**DEPARTMENT OF BIOCHEMISTRY**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBSc | BC-111 Chemistry of Biomolecules: | • Learn the elements present in biomolecules |
| | | • Differentiate between monomers and polymers. |
| | | • Explain the role of water in synthesis and breakdown of polymers. |
| | | • Compare and contrast the structure and function of the oligo and polysaccharides. |
| | | • Summarize the functions of proteins |
| | | • Recognize the importance of the three dimensional shape of a protein on its function and the role of non-covalent bonds in maintaining the shape of a protein. |
| | | • Compare and contrast saturated, mono-unsaturated, and poly-unsaturated fatty acids. |
| | | |
| | BC-112 Cell Biology: | • Differentiate between prokaryotic and eukaryotic cells |
| | | • Differentiate between plant and animal cells |
| | | • Discuss structure and functions of cell organelles |
| | | • Understand mitosis and meiosis processes. |
| | | • Explain types of tissues |
| | | • Explain types of cell junctions |
| | | |
| | BC-113 Basic techniques in biochemistry-I: | • Understand hazards and safety measure in laboratory. |
| | | • Do normality, molarity, percent solution based calculations. |
| | | • Perform qualitative tests for carbohydrates, lipids and amino acids |
| | | • Use, handling and care of compound microscope |
| | | • Identify various phases of mitosis |
| | | • Temporary mount available tissue |
| | | |
| | BC-121 Basic biochemistry: | • Recall DNA structure and functions |
| | | • Discuss types and functions of RNA |
| | | • Describe classification and properties of enzymes |
| | | • Understand industrial applications of enzymes |
| | | • Differentiate water soluble vitamins from fat soluble vitamins |
| | | • Understand clinical significance of the vitamins |
| | | |
| | BC-122 Fundamentals of Microbiology: | • Explain types, characteristics and significance of microorganisms |
| | | • Describe the structure and functions of major components of microbial cells |
| | | • Understand the concept of microbial growth, its measurement and growth curves |
| | | • Classify microorganisms based on nutrition |
| | | • Isolate bacteria on solid media |
| | | • Discuss various methods of sterilization and disinfection |
| | | |
| | BC-123 Basic techniques in biochemistry-II: | • Understand working principle of spectrophotometer and able to handle spectrophotometer |
| | | • Perform various staining techniques |
| | | • Isolate and characterize bacteria by streak plate method |
| | | • Determine viable count of the micro-organisms. |
| | | • Perform IMViC test and identify bacteria of enterobacteriaceae |
| | | • Analyze quality of drinking water |
| | | |
| SYBSc | BC-231 Food Biochemistry | • Classify food based on functions |
| | | • Calculate energy value of food and its measurement |
| | | • Explain food adulteration and its types |
| | | • Discuss food spoilage and various factors determining food spoilage |
| | | • Discuss various methods of food preservation |

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| | | • Understand the concept of food allergy and food additives |
| | | • Understand the significance of therapeutic diet |
| | | |
| | BC-232 Human physiology-I | • Understand histology and anatomy of various organs of digestive system |
| | | • Discuss digestion and absorption of carbohydrates, proteins and lipids |
| | | • Explain structure and functions of various parts of respiratory system |
| | | • Understand mechanism of respiratory process |
| | | • Learn various types of hematopoiesis |
| | | • Understand mechanism of blood coagulation |
| | | • Explain structure and functions of nephron. |
| | | • Understand mechanism of urine formation |
| | | |
| | BC-233 Practical course in Biochemistry-I | • Enumerate RBCs and WBCs |
| | | • Determine blood groups ESR and understand its clinical significance |
| | | • Determine energy value of food stuff using bomb calorimeter |
| | | • Identify adulterants present in food stuffs |
| | | • Determine rancidity in edible oil and its applications |
| | | • Determine moisture content in food sample |
| | | • Examine food for microorganisms |
| | | |
| | BC-241 Environmental Biochemistry | • Understand the concept of pollution and pollutants |
| | | • Learn about green house effect and global warming and measures to control green house effect |
| | | • Understand the concept of bioenergy |
| | | • Explain biodegradation and bioremediation |
| | | • Discuss concept and types of toxins |
| | | • Understand mode of action of pesticides and its impact on environment |
| | | |
| | BC-242 Human Physiology-II | • Explain structure, functions and types of neurons |
| | | • Discuss mechanism of synaptic transmission |
| | | • Understand anatomy, histology and functions of male and female reproductive system |
| | | • Learn molecular events during fertilization |
| | | • Learn mechanism of hormone action |
| | | • Explain various hormones secreted by endocrine glands and their functions |
| | | • Understand mechanism of taste perception and olfaction |
| | | |
| | BC-243 Practical course in Biochemistry-II | • Record blood pressure by sphygmomanometer and explain its significance |
| | | • Determine bleeding time and clotting time and explain its significance |
| | | • Determine sodium and potassium content in blood serum samples by flame photometer |
| | | • Analyze wastewater for BOD/COD |
| | | • Analyze soil and water for various parameters |
| | | • Estimate of phosphate by Fisk-Subbarow method. |
| | | |
| TYBSc | BC-351Genetics: | • Understand Mendel’s laws |
| | | • Describe structural organization of prokaryotic & eukaryotic DNA |
| | | • Describe prokaryotic replication. |
| | | • Explain fine structure of gene. |
| | | • Describe prokaryotic transcription. |
| | | • Describe prokaryotic translation. |
| | | • Explain mutations and mutagens. |
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| | BC-352 Plant Biochemistry: | • Explain Ultra structure of chloroplast. |
| | | • Discuss mechanism of photosynthesis. |
| | | • Discuss photorespiration. |
| | | • Explain electron transport chain. |
| | | • Describe mechanism of action of phytohormones. |
| | | • Classify secondary metabolites. |
| | | |
| | BC-353 Clinical Biochemistry: | • Understand regulation of blood glucose level. |
| | | • Discuss disorders related to carbohydrate metabolism. |
| | | • Explain various types of hemoglobinpathies. |
| | | • Discuss disorders related to protein metabolism. |
| | | • Explain ketosis. |
| | | • Explain types of fatty liver. |
| | | |
| | BC-354 Metabolism: | • Understand regulation of blood glucose level. |
| | | • Describe major pathways like Glycolysis, TCA cycle, Urea cycle etc. |
| | | • Discuss amino acid catabolism like transamination, transmethylation, decarboxylation etc. |
| | | • Calculate bioenergetics of carbohydrates, fatty acids etc. |
| | | • Understand biosynthesis and elongation of fatty acids. |
| | | • Describe biosynthesis and regulation of nucleotides. |
| | | |
| | BC-355 Biophysical chemistry: | • Understand the properties of water in relation to life process. |
| | | • Understand acid-base, buffers and biological buffers concepts and systems. |
| | | • Discuss diffusion, osmosis and colloids. |
| | | • Understand viscosity, surface tension and adsorption concept. |
| | | • Explain energy and energy rich compounds. |
| | | • Describe thermodynamics and redox potential. |
| | | |
| | BC-356 Biotechnology | • Understand the fermentation technology. |
| | | • Explain preservation methods for industrially important microbes. |
| | | • Discuss bioreactors. |
| | | • Describe industrial production of enzymes, acids and alcohol. |
| | | • Discuss downstream processing. |
| | | • Understand animal tissue culture. |
| | | |
| | BC-357 Techniques in molecular biology-I: | • Isolate DNA from bacteria. |
| | | • Estimate DNA and RNA. |
| | | • Estimate chlorophyll and secondary metabolites. |
| | | • Produce alcohol and enzyme. |
| | | • Prepare media for ATC. |
| | | • Isolation of cell from animal tissue. |
| | | |
| | BC-358Diagnostics biochemistry-I: | • Estimate haemoglobin and explain its clinical significance. |
| | | • Estimate urea and uric acid and explain its clinical significance. |
| | | • Estimate serum creatinine and cholesterol and explain its clinical significance. |
| | | • Estimate blood glucose and explain its clinical significance. |
| | | • Detect abnormal constituents of urine and explain its clinical significance. |
| | | • Estimate proteins and explain its clinical significance. |
| | | |
| | BC-359Analytical biochemistry and enzymology-I: | • Prepare phosphate buffer of suitable pH. |

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| | | • Determine viscosity of the given liquid. |
| | | • Estimate Lambda Max and extinction coefficient of the given liquid sample. |
| | | • Separate and purify proteins by dialysis, electrophoresis and chromatography. |
| | | • Separate amino acids by paper electrophoresis and chromatography. |
| | | • Understand instrumentation and working principle of HPLC, GC, AAS and IR. |
| | | |
| | BC-361 Genetic Engineering: | • Understand concept of genetic engineering. |
| | | • Describe vectors and its construction. |
| | | • Explain the methods of gene transfer. |
| | | • Understand the concept of gene library. |
| | | • Understand DNA sequencing methods. |
| | | • Discuss the PCR techniques. |
| | | |
| | BC-362 Plant and agrobiotechnology: | • Understand the basic requirements of PTC lab. |
| | | • Understand types of culture and micropropagation. |
| | | • Discuss various methods of genetic engineering of plants. |
| | | • Explain mechanism of nitrogen fixation. |
| | | • Describe biofertilizers and composting. |
| | | • Understand the application and scope of PTC. |
| | | |
| | BC-363Clinical Biochemistry-II: | • Understand the clinical importance of enzyme and isoenzymes. |
| | | • Discuss inborn errors of metabolism. |
| | | • Explain hematopoesis. |
| | | • Understand cell and organs of immune system. |
| | | • Explain antigen, antigenicity and immunogenicity |
| | | • Describe structures and types of antibody. |
| | | |
| | BC-364Enzymology: | • Describe enzyme nomenclature and classification. |
| | | • Explain factors affecting on enzyme activity. |
| | | • Discuss mechanisms of enzyme action. |
| | | • Understand Michaelis Menten equation and its transformation. |
| | | • Understand the allosteric enzymes, covalently modulated enzyme and classes of proteolytic enzymes. |
| | | • Describe Enzyme immobilization, its applications, Enzyme sensors and their application |
| | | |
| | BC-365-Analytical Techniques: | • Understand concept of electromagnetic radiation. |
| | | • Describe various spectrophotometric techniques. |
| | | • Understand concept of distribution coefficient. |
| | | • Explain classification, principle and application of chromatography. |
| | | • Discuss principle and application of electrophoresis. |
| | | • Understand principle and application of centrifugation. |
| | | |
| | BC-366Biostatistics and Bioinformatics: | • Understand basic terms and applications of biostatistics. |
| | | • Represent the DATA diagrammatically. |
| | | • Understand limitations of graphic representation. |
| | | • Measure central tendencies like mean, mode and median and their relationship. |
| | | • Understand probability and its applications. |
| | | • Understand the concept of genomics, proteomics and use FASTA and BLAST. |
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| | BC-367 Techniques in molecular biology-II: | • Prepare of manure by vermicomposting process. |
| | | • Prepare MS media for PTC. |

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| | | • Develop somatic embryo and seedling from suitable tissue. |
| | | • Develop shoot and callus from suitable tissue. |
| | | • Isolate protoplast. |
| | | • Perform restriction digestion of DNA and PCR techniques. |
| | | |
| | BC-368 Diagnostics biochemistry-II: | • Estimate SGOT, SGPT and understand its clinical significance. |
| | | • Estimate alkaline and acid phosphatase and understand its clinical significance.. |
| | | • Estimate serum calcium and understand its clinical significance.. |
| | | • Understand ELISA with significance. |
| | | • Estimate serum bilirubin and understand its clinical significance. |
| | | • Perform Ag-Ab reaction. |
| | | |
| | BC-369Analytical biochemistry and Enzymology-II: | • Determine the effect of enzyme and substrate concentration on rate of reaction. |
| | | • Determine the effect of pH and temperature on enzyme activity. |
| | | • Perform enzyme/cell immobilization technique. |
| | | • Prepare phylogenetic tree. |
| | | • Align protein/DNA sequence using BLAST |
| | | • Calculate mean, mode, median and probability. |
| | | |

**DEPARTMENT OF BIOTECHNOLOGY**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBSc | BT-111 Foundations of biotechnology | • Comprehend about the introduction and history of biotechnology. |
| | | • understand the scope in agriculture, medicinal, agriculture and environment. |
| | | • understand the scope of cell biology and basic structural and functional study of prokaryotic and eukaryotic cells |
| | | • understand the scope of growth, nutrition and factors affecting microbial growth |
| | | • understand the basic requirements of microorganisms and further its classification. |
| | | |
| | BT-112 Methods in biotechnology | • understand the scope and introduction to physiological properties of Water |
| | | • understand the Concept of pH and buffer |
| | | • understand the Principle of biological buffers |
| | | • understand the Stoichiometry principle and significance |
| | | • understand the Principle, general features and significance of biophysical terms like density, sedimentation, centrifugation, surface tension, adsorption |
| | | |
| | BT-113Basic techniques in biotechnology | • understand the Safety measures in laboratory, handling and care of instruments. |
| | | • understand the Determination of pKa, Standard solutions. |
| | | • understand the Monochrome staining, Negative staining , Gram´s staining. |
| | | • understand the Biochemical test, specific gravity, Viscocity. |
| | | • understand the Motility testing by hanging drop method |
| | | |
| | BT-121: Biomolecules | • understand the basic component or biomolecules of living organisms |
| | | • understand the Definition, classification, biological function and chemical and physical properties of carbohydrates |
| | | • understand the Definition, classification, biological function and chemical and physical properties of Lipids |
| | | • understand the definition, classification, biological function, chemical and physical properties, structural characteristic of proteins and nucleic acids |
| | | |
| | BT-122 Microbial Techniques | • understand the Concept, principle and types of sterilization methods |
| | | • understand the Concept and characteristics of antiseptic, disinfectant and their mode of action |
| | | • understand the Concept of culture and type of culture |
| | | • understand the Cultivation methods of bacteria, yeast, fungi and virus |
| | | • understand the Principle, working and applications of instruments viz, pH meters, spectrophotometer, centrifuge, viscometer, and laminar air flow |
| | | |
| SYBSc | BT-231 Cell Biology and Metabolism | • understand the the eukaryotic cell cycle and mitotic and meiotic cell division |
| | | • understand the Structure and organization of cell membrane |
| | | • understand the Process of membrane transport and membrane models |
| | | • understand the Structure and general features of enzymes |
| | | • understand the Concept of enzyme activity and enzyme inhibition |
| | | |
| | BT-232: Molecular biology | • understand the genomic organization or living organisms, study of genes genome, chromosome etc. |
| | | • understand the mechanism and essential component required for prokaryotic DNA replication. |
| | | • understand the fundamentals of DNA damage and repair, including types of mutation and repair mechanisms. |
| | | • understand the Transcription, enzymes involved in transcription and its inhibitors. |
| | | • understand the Translation, enzymes involved in translation and its inhibitors. |
| | | • understand the concept of operon and its structure and regulation. |
| | | |
| | BT-233 Practical course in biotechnology -1 | • understand the determination of microbial size by micrometry |
| | | • understand the Microscopic examination of mitotic and meiotic stages of eukaryotic cells |
| | | • understand the Biochemical estimation of biomolecules like DNA, RNA etc. |
| | | • understand the Effect of physical parameters on enzyme |
| | | • understand the Enzyme catalytic action of enzymes like alkaline phosphotase |
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| | BT-241: Biophysics | • understand the Concept of electromagnetic radiation, absorption spectrum, Beer's law and Lamberts law |
| | | • understand the Principle, working and applications of spectrophotometer and AAS |
| | | • understand the Concepts of chromatography and concept of partition coefficient |
| | | • understand the Principle, methodology and application of various chromatographic techniques |
| | | • understand the Principle, methodologies and application of electrophoric separation of biomolecules |
| | | |
| | BT-242: Immunology and bioprocess technology | • understand the Immunology, immune system, properties of immune system, types of immunity |
| | | • understand the Concept of antigen, antigenic determinants, hapten, factors affecting antigencity |
| | | • understand the Immunoglobulin, structure, types and functions |
| | | • understand the Basic of bioprocess technology, concept and significance of bioprocess technology, concept of bioreactor, designing of fermenter and types of fermentation. |
| | | • understand the Screening of microorganisms, storage and preservation of industrially important microorganisms |
| | | • understand the Culture collection and culture collection centres, national: NCIM, MTCC and international ATCC |
| | | |
| | BT-243 Practical course in biotechnology II | • understand the Verification of Beer's law |
| | | • understand the Determinationof lambda max by using a suitable dye |
| | | • understand the Separation of amino acids by paper chromatography |
| | | • understand the Separation of amino acids/sugar by thin layer chromatography |
| | | • understand the Ethanol production by using Saccharomyces cerevisiae |
| | | • understand the Isolation of amylase/protease producing organisms |
| | | • understand the Isolation of organic acid producing organisms |
| | | • understand the Oil overlay method for preservation of industrially important organisms |
| | | • understand the Determination of blood group with Rh typing |
| | | • Demonstrate agarose gel electrophoresis |
| | | |
| TYBSc | BT-351: Genetics | • understand the Mendelian and Neo-mendelian genetics |
| | | • study the phenomenon of dominance, laws of segregation, independent assortment of genes. |
| | | • understand the different types of genetic interaction, incomplete dominance, co-dominance, inter allelic genetic interactions, multiple alleles and quantitative inheritance etc. |
| | | • understand the principles and mechanisms of linkage and crossing over. |
| | | • study human sex anomalies including eugenics and euphenics, genetic drift and disorders due to mutant genes. |
| | | |
| | BT-352 Agricultural biotechnology | • interpret Symbiotic-Non symbiotic nitrogen fixation in leguminous plant |
| | | • interpret Assimilation of sulphur and phosphorus by plants |
| | | • interpret Bio fertilizer, comparison between bio fertilizer and chemical fertilizer |
| | | • understand the Concept of plant pathology,classification of plant diseases based on symptoms |
| | | • understand Plant diseases- a)Bacterial blight of pomegranate b) Bacterial blight of cotton c) Whip smut of sugarcane |
| | | • understand Integrated pest management(IPM)- insect resistant crop |
| | | |
| | BT-353: Animal Biotechnology | • Understand the History, scope, principle, merits and demerits of animal cell and tissue culture. |
| | | • Understand the Laboratory facilities and culture media for animal tissue culture. |
| | | • Understand the Cell lines, application of animal cell and tissue culture, biohazards and Biosafety. |
| | | • Get information about transgenic animals, cryopreservation, apoptosis, Animal cloning. |
| | | • Understand the Cell transformation, DNA microinjection. |
| | | • Understand the Economic aspects of transgenic animals and Ethical issues of animal welfare and animal rights. |
| | | |
| | BT-354 Industrial biotechnology | • Understand the Concept and types of strain improvement techniques |
| | | • Understand the Fermentative productions of representative biomolecules like Enzymes, antibiotics, vitamin, beverages |
| | | • Understand the Recovery and purification of biomolecules |
| | | • Understand the Quality control procedures like sterility, toxicity, carcinogenicity testing |

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| | | • Understand the Concept and features of cost economics and GLP |
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| | BT 355-Food Biotechnology | • Understand the Primary Source of microbes in various foods |
| | | • Understand the Definition, general features and different products of milk |
| | | • Understand the Microbial analysis of milk |
| | | • Understand the Microbial production of fermented food viz. cheese, bread etc. |
| | | • Understand the Causes of food spoilage, Spoilage of fruit, Vegetables, Dairy product |
| | | • Understand the Food Preservation –Chemical Method, Physical method |
| | | |
| | BT 356-Environmental Biotechnology | • Understand the Domestic waste water treatment, Classification Of Waste water treatment |
| | | • Understand the Biodegradation-Concept,Biodegradation of hydrocarbon,Measurement of biodegradation |
| | | • Understand the Bioremediation-Concept, Methods of Bioremediation (In-situ and Ex-situ Bioremediation) |
| | | • Understand the Phytoremediation-Concept(Rhizofiltration,Phytotransformation,Phytostimulation) |
| | | • Understand the Xenobiotics and recalcitrant ,Generalize Fate of xenobiotic Degradation |
| | | • Understand the Xenobiotic biodegradation, Herbicide Degradation ,Metabolism of Xenobiotics |
| | | |
| | BT-357 Industrial Biotechnology | • Understand the Fermentative production of biomolecules like vitamin, antibiotics, ethanol etc |
| | | • Understand the Biochemical estimation of fermentative products like organic acids, vitamin, antibiotics etc. |
| | | • Understand the  Chemical estimation of penicillin |
| | | • Understand the Industrial visit and demonstrative session at outdoor industry |
| | | |
| | BT-358: Animal Biotechnology and Immunology. | • Understand the Blood film preparation and identification of blood cells, human blood grouping |
| | | • Understand the Immunological techniques, double diffusion, widal test, ELISA. |
| | | • Understand the Animal cell culture media preparation and sterilization . |
| | | • Understand the Survival curve of bacteria against UV radiation |
| | | • Understand the Immobilization of whole cell . |
| | | • Understand the Nucleic acid separation using Agarose gel electrophoresis. |
| | | |
| | BT-359: Food and environment biotechnology | • Understand the Isolate and characterize food fermenting organisms |
| | | • Understand the Analyse the mycotoxin from fungus contaminated food materials |
| | | • Understand the Microscopic examination of food and milk by breed methods |
| | | • Understand the Qualitative checking and evaluation of pasteurization of milk by MBRT test and phosphatise test |
| | | • Understand the Study the quality of soil by determining the total carbohydrate, nitrogen and phosphorus. |
| | | • Understand the Study the quality of water by determining the Biological oxygen demand and chemical oxygen demand. |
| | | |
| | BT-361: Gene biotechnology and bioinformatics | • Understand the Basic of rDNA technology, Concept and principle and application of genetic engineering. |
| | | • Understand the Principles, material and methodology of techniques involved in rDNA technology, include Gel electrophoresis, blotting techniques, sequencing methods, PCR. RFLP, RAPD, DNA fingerprinting. |
| | | • Understand the Definition, history and scope of bioinformatics |
| | | • Understand the Classification database used in bioinformatics Primary and secondary. |
| | | • Understand the BLAST, gene bank, EMBL, DDBJ, NCBI |
| | | |
| | BT-362 Plant Biotechnology | • Understand the Preperation of media and sterilization of plant tissue culture materia |
| | | • Understand the Methods of plant tissue culture |
| | | • Understand the Methods of secondary metabolites production |
| | | • Understand the plant pathogen and pathology concepts |
| | | • Understand the methods of embrio cullture |
| | | • Understand the Methods of biofertilizer preperation |
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| | BT-363immunology | • Understand the Immune system, types of immunity, primary and secondary lymphoid organ. |

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| | | • Understand the Innate and acquired immunity, antigen, immuneresponse primary and secondary immune response, complement system, interferons. |
| | | • Understand the Ag-abinteractions,precipitation, agglutination, RIA, ELISA, monoclonal antibodies. |
| | | • Understand the Immunosuppresion, Vaccines, passive immunization, immunodeficiency disorder. |
| | | • Understand the Immunepharmacology, nonsteroidalanti-inflammatory drugs and glucocorticoids. |
| | | |
| | BT -364: Advanced bioprocess Technology | • Understand concept and types of Biotranformation |
| | | • Understand the Enzyme immobilization types and applications |
| | | • Understand the Types and principles of biofules |
| | | • Understand the Biogas and conversion of lignocellulose to biogas |
| | | • Understand the Biosorption and Bioleaching of metals |
| | | |
| | BT 365 – Pharmaceutical Biotechnology | • Understand the Concept, classification production and applications of secondary metabolites |
| | | • Understand the Classification and production and characterization of antimicrobial ganets |
| | | • Understand the Biological techniques to estimates antibiotics like MIC |
| | | • Understand the Structure, mechanisms and applications of different antibiotics like sulfonamides, griseofulvin, quinolones etc. |
| | | • Understand the Concept and principle of protein engineering |
| | | • Understand the Molecular aspects of drug designing |
| | | |
| | BT-366 Biodiversity and biometry | • Understand the Concept of evolutionary, molecular taxonomy |
| | | • Understand the Concept, characteristics of biodiversity and its conservation methods |
| | | • Understand the Concept, types and applications of bio-indicators |
| | | • Understand the Concept of biostatistics and samples |
| | | • Understand the Techniques of sampling and data analysis |
| | | • Understand the Biological data analysis through various techniques of measures of dispersion |
| | | |
| | BT-367 Plant Biotechnology | • Understand the Isolation and identification of Xanthomonascitri, Rizobiumsp, Azotobactor |
| | | • Understand the Determination of IAA Activity |
| | | • Understand the Pereration of stocks and sterization of media for PTC |
| | | • Understand the Callus culture of medicinal plants |
| | | • Understand the Shoot tip culture of medicinal plants |
| | | |
| | BT-368: Genetics and bioinformatics | • Understand the Monohybrid and dihybrid crosses, single point and two point crosses,Gene mapping |
| | | • Understand the conjugation, competent cell system and transformation. |
| | | • Understand the isolation of DNA from E. col |
| | | • Understand the various domains of bioinformatics, database. |
| | | • Understand the Gene and protein information searching and accessing from web |
| | | • Understand the Protein secondary structure prediction using Rasmol. |
| | | |
| | BT-369: Pharmaceutical Biotechnology | |
| | | • Understand the Sterility testing of pharmaceutical products injectable/Ophthalmic solution, membrane filter technique |
| | | • Understand the Chemical assay of antibiotic (Streptomycin/penicillin), Microbiological assay of Streptomycin or Penicillin by cup plate/ paper disc method, Determination of Minimum Inhibitory Concentration (MIC) of Antibiotic. |
| | | • Understand the Microbial limit test (MLT) of pharmaceutical product, Isolation of antibiotic resistant bacteria population by gradient plate method |
| | | • Understand the Validation of laminar air flow cabinet, Validation of autoclave using biological indicator |
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| MSC | BT-101 Microbial diversity and physiology | • Get an insight into Classification of microorganisms as eukarya: algae, fungi, slime molds, protozoa, viruses |
| | | • Get an insight into Nutritional requirements and nutritional grouping of microorganisms, enumeration and preservation of microbes. |
| | | • Get an insight into Microbes in natural habitats- air, water and soil |
| | | • Get an insight into Mechanism involved in transport of nutrient, photosynthesis in microorganisms |

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| | | • Get an insight into Phylogenetic relationship between various genera, new approaches to bacterial taxonomy, metagenomics, denaturing gradient gel electrophoresis |
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| | BT-102: Biomolecules and molecular enzymology | • Get an insight into Carbohydrates classification, structure, function, properties, anabolic and catabolic pathway and regulation of carbohydrate metabolism. |
| | | • Get an insight into Lipids classification, structure, function, properties, anabolic and catabolic pathway and regulation of lipid metabolism. |
| | | • Get an insight into Nucleic acids and protein classification, structure, function, properties, linking number, C-value paradox, ramchandran plot, optical and chemical properties. |
| | | • Get an insight into Enzymes classification and nomenclature, isolation, purification and large scale production, mechanisms of enzyme action. Coenzymes and cofactor, structure and function. |
| | | • Get an insight into Enzyme kinetics, enzyme activity, spefificity, Vmax, Km, unisubstrate and multisubstrate kinetics, MM equation, LB plot, Briggs Haldane hypothesi, Hill and Satchard plots. |
| | | • Get an insight into Allosteric enzymes mechanism of allosteric enzymes, enzyme inhibition, feedback inhibition, immobilization of enzyme and its industrial applications. |
| | | |
| | BT-103: Immunology | • Get an insight into Innate and adaptive immune mechanism, organs of immune system, cells of immune system, antigens, Factors affecting immunogenicity, immunoglobulins. |
| | | • Get an insight into Major histocompatibility system, Recognition of antigens, T cell receptor complex, activation of T and B cell. |
| | | • Get an insight into Complement system, Inflammation, Cytokines, |
| | | • Get an insight into Hypersensitivity, type I and type II reactions, immune complex mediated hypersensitivity, immunodeficiency syndrome, autoimmunity,. |
| | | • Get an insight into Immunodiagnostics, precipitation agglutination, ELISA, fluorescence technique, |
| | | • Get an insight into RIA, Western Blotting, monoclonal antibodies. |
| | | |
| | BT 104-LAB COURSE-1 | • Get an insight into Isolation and maintenance of microorganism by platting , dilution method, Measurement of growth by colony forming unit |
| | | • Get an insight into Bacterial Growth-Growth curve and Isolation of UV Mutant |
| | | • Get an insight into Antimicrobial Assay , Analysis of water by MPN |
| | | • Get an insight into Quantitative assay of Protein, Sugar, Estimation of Amino acid |
| | | • Get an insight into Determination of acid value |
| | | • Get an insight into Estimation of DNA and RNA |
| | | |
| | BT-105: Lab course II | • Get an insight into Blood film preparation and identification of blood cells, human blood grouping |
| | | • Get an insight into Immunological techniques, double diffusion, radial Immunodiffusion, widal test, ELISA, western blotting, rocket immunoelectrophoresis. |
| | | • Get an insight into Purification techniques, purification of IgG from serum, purification of H and O antigens, antibody-enzyme conjugates preparation. |
| | | • Get an insight into Enzyme kinetics, enzyme activity, enzyme specificity, turnover number, Km and Vmax. |
| | | • Get an insight into Enzyme immobilization and effect of pH and temperature on enzyme activity. |
| | | |
| | BT-202: Bioinstrumentation and biostatistics | • Get an insight into Principles and applications of microscopy, light, phase, fluorescence, SEM, TEM , electron, confocal microscopy. Cytophotometry and flow cytometry. |
| | | • Get an insight into Principles and techniques of preparative analytical centrifugation, include ultracentrifugation, sedimentation analysis and gradient centrifugation. |
| | | • Get an insight into Chromatography techniques, principle, material, methodology and application. Paper, TLC, Gel filtration, ion exchange, affinity, GLC, HPLC and electrophoresis. |
| | | • Get an insight into Theory and application of UV and visible spectroscopy. Fluorescence spectroscopy, NMR, ESR, AAS, X-ray diffraction, MS, MALDI-TOF, ORD and CD and radioisotopes and application radioisotopes in different techniques. |
| | | • Get an insight into Introduction to biostatistics, statistical population, samling methods, data representation, measures of variability, standard deviation, standard error, range, mean, mode and median, ANOVA, Chi square test etc. |
| | | |
| | BT-302: Plant Biotechnology | • Get an insight into Laboratory organization, culture media, callus culture, suspension culture, Assessment of growth and viability, Micropropagation, Somatic embryogenesis, synthetic seeed. |
| | | • Get an insight into Meristem culture, Somaclonal variations, haploid plants, androgenesis, gynogenesis, embryogenesis. |
| | | • Get an insight into Protoplast culture, somatic hybridization, cybrids, germplasm conservation and cryopreservation. |
| | | • Get an insight into Nuclear genome, chloroplast genome, mitochondrial genome, transposon, Chloroplast transformation, Agrobacterium mediated transformation. |
| | | • Get an insight into Application of DNA technology, plant cell as biofactories for the production of Secondary metabolites. |

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| | BT-402: Bioinformatics | • Get an insight into Genomics, Approaches for finding genes, structural genomics, functional genomics, Comparative genomics, oligonucleotide fingerprinting, gene chips |
| | | • Get an insight into Proteomics 1D and 2D electrophoresis, mass spectrometry, MALDI-TOF, protein chips. |
| | | • Get an insight into Biological databases NCBI, PUBMED, genebank, DDBJ, swissprot, PIR, EMBL, PDB, MMDB,SRS, ENTREZ, Expasy. |
| | | • Get an insight into Sequence analysis, FASTA, BLAST, sequence alignment, Scoring matrices-PAM, BLOSSUM |
| | | • Get an insight into Data mining and visualization, CN3D, rasmol, mol-mol, pymol, chimera, swissPDB viewer, Biopearl and biojava |
| | | |
| | | • Get an insight into Bioprocess engineering, mutagenesis, protoplast fusion techniques for strain improvement of primary and secondary metabolite |
| | BT-203: Bioprocess engineering and technology | • Get an insight into Bioreactors, computer control of fermentation process, tube reactors, packed bed reactors, fluidized bed reactors, cyclone reactors. |
| | | • Get an insight into Fermentation process, media in fermentation, safety in fermentation laboratory. |
| | | • Get an insight into Classification of fluids, viscocity, gas liquid mass transfer. agitation system. |
| | | • Get an insight into Downstream processing, centrifugation, liquid-liquid exctraction. |
| | | |
| | BT-123: | • Get an insight into Bioprocess engineering, mutagenesis, protoplast fusion techniques for strain improvement of primary and secondary metabolite |
| | | • Get an insight into Bioreactors, computer control of fermentation process, tube reactors, packed bed reactors, fluidized bed reactors, cyclone reactors. |
| | | • Get an insight into Fermentation process, media in fermentation, safety in fermentation laboratory. |
| | | • Get an insight into Classification of fluids, viscocity, gas liquid mass transfer. agitation system. |
| | | • Get an insight into Downstream processing, centrifugation, liquid-liquid exctraction |
| | | |
| | BT-123Basic techniques in biotechnologyII | • Get an insight into Isolation of Biomolecule starch and protein. |
| | | • Get an insight into Estimation of protein, reducing sugar and acid number of oil. |
| | | • Get an insight into Preparation and sterilization of laboratory media. |
| | | • Get an insight into Streak plate method, pour plate method and spread plate method. |
| | | • Get an insight into TVC of microflora, cultivation of fungi, study of colony characteristics. |
| | | |
| | BT-123Basic techniques in biotechnologyII | • Get an insight into Isolation of Biomolecule starch and protein. |
| | | • Get an insight into Estimation of protein, reducing sugar and acid number of oil. |
| | | • Get an insight into Preparation and sterilization of laboratory media. |
| | | • Get an insight into Streak plate method, pour plate method and spread plate method. |
| | | • Get an insight into TVC of microflora, cultivation of fungi, study of colony characteristics. |
| | | |
| | BT 303- Advanced Environmental Biotechnology | • Get an insight into Solid Waste Management, Waste water management ,Air pollution management |
| | | • Get an insight into Bioremediation – Characterization site for bioremediation ,Types of bioremediation |
| | | • Get an insight into Biodegradation-Assimilation , Detoxification , Biotransformation , Factor Affecting Biodegradation, Biodegradation of ( Pesticides, Lignin , Halogenated hydrocarbons) |
| | | • Get an insight into Biodiversity (Global and National ) Measurement of Biodiversity |
| | | • Get an insight into Biosensor : Types , Working, Application of Biosensors , |
| | | • Get an insight into Biofuels: Advantages , Energy from biomass, Biogas, Biohydrogen,Biosafety |
| | | • Get an insight into Toxicity – Bio magnification, Threshold Dose, Factor Affecting Toxicity , Antidotal Procedure |
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| | BT 305 – LAB COURSE-VI | • Get an insight into Determination of Acidity,Alkalinity,Salinity, Determination of COD |
| | | • Get an insight into Estimation of Nitrogen of soil ( Kjeldals method) , |
| | | • Get an insight into Vermicomposting , Co-composting of Biosolid , Determination of Soil Microbial Activity |
| | | • Get an insight into Testing of Cytotoxicity , Estimation of metal content of soil ,comet Assay to asses DNA damage |
| | | • Get an insight into Determination of MIC of Heavy metal , Production of biodiesel from microalgae |
| | | • Get an insight into Estimation of Biodiversity Index |
| | | |
| | BT-202 Bioinstrumentation and biostatistics | • Get an insight into Principle, working and applications of various microscopes |

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| | | • Get an insight into Principle, working and applications of chromatographic techniques |
| | | • Get an insight into Concept and working of spectroscopy and radio image analysis |
| | | • Get an insight into Introduction of biostatistics and sampling techniques |
| | | • Get an insight into Biological data analysis |
| | | • Get an insight into Statistical validation of biological data through various data sample analysis |
| | | |
| | BT204 – Lab Course III | • Get an insight into Isolation of genomic DNA , Isolation of plasmid DNA by using alkaline lysis method |
| | | • Get an insight into Determination of Tm of Nucleic Acid |
| | | • Get an insight into Isolation of RNA , Transformation of E coli |
| | | • Get an insight into Electrophoresis of protein |
| | | • Get an insight into Different types of chromatography |
| | | |
| | BT403 –Industrial and Business Biotechnology | • Get an insight into Microbial production of Organic acid and Solvent production, recovery , application |
| | | • Get an insight into Microbial production recovery of Amino Acid , Vitamins and chemotherapeutic agents |
| | | • Get an insight into General features, production and application of polysaccharides |
| | | • Get an insight into Microbial production and applications of enzymes |
| | | • Get an insight into Principle of business management and concept of IPR |
| | | |
| | BT-362 Plant Biotechnology | • Get an insight into Totipotency, organization of plant tissue culture, aseptic technique of PTC, meristem culture, organ culture |
| | | • Get an insight into Phytohormones |
| | | • Get an insight into Transgenic plants- methods, analysis, applications |
| | | • Get an insight into Concept of horticulture |
| | | • Get an insight into Types of green houses |
| | | |
| | BT-201 Molecular biology | • Get an insight into Concept of gene, gene cistron relationship in prokaryotes and eukaryotes, |
| | | • Get an insight into DNA regulation and replication |
| | | • Get an insight into Types of DNA damage,DNA repair pathways |
| | | • Get an insight into Transcription in prokaryotes |
| | | • Get an insight into Protein synthesis and processing, post translational modifications of protein |
| | | • Get an insight into Gene regulation |
| | | • Get an insight into Enzymes in genetic engineering, vectors |
| | BT-301 Recombinant DNA technology | |
| | | • Get an insight into Methods of gene transfer |
| | | • Get an insight into Gene cloning, indirect and direct screening |
| | | • Get an insight into Expression strategies for heterologus genes, gene bank, animal farming |
| | | • Get an insight into Techniques and application DNA sequencing |
| | | • Get an insight into Biotechnology in food, biofortification, food processing( heat, acid and alkal, food irradiation, food additives |
| | | |
| | BT-401 Food and pharmaceutical biotechnology | • Get an insight into Technology of typical food products,new trend in packaging, foods |
| | | • Get an insight into Genetic engineering of baker's yeast, ELISA, biosensors |
| | | • Get an insight into Estimation of toxicity, guides to good manufacturing practice |
| | | • Get an insight into Biopharmaceuticals of animal, interferon and cytokinin, gene therapy, antigene and antisense therapy |
| | | |
| | BT-304 Lab course-5 | • Get an insight into Preparation and sterilization of MS medium, stocks and explants |
| | | • Get an insight into Callus induction, regeneration of shoots, root induction, meristem culture using oscimum sanctum plant. |
| | | • Get an insight into Isolation of protoplast, fusion and culture, somatic embryogenesis |
| | | • Get an insight into Development of synthetic seeds, micropropagation of banana, citus papaya, sugarcane etc. |
| | | • Get an insight into Isolation of pBR-322, preparation of competent cells. |
| | | • Get an insight into Transformation by calcium chloride method |
| | | • Get an insight into Screening of bacterial colonies using X-gal and IPTG, isolation and purification of yeast DNA |

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| | | • Get an insight into Demonstration of southern blot/ northern blot/ western blot/ PCR. |
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| | BT-404 Lab course-7 | • Get an insight into Analysis of milk and milk products, determination of adulterants of food |
| | | • Get an insight into Estimation of thiamine, riboflavin and food stuffs |
| | | • Get an insight into Aflatoxin test, bioassay of vitamins/antibiotics |
| | | • Get an insight into Isolation of bacterial exo-polysaccharides, estimation of alkaline protease, lipase |
| | | • Get an insight into Production of sauerkraut by microorganisms |
| | | • Get an insight into Alignment and multiple sequence alignment of DNA and protein |
| | | • Get an insight into Protein structure visualization and molecular modeling, secondary structure prediction |
| | | • Get an insight into Phylogenetic analysis |
| | | |

**DEPARTMENT OF BOTANY**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| F.Y.B.Sc. | BOT.11BACTERIA, VIRUSES AND ALGAE | • Understand the diversity among Bacteria, Viruses and Algae. |
| | | • Know the systematic, morphology and structure, of Bacteria, Viruses and Algae. |
| | | • Understand the life cycle pattern of Bacteria, Viruses and Algae. |
| | | • Understand the useful and harmful activities of Bacteria, Viruses and Algae . |
| | | |
| | BOT. 112. PLANTS FOR HUMAN WELFARE | • Understand the role plants in human welfare. |
| | | • Gain knowledge about various plants of economic use |
| | | • Know importance of plants & plant products |
| | | • Understand the chemical contents of the plant products |
| | | • Know about the utility of plant resources |
| | | |
| | BOT.12FUNGI, LICHENS AND PLANT PATHOLOGY | • Understand the Biodiversity of Fungi |
| | | • Know the Economic Importance of Fungi |
| | | • Understand the features of Lichens |
| | | • Know the terminologies in plant pathology |
| | | • Understand the scope and importance of Plant Pathology |
| | | • Know the control measures of plant diseases |
| | | |
| | BOT.122. INDUSTRIAL BOTANY | • Gain thorough knowledge about various plant groups from primitive to highly evolved plants |
| | | • Become aware of applications of different plants in various industries |
| | | • To highlight the potential of these studies to become an entrepreneur |
| | | • To equip the students with skills related to laboratory as well as industries based studies |
| | | • To make the students aware about conservation and sustainable use of plants |
| | | • To create foundation for further studies in Botany |
| | | • To address the socio-economical challenges related to plant sciences |
| | | |
| | BOT:103 PRACTICAL COURSE (BASED ON BOT.111, BOT.112 | • Understand the morphological diversity among Bacteria , Viruses, Algae and Fung |
| | | • Observe vegetative and reproductive parts of various life forms of Bacteria, Viruses, Algae and Fung |
| | | • Detect chemical contents in various plant products of economic use. |
| | | • Know botanical source/s, characteristics and utilities of Plants/ plant products. |
| | | • Learn about the industrial applications of various plants and plant products. |
| | | • Visit nearby locality to observe algal and fungal diversity as well as plant diseases occur in nature and make a report of it. |
| | | • Visit either of the industries and prepare a scientific report. |
| | | |
| S Y Bsc | BOT.-231: Bryophytes and Pteridophytes | • Understand the morphological diversity of Bryophytes and Pteridophytes. |
| | | • Understand the economic importance of the Bryophytes and Pteridophytes. |
| | | • Know the evolution of Bryophytes and Pteridophytes. |
| | | |
| | BOT.-232: Morphology of Angiosperms [60 Lectures] | • Understand the habit of the angiosperm plant body. |
| | | • Know the vegetative characteristics of the plant. |
| | | • Learn about the reproductive characteristics of the plant. |
| | | • Understand the plant morphology. |
| | | |
| | BOT.-241: Plant Physiology | • Know importance and scope of plant physiology. |
| | | • 2Understand the plants and plant cells in relation to water. |
| | | • Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C3 and C4 pathways. |
| | | • Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration. |
| | | • Learn about the movement of sap and absorption of water in plant body. |

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| | | • Understand the plant movements. |
| | | |
| | BOT.-242 Taxonomy of Angiosperms | • Understand the diversity of angiosperms. |
| | | • Understand the comparative account among the families of angiosperms. |
| | | • Know the economic importance of the angiosperm plants. |
| | | • Understand the distinguishing features of angiosperm families. |
| | | |
| TYBSc | BOT. 351, PAPER – I CRYPTOGAMS | • Know the salient features of Cryptogams plants. |
| | | • Become aware of the status of cryptogams as a group in plant kingdom. |
| | | • Understand the life cycles of selected genera. |
| | | • Learn about the economic and ecological importance of Cryptogams plants. |
| | | |
| | BOT.352 - ANGIOSPERM TAXONOMY | • Understand the status of angiosperms in plant kingdom |
| | | • Realize the origin of Angiosperms with respect to time, place, origin and probable ancestors. |
| | | • Know the Pre-Darwinian and Post- Darwinian systems of Classification. |
| | | • Understand various angiosperm families emphasizing their morphology, distinctive features and biology. |
| | | • Know the role of cytology and Phytochemistry in Taxonomy. |
| | | |
| | BOT. 353 - III GENETICS AND MOLECULAR BIOLOGY | • Gain knowledge about “Cell Science”. |
| | | • Understand Cell wall Plasma membrane, Cell organelles and cell division. |
| | | • Learn the scope and importance of molecular biology. |
| | | • Understand the biochemical nature of nucleic acids, their role in living systems, experimental evidences to prove DNA as a genetic material. |
| | | • Understand the process of synthesis of proteins and role of genetic code in polypeptide formation. |
| | | |
| | BOT. 354 - PAPER-IV ADVANCED PLANT PHYSIOLOGY [60 P | • Learn and understand about mineral nutrition in plants. |
| | | • Understand the growth and developmental processes in plants. |
| | | • Know about movement in plants. |
| | | • Understand the process of translocation of solutes in plants |
| | | • Know the nitrogen metabolism and its importance |
| | | |
| | BOT.355 - PLANT ECOLOGY AND PHYTOGEOGRAPHY | • Know the scope and importance of the discipline. |
| | | • Understand plant communities and ecological adaptations in plants |
| | | • Learn about conservation of biodiversity, Non-conventional Energy and Pollution. |
| | | • Discover botanical regions of India and vegetation types of Maharashtra. |
| | | • Understand Bioremediation, Global warming and climate change. |
| | | |
| | BOT. 356.1 - PLANT BIOTECHNOLOGY | • Understand current status and future of biotechnology in India. |
| | | • Gain advance knowledge of different instruments related to biotechnology. |
| | | • Understand the importance of interdisciplinary approaches of Biotechnology. |
| | | • Recognize the impact of biotechnology on socioeconomic aspects of life. |
| | | • Gain knowledge of industrial application of biotechnology. |
| | | • Develop the skills among the students for employment or entrepreneurship |
| | | |
| | BOT. 361 - GYMNOSPERMS & PALEOBOTANY | • Understand Gymnosperms with respect to distinguishing characters, comparison with Angiosperms, economic importance and classification. |
| | | • Understand the life cycles of Pinus and Gnetum. |
| | | • Know the scope of Paleobotany, types of fossils and geological time scale. |
| | | • Understand the various fossil genera representing different fossil groups. |
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| | BOT. 362 - ANATOMY AND EMBRYOLOGY | • Understand the scope & importance of Anatomy and Embryology |
| | | • Know various tissue systems. |

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| | | • Understand the normal and anomalous secondary growth in plants and their causes. |
| | | • Perform the techniques in anatomy |
| | | • Understand structure and development in microsporangium and megasporangium |
| | | • Understand microsporogenesis and megasporogenesis |
| | | • Understand male and female gametophytes |
| | | • Know fertilization, endosperm and embryogeny |
| | | |
| | BOT : 363 GENETICS, PLANT BREEDING AND EVOLUTION | • Understand the “Science of Heredity”. |
| | | • Realize the role of genes in evolution of species. |
| | | • 3 Understand linkage, segregation and mutation of genes during evolution. |
| | | • Understand the science of plant breeding. |
| | | • To introduce the student with branch of plant breeding for the survival of human being from starvation. |
| | | • To study the techniques of production of new superior crop verities. |
| | | • To study the evolution in living organisms |
| | | |
| | BOT- 364 PLANT BIOCHEMISTRY | • Understand the current status of Biochemistry. |
| | | • Recognize the impact of Biochemistry on socioeconomic aspects of life. |
| | | • Realize the industrial application of Biochemistry. |
| | | • Understand the importance of Biomolecules. |
| | | |
| | Bot 365 -Applied Botany | • Understand the importance and scope of botanical science in the industries. |
| | | • Understand the role of microbial plants in fermentations process. |
| | | • Know the process of cultivation of cash crops. |
| | | • Understand some plants which are used as herbal cosmetics. |
| | | • Understand technique of plant tissue culture and its application. |
| | | • Realize the role plants in forensic science. |
| | | |
| | BOT. 366.1: BOTANICAL TECHNIQUES | • Understand the scope and importance of Botanical techniques. |
| | | • Know about instruments and their utility in subject Botany. |
| | | • Gain knowledge about measurement of microorganisms by studying micrometry. |
| | | • Understand the different stains and staining. |
| | | • Perform the killing, fixing and Microtomy of plant material. |
| | | • Understand & perform Chromatography and cultural techniques in Botany. |
| | | • Understand the methods used in whole mount preparation, wood maceration and cytology. |
| | | |
| MSc-I | BOT. 1.1 ANGIOSPERMTAXONOMY | • Know the conceptual development of ‘taxonomy’ vis-à-vis ‘systematics’ |
| | | • Understand the general range of variations in the group of angiosperms. |
| | | • Trace the history of development of systems of classification emphasizing angiospermic taxa. |
| | | • Learn about the characters of biologically important families of angiosperms |
| | | • Know the floral variations in angiospermic families, their phylogeny and evolution. |
| | | • Understand various rules, principles and recommendations of plant nomenclature |
| | | • Know modern trends in taxonomy |
| | | • Understand major evolutionary trends in various parts of angiospermic plants |
| | | |
| | BOT. 1.2 ENVIRONMENTALBOTANY AND BIOSTATISTICS | • Understand the environmental botany. |
| | | • Know the nature and its co-relation with human society. |
| | | • Realize the impact of human activities on environment. |
| | | • Understand global issues concerned with environment. |
| | | • Know the sustainable development and care of environment. |
| | | • Understand the connection between material wealth & resources exploitation; |

