Rayat Shikshan Sanstha's

R. B. Narayanrao Borawake College, Shrirampur, Dist- Ahmednagar- 413709

Program Outcomes (POs), Program Specific Outcomes (PSOs) and Course Outcomes (COs)

DEPARTMENT OF BOTANY

Programme Outcomes: B. Sc. Botany

Department of Botany	After successful completion of three year degree program in Botany a student will be able to:
Programme Outcomes	PO-1. Students know about different types of lower & higher plants their evolution in from algae to angiosperm & also their economic and ecological importance. PO-2. Cell biology gives knowledge about cell organelles & their functions PO-3. Molecular biology gives knowledge about chemical properties of nucleic acid and their role in living systems. PO-4. Genetics provides knowledge about laws of inheritance, various genetic interactions, chromosomal abrasions & multiple alleles. PO-5. Structural changes in chromosomes. PO-6. Student can describe morphological & reproductive characters ofplant and also identified different plant families and classification. PO-7.They knows economic importance of various plant products & artificial methods of plant propagation PO-8. Use modern Botanical techniques and decent equipments. PO-9.To inculcates the scientific temperament in the students and outside the scientific community PO-10 Industrial Botany: By studying this course students can apply this knowledge in various industries such as Mushroom cultivation, biofertilizer production, biopesticide, etc. They can also set up their own industries.

Program Specific outcome: B.Sc. (Botany)

Department of Botany	After successful completion of three year degree program in Botany a student will be able to:
Programme Specific Outcomes	PSO-1. Students acquire fundamental Botanical knowledge through theory and practical's. PSO-2. To explain basis plant of life, reproduction and their survival in nature. PSO-3. Helped to understand role of living and fossil plants in our life. PSO-4. Understand good laboratory practices and safety. PSO-5 To create awareness about cultivation, conservation and sustainableutilization of biodiversity.

	PSO-6. To know advance techniques in plant sciences like tissue culture, Phytoremediation, plant disease management, formulation of new herbal drugsetc. PSO-7 Students able to start nursery, mushroom cultivation, biofertilizer production, fruit preservation and horticultural practices

Course Outcomes of B.Sc. Botany:

Course	Outcomes
	After completion of these courses students should be able to:
Semester-I	
BO111 Plant Life and Utilization- I	CO-1 Know about life cycle of different plant groups i.e.cryptogams and phanerogams CO-2 Evolutionary study of plants CO-3 Study of Classification of plants
BO 112 Plant Morphology and anatomy	CO-1 To study External structure and internal structure of plant CO-2 To study the structure of flower, types of fruits. CO-3 Anatomy is known about Taxonomy, Physiology, Ecological interpretations, Pharmacongnosy and Wood identification.
Semester-II	
BO121 Plant Life and Utilization –II	CO-1 To study of higher cryptogams and phenarogams. CO-2 To study general characters, classification and life cycle with respective habit and habitat.
BO 121 Principles of plant sciences	CO-1 Plant physiology, Cell cycle and importance of cell cycle. CO-2 Know about Structure of DNA, RNA and also DNA replication.
Semester-III	
BO 231 Taxonomy of Angiosperms and Plant Ecology	CO-1 Know principals of taxonomy, methods in taxonomy CO-2 To gain knowledge about of taxonomy, Sources of data for taxonomy CO-3 To learn methods of preparation of Herbarium, E- Herbarium etc
BO 232 Plant Physiology	CO-1Applications of plant physiology, Mechanism ofAbsorption of water, Transpiration CO-2 Plant growth and growth regulators, NitrogenMetabolism in plants. CO-3 Physiology of flowering plants.
Semester-IV	
BO 241 Plant Anatomy andEmbryology	CO-1 To get knowledge about different tissue systems in plants CO-2 To study normal secondary growth and different types of anomalous ,secondary growth. CO-3 Study of male and female gametes in angiosperms,

	Process of fertilization and types of endosperms and structureof embryo.
BO 242 **Plant Biotechnology**	CO-1 Know various application of biotechnology like Enzymetechnology, Fermentation technology CO-2 Single Cell Proteins and Environmental biotechnology. CO-3 Know Basics of Plant Genetic Engineering, Methods of gene transfer in plants andapplications of plant genetic engineering in crop improvement CO-4 Knowledge about Nanotechnology and its applications in Agriculture
Semester-V	
BO 351 **Algae & fungi**	CO- 1It is useful to study lifecycle, thallus structure, classification of algae and fungi. CO-2 It is helpful to know about role in industry, agriculture, fodder and medicine.
BO 352 **Archegoniate**	CO-1 Study of bryophyte, pteridophtyte general character, habit and habitat and lifecycle pattern. CO-2 To know about ecological and economic importance.
BO 353 **Spermatophyte and Paleobotany**	CO-1 Spermatophyta gives knowledge of general characters, economic importance and classification ofGymnosperm and Angiosperm. CO-2 Palaeobotany provides the information regarding the Fossils..
BO 354 **Plant Ecology**	CO-1Plant ecology gives the knowledge about interrelationship between the living world and the environment, levels of organization, components and dynamism of ecosystem, homeostasis. CO-2 It is helpful to study of EIA, remote sensing and ecological management. solution about singular points.
BO 355 **Cell and Molecular Biology**	**Cell and MolecularBiology** CO-1 Cell biology gives the knowledge of Internalorganization of the cell CO-2 Cellular signaling, transport and trafficking, CellularProcesses. CO-3 Molecular biology provides the Gene structure andFunction, DNA: Structure, Functions and Damage
BO 356 **Genetics**	CO-1Genetics provides knowledge regarding ClassicalGenetics, Microbial Genetics & Cytogenetics Co-2 Plant Breeding
BO 3510 **Medicinal Botany**	CO-1 Understand scope and importance of pharmacognosy. CO-2 Know the cultivation, collection, processing & importance of various herbal drugs and scope of economicbotany. CO-3 Know the botanical resources like non wood forestproducts and study the concept of Ayurvedic pharmacy.
BO 3511 **Plant diversity**	CO- 1.To study about genetic diversity Species diversity, Plant diversity at the ecosystem level, CO-2 To know about conservation of biodiversity.

and Human Health	
Semester-VI	
BO 361 Plant Physiology	Co-1Plant physiology give knowledge regarding the Photosynthesis, Respiration, Translocation of organic solutes
BO 362 Biochemistry	CO-1 Biochemistry gives the Knowledge regarding the various biochemical activity occurs in living organism. CO-2 Carbohydrates, Amino acids and proteins, SecondaryMetabolites
BO 363 Plant Pathology	CO-1 Study scope and importance of plant pathology. CO-2 Know disease cycle and disease development, CO-3 Effect of plant diseases on economy of crops. CO-4 Know the methods of studying plant diseases they can identify the plant diseases like bacterial, nematode, and fungal, disease forecasting. CO-5 Study prevention and control measures of plantdiseases.
BO 364 Evolution and Population genetics	CO-1 To study of historical account of origin of life and organic evolution. CO-2 To know about organic evolution and population genetics. CO-3 It is helpful for the study of Hybrid in viability, Hybrid sterility & Hybrid breakdown.
BO 365 Advanced Plant Biotechnology	CO-1 To study Impact of Biotechnology on Health care, Agriculture, and Environment. CO-2 Understand Role of microbes in agriculture, medicine&industry. CO-3 Study the concept of bioinformatics & genomics Proteomics. Understand technical germplasm &cryopreservation.
BO 366 Plant Breeding and Seed Technology	CO-1 Study the scope & importance of plant breeding. CO-2 Study the technique of production of new superior cropvarieties, heterosis, hybrid vigor etc. CO-3 Know the process of hybrid variety, development &their release. CO-4 Know about seed germination, processing , production etc.
BO 3610 Nursery and Gardening Management	CO-1 To know about idea of nursery and gardening management. CO-2 To study the different techniques of nursery such as cutting, budding grafting, air layering.
BO 3611 Bio fertilizers	CO-1To study the different types of Bio fertilizers. CO-2 To know about the mass production techniques of bio fertilizers.

Programme Outcomes: M. Sc. Botany

Department of Botany	After successful completion of three year degree program in Botany a student will be able to:
Programme Outcomes	PO-1. . Student can identify and classify all plant groups from algae to angiosperms,also understand the evolutionary relationship and their taxonomic aspects. PO-2. Knows the concept, process, physiology, and molecular basis of plant development. Also knows the methods of cultivation & economic importance of various species, millets, leguminous plants, fruits, essential oils, vegetables etc. PO-3. Students know about economically important algae, their cultivation and applications. and also methods of preparation and application of algal products. PO-4. Understand the application of Biopesticides; know about sources, methods and production of biofuel. PO-5. Acquired knowledge of fermentation technology and production offermented products. PO-6.In seed technology student gain knowledge about seed structure development, chemical composition, seed production, processing, seedtesting, quality control, seed certification and new hybrid variety. PO-7.Students learn the basic biostatistics, experimental statistics and bioinformatics. PO-8. Students understood plant organism interaction, PO-9.To inculcates the scientific temperament in the students and outside the scientific community

Programme Specific Outcomes: M. Sc. Botany

Department of Botany	After successful completion of three year degree program in Botany a student will be able to:
Programme Specific Outcomes	PSO-1. Students acquired knowledge through practical work in fields as well asin laboratory. PSO-2. Students are expose to various industrial process by industrialtraining. PSO-3. Project helps for creating research attitude among the post graduate students

Course Outcomes: M. Sc. Botany

Course	Outcomes
	After completion of these courses' students should be able to:
Semester-I	
BOTANY. **BOUT 111** **Plant Systematic-I**	CO-1. To study the classification of Bryophytes. CO-2. Understand the evolutionary relationships betweenplant groups. CO- 3. Know about systematic classification &nomenclature. CO-4. Knows about taxonomic aspects of Cryptogamicplants.
BOUT 112Cell Biology and Evolution	CO-1.Knows about cell structure and cell organelles CO2.Cell Signalling and Cell cycle. CO-3. Study of Evolution, Cellular and Molecular evolution.
BOUT 113 **Cytogenetics and plant breeding**	CO-1.Study of Classical genetics CO-2. Study of recombination, Linkages and Mutations CO-3. Study of Microbial Genetics and Cytogenetics CO-4. Study of Different Techniques of Plant Breeding.
BODT 114: **Pomoculture and Fruit Processing Technology**	CO-1 To know about scope and importance of Pomoculture and Fruit Processing Technology. CO-2 To study the different techniques of fruit processing and preservation techniques.
Semester-II	
BOTANY **BOUT 121** **Plant Systematics-II**	CO-1. To study the classification of pteridophyte, gymnosperms and angiosperm CO-2.Understand the evolutionary relationships between plant groups. CO- 3. Know about systematic classification & nomenclature. CO-4. Knows about taxonomic aspects of gymnospermas and angiosperms..
BOUT 122 **Molecular Biology**	CO-1. Study of Structure and properties of Nucleic acid. CO-2.Study of Gene structure, Transcription and Translation. CO-3 To study the advanced techniques of Genomics and Proteomics.
BOUT 123 **Biochemistry**	CO- – Know about Enzymes and Biomolecules such asamino acids, carbohydrates, Proteins.
BODT 124 **Mushroom cultivation and Bio-pesticides**	CO-1 To know the idea about the Mushroom cultivation, spawn preparation. And their economic values. CO- 2 TO study the techniques of preparation of mushroom recipes. CO-3To study about bio-pesticide
Semester-III	
BOUT 231 **Computational Botany**	CO-1. Know the basic terms and test of hypothesis inbiostatistics. CO-2. Understand the technical experimental statistics. CO-3. Know the concept of bioinformatics. CO-4. To know the concept of sampling methods.

BOUT232 Developmental Botany	CO-1. Knows the concept, features & process of plant development. CO-2. Understand embryological aspects ofdevelopment. CO-3. Know about the polyembryony, apomixis, parthenogenesis etc. CO-4. They also understand physiology, molecular basis ofdevelopment CO-5. Know about various spices, millets, leguminous crop plants and their economic importance.
BOUT 233 Plant Physiology	CO-1. Knows about plant water relations, Transport ofsolute CO2.Understand physiological aspects of plants. CO-3. Study metabolism of plants. CO-4. Study plant growth regulators. Flowering, fruiting. CO-5. Know about agro-Electronics
BODT 234 Seed Science	CO-1 To know the Scope and importance of seed technology. CO-2 To study the different techniques of hybrid seed production..
Semester-IV	
MTUT141 : Fourier Analysis and Boundary Value Problems.	CO-1. Find the Fourier series representation of a function of one variable. CO-2. Find the solution of Wave equation, Laplace equation, Heat equation using the Fourier series. CO-3. Know how to solve Boundary value problems.
BOUT241 Botanical Techniques	CO-1. Study of microscopy CO-2. Study of chromatographic, electrophoretic techniques CO-3. Spectroscopic and radioactive techniques CO-4 Centrifugation, Electrochemical techniques and immunological techniques analysis of biostatical data in Botany.
BOUT 242 Plant Ecology	CO-1. Study of Relations of Plant with environment. CO-2. Study of population ecology CO-3. Study of ecosystem types.
BODT- 243 Seed Technology	CO-1 To study the the techniques of hybrid seed production in field conditions. CO-2 To gain the knowledge about seed pathology, seed entomology, Seed processing techniques. CO-3 To know the seed legislation laws.
BODT -244 Herbal Technology	CO-1 To gain knowledge of medicinal plants in Ayurveda, Siddha, Unani and Homeopathy. CO-2 To get idea about the preparation of different herbal products.

DEPARTMENT OF CHEMISTRY

Programme Outcomes: B. Sc. Chemistry

Department of Chemistry	After successful completion of three-year degree program in Chemistry a student is able to:
Programme Outcomes	PO-1. Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry. PO-2. Solve the problem and also think methodically, independently and draw a logical conclusion. PO-3. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions. PO-4. Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community. PO-5. Find out the green route for chemical reaction for sustainable development. PO-6. To inculcate the scientific temperament in the students and outside the scientific community. PO-7. Use modern techniques, decent equipment's and Chemistry software's.

Programme Specific Outcomes: B. Sc. Chemistry

Department of Chemistry	After successful completion of three-year degree program in Chemistry a student is able to;
Programme Specific Outcomes	PSO-1. Gain the knowledge of Chemistry through theory and practicals. PSO-2. To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions. PSO-3. Identify chemical formulae and solve numerical problems. PSO-4. Use modern chemical tools, Models, Chem-draw, Charts and Equipments. PSO-5. Know structure-activity relationship. PSO-6. Understand good laboratory practices and safety. PSO-7. Develop research oriented skills. PSO-8. Make aware and handle the sophisticated instruments/equipment's.

