. To understand the Exotic fish culture: selection of species, invasive species and its impact on natural fisheries.
		CO7. To understand the concept of management of fishery: Fish health management: and Fish environment.
		CO8. To understand the Principles and method of processing and preservation of fish by refrigeration and freezing, drying, salting, canning, smoking and pickling.

		CO9. To understand the Fish by products of their economic importance.
		CO10. To understand the Fish endocrinology, reproduction, genetics and biotechnology.
MSZ-402D	**Entomology-II: Insect Physiology and Economic Entomology**	CO1. To understand the digestive system of insect, insect nutrition and absorption.
		CO2. To understand the Organs of Respiration, Mechanism of Gaseous Exchange, Respiration in Aquatic Insects, Physiology of Gill and Plastron Respiration, Respiration in Terrestrial insects- different types of spiracles and their structure, opening and closing mechanism of spiracles, trachea and tracheoles, Respiration in EntomophagusEndoparasites.
		CO3. To understand the Circulatory system of insects, Accessory Pulsatile Organs, Phagocytic organs, The haemolymph, Chemical composition of haemolymph, different types of haemocytes and their functions.
		CO3. To understand the Exretory system of Insects and in relation to understand the accessory organs of Excretion.
		CO4. To understand the Nervous system of Insect:
		The Sympathetic Nervous System and nerve impulse transmission.
		CO5. To understand the Male and female reproductive System, Hormonal control of reproduction and types of Reproduction.
		CO6. To understand the classification of pest, pest of Medical importance and Forest pest.
		CO7. To understand the mechanism of pest Control and the importance of Biological pest control.
		CO8. To understand the concept of Forensic Entomology.
MSZ-402E	**Animal physiology and Biochemistry-II**	CO1. To make the student update with information about the modern techniques related with the molecular engineering and manipulations like cloning of DNA/RNA, constituting cDNA library.
		CO2. To make the student understand about the involvement of hormone molecules with the target cells as well as with different metabolic reaction pathway.
		CO3. The course will provide insight knowledge on neuroendocrinological implications of puberty fertility and sterility in male and female.
		CO4. To learn about the physiology of stress and adaptation in relation to the environment and the Physiological mechanism linked with biological clock.
		CO5. To provide knowledge of internal body defense mechanism which link with many of the human diseases and utilized of the concept in treatment of the disease.
		CO6. To understand the knowledge about the use of body component like blood, urine, enzymes, etc.
MSZ-403	**Immunology, Bioinformatics and Research Methodology**	CO1. Understand the types of immunity
		CO2. Interactions of antigens, antibodies, complements and other immune components in laboratory.
		CO3. Use of Software for database preparation and Extract data from specific databases using accessions numbers, gene names etc . Use selected tools at NCBI and EBI to run simple analyses on genomic sequences
		CO4. Perform literature reviews using print and online databases;
		CO5. Helpful for research interest area using specific research designs.
		CO6. To understand Proteomics and Genomics by sequencing and mapping of the genomes.
MSZ-404A	**Practical: Cell Molecular Biology-II**	CO 1. To identify the various types of cancer cells through permanent mounting.

		CO 2. To study the cytological staining technique of Mitochondria & Golgi bodies.
		CO 3. To understand the technique of supra vital staining of cells.
		CO 4. To understand the histochemical staining of Protein & DNA.
		CO 5. To understand the extraction & separation of genomic DNA.
		CO 6. To understand the working mechanism of PCR
MSZ-404B	**Practical: Animal Ecology & Wildlife Biology-II**	CO1: To understand the ecological succession, energy flow in ecosystem, role of decomposers.
		CO2: Use of Instruments/Equipments on field and inside the Laboratory.
		CO3: To understand the wildlife diversity by using Quadrat Method, Drift-fence Pitfall method.
		CO4: To learn the Visual Counter method and various census methods like Pellet group counting, Pugmark Census.
		CO5: Students will understand to measure the Niche Breadth and Niche Separation by Levin's measure, Mac Arthur Measure, Bray and Curtis Method.
MSZ-404C	**Practical: Fish & Fishery Biology-II**	CO1. To understand the various physiochemical parameters of water with respect to fish biology
		CO2. To understand the age determining technique in fishes.
		CO3. To analyze the haematological parameters in fishes.
		CO4. To analyze the fish population estimation & its fecundity.
		CO5. To understand the feeding habit of fishes and plankton analysis.
		CO6. To understand the various design of fish farm/hatcheries & their significance.
MSZ-404D	**Practical:**	CO1. To demonstrate the Male Reproductive system of Cockroach with help of dissection.
		CO2. To understand the Nervous System, demonstrating the nervous system of cockroach with help of dissection.
		CO3. Demonstrating the salivary gland of Cockroach to understand the importance of salivary secretion.
		CO4. Demonstrating the digestive system of cockroach by dissection so that student will understand the general overview of digestive system of insect.
		CO5. To understand the Bacterial Chamber of insect, demonstrating the bacterial chamber of termites.
		CO6. To prepare the mounting of hepatic caeca and malpighian tubules to understand the respiratory system.
		CO7. Making field visit to understand the identification and collection of insect damages to crops.
MSZ-404E	**Practical: Animal Physiology and Biochemistry-II**	CO1. To understand the reproductive cycle in mice in the laboratory.
		CO2. To learn how to count and observe the motility of spermatozoa of mammals.
		CO3. To understand the Protein analysis with the help of SDS-PAGE technique.
		CO4. Students will learn how to prepare the histological slides of different endocrine gland of mammals.
		CO5. In the practical lab students will able learn the immunological process in the body.
		CO6. To demonstrate the advanced instruments in the lab.
MSZ-405	**DISSERTATION /PROJECT**	CO1. Student understand the concept of Reseach.
		CO2. To understand how to prepare the method and methodology ffor a Research work.

		CO3. To understand the future field of interest so that one student can extend their Research Work to Ph.D. level.
		CO4. To understand the new findings in the Research work.
		CO5. To understand the expansion of research work from the level of class room to the field.
		CO6. To understand the calculation of Inhibitor Constant (ki) for an enzyme using LB plot.
		CO7. To accountant students how formulate a research proposal and to generate innovative thinking.