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| | | • Worth the relationship between economic growth and environmental degradation |
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| | BOT 1.3 CYTOGENETICSANDMOLECULARBIOLOGY | • Understand structural organization and variation in chromosome as well as karyotype analysis. |
| | | • Learn about the extra-chromosomal inheritance in plant system. |
| | | • Know the molecular biology in relation to genetic material, its inheritance, modification, replication and repair. |
| | | • Understand transcription, translation post translation modification of protein. |
| | | • Know gene regulation in prokaryotes and eukaryotes. |
| | | |
| | BOT 2.1 Diversity of Lower Cryptogams | • Understand the salient features of Algae and Fung |
| | | • Learn about diversity of lower Cryptogrammic plants in nature. |
| | | • Understand the life cycle patterns in lower cryptogams. |
| | | • They will understand the role of algae and fungi for human welfare. |
| | | |
| | BOT.2.2 Diversity of Higher Cryptogams | • Become aware of the status of higher cryptogams as a group in plant kingdom. |
| | | • Understand the habit and habitat of the higher cryptogams in the field. |
| | | • Understand the distinguishing features, interrelationships, phylogeny and evolutionary tendencies of selected orders with their affinities. |
| | | • Realize the economic importance of higher cryptogams plants. |
| | | |
| | BOT.2.3 PLANT PHYSIOLOGYAND BIOCHEMISTRY | • Understand plant structures in the context of physiological functions of plants. |
| | | • They will learn about the growth and development of plants and its regulations |
| | | • Understand the physiological details of photosynthesis and respiration. |
| | | • Understand lipid metabolism in plants. |
| | | • Understand the stress of plants and its adaptations. |
| | | • They will learn about the metabolites synthesized by plants. |
| | | • They will be able to understand the red-ox systems of plants. |
| | | |
| M Sc –Part II | BOT 3.1 GYMNOSPERMS AND PALEOBOTANY | • Understand the diversity of Gymnosperms in India |
| | | • Know the evolutionary trends and affinities of living gymnosperms with respect to external and internal features |
| | | • Understand the important fossil types in different groups of plants and Indian fossil records. |
| | | • Realize the applied aspects of Paleobotany. |
| | | |
| | BOT 3.2: PLANT BIOTECHNOLOGY AND BIOINFORMATICS | • Understand the fundamentals of totipotency plant tissue culture techniques |
| | | • Know the transgenic technology for the improvement of quality and quantity of plant and thereby product. |
| | | • Understand the advantages of in vitro propagation in various areas. |
| | | • Realize the application and importance of plant tissue culture and transgenic plants. |
| | | |
| | BOT.3.33GeneticsandPlantBreeding SpecialPaper–I | • Gain advance knowledge of Cytogenetics in relation to crash crops targeting cell division in them different alterations at genome level and their significance. |
| | | • Understand the fertilization barriers in cash crops at different genome level. |
| | | • Know the biometrical tools applied in plant breeding. |
| | | • Understand the wholesome review on fundamentals of plant breeding. |
| | | |
| | BOT.4.1: DEVELOPMENTAL BOTANY | • Understand the vascular tissues, structure of woods and anomalous secondary growth |
| | | • Detect adulterations and understand forensic botany |
| | | • Know historical development of embryology |
| | | • Understand structure and development of microsporangium, megasporangium, embryo and endosperm. |
| | | • Know the methods of pollination and fertilization |
| | | • Understand the applications of embryology in plant tissue culture |
| | | • Learn about the structure and development of pollen grains |
| | | • Realize the applications of palynology in human welfare |
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| | BOT. 4.23Genetics and Plant Breeding Special Paper-II | • Understand the modern strategies applied in Genetics and Plant Breeding to sequence and analyze genomes. |
| | | • Know cell differentiation and abnormalities in human cells with respect to oncogenesis. |
| | | • Get the detail knowledge about modern strategies applied in Plant Breeding targeted with specific character improvement. |
| | | • Know about exploitation of Heterosis, hybrid and variety development and their release |
| | | |
| | BOT.4.33Genetics and Plant Breeding Special Paper-III | • Understand the vascular tissues, structure of woods and anomalous secondary growth |
| | | • Understand the principles, |
| | | • Know the intellectual properties and different issues, GMO, current techniques applied in Molecular Plant Breeding for future challenges in crop improvement. |

**DEPARTMENT OF CHEMISTRY**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| Chemistry | | |
| FY B.Sc. | CH-111: Physical and Inorganic Chemistry | • Develop an ability to use conceptual and mathematical tools to express and predict atomic and molecular behavior |
| | | • Predict atomic structure, chemical bonding or molecular geometry based on accepted models. |
| | | • Convert scientific equation in straight line to get physical parameter for slope and intercept. |
| | | • Understand deviation of real gas from ideal behavior. |
| | | • Understand critical constant and vanderwall's constant. |
| | | |
| | CH-112: Organic and Inorganic Chemistry | • Understand the general properties of organic compounds, applications of organic compounds. |
| | | • Understand the Mono functional compounds - Common and IUPAC nomenclature of various type of organic compound. |
| | | • Understand the the alkane by many organic reaction. |
| | | • Understand of S- block Elements of alkali metals and Alkaline earth metals |
| | | • Understand Arrhenius theory, Bronsted- Lowry theory, and Lewis theory. |
| | | • Understand ionic product of water, Buffer solutions. |
| | | |
| | CH-113: Chemistry Practical | • Calibrate the apparatus like volumetric flask, pipette and burette. |
| | | • Understand the determination of heat of solution, equivalent weight, surface tension etc. |
| | | • Carry out qualitative analysis of acidic and basic radicals. |
| | | • Learn the applications of types of titrations for various estimations |
| | | • Carry out quantitative analysis by gravimetric method |
| | | • Carry out quantitative analysis by volumetric method |
| | | |
| | CH-121: Physical and Inorganic Chemistry | • Identify methods and instruments that can be used to study chemistry |
| | | • Evaluate data generated by experimental methods for chemical characterization. |
| | | • To understand specific and equivalent conductance. |
| | | • To understand cell constant and use of it to obtain specific and equivalent conductance. |
| | | • To know Kolhaurash's law and application of it. |
| | | |
| | CH-122: Organic and Inorganic Chemistry | • understand the preparations, reactions and properties of Monohalogen and Dihalogen derivatives of Alkane. |
| | | • understand the preparations, reactions and properties of Alcohol, Ether and Epoxide. |
| | | • understand the preparations and reactions of carbonyl group. |
| | | • understand the preparation of carboxylic acids. |
| | | • determine the Molecular weight, formula weight, equivalent weight of organic compounds. |
| | | • Understand the Electronic structures, size of atoms and ions, ionization energy, metallic and nonmetallic of p block elements. |
| | | |
| | CH-123: Chemistry Practical | • Handle viscometer to determine the viscosity and relative viscosity of liquids . |
| | | • Carry out quantitative analysis by instrumental method using Conductometer. |
| | | • estimate of aniline / phenol. |
| | | • Perform qualitative analysis of organic compounds. |
| | | • Carry out quantitative analysis by volumetric method and gravimetric methods |
| | | |
| SY B.Sc | CH 231: Physical and inorganic chemistry | • Understand the Electronic structures, size of atoms and ions, ionization energy, metallic and nonmetallic of d block elements. |
| | | • Understand concept of Helmolthz free energy |
| | | • Understand numerical calculations of Gibbs free energy. |
| | | • Understand concept of vapor pressure of liquids. |
| | | • Understand the concept of physical properties of metals |
| | | • Learn methods of purification of ores. |
| | | |

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| | CH 232: Organic and analytical chemistry: | • Review the concept of isomers and discuss the isomer which results from free rotation of C-C single bond, from a chirallity, from restricted rotation, R, S and E, Z nomenclature. |
| | | • Study of amines their formation reactivity. |
| | | • Study of reactivity, preparation and reactions of organo Li, Cu, Zn compounds. |
| | | • Understand the importance of analytical chemistry in analysis of compounds by titrimetric, gravimetric and instrumental methods. |
| | | • Know the importance of sampling methods and ways of interpretation of results of analysis. |
| | | • Determine the causes of errors and their minimization during analysis |
| | | • Learn the application of types of titrations for quantitative analysis of the samples. |
| | | |
| | CH 233: Chemistry practical: | • Understand techniques chromatography for separation of components in the mixture. |
| | | • Understand recrystallization for purification of organic compounds. |
| | | • Prepare various inorganic complexes. |
| | | • analyse compounds by titrimetric, gravimetric and instrumental methods.. |
| | | • Understand to determine thermodynamic parameter. |
| | | |
| | CH 241 Physical and inorganic chemistry | • Understand colligative properties and its application calculation of molecular weight of solutes |
| | | • Understand concept of electromotive force and its measurement |
| | | • Understand about properties of Lanthanides and actinides. |
| | | • Understand concept of s-s, s-p, p-p, p-d & d-d combination of orbitals. |
| | | • Understand about classification of electrodes. |
| | | |
| | CH 242: Organic and analytical chemistry | • Understand the synthesis and reaction of 5, 6 member and condensed heterocyclic systems. |
| | | • Understand the synthesis of synthetic reagents and their synthetic utility. |
| | | • Know the mechanism and stereochemistry of E1, E2 reaction. |
| | | • Understand the concept of quantitative analysis by gravimetric methos. |
| | | • Understand the concept for separation of analytes in samples by thin layer, paper and column chromatographic methods. |
| | | |
| | CH 243: chemistry practical: | • Carry out qualitative analysis of organic compounds. |
| | | • Determine molecular weight by depression of freezing point method. |
| | | • Handle landsbergers apparatus for determination of molecular weight. |
| | | • Estimate of Nickel and Barium gravimetrically. |
| | | • Make use of potentiometer for determination of standard electrode potential. |
| | | |
| T.Y.B.Sc. | CH 351: Physical chemistry | • Understand spontaneous and non spontaneous processes. |
| | | • Understand the importance of salt bridge in electrochemical cell. |
| | | • Understand the concept electrochemical cell and determination of potential of cell |
| | | • Understand the laws of photochemistry (Grothus Draper Law and Stark Einstein law) |
| | | • Understand the concept quantum yield and fluoresce and phosphorescence from Jalblonski diagram. |
| | | • Understand the various devices to measure the radiation from radioactive sample. |
| | | |
| | CH-352: Inorganic chemistry | • Understand the basic concept of the co-ordination compound, and identify the types of given ligand, chelates. |
| | | • Understand the different physical method for the study of complexes and assumptions, drawbacks and isomerism in Werner's theory. |
| | | • Understand Effective atomic number (EAN) and how to calculate EAN for any given complexes. |
| | | • Understand the modern theories of metal-ligand bond related to valence bond theory. |
| | | • Application of CFT related to different geometry e. Square planer, tetrahedral, Octahedral. |
| | | • Understand the basic concept about CFT e. Spin magnetic moment, crystal field stabilization energy related to weak and strong field, limitation of theory. |
| | | • Understand the modern theories of metal-ligand bond related to Molecular orbital theory, and difference between B.T., C.F.T. and M.O.T. |
| | | |
| | CH-353: Organic chemistry | • Understand Polarity picture of carbonyl group and nucleophilic addition reaction to it. |
| | | • Introduction concept of aromaticity electrophilic and nucleophilic aromatic substitution reaction. |

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| | | • Molecular rearrangement involving migration to C, N and Oxygen. |
| | | • Drawing the resonating structures. |
| | | • Understand Nuclophic substitution reactions. |
| | | • Understanding electrophilic addition reactions. |
| | | |
| | CH-354: Analytical Chemistry SEM V | • Understand procedure of extraction of metal ions using Solvent Extraction process. |
| | | • Understand the application of Ion Exchange Chromatography method for the separation of cations and anions using different types of resins. |
| | | • Understand applications of Size Exclusion Chromatography for the separation of analytes based on their size and shapes. |
| | | • Understand the working of Gas Chromatographic unit and apply the knowledge to separate volatile compounds in sample. |
| | | • Understand Principle, choice of column materials for HPLC and its application. |
| | | • Understand Principles of Electrophoresis and choice of techniques of electrophoresis for various applications |
| | | |
| | CH-355: Industrial chemistry | • understand general concept of Industrial chemistry. |
| | | • Understand manufacturing of sugarcane. |
| | | • understand general idea of differ physical methods used in manufacturing. |
| | | • understands various types of fertilizer. |
| | | • Understand manufacturing of Beer and spirit. |
| | | • understand the aspects of small scale industry. |
| | | |
| | CH 356: B Environmental chemistry | • Understand the concept to awareness about environmental chemistry |
| | | • Understand the concept about atmosphere and different layer and composition |
| | | • Understand the concept. awareness about air pollution and organic inorganic pollutants |
| | | • Understand the concept, water pollution and domestic sewage waste water, industrial pollution agriculture pesticide water pollution. |
| | | • Understand the different methods of water treatment, water effluents and sewage water. |
| | | • Understand the green house gases and global warming. |
| | | |
| | CH-357,367: Physical Chemistry Practical | • Prepare molar and normal solutions of various concentrations. |
| | | • determine concentration of unknown solutions by Spectrophotometric method. |
| | | • Measure the pH, pKa and Ka of various acids by potentiometry. |
| | | • Measure refractive index, molar refraction and unknown concentration of various solvents. |
| | | • Determine the molecular weight of a given polymer by turbidimetry. |
| | | • Investigate the reaction rate. |
| | | |
| | CH 358,368: Inorganic practical | • estimate ores and alloy by gravimetric and volumetric method. |
| | | • Separate and analyze binary mixtures by qualitative method |
| | | • Prepare and determine percent purity of various inorganic complexes. |
| | | • Perform chromatographic technique (paper chromatography). |
| | | • Estimate Lead, Iron by gravimetric method. |
| | | • Estimate Titanium and Iron by Spectrophotometric method. |
| | | |
| | CH 359,369: Organic practical: | • Separate and analyze binary water insoluble mixture |
| | | • Separate and analyze binary water soluble mixture |
| | | • Estimate - acetamide, glucose by volumetric method |
| | | • Estimate basicity of various acids. |
| | | • Prepare various organic compounds. |
| | | • Understand Thin Layer Chromatographic techniques and physical constant. |
| | | |
| | T.Y.B.Sc Sem VI CH-361: Physical chemistry. | • Understand the types of spectra, Rotational, Vibration and Electronic energy levels. |
| | | • difference between order and Molecularity |
| | | • Understand the first, second and third order reaction. |

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| | | • Understand the concept anisotropic, isotropic, etch figure, polymorphism, |
| | | • Learn concept Photoelectric effect, Compton Effect and Heisenberg's uncertainty principals. |
| | | • Understand the concept of X- ray analysis. |
| | | |
| | CH-362: Inorganic chemistry | • understand the electronic structure, Extraction uses, oxidation states biological role of Cu. |
| | | • know about the all basic theory of Acid and bases. |
| | | • understand the concept of Hard and Soft acid bases concept theories, application and limitations. |
| | | • know the different types and theories of Corrosion and how to protect Metal from corrosion. |
| | | |
| | CH-363: Organic chemistry | • Understands common terms in spectroscopy. |
| | | • Learn Physical methods of structure determination which includes IR, UV and NMR. |
| | | • Solve the problems based on IR, UV and NMR. |
| | | • understand retro synthesis. |
| | | • predict synthons and reagents. |
| | | • Solve the problems based on retro synthesis. |
| | | |
| | CH-364 Analytical Chemistry | • perform the analysis of samples using instrumental methods |
| | | • understand the concepts of spectrometry, know the principles of instruments and their applications |
| | | • understand principle, working and applications of Flame and Plasma Emission Spectrometry. |
| | | • understand principle, Instrumentation and application of Atomic Absorption Spectrophotometry |
| | | • understand principle, Instrumentation and applications of Turbidimetry and Nephelometry. |
| | | • understand principle, Instrumentation and applications of thermogravimetric methods like TGA, DTA and DSC. |
| | | |
| | CH-365: Industrial chemistry | • Understand the process of manufacturing of petrol and gasoline. |
| | | • Understand the process of manufacturing of methanol. |
| | | • Understand the process of manufacturing of soap. |
| | | • Understand the process of manufacturing of detergents. |
| | | • Understand classification of dyes and paints. |
| | | • Understand properties of drugs. |
| | | |
| | CH 366: Polymer chemistry | • Understand the basic concepts of polymerization. |
| | | • Understand the different methods of polymerization. |
| | | • Understand various techniques of polymerization. |
| | | • Understand the preparation, properties and applications of PE, PVC, Polystyrene, polyacrilonytrile, |
| | | • Understand the concept Glass transition temperature |
| | | |
| M.Sc. Part I: | CH-P-110: Physical Chemistry I | • Understand the terms eigen function, eigen value, operator and postulates of Quantum mechanics. |
| | | • Understand mechanics of particle in one, two and three dimensional box. |
| | | • Learn parent –daughter relationship, application of radioactivity, NAA, IDA. Effect of radiation and units of radiation. |
| | | • Learn the Fricke and cerric sulphate dosimeter. |
| | | • Understand the terms ionic strength, activity coefficient .DHO equation. |
| | | • Understand the adsorption of gases by solid types of isotherms. |
| | | |
| | CH130: Inorganic chemistry Paper I | • Learn molecular orbitals and its orientation. |
| | | • Understand about geometry and shape of the molecule |
| | | • Learn and find out bond order and dipole moments of the inorganic molecule. |
| | | • Learn 18 electron rule and application. |
| | | • Determine the point group of inorganic molecules. |
| | | • Understand preparation and properties of transition metal carbonyls. |
| | | • Understand concept of symmetry elements in molecules. |

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| | CH -150 :Basic Organic Chemistry | • understand stereo chemical principles, enantiomeric relationship R and S ,E and Z nomenclature in C,N,S,P containing compound. |
| | | • understand SN1, SN2 and SNi mechanism and stereochemistry. |
| | | • understand NGP by pi and sigma bonds, classical and non -classical carbocations . |
| | | • understand alkylation and acylation reaction . |
| | | • compare the differ between types of addition, elimination and substitution reaction. |
| | | • Learn and solve problem type of elimination |
| | | |
| | CH-P-210: Physical Chemistry II | • Understand the thermodynamic description of mixtures state function, exact, inexact differential. |
| | | • Understand the colligative properties of solutions, depression in f.p., elevation in b.p, osmotic pressure. |
| | | • Understand the statistical thermodynamics and various partition functions. |
| | | • Understand the consecutive elementary reactions, rate determining steps, steady state approximation, pre-equilibria, Michaelis-Menten mechanism, Lindemann- Hinshelwood mechanism, chain reactions. |
| | | • Understand the molecular spectroscopy: R, Raman, electronic and Mossbauer and its application. |
| | | |
| | CH: 230 -Inorganic chemistry Paper II | • learn mechanism in transition metal complexes. |
| | | • Learn radius ratio rule of coordination no 3,4, |
| | | • Understand the Born-Haber cycle to calculate lattice energy. |
| | | • Understand about classification and use of catalyst. |
| | | • Understand about structure of atom, Hunds rule, Term symbol, calculation of microstates, orbital selection rule. |
| | | • Know metal complexes involved in biological systems. Vitamin-B12, Chlorophyll, Hemoglobin. |
| | | |
| | CH-250 Name Reactions, Synthetic Organic Chemistry & Spectrosc | • learn various name reaction with example. |
| | | • use synthetic reagents of oxidation and reduction for solving the example. |
| | | • understand mechanism of rearrangements reaction . |
| | | • learn factors affecting on UV absorption spectra. |
| | | • interpret IR spectra on basic values IR frequencies |
| | | • Solve problems of UV, IR and NMR. |
| | | |
| | CH-290-General Chemistry | • Solve the problems on Chemometrics Mean and Standard deviation. |
| | | • Learn theory of electrogravimetric analysis, Electrolytic separation and determination of metals. |
| | | • Know Instrumentation, choice of Mobile Phase, Solvent Treatment systems, Pumping systems, Sample injection systems, Columns for High Performance Liquid Chromatography. |
| | | • Learn principle, theory of Glass Membrane Potential, The Alkaline and Acid Error, Standard Buffers, Accuracy of pH , Measurements with the pH-meter, types Ion-selective Electrodes. |
| | | • Learn Voltammetric Electrodes, Detectors, Amperometric Sensors, Amperometric Titrations. |
| | | • Understand Phosphorescence, Fluorescence and Photo luminescent phenomena used for determination of mixtures. |
| | | |
| | CH-P-1 : Physical Chemistry Practical | • prepare molar and normal solutions of various concentrations. |
| | | • determine concentration of unknown solutions and degree of hydrolysis and hydrolysis constant by Spectrophotometry. |
| | | • Determine stability constant of a complex ion and standard free energy change G0 and equilibrium constant by potentiometry. |
| | | • investigate the rate constant for depolymerization , energy of activation and order of the reaction |
| | | • Calculate Hammett constant and amount of aspirin in the given tablet by pH measurement. |
| | | • Determine specific rotation and percentage of two optically active substances by polarimetrically. |
| | | |
| | CH: I-1: Practical course Inorganic chemistry: | • Perform gravimetric and volumetric analysis ores. |
| | | • Analyse binary mixtures by gravimetric and volumetric method. |
| | | • Prepare various inorganic complexes and determination of its Percent purity. |
| | | • analyse iron from given drug sample and calcium in milk sample. |
| | | • Perform paper chromatographic technique. |

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| | | • Estimate phosphate from waste water by spectrophotometry. |
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| | CH –O- 1 Organic Chemistry practical | • Know uses of chemistry software's like ISI draw, chem Draw, Chem sketch. |
| | | • draw the different structure of organic compound. |
| | | • perform Thin layer chromatography technique for completion of reaction. |
| | | • perform single and two stage preparation. |
| | | • Apply knowledge of Green principle for organic synthesis |
| | | • Make use of soxhlet extractor and steam distillation assembly for Purification of organic compound. |
| | | |
| M.Sc. II | Organic CH 350: Organic Reaction Mechanism | • Compare the major and minor product of variety of organic reaction. |
| | | • Understand accepted mechanism of organic reaction including all intermediates |
| | | • Solve the problems on Taft and Hammet constant. |
| | | • Understand Concave upward and downward deviation. |
| | | • Learn the type's hydrolysis of ester. |
| | | • Solve problems on Anchimetric assisted reaction. |
| | | |
| | CH-351: Spectroscopic Methods in Structure Determination | • Understand principle and instrumentation of 1H NMR, 13 C NMR and Mass spectroscopy. |
| | | • Investigate structures on these techniques. |
| | | • Resolve structure of organic compounds by 2D NMR techniques. |
| | | • Analyze reaction sequences by using spectroscopic technique. |
| | | |
| | CH-352 (Organic stereochemistry) | • Understand the basic concepts of stereo chemistry |
| | | • assign structure of organic molecules. |
| | | • learn Three dimensional structure of cyclic and acyclic compounds |
| | | • Use selectivity of reagents for chemical reactions. |
| | | • Compare the major and minor product of asymmetric synthesis. |
| | | • solve the examples on ORD ,CD. |
| | | |
| | CH-353: Free radical, photochemistry, pericyclic reaction and their a | • Understand term quantum yield, and electronic states and transitions in molecules. |
| | | • Understand Norrish-I and Norrish-II cleavages, Paterno-Buchi reaction. |
| | | • Understand Photochemistry of olefins and arenes: 1, 2- , 1, 3- and 1, 4- additions. |
| | | • Understand free radical reaction contain Halogen, Sulphur, and, Selenium Group transfer reaction. |
| | | • Understand selection rule for thermal and photochemical reactions. |
| | | • Understand Frontier molecular orbital approach [FMO] and Aromatic transition state approach according to Huckel and Mobius system. |
| | | |
| | CH-450: Chemistry of Natural Products | • know concept of biogenesis of natural products. |
| | | • Classify sources of various vitamins. |
| | | • Learn biological importance of vitamins B1, B2, B6, folic acid, B12, C, D1, E, K1, and K |
| | | • Understand and apply the role of enzyme in reactions. |
| | | • Synthesize natural organic compounds by chemical methods. |
| | | • Learn the stereochemistry of natural product. |
| | | |
| | CH-451: Synthetic Methods in Organic Chemistry | • Understand Transition metal complexes in organic synthesis, Grubb's catalyst, Ziegler Natta catalyst. |
| | | • Design the organic compounds by use of synthetic reagents |
| | | • Understanding role of Umpolung in organic synthesis. |
| | | • Understanding Protection and deprotection in the synthesis of polypeptide and polynucleotide. |
| | | • Know basic principles of green chemistry and design green synthesis. |
| | | • Use ecofrindly green reagents, solvents, catalysts and reaction conditions. |
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| | CH-452: Heterocyclic chemistry, Chiron approach, chiral drugs and | • Know the main synthetic routes and reactivity for variety of heterocyclic compounds and applications. |

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| | | • Understand Important Terms –Receptor, therapeutic index, bioavailability, Drug assay and Drug Potency used in medicinal chemistry. |
| | | • Understand Structure of triose, Pentose, hexose, Stereochemistry and reaction of Glucose. |
| | | • Understand Synthesis and Pharmacological activity of S-Ibuprofin , S-Metaprolol, (+) Ephedrime |
| | | • Understand basic Pharmacokinetics of drugs, anti Microbial drugs, Antifungal, Antibacterial, antiviral, antiprotozoals. |
| | | |
| | CH-O2 (organic Practical chemistry MSc II) | • separate organic compounds in different phases. |
| | | • perform qualitative test to analyze functional group of organic compounds. |
| | | • learn distillation technique. |
| | | • detect elements N, S, and X in organic compounds. |
| | | • use purification techniques of organic compounds . |
| | | |
| | CH -O-3: Three stage preparations | • perform three stage preparation. |
| | | • draw the reaction mechanism. |
| | | • Purify the organic compounds by crystallization. |
| | | • Perform chromatographic technique to check completion of reaction. |
| | | • Apply the knowledge about different reaction conditions. |
| | | |
| | CHO-4: Short Research Project | • survey literature for the topic of the project. |
| | | • Learn to apply reaction conditions for synthesis, isolation of product and give mechanism. |
| | | • Handle instruments for analysis and discuss their experiment al results. |
| | | • Used ICT tools to prepare project reports and present it using Power point presentation. |
| | | • Work within a small team to achieve a common research goal. |
| | | |
| M. Sc. II : Analy | CH-391: Concepts of Analytical Chemistry | • familiar with the history and concepts and objectives of analytical chemistry. |
| | | • handling of analytical data at industrial level. |
| | | • Understand electronic circuits of analytical instruments. |
| | | • use of computer for the interpretation of analytical data. |
| | | • learn decomposition and dissolution method of inorganic samples. |
| | | • learn decomposition and dissolution method of organic samples. |
| | | |
| | CH 392: Modern Separation Science | • understand the general principles of chromatography. |
| | | • know the types of detectors used in chromatographic techniques. |
| | | • learn the various techniques of separation and analysis. |
| | | • understand the scope and applications of separation techniques. |
| | | • learn the various techniques involved in qualitative and quantitative analysis. |
| | | |
| | CH-393:Instrumental Methods Of Analysis | • learn the perspectives of electro gravimetric methods of analysis. |
| | | • learn the instrumentation and working of various techniques such as polarography, coulometry, voltammetry. |
| | | • learn the laboratory and industrial level instrumental techniques. |
| | | • understand the various techniques of quantitative and qualitative analysis such as voltammetry, high frequency titrations, polarimetry. |
| | | • learn the various terminologies involved in instrumental techniques. |
| | | • understand types of chemical analyzers. |
| | | |
| | CH-381: Analysis of Organics and Medicinal | • learn the estimation methods of organic compounds. |
| | | • learn the analysis of petroleum products. |
| | | • understand the analysis of polymers. |
| | | • understand the analysis of agrochemicals. |
| | | • understand the analysis of medicinal and drugs. |
| | | • understand the analysis of pesticides and their toxicological effect. |
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| M.Sc. II Analyti | CH-491: Spectroscopic Methods of Analysis | • understand various spectroscopic techniques for quantitative and qualitative analysis. |
| | | • understand the working principles of spectroscopic techniques such as uv- visible- IR, NMR spectroscopy. |
| | | • understand the instrumentation and working of spectroscopic instruments like atomic mass and fluorescence. |
| | | • learn the application of coupled techniques for quantization of data. |
| | | • learn the prediction and quantization of unknown compounds. |
| | | • learn the application and working of Mossbauer spectroscopy. |
| | | |
| | CH-492: Special Analytical Methods and Analysis of Complex Mate | • know various methods and solve problems on Radiochemical analysis. |
| | | • learn Neutron Activation analysis. |
| | | • learn Various Gas Volumetric methods of Analysis and solve problems on it. |
| | | • know different method for analysis of Minerals and Ores. |
| | | • know different method for analysis of Various Alloy. |
| | | • learn the separation method for solvent thinnable and waterborne coatings into polymeric binders and pigments. . |
| | | |
| | CH-481: Bio Analysis and Analysis of Food | • Aware about the biological values of food. |
| | | • Know the analysis of food products. |
| | | • Familiar with the working of food preservatives. |
| | | • Know the analysis and use of food additives. |
| | | • Learn the techniques used for the determination of food products. |
| | | • Proper use of various techniques of forensic analysis. |
| | | |
| | CH- A1: ANALYTICAL Chemistry Practical Course I | • Prepare molar and normal solutions of various concentrations. |
| | | • Describe the instrumentation required for the various separation techniques and their associated operating principles. |
| | | • determines Na, K, Ca, Li by Flame photometric method |
| | | • Learn Quantitative and quantitative analytical techniques. |
| | | • Learn interpretation of data of analysis. |
| | | • Know applications and limitations of instrumental methods. |
| | | |
| | CH-A-2 Analytical chemistry Practical | • Prepare molar and normal solutions of various concentrations |
| | | • Analyse compounds by titrimetric, gravimetric methods. |
| | | • Understand techniques chromatography for separation of components in the mixture. |
| | | • Estimate glucose and fructose by Lane and Eynone Method. |
| | | |
| | CH: A-3: A Short Research Project: | • Working within a small team to achieve a common research goal. |
| | | • Carry out project based on the use instrumental methods. |
| | | • Search the Literature for the project |
| | | • Handle instruments neatly for analysis and discuss their experiment results. |
| | | • Know specification of instrumental techniques and interpretation data. |
| | | • Use ICT tools to write project reports and Power point presentation. |
| | | |
| Certificate course in Analytical Chemistry | | • Describe the various chromatographic techniques and analyze a given chromatogram. |
| | | • Demonstrate an understanding of electrochemistry and the methods used to study the response of an electrolyte through current of potential. |
| | | • Demonstrate a mastery of various methods of expressing concentration. |
| | | |
| Diploma course in Analytical Chemistry | | • Enhance skills of the chemists employed in Industry, Research & Development and National Laboratories. |
| | | • provide training in modern analytical techniques to the learners. |
| | | • provide appropriate theoretical background and develop practical skills for analyzing materials even in trace amounts using modern analytical methods and instruments. |
| | | • Describe the various spectrochemical techniques. |
| | | • Working within a small team to achieve a common research goal in the major areas of spectroscopy, separations, mass spectrometry, and electrochemistry. |

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| | | • describe and understand the capabilities and limitations of instrumental methods. |
| | | • Know the analysis of food products. |
| | | • Familiar with the working of food preservatives |
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**DEPARTMENT OF COMMERCE & MANAGEMENT**

| Class | Course | Outcomes |
|---|---|---|
| B.Com. | Department of Accountancy and Costing | • The Accounting program aims to cultivate in students virtues of commerce professionals to effectively contribute to the needs of the society with commitment and integrity. It intends to provide a strong foundation level understanding of functioning of business organizations and various transactions in the fields of Accountancy, Auditing, Taxation and Finance. |
| | | • Have fundamental knowledge of Accountancy, Auditing, Taxation, Finance, and provide innovative solutions to problems in business. |
| | | • Develop a thorough understanding of Accounts and Finance functions of an organization. |
| | | • Develop financial leadership qualities. |
| | | • Collate and integrate systems of Accounts and Finance. |
| | | • To encourage the students to undertake higher studies and research in commerce and allied disciplines. |
| | | • Be able to communicate their ideas with industry efficiently and effectively. |
| | | • Develop the ability to work at individual level as well as at team level. |
| | | • Be able to integrate latest technology and apply mathematical and statistical tools and techniques. |
| | | • Have skills to develop business models and be responsible global citizens who exhibit cross cultural competent behavior, and ethical values. |
| | | • Become proficient in using information technology and accounting tools in decision making. |
| | | |
| | Department of Business Administration | • Problem Analysis And Decision Making Skill Identify, formulate and analyze problems reaching substantiated conclusions using different techniques of mathematics, finance and modern management subjects |
| | | • Managerial And Business competency Demonstrate knowledge and understanding of the management concepts and apply these to one's own work, as a member and leader of a team to achieve organizational goals |
| | | • Communication and Interaction Communicate effectively on various management problems, cases, and legal issues with the team member and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions |
| | | • Business in Global Environment An Understanding of the knowledge of contemporary management issues in the global context recognizing drastic changes in the global economy |
| | | • Individual and Teamwork Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings to achieve organizational goals |
| | | • The Manager and society An understanding of ethical issues and responsibilities relating to the impact of the managerial decision in societal and legal contexts |
| | | |
| | Department of Management Studies | • Apply conceptual business foundations to solve practical decision-making problems, both individually and as part of teams using techniques such as case analysis, projects and assignments. |
| | | • Recognize and address ethical issues and values and apply them in organizational settings. |
| | | • A Knowledge of contemporary issues (Social awareness). |
| | | • An ability to recognize the importance of professional development by pursuing postgraduate studies or face competitive examinations that offer challenging and rewarding careers in management (Successful career and immediate employment). |
| | | • An integrated knowledge of and demonstrated ability to perform as management professionals, and will be prepared for continued learning throughout their career. Recognition of the need for, and an ability to engage in continuing professional development and life-long learning (Continuing education awareness). |
| | | • An ability to communicate effectively, both in writing and orally (Speaking / Writing skills). |
| | | • Use information and knowledge effectively: scanning and organizing data, synthesizing and analysing in order to abstract meaning from information, and to share knowledge. |
| | | • An ability to use current techniques, skills, and tools necessary for managerial practice (Practical managerial analysis skills). |
| | | • An understanding of professional, ethical, legal, financial, marketing, sales, logistical security and social issues and responsibilities (Professional integrity). |
| | | • An ability to function effectively on multi-disciplinary teams (Team work). |
| | | • An ability to analyze a problem, identify, formulate and use the appropriate managerial skills for obtaining its solution. |
| | | • An ability to demonstrate a critical awareness of current issues (e.g., diversity, social responsibility, sustainability, innovation, knowledge management, etc.) in business and management which is informed by leading edged research and practice in the field. |
| | | • An ability to develop a systematic understanding of globalization and its impact on people, businesses and the economy. |
| | | |
| | Department of Computer Management | • Understand theory of Digital Design and Computer Organization to provide an insight of how basic computer components are specified. |
| | | • Understand the functions of various hardware components and in depth understanding of different stages of instruction executions. |
| | | • An in depth understanding of how different hardware components are related and work in coordination |

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| | | • An ability to understand computer buses and input/output peripherals |
| | | • Describe the fundamentals of Information Technology (IT) infrastructure components: hardware, software, and data communications systems. |
| | | • Explain the guiding principles of professional behavior in computing. |
| | | • Demonstrate proper file management techniques to manipulate electronic files and folders in a local and networked environment. |
| | | • Use business productivity software to manipulate data and find solutions to business problems. |
| | | • Identify emerging technologies for use in business applications. |
| | | • Complete projects that integrate business software applications. |
| | | • Apply problem-solving skills and the knowledge of computer Management to solve real problems. |
| | | |
| | Department of Commerce: | • demonstrate a grasp of theory, technically based skills and ethical perspectives relevant to core business areas, including marketing, statistics, financial accounting, management accounting, finance, economics, information systems, strategic management, organizational behavior, and commercial law. |
| | | • Show basic understanding of subject matter related to marketing, statistics, financial accounting, management accounting, finance, economics, information systems, strategic management, organizational behavior and commercial law. |
| | | • Develop their own principles on models useful in business and commerce. |
| | | • Show the understanding and ability to apply the subject matter in hypothetical situations. |
| | | • Evaluate strengths and weaknesses, solve problems and make recommendations in business and commercial practices. |
| | | • Show ability to influence people and/or organizations in relation to business and commercial practices. |
| | | |
| | Department of Personnel Management | • Students will be familiar with the industrial work environment. |
| | | • Students would know about the man power planning and sustaining the workforce |
| | | • Students will acquire an insight into the role and responsibilities of the Personnel Management function |
| | | • Students will learn about the different systems within Personnel Management viz. Recruitment and Selection, Performance Management, Compensation Management, Employee Relationship Management and recognize their strategic contribution to business and organizations. |
| | | • Students will be able to Identify the necessary managerial skills and competencies required for people management and work on an action plan to develop these. |
| | | |
| BCom | Department of Commerce and Management | • Program Specific Outcomes (Commerce & Management) |
| | | |
| | | • To build a strong foundation of knowledge in different areas of Commerce. |
| | | • To develop the skill of applying concepts and techniques used in Commerce. |
| | | • To develop an attitude for working effectively and efficiently in a business environment. |
| | | • To integrate knowledge, skill and attitude that will sustain an environment of learning and creativity among the students. |
| | | • To expose students about entrepreneurship. |
| | | • To enable a student to be capable of making decisions at personal and professional level. |
| | | |
| BBA | | • Develop ethical thinking. |
| | | • Develop functional and general management skills. |
| | | • Inculcate a global mindset. |
| | | • Evaluate different business problems using analytical and creative, and integrative abilities. |
| | | • Build and Demonstrate leadership, teamwork, and social skills. |
| | | • Communicate effectively in different contexts. |
| | | • Analyze socio-political-economic environment of business organizations. |
| | | |
| BCA | | • Improve their computer literacy, their basic understanding of operative systems and a working knowledge of software commonly used in academic and professional environments. |
| | | • Develop criteria to organize and present different type of works in academic and professional environments. |
| | | • Learn to organize information efficiently in the forms of outlines, charts, etc. using appropriate software. |
| | | • Develop skills to present ideas effectively and efficiently. |
| | | • Academic and Professional Presentations - Designing and delivering an effective presentation and developing the various IT skills to electronic databases. |
| | | • Use the Systems Analysis Design paradigm to critically analyze a problem. |

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| | | • Solve problems (programming networking database and Web design) in the Information Technology environment. Function effectively on teams to accomplish a common goal, Demonstrate professional behavior. |
| | | • Develop IT-oriented security issues and protocols. |
| | | • Able to design and implement a web page. |
| | | • Improved communication and business management skills, especially in providing technical support. |
| | | |
| MCom | | • The students will develop an ability to apply knowledge acquired in problem solving. |
| | | • Ability to work in teams with enhanced communication and inter-personal skills. |
| | | • The students will be ready for employment in functional areas like Accounting, Taxation, Banking, Insurance and Corporate Law. |
| | | • Ability to start entrepreneurial activities. |
| | | • To inculcate ethical values, team work, leadership and managerial skills. |
| | | • Students will exhibit inclination towards pursuing professional courses such as CA/ CS/ CMA/CFA etc. |

**DEPARTMENT OF COMPUTER SCIENCE**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| Computer Scien | | |
| FYBSc | CS 111 Basics of Computer | • Understand the History of Computers. |
| | | • Understand What is Computer and Basic concepts of computer. |
| | | • Aware about various types of Computers, types of input and output devices. |
| | | • Preparation of Algorithm and Flowchart of Program. |
| | | • Learn computer networks, its types and basics of Internet. |
| | | • Understand computer viruses and its types. |
| | | |
| | CS 112 C Programming - I | • Develop their programming skills. |
| | | • Be familiar with programming environment with C Program structure. |
| | | • Declaration of variables and constants. |
| | | • Understand operators, expressions and preprocessors. |
| | | • Understand arrays , it's declaration and uses. |
| | | |
| | CS 121 Internet Computing | • Understand the Types of Website, it's Structure, Site Organization Model , Site Planning and Testing. |
| | | • Understand how to design website with different website development models. |
| | | • Know the different page types on websites and it's navigations. |
| | | • Designing website using HTML language. |
| | | • Design advanced website using CSS. |
| | | |
| | CS 122 C Programming - II | • Design programs using Functions, Pointers , Structures and Unions in C language. |
| | | • Write a program using File Handling. |
| | | • Writing programs for drawing different graphical shapes. |
| | | |
| | CS-103 and 203 LAB Course on Paper I&II | • On completion of the course, students are able to develop programs using C to meet real world needs and able to develop their own websites. This course provides platform to enhance student's basic skills required for advanced programming. |
| | | |
| SYBSc | COMP 211 : Data Structure-I | • Know what is data structure and basic algorithmic notations. |
| | | • Analyse the time and space requirement of any algorithm. |
| | | • Understand different linear data structures for conversion of mathematical expressions and polynomial representations. |
| | | • Know the file structures. |
| | | |
| | COMP 212 : OOAD & Introduction to C++ | • Be familiar with Object Oriented Programming Environment. |
| | | • Differentiate between Structure oriented programming and object oriented programming. |
| | | • Understand different object modelling techniques and analysis like Generalization , Aggregation and Metadata. |
| | | • Write Reusable , Extensible and Robust programs in C++. |
| | | |
| | COMP 221 : Data Structure – II | • Know different non-linear data structures that can be used to represent hierarchical relationship between objects. |
| | | • Traverse and represent the graphs in computer. |
| | | • Understand the different approaches of sorting and searching elements in the arrays. |
| | | • Understand different techniques of designing the algorithms. |
| | | |
| | COMP 222 : Programming in C++ | • Explore polymorphism using Function and Operator Overloading. |
| | | • Write programs for handling runtime errors using exception. |
| | | • Understand the concepts of pointers in C++. |
| | | • Understand the different aspects of hierarchy of classes and their extensibility. |

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| | | • Write generic programs using templates and STL. |
| | | |
| | COMP 213 and 223 : Practical Course | • On completion of the course, students are able to develop programs using C++ based on object oriented concepts and write the ROBUST, EXTENSIBLE and EFFICIENT programs. |
| | | |
| TYBSc | CS-311 System Programming | • Get aware about system softwares and their tools like Editors and Debug Monitors. |
| | | • Get familiar with language processing activities. |
| | | • Understand detail working of Assembler , Macro and Macro Preprocessor , Compiler and linker & Loader. |
| | | |
| | CS-312 Database Management System | • Get aware of Describing & storing data. |
| | | • Know about E-R Model by overview of database design.. |
| | | • Get familiar with Conversion of ER to Relational model. |
| | | • Know about functional dependency and Data Normalisation. |
| | | • Understand Database Implementations. |
| | | • Make use of Concurrency control, Backup & recovery for large or huge of databases. |
| | | • Get aware about handling huge databases. |
| | | |
| | CS-313 Software Engineering | • Get aware of evaluation of software and Software Development Life Cycle (SDLC). |
| | | • Know about Software Development Model. |
| | | • Get knowledge of Requirement Analysis and Specification in software engineering . |
| | | • Learn use of Fact finding Techniques , Types of Requirement Modeling and Data Modeling Concepts. |
| | | • Get knowledge of Design Concepts in software engineering. |
| | | • Know about Cohesion & Coupling , Decision Table & Decision Tree, Data flow Diagram |
| | | • Know about Software Coding & Testing. |
| | | • Get aware about Elements of Software Quality Assurance. |
| | | |
| | CS-314 Computer Aided Graphics | • differentiate between interactive and non interactive graphics. |
| | | • explore different line and circle drawing algorithms. |
| | | • perform 2D and 3D transformation on different images. |
| | | • know about detail working of image clipping and windowing. |
| | | • understand raster graphics and hidden surface elimination. |
| | | |
| | CS-315 Programming in VB.NET | • get aware about .Net platform. |
| | | • understand looping structure, control flow statements and exception handling in VB.NET |
| | | • understand object oriented programming in VB.NET |
| | | • program using ADO.NET |
| | | |
| | Elective-A CS-316 A) Programming in C# | • By using c# code and ASP.Net create dynamic web pages. |
| | | • Using MS Visual Studio.NET IDE and Create Console Applications. |
| | | • Know about Basic Principal of OOP, Defining Class and using functions. |
| | | • Able to use constructor and destructor. |
| | | • Use Polymorphism ,Method Overriding ,Method hiding |
| | | |
| | Elective -B UG-CS-316 B) JAVA Programming-I | • Get knowledge JDK Environment. |
| | | • Explore polymorphism using Function and Operator Overloading ,overriding . |
| | | • Understand the different aspects of hierarchy of classes and their extensibility . |
| | | • Understand the concepts of streams and files . |
| | | • Write programs for handling runtime errors using exception. |
| | | |
| | CS-321 Operating System | • know about functions and services of operating system. |

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| | | • aware about different CPU scheduling algorithms |
| | | • get familiar with different memory management techniques. |
| | | • understand different disk and drum scheduling algorithms as well as deadlock concepts. |
| | | • get introductory knowledge about android operating system. |
| | | |
| | CS-322 MS SQL Server | • understand features and data types in SQL server. |
| | | • create and manipulate databases for various applications. |
| | | • use procedures and trigger for performing complex operation on databases. |
| | | • handle errors using exception handling concepts. |
| | | |
| | CS-323 Internet Programming using PHP | • understand how PHP works with lexical structure of it. |
| | | • program for different applications using arrays, functions and strings. |
| | | • aware about different web techniques used in PHP. |
| | | • integrate PHP with MYSQL. |
| | | |
| | CS-324 Theoretical Computer Science | • Understand what is Push down Automata and its applications. |
| | | • understand concepts of Context free grammar and normalization of CFG. |
| | | • convert regular expression to Finite Automata. |
| | | • Design Turing Machines for various applications like enumerator, function computer and universal turing machine. |
| | | |
| | CS-325 Computer Network | • understand applications of network, network structures and protocol hierarchy |
| | | • aware about details of physical, datalink, network and transport layer of TCP/IP network model. |
| | | • understand about different aspects of network security like firewalls, IP security and VPNs. |
| | | • aware about attacks and Confidentiality used in crypotgraphy. |
| | | |
| | Elective - A CS-326 A) Web Programming using ASP.NET | • Using features of ASP.Net create ASP.Net Compilation Model, Code Behind Model Execution Stages. |
| | | • Know about ASP.NET Controls , ASP.Net Intrinsic Objects |
| | | • Use page layout, styles and text balance, site map, Master pages and content Pages, Navigation controls: Tree view, site map path(bread crumb), Menu navigation. |
| | | • By using ASP.Net create dynamic web pages |
| | | |
| | Elective - B CS-326 B) JAVA Programming-II | • program using graphical user interface with Swing classes. |
| | | • handle different kinds of events generated while handling windows. |
| | | • create programs using menus and dialog boxes. |
| | | • program for websites using applets. |
| | | • understand advanced java concepts like JDBC and servlets. |
| | | |
| | CS-Lab-301 Lab on System Programming | • On completion of the course, students are able to develop system programs to provide basic applications for computing like line editor, interrupt handler, SMAC0 and lexical analyser. |
| | | |
| | CS-Lab-302 Lab on Programming in VB.NET, Computer Aided Gra | • On completion of the course, students are able to develop different programs for demonstrating different Computer graphics algorithms like circle, line drawing and clipping and filling as well as students can create dynamic web pages using VB.NET. |
| | | |
| | CS-Lab-304 Lab on MS SQL Server | • On completion of the course, students are able to develop database management system using features and services provided by MS SQL Server. |
| | | |
| | CS-Lab-305 Lab on Internet Programming using PHP | • On completion of the course, students are able to develop interactive static as well as dynamic websites. |
| | | |
| | Elective -A CS-Lab-303 A) Lab on Programming in C# and CS-Lab- | • On completion of the course, students are able to develop programs using C# based on object oriented concepts and write the ROBUST, EXTENSIBLE and EFFICIENT programs by using c# code and ASP.Net create dynamic web pages. |
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| | | • OR |
| | Elective -B CS-Lab-303 B) Lab on JAVA Programming –I and CS-L | • On completion of the course, students are able to develop efficient programs which provides graphical user interface for easy handling of computers using JAVA. |
| | | |
| MSc-I | CS-101 Advanced C++ Programming | • Understand advanced concepts for handling runtime errors using stack unwinding, uncaught exception and automatic cleanup. |
| | | • Study the Runtime Type Information of the member variables, functions and the multiple inheritance that are used in the program. |
| | | • Study advanced concepts of C++ by resolving ambiguities and duplicate sub object in virtual base classes. |
| | | • Understand applications of C++ like Smart Pointer , Generic Pointer , Object Validation and Reference Counting. |
| | | • Understand detail concepts of STL. |
| | | |
| | CS-102 Automata Theory and Computability | • Understand what is Push down Automata and its applications. |
| | | • Design Turing Machines for various applications like emunerator, function computer and universal turing machine. |
| | | • Study Post correspondence problem, decidability of membership, emptiness and equivalence problems of natural languages. |
| | | • Get familiar with Computability and complexity measures. |
| | | • Understand what is DNA and Membrane Computing. |
| | | |
| | CS-103 Advanced Operating System | • Study files subsystem for UNIX operating system. |
| | | • Understand detail working of UNIX operating system. |
| | | • Understand process and memory management techniques. |
| | | |
| | CS-104 Digital Image Processing | • Understand the application of digital image processing. |
| | | • Explore knowledge about image processing fundamentals. |
| | | • Get aware about image sampling and quantization and operation on images |
| | | • Understand histogram processing and various image filtering algorithms. |
| | | • Know about various noise models and transformation techniques. |
| | | • Be aware of various morphological techniques and segmentation schemes. |
| | | |
| | CS-105- LAB - I Lab on Advanced OS and Digital Image Processing | • Get hands on various linux commands and shell script for different application. |
| | | • Familiar with MATLAB environment. |
| | | • Explore various algorithms for digital image processing using MATLAB. |
| | | |
| | CS -106-LAB - II Lab on Advanced C++ Programming | • On completion of the course, students are able to develop ROBUST, EXTENSIBLE and EFFICIENT programs using advanced concepts of STL in C++. |
| | | |
| | CS-201 Advanced DBMS | • Explore ideas about centralized and client server architecture of DBMS. |
| | | • Differentiate and handle parallel and distributed databases. |
| | | • Realize object oriented databases and XML databases for Dynamic website development. |
| | | • Be familiar with mobile and multimedia databases. |
| | | |
| | CS-202 Machine Intelligence | • Understand artificial intelligence and AI problem solving techniques. |
| | | • Explore logic for solving various AI problems. |
| | | • grasp the techniques of knowledge representation in machine. |
| | | • Comprehend advanced machine learning techniques such as fuzzy logic and genetic algorithms. |
| | | |
| | CS-203 Compiler Construction | • Know role of compilers in program execution. |
| | | • Understand detail program execution using lexical and syntax analysis |
| | | • Be aware of code generation and optimization. |
| | | |
| | CS-204 Design and Analysis of Algorithms | • Design efficient algorithms using various algorithm designing techniques. |
| | | • Comprehend dynamic programming using control abstraction and longest common subsequence. |
| | | • Classifying any problem as NP complete and NP hard |
| | | |