Course Outcomes: B. Sc. Chemistry

Course	Outcomes After completion of these courses' students should be able to;
Semester-I	
CH-101: Physical Chemistry	CO-1. Student will be able to apply Thermodynamic Principle to physical & chemical process. CO-2. Calculation of enthalpy bond energies, Bond energy, bond dissociation energy, resonance energy CO-3. Third law of thermodynamic & its application CO-4. Variation of enthalpy with temperature-Kirchoffs equation CO-5. Knowledge of Chemical equilibrium will make students to understand relation between free energy & eqillibrium& factors affecting on equilibrium constant. CO-6. Gas equilibrium, equilibrium constant and molecular interpretation of equilibrium constant CO-7. Van't Haff equation and its application CO-8. Ionic equilibria chapter will lead students to understand Concept to ionization process occurred in acids, bases and pH scale CO-9. Related concepts such as Common ion effect hydrolysis constant, ionic product, solubility product CO-10. Degree of hydrolysis and pH for different salts, buffer solutions
CH-102: Organic Chemistry	CO-1 Study of types of bonding, hybridization and physical effects. CO-2 Aromaticity and Huckel's rule CO-3 Stereochemistry of compunds, conformations and configuration CO-4 Study of various projection formulae to draw structures of molecules CO-5 Synthesis and Reactions of Alkane Alkene and Alkynes.
Semester-II	
CH-201: Inorganic Chemistry	CO-1 To study origin of quantum mechanics, black body radiation, Bohr's Theory, wave particle dual nature, Heisenberg Uncertainty Principle. CO-2 To study periodicity and periodic elements. CO-3 Synthesis and reactions of Aromatic hydrocarbans CO-4 Study of alcohols, phenols and ethers. CO-5 IUPAC nomenclature of compounds.
CH-202: Analytical Chemistry	CO-1. Analytical Chemistry –branch of chemistry CO-2. Perspectives of analytical Chemistry iii. analytical problems CO-3. Calculations of mole, molar concentrations and various units of concentrations which will be helpful for preparation of solution CO-4. Relation between molecular formula and empirical formula CO-5. Stoichiometric calculation CO-6. Define term mole, mill mole, molar concentration, molar equilibrium

	concentration and Percent Concentration. CO-7. SI units, distinction between mass and weight CO-8. Units such as parts per million, parts per billion, parts per thousand, solution-dilatants volume ratio, function density and specific gravity of solutions. CO-9. Basics of type determination, characteristic tests and classifications, reactions of different functional groups. CO-10. Separation of binary mixtures and analysis CO-11 Elemental analysis – Detection of nitrogen, sulfur, halogen and phosphorous by Lassiagen's test. CO-12. Purification techniques for organic compounds. Paper and Thin layer Chromatography CO-13 Basics of chromatography and types of chromatography CO-14. Theoretical background for Paper and Thin Layer Chromatography CO-15. PH meter and electrodes for pH measurement CO-16. Measurement of pH CO-17. Working of pH meter CO-18. Applications of pH meter
Semester-III	
CH-301 Paper-1 Physical and Analytical Chemistry	CO-1. Define/explain adsorption, classification of given processes into physical and chemical adsorption. CO-2. Discuss factor sin fluencing adsorption, its characteristics, differentiates types asphysisorption and Chemisorption CO-3. Classification of Adsorption Isotherms, to derive isotherms. CO-4. Explanation of adsorption results in the ligh to Langmuir adsorption isotherm, Freundlich's adsorption Isotherm and BET theory. CO-5. Apply adsorption process to real life problem. CO-6. Solve/discuss problems using theory. CO-7. Define/Explain concept to kinetics, terms used, rate laws, molecularity, order. CO-8. Explain factors affecting rate of reaction. CO-9. Explain/discuss/derive integteral laws, characteristics,expression for half-life and examples of zero order, first order, and second order reactions. CO-10. Determination of order of reaction by integrated rate equation method, graphical method, half-lifemethod and differential method. CO-11. Explain/ discuss the term energyof activation with the help of Energy diagram. CO-12. Explanation for temperature coefficient and effect of temperature on rate constant k.

CH-302 Paper-2 Inorganic and Organic Chemistry	CO-1 Study of Aromatic hydrocarbons CO-2 IUPAC nomenclature, Physical and Chemical properties CO-3 Synthesis and Reactions of Phenols, Ethers and Alcohols. CO-4 Postulates of MOT and VBT, Drawbacks of VBT CO-5 MO diagrams of O2, N2, CO, NO, B, C, Li, He. CO-6 Introduction to Co-ordination Chemistry
Semester-IV	
CH-401 Paper-1 Physical and Analytical Chemistry	CO-1. To study different systems for their phase equilibrium. CO-2. To understand phase diagrams for various systems CO-3. To study Roaults law and Henry's law for ideal solutions with examples. CO-4. To understand maximum solution temperature, minimum solution temperature and their corresponding graphs.
CH-402 Section-I: Inorganic and Organic Chemistry	CO-1. Student should able to understand Isomerism in coordination Compounds. CO-2. They should able to find out different types of Isomerism in coordination compounds. CO-3. Student should able to apply principles of VBT to explain bonding in coordination compound of different geometries. CO-4. They should able to correlate no of unpaired electrons and orbitals used for bonding. CO-5. They should able to discuss inner and outer orbital complexes and limitation of VBT. CO-6. Student must understand principle of CFT and apply crystal field theory to different type of complexes (Td, Oh, Sq. Pl complexes) CO-7. Explain: i) strong field and weak field ligand approach in Oh complexes ii) Magnetic properties of coordination compounds on the basis of weak and strong ligand field ligand concept. iii) Origin of colour of coordination complex. CO-8. Calculate field stabilization energy and magnetic moment for various complexes. CO-9. To identify Td and Sq. Pl complexes on the basis of magnetic properties / unpaired electrons. CO-10. Explain spectrochemical series, tetragonal distortion / Jahn-Teller effect in Cu(II) Oh complexes only.
Semester-V	
	CO-1. To know historical of development of quantum mechanics in chemistry. CO-2 To understand and explain the differences between classical and quantum mechanics. CO-3 To understanding the operators: Position, momentum and energy CO-4 To solving Schrodinger equation for 1D, 2D and 3D model CO-5 To understand the term additive and constitutive properties. CO-6 To understand the term specific volume, molar volume and molar refraction. CO-7 To dipole moment and its experimental determination by temperature

CH-501 **Physical** **Chemistry-I**	variation method. CO-8 To understand electromagnetic spectrum, Nature of wave and its characteristics such as wavelength, wave number, frequency and velocity, Energy level diagram, CO-9 To know classification of molecules on the basis of moment of Inertia, CO-10 To draw the Stokes and anti-Stokes lines in a Raman spectrum CO-11 To understand difference between thermal and photochemical processes. CO-12 To know quantum yield and reasons for high and low quantum yield, CO-13 To understand photochemical reactions: photosynthesis, photolysis.
CH-502 **Analytical** **Chemistry-I**	CO-1 To know basic terms in gravimetry, spectrophotometry, qualitative analysis and parameters in instrumental analysis. Such as: Gravimetry, precipitation, solubility product, ionic product, common ion effect, precipitating agent, washing Of ppt., drying and ignition of ppt., linearity range, detection limit, precision, acuracy. CO-2 To identify important parameters in analytical processes or estimations. Example: minimum analyte concentration in particular method, reagent concentration in particular analysis, reagent for particular analysis, reaction condition to convert analyte into measurable form, drying and ignition temperature for ppt in gravimetry CO-3 To discuss / Describe procedure for different types analyses CO-4 To Select particular method of analysis if analyte sample is given to him. CO-5 To differentiate / distinguish / Compare among the different analytical terms, process and analytical methods. CO-6 To demonstrate theoretical principles with help of practical. CO-7 To design analytical procedure for given sample. CO-8 To understand Apply whatever theoretical principles he has studied in theory during practical session in laboratory.
CH-503 **Physical** **Chemistry** **Practical-I**	CO-1 To determine the molecular refractivity of the given liquids A, B, C and D. CO-2 To determine the molar refraction of homologues methyl, ethyl and propyl alcohol and show the constancy contribution to the molar refraction by CH2 group. CO-3 To titrate Cu2+ ions with EDTA photometrically. CO-4 To determine the indicator constant of methyl red indicator CO-5 To determine the order of reaction for the oxidation of alcohol by potassium dichromate and potassium permanganate in acidic medium calorimetrically. CO-6 Titration of a mixture of weak acid and strong acid with strong alkali. CO-7 To determine the velocity constant of hydrolysis of ethyl acetate by NaOH solution by conduct metric method. CO-8 To determine the molecular weight of a high polymer by using solutions of different concentrations. CO-9 Determine the radius of glycerol molecule from viscosity measurement.
	CO-1 To explain electroneutrality principle and different types of pi bonding. CO-2 Able to explain Nephelauxetic effect towards covalent bonding. CO-3 Able to explain Charge Transfer Spectra.

CH-504 Inorganic Chemistry-I	CO-4 To understand about inert and labile complexes and stability of complexes in aqueous solutions CO-5 To Understand basic mechanisms of ligand substitution reactions. CO-6 To understand Tran's effect and applications of Trans effect. CO-7 To know position of d-block elements in periodic table. CO-8 To know the general electronic configuration & electronic configuration of elements. CO-9 To Understand term f-block elements, Inner transition elements, lanthanides, actinides.
CH-505 Industrial Chemistry	CO-1 To know importance of chemical industry, CO-2 To Understand Their uses and manufacturing process. CO-3 To learn Importance of sugar industry, CO-4 To understand consumption (plantation white) sugar with flow diagram. CO-5 To know Cane juice extraction by various methods, CO-6 To understand concentration of juice by using multiple effect evaporator system. CO-7 To know basic requirement of fermentation process, CO-8 To know washing action of soap and detergents CO-9 To know classification of dyes, CO-10 To understand synthesis, Structures, properties and applications of dyes
CH-506 Inorganic Chemistry Practical-I	CO-1 Gravimetric estimation of Fe as Fe_2O_3. CO-2 Gravimetric estimation of Ba as $BaSO_4$ using homogeneous precipitation method. CO-3 Analysis of sodium bicarbonate from mixture by thermal decomposition method. CO-4 Determination of water of crystallization by thermal decomposition. CO-5 Preparation of hexamminenickel (II) chloride, $[Ni(NH_3)_6]Cl_2$. CO-6 Preparation of Potassium trioxalatoferrate (III), $K_3[Fe(C_2O_4)_3]$. CO-7 Inorganic Qualitative analysis
CH-507 Organic Chemistry-I	CO-1 To understand Polynuclear and Heteronuclear Aromatic Compounds CO-2 Write the structure, synthesis of polynuclear and heteronuclear aromatic hydrocarbons. CO-3 Understand the reactions and mechanisms CO-4 To describe the synthesis of chemical reactions of polynuclear and heteronuclear aromatic Hydrocarbons. CO-5 To know meaning of active methylene group CO-6 To understand reactivity of methylene group, CO-7 To Study different types of intermediate in rearrangement reactions. CO-8 To write the mechanism of some named rearrangement reactions and their applications. CO-9 To study of E1, E2 and E1cB mechanism with evidences of these reactions CO-10 Understand stereochemistry by using models and learn reactivity of geometrical isomers.

CH-508 Chemistry of Biomolecules	CO-1 Understanding of Cell types, Difference between a bacterial cell, Plant cell and animal cell. Biological composition and organization of cell membrane, structure and function of various cell organelles of plant and animal cell. CO-2 To understand the types of carbohydrates and their biochemical significance in living organisms, structure of carbohydrates and reactions of carbohydrates with Glucose as example. Properties of carbohydrates. CO-3 The student needs to know the types of lipids with examples, structure of lipids, properties of lipids CO-4 The student will understand the structure and types of amino acids. Reactions of amino acids. Properties of amino acids. Peptide bond formation. Types of proteins. Structural features in proteins. Effect of pH on structure of amino acid, Determination of N and C terminus of peptide chain. CO-5 The student know the classes of enzymes with subclasses and examples. Enzyme specificity, Equations of enzyme kinetics Km and its significance, features of various types of enzyme inhibitions, CO-6 To know basic concepts of Endocrinology. Types of Endocrine glands and their hormones. Biochemical nature of hormones. Mechanism of action of lipophilic and hydrophilic hormones
CH-509 Organic Chemistry Practical-I	**A) Separation of Binary Mixtures and Qualitative Analysis The students will be able to** CO-1 Perform the quantitative chemical analysis of binary mixture, explain principles behind it. CO-2 Separate, purify and analyse binary water insoluble mixture. CO-3 Separate, purify and analyse binary water-soluble mixture. CO-4 Understand the techniques involving drying and recrystallization by various method. CO-5 Learn the confirmatory test for various functional groups. **B) Preparations The students will be able to** CO-1 Systematic working skill in laboratory will be imparted in student. CO-2 Learn the basic principles of green and sustainable chemistry. CO-3 Synthesis of various organic compounds through greener approach. CO-4 Do and understand stoichiometric calculations and relate. CO-5 Understand the techniques involving drying and recrystallization by various method CO-6 Understand principle of Thin Layer Chromatographic techniques.

CH-510 Polymer Chemistry	CO-1 To know History of polymers. CO-2 To Difference between simple compounds and polymer. CO-3 Understand various ways of nomenclature. CO-4 To know difference between natural, synthetic, organic and inorganic polymers. CO-5 Understand the terms-Monomer, Polymer, Polymerization, Degree of polymerization, Functionality, Number average, Weight average molecular weight. CO-6 To study mechanisms of polymerization. CO-7 Understand uses & properties of polymers. CO-8 Role of polymer industry in the economy. CO-9 To know advantages of polymers.
CH-511 Environmental Chemistry	CO-1 Importance and conservation of environment. CO-2 Importance of biogeochemical cycles CO-3 To know water resources CO-4 Understand Hydrological Cycle CO-5 To know Organic and inorganic pollutants
T. Y. B. Sc. Semester – VI	
CH-601 Physical Chemistry-II	CO-1 To know Explanation of Daniell cell, Conventions to represent electrochemical cells CO-2 Understand EMF of electrochemical cell and its measurement. CO-3 To know Secondary reference electrodes: (a) The calomel electrode, (b) The glass electrode (c) The silver-silver chloride electrode. Understanding of these electrodes with reference to diagram, representation, Construction, working CO-4 To know types of Reversible electrodes: Metal-metal ion electrodes, Amalgam electrodes, Gas electrodes, Metal-metal insoluble salt electrodes, Oxidation-reduction electrodes with respect to examples, diagram, representation, construction, working and electrode potential. CO-5 To study Liquid junction potential and salt bridge CO-6 To know applications of emf measurements: CO-7 Applications for Secondary Batteries CO-8 To understand distinguish between crystalline and amorphous solids / anisotropic and isotropic solids. CO-9 To explain the term crystallography and laws of crystallography. CO-10 To know Cubic lattice and types of cubic lattice CO-11 Understand types and properties of radiations: alpha, beta and gamma CO-12 To know types of radioactive decay: α- Decay, β-Decay and γ-Decay CO-13 To study kinetics of Radioactive Decay, Half-life, average life and units of radioactivity CO-14 To study application of radioisotopes as a tracer.