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| | CS-205- LAB - III Lab on DAA and MI | • On completion of the course, students are able to build the program that can solve the problems which requires intelligence to solve them. They can build programs which can generate output in less time and execute in less space. |
| | | |
| | CS -206-LAB - IV Lab on Advanced DBMS | • On completion of the course, students are able to build and maintain the databases handling real life applications and daily needs. |
| | | |
| MSc-II | CS-301 Software Engineering | • Know the requirements of developing software. |
| | | • Be aware of various models required for software development. |
| | | • Test the developed software for its functionality and performance. |
| | | • Understand software quality and quality measures. |
| | | • Grasp the software configuration management and project planning. |
| | | |
| | CS-302 Optimization of Algorithm | • Understanding classification and limitation of quantitative techniques. |
| | | • Take hold of linear programming problem solving techniques. |
| | | • Solve various kinds of transportation problems using different techniques. |
| | | • Explore concepts in game theory |
| | | • Be aware about the network models, sequencing models and simulaon models. |
| | | |
| | CS-303 Advanced Java Programming | • Design programs using Remote method invocations (RM. |
| | | • Explore programming techniques of Java beans and swing. |
| | | • Be aware about Java Enterprise applications. |
| | | • Know about java servlets and java struts. |
| | | |
| | CS-304 Windows, WCF and WPF Programming | • Familiar with windows environment and child window controls. |
| | | • Understand windows communication foundation using WCF contracts, clients and services security. |
| | | • Understand windows presentation foundation, WPF and .Net programming. |
| | | |
| | CS-305-LAB – V Lab on Windows, WCF and WPF Programming | • On completion of the course, students are able to develop program having graphical user interface for various applications.. |
| | | |
| | CS -306-LAB –VILab on Advanced Java Programming | • On completion of the course, students will get hands on training for various java programs like JDBC, EJB, Servlets, Struts etc. |
| | | |
| | CS-401 Natural Language Processing | • Understand languages and linguistic background |
| | | • Be familiar with applications and research background in NLP. |
| | | • Grasp mathematical foundation related to NLP like probability, bays theorem and machine learning. |
| | | • Know about linguistics essentials and grammar as part of speech and parsing and differentiating them. |
| | | • Aware about word morphology and N-Gram Models. |
| | | |
| | CS-402 Advanced Network Programming | • Understand network fundamentals with TCP/IP architecture. |
| | | • Aware with client server programming and its application using socket interface. |
| | | • Understand IGMP ICMP and IP datagrams |
| | | • Understating the mobile and advoc network programming. |
| | | |
| | CS-403 Data Warehousing and Data Mining | • Understand data warehousing for business analysis using OLAP, OLTP, MOLAP and ROLAP. |
| | | • Explore the concepts of data mining and data preprocessing. |
| | | • Understand concept of association rule mining. |
| | | • Grasp classification and prediction and analysie different issues related to them. |
| | | • Identify different cluster analysis techniques. |
| | | • Know about advanced data mining techniques such as spatial data mining and understand the concept of big data analysis. |
| | | |
| | CS-404- LAB – VII Lab on Network programming and Data Mining | • On completion of the course, students are able to develop client server programs for various services like TCP, UDP, Telnet, FTP and HTTP. Students are also able to analyse the processing and classification techniques using WEKA tool. |

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| | CS -405 Mini Project (200 marks) | • Deal with real world data. |
| | | • Familiar about real time IT industry enviorment. |
| | | • Expeirnance about applying the knowledge they got uptil now. |
| | | • Build a whole real time working system which will satisfy all custmor’s needs. |

**DEPARTMENT OF INFORMATION TECHNOLOGY**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBSc. | IT 111: Web Design –I | • Understand about Analog & Digital communication. |
| | | • Understand about Overview of Information Security- Viruses & Worms, threats. |
| | | • Getting knowledge of computer network and for using internet. |
| | | • Understand the Types of Website, it's Structure, Site Organization Model , Site Planning and Testing. |
| | | • Understand how to design website with different website development models. |
| | | • Know the different page types on websites and it's navigations. |
| | | • Designing website using HTML language. |
| | | • Design advanced website using CSS. |
| | | |
| | IT 112: OOP (Object Oriented Programming-I) | • Understand the concepts of Basic C Programming Language. |
| | | • To develop the skill of programming. |
| | | • Be familiar with Object Oriented Programming. |
| | | • Differentiate between structure oriented programming and object oriented programming. |
| | | • Understand different object oriented modeling techniques. |
| | | • Write Reusable , Extensible and Robust programs in C++.. |
| | | • Able to use constructor and destructor. |
| | | |
| | IT 121: Advanced Web Design -II | • Understand and learn about evaluation of scripting languages. |
| | | • Learn about java scripting function and objects. |
| | | • Understand and learn java script object hierarchy. |
| | | • Able to design and develop dynamic web pages . |
| | | • Getting knowledge to develop web portals throh XML. |
| | | |
| | IT 122: Object Oriented Programming-II | • Explore polymorphism using Function and Operator Overloading. |
| | | • Write programs for handling runtime errors using exception. |
| | | • Understand the concepts of pointers in C++. |
| | | • Understand the different aspects of hierarchy of classes and their extensibility. |
| | | • Write generic programs using templates and STL. |
| | | |
| | IT103 and 203 LAB Course on Paper I and II | • develop programs using c++ to meet real world needs and able to develop their own websites. This course provides platform to enhance student's basic skills required for advanced programming. |
| | | |
| | IT 211 : Data Structure – I | • Know what is data structure and basic algorithmic notations. |
| | | • Analyse the time and space requirement of any algorithm. |
| | | • Understand different linear data structures for conversion of mathematical expressions and polynomial representations. |
| | | • Know the file structures. |
| | | |
| | IT-212:Programming in C# | • work by using c# code and ASP.Net create dynamic web pages. |
| | | • Use MS Visual Studio.NET IDE and Create Console Applications. |
| | | • Know about Basic Principal of OOP, Defining Class and using functions. |
| | | • use constructor and destructor. |
| | | • Use Polymorphism ,Method Overriding ,Method hiding. |
| | | |
| | IT-221: Data Structure – II | • Know different non-linear data structures that can be used to represent hierarchical relationship between objects. |
| | | • Traverse and represent the graphs in computer. |
| | | • Understand the different approaches of sorting and searching elements in the arrays. |
| | | • Understand different techniques of designing the algorithms. |
| | | |

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| | IT 222 : Web Programming using ASP.NET | • Use features of ASP.Net create ASP.Net Compilation Model, Code Behind Model Execution Stages. |
| | | • Know about ASP.NET Controls , ASP.Net Intrinsic Objects |
| | | • Use page layout, styles and text balance, site map, Master pages and content Pages, Navigation controls: Tree view, site map path(bread crumb), Menu navigation. |
| | | • use ASP.Net create dynamic web pages |
| | | |
| | IT 213 and 223: Practical Course | • Write the ROBUST, EXTENSIBLE and EFFICIENT programs and using data structure.By using c# code and ASP.Net create dynamic web pages. |
| | IT-311 System Programming | • Get insight into the system softwares and their tools like Editors and Deb Monitors. |
| | | • Get familiar with language processing activities. |
| | | • Understand detail working of Assembler, Macro and Macro Preprocessor , Compiler and linker & Loader. |
| | | |
| | IT-312 Database Management System | • Get aware of Describing & storing data. |
| | | • Know about E-R Model by overview of database design.. |
| | | • Get familiar with Conversion of ER to Relational model. |
| | | • Know about functional dependency and Data Normalization. |
| | | • Understand Database Implementations. |
| | | • Make use of Concurrency control, Backup & recovery for large or he of databases. |
| | | • Get aware about handling he databases. |
| | | |
| | | |
| | IT-313 Data Communication | • Know about Major Communication in data communication system -Transmission Path and Modems. |
| | | • Get familiar with Switching & Multiplexing. |
| | | • Understand Error Correction & Detection in Data Communication. |
| | | • Know about Wired LANs , Wireless LANs and Bluetooth. |
| | | • Get knowledge of Data Communication Services. |
| | | |
| | | • Get aware of evaluation of software and Software Development Life Cycle (SDLC). |
| | | • Know about Software Development Model. |
| | | • Get knowledge of Requirement Analysis and Specification in software engineering. |
| | | • Learn use of Fact finding Techniques, Types of Requirement Modeling and Data Modeling Concepts. |
| | | • Get knowledge of Design Concepts in software engineering. |
| | | • Know about Cohesion & Coupling , Decision Table & Decision Tree, Data flow Diagram |
| | | • Know about Software Coding & Testing. |
| | | • Get aware about Elements of Software Quality Assurance. |
| | | |
| | IT-315 Internet Programming using PHP | • understand how PHP works with lexical structure of it. |
| | | • program for different applications using arrays, functions and strings. |
| | | • aware about different web techniques used in PHP. |
| | | • integrate PHP with MYSQL. |
| | | |
| | IT-316 JAVA Programming-I | • Get knowledge JDK Environment. |
| | | • Explore polymorphism using Function and Operator Overloading ,overriding . |
| | | • Understand the different aspects of hierarchy of classes and their extensibility . |
| | | • Understand the concepts of streams and files . |
| | | • Write programs for handling runtime errors using exception. |
| | | |
| | IT-321 Operating System | • know about functions and services of operating system. |
| | | • aware about different CPU scheduling algorithms |
| | | • get familiar with different memory management techniques. |
| | | • understand different disk and drum scheduling algorithms as well as deadlock concepts. |

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| | | • get introductory knowledge about android operating system. |
| | | |
| | IT-322 MS SQL Server | • understand features and data types in SQL server. |
| | | • create and manipulate databases for various applications. |
| | | • use procedures and trigger for performing complex operation on databases. |
| | | • handle errors using exception handling concepts. |
| | | |
| | IT-323 Computer Network & Security | • understand applications of network, network structures and protocol hierarchy |
| | | • aware about details of physical, datalink, network and transport layer of TCP/IP network model. |
| | | • understand about different aspects of network security like firewalls, IP security and VPNs. |
| | | • aware about attacks and Confidentiality used in crypotgraphy. |
| | | |
| | IT-324 Automata Theory, Languages, and Computation | • Understand what is Push down Automata and its applications. |
| | | • understand concepts of Context free grammar and normalization of CFG. |
| | | • convert regular expression to Finite Automata. |
| | | • Design Turing Machines for various applications like enumerator, function computer and universal turing machine. |
| | | |
| | IT-325 Cyber Law & IT Act | • know about basics of cybernetics. |
| | | • understand theory of cyber crime like web jacking and hacking. |
| | | • aware about cyber laws and IT acts 2000 in India. |
| | | • know about intellectual property rights. |
| | | |
| | IT-326 JAVA Programming-II | • program using graphical user interface with Swing classes. |
| | | • handle different kinds of events generated while handling windows. |
| | | • create programs using menus and dialog boxes. |
| | | • program for websites using applets. |
| | | • understand advanced java concepts like JDBC and servlets. |
| | | |
| | IT-Lab-301 Lab on System Programming | • develop system programs to provide basic applications for computing like line editor, interrupt handler, SMAC0 and lexical analyser. |
| | | |
| | IT-Lab-306 Lab on JAVA Programming II | • develop interactive static as well as dynamic websites. |
| | | |
| | IT-Lab-303 Lab on JAVA Programming –I and IT-Lab-306 Lab on J | • develop efficient programs which provides graphical user interface for easy handling of computers. |
| | | |
| | IT-Lab-304 Lab on MS SQL Server | • develop database management system using features and services provided by MS SQL Server. |
| | | |
| | IT-Lab-305 Designing Dynamic Web Portal | • develop a web portal in CMS(Content Management System). using XAMP server. |
| | | |

**DEPARTMENT OF DEFENCE AND STRATEGIC STUDIES**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBA | Def-101 Indian Art of War-I | • Understand about theIndian military history. |
| | | • Understand the Concepts of Strategy, focus on India war tactics and failure of strategy. |
| | | • Identify the relationship between different warriors. |
| | | • Develops ability to solve war situation. |
| | | • Used and Develop new war planning and tactics. |
| | | |
| | Def-201 Indian Art of War-II | • Understand about the Indian, Pakistan and China Military Strength. |
| | | • Focus on India's war with Pakistan and China, failurestrategy during 196 |
| | | • Identify the relationship between different. |
| | | • Develop new war planning and tactics. |
| | | • Lecturer in history and comparative study. |
| | | |
| | DEF: -301-A India's Internal Security-I | • Understand about India's internal security threat. |
| | | • Understand the Concept of Security and meaning or scope. |
| | | • Values of India's National Security. |
| | | • Identify the India's internal security factor and developed analytical skill. |
| | | |
| | DEF: -302-A Contemporary Warfare- I | • Understand warfare and deferent war concepts. |
| | | • All type of war like Nuclear, Economic and Total. |
| | | • Judge process capability. |
| | | • Understand underlying assumptions forContemporarywarfare and their usage. |
| | | |
| | DEF: -303-A Defence Mechanism and Organisation of India- I | • Understand about the Military Organisation and Principles of Administration. |
| | | • Understand the Higher Defence Organisation of India. |
| | | • Join the defence and paramilitary forces and join defence service. |
| | | • Also understand Intelligence of India and Intelligence organisation. |
| | | • Reconstruction of Indian Armed Forces. |
| | | |
| | DEF - 351- A- Global Security – I | • Understand about the Meaning and Concept of Global Security |
| | | • Impact of Globalization in India's Security. |
| | | • Understand and analysts of new world order after cold war |
| | | • Able to comparative study to ASEAN, SAARC, OPEC and EU. |
| | | • What is world peace and security problem? |
| | | |
| | DEF- 352- A- Contemporary Study of War & Peace – I | • After world war II changes of military power. |
| | | • During the cold war understand conflict between two super powers. |
| | | • Understand about the detente and deterrence concept. |
| | | • Morganton's balance of power concept utilized of under south and north block |
| | | • Ways of Techniques of maintaining balance of power. |
| | | |
| | DEF- 353- A- Geo - strategy | • Understand about the Meaning and Concept of Geo-strategy |
| | | • World's politics of Geostrategic Minerals and conflicts. |
| | | • Understand about the Geostrategic Importance and location |
| | | • India's Geo-strategic importance. |
| | | • Understand Geostrategic Issues of India's land border and Maritime border. |
| | | |
| | DEF: -401-A India's Internal Security-II | • Understand about India's internal problems and issue. |
| | | • Understand about state wise conflict ideology |

| | | |
|---|---|---|
| | | • Cyber Crime in India. |
| | | • Identify the India’s internal security factor and developed analytical skill. |
| | | • Basic instrumentand provisions against crime and terrorism |
| | | |
| | DEF: -402-A Contemporary Warfare-II | • Understand warfare and deferent war concepts. |
| | | • All type of war like biological, chemical and information warfare. |
| | | • What is method of warfare? |
| | | • Analyses and conclude of war tactics. |
| | | • Understand underlying assumptions for Contemporary warfare and their usage. |
| | | |
| | DEF: -403 A- Defence Mechanism and Organization of India-II | • Understand about the Military Roleand War Principles. |
| | | • Understand the Armed forces activity in the peace and war time. |
| | | • Join the defence and paramilitary forces and join defence service. |
| | | • Also understand Logistic Services and role in Peace Time and War Time. |
| | | • Reconstruction of Indian Armed Forces. |
| | | |
| | DEF 361 - A - Global Security – II | • Understand about the environment Security concept. |
| | | • Impact of organized crime in India’s Security. |
| | | • Understand and analysts new technology with nuclear and cyber security. |
| | | • Understand the Global Crises with economic, energy and ethnic issue |
| | | • Also about Human Health and Food Security. |
| | | |
| | DEF- 362- A - Contemporary Study of war and Peace-II | • Understand about the Collective security concept. |
| | | • During the cold war period India's role for Non-alignment. |
| | | • Developed the concept of Disarmament and arms control. |
| | | • During the cold war understand conflict between two super powers. |
| | | • Understand the Science, Technology and National Power |
| | | • World developed the Trends of peace-Research. |
| | | |
| | DEF 363 A - Military Geography | • Understand the Importance of Geopolitics during the Peace Time and war Time. |
| | | • Develop and Evolution of Geopolitical Thoughts. |
| | | • Military Geography concept and principle. |
| | | • Geographical Factors effecting Wartime. |
| | | • Impact of Geography on Military Operations. |
| | | |
| MA-I | DEF- 111 Indian Military History | • The military organization of various armies since ancient time and strategies and tactics adopted in the decisive battles fought in India. |
| | | • Understand the Strategies, Tactics, Organizations and Weapons of Ancient and Mediaeval. |
| | | • Specially focus on Portuguese, French, Dutch and British military modernization. |
| | | • Understand about the Basic Concept of Military History. |
| | | |
| | DEF-112 National Security | • Understand the Key Concept of Security and meaning or scope. |
| | | • Understand about India’s National security threat. |
| | | • Values of India’s National Security. |
| | | • Identify the India’s national security factor and developed analytical skill. |
| | | • Cyber Crime in India. |
| | | |
| | DEF-113 Strategic Thinkers | • Understand the theories of world’s great strategicthinker |
| | | • Develop and Evolution of Thoughts. |
| | | • Understand about the ideologies and thinker. |
| | | |

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| | DEF- 114 Geopolitics & Military Geography | • Understand the Importance of Geopolitics during the Peace Time and war Time. |
| | | • Develop and Evolution of Geopolitical Thoughts. |
| | | • Military Geography concept and principle. |
| | | • Geographical Factors effecting Wartime. |
| | | • Impact of Geography on Military Operations. |
| | | |
| | DEF 115 Defence Economics | • Understand the defence economic theories |
| | | • Join the India's defenceproduction service |
| | | • Understand about the defence policy and Defence Budget. |
| | | • Trend and Analysis of India's Defence Expenditures since Independence. |
| | | • Analysis of Defence and Development |
| | | |
| | DEF- 116 Peace & Conflict Studies. | • Understand the concept of Peace & Conflict and theory. |
| | | • Understand about the Nature of International Conflict. |
| | | • Conflict Resolution and conflict management. |
| | | • Focus on Confidence Building Measures |
| | | • Study of Gandhian Approach and its relevance today |
| | | |
| | DEF- 121 International Relations | • Understand the concept of International Relations and Theories. |
| | | • During the cold war understand conflict between two super powers. |
| | | • Understand about the detente and deterrence concept. |
| | | • Developed the concept of Disarmament and arms control. |
| | | • During the cold war period United Nation: Envisaged role and actual record, |
| | | |
| | DEF- 122 Research Methodology | • Developed best research analyses. |
| | | • Formulation of Research Problem and Hypothesis. |
| | | • Research Design and Major Components of Research. |
| | | • Understand the Research Methods, Data Collection and Data Analysis |
| | | • Good scholar for Research Paper Writing |
| | | |
| | DEF-123 India's Strategic Partnership with Major Powers | • Understand the India-USA Strategic Partnership |
| | | • During the cold war understand relation between major powers. |
| | | • Analyses defence partnership with major powers |
| | | • Study to India's relation with England, Israel, Russia, France and Japan |
| | | • Conclude the India's foreign Affair. |
| | | |
| | DEF- 124 Major Crises in Post-Cold War Era | • Understand aboutmajor International conflicts taken place in various regions of the world after Cold war- |
| | | • Understand the regional wise comparative studies |
| | | • Understand deferent Ideological crisis. |
| | | |
| | DEF-125 India's Internal Security: Issues & Problems | • Understand about the India's internal problems and issue. |
| | | • Understand about the India's internal security threat. |
| | | • Understand the state wise conflict ideology |
| | | • Identify the India's internal security factor and developed analytical skill. |
| | | • Basic instrument and provisions against crime and terrorism |
| | | |
| | DEF- 126 Theories of War & Peace | • Understand warfare and deferent war concepts. |
| | | • All type of war like Nuclear, Economic and Total. |
| | | • Judge process capability. |
| | | • Understand the Terrorism as a New Mode of Conflict |

| | | |
|---|---|---|
| | | • Understand underlying assumptions for Contemporary warfare and their usage. |
| | | |
| MA-II | DEF - 231: National Security of India-I | • Understand the Key Concept of Security and meaning or scope. |
| | | • Understand about India's National security threat. |
| | | • Values of India's National Security. |
| | | • Identify the India's national security factor and developed analytical skill. |
| | | |
| | DEF- 232: Challenges to Peace and Security of UN – I | • Understand the concept of peace and Theories. |
| | | • After the cold war understand conflict. |
| | | • Understand about the human development concept. |
| | | • Developed the concept of Disarmament and arms control. |
| | | • During the cold war period United Nation: Envisaged role and actual record, |
| | | |
| | DEF–233 -India's Wars with Pakistan and China – I | • Understand about the Indian, Pakistan and China Military Strength. |
| | | • Focus on India's war with Pakistan and China, failure strategy during 196 |
| | | • Identify the relationship between different. |
| | | • Develop new war planning and tactics. |
| | | • Lecturer in history and comparative study. |
| | | |
| | DEF-235- Defence Organization of India - I | • Understand about the Military Organisation and Principles of Administration. |
| | | • Understand the Higher Defence Organisation of India. |
| | | • Join the defence and paramilitary forces and join defence service. |
| | | • Also understand Intelligence of India and Intelligence organisation. |
| | | • Reconstruction of Indian Armed Forces. |
| | | |
| | DEF-241- National Security of India – II | • Understand about India's Nationalproblems and issue. |
| | | • Understand about state wise conflict ideology |
| | | • Threat to India's National security. |
| | | • Identify the India's internal security factor and developed analytical skill. |
| | | • Basic instrument and provisions against crime and terrorism |
| | | • Understand the Security Problems after 1990 and its neighbors |
| | | |
| | DEF- 242: Challenges to Peace and Security of UN- II | • Understand the concept of diplomacyand Crisis. |
| | | • After the cold war understand conflict. |
| | | • Understand about the challenges of human health security. |
| | | • Developed the concept of organized crime. |
| | | • After cold war period United Nation: Envisaged role and actual record |
| | | |
| | DEF-243- India's Wars with Pakistan and China – II | • Understand about the Indian and Pakistan War. |
| | | • Focus on India's war with Pakistan and low intensity conflict. |
| | | • Identify the relationship between both countries. |
| | | • Develop new war planning and tactics. |
| | | • Failure strategy during 1962 and Futuristic approach of India with her neighbors. |
| | | |
| | DEF-245- Defence Organization of India – II | • Understand about the Military Roleand War Principles. |
| | | • Understand the Armed forces activity in the peace and war time. |
| | | • Join the defence and paramilitary forces and join defence service. |
| | | • Also understand Logistic Services and role in Peace Time and War Time. |
| | | • Reconstruction of Indian Armed Forces. |
| | | |

**DEPARTMENT OF DRAMATICS**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| F. Y. B. A. | (DRAMATICS Gn Paper G-I ) | |
| | | • develop their understanding and interest in Theatre. |
| | | • Organize themselves for various forms of drama |
| | | • understand the basic concepts of theatre |
| | | |
| SYBA | DRAMATICS Gn Paper G-II | • provide self analysis system to improve the standard of performance through shows of Dramas, Films, Documentary, Short Films, etc. |
| | | • communicate effectively in their various Drama Activities |
| | | |
| | ACTING (DRAMA- Special Paper –I ) | • understand different acting tools |
| | | • use their creativity in Acting, tools of Acting Bharatmuni's Natyashastra, On Stage Acting & Back Stage Work. |
| | | • develop suitable body language, volume of speech, language, dialogue, expressions, etc. |
| | | |
| | THEATRE TECHNIQUE (DRAMA-Special Paper –II) | • learn Theatre technique |
| | | • implement the values of theatre technique . |
| | | • know the types of set, light, music, make-up, costume. |
| | | |
| TYBA | DRAMA- Gn Paper G-III | • understand the basic concept of Universal Theatre. |
| | | • get acquainted with literature values of Drama studies. |
| | | • learn the history of Marathi theatre & there Set design. |
| | | • learn the origin of drama and dramatic art. |
| | | |
| | DIRECTION( DRAMA-Special Paper-III) | • learn the subject and create a own play production and they create own path in professional theatre. |
| | | • gain freedom for production, and called as `Departmental Production'. |
| | | • improve presentation ability as director and building up the confidence of the students. |
| | | |
| | MANAGEMENT & MARKETING (DRAMA- Special Paper-IV) | • understand the theatre activities management. |
| | | • learn all drama management techniques. |
| | | • get acquainted with the basic concepts in organized drama shows and performing values in theatre activities |
| | | |

**DEPARTMENT OF ECONOMICS**

| Class | Course | Outcomes |
|---|---|---|
| FYBA | Eco G-101(A) - Fundamentals of Economics-I | • Students will be aware about fundamental concepts of economics |
| | | • Students will be able to understand economic approach |
| | | • Students will be able to know role of market in real life. |
| | | • Students will be able to understand role & activities of financial institutions. |
| | | |
| | Eco G-201(A) - Fundamentals of Economics-II | • Students will be aware about various forms of market |
| | | • Students will be able to understand concept of cashless society |
| | | • Students will be able to understand BOT, BOP & type of exchange rates. |
| | | • Students will be able to understand concept of govt. financing. |
| | | |
| SYBA | ECO 231- Indian Economy since 1980 – I | • Students will be able to understand nature of Indian economy |
| | | • Students will be able to understand population & economic development |
| | | • Students will be able tounderstand infrastructure and economic development |
| | | • Students will be able tounderstand role of agriculture in Indian economy |
| | | |
| | ECO 241 - Indian Economy since 1980 – II | • Students will be able to understand industrial sector in India |
| | | • Students will be able to understand cooperative sector in economy |
| | | • Students will be able to understand economic planning in India |
| | | • Students will be able to understand recent structural changes in economy |
| | | |
| | ECO 232- Advanced Micro Economics – I | • To understand individual agents of market |
| | | • Students will be able to understand consumer behaviour |
| | | • Students will be able to understand concept of cost |
| | | • Students will be able to understand Linear & Non- Linear functional relationship |
| | | |
| | ECO 242- Advanced Micro Economics – II | • Students will be able to understand price determination of factors |
| | | • Students will be able to understand various theories of factors |
| | | • Students will be able to understand concept of profit & Interest |
| | | • Students will be able to understand market equilibrium of firm in monopolistic market. |
| | | |
| | ECO 233- Advanced Macro Economics – I | • Students will be able to understand macro economic analysis |
| | | • Able to understand of national income |
| | | • Able to understand classical & Keynesian theories of output and employment |
| | | • Able to understand consumption & Investment function |
| | | |
| | ECO 243- Advanced Macro Economics – II | • Students will be able to understand process of credit creation by commercial banks |
| | | • Students will be able to understand Quantity theory of money. |
| | | • Students will be able to understand various macroeconomic problems. |
| | | • Students will be able to understand various macroeconomic policy |
| | | |
| TYBA | ECO 351 - Indian Economy since 1980 – III | • Students will be able to understand Indian financial system |
| | | • Students will be able to understand money & banking |
| | | • Students will be able to understand India's foreign trade |
| | | • Students will be able to understand concept of globalization |
| | | |
| | ECO 361-Indian Economy since 1980 – IV | • Students will be able to understand federal fiancé in India |
| | | • Students will be able to understand Indian tax system |
| | | • Students will be able to understand public expenditure in India |

| | | |
|---|---|---|
| | | • Students will be able to understand public debt& deficit finance |
| | | |
| | ECO-352(A)- Public Finance and Policies-I | • Students will be able to understand concept of public fiancé |
| | | • Students will be able to understand concept of public revenue |
| | | • Students will be able to understand incidence & approaches of taxation |
| | | • Students will be able to understand government intervention |
| | | |
| | ECO-362(A) - Public Finance and Policies-II | • Students will be able to understand concept of public expenditure |
| | | • Students will be able to understand concept of public debt |
| | | • Students will be able to understand concept of fiscal policy |
| | | • Students will be able to understand concept of budget & deficit finance |
| | | |
| | ECO-353(A) - International Trade and Practices-I | • Students will be able to understand international trade theories |
| | | • Students will be able to understand gains from international trade & trade policy |
| | | • Students will be able to understand concept of BOP & BPT |
| | | • Students will be able to understand concept of exchange rates |
| | | |
| | ECo-362(B) - Economics of Indian Agriculture-II | • Students will be able to understand international capital movements & MNCs |
| | | • Students will be able to understand international instructions & regional economic cooperation |
| | | • Students will be able to understand concept of devaluation & convertibility of rupees |
| | | • Students will be able to understand Euro currency market |
| | | |
| MA-I | ECO-111 - ADVANCEMICROECONOMICTHEORY- I | • Students will be able to understand ordinal utility analysis of consumer demand |
| | | • Students will be able to understand modern utility analysis |
| | | • Students will be able to understand the Firm & its technology |
| | | • Students will be able to understand theory of price |
| | | |
| | ECO-121 - ADVANCEMICROECONOMICTHEORY -II | • Students will be able to understand the theory of oligopoly & duopoly |
| | | • Students will be able to understand the new theories of oligopoly market |
| | | • Students will be able to understand theory of distribution |
| | | • Students will be able to understand general equilibrium & economic efficiency & welfare |
| | | |
| | ECO-112 - MODERN PUBLIC FINANCE - I | • Students will be able to understand market vs Government |
| | | • Students will be able to understand public goods, monopoly, externalities & Asymmetric information |
| | | • Students will be able to understand macroeconomic considerations in public finance |
| | | • Students will be able to understand government & rent seeking |
| | | |
| | ECO-122- MODERN PUBLIC FINANCE- II | • Students will be able to understand fiscal federalism in India |
| | | • Students will be able to understand taxation & public debt of India |
| | | • Students will be able to understand public expenditure & subsidies in India |
| | | • Students will be able to understand fiscal administration & public governance in India |
| | | |
| | ECO-113 - STATASTICS FOR ECONOMICS - I | • Able to understand meaning, scope & importance of statistics |
| | | • Able to understand measuring central tendency |
| | | • Able to understand dispersion and co-efficient |
| | | • Able to understand methods of correlation |
| | | • Able to understand measures and types of price index |
| | | |
| | ECO-123 - RESEARCH METHODOLOGYFOR ECONOMICS | • Students will be able to understand methods of data collection & analysis |
| | | • Students will be able to understand contents of report writing |

| | | |
|---|---|---|
| | | • Students will be able to understand concepts of research designing |
| | | • Students will be able to understand concepts of hypothesis testing methods |
| | | |
| | ECO-114 (B) - AGRICULTURAL ECONOMICS -I | • Students will be able to understand economics of agriculture |
| | | • Students will be able to understand Indian agriculture sector |
| | | • Students will be able to understand agricultural prices, marketing & subsidies in India |
| | | • Students will be able to understand agriculture finance, insurance& capital formation |
| | | |
| | ECO-124 (B)- AGRICULTURAL ECONOMICS -II | • Students will be able to understand economics of agricultural production |
| | | • Students will be able to understand technology in agriculture |
| | | • Students will be able to understand management of animal genetics resources |
| | | • Students will be able to understand WTO & agriculture |
| | | |
| MA-II | Eco-231 - Modern Monetary Economics - I | • Students will be able to understand nature, scope & importance of monetary policy |
| | | • Students will be able to understand nature classical & Keynesian theories of employment |
| | | • Students will be able to understand measures of money supply. |
| | | • Students will be able to understand various theories of demand for money. |
| | | |
| | Eco-241 - Modern Monetary Economics - II | • Students will be able to understand IS-LM model |
| | | • Students will be able to understand fiscal policy |
| | | • Students will be able to understand various of trade cycle |
| | | • Students will be able to understand supply side economics |
| | | |
| | Eco-232 - Economics of Development - I | • Students will be able to understand conceptualizing development |
| | | • Students will be able to understand theories of economic development |
| | | • Students will be able to understand concept of poverty & development |
| | | • Students will be able to understand population & human development |
| | | |
| | Eco-242 - Model's of Economic Growth - II | • Students will be able to understand the economic growth & technological changes |
| | | • Students will be able to understand some growth models |
| | | • Students will be able to understand the Neo- Classical & Cambridge models of growts |
| | | • Students will be able to understand issues & techniques of economic growth |
| | | |
| | Eco-233 - International Economics - I | • Students will be able to theories international trade. |
| | | • Students will be able to understand gains from international trade & their measurements |
| | | • Students will be able to understand theory of intervention in trade |
| | | • Students will be able to understand the theory of regional blocks |
| | | |
| | Eco-243 - International Economics - II | • Students will be able to understand trade policies in India |
| | | • Students will be able to understand international financial institutions |
| | | • Students will be able to understand foreign direct investments |
| | | • Students will be able to understand foreign exchange market |
| | | |
| | Eco-234- Modern banking & Financial Markets in India - I | • Students will be able to understand commercial banking system in India |
| | | • Students will be able to understand cooperative and rural banking in India |
| | | • Students will be able to understand Non banking financial institutions & financial services in India |
| | | • Students will be able to understand working & operation of RBI |
| | | |
| | Eco-244 - Modern banking & Financial Markets in India - II | • Students will be able to understand the Indian money market |
| | | • Students will be able to understand the Indian capital market |

| | | |
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| | | • Students will be able to understand new development in Indian financial system periods |
| | | • Students will be able to understand international aspects of the Indian financial system |

**DEPARTMENT OF ELECTRONICS**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBSc | ELE 111: Analog Electronics – I | • Understand electronic systems with a continuously variable signal |
| | | • Understand proportional relationship between a signal and a voltage or current that represents the signal. |
| | | • To learn function of basic component's use in linear circuits. |
| | | • Understand component symbol, working principle, classification and specification. |
| | | • learn different theorems for simplification of basic linear electronics circuits. |
| | | |
| | ELE – 112 - Digital Electronics – I | • Understand basic digital electronic systems |
| | | • learn function of basic digital circuits and use of transistors to create logic gates in order to perform Boolean logic. |
| | | • learn different theorems for simplification of basic Digital electronics circuits. |
| | | • understand symbols, Truth tables, Boolean equations, & working principle. |
| | | |
| | | |
| | ELE 121: Analog Electronics – II | • Understand Basic Circuits using Active Devices |
| | | • Learn function of basic circuit components used in linear circuits. |
| | | • Understand basic construction, equivalent circuits and characteristics of basic electronics devices. |
| | | • Students understand basic linear electronics circuits and their working principle, |
| | | |
| | ELE – 122 - Digital Electronics – II | • Understand combinational and logical digital circuits and their differences. |
| | | • Students will be introduced to Flip-flop, shifts register, counters and Semiconductor memory for data Processing circuits. |
| | | • learn symbol, working principle of basic Digital electronics circuits for data processing application. |
| | | • At the end of this course, students should be able to recognize and analyze the basic digital circuits. |
| | | |
| SYBSc | ELE 231: Analog Circuits and Applications | • understand Basic Analog Circuits and their applications using Active Devices |
| | | • learn basic function of single stage amplifier, multistage amplifier and power Amplifier and their working principle. |
| | | • understand basic construction of feedback circuits and their application in Oscillators analog circuits. |
| | | • understand basic amplifier and oscillator circuits and their application in electrical parameter. |
| | | |
| | ELE 232: Instrumentation | • understand Basic Analog and digital meters for measurement of various |
| | | • learn basic test instruments such as power supply ,function generator, DFM and CRO and their construction and working principle. |
| | | • understand basic principle of transducers and their construction, Working principle, classification and application in various fields. |
| | | • understand the construction of data convertor circuits and their applications in digital circuits. |
| | | |
| | ELE 241: LINEAR INTEGRATED CIRCUITS & APPLICATIONS | • understand Basic differential amplifier and their applications in linear Integrated circuits |
| | | • learn basic function of operational amplifier, Ideal and practical characteristics and their mathematical application. |
| | | • understand basic construction of active filters ,comparators and their application in electronics. |
| | | • Students understand different types of multivibrator and wave form generator using IC 55 |
| | | |
| | ELE 242: 8085 Microprocessor | • understand the basic architecture of 8- bit microprocessors. |
| | | • write programs on 8085 microprocessor based systems. |
| | | • Identify the addressing modes of an instruction. |
| | | • Develop programming skills in assembly language. |
| | | |
| TYBSc | ELE 351: Semiconductor Physics | • Understand the fundamental concept of semiconductor like crystal structure, energy band gap, charge carrier statistics. |
| | | • Understand the physics, basic characteristics and operation of semiconductor devices such as p-n junctions and Zener diodes |
| | | • Have knowledge of fabrication technology for semiconductor devices and integrated circuits |
| | | |
| | ELE 361: Electrodynamics | • understand concepts in electrostatic law. |
| | | • get acquainted with Conceptual understanding of the electromagnetic laws, set up a model and perform the necessary calculations. |

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| | | • Have knowledge of electromagnetic waves and their propagation. |
| | | |
| | ELE 352: Basic Communication Systems | • Understand the basic concept of communication system. |
| | | • Understand AM , FM and demodulation. |
| | | • Understand antenna and radio wave propagation used in communication system. |
| | | |
| | ELE 362: Advanced Communication Systems | • Understand basic concept of digital communication system. |
| | | • Understand the fiber optic communication. |
| | | • Understand computer network and security. |
| | | |
| | ELE 353: 8086 Microprocessor | • understand basic architecture of 16 bit microprocessors. |
| | | • write programs on 8086 microprocessor based systems. |
| | | • Illustrate the organization of registers and memory in microprocessors. |
| | | • Differentiate Minimum and Maximum Mode bus cycle. |
| | | • Identify the addressing mode of an instruction. |
| | | • Develop programming skills in assembly language. |
| | | |
| | ELE 363: Microprocessor Interfacing Techniques and Advanced Mi | • Understand interrupt and interrupt service routine. |
| | | • Understand I/O interfacing and techniques. |
| | | • Understand advance microprocessor. |
| | | |
| | ELE 354: The C Programming Language | • Understand basic of the programming language |
| | | • Able to switch any other programming language |
| | | • Able to write C program for simple real life applications using structures. |
| | | |
| | ELE 364: Numerical Simulation in Electronics | • Find root of equation by different numerical methods |
| | | • Find out differentiation and integration of equation |
| | | • Solve linear equation system. |
| | | • Simulate electronic circuits numerically. |
| | | |
| | ELE 355: Microcontroller 8051 | • Ability to differentiate microprocessor and microcontroller. |
| | | • Describe the architecture of 8051 |
| | | • Able to write assembly language program for 8 bit microcontroller |
| | | |
| | ELE 365: Embedded Systems | • write interfacing programming. |
| | | • dentify embedded systems in various applications. |
| | | • write advanced microcontroller programming for real life application. |
| | | |
| | ELE 356: Advanced Digital System Design | • design advanced digital systems. |
| | | • Understand the Hardware Description Languages (HDL). |
| | | • Design combinational and sequential logic circuits using VHDL. |
| | | |
| | ELE 366: Industrial and Power Electronics | • Understand power semiconductor devices used in industries. |
| | | • Understand the construction and working of different power semiconductor devices |
| | | • Analyze various triggering circuits used for different semiconductor devices |
| | | • Design power electronic circuit for real time application like rectifier and convertor etc. |
| | | |

**DEPARTMENT OF ENGLISH**

| Class | Course | Outcomes |
|---|---|---|
| FYBCom | OPTIONAL ENGLISH | • The students develop interest in literature. |
| | | • The students use their moral and social sense in life. |
| | | • The students are able to make special use of language for their expression. |
| | | |
| | COMPULSORY ENGLISH | • The students are able to make accurate use of English Language in their respective fields. |
| | | • The students could communicate effectively in their various business situations. |
| | | • The verbal and non-verbal skills of communication are developed. |
| | | |
| FYBA | COMPULSORY ENGLISH | • The students could express themselves in oral and written communicative situations. |
| | | • Students use the values learnt through literary works. |
| | | |
| | OPTIONAL ENGLISH | • Development of the comprehensive ability of students. |
| | | • Inculcation of moral and human values among students. |
| | | • Understanding of the basic forms of poetry. |
| | | |
| SYBA | COMPULSORY ENGLISH | • The students' literary tendencies are developed. |
| | | • The students could express themselves in oral and written communicative situations. |
| | | • The students could improve vocabulary. |
| | | • The students are able to use English effectively in formal and informal situations of life. |
| | | |
| | General Paper -2 (Introduction to Study of English Language and Lit | • The students are able to appreciate literature critically. |
| | | • The students could use their creative and critical faculties of mind in real life situations. |
| | | • The learners are able to apply the science of pronunciation and oral form of English language. |
| | | • The students use literature to develop their social and moral sense in life. |
| | | |
| | ENGLISH Special Paper -I | • The students learn to correlate literature to socio-political conditions of its time. |
| | | • The students are able to use their creative and critical faculties of mind in real life situations. |
| | | • The learners could implement the values of literature in life. |
| | | |
| | ENGLISH Special Paper -II | • Students could learn Language through literature. |
| | | • The syllabus can implement the values of literature in life. |
| | | • Students know the culture of the times. |
| | | |
| TYBA | Compulsory English | • The students understand the basic concept of literary genre, poem, prose and stories. |
| | | • To help the students to develop literary abilities. |
| | | • The students' communicative skills are developed. |
| | | |
| | Special English-G-III | • The students learn the origin of drama and dramatic art. |
| | | • The students learn the aspects and genres of drama. |
| | | |
| | Special Paper-III | • The students develop the critical understanding literature. |
| | | • The students are exposed to Indian writing in English and American literature. |
| | | • The students are exposed to social, political and cultural background. |
| | | |
| | Special Paper-IV | • The students understand the properties and functions of language. |
| | | • Inculcation of phonological competence among students. |
| | | • The students are acquainted with English grammatical forms and functions. |
| | | • The students are acquainted with morphological concepts and processes. |

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| | | • The students are acquainted with the basic concepts in syntactic and semantic levels of language. |
| | | |
| MA-I | ENG: 111 &121- AN INTRODUCTION TO LINGUISTICS | • The students are well acquainted with the nature of human language. |
| | | • The students are familiarized with the recent trends. |
| | | • The students develop the stylistic competence for analyzing literary texts. |
| | | |
| | ENG: 112&122-POETRY | • Students are acquainted with the language, poetic style, diction of the age to which it belongs. |
| | | • Students learn values through literary works. |
| | | |
| | ENG: 113& 123-DRAMA | • Students get the knowledge of the theatre of the times |
| | | • Students are acquainted with the language, style, dialogue structure of the age to which it belongs. |
| | | • Students learn values through literary works. |
| | | |
| | ENG: 114(A) &124(A) - INDIAN WRITING IN ENGLISH | • The students develop interest in different genres in Indian writing in English. |
| | | • Make the student aware regarding of social, political, and cultural issues reflected in Indian writing in English. |
| | | |
| MA-II | ENG- 231& 241 Modern Literary Theory and Criticism. | • Students get the knowledge of critical theories. |
| | | • Students think over the theories, in effect appeal to logic and analytical capacity. |
| | | • The knowledge of the critics. |
| | | |
| | ENG- 232 & 242 FICTION | • Students get the knowledge of the culture of the times. |
| | | • The study of fiction helps students to learn human values. |
| | | • The knowledge of the behavioral patterns from great works of art. |
| | | |
| | ENG- 233 & 243-ENGLISH LANGUAGE AND LITERATURE TE | • Students understand the important of aspects English language and literature teaching. |
| | | • Students learn the concepts like curriculum, lesson plan, effective teaching method and evaluation. |
| | | • Students keep pace with new technology and its role ELLT. |
| | | |
| | ENG- 234 & 244 -AMERICAN LITERATURE. | • The student let know about American life and culture. |
| | | • Students are able to learn language through literary works. |
| | | • Learn behavioral patterns of the protagonists. |
| | | |