CH-602 Physical Chemistry-III	CO-1 To know meaning of the terms-Solution, electrolytes, nonelectrolytes and colligative properties, CO-2 To study lowering of vapour pressure of solvent in solution, elevation of B.P. of solvent in solution, Landsberger's method, CO-3 To study application of colligative properties to determine molecular weight of nonelectrolyte, abnormal molecular weight, CO-4 To Know factors affecting on solid state reactions, CO-5 To understand cohesive Energy of ionic crystals based on coulomb's law and Born Haber Cycle CO-6 To understand Conductors and insulators – Its correlation with Extent of energy in energy bands CO-7To Study temperature dependant conductivity semiconductors.
CH-603 Physical Chemistry Practical-II	CO-1 To determine the PKa value of given monobasic weak acid by potentiometric titration. CO-2 To determine the formal redox potential of Fe2+/ Fe3+ system potentiometrically. CO-3 To determine the solubility product and solubility of AgCl potentiometrically using chemical cell. CO-4 To prepare standard 0.2 M Na2HPO4 and 0.1 M Citric acid solution, hence prepare four different buffer solutions using them. Determine the pH value of these and unknown solution. CO-5 To determine the degree of hydrolysis of aniline hydrochloride. CO-6 To determine the dissociation constant of oxalic acid by pH-metric titration with strong base. CO-7 To determine the molecular weight of solute by depression in freezing point method
CH-604 Inorganic Chemistry-II	CO-1 To understand M-C bond and to define organometallic compounds. CO-2 To understand the multiple bonding due to CO ligand. CO-3 To know methods of synthesis of binary metal carbonyls. CO-4 To understand the catalytic properties of binary metal carbonyls. CO-5 Understand the phenomenon of catalysis, its basic principles and terminologies. CO-6 Understand the essential properties of homogeneous catalysts. CO-7 Understand the principle of heterogeneous catalyst and development in it. CO-8 Identify the biological role of inorganic ions & compounds. CO-9 Know the abundance of elements in living system and earth crust. CO-10 Understand the toxicity of CN- and CO binding to Hb. CO-11 Understand Preparation of inorganic solids by various methods.
CH-605 Inorganic Chemistry-III	CO-1 Student will learn the concept of acid base and their theories. CO-2 They will also come to know different properties of acids and bases. CO-3 Know the nature of solids. CO-4 Know the crystal structures of solids. CO-5 Draw the simple cubic, BCC and FCC structures. CO-6 Identify the C.N. of an ion in ionic solid.

	CO-7 Know the effect of radius ratio in determining the crystal structure. CO-8 Know how to draw Born-Haber cycle. CO-9 Be able to solve simple problems based on Born- Haber cycle. CO-10 Know about carbon nanotube and its application CO-11 To know toxic chemical in the environment. CO-12 To know the impact of toxic chemicals on enzyme.
CH-606 Inorganic Chemistry Practical-II	CO-1 Analysis of Phosphate (PO43-) from Fertilizer. CO-2 Analysis of Iodine from Iodized salt. CO-3 Estimation of Na by flame photometry by calibration curve method. CO-4 Estimation of Na by flame photometry by regression method. CO-5 Purification of water using cation/anion exchange resin and analysis by qualitative analysis /conductometry. CO-6 Synthesis of Silver nanoparticles. CO-7 Verification of periodic trends using solubility of alkaline earth metal hydroxides Ca (OH)2, Mg (OH)2, Cr (OH)2, Ba (OH)2.
CH-607 Organic Chemistry-II	CO-1 Students will learn the interaction of radiations with matter. CO-2 They will understand different regions of electromagnetic radiations. They will know different wave parameters. CO-3 Students will learn the principle of mass spectroscopy, its instrumentation and nature of mass spectrum. CO-4 Students will understand the principle of UV spectroscopy and the nature of UV spectrum. They will learn types of electronic excitations. CO-5 Students will understand the principle of NMR spectroscopy and will understand various terms used in NMR spectroscopy. They will learn measurement of chemical shift and coupling constants. CO-6 Students will be able to interpret the NMR data and they will be able to use it for determination of structure of organic compounds. CO-7 Students will be able to determine the structure of simple organic compounds on the basis of spectral data such as λ max values, IR frequencies, chemical shift (δ values).
CH-608 Organic Chemistry-III	CO-1 To know disconnection, Synthons, Synthetic equivalence, FGI, TM. One group disconnection, Retrosynthesis and Synthesis of target molecules: Acetophenone, Crotonaldehyde. CO-2 To Know chemistry of reactive intermediates (carbocations, carbanions, free radicals, carbenes, nitrenes, benzynes etc.…). CO-3 To study Michael reaction, CO-4 To Understand Wittig reaction and McMurry reaction, CO-5 To know Diels-Alder reaction, CO-6 To know Preparation and Applications of following reagents. CO-7 To study Natural products.
CH-609 Organic Chemistry Practical-II	**1. Interpretations of IR and PMR Spectra The students will be able to** CO-1 Explain "fingerprint region" of an infrared spectrum can used in the identification of an unknown compound. CO-2 Identify the functional group or groups present in a compound. CO-3 Identify the broad regions of the infrared spectrum in which occur absorptions caused by N−H, C−H, and O−H, C≡C and C≡N, C=O, C=N, and C=C.

	CO-4 Understand use NMR spectra to determine the structures of compounds. CO-5 Interpret integration of NMR spectra CO-6 Interpret elemental analysis technique **2. Organic Estimations The students will be able to** CO-7 Practical knowledge of handling chemicals. CO-8Achieve the practical skills required to estimations of glucose and glycine. CO- 9 Achieve the practical skills required to Saponification value of oil. **3. Organic Extractions The students will be able to** CO-10 Apply the principles of extraction CO-11 Understand the equipment for extraction. CO-12 Gain practical hands-on experience of modern Extraction. **4. Column chromatography the students will be able to** CO-13 Defines the basic parameters in chromatography CO-14 Explain the processes of a chromatography analysis CO-15 Describes the types and materials of column.
CH-610 Chemistry of Soil and Agrochemicals	CO-1 Understood various components of soil and soil properties and their impact on plant growth. CO-2 Understood the classification of the soil. CO-3 Understood the Reclamation and management of soil physical and chemical constraints. CO-4 Got experience on advanced analytical and instrumentation methods in the estimation of soil. CO-5 Understood various Nutrient management concepts and Nutrient use efficiencies of major and micronutrients and enhancement techniques. CO-6 Proper understanding of chemistry of pesticides will be inculcated among the students. CO-7 Imparts knowledge on different pesticides, their nature and, mode of action and their fate in soil so as to monitor their effect on the environment
CH-611 Analytical Chemistry-II	CO-1To know basic terms in solvent extraction, basics of chromatography, HPLC, GC, and AAS and AES. Some important terms are: solvent extraction, aqueous and organic phase, distribution ratio and coefficient, solute remain unextracted. CO-2 Identify important parameters in analytical processes or estimations. CO-3 To explain different principles involved in the analyses using solvent extraction, basics of instrumental chromatography, HPLC, GC, and atomic spectroscopic techniques. CO-4 To perform quantitative calculations depending upon equations students has studied in the theory. Furthermore, student should able to solve problems on the basis of theory. CO-5 To demonstrate / explain theoretical principles with help of practical. CO-6 To design analytical procedure for given sample.

Programme Outcomes: M. Sc.

Department Of Chemistry	After successful completion of two-year degree program in Analytical Chemistry a student is able to:
Programme Outcomes	PO-1. Demonstrate, operate and analyze all the concepts of Analytical Chemistry PO-2. Solve the problems independently with logical thinking PO-3. Understand basic concept, historical background, instrumentation, applications of different analytical techniques PO-4. Apply stastical treatment to analytical data PO-5. Understand principle, theory, instrumentation and optimization parameters of chromatography techniques PO-6. Analyze the food and drug substances qualitatively and quantitatively PO-7. Describe the basic principles of spectroscopic techniques PO-8. Explain importance of soil, detergents, pesticides and polymer analysis PO-9. Use of analytical techniques, standard operating procedure PO-10. Inculcate the scientific temperament in the students and in the society

Programme Specific Outcomes: M. Sc.

Department of Chemistry	After successful completion of two-year degree program in Analytical Chemistry a student is able to:
Programme Specific Outcomes	PSO-1. To gain the knowledge of Analytical Chemistry through theory, practical and project PSO-2. Able to handle instrument with SOP PSO-3. Interpret the results according to quality and quantity of asample PSO-4. Understand the good laboratory practices PSO-5. Develop research oriented skills

Course Outcomes of M.Sc. -I Semester-I

CHP-110 Physical Chemistry	CO-1. Realize the terms ionic strength, activity coefficient, DHO equation. CO-2. Know the Eigen function, Eigen value, operator and postulates of quantum mechanics. CO-3. Learn two and three dimensional box, mechanics of particle. CO-4. Understand the adsorption of gases by solid type of isotherms CO-5. Learn the thermodynamic description of exact, inexact differential and State function. CO-6. Know the qualitative properties of solution, the depression in freezing Point, elevation in boiling point and osmotic pressure. CO-7. Know the statistical thermodynamics and various partition functions. CO-8. Study the steady state approximation michaelis- menten mechanism,

	lindemann-hinshelwood mechanism, chain reaction, Rate determining stapes And consecutive elementary reactions.
CHI-130- Section-I: Molecular Symmetry and its Applications	CO-1. Student should visualize/ imagine molecules in 3 dimensions. CO-2. They should be understand the concept of symmetry and able to pass various symmetry elements through the molecule. CO-3. Understand the concept and point group and apply it to molecules. CO-4. To study product of symmetry operations. CO-5. To apply the concept of point group for determining optical activity and dipole moment. Student should understand the importance of Orthogonality Theorem. CO-7. They should able to learn the rules for constructing character table. CO-8. Using reduction formulae should be able to find out the possible type of hybridization. CO-9. Student should know the concept of SALC. CO-10. Student able to find out character for reducible representation. CO -11. To know about projection operator. CO-12. Student should be able to apply projection operator to find out the normalized wave function for atomic orbital. CO-13. Student should correlate the application of symmetry to spectroscopy. CO-14. Students able to find out the possible modes of vibration. CO-15. From the previous knowledge of symmetry student must able to find out which mode are IR active.
CHO-150 Organic Chemistry-I	CO-1. To understand some fundamental aspects of organic chemistry, to learn the concept aromaticity, to understand the various types of aromaticity CO-2. To study heterocyclic compound containing one and two heteroatoms with their structure, synthesis and reactions. CO-3. To know stereochemistry of organic compounds; able to do interconversion of Fischer to Newmann, Newmann to Sawhorse and vice versa, Able to assign R and S to given molecules ;understand stereoselective and stereospecific reactions;acquire knowledge on topicity. CO-4. To study structure, formation, stability and related name reaction of intermediates like Carbocation, Carbanion, Free Radical, Carbenes and nitrenes; Recognize neighbouring group participation CO-5. To study rearrangement reaction with specific mechanism and migratory aptitude of different groups. CO-6. To study Ylides and their reaction. CO-7. To understands the basis of redox reaction; acquire knowledge about the reagents which causes selective oxidation / reduction in various compounds; learn the basic mechanism of oxidation/ reduction in organic compounds.
CHG-190	CO-1. To understand Bonding in solids – band theory

Elective Option-A : Introduction to Solid State of Matter	CO-2. Study of Electronic conductivity CO-3. Study Semiconductors, photoconductivity CO-4. Study of Non-stoichiometry, defects and types of defects in solids CO-5. Study of Ionic conductivity and their applications CO-6. To understand Superconductivity and theory of superconductivity CO-7. Study of Method of synthesis of solids
Semester-II	
CHP-210 **Physical Chemistry**	CO-1. Recognized the Fricke and cerric sulphate Dosimeter. CO-2. Learn parent-daughter relationship, application of radioactivity, NAA, IDA. Effect of radiation and units of radiation. CO-3. Learn the molecular spectroscopy, Raman, Electronic and Mossbauer and its application. CO-4. Study of Elements of Radiation Chemistry. CO-5. Study of Nuclear Fission.
CHI-230 Section: I Co-ordination Chemistry	CO-1. Student should able to find out the no of microstates and meaningful term symbols, construction of microstate table for various configuration CO -2. They should be able to Hund's rules for arranging the terms according to energy. CO -3. Student should understand inter-electronic repulsion. CO -4. Student should know the concept of weak and strong ligand field. CO -5. Student able to find out splitting of the free ion terms in weak ligand field and strong ligand field. CO -6. They should be able to correlations diagram for various configurations in Td an Oh ligand field. CO-7. Student should know basic instrumentation and selection rules and relaxation in rules. CO-8. Student should know basic d-d transition, d-p mixing, charge transfer spectra. CO-9. Interpretation of electronic spectra for spin allowed oh and td complexes using Orgel diagram. CO-10. Understand the concept of spectrochemical series and Nephelauxetic series CO-11. Should able to solve numerical based on crystal field parameters. CO-12. They must understand the various terms involved in magneto chemistry and various phenomenon's of magnetism and their temperature dependence. CO-14. They should be able to various experimental methods to find out magnetic moment. CO -15. Understand the various Quenching of orbital angular momentum.
CHO-250 Organic Chemistry-II	CO-1. MOT and will be able to extend this inpredicting reaction mechanism and stereochemistry of electrocyclic reactions. CO-2. The concepts in free radical reactions, mechanism and the stereochemical outcomes.

	CO-3. The basic principle of spectroscopic method and their application in structure elucidation of organic compounds.
CHG-290 Elective Option - B: Organometallic and Inorganic Reaction Mechanism	CO-1. Study of Valence electron count, back bonding in organometallics, spectral characterization of organometallic compounds. CO-2. To Understand Catalytic reaction involving organometallic compounds and mechanism of these reactions CO-3. Study of Types of reaction involving organometallic compounds. CO-4. Study of Types of reactions in coordination compounds, inert and labile complexes, substitution reactions in coordination complexes and their mechanism, stereochemistry of reaction, kinetics of reactions.
CHP-227:Practical Course-II	CO-1. Students are trained to different purification techniques in organic chemistry like recrystallization, distillation, steam distillation and extraction. CO-2. Students are made aware of safety techniques and handling of chemicals. CO-3. Students are made aware of carrying out different types of reactions and their work up methods. CO-4. This practical course is designed to make student aware of green chemistry and role of green chemistry in pollution reduction.