**DEPARTMENT OF ENVIRONMENT SCIENCE**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBSc | Envi-111- Introduction to Environment- I | • Understand about the concept of environment, their structure & types, different components and their functions. |
| | | • Understand about the evolution theories of universe, elements, origin of life and life forms. |
| | | • Aware about social environment, understanding the relation between man & environment. |
| | | • Aware about global environmental issues and possible solution associated for the same. |
| | | |
| | Envi-112- Natural Resources- I (F. Y. B. Sc.) | • Understand the concepts of natural resources, their types and importance |
| | | • Understand the detailed information about biogeochemical cycles, their role & function in the environment with a-biotic and biotic components. |
| | | • Aware about mining activity and their impact on environment through some case studies. |
| | | • Understand the role and function of O2 & CO2 with complete mechanism through oxygen cycle, carbon cycle, photosynthesis, GHG and ozone layer depletion. |
| | | • Understand the concepts of lithosphere, soil, soil formation, soil profile, ecosystems. |
| | | • Aware about soil erosion, importance of soil conservation, food chain, food web and productivity. |
| | | |
| | Envi-113- Practical Course based on Theory- I | • Understand the concepts of water sampling with preservation techniques |
| | | • Understand the physical, chemical and biological properties of water samples with water quality standards. |
| | | • To determine the pH, electrical conductivity of water as well as soil which help to understand the nature of particular water and soil. |
| | | • Estimate the solids from water to evaluate their effects on humans. |
| | | • To determine Dissolved oxygen from water body which help to understand the function of water body |
| | | |
| | Envi-121- Introduction to Environment- II (F. Y. B. Sc.) | • Understand the concepts Earth Process, classification and formation of rocks, their movements beneath the earth with tectonic plates and their effects on lithosphere. |
| | | • Understand the concepts of environmental pollution, their sources and effects on biotic community. |
| | | • Aware about environmental issues and their monitoring for minimizing the environmental pollution |
| | | • Understand the concept of environmental education, its need and importance. |
| | | • Aware about objectives and principles of environmental education. |
| | | |
| | Envi-122- Natural Resources- II (F. Y. B. Sc.) | • Understand the concepts of Water, Land forest and Energy resources. |
| | | • Aware about over utilization of surface & ground water, benefit and problem associated with water availability, conflicts over water. |
| | | • Understand about the use and over exploitation of forest, causes and effects of forest, timber extraction and mining. |
| | | • Aware about importance of natural resource through some case studies like “Chipko Movements” and “Sardar Sarovar Paoject” |
| | | • Understand the concept of equitable use of natural resources for sustainable lifestyle |
| | | |
| | Envi-123- Practical Course based on Theory- II (F. Y. B. Sc.) | • To determine the chemical properties of water like acidity, alkalinity, turbidity, hardness to evaluate their impacts on biotic community. |
| | | • Understand the physical, chemical and biological properties of water samples with water quality standards. |
| | | • To determine the pH, electrical conductivity of water as well as soil which help to understand the nature of particular water and soil. |
| | | • Estimate the solids from water to evaluate their effects on humans. |
| | | |
| SYBSc | Envi-211 – Ecology | • Understand the basic concepts of ecology, their divisions and subdivisions. |
| | | • Aware about the climatic, topographic and edaphic factors and understand the relation among organisms. |
| | | • Develops ability to solve gamma-beta functions |
| | | • Understand the concept of ecosystem; describe the role and functioning of ecosystem with productivity and stability. |
| | | • Understand the concept of population ecology, their characteristics and describe the population interactions. |
| | | |
| | Envi-212 – Environmental Microbiology (S. Y. B. Sc.) | • Understand the basics of environmental microbiology, types of micro-organisms and applies branches of microbiology |
| | | • Demonstrate and describe the construction and working of Microscope with their types. |
| | | • Understand the staining procedures with mechanisms associated with different types. |
| | | • Understand the prokaryotic and eukaryotic cell structures with functional aspects. |
| | | • Study different pure culture techniques. |
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| | Envi-213 – Practical Course based on Theory – I (S. Y. B. Sc.) | • Study and Demonstrate and describe the construction and working of Microscope with their types. |
| | | • Study and describe the working of different microbial equipments like hot air oven, autoclave, incubator, water bath, laminar air flow etc. |
| | | • Isolate and identified the micro-organism using staining and pure culture techniques. |
| | | • Understand some ecological adaptations in plants and animals |
| | | • Study and aware about physical and chemical characteristic of solid waste. |
| | | |
| | Envi-221 – Social Environment and their Conservation (S. Y. B. Sc.) | • Understand the concept social environment, energy problem associated with urban areas, concept of sustainability and development, environment planning and management. |
| | | • Aware about environment impact assessment and its process for sustainable development |
| | | • Understand and aware about the importance of forest and wild life resources and need to conserve them with proper protection. |
| | | • Study the environmental resources with their individual importance. |
| | | • Understand the environmental laws like Forest Conservation Act, Wildlife Protection Act, The Water (conservation and prevention of pollution) Act, The Air (conservation and prevention of pollution) Act, etc. |
| | | |
| | Envi-222 – Applied and Industrial Microbiology (S. Y. B. Sc.) | • Understand the techniques for microbial examination through air. |
| | | • Understand the water bacterial flora, study of faecal pollution, presumptive test. MPN test, IMVIC test, purification of drinking water and its significance. |
| | | • Study of physical, chemical and biological characteristic of soil and sewage, treatment procedures. |
| | | • Understand the basic concept of industrial microbiology with different microbial processes and use of micro-organisms for controlling those processes. |
| | | • Study of medical microbiology with concept of infection, types of diseases, transmission and general principles for preventing the diseases. |
| | | |
| | Envi-223 – Practical Course based on Theory – II (S. Y. B. Sc.) | • determine soil Organic Matter to describe the fertility of soil. |
| | | • determine the illumination level for occupational health safety. |
| | | • study the primary and net primary productivity for grazed and un-grazed land for soil conservation. |
| | | • perform MPN test for identification of biological impurity in drinking water. |
| | | • understand the construction and working of Effluent Treatment Plants in industrial sectors. |
| | | |
| TYBSc | Envi-311 – Environmental Pollution – I (T. Y. B. Sc.) | • Understand the basic concept in pollution, pollutants, their types and effects. |
| | | • Understand air pollution with sources, causes and effects on biotic community. |
| | | • Understand water pollution with sources, causes and effects on biotic community. |
| | | • Understand Marine pollution with sources, causes and effects on biotic community |
| | | • Aware about their control strategies of different types of pollutions. |
| | | |
| | Envi-312 – Biodiversity and its Conservations – I (T. Y. B. Sc.) | • Understand the concept of biodiversity, their types, classification and their social, ethical and optional values. |
| | | • Aware about bioethics, habitat destruction, fragmentation, degradation and pollution. |
| | | • Aware about endangered and endemic species in the world and in the India. |
| | | • Aware for the conservation of biodiversity through In-situ and Ex-situ. |
| | | • Study of major environmental movements (case study) associated with environment and biodiversity conservation. |
| | | |
| | Envi-313 – Basic Concepts in Environmental Toxicology – I (T. Y. I | • Understands the concept of toxicology, toxicants, their exposure with time and dose, concept of carcinogen and mutagen. |
| | | • Study the mechanism of bioaccumulation, biomagnifications, acute and chronic toxicity. |
| | | • Understand the factors affecting the toxicity |
| | | • Study the toxicity of gaseous pollutants like CO, NOx, SOx and petroleum solvents. |
| | | |
| | Envi-314 – Remote Sensing & GIS – I (T. Y. B. Sc.) | • Understand the fundamental of remote sensing and their use in environment segments. |
| | | • Study of different sensors with their principles and working. |
| | | • Understand the construction and working of satellites with different resolution. |
| | | • Interpreted the image using different visual and digital recognition elements. |
| | | • Understand the concept of GIS, data using in GIS, scanning, digitization and use of GPS. |
| | | |
| | Envi-315 – Instrumental Techniques in Environmental Analysis – I | • Understand the use of instruments for environmental analysis, classification of instruments, detection limits and errors associated with instruments techniques. |

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| | | • Study of basic of elementary electronics of instrumentations. |
| | | • Study of EMR and its interactions with property of wave, particles. |
| | | • Understand the concept of polarization absorption and emission. |
| | | • Understanding the process of sampling, concept of standard solution, normalities, and oxidation numbers. |
| | | |
| | Envi-316 – Environmental Biotechnology – I (T. Y. B. Sc.) | • Understanding the concept of environmental biotechnology and its global impacts on different field like agriculture, health care and environment. |
| | | • Study the composition of biomass and its types. |
| | | • Study the biomass energy gain from petroleum plants, hydrocarbon, liquid fuel and biogas. |
| | | • Understand the concept of bioremediation with different micro-organisms. |
| | | |
| | Envi-317 – Practical Course based on Theory Papers – I (T. Y. B. Sc | • Understanding the concept of sampling and its preservations |
| | | • Demonstrate on pH and EC meter for monitoring the pH and electrical conductivity of water and soil samples. |
| | | • Analyse the water with different parameters like solids, available & residual chlorine, and phosphate for determining its quality. |
| | | • Understand and study of water quality criteria for drinking as well as for waste water. |
| | | |
| | Envi-318 – Practical Course based on Theory Papers – I (T. Y. B. Sc | • Understand and study of Air and Noise quality criteria for determining the pollution level. |
| | | • Demonstrate on RDS sampler for monitoring of oxides of nitrogen, oxides of sulphur, SPM and RSPM. |
| | | • Analyse the chlorophyll contents for estimation of pollution load. |
| | | • Understand and study of adaptations of some plants as a pollution resistant. |
| | | |
| | Envi-319 – Practical Course based on Theory Papers – I (T. Y. B. Sc | • Understand and study of metal digestion and analysis. |
| | | • Demonstrate on instruments which are used in environmental analysis like Spectrophotometer, flame photometer, gas chromatography. |
| | | • Analyse the selected metal for estimation of pollution load. |
| | | • Understand and study of construction and working of ETP for waste water treatment. |
| | | |
| | Envi-321 – Environmental Pollution – II (T. Y. B. Sc.) | • Understand Noise pollution with sources, causes and effects on biotic community. |
| | | • Understand Solid waste pollution with sources, causes and effects on biotic community. |
| | | • Understand Thermal pollution with sources, causes and effects on biotic community. |
| | | • Understand Radioactive pollution with sources, causes and effects on biotic community. |
| | | • Aware about their control strategies of different types of pollutions. |
| | | |
| | Envi-322 – Biodiversity and its Conservations – II (T. Y. B. Sc.) | • Understand the international agreements associated with environmental awareness. |
| | | • Understand and study of forest and their types, relation between forest and global warming, carbon sink, nature pollution indicators. |
| | | • Understand and study the forest conservation through laws. |
| | | • Concept of forest fire, forest population heavy loss of green beelt and forest research in India. |
| | | • Understand the strategies for wildlife conservation through study of depletion of wildlife and their effects. |
| | | |
| | Envi-323 – Basic Concepts in Environmental Toxicology – II (T. Y. | • Understand the basics of soil toxicology. |
| | | • Study of toxic elements of air and water like Lead, Mercury, Arsenic, Chromium, Cadmium, Nickel, Bismuth, Zinc, Copper, Manganese, etc. |
| | | • Aware about toxicity of pesticides and their effects. |
| | | • Understand the concept of eco-toxicology, public health, animals in relation to human health. |
| | | |
| | Envi-324 – Remote Sensing & GIS – II (T. Y. B. Sc.) | • Understand the analysis of vector data using buffering. |
| | | • Study the analysis of raster data using overlay features. |
| | | • Understand and study of applications of RS and GIS in agriculture field. |
| | | • Understand and study of applications of RS and GIS in social science & Geo- disaster management field. |
| | | • Understand and study of applications of RS and GIS in forestry, ecology, watershade & water resource management. |
| | | |
| | Envi-325 – Instrumental Techniques in Environmental Analysis – II | • Understand the use of different instruments like pH meter, EC meter, Turbidity meter, Flame photo meter, Bomb Calorimeter, etc. |
| | | • Study of spectrophotometer using UV-visible and Atomic Absorption Spectrophotometer. |

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| | | • Study of chromatography techniques using column chromatography, Ion exchange chromatography, Thin layer chromatography, Gas chromatography and HPLC. |
| | | • Understand the concept of environmental statistics through mean, mode, median and variance. |
| | | |
| | Envi-326 – Environmental Biotechnology – II (T. Y. B. Sc.) | • Understanding the concept of toxicity of bioremediation through metal and dyes. |
| | | • Study the concepts of xenobiotics. |
| | | • Study the process of bioleaching using different micro-organisms |
| | | • Understand the hazards in environmental engineering through growth inhibition and replacement of natural strains. |
| | | |
| | Envi-327 – Practical Course based on Theory Papers – II (T. Y. B. S | • Determine different parameters like ammonia, nitrates and sulphate from water samples to describe its quality. |
| | | • Demonstrate on turbidity meter to determine the water turbidity. |
| | | • Analyse the soil for measuring the chlorides for determining its quality. |
| | | • Understand and study of water quality criteria for drinking as well as for sewage waste water through BOD and COD. |
| | | |
| | Envi-328 – Practical Course based on Theory Papers – II (T. Y. B. S | • Understand and study of physical characteristics of soil like bulk density, water holding capacity, organic carbon, organic matter etc. |
| | | • Study and determining the atmospheric fungi for its effects on human |
| | | • Analyse the chlorophyll contents for estimation of pollution load. |
| | | • Understand and study of adaptations of different plant and animal species for survival in the environment. |
| | | |
| | Envi-329 – Practical Course based on Theory Papers – II (T. Y. B. S | • Understand and study of satellite images using different characteristic like tone, texture, pattern, shape and size. |
| | | • Demonstrate on instruments which are used in environmental analysis like Bomb calorimeter and HPLC. |
| | | • Computation of environmental statistics through mean, mode, median and variance. |
| | | • Understand and study of determination of selected metal for their toxicological effects. |
| | | |

**DEPARTMENT OF FINE ARTS**

| Class | Course | Outcomes (Students will be able to learn) |
|---|---|---|
| BFA 1ST YEAR (APPLIED ART) | | • History and appreciation of art: students get to know about art and its beauty and are motivated and inspired to learn from ancient art. |
| | | • Fundamental of art and colour theory: basic knowledge of colours and colour scheme and basic parameters of using colours. |
| | | • Drawing: vision about perspective, proportion, volume, anatomy, lines, light and shadow, etc. Is given. |
| | | • Painting: study of colours and its application in making various art works using various mediums. |
| | | • Design 2d and 3d: principles of design and synthesis of art and giving 3d effects to objects and creating illusions. |
| | | • Clay modelling: making art work through plaster of paris, shalu mati and other techniques. |
| | | • Print making: taking prints of various colours on a single sheet to get a complete art work. |
| | | • Perspective: creating elevation, drawing of plan, and other 3d objects on plain surface. |
| | | • basic knowledge about all the fields of art and thus they get one step ahead in pursuing and learning art. |
| | | |
| BFA 2ND YEAR (APPLIED ART) | | • Advertising art and idea: knowledge about advertising, about its hirtory and origin , and learning advertising skills. |
| | | • History of visual communication: knowledge about visual communication and its effect oh the general public. |
| | | • Drawing fron life: study of full figure, their expressions, anatomy , light and shadow. |
| | | • Lettering(typography and calligraphy): history of typography, its various mediums and techniques. |
| | | • Package designing: principles of packaging, its motive and creating a strong impact on people to buy it. |
| | | • Communication design: basic knowledge anout print media, press layout, magazine, hoardings, posters, etc. |
| | | • Information design: principles of providing appropriate information to the consumer and its designing. |
| | | • Visualisation: it’s the most important factor . So it provides the basic visualising power to the students. |
| | | • Corporate identity: making students learn the skill of creating corporate identity. |
| | | • their creativity and visualisation power in the field of advertising. |
| | | |
| BFA 3RD YEAR (APPLIED ART) | | • Advertising art and ideas: knowledge of communication medias and using it in advertising. |
| | | • Copywriting: the importance of copywriting in an advertisement is taught and about its different types. |
| | | • Drawing: creating backgrounds according to the given themes and creating the effect. |
| | | • Graphic designing: importance of graphic designing in designing and its various types. |
| | | • Information design: principles of providing appropriate information to the consumer and its designing. |
| | | • Publishing design: enhancing the creativity of students and learning publishing design. |
| | | • Communication design: basic knowledge anout print media, press layout, magazine, hoardings, posters, etc. |
| | | • Illustration: knowledge of various forms oh human figures other living things and its techniques. |
| | | • Lettering(typography and calligraphy): history of typography, its various mediums and techniques. |
| | | • Photography: importance of photography in advertising field and its use in it. |
| | | • Computer graphics: learning various softwares and uring them in making advertisement. |
| | | • Exhibition design and display: arrangement of the objects in an exhibition and their display. |
| | | • about various advertising techniques and use of illustrations, softwares, photography in advertising. |
| | | |
| BFA 4TH YEAR (APPLIED ART) | | • Advertising art and ideas: knowledge of communication medias and using it in advertising and its various fields. |
| | | • Desertation: market research on any subject related to advertising and making a book of about 3000 words. |
| | | • Project report: market research about any product, service and other advertisins media. |
| | | • Copywriting: the importance of copywriting in an advertisement is taught and about its different types. |
| | | • Information design: principles of providing appropriate information to the consumer and its designing. |
| | | • Communication design: basic knowledge anout print media, press layout, magazine, hoardings, posters, etc. |
| | | • all the advertising skills and know how to handle commercial art. |
| | | |
| BFA 1ST YEAR (PAINTING) | | • History and appreciation of art: students get to know about art and its beauty and are motivated and inspired to learn from ancient art. |
| | | • Fundamental of art and colour theory: basic knowledge of colours and colour scheme and basic parameters of using colours. |
| | | • Drawing: vision about perspective, proportion, volume, anatomy, lines, light and shadow, etc. Is given. |
| | | • Painting: study of colours and its application in making various art works using various mediums. |
| | | • Design 2d and 3d: principles of design and synthesis of art and giving 3d effects to objects and creating illusions. |

| | | |
|---|---|---|
| | | • Clay modelling: making art work through plaster of paris, shalu mati and other techniques. |
| | | • Print making: taking prints of various colours on a single sheet to get a complete art work. |
| | | • Perspective: creating elevation, drawing of plan, and other 3d objects on plain surface. |
| | | • basic knowledge about all the fields of art and thus they get one step ahead in pursuing and learning art. |
| | | |
| BFA 2ND YEAR (PAINTING) | | • History of art: indian art history and western art history are taught to the students and arouse interest in it. |
| | | • Aesthetics: knowledge about ancient indian aesthetics and western aesthetics is given. |
| | | • Pictorial composition: division of space and composition of human forms and nature or other forms in different styles. |
| | | • Still life: drawing the group of objects placed in front whether man made or natural and learning light and shadow effect. |
| | | • Head study: study of proportions of a human face, its expressions and its structure. |
| | | • Drawing from life: study of a full human figure in its various postures and ita anatomy. |
| | | • Print making: wood cut, lino cut, wood carving, and other techniques of printing aur taught . |
| | | • Anatomy: proportions of human figures is taught using antics, bust, etc. |
| | | • Outdoor sketchinh and landscape: to attain perfection in drawing basic sketching and landscape is taught. |
| | | • Computer: basic knowledge about how to use computer in art is given. |
| | | • Project ajanta: world famous ajanta caves is to be researched, its techniques, stories, etc. To be learned. |
| | | • more about painting, its history, its different styles and techniques and creativity. |
| | | |
| BFA 3RD YEAR (PAINTING) | | • History of art: indian art history and western art history are taught to the students and arouse interest in it. |
| | | • Aesthetics: knowledge about ancient indian aesthetics and western aesthetics is given. |
| | | • Art appeciation, discussion and debate: discussion and debate on different styles of art and increasing the knowledge of students. |
| | | • Library: studying from the books of library and enhancing the knowledge of students. |
| | | • Computer: basic knowledge about how to use computer in art is given. |
| | | • Drawing from life: study of a full human figure in its various postures and ita anatomy. |
| | | • Creative drawing: creating new and different forms using techniques and style. |
| | | • Anatomy: proportions of human figures is taught using antics, bust, etc. |
| | | • Cartoon: acknowledging all the great illustrators and creating a new form is taught. |
| | | • Painting from life: studying the model seated , his expressions, and posture using different mediums and techniques. |
| | | • Pictorial composition: division of space and composition of human forms and nature or other forms in different styles. |
| | | • Print making: wood cut, lino cut, wood carving, and other techniques of printing aur taught . |
| | | • Project: a project on study of any artist or monument and the view of the student regarding the same. |
| | | • Learning to create new style and techniques and enhancing the imagination power of the students. |
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| BFA 4TH YEAR (PAINTING) | | • Painting from life or mural painting: studying the model seated , his expressions, and posture using different mediums and techniques or painting different thoughts, views on the wall. |
| | | • Representative creative compostion or non- representative creative compostion: using man made or nature objects to create them and composing the same is taught. |
| | | • Print making or creative drawing: wood cut, lino cut, wood carving, and other techniques of printing aur taught and creating new and different forms using techniques and style. |
| | | • Comtempatary artist and appreciation of their paintings: study of indian and western comtempatary artist, their style, techniques and discussion on the same. |
| | | • Dessertation: an overall presentation of the knowledge gained so far and presenting it in a book. |
| | | • An overall knowledge and study in becoming an artist is given to the students to become great artist. |
| | | |
| BFA 1ST YEAR (SCULPTURE) | | • History and appreciation of art: students get to know about art and its beauty and are motivated and inspired to learn from ancient art. |
| | | • Fundamental of art and colour theory: basic knowledge of colours and colour scheme and basic parameters of using colours. |
| | | • Drawing: vision about perspective, proportion, volume, anatomy, lines, light and shadow, etc. Is given. |
| | | • Painting: study of colours and its application in making various art works using various mediums. |
| | | • Design 2d and 3d: principles of design and synthesis of art and giving 3d effects to objects and creating illusions. |
| | | • Clay modelling: making art work through plaster of paris, shalu mati and other techniques. |
| | | • Print making: taking prints of various colours on a single sheet to get a complete art work. |

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| | | • Perspective: creating elevation, drawing of plan, and other 3d objects on plain surface. |
| | | • basic knowledge about all the fields of art and thus they get one step ahead in pursuing and learning art. |
| | | |
| BFA 2ND YEAR (SCULPTURE) | | • History of art: indian art history and western art history are taught to the students and arouse interest in it. |
| | | • Aesthetics: knowledge about ancient indian aesthetics and western aesthetics is given. |
| | | • Drawing from life: study of a full human figure in its various postures and its anatomy. |
| | | • Sculpture design modelling and carving: study of different techniques and tools of making sculpture and carving. |
| | | • Modelling from life head study in clay: anatomical study of a human face using clay, its expressions, measurements, etc. |
| | | • Anatomy: proportions of human figures is taught using antics, bust, etc. |
| | | • Critical analysis and short essay: an essay on any sculpture in 1000 words to be given. |
| | | • Computer: basic knowledge about how to use computer in art is given. |
| | | • Basic knowledge of making sculpture, its techniques, tools, anatomy, measurement is given. |
| | | |
| BFA 3RD YEAR (SCULPTURE) | | • History of art: indian art history and western art history are taught to the students and arouse interest in it. |
| | | • Aesthetics: knowledge about ancient indian aesthetics and western aesthetics is given. |
| | | • Drawing from life: study of a full human figure in its various postures and its anatomy. |
| | | • Modelling from life head study in clay: anatomical study of a human face using clay, its expressions, measurements, etc. |
| | | • Sculpture composition: composition of sculpture on various principles and its study. |
| | | • Optional following any of the subject: study of wood, stone, metals, etc. And making sculpture from them. |
| | | • Critical analysis and short essay: an essay on any sculpture in 1000 words to be given. |
| | | • Computer: basic knowledge about how to use computer in art is given. |
| | | • New techniques and mediums are taught to the students. |
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| BFA 4TH YEAR (SCULPTURE) | | • History of art: indian art history and western art history are taught to the students and arouse interest in it. |
| | | • Drawing from life: study of a full human figure and nature object and other living things in its various postures and its anatomy. |
| | | • Portrait or monumental sculpture: study of proportionate portrait of ancient monument sculpture and creating new style. |
| | | • Representational or non-representational sculpture: study of realistic or unrealistic sculpture using differenr methods. |
| | | • Computer: creating 3d design using different softwares and then making it in real. |
| | | • Dessertation: an overall presentation of the knowledge gained so far and presenting it in a book. |
| | | • to make new sculpture using different methods and mediums to become a great sculptor. |
| | | |
| BFA 1ST YEAR (VISUAL COMMUNICATION) | | • History and appreciation of art: students get to know about art and its beauty and are motivated and inspired to learn from ancient art. |
| | | • Fundamental of art and colour theory: basic knowledge of colours and colour scheme and basic parameters of using colours. |
| | | • Drawing: vision about perspective, proportion, volume, anatomy, lines, light and shadow, etc. Is given. |
| | | • Painting: study of colours and its application in making various art works using various mediums. |
| | | • Design 2d and 3d: principles of design and synthesis of art and giving 3d effects to objects and creating illusions. |
| | | • Clay modelling: making art work through plaster of paris, shalu mati and other techniques. |
| | | • Print making: taking prints of various colours on a single sheet to get a complete art work. |
| | | • Perspective: creating elevation, drawing of plan, and other 3d objects on plain surface. |
| | | • basic knowledge about all the fields of art and thus they get one step ahead in pursuing and learning art. |
| | | |
| BFA 1ST YEAR (PRINT MAKING) | | • History and appreciation of art: students get to know about art and its beauty and are motivated and inspired to learn from ancient art. |
| | | • Fundamental of art and colour theory: basic knowledge of colours and colour scheme and basic parameters of using colours. |
| | | • Drawing: vision about perspective, proportion, volume, anatomy, lines, light and shadow, etc. Is given. |
| | | • Painting: study of colours and its application in making various art works using various mediums. |
| | | • Design 2d and 3d: principles of design and synthesis of art and giving 3d effects to objects and creating illusions. |
| | | • Clay modelling: making art work through plaster of paris, shalu mati and other techniques. |
| | | • Print making: taking prints of various colours on a single sheet to get a complete art work. |
| | | • Perspective: creating elevation, drawing of plan, and other 3d objects on plain surface. |
| | | • basic knowledge about all the fields of art and thus they get one step ahead in pursuing and learning art. |

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| BFA 1ST YEAR (ART HISTORY) | | • History and appreciation of art: students get to know about art and its beauty and are motivated and inspired to learn from ancient art. |
| | | • Fundamental of art and colour theory: basic knowledge of colours and colour scheme and basic parameters of using colours. |
| | | • Drawing: vision about perspective, proportion, volume, anatomy, lines, light and shadow, etc. Is given. |
| | | • Painting: study of colours and its application in making various art works using various mediums. |
| | | • Design 2d and 3d: principles of design and synthesis of art and giving 3d effects to objects and creating illusions. |
| | | • Clay modelling: making art work through plaster of paris, shalu mati and other techniques. |
| | | • Print making: taking prints of various colours on a single sheet to get a complete art work. |
| | | • Perspective: creating elevation, drawing of plan, and other 3d objects on plain surface. |
| | | • basic knowledge about all the fields of art and thus they get one step ahead in pursuing and learning art. |
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| MFA 1ST YEAR(APPLIED ART) | | • Visualisation-i: making product and service according to the mentality and view of the consumer. |
| | | • Visualisation-ii: designing products using different media according to the customer. |
| | | • Illustration: making illustrations according to the current situations and depicting them through different media in a campaign. |
| | | • Lettering typography: using different styles and tools of typography in a campaign. |
| | | • Photography: study of different techniques, new cameras, and advertising it. |
| | | • Computer graphics: using computer softwares and graphics in advertising to give it a new touch. |
| | | • Display design: using new ideas and vision to attract people in displaying an exhibition, etc. |
| | | • Animation: using new softwares and techniques in animation and creating animation files. |
| | | • Advertising and marketing research: research about different aspects of advertising, product, brand, etc. |
| | | • Report: a report on any product or service etc., its brand value in the market, and submission of the same. |
| | | • basic knowledge about research and marketing and get to know about trends in market. |
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| MFA 2ND YEAR(APPLIED ART) | | • All the subjects are the same in the last year. |
| | | • Visualisation-i: making product and service according to the mentality and view of the consumer. |
| | | • Visualisation-ii: designing products using different media according to the customer. |
| | | • Illustration: making illustrations according to the current situations and depicting them through different media in a campaign. |
| | | • Lettering typography: using different styles and tools of typography in a campaign. |
| | | • Photography: study of different techniques, new cameras, and advertising it. |
| | | • Computer graphics: using computer softwares and graphics in advertising to give it a new touch. |
| | | • Display design: using new ideas and vision to attract people in displaying an exhibition, etc. |
| | | • Animation: using new softwares and techniques in animation and creating animation files. |
| | | • Advertising and business organisation: research about different aspects of advertising, product, brand, etc. For business. |
| | | • Report and dessertation: a report on any product or service etc., its brand value in the market, and submission of the same. |
| | | • overall knowledge in the field of advertising and marketing and can successfully work in the field of advertising. |
| | | |
| MFA 1ST YEAR(PAINTING) | | • Drawing-i: creating a new form of art and study of different forms of indian and western art. |
| | | • Drawing-ii: creating a new form using different mediums, colours, techniques. |
| | | • Portraiture: study of models of different age group, male or female, child or adult, their expressions, etc. |
| | | • Creative: creating a new form in representative or non-representative in own style. |
| | | • Mural: drawing of different forms on walls like creative, doodling, etc. And creating depth in it. |
| | | • Philosophy of art: study of the artists and art of 20th century and acknowledging them. |
| | | • Report: a research on any art or artist and an overall view about its techniques, tools, etc. |
| | | • The students learn to create new forms of art and developing new techniques and get basic knowledge of different art forms. |
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| MFA 2ND YEAR(PAINTING) | | • All the subjects are the same in the last year. |
| | | • Drawing-i: creating a new form of art and study of different forms of indian and western art. |
| | | • Drawing-ii: creating a new form using different mediums, colours, techniques. |
| | | • Portraiture: study of models of different age group, male or female, child or adult, their expressions, etc. |
| | | • Creative: creating a new form in representative or non-representative in own style. |

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| | | • Mural: drawing of different forms on walls like creative, doodling, etc. And creating depth in it. |
| | | • Criticism art: criticism on different forms of indian and western art or artists and placing our views on it. |
| | | • Report and dessertation: a research on any art or artist and an overall view about its techniques, tools, etc. |
| | | • The students gain master degree and learn all the different aspects of painting and its techniques. |
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| MFA 1ST YEAR(SCULPTURE) | | • Drawing: a study of sketching and drawing and creating a new form of sculpture. |
| | | • Sculpture-i: creating new forms and techniques of portrit sculpture, creative sculpture, traditional indian sculpture, ceramic and mural sculpture. |
| | | • Sculpture-ii: creating new forms in one of the following : portrit sculpture, creative sculpture, traditional indian sculpture, ceramic and mural sculpture. |
| | | • Twentieth century art: study of the artists and art of 20th century like fluism, cubism and acknowledging them. |
| | | • Report: a report on sculpture and sculptors, different techniques, and tools and submission of the same. |
| | | • The students get to know about different sculptures and sculptors and their form of art. |
| | | |
| MFA 2ND YEAR(SCULPTURE) | | • Drawing: a study of sketching and drawing and creating a new form of sculpture. |
| | | • Sculpture-i: creating new forms and techniques of portrit sculpture, creative sculpture, traditional indian sculpture, ceramic and mural sculpture. |
| | | • Sculpture-ii: creating new forms in one of the following : portrit sculpture, creative sculpture, traditional indian sculpture, ceramic and mural sculpture. |
| | | • Criticism art: criticism on different indian and western sculptures and its techniques, tools, mediums, etc. |
| | | • Report and dessertation: a report on sculpture and sculptors, different techniques, and tools and submission of the same. |
| | | • The students learn about different sculptures and know how to create new sculptures using different mediums,tools, techniques. |
| | | |
| MFA 1ST YEAR(VISUAL COMMUNICATION) | | • Creative image making: promoting brands and products through different techniques and by our visualisation. |
| | | • Visual communication-i: making new design , packging and making them 3 dimensional. |
| | | • Visual communication-ii: learning about new techniques of advertising medias. |
| | | • Business marketing: study of marketing, business study, communication medias, etc. |
| | | • Report: a report on any product or service etc., its brand value in the market, and submission of the same. |
| | | • The students learn about different types of advertising techniques and promoting brands. |
| | | |
| MFA 2ND YEAR(VISUAL COMMUNICATION) | | • Creative image making: promoting brands and products through different techniques and by our visualisation. |
| | | • Visual communication-i: making new design , packging and making them 3 dimensional. |
| | | • Visual communication-ii: learning about new techniques of advertising medias. |
| | | • Business marketing: study of marketing, business study, communication medias, etc. |
| | | • Report and dessertation: a report on any product or service etc., its brand value in the market, and submission of the same. |
| | | • The students learn marketing skills and know how to promote their product. |
| | | |
| MFA 1ST YEAR(PRINT MAKING) | | • Drawing: creating a new form of art and study of different forms of indian and western art. |
| | | • Print making-i: creating prints on the following: relief, intalgio, lithography, screen print, mixed print. |
| | | • Print making-ii: creating prints on the following using own techniques: relief, intalgio, lithography, screen print, mixed print. |
| | | • Twentieth century art: study on various artists and art, the variations in the art forms. |
| | | • Report: a research on any art or artist and an overall view about its techniques, tools, etc. |
| | | • to create new forms of art and developing new techniques and get basic knowledge of different art forms. |
| MFA 2ND YEAR(PRINT MAKING) | | • |
| | | • Drawing: creating a new form of art and study of different forms of indian and western art. |
| | | • Print making-i: creating prints on the following: relief, intalgio, lithography, screen print, mixed print. |
| | | • Print making-ii: creating prints on the following using own techniques: relief, intalgio, lithography, screen print, mixed print. |
| | | • Print making: creating new prints and learning its history. |
| | | • Report and dessertation: a research on any art or artist and an overall view about its techniques, tools, etc. |
| | | • to create new forms of art and developing new techniques and get basic knowledge of different art forms. |

**DEPARTMENT OF GEOGRAPHY**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBSc | Paper I Physical Geography I | • Understand the effect of rotation of revolution the Earth |
| | | • Know the internal structure of the earth know the importance of longitudes & latitudes International Date line and Standard time |
| | | • Understand interior structure of the earth |
| | | • Understand Theory regarding of Origin of Continents and oceans |
| | | • Study the formation of Rocks Understand the work of internal and external forces and their associated landforms. |
| | | |
| | Paper II Physical Geography II | • Understand the importance of Atmosphere |
| | | • Understand the composition of atmosphere |
| | | • Know Measurement of Atmospheric Pressure and formation of Pressure Belts |
| | | • Understand the types of winds |
| | | |
| SYBA | Gg. 231: G2 Human Geography | • Understand the relationship of man and environment |
| | | • Studies of races of man kinds. |
| | | • Understand the modes of life of aximo, pigmy, gonad ,Bhil And nagas. |
| | | • Importance of Right to Information Acts. |
| | | |
| | Gg. 232: S1 Geography of Maharashtra | • Understand the Geographical Personality of Maharashtra |
| | | • Study the Major river in Maharashtra |
| | | • Understand the Geographical Personality of Maharashtra |
| | | • Study of major crops of Maharashtra. |
| | | • Acquire knowledge of forests in Maharashtra. |
| | | |
| | Gg. 241: G2 Economic Geography | • Study the Human Economic Activities |
| | | • Explain the Weber theory Rostov modal |
| | | • Understand the mineral and power resources |
| | | • Study of the distribution of engineering, cotton sugar Industries in India |
| | | • Study Of India's foreign tread |
| | | |
| | Gg. 242 S1 Regional Geography Of India | • Understand the location Physiography, Drainage, Climate, and Vegetation of India |
| | | • To know the silent feature, problems and prospects of Agriculture. |
| | | • Study the Problems And Prospect of Industrial Area. |
| | | • Population Composition India. |
| | | |
| | S2 Practical Geography Study of Scales, Projections and Surveying ( | • Understand the different surviving techniques. |
| | | • Knowledge about preparation of layout. |
| | | • Understand the socio economic condition of the villages. |
| | | • Acquire knowledge of preparation of drawing of profile with the help of Dumpy level. |
| | | |
| | S3 Environmental Geography | • Understand Structure, Components of Atmosphere. |
| | | • Study about Nutrient cycling. |
| | | • Acquire knowledge about biodiversity. |
| | | • Understand the value of Resource. |
| | | • Understand environmental problems there Cause, Effect and Remedies. |
| | | • Get knowledge about environmental hazards and management. |
| | | • Make aware about conservation of resources. |
| | | • Understand the various environmental protection acts. |
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| | S3 Remote Sensing & GIS | • Understand the History of Remote Sensing |

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| | | • Know Arial Photographs and Satellite Imageries |
| | | • Acquire Knowledge about Indian Remote sensing. |
| | | • Investigate components and function of GIS |
| | | • Study GIS Data models. |
| | | • Introduce GPS and Its Functions. |
| | | • Make use GIS & GPS software. |
| | | |
| | G3 Population Geography | • Understand the history of population |
| | | • Understand the types of data |
| | | • Study of distribution and density of population. |
| | | • Get knowledge of population theories. |
| | | • Investigate Current Issues and Problems in India |
| | G3 Political Geography | |
| | | • Understand the history of Political Geography. |
| | | • Get knowledge about Evolution of states & nations. |
| | | • Get knowledge of Geopolitical theories. |
| | | • Investigate Problems and disputes in India |
| | | |
| | S4 Practical: Interpretation of Toposheet, weather reports, Cartograp | • Introduce the student of top sheet, weather map. |
| | | • Understand the mechanism function of topographical maps. |
| | | • Understand interpretation if weather images. |
| | | • Get knowledge about Geo Statistical Methods. |
| | | |
| TYBA | Gg.311: Geomorphology | • To know the fundamentals of Physical Geography. |
| | | • Understand latitudes, longitudes and international dead line. |
| | | • Acquire knowledge about origin of various landforms. |
| | | • Understand the origin of oceans and currents. |
| | | • To Understand formation of rocks there types and uses. |
| | | • Understand the work of internal coerces. |
| | | • Acquire knowledge of external forces. |
| | | • Study the land forms and process. |
| | | • Study the denudation processes. |
| | | |
| | Gg.312: Climatology | • Understand the structure, composition of Atmosphere. |
| | | • Understand weather phenomena winds, humidity, precipitation. |
| | | • Understand heat balance. |
| | | • Understand forecasting methods. |
| | | • To understanding the process of weather forecasting. |
| | | • Study of koppens classification. |
| | | • To understand climatic changes through Dust and carbon die oxide theory. |
| | | |
| | Gg.313: Oceanography | • Understand importance of ocean. |
| | | • Knowledge about effect of ocean Currents. |
| | | • Understand human impacts on Ocean. |
| | | • Study about types of tides. |
| | | • To make aware about jadeites use of water. |
| | | • To understand Watershed management and water harvesting Structure. |
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| | Gg.314: Plant Geography | • To understand the Function and types of Biogeography. |
| | | • To understand the controlling factors on distribution of plants |

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| | | • To Acquire Knowledge about bio geographical regions of India. |
| | | • Major soil types and there agricultural potential of India. |
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| | Gg. 315: Soil Geography | • Importance of soil in food Production. |
| | | • To study the soil forming process. |
| | | • To understand Chemical and physical properties of soil. |
| | | • Know soil types of India. |
| | | • Understand food Security and soil quality. |
| | | |
| | Gg.316: Monsoon Asia | • Understand economic Political importance of Monsoon Asia. |
| | | • Understand the physiography , drainage, climate of Monsoon Asia. |
| | | • May the major crops, types of Agriculture of Monsoon Asia. |
| | | • Understand the Monsoon Phenomena. |
| | | |
| | Gg. 321: Zoo Geography | • Introduce the create Awareness about conservation of animals. |
| | | • Understand the ecology testimony of animal in relation of Geography. |
| | | • Motivate the students to conservation of Animals. |
| | | • Understand the geographical dispersion of Animal. |
| | | • Understand the Theory of Distribution of Animals. |
| | | |
| | Gg.322: Remote sensing And GIS | • Understand the History of Remote Sensing |
| | | • Know Arial Photographs and Satellite Imageries |
| | | • Acquire Knowledge about Indian Remote sensing. |
| | | • Investigate components and function of GIS |
| | | • Study GIS Data models. |
| | | • Introduce GPS and Its Functions. |
| | | • Make use GIS & GPS software. |
| | | |
| | Gg.323: Water Resource Management | • Understand the Hydrological cycle. |
| | | • To know the Importance of water Resources. |
| | | • To compute water requirement of Different Crops |
| | | • Create Awareness about water harvesting methods. |
| | | |
| | Gg.324 Geography of Health | • Understand the Ecology and epidemic Deciles. |
| | | • Find out the Geographical Background of Diseases. |
| | | • Create Awareness o malnutrition and hygiene. |
| | | • Understand the Process of health care planning in India. |
| | | • Function of WHO, UNICEF and RED CROSS. |
| | | |
| | Gg.325: Geo statistical Methods | • Understand the representation of Statistical data. |
| | | • Know the Importance of Statistic in Geography. |
| | | • Compute of Measures of Central tendency of dispersion. |
| | | • Calculation and plotting moving Average. |
| | | • Compute the Correlation of Pearson’s and Spearman’s methods. |
| | | • Statistical data Analysis of simple regression. |
| | | |
| | Gg.326: Regional Geography of USA | • Understand the location Physiography, Drainage, Climate, and Vegetation of USA. |
| | | • To know the silent feature, problems and prospects of Agriculture. |
| | | • Study the Problems And Prospect of Industrial Area. |
| | | • Population Composition of USA to India. |

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| | Gg.301: Morphometric Techniques | • To understand method of representation of relief. |
| | | • Drawing of Profile of slope maps. |
| | | • Demarcation of drainage basin of watershed Estimation of Basin area. Drainage Frequency, Bifurcation ratio. |
| | | • Drawing cross section and measurement of angle of Dip thickness of rock. |
| | | • Understand the basic concept of RS. |
| | | • Identify the various landforms. |
| | | • Mapping and interpretation of Arial Photograph. |
| | | • Calculation of scale of land sat imageries. |
| | | • Understand the GIS& GPS. |
| | | |
| | Gg. 302: Practical of Remote sensing, GIS and GPS | • To Develops Skill of soil and water analysis techniques. |
| | | • To Suggests fertilizers to the crops according soil analysis. |
| | | • To collect soil and water Sample. |
| | | |
| M.A/M.Sc-1st Y | Gg. 101: Principles of Economic Geography | • Students Understand about the Nature and Scope of Economic Geography, approaches and recent trends of economics in the field of geography |
| | | • Understand about the basic Economic Processes- Production, Exchange, Consumption and its applications |
| | | • Understand the fundamental theories in subject. |
| | | • Review, understand and apply the modes of economics development by various models |
| | | • Compare the economic environment and economic development in the world |
| | | • Understand the economies scale, transportation and communication and nature and role of international trade. |
| | | |
| | Gg. 102: Principles of Population and Settlement | • Understand the Nature and Scope of Population Geography and their evolution, significance and approaches for the study. |
| | | • Understand the Sources of Population Data and History of World Population and some factors responsible for world population and data sources for study. |
| | | • To understand the fundamental Concepts Related to Population such as density, over, optimum & under population, fertility, mortality and population for future perspectives. |
| | | • To review and understand the subject matter with the help of Theories of Population |
| | | • Fundamental/Basic Statistical Analysis using Statistical Software MS-Excel |
| | | • Understand the Population Movement, Migration and some causes, consequences and its effects. |
| | | • Understand the Nature and Scope of Settlement Geography Characteristics of Rural and Urban Settlements according to Indian Census and nature, scope, evolution and study methods. |
| | | • Understand the settlement types, pattern and nature and process of urban settlement and some basic concept related to settlement geography. |
| | | |
| | Gg. 103: Principles of Climatology | • Understand the introduction to Climatology considering weather & climate, role of climate in human life, aims, nature, scope, and some other sub division of the course. |
| | | • Understand the Atmosphere and their process and function, origin, composition, structure of Atmosphere. |
| | | • To examining the Insolation and Heat Budget and its factors effects and their relations to other some elements. |
| | | • Understand the concept of temperature and factors, horizontal, vertical and invasion of temperature |
| | | • Identify the Atmospheric pressure and winds humidity and concept of precipitation and its types. |
| | | • To compare the Airmasses and Fronts, atmospheric destructions and its relation of local to global |
| | | • Understand the climatic classification based of nature and variability in climatic variations by Koppen.s and Thornwaites climatologist. |
| | | |
| | Gg. 104: Principles of Geomorphology | • Understand the nature, scope and significance of geomorphology and fundamental concepts in subject. |
| | | • To examining the Origin and Evolution of the earth primary relief features by different theories in subject. |
| | | • Understand about Exogenous Processes considering weathering and mass wasting and nature and types of the slope. |
| | | • Evaluate the fundamental Model of Davisian Cylcle of Erosion to learn the function of fiver and its landforms development process. |
| | | • Understand formation, process and development of Fluvial and Karst Landforms |
| | | • To recognize and understand the formation, process and development of Glacial and Aeolian Landforms in geomorphology. |
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| | Gg. 105: Practical of Computerize Data Analysis Techniques in Hun | • Students understand the Microsoft Excel, work sheet and learn the basic about the preparation of graphs, maps, in software for Presentation Techniques |
| | | • To evaluate and investigation the population date in Microsoft excel software. |
| | | • Applied and understand the data analysis techniques for rural and urban settlement and prepare the adequate maps, various graphs. |
| | | • Evaluate the Data Analysis Techniques in Agricultural Geography and Climatology |
| | | • Understand the various basics statistical Techniques for analysis the geographical data. |
| | | • Organize the field work and collect the authentic and appropriate data about selected village and analysed that data help with Microsoft Excel, work sheet and prepare slide and the village report for presentation. |
| | | |
| | Gg. 201: Geographical Thoughts | • Students understand the pre history of geographical Ideas in different duration form Greeks, roman's, Arab and impact of explorations & discoveries. |
| | | • Understand the modern geographical thoughts and contribution of eminent geographers. |
| | | • To learn about the beginning of modern geography, fundamental concepts and models in geography. |
| | | • Examining the sciences of geography and Geography in the Second Half of the 20th Century and its trends in geographical thoughts |
| | | • Compare between the fundamental concepts in geography these are General Geography v/s Regional Geography, Physical Geography v/s Human Geography, and Determinism Geography v/s Possibilist. |
| | | • To understand the present status and application of modern techniques and its uses in climatology, geomorphology, economics geography, and population geography. |
| | Gg. 202: Social and Cultural Geography | • Understand the nature, scope, and concept, relationship between culture and social environment, and right of information act. |
| | | • To examining the cultural complex and traits of culture and its concepts. |
| | | • Evolution to civilization and various cultural development and cultural system according to religion, language and geography, and global cultural changes. |
| | | • To study the origin and growth of culture and agriculture and its basic concepts. |
| | | • Understand the concept of space and social process and present status. |
| | | |
| | Gg. 203: (B) Geoinformatics-I | • Understand the modern techniques in geography under this course such as remote sensing and aerial photography. |
| | | • Examining the history, basic theories of EMR, and other concepts. |
| | | • Understand and get the knowledge about fundamental concept, types of aerial photography, characteristics of aerial photographs and aerial camera. |
| | | • Review on development of Indian remote sensing and functions of IRS. |
| | | • To understand the types of remote sensing, and types of platforms in remote sensing. |
| | | • To get an knowledge about satellite sensor and types of sensors, and their functions and characteristics |
| | | • Understand the data product, types of data product and its applications and uses in remote sensing. |
| | | |
| | Gg 204: Geo-Statistical Methods | • Understand the introduction of geo-sciences system and statistical techniques and characteristics of data. |
| | | • To examining to probability assessment and their calculation procedures and applications and uses in different field of geography. |
| | | • Understand the concept of sampling and designing and conducting a sample survey for data collation and data analysis. |
| | | • Evaluate, calculate and understand the parametric statistics in geo-science system small sized sample and Non Parametric Statistics in geo-science system of various test and techniques. |
| | | • To understand the regression analysis in geo sciences system and calculation, application in various field of geography. |
| | | |
| | Gg. 205: Cartographic Techniques with the Help of GIS & | • Excursion Report |
| | | • Understand the introductory part of GIS software, its tool, functions, data import, scale factors, and basics of digitization |
| | | • Use this software for prepare the various types of maps in geography with the help of cartographic Techniques of GIS software. |
| | | • Applied this software and cartographic techniques for analysis and study in rural settlement geography and urban settlement for planning and development. |
| | | • Understand the cartographic techniques and its tolls, functions, applied in agriculture geography and physical geography for assessment and visualization purpose. |
| | | • Help with these techniques, tool, methods, procedures; analysis potential and cartographic technique etc. prepare the project report considering all types of data related to geography of any selected study area or village. |
| | | |
| M.A/M.Sc-2nd | Gg. 301 (A) : Rigional Geography of U.S.A | • Understand the location, geostrategic importance, characteristics of size of USA |
| | | • To examine the physiographic features of USA |
| | | • To understand climatic variations, types of soil and vegetation and their problems. |
| | | • To extract and understand the natural resources, energy and mineral resources |
| | | • Understand to agricultural activities, patterns, regions, problems and prospect, and some important issues related to USA. |