Course Outcomes: M. Sc. -II Analytical Chemistry

Semester-III

Course	Outcomes
	After completion of these courses students should be able to:
Semester-III	
CHA-390 Electrochemical and Thermogravimetric Method of Chemical Analysis	CO-1. Study of coulometry, Faraday ‘law, Faraday ‘law. CO-2. Study of voltametry and paleographic method of analysis, heterodynamic voltametry, plus paleography and cyclic voltametry. CO-3. Study of ampherometry and their applications. CO-4. Learn radio analytical methods of analysis, activation analysis, isotope dilution analysis, radio metric titration. CO-5. Understand thermal methods of analysis TGA, DTA, DSC.
CHA-391 Analytical Method Development and Extraction	CO-1. Study of Assay validation and Inter laboratory Transfer. CO-2. Study of Validation Parameter:Accuracy, Precision, Mean and Standard deviation, calibration response function CO-3. Study of Overview of world-wide regulation CO-4. Study of Dissolution Studies, USP- type I, USP –II
CHA-392 : Advanced Chromatograph	CO-1. Define / understand various terms in chromatography (GC and HPLC) and mass spectroscopy. CO-2. Explain instrumentations in chromatography (GC and HPLC) and

ic Methods Of Analysis	mass spectroscopy. CO-3. Explain / describe i) basic principles of chromatography (GC and HPLC) and mass spectroscopy. ii) separation in GC / HPLC column. iii) Functioning and construction of GC /HPLC/ MS detectors. CO-4. Explain /Describe applications chromatography (GC and HPLC) in industry and in analytical laboratory. CO-5. Apply / select particular method / instrumental parameters for analysis for sample GC / HPLC. CO-6. Solve numerical problems on chromatography (GC and HPLC) and mass spectroscopy. CO-7. IntegrateGC and HPLC chromatogram, Mass spectrum CO-8. Differentiate among the chromatography
CHA-393 B) Analysis of Food and Controlled Substances	CO-1. Define / understand various terms in food analysis techniques and methods, forensic science and drug substances. CO-2. Explain methods and principles of analysis of i) Food -carbohydrates, proteins, preservatives, ii) drug substances. CO-3. Select appropriate methods of food analysis for its quality. CO-4. Select appropriate methods for identification of drug and analysis of drug from sample. CO-5. Select and describe the parameters required for food quality. CO-6. Solve numerical problems on analysis food and drug substances. CO-7. Interpret food quality and drug substances from analytical results. CO-8. Differentiate among the different methods of analysis of food and drug substances
CHA-394 Analysis of materials	CO-1. Maintain proper record of analytical data in notebook. Observer personal safety in laboratory and able handle all chemicals, instruments, etc safely in laboratory. CO-2. Define / understand various terms involved practical methods of quantitative analysis. CO-3. Explain instrumentations of colorimeter, spectrophotometer, photoflurometer, TGA, HPLC, GC, Flame-photometer, CV, AAS, etc. CO-4. Explain / describe basic principles of chromatography different instrumental methods of analysis. Able to handle particular instrument according to SOP. CO-5. Design / modify and validate new analytical method for chemical analysis of particular sample. CO-6. Apply / select particular method / instrumental parameters for analysis of given sample. CO-7. Give mathematical treatment to analytical data and able to interpret the results accurately. CO-8. Verify theoretical principle practically or apply theory to explain practical observations. CO-9. To conclude the results able to take the decision regarding quality of

	sample. CO-10. Differentiate among the various analytical methods / techniques of chemical analysis.
Semester-IV	
CHA-490: Advanced Analytical Spectroscopic Techniques	CO-1. Define / understand various terms in atomic absorption, atomic emission, fluorescence, ESR and electron spectroscopy. CO-2. Explain instrumentation of atomic absorption, atomic emission, ICPAES, ICPAES-MS, fluorescence, ESR and electron spectroscopy. CO-3. To describe basic principles of atomic absorption, atomic emission, ICPAES, ICPAES-MS, fluorescence, ESR and electron spectroscopy. CO-4. Select appropriate methods for sample treatment in AAS / AES, ICPAES, ICPAES-MS. CO-5. Explain advantages of ICPAES-MS over AES spectroscopy, fluorescence spectroscopy. CO-6. Solve numerical problems on analysis all these spectroscopic methods. CO-7. Interpret ESR spectra, super hyperfine splitting and g value in ESR, and parameters affecting it CO-8. Calculate theoretical parameters from ESR data and characterize compound. CO-9. Solve problems based on atomic absorption, atomic emission, ICPAES, ICPAES-MS, fluorescence, ESR and electron spectroscopy.
CHA-491 Chemical Methods of Pharmaceuticals Analysis	CO-1. Define / understand various terms in pharmaceutical raw material and finished product analysis. CO-2. Explain various pharmaceutical dosage forms and types of raw materials used. CO-3. To describe basic principles of methods of pharmaceutical analysis according to IP. CO-4. Explain importance particular test in pharmaceutical raw material and finished product analysis. CO-5. Perform and explain importance of limit tests, identification tests and micobiological limit test of raw materials and finished products. CO-6. Solve numerical problems on analysis pharmaceutical raw material and finished product analysis. CO-7. Interpret IR spectra, HPLC chromatogram, UV-Visible spectra of pharmaceutical materials. CO-8. To perform total analysis of pharmaceutical raw material and finished product analysis according to IP / BP / USP. CO-9. Standardize analytical instruments according IP /BP/ USP. CO-10. Take a decision on the basis of analytical results regarding quality of raw materials so that material can be accepted for production or rejected.
CHA-492: Analytical	CO-1. Define / understand various terms in soil analysis, pesticide residue analysis, detergent analysis and polymer analysis.

Chemistry of agriculture, Polymer and Detergents	CO-2. Explain / describe techniques / methods of soil analysis, pesticide residue analysis, detergent analysis and polymer analysis. CO-3. To describe basic principles techniques / method soil analysis, pesticide residue analysis, detergent analysis and polymer analysis. CO-4. Explain importance of soil analysis, pesticide residue analysis, detergent analysis and polymer analysis. CO-5. Choose suitable method / techniques to characterize quality of soli polymer and detergent. CO-6. Describe / explain results of analysis soil, pesticide residue, detergent and polymer. CO-7. Solve numerical problems on analysis soil, pesticide residue, detergent and polymer. CO-8. Draw conclusion regarding soil, detergent and polymer quality from analytical results.
CHA-493 A Practical III Optional Analytical Chemistry Practical	CO-1. Maintain proper record of analytical data in notebook. Observer personal safety in laboratory and able handle all chemicals, instruments, etc safely in laboratory. CO-2. Define / understand various terms involved practical methods of quantitative analysis. CO-3. To analyze organic and inorganic materials using appropriate chemical / instrumental methods CO-4. Explain / describe basic principles of chemical / instrumental methods used for analysis. Able to handle particular instrument according to SOP. CO-5. Perform analysis of sample with described procedure. Able to handle analytical instruments. CO-6. Apply / select particular method / instrumental parameters for analysis of given sample. CO-7. Maintain appropriate reaction conditions as described in procedures. CO-8. To perform i) selective analysis of particular component from sample. ii) Analysis at trace level from sample. CO-9. To conclude the results able to take the decision regarding quality of sample. CO-10. To perform calculations and interpret the results.
CHA-493 B Project	CO-1. Maintain proper record of analytical data in note book for research purpose. CO-2. Perform review of literature related to the topic of project work and design the problem for project work. CO-3. Decide and describe methodology for problem to solve proposed problem in the form of project. Decide and perform application of research work. CO-4. To design experiment for research work. Collect the resources, design small equipment, etc. for completion of research work.

	CO-5. Collect experimental data (raw data) and analyze the data in the perspective of problem. Present data in graphical forms for the conclusive results. CO-6. Use computer as a tool for result analysis, presentation and writing the project. CO-7. To obtain concrete conclusion from the results on the basis of reported theory / research work and analytical results. CO-8. To perform report writing, scientifically. CO-9. To write research project / paper in scientific manner.
CHA-494 Practical III Applied Analytical Chemistry	CO-1. Maintain proper record of analytical data in notebook. Observer personal safety in laboratory and able handle all chemicals, instruments, etc safely in laboratory. CO-2. Define / understand various terms involved practical methods of quantitative analysis. CO-3. To analyze organic and inorganic materials using appropriate chemical / instrumental methods CO-4. Explain / describe basic principles of chemical / instrumental methods used for analysis. Able to handle particular instrument according to SOP. CO-5. Perform analysis of sample with described procedure. Able to handle analytical instruments. CO-6. Apply / select particular method / instrumental parameters for analysis of given sample. CO-7. Maintain appropriate reaction conditions as described in procedures. CO-8. To perform i) selective analysis of particular component from sample. ii) Analysis at trace level from sample. CO-9. To conclude the results able to take the decision regarding quality of sample. CO-10. To perform calculations and interpret the results

Course Outcomes: M. Sc. -II Organic Chemistry
Semester-III

CHO-350: Organic Reaction Mechanism and Biogenesis	CO-1 To understand reaction mechanism CO-2 To study generation, stability, reactivity of free radicals. CO-3 Understand free radical substitution, addition to multiple bonds, radical in synthesis. CO-4 To study linear free energy relationship. CO-5 To study Mono. Sesqui- Di, Tri-terpenoids Student must be able to derive ornithine lysine, Nicotinic acid, tryptophan from alkaloids CO-6 Isolation of alkaloids from the roots of piper nigrum.
CHO-351 Spectroscopic methods in structure determination	. CO-1. Study 1H NMR Spectroscopy: Chemical Shift, deshielding, correlation for protons bonded to carbon and other nuclei. CO-2. Study of 13C NMR spectroscopy: FT- NMR, type of 13C NMR spectra, proton decoupled, off resonance, APT, INEPT, DEPT, Chemical shift, nuclear and hetero nuclear coupling constant CO-3. 2D NMR techniques: COSY, homo and hetero nuclear 2D resorts spectroscopy, NOESY and the applications CO-4. Study of mass spectrometry: Instrumentation, various methods of ionization, SIMS, FAB, MALDI. Different detectors rules of fragmentations of different functional groups
CHO-352 Stereochemistry and Asymmetric Synthesis of Organic Compound	Co.1. To study conformations of polysubstituted cyclohexane six member ring with SP^2 Carbon CO.2. To study stereochemical principles involved in reactions of six member ring and other than six-member ring CO.3.Study stereochemistry of fused and bridge ring system CO.4 To understand asymmetric synthesis, chiral pool and chiral auxiliaries CO.5 to study transition metal catalyzed homogenous asymmetric hydrogenation

CHO-353 **Protection –Deprotection, Chiron approach and Carbohydrate**	CO-1. Study of protection and deprotection in ketone and aldehyde. CO-2. Study of Protection and deprotection in amine. CO-3. To understand the concept of Chiral templates. CO-4. Study of concept of Glycosyl Donor and acceptor. CO-5 Study the synthesis of Glycosides. CO-6 To Understand intramolecular Glycosylation.
CHO –354 **Practical-I** **Solvent Free Organic Synthesis**	CO -1 Study of solvent free carbon carbon bond formation in different reaction CO.2. Study of Beckmann Rearrangement in Nitrogen Nitrogen bond formation CO-3. To understand oxidative coupling of Thiol by using MnO2 CO-4. Study of solvent free supra molecular assembly formation
Semester-IV	
CHO-450 **Chemistry of Natural Products**	CO-1. Learn different synthesis of heterocycles like. CO-2. Understand the stereochemistry of complex compound. CO-3. Knowledge of name reaction in synthesis. CO-4. Study of different applications of name reactions. CO-5. To understand the use of various synthesis strategies in drug synthesis. CO-6. Study of recent drug development. CO-7. Study of synthetic strategies involved in preparation.
CHO-451 Organometallic Reagents in Organic Synthesis	CO-1 To study ring formation reaction CO-2 To understand criteria for Click Reaction. CO-3 To study the use of Boron and Silicon in Organic Synthesis. CO-4 To study carbon-carbon double bond formation reaction in organic synthesis. CO-5 To study transition metal complex in organic synthesis. CO-6 To understand mechanism for multi component Reaction. CO-7 To Study Metathesis in organic synthesis.
CHO-452-Concepts and applications of Medicinal Chemistry	CO-1. Understand the chemistry of peptides and proteins to study the catalytic activity of proteins as enzymes. CO-2. To study the nucleic acid mechanism. CO-3.Understanding of chemistry of vitamins in biological system. CO-4. To understand the drug design chemistry of diseases and drug

	development. CO-5.To studies the peptides sequencing in therapeutics. CO-6 To study the pharmacokinetics and pharmacodynamics of drugs.
CHO-453 Carbohydrate synthesis and Natural Product Extraction	CO-1 To separate ternary mixture by using ether solvent. CO-2 To carry out individual qualitative analysis of compound. CO-3 To find functional group CO-4 To find out the physical constants. CO-5 To Identify colourd pigments from plant material.
CHO-454 Convergent and Divergent Organic Synthesis	CO-1. To Study the Synthesis of 4-amino anisole from Anisole. CO-2. To Synthesize Pyrimidine from Acetyl acetone CO-3. To Synthesize dye from Beta-Naphthol

DEPARTMENT OF COMPUTER SCIENCE

Programme Outcomes: B. Sc. Computer Science

Department of Computer Science	After successful completion of three year degree program in Computer Science a student will be able to:
Programme Outcomes	PO1: To develop problem solving abilities using a computer.; PO2: To prepare necessary knowledge base for research and development in Computer Science. PO3:To build the necessary skill set and analytical abilities for developing computerbased solutions for real life problems. PO4:communicate scientific information in a clear and concise manner both orallyand in writing. PO5:To train students in professional skills related to Software Industry PO6: Have developed their critical reasoning, logic judgment and communication skills. PO7: Augment the recent developments in the field of IT and relevant fields of Research and Development. PO8: Enhance the scientific temper among the students so that to develop are search culture and Implementation the policies to tackle the burning issues at global and local level.

Programme Specific Outcomes: B. Sc. Computer Science

Department of Computer Science	After successful completion of three year degree program in Computer Science a student will be able to:
Programme Specific Outcomes	PSO1: Students understand the concepts of software application and projects. PSO2: Students understand the computer subjects with demonstration of allprogramming and theoretical concepts with the use of ICT. PSO3: Development of in-house applications in terms of projects PSO4: Students will build up programming, analytical and logical thinking abilities.PS06: Aware them to publish their work in reputed journals PS05: To make them employable according to current demand of IT Industryand responsible citizen.

Course Outcomes: B. Sc. Computer Science

Course	Outcomes
	After completion of these courses students should be able to:
Semester-I	
Course CS-111: Problem Solving using Computer and 'C' Programming	CO1: Students will understand algorithms and flowchart for solving problems using computers. CO2: Students will understand and can choose the loops and decision-making statements to solve the problem. C03: Student will implement different Operations on arrays and will use functions to solve thegiven problem. CO4: To enrich the students in logic development required for programming. CO5: To help the students to build carrier in various branches of software development.
Course CS-112 Database Management Systems	CO1: Will understand user requirements and frame it in data model. CO2: Will understand creations, manipulation and querying of data in databases CO3: Solve real world problems using appropriate set function, and relational models. CO4: Design E-R Model for given requirements and convert the same into database tables. CO5:Use SQL.
Course CS103 : Practical course on Problem Solving using Computer and 'C' programming and Database Management Systems	CO1: Devise pseudocodes and flowchart for computational problems. CO2: Write, debug and execute simple programs in 'C'. CO3: Create database tables in post gre SQL. CO4: Write and execute simple, nested queries.
Semester-II	
Course CS121 Advanced 'C' Programming	CO1: Study advanced concepts of programming using the 'C' language. CO2: Design and develop solutions to real world problems using C. CO3: To Develop modular programs using control structures, pointers, arrays, stringsand structures
Course CS122 :	CO1: Use database techniques such as SQL & PL/SQL.