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| | Gg302: Environmental Geography | • Understand the fundamental concept related to environment, meaning, structure, types, component, geography and environment, man's interaction with environment |
| | | • To study about the nature, scope, basic concept, interdisciplinary science, and study methods. |
| | | • Understand the types, functions and component of ecosystem and biodiversity, its types, conservation methods, and preservation of ecosystem. |
| | | • To understand the environmental global problems such as deforestation, desertification, depletion of ozone, global warming, La-nina and El neon. |
| | | • Understand the role of environmental legislation laws and acts for environment protection and conservation. |
| | | • Study the environmental planning and management for future and also understand the climatic changes and its effect on environment and human being. |
| | | |
| | Gg. 303: Geographical Information System | • Understand the all fundamental concept of GIS, potential of GIS, concept of space & time, objectives of GIS, elements of GIS, GIS tasks, history of GIS and GIS applications in different field. |
| | | • To examine and understand the spatial and non spatial data models and all its functions components and applications in geography. |
| | | • Extract the knowledge and information about geospatial analysis and database query and GIS data analysis the various concept and problems in analysed in GIS environment. |
| | | • Understand the concept of map, projections, and coordinate systems and basic of the same for different purposes in geography. |
| | | • GIS applied in the various kinds of fields, agriculture, populations, watershed planning and land use planning. |
| | | |
| | Gg 304: Watershed Management & Planning | • Understand the fundamentals concepts related to watershed, significances of watershed development, demarcation of watershed, types of watershed according to area and shape |
| | | • Study about the physical parameters of watershed, channel geometry and basin morphology. |
| | | • Understand the hydrological parameters, rainfall, aerial precipitation, evaporation and transpiration, infiltration, run off and drainage. |
| | | • Understand the watershed development planning and sample of watershed management and planning for appropriate development of watershed management for water conservation and development. |
| | | |
| | Gg. 305: Practical of Physical Geography with the Help of G.I.S | • Understand the introduction of GIS software's special reference of ILWIS, to examining the types of GIS software and applications, introduction of menu, tools, page layout and setting, scanning image, import of image in the software. |
| | | • To study and understand the image registration and its analysis done in software. |
| | | • To understand and prepare the topology of point, line and polygon and understand non spatial data analysis. |
| | | • To prepare the different kinds of map using GIS software and also create the profile of relief representation. |
| | | • To understand the GPS and its functions, work, types and components for filed survey and make project report using both GPS and GIS software. |
| | | |
| | Gg. 401: (B) INDUSTRIAL GEOGRAPHY | • Understand study about the industrial geography, its nature, scope, and different study methods. |
| | | • To study the locations of industry and their activities primary and secondary and its factors responsible for same. |
| | | • To review on world distribution of some industries and selected countries. |
| | | • To understand the global nature of industrialization and related problems, methods of measuring the spatial distribution of manufacturing. |
| | | • Understand the environmental degradation, industrial hazards and occupational health, manufacturing industry, role and factors affecting on the same. |
| | | |
| | Gg. 402 (B): Geography of Trade & Transportation | • Understand the concept, development and significance of trade, its types, role of tread in the world etc. |
| | | • To understand the trading blocks and trading pacts and international trade, its history, factors influencing, and India's foreign trade. |
| | | • To study the transport and its basics, physical, economical, social and cultural and modes of transportation, land ways, water ways, and airways and all its functions. |
| | | • Examining the transportation network, measurement of accessibility, its hierarchies, hinterlands, models of network changes, gravity models and transport network and economic development. |
| | | • Understand the problems and urban transport with growth of urban transportation in developing courtiers |
| | | |
| | Gg. 403: (A) Research Methodology | • Examining the introduction of research, motivation in research, types of research, significance of research, research process and criteria of good research. |
| | | • To understand the research problems, selecting research problems, literature review and to study the hypothesis, its types, sources, formation of hypothesis and utility of hypothesis in scientific research. |
| | | • To understand the research design, need, features, basic principal and developing of research plan, and sampling design and its basic types, steps, characteristics of sampling design. |

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| | | • Study about type's data and methods of data collection and study the processing and analysis of data using different statistical methods. |
| | | • Understand the interpretation and report writing, techniques, precaution of interpretation, layout of research report, types of reports and oral presentation mechanics of writing a research report. |
| | | |
| | Gg. 404 (C): Agricultural Geography | • Examining the introduction to agriculture, nature, scope, significance and development of agriculture geography, approaches to study. |
| | | • Understand the fundamental concept, land use, crops, agricultural production and envelopment and study the determinants of agricultural activities, physical determinants, and socio-economic determinants. |
| | | • To understand the agricultural system its meaning and concept, whittlesey's classification of agricultural system, types of agricultural, study of the following types of agricultural in respect of area, salient features and their problems. |
| | | • Understand the agricultural regionalization and modes in agricultural geography and their classification of agricultural models and some theories. |
| | | • Understand the agricultural statistics & land use survey techniques and agrarian revolution, meaning &merit and demerit of green revolution and white revolution. |
| | | |
| | Gg. 404 (C): Agricultural Geography | • Understand the topographical maps, its introduction, types, index, grid reference, and interpretation of topographical maps |
| | | • Study the satellite imageries- introduction, calculation of geographical area, interpretation of satellite imageries. |
| | | • Understand the aerial photographs- introduction, definition, types, geometry of aerial photographs, methods, measurement of geographical area, elements of photo interpretation using stereoscope. |
| | | • Study and understand the techniques of surveying, using dumpy level and theodolite instrument for practical and field work, research, and measurement and management of area. |

**DEPARTMENT OF GEOINFORMATICS**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBSC | Course 1: GEOI 111: Introduction to Computer- | • Familiarize themselves the with basics of computer |
| | | • Study characteristics of computer |
| | | • Learn various advantages and disadvantages of computer |
| | | • Know about generation of computer |
| | | • Learn the concept of data, information and knowledge |
| | | • Learn about memory and its types |
| | | • Acquire knowledge about different types of computer hardware and software |
| | | |
| | Course 2: GEOI 112: Introduction to Geoinformatics – I | • Know about fundamental concepts in geoinformatics |
| | | • Study applications of geoinformatics in various fields |
| | | • Study the roles and functions of different Indian geoinformatics organizations and initiatives |
| | | • Learn digital and conventional cartographic techniques |
| | | • Impart knowledge about map, its components and map making process |
| | | • Learn methods of graphical and cartographic data representation |
| | | • Learn about different thematic maps |
| | | |
| | Course 3: GEOI 101: Practicals based on Computer, Python Programming & Geoinformatics (Practicals based on GEOI 111 and GEOI 112) | • Learnin different components of computer system |
| | | • Learn installation, access and uninstallation of software |
| | | • Learn and exploring different functions in word such as editing, formatting, inserting tables |
| | | • Learn and exploring different functions in spreadsheet such as inserting pivot table and formula |
| | | • Prepare animated presentation in powerpoint |
| | | • Convert map scale in different formats |
| | | • Learn different methods of graphical representation of statistical data |
| | | • Learn the skill of construction of map projections |
| | | |
| | Course 4: GEOI 121: Problem Solving using Computers and Python Programming | • Learn concept of problem and problem solving |
| | | • Learn concept of program and programming language |
| | | • Study algorithms and flowcharts |
| | | • Study basics of python |
| | | • Learn about decision making, loops and functions in python |
| | | |
| | Course 5: GEOI 122: Introduction to Geoinformatics - II | • Learn basics of toposheet |
| | | • Impart knowledge about defense series and open series maps |
| | | • Study toposheet indexing and interpret them. |
| | | • Know historical background of RS and GIS |
| | | • Learn components of GIS |
| | | • Learn GIS data types |
| | | • Know introduction and historical background of GPS |
| | | • Study segments of GPS |
| | | • Learn worldwide satellite navigation systems |
| | | |
| | Course 6: Practicals based on Computer, Python Programming & Geoinformatics (Practicals based on GEOI 121 and GEOI 122) | • Learn and write different python programs |
| | | • Identifying and interpret features on toposheet |

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| | | • Learn and useUse basic tools and functions in GIS software |
| | | • use Digitized and data editing skill by using GIS software |
| | | • Manage spatial data in GIS software |
| | | • Collect data using GPS |
| | | • Explore different features on virtual globes |
| | | |
| SYBSc | Course 1: GEOI 231: Introduction to C++ & OOP – I | • Learn history, applications and uses of C++ |
| | | • Study structure of C++ program |
| | | • Learn about header files, keywords, variables, constants and data types |
| | | • Learn operators and manipulators in C++ |
| | | • Study control structures and looping |
| | | • Learn about arrays and functions |
| | | |
| | Course 2: GEOI 232: Introduction to Geoscience | • Study overview about geomorphology |
| | | • Study weathering processes and agents |
| | | • Learn geomorphological cycle |
| | | • Learn about different landforms formed by the action of water, wind, sea and glacier |
| | | • Study about watershed, soil profile, soil survey, soil formation, soil erosion, soil sedimentation and soil conservation, alkaline and saline soils and their reclamation |
| | | • Learn hydrologic cycle, groundwater distribution, aquifer, hydraulic properties of rocks |
| | | • Study common groundwater problems (contamination, overuse and depletion) and groundwater management using artificial recharge methods |
| | | |
| | Course 3: GEOI 233 Lab course based on GEOI 231 & GEOI 232 | • Learn about C++ environment |
| | | • Learn Programming various C++ concepts |
| | | • Study physical characteristics of minerals |
| | | • Interpret the types of rocks and landforms |
| | | • Study relief features by using contours, profiles-longitudinal profile, transverse profiles and intervisibility |
| | | • Interpret geological maps |
| | | • Learn Delineating watershed |
| | | • Do Morphometric analysis in AutoCAD |
| | | • Study soil maps of India |
| | | |
| | Course 4: GEOI 241: Introduction to C++ & OOP – II | • Study overview of OOP |
| | | • Learn the concept of class and object |
| | | • Learn about inheritance and its types |
| | | • Learn about polymorphism and its types |
| | | • Learn the skill of exception handling and file |
| | | |
| | Course 5: GEOI 242: Introduction to Remote Sensing | • Study working principle of remote sensing |
| | | • Study active and passive methods of remote sensing |
| | | • Learn with EMR, EMS, energy interactions and atmospheric window |
| | | • Learn about spectral signatures and spectral reflectance curves |
| | | • Study different remote sensing platforms and sensors |
| | | • Learn basics of satellites and different types of satellites |
| | | • Learn gray scale image, true color composite and false color composite |
| | | • Learn digital and visual image interpretation methods |
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| | Course 6: GEOI 243: Lab course based on GEOI 241 & GEOI 242 | • Implement various OOP concepts using C++ |
| | | • Study basics of satellite image |
| | | • Study spectral reflectance curves of different earth features |
| | | • Interpret satellite image visually |
| | | • Identify & map drainage pattern, land use land cover, geomorphic features and landforms on satellite image |
| | | |
| TYBSc | Course 1: GEOI 331: Introduction to Programming (Visual Basic 6.0) | • Learn the skill of programming concepts, flowcharts and algorithms |
| | | • Learn basic VB concepts like project, forms and controls |
| | | • Study concept of event |
| | | • Learn advanced controls like ActiveX, FlexGrid, dialog box and windows common controls |
| | | • Gaining knowledge about database programming |
| | | |
| | Course 2: GEOI 332: Introduction to GIS and GPS | • Learn spatial and non-spatial data and data formats of GIS |
| | | • Learn about map scanning, digitizing and topology |
| | | • Acquire knowledge about data acquisition and data management |
| | | • Learn the skill of Making spatial and attribute data query |
| | | • Learn about spatial analysis |
| | | • Learn the basics and working of GPS and DGPS |
| | | |
| | Course 3: GEOI 333: Digital Image Processing – I | • Gain knowledge of structure of image, different types of images |
| | | • Learn about different image enhancement techniques |
| | | • Learn spatial filtering techniques |
| | | • Study about image manipulation techniques |
| | | • Gain knowledge about radiometric, atmospheric and geometric corrections to rectify data |
| | | • Do digital image analysis to extract information |
| | | |
| | Course 4: GEOI 334: Advances in Remote Sensing Technology | • Acquire knowledge about optical remote sensing |
| | | • Learn about microwave remote sensing with emphasis on SLAR |
| | | • Learn the applications of microwave remote sensing |
| | | • Learn about thermal remote sensing, geometric characteristics of thermal image and applications of thermal remote sensing |
| | | • Acquire knowledge about hyperspectral remote sensing, geometric characteristics of hyperspectral image and applications of hyperspectral remote sensing |
| | | • Gain knowledge about High Resolution Earth Resource Satellites |
| | | |
| | Course 5: GEOI 335: Basics of Aerial Photography and Photogrammetry | • Learn about process of aerial photography and different types of aerial photographs and aerial cameras |
| | | • Learn geometric characteristics of aerial photography |
| | | • Learn about image interpretation techniques |
| | | • Study different instruments used in aerial photography such as pocket stereoscope, mirror stereoscope, radial line plotter etc. |
| | | • Learn the skill of making photos from aerial photographs |
| | | • Learn about digital photogrammetry and its applications |
| | | |
| | Course 6: GEOI 336: Application of Remote Sensing in Geoscience | • Learn the scope of remote sensing in earth science |
| | | • Learn the use of remote sensing in lithology, geomorphology and natural hazard management |

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| | | • Learning about different geomorphological features and their classification |
| | | • Study geomorphic agents and processes |
| | | • Learn about soil and water pollution risk assessment and management by using remote sensing |
| | | • Study geospatial modeling, its methods and importance |
| | | |
| | Course 7: GEOI 341: Database Concepts | • Learn about basics of DBMS |
| | | • Study data abstraction and data independence |
| | | • Learn about different data models |
| | | • Learn about SQL |
| | | • Learn the concepts of RDMS |
| | | • Understand the concept of spatial database extensions |
| | | |
| | Course 8: GEOI 342: Advances in GIS and GPS | • Learn about DEM and TIN and their various products |
| | | • Learn about PGIS, demographic GIS software |
| | | • Study spatial data quality parameter |
| | | • Learn about open source GIS |
| | | • Learn about 3D modeling and visualization |
| | | • Study Spatial Decision Support System |
| | | |
| | Course 9: GEOI 343: Digital Image Processing - II | • Learn Image classification – Supervised and Unsupervised classification |
| | | • Learn classification accuracy assessment. |
| | | • Study about data merging |
| | | • Learn change detection techniques |
| | | • Learn about NDVI |
| | | |
| | Course 10: GEOI 344: Introduction to RS, GIS and GPS Softwares | • Learn skill of image processing techniques, data import/export |
| | | • Do data preparation |
| | | • Learn to handle data analysis tools |
| | | • Learn the skill of handling various tools and commands of specialized GIS software |
| | | • To learn the skill of data importing from GPS into GIS software |
| | | |
| | Course 11: GEOI 345: Applications of RS & GIS in Agriculture and Forestry | • Learn about agriculture ecosystem, factors affecting the crop yield, spectral properties of crops, crop acreage estimation and vegetation indices |
| | | • Forecast crop production through digital analysis, studying how crop monitoring and crop condition assessment is done using remote sensing and GIS |
| | | • Learn about soil survey methods, soil classification, mapping of saline and alkaline soils |
| | | • Study oil conservation and its methods |
| | | • Learn about forest, forest taxonomy, forest density and how RS and GIS is used for forest mapping, forest damage assessment, delineation of degraded forest |
| | | • Study about forest inventory and how it is prepared |
| | | • Learn about forest ecosystem management, forest preservation and recreation |
| | | • |
| | Course 12: GEOI 346: Applications of RS & GIS in Mineral Resources and Watershed Management | • Learn about hydrologic cycle: origin of water, types of water - meteoric, Juvenile, magmatic and seawater, |
| | | • Learn about porosity, specific yield, specific retention and permeability, types of aquifers, ground water recharge, artificial recharge and remote sensing studies in ground water |
| | | • Study the methods of watershed delinetation and sustainable watershed management |
| | | • Learn the use of remote sensing and GIS in watershed studies |

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| | | • Study the origin of oil and natural gas, coal, use of remote sensing and GIS in locating the petroleum and coal deposits and their significance |
| | | • Learn about the types of mineral deposits and finding out their location by using RS and GIS techniques |
| | | |
| | Course 1: GEOI 301: Practical based on Visual Basic 6.0 and Database Concepts | • Understand the basic concepts of VB language |
| | | • Learn the basic and advanced control on VB language |
| | | • Learn the integration of front end and back end of the applications |
| | | • Generate the reposts with report control tool |
| | | • Understand the concept of database management tools |
| | | • Study of various commands to manage table operations |
| | | • Learn the extraction of data from table through queries |
| | | • Study the spatial extensions |
| | | |
| | Course 2: GEOI 302: Practical based on Digital Image Processing and Aerial Photography | • Generate the 3D view |
| | | • Understand of digital photo interpretation |
| | | • Learn the image rectification and enhancement |
| | | • Learn the supervise and unsupervised classification of image |
| | | • Study land use applications |
| | | • Do morphometric and slope analysis |
| | | |
| | Course 3: GEOI 303: Practical based on GIS, RS and GPS Software with Mini Project | • Get exposure on RS and GIS software |
| | | • Learn data import/export |
| | | • DO vector and raster analysis |
| | | • Perform different GIS operations such as dissolve, clip, split, union, merge etc |
| | | • Learn GPS based surveying |
| | | • Perform 3D visualization |
| | | • Learn the skill of map-making. |

**DEPARTMENT OF GEOLOGY**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBA | GL-111: GEODYNAMICS | • Earth and Universe, origin of Earth and its Structure. |
| | | • Dynamic Processes, Landforms formed by varies agencies. |
| | | • Geological Time-Scale, Tabular classification of Geological Time-Scale. |
| | | • Causes of Dynamic processes, Sea-floor spreading, Continental drift, Plate tectonics, Mountains, Isostacy, Volcanoes. , Earthquakes. |
| | | • Scope and subdivisions of geology, List of Major National and State level organizations related to geology |
| | | |
| | GL-112 : Mineralogy | • Definition, branches and scope of mineralogy. |
| | | • Occurrence of Minerals, Processes of Mineral formation: Igneous, Sedimentary and Metamorphic. |
| | | • Mineral Identification, Physical properties of minerals. |
| | | • Classification of minerals, Silicate structures |
| | | • Crystallography, external morphology of crystal, Elements of symmetry, Crystallographic and geometric symmetry, Crystallographic axis, Lettering and ordering of crystallographic axis ,parameters and indices, Crystallographic notations. |
| | | • Descriptive Crystallography, Classification of crystals, Study of following crystal systems Cubic system, Tetragonal system, Orthorhombic system |
| | | • Optical Mineralogy |
| | | |
| | GL-121 : PALAEONTOLOGY | • Definition and introduction of Palaeontology, Branches of Palaeontology, Introduction to the origin of life |
| | | • Process of Fossilizations, Conditions of fossilization, Modes of fossil preservation, Techniques in collection, Uses of fossils |
| | | • Invertebrate Fossil Study, Systematic position, Hard part, morphology, Geological history of the following a) Phyllum Mollusca. • Pelecypoda(Bivalvia) • Gastropoda • Cephalopoda (Nautilus, Ammonoites, ) b) Phyllum Brachiopoda: Difference between bivalves & brachiopods. c) Phyllum Echinodermata: d) Phyllum Arthopoda : • Trilobites: Head, Thorax & Pygidium. |
| | | • Definition and importance of Microfossils, trace fossils in Geology |
| | | |
| | GL 122 : PETROLOGY | • Introduction, Classification of rocks, Characteristics of Igneous, Sedimentary and metamorphic rocks, Rock cycle |
| | | • Igneous Petrology, Definition of Magma and Lava, Forms of igneous bodies, Structures & textures in igneous rocks, Crystallisation of Unicomponent magma, Tabular classification of igneous rocks |
| | | • Sedimentary Petrology, Introduction on weathering, transportation, deposition, Classification of sediments (Wentworth) based on size, Classification based on the products of weathering, Structures & textures |
| | | • Metamorphic Petrology, Agents of metamorphism- temperature, pressure, chemically active fluids ( water & gases), Types of metamorphism, Depth zones & metamorphism, Grade of metamorphism, Structures in metamorphic rocks- granulose, schistose, gneissose. |
| | | |
| | GL -101 : Practicals | • Introduction to physical properties of Minerals and Ore Minerals. |
| | | • Determination of Specific Gravity. |
| | | • Crystallography, Cubic system-Galena type. Tetragonal system-Zircon type. Orthorhombic system-Baryte type. Interfacial angle by contact goniometer |
| | | • Optical Mineralogy, Study of petrological microscope. |
| | | • Structural Maps |
| | | |
| | GL -101 : Practicals | • Palaeontology, Unio, Meretrix, Ostrea, Arca, Turritella, Turbo, Cypreae, Physa, Conus, Ammonoite. Terebratula, Productus, Echinus |
| | | • Introduction to Petrology and Classification tables, Igneous rocks, sedimentary rocks, metamorphic rocks. |
| | | • Structural (Geological) Maps |
| | | • Field visit and excursion to any place of Geological Interest. |
| | | |
| SYBSc | GL 231 - Mineralogy | • Mineralogy, Introduction, Classification of Minerals, Silicate structures, Physical and optical properties |
| | | • Gemology, Introduction, Physical and optical properties. |
| | | • Crystallography, Crystallographic axis, symmetry and forms with indices. |
| | | • Mineral Optics, Optical properties, signs of elongation |
| | | |
| | GL- 232 - Principles of Stratigraphy | • Introduction Definition, branches and importance of Stratigraphy. |
| | | • The different Principles of Stratigraphy. |

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| | | • Geologic Time Scale with Geological and Biological Events. |
| | | • Physical, Chemical & Biological controlled stratification |
| | | • Vertical Succession , Lithologic Uniformity, Heterogeneous Succession, Patterned Succession |
| | | • Unconformity, Classification, Evidences of unconformity |
| | | • Stratigraphy Classification |
| | | • Lateral Succession |
| | | • Principles of Correlation, Introduction, Physical and Paleontological evidences of Correlation |
| | | |
| | GL- 241: Petrology | • Definition, Introduction, Definition, Branches and Scope |
| | | • Igneous petrology, Physico-chemical constituents of magma, Types of magmas, Crystallization of Binary Magma, Textures, Classification |
| | | • Sedimentary Petrology, Derivation and sources of sediments, Mineral composition of clastic sediments, Concept of Matrix/Cement, Classification, |
| | | • Metamorphic Petrology, Definition and salient features of metamorphism as a process, Metamorphic minerals, Types of metamorphism |
| | | |
| | GL 242: Structural Geology | • Definition and its relations with other branches of geology |
| | | • Planar/Linear Structures, Outliers / Inliers, Clinometers and Brunton Compass and its uses, Reading of Toposheets |
| | | • Folds, Definition causes and parts of fold, Recognition of folds |
| | | • Joints, Definition and general characteristics of Joints, classification of joints |
| | | • Faults, Definition Movement along faults , classification of faults , Recognition of faults in the field |
| | | |
| | GL -203: Practical | • Physical Properties of the Minerals. |
| | | • Physical properties of the Ore Minerals |
| | | • Optical Mineralogy |
| | | • Crystallography, |
| | | • CO5:Structural Maps, Crystallographic axis, elements of symmetry and forms present with indices |
| | | • Structural Problems |
| | | • Field work |
| | | |
| | GL -203: Practical | • Introduction to Petrology and Classification tables |
| | | • Igneous rocks, sedimentary rocks, metamorphic rocks. |
| | | • Microscopic Petrology |
| | | • Paleontology – Classification, hard part morphology and range |
| | | • Structural (Geological) Maps |
| | | • Field work |
| | | |
| TYBSc | GL 311: Structural Geology | • Mechanical principles, Mechanics of Plastic deformation, Fold, Principles of failure by rupture. |
| | | • Fault, Foliation (Cleavage) and Schistosity, |
| | | • Introduction, Evaporite diapir (Shape, composition and internal structure. |
| | | • CO4 Structure of surrounding sedimentary rocks (Saltdomes) – Introduction, structural evolution and origin. |
| | | • . Introduction and descriptive terminology. Relations of cleavage and schistosity to major structures |
| | | |
| | GL 312 : Indian Stratigraphy | • Physiographic divisions of India Introduction to Indian Stratigraphic Time Scale Tectonic framework of India and orogenic activity. |
| | | • Description based on stratigraphy, lithology, structure, environment of deposition, intrusive activity, fossil and economic importance of Gondwana Supergroup. |
| | | • Mesozoic Formations of India. |
| | | • Tertiary of Assam: Stratigraphy, lithology and fossils |
| | | • a.Introduction to Lesser, Central and Higher Himalayan formation. Siwaliks – Introduction, stratigraphy and sedimentation, fauna, and lithology. |
| | | |
| | GL 313 : Mineralogy and Optics | • Study of following mineral groups with respect to their Structure, chemistry, Optical and physical properties, Distinguishing characters, and Importance |
| | | • Introduction to the following Mineral Groups. Zeolites Clay Minerals Feldspathoids |
| | | • Structure, Chemistry, Optical and Physical properties, mode of occurrence and uses |
| | | • Refractive Index and Relief, Becke line and its uses. b) Uniaxial and Biaxial indicatrices. |

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| | | • Explanation of Central uniaxial interference figure and its sign when the section is perpendicular to optic axis |
| | | • Introduction to 32 classes of crystallographic symmetry |
| | | |
| | GL 314 : Igneous Petrology | • Igneous rocks in a broad tectonic frame |
| | | • Temperature -Pressure conditions, generation of magma in their source region, boundary conditions. |
| | | • Reaction series and its interpretation |
| | | • Crystal fractionation, Fo-Fa and Fo-Silica systems. Separation mechanisms: Gravity settling. Flow differentiation. Flow crystallization. i Gas streaming. b. Liquid immiscibility (Silicate-Silicate) |
| | | • Crystal fractionation, Fo-Fa and Fo-Silica systems. Separation mechanisms: Gravity settling. Flow differentiation. Flow crystallization. i Gas streaming. b. Liquid immiscibility (Silicate-Silicate) |
| | | |
| | GL 315 : Sedimentary Petrology | • Origin of Sedimentary rocks. |
| | | • Fabric and frame work, Abundance of common minerals. |
| | | • Textural characters of Sedimentary rocks |
| | | • Provenance. |
| | | • Environment of Deposition |
| | | • Introduction and map of sedimentary basins of India |
| | | |
| | GL 316 : Geomorphology | • Origin of Sedimentary rocks. |
| | | • Fabric and frame work, Abundance of common minerals. |
| | | • Textural characters of Sedimentary rocks |
| | | • Provenance. |
| | | • Environment of Deposition |
| | | • Introduction and map of sedimentary basins of India |
| | | |
| | GL 317 : Mineralogy | • Study of following minerals for its physical properties, uses, occurrences of |
| | | • Ore minerals |
| | | • Hess calculation for Pyroxenes |
| | | • Mineral calculation for Feldspars |
| | | • Optics: Optical Properties |
| | | • Preparation of an ore-mineral map of India |
| | | |
| | GL 318 : Sedimentary Petrology, Paleontology and Indian Stratigrap | • Study of the following Megascopic rocks with regards to their texture/ structure, description, identification and classification, giving their sedimentological significance |
| | | • Thin section study of the following sedimentary rocks : Sandstone, Feuginous sandstone Arkose, Nummulitic limestone |
| | | • Interpretation of the sedimentary structures giving their geological significance. |
| | | • Plotting and calculation of the sieve analysis data and environmental interpretation and energy condition |
| | | • Study of 25 animal fossil/Shells and 5 plant fossils |
| | | • Maps showing cratons, Mobile belts and sedimentary basins of India. |
| | | |
| | GL 319 : Structural Geology, Geomorphology, Field Geology | • Geological Maps |
| | | • Structural problems |
| | | • Geomorphology, Bifurcation ratio of given basin |
| | | • Field Geology |
| | | • Field work for about one week in an area of geological interest. |
| | | |
| | GL 321 : Metamorphic Petrology | • Scope of Metamorphic Petrology Definition and types of metamorphic rocks |
| | | • Controls: Pressure, Temperature and Composition of original rock |
| | | • Metamorphic processes: initiation of metamorphic processes, preferred orientation, |
| | | • Upper limits of metamorphism. |

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| | | • Metamorphic Aureole, Thermal metamorphism of Impure calcareous rocks. Introduction to facies of contact metamophism. |
| | | • P-T boundaries and mineral equations of : Zeolites, Chlorites, Muscovite, Biotite, Staurolite, Garnets, Pyroxenes, Amphiboles, Aluminosilicates |
| | | |
| | GL 322 : Economic Geology | • Brief history of use of minerals and development of Economic Geology. |
| | | • Ore mineral, Tenor of ore, Gangue minerals |
| | | • Classification of minerals deposits |
| | | • Process of formation of Mineral Deposition. |
| | | • Oxidation and supergene enrichment. Metamorphism. |
| | | • Polymetallic nodules. |
| | | |
| | GL 323 : Natural Resources – Minerals and Energy | • Origin and varieties Different Classifications, Rank and Grades Distribution of coal in India |
| | | • Stratigraphy, structure, lithology of: Raniganj, Neyveli lignite. Coalfields of Maharashtra. |
| | | • Origin Migration Distribution of oil and gas in India. |
| | | • Stratigraphy, structure, lithology of oil fields: Upper Assam Bombay High and Cambay Basin |
| | | • Geological and geographical distribution, uses and characters of Radio active minerals. |
| | | |
| | GL 324 : Geotechniques | • Learning image processing techniques, data import/export |
| | | • Engineering properties of rocks, road metal and their characteristics |
| | | • Remote Sensing - Introduction, types - active and passive, working principle of remote sensing system, advantages and limitations of remote sensing |
| | | • Studying data importing from GPS into GIS software |
| | | |
| | GL 325 : Environmental Geology | • Fundamental Concepts of Environmental Geology |
| | | • Seven fundamental concepts of Environmental Geology |
| | | • Land as a Resource, soil and recources. |
| | | • Water as a resources |
| | | • Natural and Man-Made hazards |
| | | |
| | GL 326 : Hydrogeology | • Definition of terms like Hydrology, Geohydrology and Hydrogeology |
| | | • Scope of groundwater geology. Distribution of water on earth's surface with percentage |
| | | • Groundwater in the Hydrologic cycle and hydrologic properties: precipitation, infiltration, soil moisture, evaporation, transpiration |
| | | • Occurrence Distribution and Movement of Groundwater: |
| | | • Watershed Development and resources management strategy |
| | | • Groundwater Investigation |
| | | • Artificial recharge of Groundwater |
| | | |
| | GL 327 : Igneous Petrology | • Study of the following Megascopic rocks with regard to their texture, mineral composition, colour index, identification and classification |
| | | • Thin section study of the following rocks with regard to their texture, mineral composition, colour index, identification and classification |
| | | • Description, Genesis and Significance of the following Megascopic textures / structures : Granitic, Porphyritic, Graphic, Ropy, Glassy, Columnar, Vesicular and Amygdaloida |
| | | • Description genesis and significance of the following textures / structures seen in thin section |
| | | • CIPW Norm calculation of saturated rocks based on given chemical data. |
| | | |
| | GL 328 : Metamorphic Petrology | • Study of the following Megascopic rocks with regard to their texture/structure, mineral composition, colour, type of metamorphism, grade and the original rock |
| | | • Study of the thin sections of the following rocks with regard to the their texture/ structure, mineral composition, colour, type of metamorphism and grade |
| | | • Interpretation of Microscopic structures giving their geological significance. |
| | | |
| | GL 329 : Structural Geology, Field Geology and Hydrogeology | • Structural Problems |
| | | • Outcrop Completion of the Map |
| | | • Calculation of Basin area, Stream length and Drainage texture |
| | | • Vertical Electrical Sounding for Groundwater exploration |

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| | | • Field work for about one week in an area of geological interest |

**DEPARTMENT OF GREEN HOUSE TECHNOLOGY**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBVoc | GHT-111 Introduction to Green House Technology | • Understand the concept of green house, their structure & types, different components and their functions. |
| | | • Study the classification of Green Houses based on shape, utility, construction, covering materials and cost. |
| | | • Understand the factors considered for green house construction. |
| | | • Study the planning of green house. |
| | | • Study of designing of the green houses. |
| | | |
| | GHT – 112 Greenhouse Structural Design and Construction | • Study of factors affecting the construction of a greenhouse. |
| | | • Study of different materials required for fabrication of green house. |
| | | • Understand the structural components of greenhouse role. |
| | | • Study of constraints in greenhouse vegetable cultivation. |
| | | • Study of Classification of greenhouse. |
| | | |
| | GHT – 113 Greenhouse and Shade Net House Management | • Study of Shade house |
| | | • Study of Net house and green house. |
| | | • Study of climate control in greenhouse. |
| | | • Study of different heating systems used in greenhouse. |
| | | • Study of installation and management of irrigation systems. |
| | | • Study of irrigation and nutrient management in shade house and green house |
| | | |
| | GHT – 121 Greenhouse Agrotechniques and Crop Cultivation | • Understand the concept of agrotechniques, importance and scope. |
| | | • Understand the different branches of horticulture. |
| | | • Study the Cultivation of Crops in Shade Net and Green House. |
| | | • Understand the intercultural operations used in green houses. |
| | | • Study the seedling raising techniques |
| | | • Study the transplanting and irrigation techniques. |
| | | |
| | GHT – 122 Cultivation of Vegetable and Flower Crops in Greenhous | • Study of horticultural equipment in greenhouse cultivation. |
| | | • Aware about Selection of site for commercial protective cultivation of crops. |
| | | • Understand about the Identification of crops their seeds and varieties. |
| | | • Study of layout for planting of flowers and vegetables. |
| | | • Study of methods of planting and transplanting of seedlings. |
| | | • Study the Intercultural operations in vegetable and flower crops. |
| | | |
| | GHT – 123 Horticultural Techniques in Greenhouse | • Study of various growing media used in raising of seedlings. |
| | | • Study of plant propagation methods. |
| | | • Study of use of soilless culture, hydroponic and aeroponic technique for commercial cultivation. |
| | | • Study of special horticultural practices. |
| | | • Study of growing media. |
| | | |
| SYBVoc | GHT – 231 Greenhouse design construction and management | • Understand the concept of green house, their structure & types, different components and their functions. |
| | | • Study the classification of Green Houses based on shape, utility, construction, covering materials and cost. |
| | | • Understand the factors considered for green house construction. |
| | | • Study the planning of green house. |
| | | • Study of designing of the green houses. |
| | | |
| | GHT – 232 Greenhouse structural design and construction | • Study of factors affecting the construction of a greenhouse. |
| | | • Study of different materials required for fabrication of green house. |
| | | • Understand the structural components of greenhouse role. |

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| | | • Study of constraints in greenhouse vegetable cultivation. |
| | | • Study of Classification of greenhouse. |
| | | |
| | GHT - 233: Greenhouse and shed net house management. | • Study of Shade house |
| | | • Study of Net house and green house. |
| | | • Study of climate control in greenhouse. |
| | | • Study of different heating systems used in greenhouse. |
| | | • Study of installation and management of irrigation systems. |
| | | • Study of irrigation and nutrient management in shade house and green house |
| | | |
| | GHT – 241 Crop production - experiential learning in greenhouse | • Study the cultivation practices of vegetables and cut flowers in green house. |
| | | • Understand the Time of sowing/ planting/ transplanting |
| | | • Understand Fertigation and spraying schedule |
| | | • Study Temperature and humidity recording |
| | | • Aware about Labour register |
| | | • Understand the Drip irrigation and fogging system |
| | | • Study the cost of cultivation and cost of production. |
| | | |
| | GHT – 242 Design and installation of modern irrigation systems | • Study of drip irrigation systems and its design criteria. |
| | | • Study of filtration unit and its components. |
| | | • Study of fertilizer application equipments. |
| | | • Understand the Computation of fertilizer dose for fertigation |
| | | • Understand the Cleaning and maintenance of drip irrigation system |
| | | • Study of installation of foggers for controlling temperature |
| | | |
| | GHT - 243 Experiential learning in greenhouse | • Understand Cultivation practices of vegetables and cut flower in greenhouse |
| | | • Study Protected cultivation – polyhouse/ shedhouse. |
| | | • To study the Time of sowing/ planting/ transplanting. |
| | | • Study of fertigation and spraying schedule. |
| | | • Study the cost of cultivation and cost of production. |
| | | |
| TYBVoc | GHT – 351 Pre Harvest Techniques of Green house Crops | • Understand about pre harvest maintains quality of produce. |
| | | • To impart knowledge regarding causes of post harvest losses |
| | | • Understand the factors affecting quality and deterioration of horticultural produce |
| | | • Understand the hardening and ripening process |
| | | • To know good horticultural practices and good green house practices. |
| | | • Understand pre harvest treatment of horticultural crops |
| | | • Understand structure of fruit, vegetables, and cut flowers related to physiological changes after harvest |
| | | |
| | GHT – 352 Harvesting Techniques of Vegetables | • To impart knowledge regarding losses during harvesting of green house vegetables. |
| | | • To get knowledge about harvesting methods to minimize losses during harvesting. |
| | | • Understand the various harvesting techniques for vegetables to reduce the food losses and quality by using mechanical tools |
| | | • Study the factors responsible for harvesting of vegetables |
| | | • To study harvesting indices of crops grown under green house condition |
| | | |
| | GHT – 353 Harvesting Techniques of Cut Flowers | • To impart knowledge regarding losses during harvesting of green house cut flowers. |
| | | • To get knowledge about harvesting methods to minimize losses during harvesting. |
| | | • Study the Importance & scope of Harvesting Techniques in cut flowers |
| | | • Understands the factors responsible for harvest |
| | | • Study the Harvesting indices of crops grown under green house condition |

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| | | • Study the Harvesting tools and their design aspects |
| | | |
| | GHT – 354 Post Harvest Techniques of Green house Crops | • To get knowledge of post harvest losses and how to minimize losses during handling of produce |
| | | • Understand the Importance of Post-harvest technology lies in the fact that it has the capability to meet food requirement of growing population |
| | | • Study the post harvest handling of green house crops |
| | | • Study factors responsible for hardening and delaying ripening |
| | | • Understand Standards and specifications for vegetables and flowers for market |
| | | • Study processing for sorting and grading |
| | | • Study Post-harvest treatment |
| | | |
| | GHT – 355 Post Harvest Techniques of Vegetable Crops | • To get knowledge of post harvest losses and how to minimize losses during handling of produce |
| | | • Understand the Importance of Post-harvest technology lies in the fact that it has the capability to meet food requirement of growing population |
| | | • Study of Standards and specifications for vegetables for market |
| | | • Study processing for sorting and grading |
| | | • Study Post-harvest treatment |
| | | |
| | GHT – 356 Post Harvest Techniques of cut flowers | • To get knowledge of post harvest losses and how to minimize losses during handling of produce |
| | | • Importance of Post-harvest technology lies in the fact that it has the capability to meet food requirement of growing population |
| | | • Study Handling of important cut flowers |
| | | • Study Prepackaging of cut flowers |
| | | • Understand Packaging and marketing of cut flowers. |
| | | |
| | GHT – 357 Pre- Harvest Management of Green House Crops, Vegeta | • Study of Good Cultivation Practices of Cut Flowers |
| | | • Understand the Judging maturity indices of Flowers |
| | | • Study about Packaging material – types of packaging for cut flowers. |
| | | • Study about Drying of Various Flowers for long term use and decoration purpose. |
| | | • Understand and Study of Methods of Harvesting of Cut Flowers. |
| | | • Study of Handling of Cut Flower to maintain quality. |
| | | • Study of Pre-Packaging of Cut Flowers for export purpose |
| | | • Study of Post-Packaging of Cut Flowers for export purpose for distance market. |
| | | |
| | GHT – 358 Post Harvest Management of Green House Crops, Veget | • Understand and study of Good Cultivation Practices of Vegetables. |
| | | • Study of Judging Maturity Indices of Vegetables to know better harvesting time. |
| | | • Study of Methods of Harvesting of Vegetables to avoid food losses. |
| | | • Understand and Study of Unit Operation of Green House Vegetables (Sorting, Grading and Cleaning) for good market value. |
| | | • Study of Packaging Material, Types of Packaging For Vegetables to maintain quality. |
| | | • Study of Packaging of Various Fresh Vegetables. |
| | | • Study of Preservation By Drying and Dehydration of vegetables for long term use. |
| | | • Storage Study of Green House Vegetables |
| | | |
| | GHT – 359 Quantitative, Qualitative and sensory of Green House Cr | • Understand and study of Study of GGP, GAP during food processing. |
| | | • Study of Use of Growth Regulators for vegetables and cut flower production to obtain fast and best yield. |
| | | • Study of improving post harvest life and quality of cut flowers for long vase life of cut flowers. |
| | | • Study of improving post harvest life and quality of vegetables for long term use. |
| | | • Understand and study of Determination of physiological loss weight (PLW). |
| | | • Study of preservatives and food color of vegetables to gain good market value. |
| | | • Study of sensory characteristics of vegetables. |
| | | |
| | GHT – 361 Green house vegetable processing | • Understand and study of Quality attributes- physical, chemical, nutritional, microbial, and sensory their measurement and evaluation; |
| | | • Study of Sensory vis-à-vis instrumental methods for testing quality. |

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| | | • Understand and study of Concepts of quality management: Objectives. |
| | | • Study the Importance and functions of quality control |
| | | • Study the Quality management systems in India; Sampling procedures and plans |
| | | • Study of Packaging, Labeling & Branding of raw & processed Agriculture produce |
| | | |
| | GHT – 362 Quality analysis of vegetables and cut Flowers | • Understand the Quality attributes – classification of vegetables and cut flowers |
| | | • Understand and study of Importance and function of quality control. |
| | | • Study of Quality assessment of vegetables. |
| | | • Study of Quality assessment of cut flowers. |
| | | • Understand and Study of Fresh vegetables and cut flower grade and standards |
| | | |
| | GHT – 363 Process of Implementation of HACCP in an Industry | • Understand the Total Quality Management; GMP/GHP, GAP;. |
| | | • Study of Sanitary and hygienic practices; |
| | | • Aware about HACCP; Quality manuals, documentation and audits; |
| | | • Understand the concept of Indian & International quality systems and standards like ISO and Food Codex. |
| | | • Study of Export import policy, export documentation. |
| | | • Study of Laboratory quality procedures and assessment of laboratory performance Applications in different food industries. |
| | | • Understand and study of Food adulteration and food safety. |
| | | |
| | GHT – 364 Preservation by drying and dehydration of vegetables an | • To get knowledge about losses during harvesting and handling of produce and use of methods of preservation through various methods |
| | | • Understand the Principles, objectives, Introduction- drying, dehydration. |
| | | • Study of Scope and importance. |
| | | • Understand and study of Methods of drying, specifications for drying. |
| | | • Study of Dehydration, methods of dehydration and specifications of dehydration. |
| | | • Study of Flow charts of drying, dehydration. |
| | | |
| | GHT – 365 Food laws, Standards, International food regulations and | • Understand and study of Food Laws. |
| | | • Understand the Need of food laws. |
| | | • Understand the Need for food standards. |
| | | • Study of Product order 195 |
| | | • Study of Sanitary requirements of factory. |
| | | • Study of Licensing officer |
| | | • To get Knowledge of food laws, standards, food safety. |
| | | |
| | GHT – 366 Packaging and Labeling; Laws of Value added Products | • Understanding the concept of Packaging , importance, objectives |
| | | • Study the Packaging materials for fresh vegetables and cut flowers, advantages. |
| | | • Study of Materials for pre packaging |
| | | • Study of Importance of ventilation of packages. |
| | | • Study of Different packaging for important vegetables. |
| | | • Study of Different packaging for important cut flowers. |
| | | • To get knowledge and importance of packaging materials and procedure, labeling for selling of produce |
| | | |
| | GHT – 367 Post Harvest and Value addition of Vegetables and cut fl | • Determine different Post harvest treatment of vegetables. |
| | | • Study of Determination of TSS of vegetables. |
| | | • Study of Determination of acidity of vegetables. |
| | | • Study of Determination of pH of vegetables. |
| | | • Study of Determination of post harvest losses during storage. |
| | | • Study of Determination of quality deterioration of vegetables during storage. |
| | | |
| | GHT – 368 Value addition of Green House Vegetables and Cut Flow | • Understand and Study of general maturity indices of vegetables. |

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| | | • Study and determining the Preservation of green house vegetables by wax-coating. |
| | | • Study of Preservation of green house vegetables by dehydration. |
| | | • Study of Preparation of tomato ketchup. |
| | | • Study of Preparation of Gulkand. |
| | | • Study of Packaging and labeling of green house vegetables. |
| | | |
| | GHT – 369 Quality determination of green house vegetables and cut | • Understand and study of Determination of TSS, Acidity and pH food product. |
| | | • Study of Estimation of protein. |
| | | • Study of Estimation of carbohydrates. |
| | | • Study of Estimation of fats. |
| | | • Study of Estimation of fiber. |
| | | • Study of Estimation of Ash. |
| | | |

**DEPARTMENT OF HINDI**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| | | |
| FYBCom | HIN 102 - F. Y. B COM - OPTIONAL HINDI | • develop Hindi reading and linguistic comprehension of students. |
| | | • develop interest in literature, fiction and poetry. |
| | | • use their vocabulary for developing moral and social sense in life. |
| | | • make special use of language for their expression.. |
| | | |
| | | |
| | HIN 111 FYBA General Hindi | • Develop the comprehensive ability. |
| | | • Inculcate moral and human values within themselves. |
| | | • Understand the basic forms of fiction and poetry. |
| | | |
| SYBA | HIN 231 S.Y.B.A GENERAL 2 :- Short Story | • develop literary tendencies. |
| | | • understand the types of Hindi Short story writing. |
| | | |
| | HIN 232 S.Y.B.A SPLCIAL I :- Kavyashatra | • know Indian Poetry structure in ancient and modern era. |
| | | • know the importance of criticism. |
| | | • increase vision regarding literary value. |
| | | • know the concept and process of literature. |
| | | |
| | HIN 233 S.Y.B.A SPLCIAL II :- Upnyas and Natak | • understand novel forms and their types |
| | | • know the concept and process of dramatics |
| | | |
| TYBA | HIN 351 T.Y.B.A GENERAL 3 :- One Act Play, Essay and Hindi Grammar | • introduce to the minor genres such as One Act Play, Essay and Hindi Prose |
| | | • study Grammar which acquainted them to the correct usage language. |
| | | • use literature to develop their social and moral sense in life. |
| | | |
| | HIN 352 T.Y.B.A SPACIAL 3 :- Hindi Sahitya ka Etihas | • introduce to the minor genres such as One Act Play, Essay and Hindi Prose |
| | | • study Grammar which acquainted them to the correct usage language. |
| | | • use literature to develop their social and moral sense in life. |
| | | |
| | HIN 353 T.Y.B.A SPACIAL 4 :- Bhasha vigyan Evam Hindi Bhasha Aandolan ka Etihas | • Inculcation of phonological competence among students. |
| | | • study the various Dialects of Hindi. |
| | | • get acquainted with Hindi grammatical forms and functions. |
| | | • get acquainted with morphological concepts and processes. |
| | | • get acquainted with the basic concepts in syntactic and semantic levels of Hindi language. |
| | | |
| MA-I | HIN 1110 : General level – Katha Sahitya | • get information about the Novel and Story Literature. |
| | | • get information about Hindi Literature Forms. |
| | | • understand Socio-Cultural & Political Impact on Hindi Literature. |
| | | |
| | HIN 1120 : Special level : Aadikalin avam Madhyayugin kavya | • get information about Sant poet & their Literature. |
| | | • get information about Hindi's Historical Literature Forms. |
| | | • get information Well Known poet Vidyapati & Sant Tulasidaas |
| | | |
| | HIN 1130 : Special level : Bhartiya kavyashastra ke siddhant avam a | • know Indian Poetry structure in ancient era |
| | | • know the importance of criticism. |

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| | | • increase vision regarding literary value. |
| | | • know the concept and process of literature. |
| | | |
| | HIN 1140 : Special level : Aatmkatha | • get information Well Known female writer in Hindi |
| | | • know the literary contribution of female writer |
| | | • know the gender equality among the literature. |
| | | • know the importance of feminism. |
| | | • know the characteristics of feminine literature. |
| | | |
| | HIN 1210 : General level : kathetar gadya sahitya | • get introduction of Hindi writer. |
| | | • get information about the autobiography, essay and drama Literature. |
| | | • get information about Hindi Literature Forms. |
| | | • understand Socio-Cultural & Political Impact on Hindi Literature. |
| | | |
| | HIN 1220: Spl. – Ritikalin kavya | • know the Medieval Hindi literature |
| | | • get information about Hindi's Historical Literature Forms. |
| | | • get information Well Known poet Bihari, Ghananand & Bhushan |
| | | |
| | HIN 1230 : Spl. Level – Paschatya kavyshastra evam Vaad | • know western Poetry structure in ancient and modern era |
| | | • know the importance of criticism. |
| | | • increase vision regarding literary value. |
| | | • know the concept and process of literature. |
| | | |
| | HIN 1240 : Spl. Optional : Dalit Vimarsh | • get introduction of Dalit agitation ( India & World) |
| | | • know the history of the Dalit movement in India |
| | | • study of literature in Dalit approach. |
| | | |
| | HI 2310 : General level : poetry | • get acquainted with the language, poetic style, diction of the age to which it belongs. |
| | | • learn values through literary works. |
| | | |
| | HI 2320 : Spl. level : Bhasha vigyan | • know the importance of language in human life. |
| | | • know the various methods to the the study of language. |
| | | • understand the communication process and method |
| | | |
| | HI 2330 : Spl. level : Hindi sahitya ka Etihas | • Study the historical Development of Hindi Literature. |
| | | • know the brief literature in same perio |
| | | • know the various literary form in same period. |
| | | |
| | HI 2340 : Spl. level optional : Loksahitya | • know the concept of folk-literature. |
| | | • know the tradition of folk literature in India |
| | | • know the co-relation between folk literature and other branches. |
| | | • know the new trends study of folk literature in new era. |
| | | |
| | HI 2410 : General level : poetic Drama, New Poetry and Gazal | • know the new trends study of poetic Drama, New Poetry and Gazal literature in new era. |
| | | • get acquainted with the poetic style, diction of the age to which it belongs. |
| | | • learn values through literary works. |
| | | |
| | HI 2420 : Spl. level – Hindi Bhasha | • know the importance of language in human life. |
| | | • know the various methods to the study of Hindi language. |
| | | • understand the communication process and method. |