Relational Database Management Systems	CO2: Explain transaction Management in relational database System. CO3: Use advanced database Programming concepts
Course CS123 : Practical Course on Advanced 'C' Programming and RDBMS	CO1: Write, debug and execute programs using advanced features in 'C'. CO2: To use SQL & PL/SQL. CO3: To perform advanced database operations.
Semester-III	
Course CS-231: Data Structures and Algorithms-I	CO1. Use well-organized data structures in solving various problems. CO2. Differentiate the usage of various structures in problem solution. CO3. Implement algorithms to solve problems using appropriate data structures.
Course CS 232 Software Engineering	CO1. Compare and chose a process model for a software project development. CO2. Identify requirements, analyze and prepare models. CO3. Prepare the SRS, Design document, Project plan of a given software system.
CS 233 Practical course on CS 231 and CS 232	CO1. Prepare a detailed statement of problem for the selected mini project CO2. Identify suitable process models for the same. CO3. Develop Software Requirement Specification for the project. CO4. Identify scenarios and develop UML Use case
Semester-IV	
Course CS-241: Data Structures and Algorithms-II	CO1-Implementation of different data structures efficiently CO2-Usage of well-organized data structures to handle large amount of data CO3-Usage of appropriate data structures for problem solving
Course CS-242: Computer Networks-I	CO1: Students will know the design issues for the layers, layered architecture of the NetworkModels & functions performed at each layer. CO2: Students will come to know the role played by different addresses at different layers ofthe network models. CO3: Students will be able to understand the need and importance of protocols at each layerin the communicating computers.
Semester-V	

Course CS 351: Operating System-I	CO1: Students will understand the design and implementation of System programs. CO2: Students will understand the role of System programs in program development. CO3: Students will able to differentiate between System program and Application program.
Course CS 352: Computer Networks II	CO1: Students will get acquainted with fundamentals of Networking like PAN, LAN, MAN,WAN, topologies and Home & Business applications of Networks. CO2: Students will clear their basic concepts about the standards, their need & types ofstandards. CO3: Students will know the design issues for the layers, layered architecture of the NetworkModels & functions performed at each layer. CO4: Students will come to know the role played by different addresses at different layers ofthe network models.
Course CS 353: Web Technologies-I	CO1: Students will gain deep understanding of the use and implementation of HTML 5 andPHP language. CO2: Students will be able to write well-structured, easily maintained, standards-compliant,responsive HTML code. CO3: Students will get acquainted with Object Oriented Web applications.
Course Code: CS - 354	CO1: Perform Exploratory Data Analysis CO2: Obtain, clean/process, and transform data. CO3: Detect and diagnose common data issues, such as missing values, special values, outliers, inconsistencies, and localization. CO4: Demonstrate proficiency with statistical analysis of data.
Course Code: CS - 355	CO1-Understand the concept of classes, object, packages and Collections. CO2-To develop GUI based application.
Course CS 356: Theoretical Computer Science	CO1: Design a finite automaton to recognize a given regular language. CO2: Transform a language into regular expression or finite automaton or transition graph anddefine deterministic and nondeterministic finite automata. CO3: Prove properties of regular languages and classify them. CO4: Define relationship between regular languages and context-free grammars.
Course Code: CS - 357 Practical Course based on CS - 351	CO1-Process synchronization CO2. Processes and Thread Scheduling by operating system CO3. Memory management by operating system using with the help of various schemes
Course Code: CS - 358	CO1- Understand how to develop dynamic and interactive Web Page CO2-Prepare data for use with a variety of statistical methods and

Practical Course based on CS - 353 and CS - 354	recognize how the quality of the data may affect conclusions. CO3- Perform exploratory data analysis
Course Code: CS - 359 Practical Course based on CS - 355	CO1-Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs. CO2-Read and make elementary modifications to Java programs that solve real-world problems. CO3-Validate input in a Java program.
Course Code : CS-3510 Course Title: Python Programming	CO1-Develop logic for problem solving CO2- Determine the methods to create and develop **Python programs** by utilizing the data CO3- structures like lists, dictionaries, tuples and sets.
Course Code : CS-3511 Blockchain Technology	CO1. Learn the fundamentals of Blockchain Technology. CO2. Learn Blockchain programming CO3. Basic knowledge of Smart Contracts and how they function.
Semester-VI	
Course CS 361: Operating System-II	CO1. Management of deadlocks and File System by operating system CO2. Scheduling storage or disk for processes CO3. Distributed Operating System and its architecture and the extended features in mobile OS.
Course Code: CS - 362 Software Testing	CO1-To understand various software testing methods and strategies. CO2- To understand a variety of software metrics, and identify defects and managing those defects for improvement in quality for given software.
Course Code: CS - 363 Course Title : Web Technologies - II	CO1- Build dynamic website. CO2- Using MVC based framework easy to design and handling the errors in dynamic website.
Course Code: CS - 364 Data Analytics	CO1-Use appropriate models of analysis, assess the quality of input, and derive insight from results. CO2-Analyze data, choose relevant models and algorithms for respective applications
Course Code : CS - 365 Object Oriented Programming using Java – II	CO1-To access open database through Java programs using Java Data Base Connectivity (JDBC) and develop the application. CO2- Understand and Create dynamic web pages, using Servlets and JSP.

Course Code: CS - 366 Compiler Construction	CO1-Understand the process of scanning and parsing of source code. CO2-Learn the conversion code written in source language to machine anguage. CO3-Understand tools like LEX and YACC.
Course Code: CS - 3610 Software Testing Tools	CO1-To understand various software testing methods and strategies. CO2- To understand a variety of software metrics and identify defects and managing those defects for improvement in quality for given software.

Programme Outcomes: M. Sc. Computer Science

Department of Computer Science	After successful completion of three year degree program in Computer Science a student will be able to:
Programme Outcomes	PO1-Become technology-oriented with the knowledge and will get the ability to develop creativesolutions, and will better understand the effects of future developments of computer systems and technology on people and society. PO2-Identify, formulate, and develop solutions to computational challenges. through projectwork. PO3- Get ability to apply knowledge of computer science and skills to succeed in their career/ professional development and/or postgraduate education to pursue flexible career paths amidst future technological changes to real-world issues. PO4-Understand and apply computer science principles to manage multi disciplinary projects using knowledge of programming languages, cloud computing, web services, different database technologies, operating systems and different design patterns

Programme Specific Outcomes: M. Sc. Computer Science

Department of Computer Science	After successful completion of three year degree program in Computer Science a student will be able to:
Programme Specific Outcomes	PSO1-Apply the fundamentals of mathematics, science knowledge to understand, analyze and develop computer programs in the areas related to algorithms, Advanced Operating System, Database Technology, mobile technologies, software projectmanagement, multimedia, big data

	analytics, machine learning, artificial intelligence and networking for efficient design of computer-based systems of varying complexity PSO2-Communicate computer science concepts, designs, and solutions effectively andprofessionally. PSO3- Apply appropriate techniques and modern hardware and software tools for the design andintegration of computer systems and related technologies with the use of ICT. PSO4- Interact with IT experts & will gain knowledge by IT visits.

Course Outcomes: M. Sc. Computer Science

Course	Outcomes
	After completion of these courses' students should be able to:
Semester-I	
CSUT111 : Paradigm of Programming Language	CO1-Separate syntax from semantics CO2-Compare programming language CO3-Understand basic language implementation techniques CO4-Learn small programs in different programming Languages
Course Code: CSUT112 Design and Analysis of Algorithm	CO1-To learn basic Algorithm Analysis techniques and understand the use of asymptotic notation CO2-Understand different design strategies CO3-To provide foundation in algorithm design and analysis CO4- To develop ability to understand and design algorithms in context of space and time complexity
Course Code: CSUT113 Database Technologies	CO1-Provide an overview of the concept of NoSQL technology. CO2- Provide an insight to the different types of NoSQL databases
Course Code: CSDT114A Cloud Computing	CO1-To Learn the principles and paradigm of Cloud Computing CO2-To appreciate the role of Virtualization Technologies CO3-Ability to design and deploy Cloud Infrastructure
Semester-II	
Course Code: CSUT121 Advanced Operating System	CO1-Learn programming interface to the Unix/Linux system - the system call interface. CO2- It is intended for anyone writing C programs that run under Unix/Linux. CO3-Understanding of the functions of Operating Systems. It also provides provide an insight into functional modules of Operating Systems.
Course Code: CSUT122	CO1-To impart basic understanding of the wireless communication systems. CO2-To expose students to various aspects of mobile and ad-hoc networks.

Mobile Technologies	CO3-Understand the issues relating to Wireless applications CO4-Understand the Mobile security
Course Code: CSUT123 Software Project Management	CO1-Software Metrics and Project Management covers skills that are required to ensure successful medium and large scale software projects. CO2- It examines Requirements Elicitation, Project Management, Verification &Validation and Management of Large Software Engineering Projects.
Semester-III	
CSUT231- Software Architecture and Design Patterns	CO1-Recognize the characteristics of patterns that make it useful to solve real world problems. CO2- Able to use specific frameworks as per applications need. CO3- Design java application using design pattern techniques.
CSUT232 Machine Learning	CO1-Recognize the characteristics of machine learning that make it useful to real-world problems. CO2- Process available data using python libraries and predict outcomes using Machine Learning algorithms to solve given problem CO3-Able to estimate Machine Learning models efficiency using suitable metrics. CO4- Design application using machine learning techniques
CSUT233- Web Frameworks	CO1-Students will be ready with the technology which is used widely in Industry as a part of full stack developer. CO2-Students will know the powerful way to develop the web application in Python. CO3-Students will understand what really the asynchronous programming.
Semester-IV	
CSUIT241 : Industrial Training /Institutional project	CO1-Learn the basic concepts of Project & Project Management. CO2-Become capable of self-education and clearly understand the value of achieving Perfection inthe respective Project work CO3- Plan, schedule and execute a project considering the risk management and apply qualityattributes in software development life cycle

DEPARTMENT DEFENCE STUDY

Course Outcomes: B. A. DEFENCE STUDY

Course	Outcomes
	After successful completion of three year course in Defence study student will be able to:
Semester-I	
Defence organization of India Ds101 11271	CO-1. This paper will cover military organization in India, reconstruction of armed forces after 1947, higher defense organization as well as intelligence organization in India. CO-2. The basic outcome of the paper is to introduce students to defence organization of India. CO-3. The students were introduced to the committee, regional organization and command organization in the Indian armed forces defence system. CO-4. A sense of national service should be created in the students.
Semester-II	
India's national security Ds 201 11272	CO-1. The basic aim of this paper is to make aware the students about India's national security. CO-2. This paper covers overall picture of India's national security. CO-3. Which encompasses the internal, external challenges to India's national security along with its dimensions CO-4. The national security or safety of a country also depends on the social and economic factors of the respective country
Semester-III	
Chhatrapati Shivaji Maharaj as a nation builder cc-1d 23173	CO-1. The course focuses on the war history of the Marathas. CO-2. The emphasis is on the strategies and tactics used and on the approaches to war. CO-3. Specific battles would be used as illustrations for the study.
Semester-IV	
Chhatrapati Shivaji Maharaj as a nation builder cc-1d 24273	CO-1. The focus is on the strategies and tactics used and on the approaches to war. CO-2. To gain knowledge of military history. CO-3. Chhatrapati Shivaji Maharaj occupied thee forts of Chakan, Kondana and Purandhar
Semester-V	

India's national security cc-1d 35273	CO-1. Internationally; aimed at to create favorable national and international conditions for the protection or extensions of national interests against existing or potential enemy threats". CO-2. In this context, the aim of the paper is to make students to understand ever changing different issues directly or indirectly involved in this study.
Semester-VI	
India's national security cc-1d 36273	CO-1. The security has an extended meaning beyond its military dimension; there is better appreciation now of its non – military and human dimensions. CO-2. Understand the importance of guidance and counselling in Education.

DEPARTMENT OF ECONOMICS

PROGRAM OUTCOMES: B. A. ECONOMICS

DEPARTMENT OF ECONOMICS	After successful completion of three year degree program in Economics student should be able to
Programme Outcomes	PO-1. To able to understand basic concepts of economics. PO-2. To able to analyze economic behavior in practice. PO-3. Understand the economic way of thinking. PO-4. The ability to analyze historical and current events from an economic perspective. PO-5. The ability to write clearly expressing an economic point of view. PO-6. Be exposed to alternative approaches to economic problems through exposure to coursework in allied fields. PO-7. To create student's ability to suggest of the various economic problems.

PROGRAM SPECIFIC OUTCOMES: B. A. ECONOMICS

DEPARTMENT OF ECONOMICS	After successful completion of three year degree program in Economics student should be able to
Program Specific Outcomes	PSO-1. To able to understand basic concepts of economics. PSO-2. Use the basic models of consumer and firm theory to derive consumer demand and firm input functions; and demonstrate key results in economic theory (such as the laws of demand and supply). PSO-3. Explain what is meant by economic efficiency and the mechanism by which competitive markets lead to an efficient allocation of resources. PSO-4. The ability to analyze historical and current events from an economic perspective. PSO-5. The ability to write clearly expressing an economic point of view. PSO-6. Analyze economic information and develop solutions to economic problems. PSO-7. To create student's ability to suggest of the various economic problems. PSO-8. Recognize that although economists address economic problems with a common approach, the science is ever changing, and one's approach must be regularly evaluated and updated. PSO-9. Explain the distinction between real and nominal values, and why this matters for understanding consumer and firm behaviour as well as the national economy. PSO-10. Predict the impact of fiscal and monetary policy – use of deficits, changes in the money supply, etc. – on overall economic performance.

COURSE OUTCOMES: B. A. ECONOMICS

Course	Outcomes
	After completion of these courses students should be able to :-
Semester-I	
EC- 11151: G-1 Indian Economic Environment-I (SEM I)	CO-1. To able to understand nature, Basic Characteristics and Major issues of Indian economy. CO-2. To able to make it contextual as well as applicable and to incorporate all the latest changes in the national economy. CO-3. To familiarize the students with the recent developments in the Indian Economy CO-4. To provide the students with the background of the Indian Economy with focus on contemporary issues like economic environment. CO-5. To provide the students with the background of the Indian Economy with focus on contemporary issues like economic environment. CO-6. Ability to develop an understanding of the economic environment and the factors affecting economic environment.
Semester-II	
EC- 11152: G-1 Indian Economic Environment (Sem. II)	CO-1. To help the students to prepare for varied competitive examinations CO-2. To enable students to understand and comprehend the current business scenario, agricultural scenario and other sectorial growth in the Indian. CO-3. To enable students to understand and comprehend the current business scenario, agricultural scenario and other sectorial growth in the Indian CO-4. Ability to develop awareness on the various new developments in the different sectors of an economy – agriculture, industry, services, banking, etc. CO-5. Context. To make the student aware of the developments such as MSMEs, Digital Economy, E-Banking, BPO & KPO, etc. CO-6. Ability to compare and contrast Indian Economy with other world economies. At the end of the course, the student should be able discuss and debate on the various issues and challenges facing the Indian Economic Environment. Understand population & economic development.
Semester-III	
DSE-1A **S-1: Micro Economics-I** (23151)	CO-1. To develop an understanding about subject matter of Economics. CO-2. To impart knowledge of microeconomics. CO-3. To clarify micro economic concepts. CO-4. To analyze and interpret charts, graphs and figures. CO-5. To develop an understanding of basic theories of micro economics and their application. CO-6. To demonstrate that the theories discussed in class will usually be applied to real-life situations. CO-7. To help the students to prepare for varied competitive examinations.