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| | | • know the importance of Devnagari Script |
| | | |
| | HI 2430 : Spl. level – Hindi Sahitya ka aadhunik Etihas | • study the socio-cultural & political Background of from 1900 to 2000 periods. |
| | | • know the brief literature in same period. |
| | | • know the various literary form in same period. |
| | | • |
| | HI 2440 : Spl. level optional- Prayojanmoolak Hindi | • understand the communication process and method |
| | | • introduce the media writing |
| | | • introduce the Devnagari script various aspect. |

**DEPARTMENT OF HISTORY**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBA | HIS- 101 – G1 History of Indian Freedom Movement | • Understand modern Indian history |
| | | • Identify the importance and the legacy of Freedom Movement. |
| | | • Distinguish the detail account of British raj as well as its overall impacts on the Indian society. |
| | | • Evaluate the renaissance and social reform movement in India. |
| | | • Understand some of the early resistance to British rule. |
| | | |
| | HIS - 201 - G1 History of Indian Freedom Movement(A. D. 1905 - 1 | • Understand early political awakening in Indian freedom struggle. |
| | | • Identify the social institutions of late nineteenth century. |
| | | • Understand various phases of the national movement. |
| | | • Understand the difference between moderates, extremists and revolutionaries. |
| | | • Comprehend the socio-religious scenario and the social reformation. |
| | | • Grasp the details of freedom movement under the Mahatma Gandhi's leadership. |
| | | • Understandthe evolutionary processes of constitutional developments. |
| | | |
| | HIS - 231-G-2 Rise of Maratha Power (1630-1674) | • Understand the inspiration behind the establishment of swarajya. |
| | | • Explain the reasons behind ChatrapatiShivaji'searly conflicts with the regional lords and the outsiders. |
| | | • Know about the administrative need and the importance of grand coronation of ChatrapatiShivaj |
| | | • Asses the ChhatrpatiShivaji's invasion on Karnataka. |
| | | |
| | HIS- 232 – (B) S1 History of USA (1776-1914) | • Explain the processes of the colonisation of American land. |
| | | • Understand the founding principles and ideals propagated by the American Revolution. |
| | | • Evaluate the development and the nature American democracy. |
| | | • How the American people successfully overcame from the stigma of Slavery and the Civil War. |
| | | • Describe the policies of US's President Theodore Roosevelt and President Woodrow Wilson. |
| | | |
| | HIS- 233- S2 History of Ancient India (B.C.3000 - B.C.400) | • Perceive various sources to study of Ancient India. |
| | | • Know about the development and the achievements of man in the Stone Age. |
| | | • Understand the glory of Indian history in the age of Harappan civilization. |
| | | • Comprehend the history of Vedic period. |
| | | • Understand the philosophy of Jainism and Buddism. |
| | | • Perceive influence of political support on religion. |
| | | |
| | HIS 241 (G-2) : Rise of Maratha Power (1674-1707 ) | • Understand the formation of welfare state during the Maratha rule |
| | | • Understandtheindustrial and agricultural aspects of ChhatrpatiShivaji's regime |
| | | • Understand the administrative aspect of the Swarajya. |
| | | • Understandthe conflict for throne after the death of ChhatrpatiShivaj |
| | | |
| | HIS- 242 – B S1 History of USA (1914-1970) | • Explain how the America marched towards to become a world power. |
| | | • Critically assess the importance of the role played by US in the world war-I and world war- |
| | | • How the America became the world economic power. |
| | | • Understand the Civil Rights Movement. |
| | | • Explain and critique the Indo-US relations. |
| | | |
| | HIS 243 (S-2) : History of Ancient India (B.C.400 – A.D. 1206 ) | • Know about the MauryanEmpire. |
| | | • Perceive socio-economic, religious situation under the Maurya. |
| | | • Comprehend about the Gupta period. |
| | | • Understand emergence of feudal system in Indian society |
| | | • Understand the History of Satvahanas, Shungas, Kushans, and Hunas. |

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| | | • Know about the Sangam age, the Cholas, Pallavas and Chalukyas. |
| | | |
| | HIS 351 -G3- History of Modern World (1789-1900) | • Learn about the causes and aftermaths of the French revolution. |
| | | • Understand the factors responsible for the end of monarchy in France. |
| | | • Understand the rise of Nepolean and how Meternic dominated the European politics. |
| | | • Describe how feudalism came to end In Europe. |
| | | • Describe the historical process which leads to rise of nationalism in Europe. |
| | | • Understandhow industrial revolution encouraged to colonial expansion. |
| | | |
| | HIS 352(B)- S3 - Expansion of the Maratha Power (1707-1761) | • Understand the importance of the Maratha history in 18th century. |
| | | • Asses the circumstances under which rise of the Peshwas took place. |
| | | • Understand the political scenario of the Maratha power in the early 18th century |
| | | • Understand the policies adopted by early Peshwas. |
| | | |
| | HIS 353 - S4 - History of Sultanate (1206-1526) | • Understand early difficulties of Sultans in India |
| | | • Grasp territorial expansion of Sultanat Period. |
| | | • Understand the administrative setup of Sultanat from central to local level. |
| | | • Know the system of trade & commerce during the period of Sultant . |
| | | • Understand the nature of village community & the relationship between the different sections of society. |
| | | • Understand the aspects of fiscals & monetary system under the Sultanat. |
| | | • Grasp the attitude of emperors towards religion under the regime of Sultanat. |
| | | |
| | HIS 361 - G3 - History of Modern World (1901-1945) | • Understand the importance of world peace right after the world war Ist. |
| | | • Evaluate the Russian revolution and the first experiment of the communist government. |
| | | • Understand the fascism and the rise of dictatorship in Europe. |
| | | • Explain the aftermaths of the World War II on the world politics. |
| | | • Understand how Russia and America emerged as superpowers on the verge of cold war. |
| | | |
| | HIS 362(B) -S3- Expansion and fall of the Maratha Power (1761-18 | • Explain the circumstances of the Maratha power after the battle of Panipat. |
| | | • Knowthe reasons of political disintegration of the Marathas. |
| | | • Understandthe nature of Aglo-Maratha relations. |
| | | • Understandthe central and provincial administration of Marathas under the Peshwas. |
| | | |
| | HIS 363 -S4- History of Mughal (1526-1707) | • Understand the political situation of India on the eve of Babar's invasion. |
| | | • Grasp territorial expansion of Mughal empire |
| | | • Understand the emergence & consolidation of Sher Shah. |
| | | • Grasp the Mughal concept at divine theory of kingship & state |
| | | • Understand the administrative set up of Mughals. |
| | | • Comprehend the basic features of Mansabdari& change in it during 17th century. |
| | | • Know the system of trade & commerce during the period of Mughals. |
| | | • Understand the nature of village community. |
| | | • Grasp the some aspects of fiscals & monetary system of Mughals. |
| | | |
| MA-I | HIS-111 Trends in Historiography | • Understand the meaning, nature and scope of history. |
| | | • Apply the theory of Historicism as a professional skill in various fields of intellect. |
| | | • Critically analyse the process of development of historiography since ancient times to modern times. |
| | | • Comparatively understand the various traditions of historical writings emerged in Europe, Arab-Persia, China and India. |
| | | • Describe and evaluate the various traditions and theories of Maratha historiography. |
| | | |
| | HIS-112 History of Ancient India | • Understand the important role of sources in historiography. |

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| | | • Understand the basic concept of ancient India. |
| | | • Know about the Stone Age, prehistoryand proto history. |
| | | • Explain the debate on Aryan migration theory and their early settlements. |
| | | • Understandthe religious revolution and the rise of Jainism and Buddhism |
| | | |
| | HIS-113 History of India (1206 to 1526) | • Understand early difficulties of Sultans in India. |
| | | • Grasp territorial expansion of Sultanat Period. |
| | | • Grasp the concept at theory of kingship & statein the Sultanat period. |
| | | • Understand the administrative setup of Sultanat. |
| | | • Know the system of trade & commerce during the period of sultant . |
| | | • Understand the nature of village community. |
| | | • Understand Some aspects of fiscals & monetary system under the Sultanat. |
| | | • Grasp the policies of emperors towards the religion. |
| | | |
| | HIS-114-B An Introduction to Tribal History | • Acquaint the Indian tribal communities in brief. |
| | | • Describe the nature of history writing on the tribal in India. |
| | | • Understandthe early tribal resistance to the British rule. |
| | | • An outline of the provision of the protection of the tribes in the constitution of india |
| | | • Understanding the increasing threats to tribal in the process of globalisation |
| | | |
| | HIS-121 Historiography-Tools, Methods and Theories | • Distinguish the various types of sources of history and their importance. |
| | | • Reach at the original sources of historical importance preserved in the different archives situated in India and Maharashtra. |
| | | • Acquire basic skills of historical research. |
| | | • Assessing the major approaches of historical research, such as Orientalist, Nationalist, and the Materialist. |
| | | • How to use the tool of theoretical application in their research. |
| | | |
| | HIS-122:- History of Ancient India (Post Mauryan Period to AD 12tl | • Understandthe history of Indian subcontinent after the decline of the mauryan empire |
| | | • Find out the factors responsible for the rise of Indo-Greeks,Perthians and kushanas. |
| | | • Understandthe process of assimilation of the new elements in the Indian society |
| | | • Evaluate the contribution of the Guptas and the Vakatakas in the fields of polity, economy, culture, art and religion. |
| | | • Understandthe political scenario of the Indian sub-continent between 7th and 12th century |
| | | |
| | HIS123History Of India (Ad 1526 To Ad 1707) | • Understandthe political situation of India on the eve of Babar's invasion. |
| | | • Grasp the reasons behind the successful expansion of the Mughal Empire. |
| | | • Understand the emergence & consolidation of Sher Shah. |
| | | • Grasp the Mughal concept of divine theory of kingship & state |
| | | • Understand the administrative set up of Mughals. |
| | | • Comprehend basic features of Mansabdari &the changes occurred in it during 17th century. |
| | | • Critically analyse the growth occurred in the trade & commerce during the Mughal period. |
| | | • Critically evaluate the nature of village community and the system of jajman |
| | | • Grasp some aspects of fiscals & monetary system of Mughals. |
| | | • Comprehend the attitude of Mughal emperors toward religion. |
| | | |
| | HIS-124-B- History Of Dalit Movement | • Understand the nature of pre Ambedkarite dalit movements. |
| | | • Understand the nature of of Dr. Ambedkar's social political and economic struggle. |
| | | • Evaluate contribution made by Dalit movement towards upheld the values like humanism, democracy and justice. |
| | | • Study in brief, the significant contribution made by Dr. Ambedkar in the making of Indian constitution |
| | | • Critically evaluate the relevance and success of post Ambedkar Dalit movements. |
| | | |
| MA-II | HIS-231 : Contemporary World (1945-1970) | • Understand the aftermaths of the world war IInd. |

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| | | • Trace out the reasons behind the emergence of nationalism in Asia and Africa |
| | | • Understand how Russia and America emerged as superpowers on the verge of cold war. |
| | | • Critically describe Non alignment movement and the rise of third world. |
| | | • Understand the red revolution led by Mao-Tse-Tung. |
| | | |
| | HIS-232- India After Independence [Part - I] | • Understand the relevance and importance of the Independence in our national life. |
| | | • Evaluate the efforts taken by our forefathers in architecting the constitution for newly born Nation, India. |
| | | • Assessing the processes of the unification of India. |
| | | • Critically state the political developments happened in post-independence India. |
| | | • Understand the evolution of India's Foreign policy and Economy. |
| | | |
| | HIS-233 : History Of Medieval Maharashtra [Part - I] | • Perceive various sources to study Histoy of Medieval Maharashtra. |
| | | • Comprehend theory of Kingship and the state in the medieval Maharashtra. |
| | | • Understand the general structure of administration under the Marathas. |
| | | • Perceive the Military system in the medieval Maharashtra. |
| | | • Understand the salient features and structure of the Maratha judiciary. |
| | | • Asses the Agrarian system and land revenue system under the Marathas. |
| | | • Understand the importance of the sanadsof Swarwjya, Chauth, Sardeshmukh |
| | | |
| | His-234 (A)-History of modern Maharashtra (part I) | • Identify any analyse the factors responsible for the rise of Modern Maharashtra. |
| | | • Understandthe political scenario of Maharashtra on the eve of British Empire. |
| | | • Evaluate the nature of Renaissance occur in modern Maharshtra. |
| | | • Asses the early resistance and the activities of political awakening in 19th century. |
| | | • Understand the nature of armed and revolutionary movements. |
| | | |
| | HIS-241- Contemporary World (1970-2000) | • Identify the basic principles and values propagated by Non alignment movement. |
| | | • Evaluate the rise of new economy on the eve of the globalization. |
| | | • Understand the threat of terrorism to the world. |
| | | • Acquainted with the issues related to Oil Politics in the western Asia. |
| | | • Evaluate the progress of the science and technology in the 20th century |
| | | |
| | HIS-242 : India After Independence [Part - II] | • Define and understand the challenges rooted in agriculture sector and how it deal by government of India. |
| | | • Critically examine the rising of various people's Struggles in Independent India. |
| | | • Understand the theory and practice of Social Justice in Independent India. |
| | | • Explore and resolve the major challenges emerged in Post-Independent scenario. |
| | | • Describe the achievements of India in the fields of education, Science and Technology in the historical context. |
| | | |
| | HIS-243 : History Of Medieval Maharashtra [Part - II] | • Comprehend the salient features of Caste - Based Feudalismin the medieval Maharashtra. |
| | | • Understand the Social Stratification in Village Community and Position of Women. |
| | | • Comprehend economic condition with special reference tomajor and Minor IndustriesTrade, Currency and Banking. |
| | | • Grasp salient features of Sculpture, Paintings, Architecture, and the Forts. |
| | | • Understand impact of Islam on the language, social life inthe medieval Maharashtra. |
| | | |
| | HIS-244-A- History of Modern Maharashtra [Part -II] | • Understand the role of social reformers in the making of Modern Maharashtra. |
| | | • Evaluate the Socio-religious conditions in 19th century Maharashtra. |
| | | • Understand the social struggle andemancipation movements during the British raj. |
| | | • Evaluate the Cultural,economic and educational impact on Maharashtra. |
| | | • Understand and estimate the process of the modernisation of Maharashtra. |
| | | |

**DEPARTMENT OF MASS COMMUNICATION**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| | | |
| MA-I | **CJ-101 Introduction to Mass Communication and Journalism-** | • Students learn communication skills, Media Communication skills. |
| | | • Students are familiarized with the recent trends in Media Communication. |
| | | |
| | **CJ-102 Development of Media (Print & Electronic)-** | • Students learn history of Media development. |
| | | • Students are made aware of internet facility for mass communication skills. |
| | | |
| | **CJ-103 News reporting and editing-** | • Students get acquainted with the art of news reporting. |
| | | • Students learn about interview techniques, editing of news and feature writing. |
| | | • Students get familiarized with different fields of news reporting. |
| | | |
| | **CJ-104 Environment Communication-** | • Students learn about relation between environment and its ecology. |
| | | • Students develop insight into environmental communication. |
| | | • Students learn about bio-diversity and its importance. |
| | | |
| | **CJ-201 Sustainable Development Communication -** | • Students learn about sustainable development of agricultural, social and related issues. |
| | | • Students learn news reporting related to sustainable development. |
| | | |
| | **CJ-202 Media and Cultural Studies (Rural & Adivasi)-** | • Students are taught about the introduction of Adivasi and Rural cultural. |
| | | • Students get acquainted with different surveys related to tribal and adivasi sectors. |
| | | |
| | **CJ-203 Media Law and Ethics-** | • Students are informed about different laws and ethical norms. |
| | | • Students are taught regarding the importance of media laws. |
| | | • Students learn about various laws vide handling social activities. |
| | | |
| | **CJ-204 Media Management-** | • Students learn about media management related to distribution and advertisement of news papers. |
| | | • Students get information about financial management and media strategy for electronic media management. |
| | | |
| MA-II | **CJ-301 Leader and Feature Writing Photo Journalism-** | • Students learn about different types of editorials. |
| | | • Students are taught regarding style of news writing, reader's Colums and related subjects. |
| | | • Students are informed about various computer techniques for handling photos, graphics and cartoons. |
| | | |
| | **CJ-302 Electronic Media and Production-** | • Students are taught about radio journalism and entertainment based programs. |
| | | • Students learn about difference between production process of radio, TV and other media. |
| | | |
| | **CJ-303 Public Relation/ Corporate Communication-** | • Students learn about corporate communication. |
| | | • Students are taught about role of Public Relation Officer (PRO) in crisis communication. |
| | | • Students are taught about role of Public Relation Officer (PRO) in organizational communication and HRD management. |
| | | |
| | **CJ-304 Folk Media: Adivasi Arts of Khandesh-** | • Students learn about traditional folk media in india with special reference to Khandesh. |
| | | • Students taught about Ahirani language and its strength in communication. |
| | | • Students learn about different problems related to tribal community. |
| | | |
| | **CJ-401 New Media Technology-** | • Students are taught about future of FM Radio Industry. |
| | | • Students get acquainted with use of electronic technology in social media. |
| | | • Students are taught about cyber journalism. |
| | | |
| | **CJ-402 Environmental Communication and Science Reporting-** | • Students learn about relation between environment and its ecology. |

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| | | • Students develop insight into environmental communication. |
| | | • Students learn about different policies related to environment at National and International levels. |

**DEPARTMENT OF MARATHI**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| B.A. (Marath | | • Develop Attitude of Literary Forms. ( Marathi Poetry & Story) |
| | | • Develop Reading, Writing & Communication Skills of Students. |
| | | • Develop Attitude of Literary Forms. ( Marathi Aatmkathan & Novel) |
| | | • Develop Reading, Writing & Communication Skills of Students. |
| | | • Information about the history of Medieval Marathi Literature. |
| | | • Information about Literary Theory. |
| | | • Develop Attitude of Literary Forms. ( Marathi Drama & Lalit Gadya) |
| | | • Develop Reading, Writing & Communication Skills of Students. |
| | | • Information about the history of MODERN Marathi Literature. |
| | | • Develop Attitude of Marathi Linguistics & Grammar. |
| | | |
| MA-I | MAR 111: Madhyayugin Marathi Vangmayacha Itihas (Prarambh to | • get Information about the history of Medieval Marathi Literature. |
| | | • get Information about Medieval Marathi Literature Forms. |
| | | • study Social Change effect on Medieval Marathi Literature. |
| | | • understand Socio-Cultural & Political Impact on Medieval Marathi Literature. |
| | | |
| | MAR 121: Madhyayugin Marathi Vangmayacha Itihas (1650 to 1818 | • get Information about Sant, Pandit & Sahir Medieval Marathi Literature. |
| | | • get Information about Medieval Marathi Literature Forms. |
| | | • get Information Well Known poet Sant Tukaram & Ramdas . |
| | | |
| | MAR 112: Samiksha | • know the importance of criticism. |
| | | • increase vision regarding literary value. |
| | | • know the concept and process of literature. |
| | | |
| | MAR 122: SANSHODHAN PRAKRIYA | • develop of critical approach about Art & literature. |
| | | • know the research methodology & process. |
| | | • know the importance of research. |
| | | |
| | MAR 113: sahityik:Annabhau sathe | • know the literary contribution of the writer. |
| | | • know the life value among the literature. |
| | | • get Indroduction of writer. |
| | | |
| | MAR 123: Lokshahir: Annabhau sathe | • know the folksong of annabhau |
| | | • study life and literary value of Annabhau's Povada And Lavani |
| | | • Study of Annabhau's folk- Drama |
| | | |
| | MAR 114/A: Strivadi Sahitya | • introduce new trends in Marathi literature. |
| | | • know the importance of feminism. |
| | | • know the characteristics of feminine literature. |
| | | |
| | MAR 124/A: Strivadi Sahitya | • get Introduction of feminine agitation ( India & World) |
| | | • know the history of the feminine movement in Maharashtra. |
| | | • study of literature in feministic approach. |
| | | |
| MA-II | MAR 231 Aadhunik Marathi Vangamayacha Itihas (1945-90) | • study the socio-cultural & political Background of 1945 to 1960 periods. |
| | | • know the brief literature in same period. |
| | | • know the various literary form in same period. |
| | | |

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| | MAR 241 Aadhunik Marathi Vangamayacha Itihas (1945-90) | • study the socio-cultural & political Background of 1945 to 1960 periods. |
| | | • know the brief literature in same period. |
| | | • know the various literary form in same period. |
| | | |
| | MAR 232: BHASHAVIDNYAN | • know the importance of language in human life. |
| | | • know the various methods to the the study of language. |
| | | • understand the communication process and method. |
| | | |
| | MAR 242: BHASHAVIDNYAN | • know the importance of language in human life. |
| | | • know the various methods to the the study of language. |
| | | • understand the communication process and method. |
| | | |
| | MAR 233: Sathottary Marathi vangamayin pravah. | • study the impact on literature of the socio-political and cultural background of Maharashtra after 1960. |
| | | • know the literary trend in Marathi literature after 1960. |
| | | • introduce the literary form after 1960. |
| | | |
| | MAR 243: Sathottary Marathi vangamayin pravah. | • study the impact on literature of the socio-political and cultural background of Maharashtra after 1960. |
| | | • know the literary trend in Marathi literature after 1960. |
| | | • introduce the literary form after 1960. |
| | | |
| | MAR 234/A LOKSAHITYA ANI KHANDESHI LOKSAHITYA | • know the concept of folk-literature. |
| | | • know the co-relation between folk literature and other branches. |
| | | • know the new trends study of folk literature in new era. |
| | | |
| | MAR 244/A KHANDESHI LOKSAHITYA | • know the concept of folk-literature. |
| | | • know the tradition of folk literature in khandesh region. |
| | | • know the co-relation between folk literature and other branches. |
| | | • know the new trends study of folk literature in new era. |

**DEPARTMENT OF MATHEMATICS**

| Class | Course | Outcomes |
|---|---|---|
| FYBSc | 1. MTH-111: Theory of Matrices: | • Understanding of operations on matrices |
| | | • Understanding the concept of inverse of a marix |
| | | • Matrices are used in solving linear equations. |
| | | • Linear equations are vital for solving any differential equations |
| | | • Many areas of Numerical analysis depend upon linear equations. |
| | | • Specific fields of applications are computer graphics, Cryptography etc. |
| | | |
| | 2. MTH-112: Calculus of one variable | • It is used in almost all branches of engineering. |
| | | • It is a science that deals with rate of change. |
| | | • Understanding the concept of differentiation. |
| | | • Understanding the concept of Integration. |
| | | • Applications of differentiation include measuring velocity, acceleration, etc. |
| | | • Applications of Integration include estimating areas, volumes, etc. |
| | | |
| | 3. MTH-113(A): Geometry: | • Understanding the concept of distance between two points |
| | | • Understanding the concept of slope |
| | | • Understanding the change of origin and change of scale. |
| | | • Learn various forms of straight lines. |
| | | • Learn about various conic sections. |
| | | • It is used in Mechanics and Astronomy. |
| | | |
| | 4. MTH-113(B): Discrete Mathematics: | • Understand the basics of graph theory. |
| | | • To learn operations on graphs. |
| | | • To learn about connected graphs. |
| | | • To understand various problems related with planar graphs |
| | | • To understand trees and spanning trees. |
| | | • It is used in Genomics, networks, etc. |
| | | |
| | 5. MTH-121: Ordinary Differential Equations: | • To understand the necessity of differential equations |
| | | • To learn about forming differential equations from physical situations |
| | | • To know various types of differential equations |
| | | • To practice methods of solution for various types of differential equations. |
| | | • It is useful for methods of momentum and energy transfer. |
| | | • It is used in all branches of engineering. |
| | | |
| | 6. MTH-122: Theory of Numbers and equations: | • To know about number system |
| | | • To learn division algorithm and its application |
| | | • To know about congruence classes |
| | | • To understand the famous Fermat's theorem . |
| | | • To learn how to solve various types of equations. |
| | | • It is used in Cryptography, Computer Science, etc. |
| | | |
| | 7. MTH-123(A): Laplace Transforms: | • To know Method of changing equations from one form to another easier form |
| | | • It is used to solve both ordinary and partial differential equations. |
| | | • Applications are in all branches of engineering. |
| | | • To learn properties of Laplace transforms. |
| | | • To learn properties of inverse Laplace transforms. |
| | | |

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| | 8. MTH-123(B): Numerical Methods: | • It is used for solving a system of equations |
| | | • It has application in all branches of engineering. |
| | | • To know how to find the roots of transcendental equations. |
| | | • To learn how to interpolate the given set of values |
| | | • To understand the curve fitting for various polynomials |
| | | • T learn numerical solution of differential equations. |
| | | |
| SYBSc | 1. MTH 211:Calculus of Several variables : | • It is used in almost all branches of engineering. |
| | | • It deals with calculus of several variables. |
| | | • To understand the importance of Taylors series. |
| | | • To understand Mean value theorem. |
| | | • To find area by double integration. |
| | | • To find volume by triple integration. |
| | | |
| | 2. MTH-212(A): Abstract Algebra: | • Algebra is science of operations |
| | | • It is widely used in Computer science and T. |
| | | • It is also useful for logic and fuzzy set theory |
| | | • To understand the concept of groups. |
| | | • To learn homomorphism and isomorphism. |
| | | • To under the structure of ring and integral domain. |
| | | |
| | 3. MTH-212(B): Computational Algebra: | • To learn computations using algebra. |
| | | • It is mainly used in Computer science and T. |
| | | • It is also useful for logic and fuzzy set theory |
| | | • To understand the concept of groups. |
| | | • To learn homomorphism and isomorphism. |
| | | • To learn group codes and how to uncode. |
| | | |
| | 4. MTH 221:Complex Analysis : | • It is widely used in Fluid Mechanics and Electrical engineering. |
| | | • To learn properties of complex numbers. |
| | | • To understand the use of complex numbers in the field of Calculus. |
| | | • To learn the importance of analytic functions. |
| | | • To gain knowledge of singularities and residues. |
| | | • To apply the knowledge of residues in complex integration. |
| | | |
| | 5. MTH 222(A) :Topics in Differential Equations : | • It is used in all branches of engineering. |
| | | • It is useful for methods of momentum and energy transfer. |
| | | • To study existence and uniqueness about solutions. |
| | | • To learn about the simultaneous differential equations. |
| | | • To understand the methods of solution for total differential equations. |
| | | • To study properties of Beta and Gamma functions. |
| | | |
| | 6. MTH 222(B) : Differential Equations and Numerical methods : | • It is useful for methods of momentum and energy transfer. |
| | | • To study existence and uniqueness about solutions. |
| | | • To learn about the simultaneous differential equations. |
| | | • To understand the methods of solution for total differential equations |
| | | • It is widely used in Civil engineering , Mechanical engineering, etc. |
| | | • To understand definition and properties of difference equations. |
| | | |
| T.Y.B.Sc.: | 1. MTH – 351 : Metric spaces : | • A metric space is a set for which distances between all members of the set are defined |

| | | |
|---|---|---|
| | | • It is used in fixed point theorem and mapping principles. |
| | | • To study continuous functions on metric spaces. |
| | | • To learn connected metric spaces. |
| | | • To understand complete metric spaces. |
| | | • To study compact metric spaces. |
| | | |
| | 2. MTH – 352 : Integral Calculus: | • It is useful for measuring areas and volumes. |
| | | • It is used in all branches of engineering. |
| | | • To study differentiability and integrability. |
| | | • To learn mean value theorem of integral calculus. |
| | | • To learn how to solve improper integrals. |
| | | • To understand the importance of Legendre polynomials. |
| | | |
| | 3. MTH – 353 :Modern Algebra: | • Algebra is science of operations |
| | | • It is widely used in Computer science and Information Technology |
| | | • It is also useful for logic and fuzzy set theory |
| | | • To learn normal subgroups. |
| | | • To study permutations. |
| | | • To know about quotient and polynomial rings. |
| | | |
| | 4. MTH – 354 : Lattice theory: | • It is primarily useful for understanding sets, logic and probability theory. |
| | | • It is widely used in discrete mathematics, computer science and T. |
| | | • To understand posets and chains. |
| | | • To understand lattices. |
| | | • To understand various types of lattices. |
| | | • To learn about ideals and homomorphism. |
| | | |
| | 5. MTH – 355(B) : Number Theory: | • It is a branch of pure mathematics which studies integers and its properties. |
| | | • It is used in Cryptography, Computer Science, etc. |
| | | • To understand prime numbers and relevant conjectures. |
| | | • To learn theory of congruences. |
| | | • To know about perfect numbers and Fermat's theorem. |
| | | • Understanding Fibanocci numbers. |
| | | |
| | 6. MTH-356(B): Vector Calculus: | • Study of Rate of change of vectors is vector calculus. |
| | | • It is widely used in Physics and Mechanics. |
| | | • To study various operations on vectors. |
| | | • To learn about differentiation and integration of vectors. |
| | | • To understand the concepts of gradient, divergence and curl. |
| | | • To know the importance of Stokes theorem and Gauss divergence theorem. |
| | | |
| | 7. MTH-361: Measure and Integration: | • It is a branch of pure mathematics. |
| | | • It is used in Statistics, Probability and Analysis. |
| | | • To learn measurable sets. |
| | | • To learn measurable functions. |
| | | • To understand Lebesgue integrals. |
| | | • To learn Fatou's lemma. |
| | | |
| | 8. MTH-362: Method of Real Analysis: | • It is a branch of pure mathematics. |
| | | • It is useful and Statistics, Probability, Operations Research, etc. |

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| | | • To study sequences. |
| | | • To study series of real functions. |
| | | • To know the Fourier series. |
| | | • To study half range series. |
| | | |
| | 9. MTH-363: Linear Algebra: | • It is a branch of Algebra. |
| | | • It is used in Computer Science, Electrical engineering, etc. |
| | | • To learn about vector spaces. |
| | | • To understand theorems on basis and dimension. |
| | | • To know about eigen values and eigen vectors. |
| | | • To study linear transformations. |
| | | |
| | 10. MTH-364: Ordinary and Partial differential equations: | • To understand the importance of ordinary and partial differential equations. |
| | | • It is used in solving many problems of engineering and physics. |
| | | • To learn about exact differential equations and various types. |
| | | • To learn about second order linear differential equations. |
| | | • To study series method of solution. |
| | | • To study about linear partial differential equations. |
| | | |
| | 11. MTH-365(A): Optimization Techniques: | • Optimization techniques is a branch of Operations Research. |
| | | • It deals with minimization of cost or maximization of profit. |
| | | • It is used in Production engineering, Mathematics of finance, Networking, etc. |
| | | • To study linear programming problems. |
| | | • To learn about transportation problems. |
| | | • To know the fundamentals of game theory. |
| | | |
| | 12. MTH-366 (A): Applied Numerical Methods: | • It is a branch of numerical analysis |
| | | • It is used for solving a system of equations and used in all branches of engineering. |
| | | • To solve a system of linear equations. |
| | | • To learn numerical differentiation and integration. |
| | | • To learn about interpolation polynomials. |
| | | • To apply numerical methods for differential equations. |
| | | |
| MSc-I | 1. MT -101 Advanced Calculus: | • Mainly deals with differentiation and Integration . |
| | | • Used in all branches of engieeering. |
| | | • To learn measurable sets |
| | | • To learn about integrablefunctins. |
| | | • To know about differentiation of functions. |
| | | • To understand monotone functions. |
| | | |
| | 2. MT -102 General Topology: | • It is used in Functional analysis and Real analysis. |
| | | • It has applications in many fields such as theoretical physics, general relativity, etc. |
| | | • To learn about topological spaces. |
| | | • To learn about connectedness. |
| | | • To understand compact spaces. |
| | | • To understand countability and separation axioms. |
| | | |
| | 3. MT103: Algebra: | • It is science of operations. |
| | | • Used in Discrete mathematics, Computer science, Information Technology., etc. |
| | | • To learn about sub groups. |

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| | | • To learn about factorisation. |
| | | • To understand Noetherian Rings. |
| | | • To understand Hilbert basis theorem. |
| | | |
| | 4. MT -104 Ordinary and Partial Differential Equations: | • Differential equations are used in Mathematical Modelling. |
| | | • Useful for solving many engineering problems. |
| | | • To learn about second order differential equations. |
| | | • To learn about linear partial differential equations of order one. |
| | | • To understand non-linear partial differential equations of order one |
| | | • To under partial differential equations with constant coefficients |
| | | |
| | 5. MT -106 Programming in C++ : | • Programme is a logical sequence to solve a problem. |
| | | • Widely used in Computer science and Information Technology. |
| | | • To learn basics of programming in c++. |
| | | • To learn about conditional statements. |
| | | • To learn about loop structures. |
| | | • To learn about arrays and functions. |
| | | |
| | 6. MT201: General Measure theory: | • It is a branch of pure mathematics. |
| | | • It is used in Statistics, Probability and Analysis. |
| | | • To learn measurable spaces. |
| | | • To learn measurable functions. |
| | | • To understand lp spaces and integration. |
| | | • To learn measure and differentiation |
| | | |
| | 7. MT202: Complex analysis: | • It is widely used in Fluid Mechanics and Electrical engineering. |
| | | • To learn properties of complex numbers. |
| | | • To learn about power series. |
| | | • To learn the importance of Riemann-Stieltjes Integration |
| | | • To gain knowledge of singularities and residues. |
| | | • To apply the knowledge of residues in complex integration. |
| | | |
| | 8. MT203: Linear Algebra: | • It is a branch of algebra. |
| | | • Used in Discrete mathematics, Computer science, Information Technology, etc. |
| | | • To learn about modules. |
| | | • To learn about Canonical forms. |
| | | • To understand rings. |
| | | • To understand primary decomposition of modules. |
| | | |
| | 9. MT204: Mathematical Methods: | • It is widely used in mathematical modelling. |
| | | • It is also used in Fourier Series, Boundary value problems and many engineering fields. |
| | | • To learn about boundary value and initial value problems. |
| | | • To learn about orthogonality and Fourier series. |
| | | • To learn about method of separation of variables. |
| | | • To study Bessel functions. |
| | | |
| | 10. MT205: Number Theory: | • It is a branch of pure mathematics which studies integers and its properties. |
| | | • It is used in Cryptography, Computer Science, etc. |
| | | • To learn about arithmetic functions. |
| | | • To learn about congruences. |

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| | | • To study quadratic residues. |
| | | • To understand primitive roots. |
| | | |
| SYBSc | 11. MT -301: Functional Analysis | • It is a branch of pure mathematics. |
| | | • It is useful in Harmonic analysis, Distribution theory, Numerical analysis, etc. |
| | | • To learn about normed linear spaces. |
| | | • To learn about inner product spaces. |
| | | • To learn about Banach spaces. |
| | | • To learn about Hilbert spaces. |
| | | |
| | 12. MT -302: Fluid Mechanics | • Mechanics applied to fluids is called Fluid mechanics. |
| | | • It iswidely used in Civil engineering, Mechanical engineering, etc. |
| | | • To learn about properties of fluids. |
| | | • To learn about conservation of mass. |
| | | • To learn about equations of motion. |
| | | • To study about 2-dimensional motion. |
| | | • To study luminary flow. |
| | | |
| | 13. MT -303 : Topics in Field theory | • It is used in statistical Mechanics, Electro-Magnetics, etc |
| | | • To study algebraic extension and splitting fields. |
| | | • To study about algebraic closure. |
| | | • To study perfect fields of infinite fields. |
| | | • To learn about Galois extensions. |
| | | • To study Fundamental theorem of Galois Theory. |
| | | |
| | 14. MT -304 : Statistical Techniques: | • It is used in Industries, Quality Control, etc. |
| | | • To learn about central tendencies and dispersion. |
| | | • To learn about mathematical probability. |
| | | • To study theoretical distributions. |
| | | • To study correlation theory. |
| | | • To study Regression theory. |
| | | • To learn about sampling and various statistical tests. |
| | | |
| | 15. MT -306 Lattice theory : | • It is primarily useful for understanding sets, logic and probability. |
| | | • Understand posets. |
| | | • Understand congruence relations. |
| | | • To learn about Boolean lattices. |
| | | • To learn about modular and distributive lattices. |
| | | • To know Stone algebra. |
| | | |
| | 16. MT -401 Advanced Mathematical Methods : | • These methods are useful for solving ordinary and partial differential euations. |
| | | • It is widely used in many engineering fields. |
| | | • To learn about integral equations |
| | | • To learn about Fourier transforms. |
| | | • To study calculus of variations. |
| | | • To study Z-transforms. |
| | | |
| | 17. MT -402 : Operations Research : | • It is used in industrial engineering, Networks, Transportation problems, Game theory, etc. |
| | | • To learn about PERT AND CPM. |
| | | • To learn about Decision theory. |

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| | | • To study Queuing theory. |
| | | • To study Replacement theory. |
| | | • To study inventory management. |
| | | |
| | 18. MT -403 : Commutative Algebra: | • Used in Discrete mathematics, Computer science, Information Technology, etc. |
| | | • To learn about various types of modules. |
| | | • To know about Noetherian and Artinian modules. |
| | | • To understand integral extensions. |
| | | • To study valuation rings. |
| | | • To understand Dedekind domain. |
| | | |
| | 19. MT-404: Advanced Numerical Methods: | • It is a branch of Numerical Analysis. |
| | | • Useful in many branches of engineering. |
| | | • To learn about solving system of equations. |
| | | • To learn about numerical differentiation and integration. |
| | | • To understand numerical solution of initial value problems. |
| | | • To understand numerical solution of boundary value problems. |
| | | |
| | 20. MT-406: Algebraic Topology: | • Used in algebra and useful for solving many engineering problems. |
| | | • To understand geometric complexes. |
| | | • To learn about chains. |
| | | • To learn about simplicial expressions. |
| | | • To understand homotopic paths. |
| | | • To know the relation between homotopic path and fundamental groups. |
| | | |

**DEPARTMENT OF MICROBIOLOGY**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBSc | MB-111: Elementay Microbiology | • Get an idea about the historical events in microbiology |
| | | • Understand the diversity in microbiology |
| | | • Know the scope of Microbiology |
| | | • Understand the taxonomic classification of microorganisms |
| | | |
| | MB-112: Microscopy and Basic Biochemistry | • Know parts of microscope, type and its principal |
| | | • Get the theoretical concepts of related stain |
| | | • Understand different methods of staining techniques |
| | | • Understand nutritional requirements of bacterial. |
| | | |
| | MB-113: Basic Techniques in Microbiology I | • Develop basic skill in aseptic techniques |
| | | • Understand various accessories for microbiology practicals |
| | | • Perform various staining techniques |
| | | • Cultivate bacteria with different cultivation technique |
| | | |
| | MB-121: Cell Biology of Microorganism | • Understand concepts of growth and reproduction of bacteria |
| | | • Know anatomy of prokaryotic cell |
| | | • Know structural detail of eukaryotic cell |
| | | • Understood various parts of cell and its importance |
| | | |
| | MB-122: Methods in Microbiology | • Acquainted with various sterilization techniques |
| | | • Use various method to control microbes. |
| | | • Gather theoretical background of microbial cultivation |
| | | • Understand various specialized techniques such as pasteurization |
| | | |
| | MB: 123 Basic Techniques in Microbiology II | • Perform various biochemical test |
| | | • Stain the bacteria with differential staining techniques |
| | | • Understand the effect of various environmental factors |
| | | • Get familiar with various instrumentation |
| | | |
| SYBSc | MB:231 Fundamental Biochemistry | • Develop fundamental knowledge about various biomolecules |
| | | • Understand the basic concepts related to enzymes |
| | | • Know various biochemical pathway |
| | | • Understand the concept of microbial metabolism |
| | | |
| | MB:232 Microscopy and Microbial Ecology | • Understand Principle, working, ray diagram and application of advance microscopes |
| | | • Know concepts related with of microbial interaction |
| | | • Get an idea regarding microbes and their relation with environment |
| | | • Understand the enumeration technique for microbes |
| | | |
| | MB:233 Practical course in Microbiology –I | • Detect microbial enzymes |
| | | • Detection of biomolecules, |
| | | • Understand symbiotic interaction |
| | | • Check portability of water, microflora of air. |
| | | |
| | MB:241 Genetics and Immunology | • Understand concept of genes and chromosomes |
| | | • Familiar with concept of mutations |
| | | • Know the concepts of spontaneous mutations |

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| | | • Understand basics of immunology |
| | | |
| | MB: 242 Basic Microbial Biotechnology | • Aware of screening of bacteria |
| | | • Understand fermentation process |
| | | • Implement techniques of continuous culture |
| | | • Know various downstream processing |
| | | |
| | MB:244 Practical course in Microbiology I | • Develop skill to stain parts of bacterial cell |
| | | • Detect fermentation product |
| | | • Isolate mutants |
| | | • Screen bacteria for organic acid and antibiotics |
| | | |
| TYBSc | MB351 Microbial genetics | • Concept of central dogma of molecular biology |
| | | • Process of DNA replication transcription, translation |
| | | • Viral genetics |
| | | • Various method used for genetic recombination |
| | | |
| | MB352 Fermentation Technology | • Bbioreactors, |
| | | • Industrial sterilization |
| | | • Strain improvement |
| | | • Scale up and large scale production |
| | | |
| | MB353 Microbial Metabolism | • Concept of bioenergetics |
| | | • Anabolism and catabolism with examples |
| | | • Laws of thermodynamics |
| | | • Bacterial photosynthesis |
| | | |
| | MB 354 Medical Microbiology | • Various concepts of medical microbiology |
| | | • Role of international organizations such as CDC and WHO |
| | | • Anatomy of human system |
| | | • Various chemotherapeutic agent and their mode of action |
| | | |
| | MB355 Immunology | • Concept related to cells and organs related to immune system |
| | | • Immune response and immune mechanism |
| | | • Immunological disorders |
| | | • Concepts related to Immunodeficiency |
| | | |
| | MB356 Applied Microbiology | • Milk microbiology- technique used in milk industry, |
| | | • Food microbiology – technique used in food industries, |
| | | • Microbial food poisoning |
| | | • Concepts related to geo-microbiology and nanotechnology |
| | | |
| | MB361 Molecular Biology | • Concept of gene regulation |
| | | • Principals and applications of various molecular techniques |
| | | • Concept, methods and application of r-DNA technology |
| | | • Gene library and gene mapping |
| | | |
| | MB362 Pharmaceutical Microbiology | • Quality control and assurance, |
| | | • Concepts of GMP and GLP regulations |
| | | • Standard protocols in pharmaceutical industry - IP, BP, USP and EP, |

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| | | • Pharmaceutical audit and testing procedures for fermentation process |
| | | |
| | MB 363 Enzymology | • Vitamin as cofactor, its role metabolism, |
| | | • Regulation of enzyme |
| | | • Various methods used for enzyme purification |
| | | • Enzyme assays |
| | | |
| | MB 364 Clinical Microbiology | • Various viral disease, their causative agent, mode of infection, epidemiology, treatment, lab diagnosis, prophylaxsis |
| | | • Various bacterial disease, their causative agent, mode of infection, epidemiology, treatment, lab diagnosis, prophylaxsis |
| | | • Various fungal disease, their causative agent, mode of infection, epidemiology, treatment, lab diagnosis, prophylaxsis |
| | | • Various protozoal disease, their causative agent, mode of infection, epidemiology, treatment, lab diagnosis, prophylaxsis |
| | | |
| | MB 365 Diagnostic Immunology | • Various antigen antibody reaction, |
| | | • Different immunological techniques |
| | | • Concepts related to transplantation, |
| | | • Concept of tumor immunology, type of tumors, immune mechanisms against tumors |
| | | |
| | MB366 Environmental Microbiology | • Concepts related to Plant pathology |
| | | • Various plant pathogens and disease |
| | | • Soil microbiology and xenobiotics |
| | | • Microbial waste treatment methods. |
| | | |
| | MB357 Techniques in Diagnostic Microbiology –I | • Isolate and identify microorganism form laboratory sample |
| | | • Perform MIC of antibiotics |
| | | • ELISA test for disease diagnosis |
| | | • Immuno-diffusion techniques |
| | | |
| | MB358 Techniques in Industrial Microbiology –I | • Techniques used in industrial production of alcohol |
| | | • Phenol coefficient test |
| | | • Evaluation of sterilization techniques |
| | | • Temperature relation with microorganism- TDT, TDP |
| | | |
| | MB359 Techniques in Applied Microbiology –I | • Various techniques to estimate size of microbes |
| | | • Isolation of bacteriophage and endophytic microorganism |
| | | • Check quality of milk |
| | | • Awareness of material safety Data sheet. |
| | | |
| | MB367 Techniques in Diagnostic Microbiology –II | • Isolate and identify microorganism form laboratory sample, |
| | | • Antibiotics senstitivity and resistance test |
| | | • Detection of parasite |
| | | • Handling of blood and body fluids |
| | | |
| | MB368 Techniques in Industrial Microbiology –II | • Techniques used in industries –Citric acid fermentation, |
| | | • UV-survival curve |
| | | • Enzyme production and determination of its activity |
| | | • Validation techniques of instruments and immobilization process. |
| | | |
| | MB369 Techniques in Applied Microbiology -II | • Various methods used in agriculturally important microbes |
| | | • Tests in waste water treatment |
| | | • Antimicrobial action of plant extract |

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| | | • Test for milk quality |
| | | |
| | M.Sc-I : MB 101 Microbial Diversity | • Microbial taxonomy – concepts and techniques for identification |
| | | • Concept related to extremophilic microbes and archea |
| | | • Characters and significance of algae and fungi |
| | | • Characters and significance of virus |
| | | |
| | MB 102 Microbial Biochemistry | • Structure and properties of Biomolecules |
| | | • Transport and energy metabolism |
| | | • Metabolism of carbohydrates, lipids, amino acid, nucleotide. |
| | | • Metabolic pathways and Bioenergetics |
| | | |
| | MB 103 Bio-Instrumentation | • Principles of biophysical chemistry |
| | | • Methods of separation techniques |
| | | • Radio-labeling techniques |
| | | • Microscopic techniques for electron microscopy |
| | | |
| | MB 104 Methods in Microbiology | • Biosafty procedures in microbiology |
| | | • Cultivation of algae, and fungi |
| | | • Nucleic acid and protein separation techniques |
| | | • Advance instrumentation such as HPLC, GC, AAS |
| | | |
| | MB 105 Methods in Biochemistry | • Basic biochemistry perpetrations |
| | | • Biochemical analysis of sugar, protein, by various methods |
| | | • Quantitative and qualitative estimation of nucleic acid |
| | | • Basic bioinformatics softwares’ |
| | | |
| | MB201 Microbial Genetics | • Genome organization and vocabulary |
| | | • Virus genome replication |
| | | • DNA damage and repair |
| | | • Gene regulations in bacteria, virus and eukaryotes |
| | | |
| | MB202 Microbial Enzymology | • Basic Enzymology |
| | | • Enzyme kinetics and inhibitions |
| | | • Catalytic mechanisms and regulation, |
| | | • Industrial applications of enzymes and extremozymes |
| | | |
| | MB203 Immunology | • Immune system and immune response |
| | | • Detail procedure of hyper immune response |
| | | • Immune response to infections and diseases |
| | | • Histochemical and immune techniques |
| | | |
| | MB 204 Methods in Enzymology | • Qualitative and quantitative enzyme assay |
| | | • Effect of environmental factors on enzyme |
| | | • Enzyme kinetics and immobilization |
| | | • Purification of enzymes |
| | | |
| | MB 205 Methods in Molecular Biology | • Methods used in molecular biology. |
| | | • DNA amplification using PCR technique |
| | | • Isolation of plasmid and fungal DNA |

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| | | • Protein and DNA separation techniques |
| | | |
| | MB301 Applied and Environmental Microbiology | • Method of sampling, investigation and examination of food |
| | | • Different techniques used to treat waste water |
| | | • Biological conversion of lignocellulosic waste, |
| | | • Bioremediation and biodegradation of xenobiotic compound, biomarkers and bioreporters |
| | | |
| | MB302 Molecular Biology and Bioinformatics | • Basic concept of molecular biology |
| | | • Basic concept in Bioinformatics |
| | | • Process of transcription, translation, |
| | | • Protein targeting and degradation. |
| | | |
| | MB303 Pharmaceutical Microbiology | • Antibiotics and synthetic antimicrobial agents |
| | | • Regulations aspects in pharmaceutical industry |
| | | • Production of few biopharmaceuticals |
| | | • Concept of drug design |
| | | |
| | MB 304 Methods in Biostatistics and Bioinformatics | • Different computational methods used in basic biostatistics |
| | | • Software used in the bioinformatics |
| | | • Biological databases for protein and nucleic acid |
| | | • Multivariate analysis in biostatistics |
| | | |
| | MB 305 Methods in Applied Microbiology | • Validation of instruments |
| | | • Microbiological assay of vitamin |
| | | • Environmental monitoring in pharmaceutical industry |
| | | • Analytical tests such as Microbial limit tests, Phenol coefficient, LAL |
| | | |
| | MB401 Fermentation Technology | • Principals in upstream process in fermentation industries. |
| | | • Design and application of bioreactor |
| | | • Downstream processing and recovery |
| | | • Production of few microbial products |
| | | |
| | MB402 Applied Molecular Biology | • Tools of molecular biology for rDNA technology |
| | | • Methods in r DNA technology |
| | | • Concept of microbial genome |
| | | • Protein engineering and proteomics |
| | | |
| | MB403 Agricultural Microbiology | • Approaches used in agriculture to control disease in plant |
| | | • Microbial ecology and microbial interaction |
| | | • Pathogenic interactions with plant |
| | | • Microbial biocontrol agents |
| | | |
| | MB 404 Methods in Biotechnology | • Analysis of biogas digested slurry |
| | | • Isolation and estimation of RNA/DNA from various sources |
| | | • Protocols regarding siderophore, VAM fungi spores, PGPR |
| | | • Protocols regarding DNA fingerprinting, GFP marker |
| | | |
| | MB 405 Laboratory course (Project Dissertation) | • Selection of research topic |
| | | • Collection and compilation of literature |
| | | • Designing of experiment with objectivity |

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|---|---|---|
| | | • Compilation and interpretation of results |
| | | • Presentation of research data in report form |

**DEPARTMENT OF MUSIC**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| F. Y. B. A. | MUSIC-Gn Paper G-I | · express oneself orally in music: singing, composing by experimenting with the voice and participating in playing music together and vocal performances. |
| | | · Being able to express oneself in writing in music: using various forms of notation. Writing is also used to experiment with language rhymes, rhythm and sound, to present musical experiences, ideas and forms of expression, and to reflect upon subject knowledge. |
| | | · read notations, various ragas in music, will be able to interpret and understand various musical expressions, symbols, signs . |
| | | |
| S. Y. B. A. | MUSIC-Gn Paper G-II | · self analysis system to improve the standard of performance through singing practice with all musical instruments (classical / western/ light vocal singing). |
| | | · Music continued to grow and flourish with the encouragement being given to the performing arts. |
| | | · develop mastery in the Indian Classical Music, be able to decide type of Instrumentation for specific needs. |
| | | |
| | MUSIC- Special Paper –I | · develop new vision for Music & work from rout. |
| | | · remember the basic information needed to acquire skills in musical instrumention |
| | | · develop sense of musical melody alongwith body, volume, language, expressions, etc. |
| | | |
| | MUSIC-Special Paper –II | · learn all musical technique |
| | | · implement the values of musical performance technique . |
| | | · know the types of RAGA'S, & TALA'S. |
| T. Y. B. A. | MUSIC-Gn Paper G-III | |
| | | · Develop basic knowledge about south Indian and north Indian music. |
| | | · learn about Taal, notation writing, fusion |
| | | |
| | MUSIC-Special Paper-III | · learn and create a own musical compositions and basics of corus orchestra |
| | | · get insight into different khyal and Taal, Tanas |
| | | · learn techniques for improving 'aaroh' , 'aavaroh', 'swar-vistar' & 'pakad'. |
| | | |
| | Music- Special Paper-IV | · understand the staff notations & types of Swar lekhan |
| | | · learn mathematical 'Lay' & 'Laykari'. |
| | | · get acquainted with the basic concepts of Tabla such as aad, kuaad, beaad, etc. |
| | | · get acquainted with the basic concepts in science and psychology of music |
| | | |
| M. A. I | MV 101 | · understand and recfite ragas like mmalkans, Devgiri Bilawal, Bhairav, etc.. |
| | | · understand concepts of light vocal, naatyasangeet, abhang, etc |
| | | |
| | MV - 102 | · understand and recite ragas like chandrakans, kalingada, tilang, bageshree, etc. |
| | | · understand and recite ragas like dhrupad, dhamar, tarana, etc.. |
| | | · understand and recite talas like trital, zaptal, rupak, etc. |
| | | |
| | MV - 103 | · understand and recite Thumari, Tappa, dhun in ragas like khamaj, pilu, kaafi and bhairavi. |
| | | · understand and compare north Indian and south Indian music. |
| | | · understand and recite creation nof naad and its variations. |
| | | · understand and realise self made errors in musical notations. |
| | | |
| | MV 104 | · understand and realise variation in ragas and their classification. |
| | | · understand and realise timings of recitement of different ragas. |
| | | · understand light vocal and classical ragas and their comparison. |
| | | |
| M. A. II | MV - 201 | · understand and recite ragas like miya malhar, madhuvanti, ahir bhairav, etc. |
| | | · understand different concepts in natya sangeet, bhav geet, abhang, etc. |
| | | |

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|---|---|---|---|
| | MV 202 | · | understand basics of raga bahar patdeep, sohoni, miya ki todi, natabhairav, etc |
| | | · | understand basics of chatrang, tarana, trivat, etc. |
| | | · | understand Taal, chautal, dhamal, deepchandi, etc. |
| | | | |
| | MV 203 | · | understand and recite bade and chote khyal |
| | | · | study dedicated efforts of poetess Bahinabai Chaudhari. |
| | | · | understand and realise the basic concepts of Paluskar's swar and taal lekhan and their comparison with others. |
| | | | |
| | MV 204 | · | understand and realise importance of acoustics in music and science behind the same |
| | | · | understand basics of bhavas such as avirbhav, tirobhav, gayaki and nayaki, etc |
| | | · | understand basics of haveli sangeet. |

**DEPARTMENT OF PHILOSOPHY**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBA | General Philosophy &Ethics | • Introduce the students to major ethical concepts and theories to help them develop moral sensitivity. The objectives of the paper are to enable the students: |
| | | • Acquire fundamental concepts, terms, definitions, principles interest in the study of ethics. |
| | | • Develop interest in the study of ethics. |
| | | • Acquaint with the various forms of ethics. |
| | | • Develop an ability to assess the relevance of information to the particular moral problem. |
| | | • Understand various moral problems like violence, punishment, evil and Indian approaches wherever required |
| | | |
| | S.Y.B.A. General Philosophy | • Offer students a close acquaintance with the major issues and important concepts of Indian Philosophy. |
| | | • Introduce the nature of Indian Philosophy and the major heterodox and orthodox systems. |
| | | |
| | T.Y.B.A. General Philosophy | • Acquaint students with thinkers of Indian Philosophy. |
| | | • Introduce some original writings contributed by 20th century Indian philosophers. |
| | | • Acquaint the students with some main thinkers of Post-classical Indian Philosophy |
| | | • Introduce some original writings contributed by some 20th century philosophers. |
| | | |
| M.A. 1st | 1) Issues in Western Philosophy (Epistemological& Metaphysical | • Introduce basic epistemological issues and problems of philosophy as discussed in the western tradition and to help develop an attitude of critical thinking and understanding of it. |
| | | |
| | 2) Issues in Indian Philosophy (Issues in Epistemology& Metaphys | • Offer students a close acquaintance with the major issues and important concepts of Indian Philosophy. |
| | | • It is divided into two sections. Issue involved in the concept of knowledge. Form the first section, which deals with epistemology and the other is Metaphysics. |
| | | |
| | 3) Traditional and modern Logic | • Logic is the study of the methods and principles used to distinguish good (valid) from bad (Invalid) reasoning. |
| | | • Acquaint students with various techniques to identify validity and invalidity of arguments and the basic rules as how to avoid fallacies in deductive and inductive arguments. |
| | | • It is divided into two sections: Section – I deals with traditional logic and section – II deals with modern logic |
| | | |
| | 4) The study of Classical Texts (IndianPhilosophy) (Nyaya and Va | • Study two classical texts, one in NyayaVaisesika and the other in the Yoga system. Study the philosophical issues. |
| | | |
| M.A. 2nd | 5) Western Ethics and Indian Ethics: | • The course is meant to introduce the students to some ethical theories to help them develop moral sensitivity, to understand the different moral conflicts and their resolution through such theories. |
| | | |
| | 6) Modern Logic and Analytic Philosophy Phenomenology | • Logic is the study of the methods and principles used to distinguish good (Valid) from bad (invalid) reasoning. The course aims to acquaint student with various techniques to identify validity and invalidity of argument and the basic rules as how to avoid fallacies in deductive and inductive arguments. |
| | | • The First section aims to acquaint the students with the origin, development, nature, method, technique and the evaluation of the analytic moment in western philosophy. The aim of the Second section is to enable students to view phenomenology as a method of philosophy, and a philosophical approach. |
| | | |
| | 7) Advaita Vedanta: Concepts and Doctrines and Textual study | • Introduce the important concepts of Shankara's Vedanta. The important sutras have also been included for the students' first hand acquaintance. Stotra makes him aware of the literary and social dimension of Shankara’s thought. |
| | | |
| | 8) Aesthetics & Religion | • In first section, acquaint studentswith the range of concepts fundamental to aesthetics from both the tradition, Indianand Western. |
| | | • In the Second Section, acquaint the students with the fundamental concepts as well as issues involved in the philosophy of religion. |
| | | |

**DEPARTMENT OF PHYSICS**

| Class | Course | Outcomes |
|---|---|---|
| FYBSc | PHY-111: Mechanics and Properties of matter | • Learner will understand basic theorems and concepts of basic physics. |
| | | • To understand the dynamics of different types of pendulum and to determine ‘g’. |
| | | • To understand the elastic properties of matter and expression of bending beam with its application as a cantilever. |
| | | • To understand concept of surface tension and its relation with excess pressure and radius of curvature. |
| | | • To determine the surface tension by Jaeger’s method from experiments. |
| | | • To understand concept of fluid flow and pressure energy in fluids. |
| | | • To determine Bernoulli’s Theorem and its applications: venturimeter, pitot tube. |
| | | • To design experiment to determine coefficient of viscosity by using Poiseuillie’s equation. |
| | | • To understand basic theories related with properties of matter and its application to determine values of various physical quantities associated with matter. |
| | | • To develop basic skills to perform experiments to understand the concept from existing theories of Basic physics. |
| | | |
| | PHY-112: Electricity and Magnetism | • To understand basic concept of current and current density vector. |
| | | • To understand Kirchhoff’s law by loop analysis. |
| | | • To understand and illustrate Network theorem including Thevenin’s theorem, Norton’s theorem and Maximum power theorem. |
| | | • To determine Time constant of L-R and C-R circuit and its physical significances. |
| | | • To understand the concept of magnetism and and magnetic properties of materials such as Ferromagnetic, Anti ferromagnetic and Ferrimagnetic. |
| | | • To understand the concept of electromagnetic induction, self induction of solenoid, mutual induction of coaxial solenoid |
| | | • To illustrate the working of Inductors in series and parallel |
| | | • To understand the applications of transformers, losses in transformer, and to distinguish between transformers including closed core transformer, Transformer with tapped secondary, Autotransformer, isolation transformer. |
| | | |
| | PHY-121 : Heat and Thermodynamics | • To understand and discuss the results of Andrew’s experiment and Amagat’s experiments. |
| | | • To determine van der Wall’s equation, Critical constants and concept of Bolye’s temperature. |
| | | • Understand basic concept of thermodynamics and to distinguish between work done due to Adiabatic and isothermal changes. |
| | | • To state laws of thermodynamics and concept of internal energy. |
| | | • To understand Carnot’s ideal heats engine, Carnot cycle and its efficiency, Carnot’s theorem, Otto and Diesel engines with their efficiencies. |
| | | • To state First and Second latent heat equations. |
| | | • To understand Concept of entropy, Change of entropy in Reversible process and Irreversible process, T-S diagram. |
| | | • Knowledge of basic principles of refrigeration methods: Evaporative refrigeration, refrigeration by throttling of gas, vapour refrigeration. |
| | | • To learn basic components of simple vapour compression refrigeration understand its working with Flow diagram. |
| | | |
| | PHY-122: THEORETICAL PHYSICS | • To understand Complex number (Addition, Subtraction, Multiplication, Division, Complex conjugate) and Exponential form of complex number. |
| | | • To solve problems using Euler’s formula, |
| | | • To state de-Moivere’s theorem and to Trigonometrical functions Application of exponential form for power and roots of complex numbers. |
| | | • Be able to solve relevant theoretical problems. |
| | | • To solve partial differentiation. |
| | | • To understand Vector Algebra including Scalar and Vector product Scalar triple product and its geometrical interpretation, Vector triple product |
| | | • To apply vector algebra to interpret physical quantities such as angular displacement, angular velocity and angular acceleration. |
| | | • Application of vector analysis such as vector operator, Gradient, Divergence, Curl of a vector to solve the problems of Physics. |
| | | |
| | PHY 103: Practical Physics | • M. of a disc by torsional pendulum. |
| | | • by torsional oscillation. |
| | | • Determination of acceleration due to gravity by Kater’s reversible pendulum. |
| | | • Determination of Y by using flat spiral spring. |
| | | • Determination of by using flat spiral spring. |
| | | • To determine Y of rectangular beam by method of bending. |
| | | • To determine Y by vibrational cantilever. |
| | | • Poisson’s ratio of rubber by using cord/rubber tube. |

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| | | • Determination of coefficient of viscosity of water by Poiseuille's method. |
| | | • Verification of Bernoulli's theorem. |
| | | • To determine the surface tension by Jaeger's method. |
| | | • Thermal conductivity by Lee's method. |
| | | • Thermocouple as thermometer. |
| | | • SECTION-II |
| | | • Verification of Kirchhoff's laws. |
| | | • Verification of Thevenin's theorem. |
| | | • Verification of Norton's theorem. |
| | | • Maximum power transfer theorem. |
| | | • Verification of Joule's law. |
| | | • Determination of time constant of L-R circuit. |
| | | • Determination of time constant of R-C circuit using charging and discharging of condenser through resistor. |
| | | • To determine efficiency and turns ratio of transformer. |
| | | • Study of spectrometer and determination of angle of prism. |
| | | • Use of analog/digital multimeter. |
| | | • Electric billing with energy meter. |
| | | • Study of I-V characteristics of solar cell. |
| | | • Frequency of a. c. using vibrating wire and magnet. |
| | | |
| SYBSc | PHY-231: Waves and Oscillations | • To demonstrate Lissajous figures by mechanical, optical and electrical methods. |
| | | • To understand composition of two S.H.M.s of equal frequencies along same line of vibration, at right angles (analytical method with different cases). |
| | | • To understand Free and damped oscillations. |
| | | • To solve differential equation of damped harmonic oscillator and Energy equation. |
| | | • To demonstrate Resonance and its types- Mechanical resonance (Barton's pendulum), Acoustic resonance (resonance tube), Electrical resonance (LCR circuit) and Optical resonance (sodium vapour lamp). |
| | | • To solve differential equation of forced oscillations and its solution, and to obtain amplitude, Energy of forced oscillations, Amplitude and Sharpness and Velocity of resonance, Power dissipation, Band width and quality factor. |
| | | • To understand concept of sound and to classify sound frequencies. |
| | | • To understand piezoelectric effect, Magnetostriction effect. |
| | | • To learn Generation, Detection and Applications of ultrasonic waves by Piezoelectric and Magnetostriction oscillator. |
| | | • To understand Doppler effect in sound and light and its application. |
| | | |
| | PHY- 232 (A): Electronics- I | • To distinguish between P-N diode, Zener diode, LED and Photodiode. |
| | | • To understand Half wave, full wave and bridge rectifiers and filters: capacitance filter, inductor filter and |
| | | • filter. |
| | | $\pi$To demonstrate voltage regulation using Zener diode. |
| | | • To understand basic construction and operation of bipolar transistors (NPN and PNP), |
| | | • To distinguish between transistor circuit configurations (CB, CE, CC), current gains ( |
| | | • , and |
| | | $\alpha$) and their interrelationship. |
| | | $\beta$To solve problems of electronics using decimal and hexadecimal number system. |
| | | • To learn logic gates and to design R-S, clocked R-S, D , JK and T flip flops using logic gates. |
| | | • To state De Morgan's theorems and understand symbols, Boolean expression and truth tables for gates. |
| | | |
| | PHY- 232 (B) - Instrumentation -I | • To understand standards of measurements and calibration. |
| | | • To learn measurement of temperature using: Non - electrical, Electrical and Radiation Methods. |
| | | • To learn measurement of pressure using McLaud Guage (b) Pirani Gauge. |
| | | • To learn Measurement of flow using: Venturi tube, Pitot tube and Rotameter . |
| | | • To understand characteristics of sound and to know typical sound measuring system. |

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| | | • To learn Measurement of magnetic field by using search coil method and Hall gauge meter. |
| | | |
| | PHY – 241: Modern Physics | • To solve problems associated with energy crisis by means of photo thermal conversion and photovoltaic conversion. |
| | | • To demonstrate construction and working of flat-plate collector, liquid flat plate collector, Basic photovoltaic system and solar modules for power generation. |
| | | • To understand Laser, its types, applications - Ruby LASER, He-Ne LASER. |
| | | • To verify experimentally of discrete atomic energy levels and correspondence principle |
| | | • To understand atomic spectra and distinguish classical planetary model and Bohr's theory of hydrogen atom and quantum mechanical Bohr's Sommerfield model. |
| | | • To understand matter wave, concept of wave group, and relations between phase velocity, group velocity, particle velocity. |
| | | • To demonstrate Davission and Germer experiment. |
| | | • To understand Uncertainty principle and its application in Non existence of electron in nucleus, determination of ground state of electron and size of hydrogen atom). |
| | | |
| | PHY-242: Optics | • To learn Power of lens, Spherical aberration in lens, and to distinguish Chromatic aberration and Achromatism aberration. |
| | | • To understand concept of interference pattern due to reflected light in parallel sided thin films and in thin wedge shaped film. |
| | | • To demonstrate experimental set up for Newton's rings, theory and its application to determine wavelength of source and refractive index of liquids. |
| | | • To demonstrate Michelson Interferometer (experimental setup and its application for measurement of wavelength of monochromatic source). |
| | | • To distinguish between Fresnel and Fraunhoffer diffraction. |
| | | • To understand theory of plane transmission grating and its resolving power. |
| | | • To state Brewster's law and Maluss law for polarization by double refraction in crystals. |
| | | • To understand Construction of Polaroid, Quarter and Half wave plates, Nicol prism. |
| | | • To learn production and detection of circularly and elliptically polarized light |
| | | • To demonstrate principle and working of Polarimeter or Sacherimeter. |
| | | |
| | PHY 233: PRACTICAL COURSE-I | • Determination of the decrement factor by using Logarithmic decrement (in air / water). |
| | | • Study of acoustic resonance by using bottle as a resonator. |
| | | • Determination of velocity of sound by using Kundt's tube. |
| | | • Study of electrical resonance by using series L-C-R circuit. |
| | | • Study of acoustic resonance by using resonance tube. |
| | | • Study of resonance using Kater's pendulum. |
| | | • Comparison of capacities by De Saughty's method. |
| | | • R, , Q using damped harmonic motion. |
| | | • Demonstration of Lissajous figures by using C.R.O. |
| | | • (ELECTRONICS) |
| | | • Study of full wave rectifier with capacitor filter and to calculate its ripple factor. |
| | | • Study of zener diode as a voltage regulator. |
| | | • Study of CE transistor characteristics to find out ' ' of the transistor. |
| | | • Study of logic gates (AND, OR and NOT) using diodes and transistors. |
| | | • Verification of De Morgan's Theorems (using ICs). |
| | | • To study the characteristics of Light Emitting Diode (LED). |
| | | • Experimental verification of NAND gate as a universal building block. |
| | | • Experimental verification of NOR gate as a universal building block. |
| | | • To study I – V characteristic of ( a resistor and ( a p–n junction diode and compare it. |
| | | • Frequency response of CE single stage transistor amplifier and to calculate its bandwidth. |
| | | • OR |
| | | • SECTION-II |
| | | • (INSTRUMENTATION- |
| | | • Use of C.R.O as a measurement tool for different electrical parameters (frequency, a.c. /d.c.voltage, pulse height, pulse width, rise time and fall time). |
| | | • To obtain Lissajous figures using C.R.O. |
| | | • To determine characteristics of Thermistor and to find an unknown temperature by using thermistor. |
| | | • Measurement of magnetic field by search coil. |

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| | | • Measurement of magnetic field by hall probe method. |
| | | • Directional characteristics of a microphone. |
| | | • Platinum resistance thermometer. (Determine the melting temperature of Wax) |
| | | • Velocity of sound by phase shift method. |
| | | • Measurement of Noise by Using Sound Pressure level Meter. |
| | | |
| TYBSc | 351: Mathematical Physics | • Have knowledge about, and being able to use, advanced mathematical methods and theories on various mathematical and physical problems. |
| | | • Use mathematical formulations, analyses and models to obtain insight in specialized areas of Physics. |
| | | • Be able to apply skills of mathematical, statistical and physical modeling in applied fields and on technological problems. |
| | | • Be able to carry out, present and document a comprehensive independent work, demonstrating command of the terminology of the subject area. |
| | | • Identify different special mathematical functions. |
| | | • Apply techniques of vector analysis, such as gradient of scalar, divergence of vector, curl of vector, |
| | | • To the study of special functions of mathematical physics |
| | | • To understand Cartesian (X, Y, Z), Spherical polar (r, , ) and Cylindrical ( , ,z) co-ordinate systems and their transformation equations. |
| | | • To understand expression for gradient, divergence, curl and Laplacian in curvilinear, spherical polar and cylindrical co-ordinate systems. |
| | | • Solve partial differential equations with appropriate initial or boundary conditions with Green function techniques |
| | | • Have confidence in solving mathematical problems arising in physics by a variety of mathematical techniques |
| | | • To understand special relativity theory and to solve Lorent'z transformation equations, Length contraction, time dilation, |
| | | |
| | PHY 352: Classical Mechanics | • Apply the basic laws of physics in the areas of classical mechanics, Newtonian gravitation, Types of forces: Forces of Gravitation, Lorentz force, Hooks Force, Frictional Force, and Fundamental Forces of Nature. |
| | | • Recognize how observation, experiment and theory work together to continue to expand the frontiers of knowledge of the physical universe. |
| | | • Apply basic mathematical tools commonly used in physics, including elementary probability theory, differential and integral calculus, vector calculus, ordinary differential equations, partial differential equations, and linear algebra. |
| | | • To solve Lagrange's equation, Properties and simple application of Lagrange's equation (simple pendulum, harmonic oscillator, compound pendulum, atwoods machine), |
| | | • To solve Hamiltonian, Hamilton's canonical equation of motion, and to understand Physical significance Advantages and Applications of Hamilton's equations of motion (simple pendulum, compound pendulum, Linear harmonic oscillator). |
| | | • To understand Central force, Reduction of two body problem into equivalent one body problem, Motion in inverse square law force field and to state Kepler's laws. |
| | | • To apply Rotating coordinates system and to Derive the Corioli's force from Lagrangian formulation . |
| | | |
| | PHY 353: Atomic and Molecular Physics | • State and explain the key properties of vector atom model and the importance of the Pauli Exclusion Principle. |
| | | • To explain the observed dependence of atomic spectral lines on externally applied electric and magnetic fields. |
| | | • To state and justify the selection rules for various optical spectroscopies in terms of the symmetries of molecular vibrations. |
| | | • List different types of atomic and molecular spectra and related instrumentation. |
| | | • Describe theories explaining the structure of atoms and the origin of the observed spectra |
| | | • Identify atomic effect such as space quantization and Zeeman Effect. |
| | | • To understand the Origin and nature of x-ray, Characteristic x-ray spectra, |
| | | • To state Moseley's law and its importance, regular and irregular doublets and their laws. |
| | | |
| | PHY 355: Solid State Physics | • Be able to account for interatomic forces and bonds |
| | | • Have a basic knowledge of crystal systems and spatial symmetries |
| | | • Be able to account for how crystalline materials are studied using diffraction, including concepts like the Ewald sphere, form factor, structure factor, and scattering amplitude. |
| | | • Be able to perform structure determination of simple structures |
| | | • Understand the concept of reciprocal space and be able to use it as a toolknow the significance of Brillouin zones |
| | | • Know what phonons are, and be able to perform estimates of their dispersive and thermal properties |
| | | • Be able to calculate thermal and electrical properties in the free-electron model and know Bloch's theorem and energy band and distinction between metals, semiconductors and insulators |

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| | | • Be able to estimate the charge carrier mobility and density. |
| | | • Be able to account for what the Fermi surface is and how it can be measured. |
| | | • To understand Lattice heat capacity and to compare Classical theory, Einstein's theory, Debye's theory of specific heat of solids. |
| | | • To apply techniques of X-Ray Diffraction and UV Spectroscopy to study crystals. |
| | | |
| | PHY 361: Classical Electrodynamics | • To state Gauss law and its application to obtain electric field for different cases. |
| | | • Describe and explain the relationship between the electric field and the electrostatic potential. |
| | | • Understand the relation between Electric displacement vector D, Susceptibility, Permittivity, Dielectric constant. |
| | | • To understand Lorentz force on a point charge moving in a magnetic field. |
| | | • To state Biot and Savert's law and Ampere's circuital law to Describe and explain the generation of magnetic fields by electrical currents; |
| | | • Be able to solve relevant theoretical problem and use their conceptual understanding of the electromagnetic laws in order to qualitatively describe the behavior of the solution to the problem |
| | | • Understand origin of Maxwell's equations in magnetic and dielectric media |
| | | • Write down Maxwell's equations in linear, isotropic, homogeneous media |
| | | • To derive continuity conditions on electromagnetic fields at boundaries |
| | | • To derive electromagnetic wave solutions and propagation in dielectric and other media and understand transport of energy and Poynting vector. |
| | | • To Show laws of geometric optics originate with Maxwell's equations at dielectric boundaries calculate reflection and transmission coefficients for waves at dielectric boundaries. |
| | | |
| | PHY-362: Quantum Mechanics | • To develop a knowledge and understanding of the concept that quantum states live in a vector space. |
| | | • To solve quantum mechanics problems. |
| | | • Formulation of Schrödinger equation-time dependent and time independent forms. |
| | | • To derive energy Eigen value and eigen functions particle in a box and 1-D harmonic oscillator. |
| | | • To formulate the Schrödinger wave equation in terms of spherical polar co-ordinates for its application to solve Hydrogen atom problem. |
| | | • To understand Postulate of quantum mechanics, operators and use of commutation and commutative algebra of operators to solve quantum mechanics problem. |
| | | |
| | PHY 363: Nuclear Physics | • To understand nuclear compositions and Elementary particles, charge symmetry and independence, spin dependence of nuclear force. |
| | | • To state Law of radioactive decay and its application. |
| | | • To distinguish between Types of nuclear models: Single particle shell model and Liquid drop model. |
| | | • To understand nuclear reactions and conservation laws. |
| | | • To understand nuclear fission on the basis of liquid drop model and nuclear fusion. |
| | | • To understand basic principles and classification of Nuclear Reactor. |
| | | • To learn types of detectors and classification of accelerators. |
| | | |
| | PHY 364: Statistical Mechanics & Thermodynamics | • To understand basic concepts of probability and probability distribution. |
| | | • To solve Random walk problem in one dimension and Gaussian probability distribution. |
| | | • To understand specification of the state of the system (Classical & Quantum). |
| | | • To state Basic postulate of equal a priori probability, |
| | | • To understand Statistical Ensembles and Calculation of microstates of an ideal monatomic gas. |
| | | • To understand Distribution of energy between systems in equilibrium. |
| | | • To state Boltzmann relation for entropy and to perform Statistical calculations of thermodynamic quantities. |
| | | • To state Equipartition theorem and its application to mean K.E. of a molecule in a gas and to Harmonic oscillator. |
| | | • To derive Maxwell's equations from thermodynamic potentials |
| | | • To state TdS and energy equation. |
| | | |
| | PHY 365: Elements of Material Science | • Get knowledge of Historical perspectives of materials science. |
| | | • To classify between advanced materials, Smart materials, Nano structured Materials. |
| | | • To understand chemistry of organic material and its classification. |
| | | • To understand and learn the Mechanical Properties, Thermal Properties, Electrical Properties, and Magnetic Properties of materials. |
| | | • To understand the basic concept of Dislocations and Plastic Deformation. |

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| | | • To understand Atomic Diffusions and its Mechanism. |
| | | • To state Fick's Law ( Ist and IInd Law). |
| | | • To understand basics of phase diagram, its classifications, and its interpretation. |
| | | • To study Binary Phase Diagram for: Sugar-Water, NaCl-water, and Alloys forming Eutectic: Pb –Sn diagram. |
| | | |

**DEPARTMENT OF POLITICS**

| Class | Course | Outcomes |
|---|---|---|
| MA-I | POL 111: Indian Foreign Policy | • Information about the Indian Foreign Policy. |
| | | • Information about objectives of Indian Foreign Policy. |
| | | • Decision making process in Indian Foreign Policy. |
| | | • Internal and external determinants of Indian Foreign Policy. |
| | | |
| | POL 121: Indian Foreign Policy | • Information about relations between india and U.S.A. |
| | | • Information about relations between india and china. |
| | | • Information about relations between india and Pakistan , india and U.N.O , Kashmir issue , disarmament , treaties about disarmament. |
| | | |
| | POL 112: MODERN POLITICAL ISSUES . | • to know the cold war . |
| | | • To increase vision regarding modern political issues . |
| | | • To know the concept and process of globalisation . |
| | | |
| | POL 122: MODERN POLITICAL ISSUES | • to develop of critical approach about modern political issues . |
| | | • To know the global issues . |
| | | • To know the importance of global issues . |
| | | |
| | POL 113: POLITICAL PROCESS IN INDIAN FEDRATION | • To know the theoretical framework for the study of state political process . |
| | | • To know thesocio-political determinants of the state political process. |
| | | • Indroduction of centre state relations . |
| | | |
| | POL 123: POLITICAL PROCESS IN INDIAN STATES | • To know the interstate issues . |
| | | • To study emerging trends in state politics . |
| | | • Study of panchayatraj system , HDI etc. |
| | | |
| | POL 114/A: PUBLIC ADMINISTRATION | • To introduce administration . |
| | | • To know the importance public administration. |
| | | • To know the characteristics public administration. |
| | | |
| | POL 124/A: INDIAN ADMINISTRATION | • Introduction of Indian administration . |
| | | • To know the history of the Indian administration. |
| | | • To study of Indian administration. |
| | | |
| MA-II | POL 231 : SOCIO-POLITICAL RESEARCH METHODS | • To study the socio-political research methods . |
| | | • to know the nature of research and literature review . |
| | | • To know the research methods . |
| | | |
| | POL 241 : SOCIO-POLITICAL RESEARCH METHODS | • To study the observation . |
| | | • to know the interview . |
| | | • To know thedata analysis and interpretation . |
| | | |
| | POL 232: COMPARATIVE POLITICAL PROCESS | • To know the comparative political political process . |
| | | • To know the various methods comparative political political process . |
| | | • To understand the comparative political political process. |
| | | |
| | POL 242: COMPARATIVE POLITICAL PROCESS | • To know the importance comparative political political process . |
| | | • To know the various methods to the the study of comparative political political process. |
| | | • To understand the process and method comparative political political process . |

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| | POL 233: INTERNATIONAL RELATIONS . | • To study the international relations . |
| | | • To know the new trend in international relations. |
| | | • To introduce the international relations . |
| | | |
| | POL 243: INTERNATIONAL RELATIONS . | • To study the arms control and disarmaments . |
| | | • To know the crisis and co-operations . |
| | | • To introduce the dependency theory . |
| | | |
| | POL 234/B : UN AND REGIONAL ORGANIZATIONS | • To know the UN. |
| | | • To know the general assembly and security council . |
| | | • To know the international conflicts . |
| | | |
| | POL 244/B : UN AND REGIONAL ORGANIZATIONS | • To know the NATO , SEATO , EU . |
| | | • To know the regional organizations . |
| | | • To know the OPEAC , Arab league etc. . |
| | | • To know the SAARC , ASEAN . |
| | | |

**DEPARTMENT OF PRINTING TECHNOLOGY**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBVoc Printin | PT-111 Printing Technology I | • Understand the concept of Printing and different types of printing. |
| | | • Understand the knowledge of Desk Top Publishing(DTP). |
| | | • Develop the designs for different Jobs using Photoshop software. |
| | | • Develop the designs for different Jobs using CorelDraw . |
| | | • Develop the creative design. |
| | | • Understand the knowledge of supervisory skill and Marketing. |
| | | |
| | PT – 112 Practical at Workshop | • Understand Offset Machine components. |
| | | • Understand types digital printing machines. |
| | | • Know the equipments, tools required for offset printing machine. |
| | | • Know the various sections of Offset Machine. |
| | | • Prepare designs for banner printing . |
| | | • Prepare designs for visiting Cards, Greeting Cards for printing purpose. |
| | | |
| | PT – 113 Practical at Lab | • Work with MS Word. |
| | | • Create presentation using PPT. |
| | | • Design single colour & Multi colour Logo. |
| | | • Create 3D logo . |
| | | • Study of installation of software. |
| | | • Develop Background designs for different advertisements. |
| | | |
| | PT – 121 Printing Technology II | • Understand the concept of Design Elements. |
| | | • Understand the concept of Design Principles. |
| | | • Know the colour theory. |
| | | • Understand the concept of CTP. |
| | | • Know concept of screen Printing. |
| | | • Understand different kinds of Printing processes. |
| | | • Report writing ,resume writing and different correspondence letters . |
| | | |
| | PT – 122 Practical at Workshop | • Making adjustment of feeders in sheet fed machine. |
| | | • Preparation and Fitting of blankets for Offset machine. |
| | | • Understand about care and treatment of blanket used for offset printing. |
| | | • Mounting plates on cylinder. |
| | | • Print banner on Flex printing machine. |
| | | • Develop photo album. |
| | | |
| | PT – 123 Project | • Folding brochure. |
| | | • Phamplets. |
| | | • Office documents. |
| | | • Corporate level Logos. |
| | | • Visiting Cards. |
| | | • Table Calender. |
| | | • Newspaper Advertisments. |
| | | • Photo Album |
| | | |
| SYBVoc Printin | PT – 231 Printing Technology III | • Understand the concept of pre press process for offset printing . |
| | | • Know the offset press and rollers. |
| | | • Understand the concept of film making(Plates making.) |

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| | | • Colour theory and its separation for printing purpose. |
| | | • Understand the concept of multimedia. |
| | | |
| | PT – 232 Practical at Workshop | • Printing of digital image using digital printing. |
| | | • Preparation of Plate Making. |
| | | • Printing of Flex banner. |
| | | • Preparation of pamphlets design and printing. |
| | | • Preparation of broacher design and printing. |
| | | • Maintained and Precaution of Plate Making. |
| | | |
| | PT - 233: Practical at Lab. | • Prepare 2D Logos using Flash. |
| | | • Prepare animated Advertisement for e-media. |
| | | • Develop presentation using multimedia. |
| | | • Prepare web banner for e-media. |
| | | • Develop photo album using Flash software. |
| | | • Installation of multimedia software. |
| | | |
| | PT – 241 Printing Technology IV | • Understand the offset printing operation. |
| | | • Understand the binding process. |
| | | • Understand binding types & techniques . |
| | | • Maintained quality of printing. |
| | | • Aware about materials requires for printing. |
| | | • Understand uses of different tools for printing purpose. |
| | | |
| | PT – 242 Practical | • Book Binding. |
| | | • Register Binding. |
| | | • Preparing of dummy book before printing. |
| | | • Preparation of Web banner. |
| | | • Recognise different types and thickness(GSM) of paper . |
| | | • Preparation of 3D logo for e-advertisement. |
| | | |
| | PT - 243 Project | • Folding Boucher. |
| | | • Photo Album |
| | | • 3d Product |
| | | • Animated Web Banner |
| | | • Different text effects for offset printing. |
| | | • Two colour Boucher |
| | | • Seasonal Greeting Cards. |
| | | • Table Calendar. |
| | | • Flex Banner and Print. |
| | | • Book Cover design. |
| | | |
| TYBVoc Printin | PT – 351 Web offset Technology | • Understand construction of web offset machine. |
| | | • Make Comparison of sheet fed offset machine and web offset machine. |
| | | • Understand the operations of different sections of web offset machine. |
| | | • Understand the trouble occurs in web offset printing. |
| | | • Understand setting of electronic panel. |
| | | • Understand components of folding section of web offset machine. |
| | | |
| | PT – 352 Digital Printings | • Know the concept of digital printing. |

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| | | • Know the computer graphics and software. |
| | | • Handle the scanner machine and create Scanned documents. |
| | | • Understand the proofing techniques. |
| | | • Understand the different types of digital printing. |
| | | • Understand the variable data printing for e.g Icards |
| | | |
| | PT – 353 Paper Science | • Understand the paper manufacturing process. |
| | | • Understand inventory of the paper. |
| | | • Understand the finishing processes of paper. |
| | | • Understand the paper properties for printability. |
| | | • Understand the paper properties for runnability and end use. |
| | | |
| | PT – 354 Ink Science | • Understand the types of ink for different printing process. |
| | | • Understand the Importance of ingredients of ink used for printing process. |
| | | • Understand the terminology of printing Ink. |
| | | • Understand the pigment properties of printing Ink |
| | | • Understand water in Ink and Ink in Water emulsion which affects on print quality. |
| | | |
| | PT – 355 Assembly and Maintenance | • Recognize the mechanical components . |
| | | • Understand the functions mechanical components . |
| | | • Understand the assembly of sheet fed printing machine. |
| | | • Recognize the different types of tools used for maintenance of printing machine. |
| | | • Understand the mechanism of cutting and stitching machine. |
| | | • Understand the mechanism of folding machine. |
| | | |
| | PT – 356 Advanced Graphics and Multimedia | • Understand the importance of multimedia. |
| | | • Work with Illustrator software for print media. |
| | | • Develop different logos using Illustrator software . |
| | | • Prepared visiting card, Greeting Cards using Illustrator software |
| | | • Prepare banner design with 3D logos using Illustrator. |
| | | • Develop presentation of different images Using Flash Software. |
| | | |
| | PT – 357 Practical at Workshop | • Find out trouble while web printing. |
| | | • Handle the electronic panel. |
| | | • Understand the operation folding machine. |
| | | • Handling of different paper for different job. |
| | | • Understand the digital workflow. |
| | | • Scan the multiple documents with the help of scanner. |
| | | |
| | PT – 358 Practical at Lab | • Prepare animated advertisement for e-media. |
| | | • Develop web templates. |
| | | • Prepare corporate advertisements. |
| | | • Develop different printing jobs. |
| | | • Design and Develop magazine cover, magazine Advertise, news paper advertise etc. |
| | | |
| | PT – 359 Project | • Industry Project. |
| | | • Computer Project. |
| | | • Printing Management Project. |
| | | • Graphic Design Project |
| | | • Presentation for seminar |

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| | PT – 361 Packaging Technology | • Understand the concept of packaging |
| | | • Understand the concept of packaging functions. |
| | | • Understand the concept of packaging hazards. |
| | | • Know the classification of packaging . |
| | | • Know the Packaging Laws and Regulations. |
| | | |
| | PT – 362 Flexograpgy | • Understand the concept Flexography. |
| | | • Know the comparison between flexography and other major printing processes. |
| | | • Understand types of flexographic press. |
| | | • Know the inks and substrates for flexography. |
| | | • Understand the techniques for quality control for flexographic printing. |
| | | • Know the standard rule for environment and safety in flexographic printing. |
| | | |
| | PT – 363 Gravure Printing | • Understand the concept of gravure printing. |
| | | • Know the applications of gravure printing. |
| | | • Know the difference between gravure printing and flexography printing. |
| | | • Understand the components of gravure printing machine |
| | | • Understand the engraving method for gravure printing. |
| | | |
| | PT – 364 Printing Organization Management | • Understand the types of organization structure. |
| | | • Know the decision making. |
| | | • Work in inventory management. |
| | | • Work in administrative office. |
| | | • Analyze qualitative factors for working environment. |
| | | |
| | PT – 365 Advertise and Multimedia | • Understand the types of media. |
| | | • Understand concept of advertising and its impact . |
| | | • Understand the role of printing press in advertising. |
| | | • Plan and making decisions for advertising. |
| | | • Coordinate advertising activities. |
| | | • Start advertising business. |
| | | |
| | PT – 366 Introduction to 3D Technology | • Understanding about 3D printing. |
| | | • Understanding about 3D printing process. |
| | | • Understand the comparison between 3D printing process and other printing process. |
| | | • Know the applications of 3D Printing. |
| | | • Understand the scope of 3D Printing . |
| | | |
| | PT – 367 Industrial Training (IT) | • Web Printing |
| | | • Flexography Printing |
| | | • Digital Printing |
| | | • Screen Printing |
| | | • Gravure Printing |
| | | • Offset Printing |
| | | • Packaging |
| | | • Graphic Designing & Multimedia |
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**DEPARTMENT OF PSYCHOLOGY**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBA | Psy – G-101 (A) Modern General Psychology | • Relate the fundamental principles of Psychology in everyday life. |
| | | • Make the students aware of the applications of Psychological concepts in various fields. |
| | | • Develop Cognitive and Emotive Skills in the students. |
| | | |
| SYBA | Psy – G-201 (A) Modern General Psychology | • Relate the fundamental principles of Psychology in everyday life. |
| | | • Make the students aware of the applications of Psychological concepts in various fields. |
| | | • Develop Cognitive and Emotive Skills in the students. |
| | | |
| | G2 PSY- 231(A) Advanced Social Psychology | • Impart knowledge of the basic concepts and modern trends in Social Psychology. |
| | | • Foster interest in Social Psychology as a field of study and research |
| | | • Understand the students self in a social world |
| | | |
| | G2 PSY- 241(A) Social Psychology Process | • Make the students aware of the applications of the various concepts in Social Psychology in the Indian context. |
| | | • Understand the Present social problems in Indian society. |
| | | • Study social influence and pro-social behavior. |
| | | |
| | Paper–II-S1 PSY - 232 Psychodignostics | • Define abnormal behavior and explain the rationale behind it. |
| | | • Discuss procedures used to evaluate and diagnose abnormal behavior. |
| | | |
| | S1 PSY - 242 Psychopathology | • Compare, contrast, and integrate biological, psychological, and socio cultural explanations of abnormal behavior. |
| | | • Identify treatments for mental disorders and compare their efficacy in treating such disorders. |
| | | • Get acquainted with the subject knowledge, the students of the psychology department, are expected to visit mental hospital, old age homes, remand homes, psychological clinics, mentally retarded children's school etc. |
| | | |
| | S2-PSY-233(A) Counseling Content and Process | • Familiarize the students with nature & need of the counseling. |
| | | • Acquainted the students to know day to day problems and know to solve it through counseling. |
| | | • Students know, how psychological test help to understand the client. |
| | | |
| | | • Familiarizes the students with counseling therapy. |
| | S2 PSY-243(A) Counseling Therapy & Application | • Develop the knowledge of students how to follow up the behavioral problem & solve through with the help of therapy. |
| | | • Students know the application of the counseling therapy. |
| | | |
| | (G-3) Modern Applied Psychology | • Facilitate the learning of traditional emerging fields of psychology. |
| | | • Understand the relationship between theoretical and practical psychological principals. |
| | | • Impart knowledge of the Applied Psychology. |
| | | • Understand the Clinical Applications. |
| | | |
| TYBA | PSY-361A - (G-3) Applied Psychology and Human Life | • Prepare the students to function effectively and confidently in wide range of society. |
| | | • Understand the application in controlling criminal behavior-Social awareness and Social Responsibility. |
| | | • Application in professional life- sales and negotiations and responding through proper gesture and knowledge. |
| | | |
| | PSY-352A- (S-3) Research Methods in Behavioral Sciences | • Provide an overview of scientific research, sampling technique, methods and research design to the students |
| | | • Acquaint the students with the general & special abilities with respects to psychological testing. |
| | | • Encourage and guide the students to undertake a small scale research projects. |
| | | |
| | PSY-362A - (S-3) Experimental Psychology and Test Measurement | • Understanding the nature and uses of psychological test. |
| | | • Develop the practical approach. |
| | | • Application in professional life, like problem solving, logical thinking . |

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| | PSY-363 - (S-4) Psychology Practical: Experiments and Tests | • Familiarized the students with the use of elementary statistical techniques. |
| | | • Give practical experience to the students in administrating and scoring psychological tests and interpreting the scores. |
| | | • Acquaint the students with the basic procedure and design of Psychology Experiments |
| | | • Encourage and guide the students to undertake a small scale research projects |
| | | |
| | PSY-111 Approaches and Aspects of Personality | • Understand the basic aspects of personality. |
| MA-I | | • Understand how to develop personality. |
| | | • Application of personality theories in day to day life. |
| | | • How to shape behavior by using techniques- Shaping, Systematic Desensitization, Token Economy, Flooding, Virtual Reality. |
| | | |
| | PSY-121 Motivation and Emotion | • Provide comprehensive overview of the major theories of motivation and emotion |
| | | • Create awareness about the role of biological factors in motivation and emotion. |
| | | • Emphasize the importance of positive and negative emotions in human life. |
| | | |
| | PSY-112 Cognitive Psychology | • Understanding basic processes of cognitive psychology to students. |
| | | • Acquaint the students with the application of cognitive process in day-to-day life. |
| | | • How to solve problems with the help of abstract thinking, creative thinking. |
| | | |
| | PSY-122 Cognitive Phenomenon | • Understanding the function of brain |
| | | • Create awareness about the role of biological factors in learning and memory process. |
| | | • Improving decision making skills |
| | | |
| | PSY-113 Advanced Psychological Testing | • Acquaint student with the characteristics of standardized tests. |
| | | • Familiarize the students with psychometric theories and principles of test construction. |
| | | • Develop occupational skills in student related with psychological testing. |
| | | |
| | PSY 123 Statistics in Psychology | • Understanding fundamental concepts of statistics. |
| | | • Understanding statistical application for Psychology. |
| | | • Multivariate methods and computer applications to statistics. |
| | | |
| | PSY- 114 Psychology Practical (Tests) | • Create interest in Psychological Phenomenon. |
| | | • Develop awareness of Psychological tools, test and techniques. |
| | | • Evaluation and prediction of specific aspects of human behavior. |
| | | • Applying psychological parameters for Counseling and guidance. |
| | | |
| | PSY-124 Psychology Practical (Experiments) | • Acquaint the students with Skills of scientific techniques of conducting experiments in psychology |
| | | • Understanding the different areas of experimental research in psychology |
| | | • Application of experimental findings in day to day life. |
| | | |
| | PSY-231 Health Psychology | • Acquaint the students with the psychological aspect of health. |
| MA-II | | • Familiarize the nature and need of health psychology. |
| | | • How to manage stress. |
| | | |
| | PSY-241 Health Issues in Health Psychology | • Understanding health problem. |
| | | • Understanding the psychosomatic problem. |
| | | • Becoming a health psychologist. |
| | | |
| | PSY – 232 Group (A) Psychopathology | • Acquaint students with various manifestations of psychopathology. |
| | | • Impart knowledge and skills required for diagnosis of psychopathological conditions. |