DSE-2A **S2: Macro Economics-I (23152)**	CO-1. To introduce students to the historical background of the emergence of macroeconomics. CO-2. To familiarize students with the differences between microeconomics and macroeconomics CO-3. To familiarize students with various concepts of national income CO-4. To familiarize students with Keynesian macroeconomic theoretical framework of consumption and investment functions CO-5. To introduce students to the role of money in an economy. CO-6. To introduce students to the conceptual and theoretical frameworks of inflation, deflation and stagflation, Business Cycle.
Semester-IV	
CC-1C **G2: Financial System-I (23153)**	CO-1. To understand fundamentals of modern financial system. CO-2. To understand the recent trends and developments in banking system. CO-3. To understand the role of the Reserve Bank of India in Indian financial system. CO-4. To provide the knowledge of various financial and non-financial institutions. CO-5. To provide the students the intricacies of Indian financial system for better financial decision making.
SEC-2A Basic Concept of Research Methodology-I (23154)	CO-1. Prepare a chart showing the steps of research. CO-2. Prepare a chart showing the sampling technique. CO-3. Prepare Charts showing sources of primary data. CO-4. Prepare a chart showing sources of secondary data. CO-5. Construct a questionnaire to measure student's attitude towards the purchase of two wheelers / readymade garments etc. CO-6. Collect the data related to any schemes of your locality and Present in front of the students. CO-7. Construct a questionnaire for collection of primary data on any Social issue.
DSE-2B **S-1: Micro Economics-II** (24151)	CO-1. Student is expected to understand the behavior of an economic agent, namely, a consumer, a producer, a factor owner, and the price fluctuation in a market. CO-2. To understand nature and scope of economics, the theory of consumer behavior, analysis of production function and equilibrium of a producer, the price formation in different markets structures and the equilibrium of a firm and Industry. CO-3. To able to understand concept of Revenues and cost of Production. CO-4. To able to understand Linear & Non- Linear functional relationship. CO-5. To able to understand price determination of factors (Rant, wages, interest and Profit.) CO-6. To able to understand meaning of social welfare function.
DSE-2B **S2: Macro Economics-II (24152)**	CO-1. To introduce students to the historical background of the emergence of macroeconomics. CO-2. To familiarize students with the differences between microeconomics and macroeconomics. CO-3. To introduce students to the conceptual and theoretical frameworks of Inflation, deflation and stagflation, Business Cycle. CO-4. To familiarize students with the conceptual and theoretical framework of business cycles. CO-5. To introduce students to the role of monetary and fiscal policies in

	fulfilling the macroeconomic objectives of stability, full employment and growth. CO-6. To introduce students to the various instruments of monetary and fiscal policies.
CC-2D **Financial System-II (24153)**	CO-1. To develop an understanding about subject matter of Economics. CO-2. To impart knowledge of microeconomics. CO-3. To clarify micro economic concepts. CO-4. To analyze and interpret charts, graphs and figures. CO-5. To develop an understanding of basic theories of micro economics and their application. CO-6. To demonstrate that the theories discussed in class will usually be applied to real-life situations. CO-7. To help the students to prepare for varied competitive examinations.
SEC-2B Basic Concept of Research Methodology-II (24154)	CO-1. Demonstrate his/her understanding of sampling methods and the ability to use collection of data. CO-2. Identify the appropriate sample techniques for different kinds of research questions. CO-3. Identify the appropriate source of data in relation to the collection of Research data. CO-4. Able to classify and present the collected data in the form of graph, bar diagram, chart etc.
Semester-V	
G-3: Economic Development and Planning (3157)	CO-1. To understand the differences between Economic growth and Development, Indicators of Economic Development. CO-2. To able to understand Characteristics of Developing Countries. CO-3. To able to understand Constraints on Development Process. CO-4. To able to understand theories and Approaches of economic development. CO-5. To able to understand some growth models. CO-6. To understand macroeconomic policies, roll of foreign capital and economic planning etc. in developing countries.
S-3: International Economics (3158)	CO-1. To able to understand Nature, Scope and Importance of International Economics. CO-2. To able to understand theories international trade. CO-3. To able to understand gains from international trade & their measurements. CO-4. To able to understand theory of intervention in trade. CO-5. To able to understand the theory of regional blocks. CO-6. To able to understand trade policies in India. CO-7. To able to understand international financial institutions. CO-8. To able to understand foreign direct investments. CO-9. To able to understand foreign exchange market.
S-4: Public Finance (3159)	CO-1. To able to understand Functions and Role of Government in Economy and Meaning, Nature, Scope & Importance's of public finance CO-2. To understand various Approaches about Role of Government and Principle of Maximum Social Advantage- Dr. Dalton. CO-3. To able to understand concept of public expenditure and understand concept of public revenue. CO-4. To able to understand incidence & approaches of taxation. CO-5. To able to understand concept of public debt.

	CO-6. To able to understand concept of budget & deficit finance. CO-7. To able to understand taxation & public debt of India. CO-8. To able to understand fiscal federalism in India.

PROGRAM OUTCOMES: M. A. ECONOMICS

	After successful completion of three year degree program in Economics student should be able to
Programme Outcomes	PO-1. Use the basic models of consumer and firm theory to derive consumer demand and firm input functions; and demonstrate key results in economic theory (such as the laws of demand and supply). PO-2**.** Use models to describe economic phenomena; analyze and make predictions about the impact of government intervention and changing market conditions on consumer and producer behavior and well-being. PO-3. Explain what is meant by economic efficiency and the mechanism by which competitive markets lead to an efficient allocation of resources. PO-4. Recognize that markets fail to efficiently allocate resources in the presence of externalities, market power, and imperfect information. PO-5. The ability to write clearly expressing an economic point of view. PO-6. Discuss the potential for efficiency-improving government intervention into inefficient markets. PO-7. To create student's ability to suggest of the various economic problems. PO-8. Explain the distinction between real and nominal values, and why this matters for understanding consumer and firm behavior as well as the national economy. PO-9. Predict the impact of fiscal and monetary policy – use of deficits, changes in the money supply, etc. – on overall economic performance. PO-10. Discuss the costs and causes of unemployment, and assess public policies to ameliorate it. PO-11. Discuss economic globalization and the inter-connectedness of nations.

PROGRAM SPECIFIC OUTCOMES: M. A. ECONOMICS

After successful completion of two year degree program in Economics student should be able to	
Program Specific Outcomes	PSO-1. To able to understand basic concepts of economics. PSO-2. Use the basic models of consumer and firm theory to derive consumer demand and firm input functions; and demonstrate key results in economic theory (such as the laws of demand and supply). PSO-3. Explain what is meant by economic efficiency and the mechanism by which competitive markets lead to an efficient allocation of resources. PSO-4. The ability to analyze historical and current events from an economic perspective. PSO-5. The ability to write clearly expressing an economic point of view. PSO-6. Analyze economic information and develop solutions to economic problems. PSO-7. To create student's ability to suggest of the various economic problems. PSO-8. Recognize that although economists address economic problems with a common approach, the science is ever changing, and one's approach must be regularly evaluated and updated. PSO-9**.** Explain the distinction between real and nominal values, and why this matters for understanding consumer and firm behavior as well as the national economy. PSO-10**.** Predict the impact of fiscal and monetary policy – use of deficits, changes in the money supply, etc. on overall economic performance.

COURSE OUTCOMES: M. A. ECONOMICS

Course	**Outcomes**
	After completion of these courses students should be able to :-
Semester-I	
EC- 1001: Micro Economic Analysis I (12301)	CO-1. To provide a thorough understanding of the principles of economics CO-2. To enable students to apply micro economic concepts in various contexts. CO-3. To enable understanding the basic theories in microeconomics such as demand theory, production theory, market structures. CO-4. To discuss the modern developments in micro economics such as Modern Demand theories. CO-5. Ability to apply the concepts of micro economics such as demand, supply, revenue, cost, elasticity, etc. CO-6. Ability to analyze and demonstrate knowledge of the basic theories/laws in economics- law of demand, law of supply, production function, etc. CO-7. At the end of the course, the student should be able to evaluate Microeconomic concepts, models and its use in real life situations.

EC-1002 Public Economics I (12302)	CO-1. To develop an understanding of the changing role of the government and the fiscal functions of the modern governments. CO-2. To discuss and deliberate on the concepts and theories in public economies like public policy, principles of taxation, theories of public expenditure, etc. CO-3. To develop an understanding of various policies in public economics like fiscal policy, taxation policy, public debt policy, public expenditure policy etc. CO-4. Ability to recognize, apply and analyze concepts and theories in public economics. CO-5. Ability to appraise and assess the theory of public economics in real life situations.
EC-12303: International Trade (12303)	CO-1. To develop an understanding of the theoretical concept in international trade. CO-2. To analyze international economics with reference to terms of trade, trade policy, trade agreements etc. CO-3. To provide knowledge to students regarding recent developments and changes in international banking, international banking agreements etc. CO-4. To make the students understand role of international economic organization and global crisis development. CO-5. Ability to understand the concepts of international economics such as comparative cost, terms of trade, trade policies and trade agreements. CO-6. Ability to interpret and apply theory relating to understand international trade. CO-7. Ability to discuss and debate the effects of trade policy, trade agreements, exchange rate policies on the world economy/trade
EC-1004: Agricultural Economics (12304)	CO-1. To develop an understanding of agricultural economics in the theoretical as well as practical context. CO-2. To discuss and debate the various issues and challenges faced by agrarian economies w.r.t. production, productivity, efficiency, employment, etc. CO-3. Ability to analyze and evaluate the subject with reference to various aspects of agrarian economies. CO-4. Ability to develop an understanding of agriculture with its intricacies and imperfections and to be able to construct intellectual dialogue on the challenges of agriculture.
Semester-II	
EC2001: Micro Economic Analysis II (22301)	CO-1. To provide a thorough understanding of the principles of economics. CO-2. To enable students to apply micro economic concepts in various contexts. CO-3. To enable understanding the basic theories in microeconomics such as demand theory, production theory, market structures. CO-4. To discuss the modern developments in micro economics such as Game Theory. CO-5. Ability to apply the concepts of micro economics such as demand, supply, revenue, cost, elasticity, etc.
EC2002 Public Economics II (22302)	CO-1. To develop an understanding of various policies in public economics like fiscal policy, public debt policy, fiscal finances, etc. CO-2. To help the students to understand the normative policies and compare

	it with the policies framed and followed by Indian economy. CO-3. To impart information to the students about the reforms like taxation reforms in India. CO-4. Ability to understand, apply and analyze concepts-public debt, budget, fiscal policy in public economics. CO-5. Ability to interpret the theories relating to public economics in real life situations. CO-6. Ability to discuss and debate on the public finance and policies w.r.t. India.
EC2003: International Finance (22303)	CO-1. To develop an understanding of the theoretical concept in international finance- Balance of Payments, exchange rate policies, capital flows, etc. CO-2. To compare and contrast the scenarios on international trade in India vis-à-vis the world economy. CO-3. To provide knowledge to students regarding recent developments and changes in international banking, international banking agreements etc. CO-4. To make the students understand role of international economic organization and global crisis development. CO-5. Ability to understand and interpret the concepts such as Balance of Payments, Exchange Rates, Foreign Exchange transactions, International capital flows, etc. CO-6. Ability to critically analyze the effects of deficits, exchange risk, role of foreign capital on the world economy/trade. CO-7. Ability to discuss and debate on subjects related to international trade and finance w.r.t the Indian Economy.
EC2004: Labour Economics (22304)	CO-1. To develop an understanding of labour economics in the theoretical as well as practical context. CO-2. To discuss and debate the various issues and challenges faced by labour with reference to division of labour, employment, wage determination, etc. CO-3. To demonstrate on the various aspects of labour dynamics and labour relations w.r.t. India. CO-4. Ability to analyze and evaluate the subject with reference to various aspects of Labour economics. CO-5. Ability to develop an understanding of the labour with its intricacies and imperfections and to be able to construct intellectual dialogue on the challenges of labour w.r.t. the Indian Economy.
Semester – III	
EC3001 Macro Economics Analysis-I (32301)	CO-1. To provide a thorough understanding of the principles of macroeconomics and the application of macroeconomic concepts in real-life situations. CO-2. To discuss the modern developments in macroeconomics. CO-3. Ability to analyze and demonstrate knowledge of the basic theories / laws in macroeconomics. CO-4. At the end of the course, the student should be able to evaluate macroeconomic concepts, models and its use in real life situations.
EC-3002: Growth & Development – I (32302)	CO-1. To enable learning and understanding of the basic concepts and process to measure the growth and economic development etc. CO-2. To analyze and evaluate the obstacles in the process of economic growth and development. CO-3. Ability to apply the concepts of economic growth and compare

	international comparison of economic development, etc. CO-4. Ability to analyze and demonstrate knowledge of the economic growth and development theories of economic growth and development
EC-3003: Research Methodology- I (32303)	CO-1. To enable an understanding of Research and its methods under various areas of economics. CO-2. To demonstrate the practical and the applied aspects of research in relation to Economics. CO-3. Ability to develop, demonstrate and examine topics under Economics to pursue research. CO-4. Ability to evaluate and examine subject areas in economics and explore possibilities of research.
EC3004: Demography (32305)	CO-1. To provide an understanding of Demography and its application under various topics under economics. CO-2. To demonstrate the practical and the applied aspects of Demography and the study of Population and its relation to Economics. CO-3. Ability to develop, demonstrate and examine various topics under Demography. CO-4. Ability to evaluate and examine subject areas in economics bringing out the relation to population studies and demography.
Semester – IV	
EC4001: Macro I Economics Analysis- II (42301)	CO-1. To provide a thorough understanding of the principles of macroeconomics and the application of macroeconomic concepts in various contexts. CO-2. To discuss the modern developments in macroeconomics. CO-3. Ability to analyze and demonstrate knowledge of the basic theories/laws in economics- general equilibrium psychological law of consumption, etc. CO-4. At the end of the course, the student should be able to evaluate macroeconomic concepts, models and its use in real life situations.
EC-4002: Growth & Development II (42302)	CO-1. To enable learning and understanding of the basic concepts and process to measure the growth and economic development etc. CO-2. To analyze and evaluate the obstacles in the process of economic growth and development. CO-3. to analyze and demonstrate knowledge of the economic growth and development theories of economic growth and development. CO-4. Ability analyze, evaluate and apply the growth and development concepts, role of human capital, etc. in real life situations.
EC-4003: Research Project (Only Regular Students) (42303)	CO-1. To enable an understanding of Research and its methods under various areas of economics. CO-2. Ability to develop, demonstrate and examine topics under Economics to pursue research. CO-3. To demonstrate the practical and the applied aspects of research in relation to Economics. CO-4. Ability to evaluate and examine subject areas in economics and explore possibilities of research. CO-5. Post- graduation, as internal students will be given an opportunity to get exposed to a few elements of social research and also they are expected to complete a small research. CO-6. Therefore, regular students who do their project under the expert guidance and supervision, Elementary knowledge of research

	CO-7. Methodology shall consolidate and deepen their understanding of various branches of Economics. Preparing a small dissertation is intended to train them in scientific thinking and art of systematic presentation.
EC-4004: Economics of Environment (42306)	CO-1. To develop an understanding of the economics of environment in the theoretical as well as practical context. CO-2. To discusses various analytical tools to comprehend various environmental issues. CO-3. Ability to analyze and evaluate the subject with reference to various aspects of the economics of environment. CO-4. Ability to develop an understanding of the economics of environment and various analytical tools to comprehend environmental issues.