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| | | • Understanding different perspectives and models regarding the causation of mental illness and dysfunctional behavior and to highlight the contribution of these approaches |
| | | |
| | PSY – 242 Clinical Psychopathology | • Pathogenesis of a wide range of mental and behavioral disorders. |
| | | • Understanding the psychosomatic problem. |
| | | • Understanding the effect of anxiety on mood disturbance. |
| | | |
| | PSY – 233 Group (A) PSYCHO-DIAGNOSTICS THEORY | • Understanding Psycho-diagnostic procedures |
| | | • Personality theories essential for understanding Psychopathology and Psychotherapies |
| | | • Explain the various Psychotherapeutic procedures |
| | | |
| | PSY – 243 Psycho-diagnostics: Procedure & Techniques | • How to Write Clinical Report. |
| | | • Understanding the Family Conflict and Assessment Techniques. |
| | | • Understanding the Cognitive Assessment. |
| | | |
| | | |
| | PSY – 232 Group (C) Counseling Process and Content | • Familiarize students with the nature and process of counseling. |
| | | • Acquaint students with various assessment techniques. |
| | | • Expose the students to the various types of intervention strategies. |
| | | |
| | PSY – 242 Counselling Assessment | • How to use Standardized Techniques for Human Assessment. |
| | | • Understanding the Counseling Approaches and Therapies. |
| | | • Understanding the Adjunctive Therapies. |
| | | |
| | PSY – 233 Group (C) Modern Career Counseling | • Expose the students to the application of counseling in various fields. |
| | | • Acquaint the students with various problems of adjustment across the life-span. |
| | | • Importance of Career Counseling inhuman life. |
| | | |
| | PSY – 243 Special Areas in Counseling | • Affect of anxiety no performance. |
| | | • Understanding the Counseling at Work Place. |
| | | • Understanding the Family and Group Counseling. |
| | | |
| | PSY – 234 RESEARCH METHODOLOGY | • Understand the basic research concepts |
| | | • Understanding the Steps in research process |
| | | • The basic terminology of advanced research techniques |
| | | |
| | PSY – 244 Dissertation | • Familiarized the students with research method and statistical treatment. |
| | | • Practical experience to the students in administrating and scoring psychological tests and interpreting the scores. |
| | | • Acquaint the students with the basic procedure and design of Psychological research method. |
| | | • Encourage and guide the students to undertake a research projects |
| | | |

**DEPARTMENT OF SANSKRIT**

| Class | Course | Outcomes (Students will be able to) |
|---|---|---|
| BA | Sanskrit | • Develop aptitude of literary forms. |
| | | • Develop reading, writing and communication skills of the students. |
| | | • Information about the ancient Vedic literature. |
| | | • Develop aptitude of English linguistics and grammar. |
| | | |
| TYBA | SNK- 351. PAPER G.3 SAHITYA (SEM- V) | • BHAMINI VILAS – PANDIT JAGANNATH |
| | | • Introduction to poetry. |
| | | • To study the writing skill of Kavya/poetry |
| | | • To develop the aptitude of literary form |
| | | • To study the beauty of Kavya /poetry |
| | | |
| | SAHITYA (G.3)(SEM- VI) SNK -361 | • RATNAVALI (Drama) – SHRIHARSHA |
| | | • To know the concept of drama. |
| | | • To know the writing style of Shriharsha. |
| | | • To know the contribution of Shriharsha in Sanskrit literature. |
| | | • To know the beauty, character sketch, uniqueness of the drama. |
| | | |
| | SNK-351 - BHAGVAT GITA AND HARSHACHARITASAAR (S3) | • BHAGVAD GITA (KARMA YOGA) |
| | | • To introduce the philosophy of Bhagvadgita. |
| | | • To know the importance of karma. |
| | | • To know the place and importance of Bhagvadgita in Indian society. |
| | | • The importance of Bhagvad gita in our day-to-day life. |
| | | |
| | 2. KADAMBARI- HARSHACHARITASAAR- BANABHATTA (S.3 | • HARSHACHARITASAAR (1, 2 UCCHAVASA.) |
| | | • To introduce the prose literature. |
| | | • To know the contribution of banabhatta in Sanskrit literature. |
| | | • To introduce the features of prose. |
| | | • To know the writing style of Banabhatta. |
| | | |
| | SNK 362- VED VA VYAKARAN. | • VED (SELECTED SUKTAS.) (S- (SNK – 36 SEM-V |
| | | • To know the humanization of Vedic Deities. |
| | | • To study the importance of ancient Vedic literature. |
| | | • To know the literary view of Vedic literature. |
| | | • To study the Vedas from the new approaches |
| | | |
| | VYAKARAN (S4) SNK- 363 (SEM-VI) | • To introduce the Tradition of sanskrit grammar. |
| | | • To know the importance of grammar. |
| | | • To study the Sanskrit grammar form linguistic point of view. |
| | | |
| MA-I | 1. KIRATARJUNIYAM- Sarga-1,2,3 and 2. RAGHUVANSHAM- S | • To study the definition and Lakshanas of Mahakavya. |
| | | • To study the beauty of Kavya/poetry of Mahakavya. |
| | | • To study the language skills of Bhar |
| | | • To study the Arthaantaranyaas Alankara used by Bhar |
| | | • To do the comparative study of Mahakavya. |
| | | |
| | SNK. 112 /SNK 122. VED va NIRUKTA . (SEM-I & II) | • RIGVEDA |
| | | • To study the ancient Vedic literature. |
| | | • To study the Vedic language and grammar. |

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| | | • To study the importance of Padapatha. |
| | | • To know the humanization of Vedic deities. |
| | | |
| | | • NIRUKTA |
| | | • To know the uniqueness of Vedic words and its meaning. |
| | | • To know the theory of development of words in Nirukta. |
| | | • To know the importance of Nirukta. |
| | | • To know about Nighantu. |
| | | |
| | SNK. 113 /SNK.123. NATYASAHITYA (SEM-I & II) | • UTTARAMCHARITAM |
| | | • To know the changes of story done by Bhavabhuti from the original text. |
| | | • To do the technical study of Drama. |
| | | • To know the literary contribution of Bhavabhut |
| | | • To know the contribution of 'Karuna' sentiment in drama. |
| | | |
| | | • DASAHARUPAKAM |
| | | • To know the Ancient tradition of Natyashastra. |
| | | • To know the technical phase of Natyashastra. |
| | | • To know the criticism about Rupakas. |
| | | • To know the pattern of Dasharupaka. |
| | | |
| M.A.II | SNK 231/ SNK 241. NATAKA/ NATYASHASTRA. (SEM- III & IV | • NATAKA- ABHIJNANSHAKUNTALAM AND MRICHAKATIKAM |
| | | • To know the writing style of Shudraka and Kalidasa. |
| | | • To know the contribution of Kalidasa and Shudraka in Sanskrit literature. |
| | | • To know the beauty, character sketch, uniqueness of the dramas. |
| | | |
| | | • NATYASHASTRA AND ABHIJAT SANSKRIT SAHITYACHA ITIHAS |
| | | • To know the Ancient tradition of Natyashastra. |
| | | • To know the technical phase of Natyashastra. |
| | | • To know the contribution of sage Bharata in Natyashastra. |
| | | • To know the stage management and sentiments in Natyashastra. |
| | | • To know the contribution of poets in Abhijat Sanskrit Sahitya. |
| | | • To know the Literary view of Abhijat Sanskrit Sahitya. |
| | | |
| | SNK 232/242. VYAKARAN va BHASHASHASTRA. (SEM- III & I | • VYAKARAN- |
| | | • To introduce the Tradition of sanskrit grammar. |
| | | • To know the importance of grammar. |
| | | • To know the aim of writing Rajyavyavhar kosh dictionary. |
| | | |
| | | • BHASHASHASTRA- |
| | | • To know the Bhashashastra, its theory and its concepts. |
| | | • To know the transformation of Language. |
| | | • To know the tradition of learning Sanskrit linguistics. |
| | | |
| | SNK- 233/243. PRACHIN VIJNAN va ITIHAS. (SEM- III & IV) | • Introduction to Brihatsamhita. |
| | | • To know the importance of Vedic literature. |
| | | • To study the importance of Ancient science from Sanskrit texts. |
| | | |
| | | |

## DEPARTMENT OF SOCIOLOGY

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBA | SOC.G: मुलभूत समाजशास्त्र | १. समाजव्यवस्थेचा उगम आणि विकास लक्षात घेणे. |
| | | २. समाजातील विविध संस्था व त्यांची उपयुक्तता याची विद्यार्थ्यांना ओळख करून देणे. |
| | | ३. समाजातील विविध प्रक्रिया उदा. स्पर्धा, सहकार्य, संघर्ष इ. विद्यार्थ्यांच्या लक्षात आणून देणे. |
| | | ४. विद्यार्थ्यांच्या जडण-घडणीत कुटुंबाचे असलेले महत्वाप्रती विद्यार्थ्यांना अभिमुख करणे. |
| | | |
| SYBA | SOC. G2: भारतीय समाज: प्रश्न आणि आव्हाणे | १. समाजातील परंपरागत समस्यांची जाणिव विद्यार्थ्यांना करून देणे. |
| | | २. वैज्ञानिक युगात निर्माण झालेल्या विविध समस्यांप्रती विद्यार्थ्यांना सजग करणे. |
| | | ३. समाज सशक्तीकरणासाठी विद्यार्थ्यांमध्ये माणुसकीचे बीज रोवणे. |
| | | ४. विद्यार्थ्यांचे व्यक्तीमत्व विकसित करणे. |
| | SOC. S1: मुलभूत समाजशास्त्रीय विचार | |
| | | १. सामाजिक विचारांचा झालेला विकास अभ्यासणे. |
| | | २. समाजासंबंधित माडलेगेलेल्या सिध्दांताची ओळख विद्यार्थ्यांना करू देणे. |
| | | ३. पाश्चिमात्य तसेच भारतीय विचारवंतांच्या विचारांची उपयुक्तता लक्षात घेणे. |
| | | ४. थोर विचारवंतांची विचारसरणी समाजात रूजवणे. |
| | SOC. S2: लोकसंख्या आणि समाज | |
| | | १. जागतिक लोकसंख्या व भारतीय लोकसंख्येची ओळख विद्यार्थ्यांना करून देणे. |
| | | २. भारतातील वाढत्या लोकसंख्येच्या दुष्परिणामांची जाणिव विद्यार्थ्यांना करूण देणे |
| | | ३. कुटुंब कल्याण कार्यक्रम, विविध योजना त्यांची माहिती विद्यार्थ्यांपर्यंत पोहचविणे. |
| | | ४. लोकसंख्यावाढ कमी करण्याच्या दृष्टिकोनातून विद्यार्थ्यांना अंतर्मुख करणे. |
| | | |
| TYBA | SOC. G३:भारतीय समाज: संरचना आणि परिवर्तन | १. भारतातील एकता आणि विविधता व त्याचे स्वरूप अभ्यासणे. |
| | | २. आदिवासी समाजाबद्दल विद्यार्थ्यांना माहिती करून देणे. |
| | | ३. ग्रामीण समाज व शहरी समाज यांचा तुलनात्मक अभ्यासाची ओळख् विद्यार्थ्यांनाकरून देणे. |
| | | ४. परंपरागत भारतीय संस्कृती आणि समाजाची ओळख विद्यार्थ्यांना करून देणे. |
| | | |
| | SOC. S3: सामाजिक संशोधनाचे तंत्र | १. संशोधनाप्रती विद्यार्थ्यांमध्ये जाणिव जागृती निर्माण करणे. |
| | | २. समाजात सामाजिक संशोधन कसे करता येईल यासंबंधात माहिती देणे. |
| | | ३. सशोधनाचे महत्व विद्यार्थ्यांमध्ये बिंबवणे. |
| | | ४. संशोधनासाठी विद्यार्थ्यांना मार्गदर्शन करणे. |
| | | |
| | SOC. S4: औद्योगिक समाजशास्त्र | १. समाजाच्या आर्थिक व्यवस्थेबद्दलची माहिती विद्यार्थ्यांना दिली जाते. |
| | | २. आधुनिक उद्योग आणि त्याची रचना याप्रती विद्यार्थ्यांना अभिमुख केले जाते. |
| | | ३. सामाजिक सुरक्षितता कायद्याबद्दल विद्यार्थ्यांमध्ये जाणिव-जागृती निर्माण केली जाते. |
| | | ४. औद्योगिकरणामुळे झालेल्या परिवर्तनाविषयीविद्यार्थ्यांचीजागृतीकेली जाते. |
| | | |

**DEPARTMENT OF STATISTICS**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBSc | ST-111 Descriptive Statistics- I | • Understand about the collection of the data, condensation and summarisation into a compact form |
| | | • Understand about the representation of data in a neat, compact and clear form |
| | | • Compare the two or more data sets |
| | | • Help in planning, investigation and sample surveys |
| | | • Explore about the various Statistical institutes and organizations: ISI, NSS, Bureau of Economics and Statistics in States, Indian Institute of Population Sciences(IIPS) |
| | | • Compute of measures of central tendency, Dispersion, Skewness and Kurtosis |
| | | |
| | ST-112 Probability and Probability Distributions-I | • Understand the concepts of Sample space and events, theory of Permutation and Combinations |
| | | • Understand the concept of Probability, Conditional probability of an event, Independence of events |
| | | • Compute probability and apply Bayes' theorem in real life situations problems |
| | | • Understand the concepts of random variable, discrete random variable, Probability mass function |
| | | • Fundamental/Basic Statistical Analysis using Statistical Software MS-Excel |
| | | • Understand the concepts of median and mode of discrete random variable |
| | | |
| | ST-121: Descriptive Statistics-II | • Understand the concepts of symmetry and peakedness of frequency distribution |
| | | • Understand the concepts of Bivariate data, Correlation, types of correlation |
| | | • Estimate, predict and forecast the observed datasets |
| | | • Identify the relationship between different factors |
| | | • Identify the association of two attributes and Independence (if any) |
| | | • Compare two or more data sets using appropriate tools such as correlation, regression, covariance etc. |
| | | |
| | ST-122 Probability and Probability Distributions-II | • Understand the concepts of Univariate Random Variable and bivariate random variable |
| | | • Compute probabilities of events in bivariate probability distribution |
| | | • Understand about the application of standard discrete distributions in real life situations |
| | | • Model sampling from Discrete Uniform, Binomial and Hypergeometric distributions |
| | | • Understand the concept of standardized random variable. |
| | | • Able to analyze the data using Statistical Software such as MS-Excel etc. |
| | | |
| SYBSc | ST-231 Probability Distributions-I | • Understand the fundamentals of random variable (Moments and Cumulants) |
| | | • Compute Expected value, Finding MGF(Moment), CGF(Cumulant), PGF(Probability), FMGF(Factorial Moment); GF=Generating Functions |
| | | • Develops ability to solve gamma-beta functions |
| | | • Describe Poisson, Geometric distribution; their real-life situations and other basic relevant properties |
| | | • Understand Normal distribution (Continuous); real-life situations and other basic relevant properties |
| | | • Develop problem-solving techniques needed to accurately calculate, apply and interpret probability of a given event/selected probability distribution(s) |
| | | • Understand underlying assumptions for common probability distributions and their usage. |
| | | |
| | ST-232: Statistical Methods-I | • Understand the notion of multiple linear regression models, Yule's notation |
| | | • Compute and interpret Multiple & Partial correlation coefficient; coefficient of Determination; study their properties |
| | | • Understand the meaning, usefulness of Time series and its components (trend and other types of variations); study additive and multiplicative models |
| | | • Understand the meaning and purpose of Statistical Process Control, quality of a product, need of quality control, chance and assignable causes |
| | | • Derive 3s control limits (when standards are given/ not given); Draw control charts for variables and attributes |
| | | • Understand meaning of statistical decision theory, acts, states of nature, outcomes, pay-off and opportunity loss(regret) |
| | | • Take decisions under certainty, uncertainty and risk using various decision rules |
| | | |
| | ST-241: PROBABILITY DISTRIBUTIONS-II | • Understand the fundamentals bivariate continuous probability distribution |
| | | • Compute mean, variance, median, mode, MGF, CGF, PGF of Gamma, Exponential, Beta (of both kinds), chi-square, t and F distributions (wherever it exists) |
| | | • Distinguish between two kinds of beta variates |

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|---|---|---|
| | | • Use of |
| | | • tables for calculation of probabilities |
| | | • Understand interrelations among Normal, |
| | | • distribution |
| | | • Understand additive property of Gamma, chi-square distribution, Lack of memory property of exponential distribution, reciprocal property of F distribution |
| | | |
| | ST-242: Statistical Methods-II | • Understand the concept of statistic, estimator, sampling distribution of statistic |
| | | • Perform test of hypothesis: null Vs alternative, compute error, find critical region |
| | | • Carryout Large sample tests (tests based on normal distribution) |
| | | • Carryout tests based on |
| | | • distribution |
| | | • Carryout tests based on |
| | | • distribution |
| | | • Perform ANOVA (Analysis of Variance) on one-way and two-way model |
| | | |
| TYBSc | ST-351: Distribution Theory-I | • Compute probability and apply Bayes' theorem in real life situation/problems |
| | | • Use Chebychev's inequality and WLLN to solve statistical problems |
| | | • Compute various events probability using Central Limit Theorem |
| | | • Apply negative binomial distribution in real life situations |
| | | • Apply truncated binomial, Poisson and normal distributions |
| | | • Obtain distribution of order statistics |
| | | |
| | ST-352: Statistical Inference-I | • Understand problem of estimation of parameters |
| | | • Distinguish between estimator and estimate |
| | | • Test whether estimator is unbiased or not, attains the Cramer-Rao lower bound or not |
| | | • Find efficiency of estimator relative to another estimator |
| | | • Test whether statistic is sufficient or not for unknown parameter |
| | | • Find estimator of unknown parameter using maximum likelihood estimation and method of moments. |
| | | |
| | ST-353: Design of Experiments | • Plan the experiment, obtain relevant information from it |
| | | • Understand basic principles of Design of Experiments (DOE) |
| | | • Study Standard Designs: CRD, RBD, LSD etc. |
| | | • Identify real life situations where the above designs are useful |
| | | • Minimise experimental errors which may result in increased production and reduction in production variances etc. |
| | | • Compare the various designs using the concept of efficiency |
| | | |
| | ST-354: Sampling Theory | • Obtain simple random sample with replacement and without replacement |
| | | • Identify unbiased estimator of population mean and population mean square |
| | | • Derive variance of unbiased estimator in case of SRSWR and SRSWOR |
| | | • Determine sample size to conduct sample survey |
| | | • Compare variance of mean under SRSWR with SRWOR |
| | | • Construct stratified random sample and systematic random sample in real life situations where these samplings are appropriate |
| | | • Identify appropriate sampling techniques in real life situations |
| | | • Apply ratio method of estimation and regression method of estimation |
| | | |
| | | |
| | ST- 355: Introduction to Regression Analysis | • Investigate the relationship between a variable of interest (the response) and a set of related predictor variables. |
| | | • Formulate and fit the appropriate regression model to the given dataset |
| | | • Statistical data analysis using regression in various real-life situations. |
| | | • Test the significance of regression parameters |

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| | | • Understand the concept of binary response variable, Logit transform, estimation of parameters, interpretation of parameters |
| | | • Compute AIC and BIC criteria for model selection in regression analysis |
| | | |
| | ST-356: Statistical Computing Using R Software | • Download, Install R, Understand Features, Meaning of package & workspace of R |
| | | • Recognize and make appropriate use of different types of data modes; create data objects (vector, factor, data frame, list, array, matrix) |
| | | • Design (reusable) functions to divide the solution of a problem into simpler steps and write functions in R using in-built functions, mathematical functions etc. |
| | | • Write scripts with the R language to solve common tasks |
| | | • Develop and Use of arithmetic, relational, logical expressions comprising respective operators, constants, and variables |
| | | • Develop matrices, matrix algebra, solving system of linear equations using matrices |
| | | • Use R in statistical applications viz. Sampling and its types; Diagrams and Graphs; Measures of Central Tendency, Dispersion, Skewness, Kurtosis; Probability (permutation and combination), Probability distributions (Discrete & Continuous); Testing Normality (Shapiro Wilk's); Correlation and Regression Analysis |
| | | |
| | ST-361: Distribution Theory-II | • Use continuous uniform distribution in real life situation |
| | | • Derive probability distributions of functions of uniform random variables |
| | | • Understand relation between normal distribution and log-normal distribution |
| | | • Apply Log-normal and Weibull distribution in real life situations |
| | | • Identify situations where Cauchy and Laplace distribution is applicable |
| | | • Use multinomial distribution in various situations where this distribution is applicable |
| | | • Apply bivariate normal distribution in real life situation. |
| | | |
| | ST-362: Statistical Inference-II | • Construct simple statistical hypothesis and composite statistical hypothesis |
| | | • Determine probability of the error of first kind and second kind |
| | | • Test null hypothesis against the alternative hypothesis |
| | | • Write critical regions and Identify the one that has maximum power among all critical regions |
| | | • Find uniformly most powerful critical region |
| | | • Apply non-parametric test where these tests are applicable |
| | | • Find confidence interval for unknown parameter |
| | | • Apply sequential tests where these tests are applicable |
| | | |
| | ST-363: Statistical Quality Control | • Construct, read and interpret control charts for variables, proportion of defectives and number of defects |
| | | • Judge process capability |
| | | • Design and use sampling inspection plan |
| | | • Apply tools such as histogram, scatter diagram, cause and effect diagram etc |
| | | • Understand role of statistical methods in ISO |
| | | • Estimate percentage of defective product in a production process |
| | | • Compute Producer's risk, Consumer's risk, Average Outgoing Quality Limits etc |
| | | |
| | ST -364: Official Statistics and Applied Statistics | • Understand about the agencies responsible for collection of data on Official Statistics on Agriculture, Industrial production, Trade, Price (Retail and Wholesale) and their important publications |
| | | • Construct the consumer price index number |
| | | • Understand the problems in construction of index numbers |
| | | • Testing for Adequacy of all index number using time reversal test, factor Reversal test, Circular test |
| | | • Understand the Vital Statistics, uses and various measures of population. |
| | | • Aware about the measures of mortality such as crude death rate, specific death rates (age wise, sex wise), Standardized death rates (based on age-specific death rates) direct and indirect method |
| | | • Compare these measures of mortality and make the suggestions through it |
| | | • Understand the Demand and supply Analysis |
| | | |
| | ST-365: Optimization Techniques | • Understand the basics of Linear Programming Problem(LPP) |
| | | • Solve LPP by graphical and simplex method, Big M (penalty) method, artificial variable technique (choice of method as per problem) |

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| | | • Write dual of primal problem |
| | | • Solve LPP by using its Dual |
| | | • Apply various method for solving Transportation problems; Assignment Problems |
| | | • Construct network and analyze using CPM(Critical Path Method) and PERT |
| | | • Generate Pseudo random numbers, simulate from normal distribution, apply monte-carlo method of simulation |
| | | |
| | ST-366(A): C PROGRAMMING | • Understand procedural language, middle level language, higher level language, general language structure, character set, keywords, identifiers |
| | | • Use if, if else, while, do....while, for, switch, goto, break, continue, nested loops, programs using control structures. |
| | | • Find GCD of two integer numbers(both recursive and non-recursive), mean, median, mode, maximum, minimum etc |
| | | • Write program to generate Fibonacci series like 0, 1, 1,2,3,5… |
| | | • Write a program in C to prepare a 2X2 contingency table for chi square test and to find the value of test statistic and to check whether two attributes are independent. |
| | | • Sort, Search, Combine strings using string function |

**DEPARTMENT OF YOGIC SCIENCE**

| Class | Course | Outcomes |
|---|---|---|
| F. Y. B. A. | YOG- 14511 Yogic Science- I | • Awareness of Yoga on Physical Level |
| | YOG- 14521 Yogic Science- I (Practical) | • Awareness of Yoga on Physical Level |
| | | |
| SYBA | Yogaurvedshastra (Gen.) | • Knowledge of relation between Yoga & Ayurveda |
| | Yogaurvedshastra ( Practical) | • Physical implementation of Yoga |
| | | |
| | S- I Yoga & Manswastya ( Theory) | • Theoretical Knowledge of relation between Yoga & body ( physical & Mental) in a spiritual way. |
| | S- I Yoga & Manswastya ( Practical) | • Knowledge of Yogic Kriyas to improve health. |
| | | |
| | S- II Nisargasharirshastra ( theory) | • General knowledge of anatomy _ physiology & Naturopathy Concept. |
| | S- II Nisargasharirshastra ( Practical) | • Experence fo common Naturopathy treatments, diet & Pranayama. |
| | | |
| TYBA | YOG- 351 Vivivdh Dharma & Yoga Tatwadnhyan ( Theory) | • Knowledge of Yoga through Religion |
| | YOG- 362 Vivivdh Dharma & Yoga Tatwadnhyan ( Practical) | • Experience of Yoga on Physical Level |
| | | |
| | S- III YOG- 352 Yoga Tatwdhnyan & Shikshanshastra ( Theory) | • Knowledge of Yoga Concept & Teaching Method of How to conduct yoga Class. |
| | S- III YOG- 352 Yoga Tatwdhnyan & Shikshanshastra ( Practical) | • Practical Implementation of Yoga Class on Basic Level |
| | | |
| | S- IV YOG- 353 Yoga Prachin & Arwachin ( Theory) | • Theoretical Knowledge of Yoga Concept & How to represent as an ideal yoga Teacher. |
| | S- IV YOG- 363 Yoga Prachin & Arwachin ( Practical) | • Experience of Yoga Practices in a long duration ( Up to certain Limit.) |
| | | |
| MA-I | YOG- 111 Fundamental of Yoga- I | • Deep knowledge of Yogic Concept |
| | | |
| | YOG- 112 Anatomy & Physiology | • General knowledge of anatomy & Physiology |
| | | |
| | YOG- 113 Practical Yoga- I | • Awareness of Yoga on Physical Level |
| | | |
| | YOG- 114 Practical Yoga- II | • Practical Knowledge of Theoretical Yoga |
| | | |
| | YOG- 121 Fundamental of Yoga- II | • Deep knowledge of Yogic Concept |
| | | |
| | YOG- 122 Therapeutic Yoga | • Knowledge of Therapeutic Yoga which helps to solve Physical & mental Disorder |
| | | |
| | YOG- 123 Practical Yoga- III | • Awareness of Practical Yoga on Mind & Body. |
| | | |
| | YOG- 124 Practical Yoga- IV | • A Specific Experience of yogic Kriyas. |
| | | |
| | YOG- 231 History & Philosophy of Yoga | • Deep knowledge of Yoga Concept History & Philosophy of Yoga. |
| | | |
| | YOG- 232 Yoga Education & research Methodology | • Knowledge of Teaching aptitude and research project. |
| | | |
| | YOG- 233 Practical Yoga – V | • Experience of physical and mental Stability of Yogic Practices |
| | | |
| | YOG- 234 Practical Yoga- VI | • Knowledge of How to conduct awareness Project of Yoga in our Community. |
| | | |
| | YOG- 241 Bhagwatgeeta & Yogashastra | • Knowledge of Yoga through spiritual study. |
| | | |
| | YOG- 242 Psychology & Yoga for Personality Development. | • Knowledge of Spiritual and Therotical Yoga to develop personality. |

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| | | |
| | YOG- 243 Practical Yoga – VII | • Feeling of Spiritual Stability |
| | | |
| | YOG- 244 Dissertation | • Research Project on specific yogic Kriya for the welfare of community and awareness of yoga & Human Values. |
| | | |

**DEPARTMENT OF ZOOLOGY**

| Class | Course | Outcomes (Students will be able to ) |
|---|---|---|
| FYBSc | ZOO-111 Non Chordates-I | • Understand the evolution, history of phylum. |
| | | • Understand about the Non Chordate animals. |
| | | • To study the external as well as internal characters of non chordates. |
| | | • To study the distinguishing characters of non chordates. |
| | | • Understand the economical importance of Molluscs. |
| | | |
| | ZOO-112 Cell Biology | • Understand the Scope of cell biology, because cell is the basic unit of life. |
| | | • Understand the Main distinguishing characters between plant cell and animal cell. |
| | | • To study and understand the whole cell organelles with their structure and function. |
| | | • Understand the cell cycle and know the importance of various cells in body of organisms. |
| | | • Understand the various applications of cells by using cell biology like study of various types of tumour. |
| | | |
| | ZOO-121 Chordate-I | • Understand the phylum Chordate. |
| | | • Understand the basic concepts about chordates. |
| | | • Understand the external morphology and sexual dimorphism in chordates. |
| | | • Study and understand the various systems, adaptation and dentition in Mammals. |
| | | |
| | ZOO-122 Applied Zoology I | • Understand the concepts of Goatary and Lac culture. |
| | | • Understand the various Indian breeds and their distribution and characteristics of Goats. |
| | | • To aware the students about Goatary and its economical importance. |
| | | • Understand the Various concepts in Lac Cultivation. |
| | | • To know the Economical importance of lac Cultivation. |
| | | • This is a job oriented subject. |
| | | |
| | ZOO-111 Non Chordates-I-Sem-I | • Understand the various internal systems like Digestive system, nervous system with the help of charts. |
| | | • Understand the functions of Gemmules and spicules. |
| | | • Understand the economical importance of Molluscan shells. |
| | | • To study and understand the classification of whole phyla includes in Non chordates with the help of charts/models/pictures. |
| | | • Understand the evolutionary history of Non chordates. |
| | | |
| | ZOO-112: Cell Biology Sem-I | • Understand the Animal cells and various cell organelles by using microphotographs. |
| | | • Understand the concept vital staining , distinguishing points between nuclear stain and cytoplasmic stain. |
| | | • Understand the techniques using for the study of blood corpuscles. |
| | | • Understand the meaning of Osmotic pressure, isotonic, hypotonic, hypertonic. |
| | | |
| | ZOO-121: Chordate-I Sem-II | • Understand the Systematic position and external morphology of Calotese versicolar. |
| | | • Understand and study the various systems like Digestive systems |
| | | • To study and understand the Scales, Fins, Arial adaptation and Dental formula. |
| | | • Understand the Classification various classes of phylum Chordate e.Pisces, Reptiles, Aves and Mammals. |
| | | • Compulsory visit to any Ecosystem gives more knowledge to the students. |
| | | |
| | ZOO 122: Applied Zoology I Sem-II | • Understand the concept of Goatary and Lac cultivation. |
| | | • To study and understand the various diseases and treatment of Goats. |
| | | • Observation of Lac Producing insects and their life cycle. |
| | | • Understand the various techniques of isolation of seed lac from raw lac. |
| | | • Compulsory visit to the Goatary and Lac Cultivation Industry gives more knowledge to the students. |
| | | |
| SYBSc | ZOO 231: Non Chordates-II | • Understand the Characters of class Asterias with help of animal Sea star. |

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| | | • Understand the internal as well as external morphology of that animal. |
| | | • To study and understand the concepts-Metamorphosis, regeneration and autotomy. |
| | | • Understand the Mouthparts of insects. |
| | | • Understand the Canal system in sponges. |
| | | • Understand the Locomotion in Protozoa. |
| | | • To observe and study the Foot in Mollusca. |
| | | |
| | ZOO 232: Medical Zoology | • To study and understand the scope and branches of Medical Zoology. |
| | | • To aware the students for various parasites and diseases which spreads in human with the help of study of host-parasite relationship. |
| | | • To increase awareness for the health in students. |
| | | • Understand the various disease causing vectors like Mosquitoes. |
| | | • To aware about the typhoid, cholera like disease. |
| | | • Understand the importance of medical diagnostic and also understand the term forensic Entomology. |
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| | ZOO 241: Chordates -II | • To study and understand the external as well as internal characters of class Aves,by studying animal Columbia livia domestica. |
| | | • Understand the various systems of pigeon. |
| | | • Understand the General Topics like Accessory respiratory organs in fishes. |
| | | • Able to know the reptiles of Mesozoic era. |
| | | • Understand the adaptations in aquatic mammals. |
| | | |
| | ZOO 242: Applied Zoology | • Introduce the term apiculture to the students. |
| | | • To aware the students and provides the economical importance of Apiculture. |
| | | • Understand the Bee keeping equipments and apiary management. |
| | | • To study and understand the various species of Bees. |
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| | ZOO 233: Practical Sem-I | • Understand the external characters and water vascular system in sea star . |
| | | • Understand the locomotion in protozoa and Modification of foot in molluscs. |
| | | • To understand the viruses like chikungunya, Swine flu, tetanus. |
| | | • To aware the students for virus carrying vectors, like Aedes, culex and anopheles. |
| | | • To understand the various diseases diagnostic methods. |
| | | $\chi^2, t$ and $F$ |
| | ZOO 243:Practicals sem-II | • Study of Evolutionary history of animals. |
| | | $\chi^2, t$ and $F$ nderstand the types of fins. |
| | | • Understand the adaptation in Aquatic mammals ex. whale and seal. |
| | | • Study and understand the diseases, pest, parasites and predators of Honey Bee. |
| | | • To study and aware the students for honey bee products and their uses. |
| | | • To aware the students for Adulteration. |
| | | |
| TYBSc | ZOO 351: Non-Chordates III | • To understand the Parasite leech Derive. |
| | | $\chi^2$ Inderstand relation between host and parasite. |
| | | • Study the various systems in leech. |
| | | $t$ and $F$ tand the economical importance of Leech. |
| | | • Understand the terms Spiracles. |
| | | • Understand the osmoregulation in Protozoa. |
| | | • Understand the process of pearl formation. |
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| | ZOO 352: Cell and Molecular Biology | • Understand the cell biology and molecular biology. |
| | | • Understand the various cell types and cell divisions. |
| | | • Understand the structure and function of the cells. |

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| | | • Understand the term cell signalling. |
| | | • Aware the students for Cancer. |
| | | • Understand the Tools and Techniques in Molecular Biology. |
| | | • Understand the term ELISA technique and DNA finger printing. |
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| | ZOO 353: Mammalian Histology and Physiology I | • Understand the terms Histology and Physiology |
| | | • Understand the cell, tissue, organ, system and organisms. |
| | | • Study the derivatives of skin- horns, nails, hairs. |
| | | • Study and understand the terms- acidosis, alkalosis, asphexia, hypoxia, anoxia and cyanosis. |
| | | |
| | ZOO 354: Biochemistry | • Understand about the agencies responsible for Production of various products using biochemistry. |
| | | • Understand the term pH ,Buffer. |
| | | • Understand the structure and function of carbohydrate, amino acids, proteins, and lipids. |
| | | • Understand the concept Enzymes and also Vitamins and minerals. |
| | | • Understand the Principle role of Vitamins in metabolism and Deficiency diseases. |
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| | ZOO 355: Systematic, Evolution and Palaeontology | • Understand the Origin and development of animals. |
| | | • Understand the process of evolution. |
| | | • Clear the concepts of Universe, theories of life cycles. |
| | | • Understand the Lamarkism, Neo-Lamarkism and Darwinism. |
| | | • Understand the Geological time scale. |
| | | • To aware the students for Palaentology ie. Fossils and its significance. |
| | | • Understand the Zoogeographical realm. |
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| | ZOO 356: Biotechnology | • Understand the various Applications of Biotechnology. |
| | | • Study and Understand the Hybridoma technology as well as Enzyme biotechnology. |
| | | • Study and understand the DNA Recombinant technology. |
| | | • Understand the industrial and environmental biotechnology. |
| | | • Study and understand the Stem cell biotechnology. |
| | | • Understand the Scope and Significance of Biotechnology. |
| | ZOO 357: Practical I | • Understand the Internal as well as External characters of the Non-Chordates. |
| | | • Study and understand the different types of tissues. |
| | | • Understand and study of histological permanent slide of mammalian skin. |
| | | • Understand the methods how to measure the blood pressure as well as heart beat under normal and stress condition. |
| | | • Understand the techniques of preparation of Haemin crystals. |
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| | ZOO 358: Practical II | • Understand and study of different cell organelles with respect to their structure and function. |
| | | • Understand the Estimation technique of DNA and RNA. |
| | | • Understand the process of Vital Staining by using Janus Green-B stain. |
| | | • Understand preparation of Paper model of DNA. |
| | | • Understand the Hierarchic classification of Non-chordates. |
| | | • Understand the evidences from evolution. |
| | | • Understand the Geological time scale. |
| | | • Understand the Study of Fossils of different animals. |
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| | ZOO 359:Practical III | • Understand the test of Identification of carbohydrates, like Solubility test, Molisch's test, Iodine test, Benedict's test, Barfoed's test, Phosphoric acid test and Osazone test. |
| | | • Understand the process of isolation oh Casein from milk by isoelectric precipitation. |
| | | • Understand the Detection of amino acids by Lowry's method. |
| | | • Study the Qualitative test for fats. |

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| | | • Understand the detection of amino acids. |
| | | • Isolation of starch from potato and haemoglobin from blood sample. |
| | | • Understand the preparation of solution of given percentage, normality and molarity. |
| | | • Understand the analytical instruments. |
| | | • Estimation of DNA and RNA. |
| | | • Understand the working principle of laminar air flow, autoclave, inverted microscopes, colorimeter. |
| | | • Unerstand the techniques of cell culture and preparation of primary culture media. |
| | | • Understand the process of Electrophoresis. |
| | | • Understand the Biogas plant. |
| | | • Understand the process of isolation of microorganisms. |
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| | ZOO 101:Structure and function of Invertebrates | • Understand the Organization And Life: Homology and Analogy, Diversity of invertebrates, Phylogeny of invertebrates. |
| | | • Understand the Organization of coelom and its types. |
| | | • Understand various processes like Digestion, Locomotion, Respiration, Excretion, Nervous system. |
| | | • Understand the larval forms of the invertebrates. |
| | | • Understand the colonial and social life in invertebrates. |
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| | ZOO 102:Cell and Developmental Biology | • Understand the structure and function of the cell and its organelles. |
| | | • Understand the various processes like cell cycle and cell signalling. |
| | | • Understand the terms: Gametogenesis, Fertilization and early development. |
| | | • Understand the Morphogenesis and Organogenesis in animals. |
| | | • Understand the Aging, Apoptosis and Senescence. |
| | | |
| | ZOO 103:Quantitative Biology | • Understand the Applications and uses of Statistics. |
| | | • Understand the Data Classification: Frequency, Relative frequency, class limits, class width, inclusive and exclusive method of classification. |
| | | • Understand the measures of central tendency and dispersion like Computation of arithmetic mean, mode and median. |
| | | • Understand the Computation of Variation. |
| | | • Understand the Correlation and Regression. |
| | | • Understand the testing of hypothesis. |
| | | • Understand the Statistical hypothesis, Null Hypothesis, Alternative hypothesis etc. |
| | | • Understan the t-test, F-test. |
| | | • Understand the analysis of variance, meaning of ANOVA. One way and two way classification. |
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| | ZOO 104:Practical Sem-I | • Understand the various systems of Grasshopper by Dissecting the Grasshopper. |
| | | • Understand the process of Mounting. |
| | | • Understand the classification of Invertebrates. |
| | | • Study of various cell organelles by using their microphotographs. |
| | | • Understand how to prepare the mitotic chromosomes. |
| | | • Understand the Detection of Carbohydrates by PAS reaction, Protein by bromophenol blue, DNA by feulgen reaction, Mitochondria by Janus green method. |
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| | ZOO 105:Practical Sem-II | • Understand the Preparation of permanent slide of Chick Embryo. |
| | | • Understand the different types of eggs. |
| | | • Study and understand the term Cleavage, Blastulae, Gastrulae, and types of Placenta. |
| | | • Constuct the frequency distribution and its graphical representation. |
| | | • Understand the computation of Arithmetic Mean, Mode, median. |
| | | • Understand the computation of Standard deviation, Variance and Coefficient of Variation. |
| | | • Understand the correlation and REGRESSION. |
| | | • Understand the F-Test and ANOVA. |
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| | ZOO 201:Structure and Function of Vertebrates | • Understand the Organization of Protochords, Urochordata and Cephalochordata. |

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| | | • Understand and study of the Origin and phylogeny of the vertebrates. |
| | | • Understand the classes of vertebrates: fishes, Amphibia, Reptilia, Aves and Mammals. |
| | | • Study of endoskeleton of human. |
| | | • Understand the comparative account of urogenital system of vertebrates. |
| | | • Understand the Receptor organs in vertebrates. |
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| | ZOO 202: Biochemistry and Enzymology | • Understand the Basics of Biochemistry and Chemistry of biomolecules and their significance. |
| | | • Understand the Protein structure e. Primary, Secondary, Tertiary and Quaternary. |
| | | • Understand the chemistry of hormones. |
| | | • Understasnd the structure and properties of the enzymes as well as its activity. |
| | | • Understand the process of Immobilization. |
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| | ZOO 203: Tools and Techniques for Biology | • Understand the Principle, parts, and its application of Microscopic techniques. |
| | | • Understand the principle of analytical instruments. |
| | | • Understand the working principle of UV-Vis principle, Colorimeter, Fluorimeter. |
| | | • Understand the term Electrophoresis, Radioactivity. |
| | | • Understand the working principle of Centrifuge, Incubator, pH meter. |
| | | • Understand the cell culture techniques and separation techniques in biology. |
| | | • Understand the function of Biosensors. |
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| | ZOO 204:Practical Sem II | • Understand the classification of Urochordata up to order Doliolida and Cephalopodata up to order Amphioxiformes. |
| | | • Understand the classification of Pisces. |
| | | • Understand the classification of Amphibia, Reptilia, Aves, Mammals. |
| | | • Understand the Axial skeleton of human. |
| | | • Understand the urinogenital system of vertebrates. |
| | | • Understand the Preparation of Buffer of known molarity and pH. |
| | | • Determine the pKa value of Glycine. |
| | | • Estimate the Cholesterol, Nucleic acid, DNA and RNA. |
| | | • Determine the protein by using Lowery method. |
| | | • Estimate the Vit “C” from suitable source. |
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| | ZOO 301 (A):Animal physiology sec-I | • Understand the Importance of physiology and branches of it. |
| | | • Understand the terms-Osmosis, diffusion, pH and Buffer. |
| | | • Understand the Digestion and Excretion process, by studying the Organs of it. |
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| | ZOO 301 (B):Animal physiology sec-II | • Understand the process of Metabolism. |
| | | • Understand the term Detoxification. |
| | | • Understand the Circulatory system and Lymphatic system. |
| | | • Study the nervous system. |
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| | ZOO 302 (A):Freshwater Zoology | • Understand the Aquatic environment like Lotic habitat and Lentic habitat. |
| | | • Understand the Physical conditions of water: Depth, Viscosity, Density, Buoyancy. |
| | | • Understand the chemical conditions of water: dissolved oxygen and carbon-di-oxide, hardness etc. |
| | | • Understand the physiological and protective adaptations in: Protozoa, Rotifer, Crustaceans, Fishes. |
| | | • Understand the respiratory and locomotory adaptations in freshwater insects and their larvae. |
| | | • Understand the economical importance of molluscs. |
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| | ZOO 302 (B): Scientific research Report writing | • Understand the scope of Communication. |
| | | • Understand the techniques which improve the communication. |
| | | • Understand the terms listening, Conferencing, oral communication, presentation skill. |

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| | | • Understand how to write a research report. |
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| | ZOO 303(A): Medical physiology | • Understand the Digestive System and disorders of Liver, Pancreas, Stomach. |
| | | • Understand the Excretory System-Renal function test, Nephrotoxicity, Nephritic syndrome. |
| | | • Understand the Circulation and Respiratory System, Blood clotting, Clotting factors and like all this. |
| | | • Understand the disorders like asthma, bronchitis, swine flu, emphysema. |
| | | • Understand the Nervous system and its disorders like Alziemer, Parkinson's. |
| | | • Understand the Process of reproduction and endocrinology. |
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| | ZOO 303 (B):Animal Biotechnology | • Understand the animal cell and tissue, Introduction of animal tissue culture and terminologies used in animal biotech. |
| | | • Principle and merits and demerits of Animal cell/tissue culture. |
| | | • Understand the Equipments and media for cell culture. |
| | | • Understand the cell culture I-Measurement of Viability and cytotoxicity of cell. |
| | | • Understand the process of scaling up of Animal cell culture. |
| | | • Understand the cell transformation, risks and safety in the animal cell culture. |
| | | • Understand the applications of animal biotechnology, Application of Recombinant DNA. |
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| | ZOO 304:Practical-I | • Understand the units of measurements buffers, normal solutions and normalities, physiological Saline solution.2 |
| | | • Demonstratesd the principle of dialysis as well as Osmosis. |
| | | • Determine the Salivary digestion and Pancreatic digestion. |
| | | • Determine the GFR. |
| | | • Determine the Nitrogenous excretory product. |
| | | • Understand the Antioxidant activity. |
| | | • Understand the reflexes in man. |
| | | • Estimate the plasma proteins by copper sulphate specific Gravity method. Prepare the culture of Paramoecium, Daphnia and Hydra. |
| | | • Understand the locomotory and respiratory adaptations in amphibians and reptiles. |
| | | • Study of aquatic and semi aquatic adaptations in amphibians and reptiles. |
| | | • Understand the economical importance of Freshwater fishes and crustaceans. |
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| | ZOO 305:Practical-II | • Understand the Communication techniques. |
| | | • Prepare a protocol of any experiment. |
| | | • Prepare tables and graphs from any hypothetical data. |
| | | • Understand the paragraph writing. |
| | | • Record the lung volumes and capacities by spirometry. |
| | | • Determine the SGOT/SGPT. |
| | | • Perform semen analysis. |
| | | • Study the blood clotting and bleeding time, RBC and WBC counting. |
| | | • Construct the ideal animal cell culture laboratory and understand the working principles of instrument using in it. |
| | | • Prepare a cell culture media. |
| | | • Understand the Cell counting and testing cell viability. |
| | | • Prepare a single cell suspension. |
| | | • Understand the process of ovulation e. Induction of Super ovulation in any suitable animal. |
| | | • Assessment of glandular product for its biological activity. |
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| | ZOO 401 (A): Animal physiology -II | • Understand the water relation and ionic regulation as well as Adaptation To freshwater habitat; Adaptation to terrestrial habitat; Adaptation to brackish water habitat. |
| | | • Understand the support and location means their properties. Also study the skeleton joints. |
| | | • Understand the physiology of movements. |
| | | • Understand the respiratory system and Respiratory pigments. |
| | | • Understand the process of Temperature regulation. |

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| | ZOO 401 (B):Animal physiology II | • Understand the reproductive system. |
| | | • Understand the Endocrine system and Mechanism of hormone action. |
| | | • Understand the Integumentary system e. Structure of skin. |
| | | • Understand the Sensory physiology e.sensory coding, chemoreception, Mechano reception, Mechano transduction, mechanoreceptors. |
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| | ZOO 402(A): Systematic and evolutionary biology | • Understand the principles and methods of taxonomy. |
| | | • Understand the Levels of structural organization. |
| | | • Understand the Outline classification of Animals :Classification of animals. |
| | | • Able to understand the Natural history of Indian subcontinent. |
| | | • Understand the Common parasites and pathogens of humans, domestic animals, Host-Parasite relationship, |
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| | ZOO 402(B): Advanced methods in Biology | • Understand the process of microbial fermentation and production of Useful Macromolecules. |
| | | • Understand the Application of immunological principles e. Transgenic animals, molecular approaches to diagnosis and strain identification. |
| | | • Understand the terms, Genomics and Proteomics. |
| | | • To know the Biodiversity, Breeding in animals. |
| | | • Understand the Bioremediation and Biosensors as well as Epigenetics. |
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| | ZOO 403(A):Fundamental Processes and Tools in Biology | • Understand the Various Microscopic techniques. |
| | | • Know the terms Photometry and Fluorimetry. |
| | | • Understand the Electrophoresis and Radioactivity technique. |
| | | • To know the working principles of various instruments like Centrifuge, Incubator, pH meter. |
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| | ZOO 403(B):Forensic Biology | • Understand the term Forensic Science: Def, History and Development. |
| | | • Know the Various Forensic laboratories in India. |
| | | • Understand the various steps includes in the investigation in crime cases. |
| | | • Unerstand and know the Various Biological fluids and its analysis. |
| | | • Understand the Forensic Entemology. |
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| | ZOO 404:Practical I | • Understand the Adaptation in various water bodies. |
| | | • Determine the oxygen consumption. |
| | | • Understand the different types of joints. |
| | | • Understand the Super ovulation in Rat, |
| | | • To know the Structure and function of skin and its derivatives. |
| | | • Study the Endocrine glands with the help of slides/photographs. |
| | | • Understand the Estimation of hCG. |
| | | • Understand the level of organization and criteria used for classification. |
| | | • Understand the various parasites and pathogens of human and domestic animals. |
| | | • To demonstrate the Endo parasites in Frog. |
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| | ZOO 405:Practical II | • Understand the process of Fermentation. |
| | | • Understand the Isolation technique IgG immunoglobulin by Ammonium sulphate precipitation |
| | | • Understand the various equipments used in Animal cell culture. |
| | | • Understand the Biosensors. |
| | | • Understand the calibration process. |
| | | • Determine the Lamberts and Beers Law. |
| | | • Understand and able to Record the ECG. |
| | | • Determine the Molecular Weight of DNA by electrophoresis. |
| | | • Identify the Animal hair and human hair. |
| | | • Identify the own Blood group. |

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| | | • Examine the Spermatozoa. |
| | | • Understand the process of DNA Extraction and Quantification by Colorimetric method. |
| | | • Examine the zooplankton under Microscope. |
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