DEPARTMENT OF ENGLISH

Programme Outcomes: B. A. English

After successfully completing undergraduate B.A. English Program students should be able to:	
Programme Outcomes	• **Critical Thinking** **PO-1**-Interpret literature by applying critical approaches. **PO-2**-Able to implement literary devices. **PO-3**-Get acquainted with the terminology in critical appreciation.
	• **Comprehension Skills** **PO-4**-To comprehend evolution of different genre of literature.
	• **Effective Communication** **PO-5**-To develop oral and written communication skills in English. **PO-6**-To enhance vocabulary and its application in communication
	• **Business Communication** **PO-7**-To apply syntactic in business communication.
	• **Social Interaction** **PO-8**-To use interpersonal and intrapersonal communication skills to interact in different situations.
	• **Ideal Citizenship** **PO-9**-To inculcate values of ideal citizen through creating respect self and others.
	• **Ethics** **PO-10**-To study and understand what is right and wrong in human behavior. **PO-11**-To give real and practical guidance to our lives.
	• **Environment and Sustainability** **PO-12**-To take care of our Eco-system for future of mankind. **PO-13**-To sustain natural resource to protect life.
	• **Goal Oriented Education** **PO-14**-To engage students on reaching a specific objective driven by purpose.

Programme Specific Outcomes: B. A. English

After successfully completing undergraduate B.A. English Program students should be able to:	
Programme Specific Outcomes	PSO-1. To comprehend evolution of criticism and its application in language and literature.

	PSO-2. Able to comprehend renowned master pieces of English literature. PSO-3. To apply English language to improve skills in Listening, Speaking, Reading and Writing.

Course Outcomes: B. A. English

Course	Outcomes
	After completion of these courses students should be able to:
Semester-I	
Compulsory English (11011/11012)	CO-1. Revise and reinforce structures already learnt. CO-2. Learn importance of vocabulary. CO-3. Realize the beauty of literature. CO-4. Develop the ability to appreciate ideas and think critically. CO-5. Enhance employability by developing linguistic competence. CO-6. Enrich communication skills for corporate sector.
Optional English (General Paper-1) (11331/11332)	CO-1. Know the basics of literature and language. CO-2. Develop an integrated view about language and literature. CO-3. Interpret, evaluate and analyze literary pieces of different genres. CO-4. Comprehend elements of short story and one act play. CO-5. Acquaint with minor literary forms of English literature. CO-6. Appreciate creative use of language and literature. CO-7. Know the basics of phonology to speak English correctly. CO-8. Enhance job-potential through improving language skills.
Semester-II	
Compulsory English (11011/11012)	CO-1. Revise and reinforce structures already learnt. CO-2. Learn importance of vocabulary. CO-3. Realize the beauty of literature. CO-4. Develop the ability to appreciate ideas and think critically. CO-5. Enhance employability by developing linguistic competence. CO-6. Enrich communication skills for corporate sector.
Optional English (General Paper-1) (11331/11332)	CO-1. Know the basics of literature and language. CO-2. Develop an integrated view about language and literature. CO-3. Interpret, evaluate and analyze literary pieces of different genres. CO-4. Comprehend elements of short story and one act play. CO-5. Acquaint with minor literary forms of English literature. CO-6. Appreciate creative use of language and literature. CO-7. Know the basics of phonology to speak English correctly. CO-8. Enhance job-potential through improving language skills.
Semester-III	

Compulsory English (CC) (23001/24001)	CO-1. Revise and reinforce grammar for better linguistic competence. CO-2. Know importance of soft skills for employability. CO-3. Enrich vocabulary. CO-4. Demonstrate competence in usage of language in day to day life. CO-5. Know best universal human values. CO-6. Contribute emotional quotient and independent thinking.
SEC-1 Advanced Study of English Language (23333/ 24333)	CO-1. Familiar various components of language. CO-2. Acquire linguistic competence CO-3. Enhance communication skills. CO-4. Know importance of semantics and syntax.
DSC 1 Appreciating Drama (23331/24331)	CO-1. Identify elements of the genre. CO-2. Interpret the prescribed plays by applying the theory CO-3. Analyze scenes and acts of the play. CO-4. Understand types of characters. CO-5. Develop literary competence to help pleasure by reading prescribed plays. CO-6. Evaluate the prescribed plays by categorizing their types.
DSC-2 Appreciating Poetry (23332/24332)	CO-1. Identify and describe types of poetry. CO-2. Identify various elements of poetry. CO-3. Describe literary devices used in poetry. CO-4. Summarize a poem. CO-5. Discuss various literary devices in a poem. CO-6. Critically appreciate prescribed poems.
Semester-IV	
Compulsory English (CC) (23001/24001)	CO-1. Revise and reinforce grammar for better linguistic competence. CO-2. Know importance of soft skills for employability. CO-3. Enrich vocabulary. CO-4. Demonstrate competence in usage of language in day to day life. CO-5. Know best universal human values. CO-6. Contribute emotional quotient and independent thinking.
SEC-1 Advanced Study of English Language (23333/ 24333)	CO-1. Familiar various components of language. CO-2. Acquire linguistic competence CO-3. Enhance communication skills. CO-4. Know importance of semantics and syntax.
DSC 1 Appreciating Drama (23331/24331)	CO-1. Identify elements of the genre. CO-2. Interpret the prescribed plays by applying the theory CO-3. Analyze scenes and acts of the play. CO-4. Understand types of characters. CO-5. Develop literary competence to help pleasure by reading prescribed plays. CO-6. Evaluate the prescribed plays by categorizing their types.
DSC-2 Appreciating	CO-1. Identify and describe types of poetry. CO-2. Identify various elements of poetry.

Poetry (23332/24332)	CO-3. Describe literary devices used in poetry. CO-4. Summarize a poem. CO-5. Discuss various literary devices in a poem. CO-6. Critically appreciate prescribed poems.
Semester-V	
Course: 3017 Compulsory English	CO-1. Define communicative use of language in Indian Context. CO-2. Identify types of sentences. CO-3. Outline the idea of varied cultural experiences. CO-4. Define types of communication. CO-5. Summarize in English Prose and Poetry. CO-6. Apply sentence transformation in given format.
Course: 3337 General III Advanced Study of English Language and Literature	CO-1. Define communicative use of language in Indian Context. CO-2. Identify types of sentences. CO-3. Outline the idea of varied cultural experiences CO-4. Define types of communication. CO-5. Summarize in English Prose and Poetry. CO-6. Apply sentence transformation in given format.
Course: 3338 Special III Appreciating Novel	CO-1. Define purpose and types of fiction. CO-2. Comprehend various elements of a novel. CO-3. Apply critical theories to the study of novel. CO-4. Identify different literary devices used in novel CO-5. Compare and contrast the prescribed novels in the syllabus.
Course: 3339 Special IV Introduction to Literary Criticism	CO-1. Define criticism and identify different types of criticism. CO-2. Outline the history of English literary criticism CO-3. Analyze independently prose passages and poems. CO-4. Compare and contrast different critical theories. CO-5. Develop literary competence for aesthetic pleasure.
Course: 3339 (SEC 2-C & SEC 2-D) Title of the Paper: Mastering Life Skills and Life Values	CO-1.To equip the students with the social skills CO-2.To train the students interpersonal skills CO-3.To build self-confidence and communicate effectively CO-4.To Encourage the students to think critically CO-5.To learn stress management and positive thinking CO-6.To enhance leadership qualities CO-7.To aware the students about universal human values CO-8.To develop overall personality of the students
Semester-VI	
Course: 3017 Compulsory English	CO-1. Define communicative use of language in Indian Context. CO-2. Identify types of sentences. CO-3. Outline the idea of varied cultural experiences. CO-4. Define types of communication. CO-5. Summarize in English Prose and Poetry. CO-6. Apply sentence transformation in given format.

Course: 3337 General III Advanced Study of English Language and Literature	CO-1. Define communicative use of language in Indian Context. CO-2. Identify types of sentences. CO-3. Outline the idea of varied cultural experiences CO-4. Define types of communication. CO-5. Summarize in English Prose and Poetry. CO-6. Apply sentence transformation in given format.
Course: 3338 Special III Appreciating Novel	CO-1. Define purpose and types of fiction. CO-2. Comprehend various elements of a novel. CO-3. Apply critical theories to the study of novel. CO-4. Identify different literary devices used in novel CO-5. Compare and contrast the prescribed novels in the syllabus.
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Course: 3339 (SEC 2-C & SEC 2-D) Title of the Paper: Mastering Life Skills and Life Values	CO-1.To equip the students with the social skills CO-2.To train the students interpersonal skills CO-3.To build self-confidence and communicate effectively CO-4.To Encourage the students to think critically CO-5.To learn stress management and positive thinking CO-6.To enhance leadership qualities CO-7.To aware the students about universal human values CO-8.To develop overall personality of the students

DEPARTMENT OF GEOGRAPHY

Programme Outcomes: B.A. Geography

Department of Geography	After successful completion of three year degree program in Geography student should be able to
Programme Outcomes	PO-1. Demonstrate knowledge of Human, Physical and Cultural features of the earth and locate them on a map. PO-2. Know about the basic disciplines of Geography and its sub branches. PO-3. Know the basic concepts and terminologies used in Geography like interior of the earth, plate tectonic, sea floor spreading, population growth, disasters,composition and structure of atmosphere, hydrosphere, etc. PO-4. Differentiate between minerals and rocks, weather and climate, interior ofthe earth, basic industries, farming etc. PO-5. Get information about the causes and effects of local, national and international problems like global warming, acid rain, ozone depletion, soildegradation, deforestation etc. PO-6. Carry out surveying and learn the art of map making and prepare maps for the areas with the help of surveying techniques. PO-7. Gain knowledge of quantitative methods and their ability to use statisticaland cartographical methods to solve geographical problems. PO-8. Construct various types of projections and scales as per requirement of thestudy. PO-9. Collect primary and secondary data in the field. PO-10. Apply various statistical formulas to analyse data. PO-11. Use cartographic techniques with the help of simple software techniques likeMS Excel. PO-12. Handle topographical and weather maps and interpret them. PO-13. Identify types of rocks. PO-14. Know about Geographical Information System (GIS) and Remote Sensing(RS). PO-15. Develop of the basic concept of research. PO-16. The understanding of the basic framework of sampling and data collection. PO-17. Knowledge acquires various sampling methods and techniques.

Programme Specific Outcomes: B.A. Geography

Department of Geography	After successful completion of three year degree program in Geography student should be able to
Programme Specific Outcomes	PSO-1. Serve as a Geographer PSO-2. Serve as a Surveyors PSO-3. Work as a professor/teacher in colleges, schools and high schools. PSO-4. Serve as conservator in Soil, Agricultural departments. PSO-5. Work in disaster and water resources management. PSO-6. Serve in forest department as forest conservator. PSO-7. Serve in cartographer in map making divisions of Government. PSO-8. Work in NGOs. PSO-9. Work in MNC for digitizing and analyzing remotely sensed data. PSO-10. Can prepare for various competitive exams.

Course Outcomes: B.A. Geography

Course	Outcomes
	After completion of these courses students should be able to :-
Semester-I	
Physical Geography	CO-1. The geographical maturity of students in their current and future courses shall develop. CO-2. The student develops theoretical, applied and computational skills.
Semester-II	
Human Geography	CO-1. Gain knowledge about major themes of human geography. CO-2. Develop an idea about space and society. CO-3. Build an idea about population growth and distribution of population. CO-4. Know about population –resource relationship.
Semester-III	
Environment Geography	CO-1. Gain knowledge about concept, scope of environmental geography and components of environment. CO-2. Develop an idea about human-environment relationships. CO-3. Build an idea about ecosystem. CO-4. Know about environmental programmes and policies. CO-5. To make the students understand the key concepts of cause and effect and how they relate to influence the human activities and climate in shaping the Earth surface.
Environment Geography- II	CO-1. Understand Study about nutrient cycling. CO-2. Understand the value of resources. CO-3. Understand environmental problem their cause, effects and

	remedies. CO-4. Get the knowledge about environmental hazardous and management. CO-5. Make awareness about conservation of resources. CO-6. Understand the various environmental protection acts.
Geography of Maharashtra-I	CO-1. Understand the location of physiographic, natural, historical and political of Maharashtra. CO-2. Understand the geographical area and administrative division of Maharashtra. CO-3. To understand the major rivers and dams of Maharashtra. CO-4. To understand the climate, soils, and natural vegetations. CO-5. Understand the water , forest, minerals and power resources in Maharashtra.
Semester-IV	
Geography of Maharashtra-II	CO-1. Study the distribution and factors affecting growth of population in Maharashtra. CO-2. Get the knowledge about types of agriculture, recent trends in agriculture, problems and prospects about agriculture, trade and transport in Maharashtra.
Practical Geography-I (Scale and Map Projections)	CO-1. Develop practical skill and use of map scale and projection. CO-2. To make students aware of the new techniques, accuracy and skills of map making. CO-3. Understand the different types of scale. CO-4. Understand the construction of simple geographical scale, time and distance scale. CO-5. Understand the different types of map projection and its classifications. CO-6. Understand the construction of various Projections.
Practical Geography – II (Cartographic Techniques, Surveying and Excursion / Village / Project Report)	CO-1. Develop practical knowledge and application of cartographical techniques. CO-2. To make students aware of the new techniques, accuracy and skills of Map Making. CO-3. Understand the different techniques of surviving. CO-4. Knowledge about the preparation of layout. CO-5. Understand the socio-economic condition of village.
SEC- A Introduction to Geographical Information System (GIS)	CO-1. Comprehend knowledge about the concepts in GIS. CO-2. Acquire skills of map making using GIS. CO-3. To increase awareness among students of GIS and modelling tools with the latest learning and teaching experiences to deal with real world problems.
SEC- B Introduction to Remote Sensing	CO-1. To develop technical skills and competence in data and information acquisitions, extraction, management and analysis for mapping and visualization.

	CO-2. Student will be familiar with modern techniques in Geography. CO-3. Students will be prepared to apply their skills in professional careers.
Semester-V	
Geography of India -I	CO-1. To acquaint the students with geography of our Nation. CO-2. To make the student aware of the magnitude of problems and Prospects at National level. CO-3. To help the students to understand the inter relationship between the subject and the society. CO-4. To help the students to understand the recent trends in regional studied
Geography of India -II	CO-1. To acquaint the students with geography of our Nation. CO-2. To make the student aware of the magnitude of problems and Prospects at National level. CO-3. To help the students to understand the inter relationship between the subject and the society. CO-4. To help the students to understand the recent trends in regional studied
Practical Geography- I (Techniques of Spatial Analysis) **Practical Geography- II (Techniques of Spatial Analysis, Surveying and Excursion /Village/ Project Report)**	CO-1. To introduce the basic concepts and techniques of Geographical Analysis. CO-2. To introduce the students with SOI Toposheets and acquire the Knowledge of Toposheet interpretation. CO-3. To introduce the students with Weather Maps and acquire the Knowledge of its interpretation. CO-4. To introduce the students with Aerial Photographs and Satellite Images and acquire knowledge to interpret it . CO-5. To acquaint students with the spatial and structural characteristics of Practical Geography. CO-6. To explain the elementary and essential principles on field of practical work.
SEC 2 C Value/Skill based Course Research Methodology - I	CO-1. To develop the understanding of the basic concept of research CO-2. To develop the understanding of the basic framework of sampling and data collection CO-3. To develop the understanding of various sampling methods and Techniques
Semester-VI	

SEC 2 D Value/ Skill based Course Research Methodology – II	CO-1. To identify various sources of information for data collection. CO-2. Understanding of the conducting survey on various issues and develop the Report writing skill of students
Geography of Disaster Management-I & II	CO-1. To introduce students the concept of disaster & its relation with Geography. CO-2. To acquaint the students with the utility & application of hazards in different areas & its management. CO-3. To make the students aware of the need of protection & disaster management.

PROGRAMME OUTCOMES: M.A. Geography

Department of Geography	After successful completion of Two year degree program in Geography student should be able to:
Programme Outcomes	PO-1. Ability of Problem Analysis: Student will be able to analyses the problems of physical as well as cultural environments of both rural and urban areas. Moreover, they will try to find out the possible measures to solve those problems. PO-2.Conduct Social Survey Project: They will be eligible for conducting social survey project, which is needed for measuring the status of development of a particular group or section of the society. PO-3. Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. PO-4. Application of modern instruments: Students will be able to learn the application of various modern instruments and by these; they will be able to collect primary data. PO-5.Application of GIS and modern Geographical Map Making Techniques: They will learn how to prepare map based on GIS by using the modern geographical map-making techniques. PO-6.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions from different perspectives. PO-7. Development of Observation Power: As a student of Geography Course, they will be capable to develop their observation power through field experience and in future, they will be able to identify the socio-environmental problems of a locality. PO-8. Development of Communication Skill and Interaction Power: After the completion of the course, they will be efficient in their communication skill as well as power of social interaction. Some of the students are being able to understand and write effective reports and design credentials, make effective demonstrations, and give and receive clear instructions.

	PO-9. Effective Citizenship: Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering. PO-10. Enhancement of the ability of Management: Demonstrate knowledge and understanding of the management principles and apply these to their own work, as a member and leader in a team, to manage projects. They will perform effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Programme Specific Outcomes: M.A. Geography

Department of Geography	After successful completion of Two year degree program in Geography student should be able to
	PSO-1. Design and conduct independent research in their chosen field in the discipline PSO-2. Demonstrate knowledge of concepts, methods, and theories designed to enhance understanding of the natural world and human society. PSO-3. Communicate the results and significance of their research in both written and oral form PSO-4. Evaluate how historical events have been influenced by, and have influenced, physical and human geographic factors in local, regional, national, and global settings. PSO-5. Examine social and environmental processes, with a particular focus on space and place, critical theory, practical application, analysis and intervention in chosen field within the discipline of Geography PSO-6. Evaluate causes, consequences, and possible solutions to persistent, contemporary, and emerging global issues. PSO-7. Follow established ethical guidelines for research and teaching PSO-8. Have an in-depth understanding of and mastery of the literature in, at least one particular geographic subfield. PSO-9. Classify processes of environmental change and evaluate the relationship between human beings and their surroundings, bringing to bear knowledge from many disciplines. PSO-10. A geographer has better job opportunities in government departments, Cartographer, Researcher, Teacher/Professor, Competitive Examinations, Government employer, GIS specialist, Climatologist, Transportation Manager, Surveyor, GPS Surveyors

Course Outcomes: M.A. Geography

Course	**Outcomes**
	After completion of these courses students should be able to :-
Semester-I	

Principals of Geomorphology	CO-1. Understand the nature, scope and significance of geomorphology and fundamental concepts. CO-2. Examining the Origin and Evolution of the earth primary relief features by different theories in subject. CO-3. Understand about Exogenous Processes considering weathering and mass wasting and nature and types of the slope. CO-4. Evaluate the fundamental Model of Davisian Cycle of Erosion to learn the function of fiver and its landforms development process. CO-5. Understand formation, process and development of Fluvial and Karst, Glacial and Aeolian Landforms in geomorphology
Principals of Climatology	CO-1. Understand the difference between weather & climate and nature, scope, origin, composition and structure of atmosphere. CO-2. Getting facts about Heat Budget and factors effects Heat Budget. CO-3. Understand the concept of horizontal, vertical temperature and inversion of temperature. CO-4. Identify the Atmospheric pressure and winds humidity and concept of precipitation and its types. CO-5. Understand the Air masses and Fronts and the Weather Forecasting
Principals of Economic Geography	CO-1. Students understand about the nature, scope, approaches, production, exchange, consumption and recent trends of economic geography. CO-2. Understand the fundamental theories in economic geography. CO-3. Review, understand and apply the modes of economics development by various models. CO-4. Understand the economies scale, transportation and communication, nature and role of international trade in economic development of India.
Principals of Settlement & Population Geography	CO-1. Understand the nature and scope and their evolution, significance, approaches, settlement types, pattern and nature and process of urban settlement of population & settlement Geography CO-2. Examine and understand the various factors responsible for World Population growth and Distribution. CO-3. Understand the fundamental Concepts Related to Population such as density, over, Optimum & under population, fertility, mortality and population for future Perspectives. CO-4. Getting review and understand the subject matter with the help of Theories of Population.
Practical in Physical Geography & Practical in Human Geography	CO-1. Understand the stream ordering methods of Stahlers and Harton and calculate the stream orders and bifurcation ratio CO-2. Getting knowledge of the drainage basin analysis and prepare the slope map, dissection index map, relative relief map, absolute relief map. CO-3. Understand the slope profile and their types and drawing the block diagram. CO-4. Understand the Climograph, Hydher graph Climate graph. CO-5. Make familiar with classify climatic region using Koppen's and Thornwaite climatic classification methods CO-6. Students understand the crop combination methods, agricultural

	efficiency by various methods. CO-7. Understand & Draw Lorenz Curve and location quotient. CO-8. Understand population indices' and population projection Analysis CO-9. Applied and understand the data analysis techniques for rural and urban settlement CO-10. Student can prepare the adequate maps, various Graphs.
Semester-II	
Geoinformatics - I	CO-1. Understand the concept of GIS, elements of GIS, history of GIS and GIS applications in different field. CO-2. Student can understand the spatial and non spatial data models, all its functions components and applications in geography. CO-3. Getting the knowledge about geospatial analysis and GIS data analysis the various concept and problems in analyzed in GIS . CO-4. Understand the concept of map, projections, and coordinate systems and basic of the same for different purposes in geography. CO-5. Student can apply GIS techniques in the various kinds of fields, eg. Agriculture, populations, watershed planning and land use planning.
Agricultural Geography	CO-1. Understand about the introduction to agriculture, nature, scope, significance and approaches of agriculture geography. CO-2. Understand the influence of physical, Economic and Technological factors on agriculture patterns. CO-3. Getting ideas of the agricultural system its meaning and concept, whittlesey's classification of agricultural system. CO-4. Understand the agricultural regionalization and modes in agricultural geography and their classification of agricultural models and some theories. CO-5. Understand definition and characteristics of arid and semi-arid regions and study about droughts and famines, role of irrigation and dry farming. CO-6. Understand Types agricultural and problem and prospect of agricultural and study about Sustainable agricultural development in India.
Industrial Geography	CO-1. Understand study about the industrial geography, its nature, scope, and different study methods. CO-2. Aware about the locations of industry and their activities primary and secondary and its factors responsible for same. CO-3. Understand review on world distribution of some industries and selected countries. CO-4. Getting the global nature of industrialization and related problems, methods of measuring the spatial distribution of manufacturing. CO-5. Understand the environmental degradation, industrial hazards and occupational health, manufacturing industry, role and factors affecting on the same.
Geography of Tourism	CO-1. To students understand about the tourism influencing factors: historical, natural, social-cultural and economic.

	CO-2. Study the tourism motivating factors for pilgrimages, leisure, recreation, elements. CO-3. Understand the Tourism types: eco-ethonocoastal and adventure tourism, national and international tourism, globalization and tourism. CO-4. Study and understand the environmental laws and tourism-current trends, spatial and recent changes, Tourism circuits-short and longer, accommodation and supplementary accommodation other facility, Indian hotel industry.
Practical in Map Projection	CO-1. Understand Definition and the types of Map projection. CO-2. Use data representation by various techniques of maps and Diagrams. CO-3. Understand the map projections definition and necessity of projections and types – perspective and non-perspective, conventional and classification of projection.
Practical of Statistical Techniques for Geography	CO-1. Understand the statistical characteristics of geographical data, scales of measurement. CO-2. Clear the facts about the probability, types of probability and applications and uses. CO-3. Understand the concept of sampling and designing and conducting a sample survey for data collation and data analysis. CO-4. Evaluate, calculate and understand the parametric and non-parametric statistical tests. CO-5. Understand the correlation and regression analysis and their application in various fields of geography.
Semester-III	
Geoinformatics - II	CO-1. Understand the modern techniques in geography under this course such as remote sensing and aerial photography. CO-2. Examining the history, basic theories of EMR, and other concepts. CO-3. Understand and get the knowledge about fundamental concept, types of aerial photography characteristics of aerial photographs and aerial camera. CO-4. Understand the types of remote sensing, types of platforms and get the knowledge about satellite sensor and types of sensors in remote sensing. CO-5. Get basic Knowledge about the image interpretation Techniques
Geographical Thoughts	CO-1. Understand the historical development of geographical thought according to Greek, Roman, Indian, German, French, British and American school. CO-2. Getting the knowledge about the dualisms in geography; determinism and possibilism, systematic Vs regional and physical Vs human geography. CO-3. Understand recent trends, scientific methods, quantitative revolution and computer application in geography. CO-4. Understand the definition, need, and signification of applied geography
Geography of Rural Development	CO-1. Understand the concept, Nature and scope of Rural development CO-2. Understand the factors and rural basic services in rural development. CO-3. Understand the about the Rural development planning and

	Government policies. CO-4. Get basic Knowledge about Rural management and Application of computer & information technology in Rural development.
Practical in Geoinformatics	CO-1. Understand the modern techniques in geography under this course such as remote sensing and aerial photography. CO-2. Examining the history, basic theories of EMR, and other concepts. CO-3. Understand and get the knowledge about fundamental concept, types of aerial photography characteristics of aerial photographs and aerial camera. CO-4. Understand the types of remote sensing, types of platforms and get the knowledge about satellite sensor and types of sensors in remote sensing. CO-5. Get basic Knowledge about the image interpretation Techniques
Watershed Management	CO-1. Understand the fundamentals concepts related to watershed, significances of watershed development, demarcation of watershed, types of watershed according to area and shape CO-2. Getting the ideas about the physical parameters of watershed, channel geometry and basin morphology. CO-3. Understand the hydrological parameters, rainfall, aerial precipitation, evaporation and transpiration, infiltration, run off and drainage. CO-4. Aware about the watershed development planning and sample of watershed management and planning for appropriate development of watershed management for water conservation and development.
Practical in Economic Geography	CO-1. Understand concepts of crop combination, Agricultural Efficiency and Agricultural Productivity. CO-2. Examine Location Quotient, Lorenz Curve, Gini's Coefficient and Von Thunean. CO-3. Understand transport Network Analysis CO-4. Get information about gravity potential population surface model CO-5. Understand application Breaking Point theory (Trade Area)
Semester-IV	
Geography of India	CO-1. Understand the about the physiographic division of India and Maharashtra. CO-2. Understand the drainage system of India and Maharashtra. CO-3. Understand the climatic variation in India and climatic region of India and Maharashtra. CO-4. Examine and understand the types of vegetation of India and Maharashtra. CO-5. Understand the variation in industrial development in India and Maharashtra. CO-6. Examine and understand the developed and underdeveloped states in India.
Oceanography	CO-1. Understand the meaning, nature and scope, ocean floor and relief of the ocean bottom and modern trends in Oceanography. CO-2. Understand the ocean floor and relief of the ocean bottom and properties like temperature, density, salinity of ocean water. CO-3. Understand the characteristics and properties of factors affecting on formation of sea waves.

	CO-4. Understand the tides, tide generating forces, types of tides and tidal effects in coastal areas.
Research Method	CO-1. Understand the types, 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. CO-2. Aware about the research design, need, features, basic principal and developing of research plan, and sampling design and its basic types, steps, characteristics of sampling design. CO-3. Getting the ideas about type's data and methods of data collection and study the processing and analysis of data using different statistical methods. CO-4. Understand the report writing, techniques, precaution of interpretation, layout of research report, types of reports and oral presentation mechanics of writing a research report.
Soil Geography	CO-1. Understand the nature, scope, and concept of soil geography CO-2. Understand physical and chemical properties of soil and factors affecting formation of soil. CO-3. Understand vertical structure of soil and soil horizon. CO-4. Understand soil classification of USDA
Practical in Watershed Analysis	CO-1. Understand the fundamentals concepts related to watershed, significances of watershed development, demarcation of watershed, types of water shed according to area and shape CO-2. Getting the ideas about the physical parameters of watershed, channel geometry and basin morphology. CO-3. Understand the hydrological parameters, rainfall, aerial precipitation, evaporation and transpiration, infiltration, run off and drainage. CO-4. Aware about the watershed development planning and sample of Water shed management and planning for appropriate development of watershed management for water conservation and development.
Dissertation / research project	CO-1. Understand and get the knowledge about research problems, selecting research problems CO-2. Aware about the aims and objective, research design, need, features, basic principal and developing of research plan, and sampling design. CO-3. Getting the ideas about data and methods of data collection and study the processing and analysis of data using different statistical methods.

DEPARTMENT OF HINDI

Programme Outcomes: B. A. Hindi

Department of Hindi	After successful completion of three year degree program in Hindi student should be able to
Programme Outcomes	PO-1. छात्रों को हिंदी भाषा के उद्भव, विकास तथा विभिन्न रुपों एवं बोलियों का ज्ञान प्राप्त हुआ। PO-2. छात्रों काव्यशास्त्र का सैद्धांतिक एवं अनुप्रयोगात्मक ज्ञान प्राप्त हुआ। PO-3. छात्रों में हिंदी साहित्य के इतिहास के विकासक्रम और लेखन परंपरा के संबंध मे यथोचित दृष्टिकोन विकसित हुआ। PO-4. छात्रों को भाषा विज्ञान के माध्यम से हिंदी भाषा के व्यवस्थित और यथोचित प्रयोग का ज्ञान प्राप्त हुआ। PO-5. छात्र हिंदी गद्य और पद्य की विभिन्न साहित्य विधाओं से परिचित हुए। PO-6. छात्रों में हिंदी भाषा और साहित्य को समझने, अध्ययन, आस्वादन और मूल्यांकन की क्षमता निर्माण हुई। PO-7. साहित्य की विभिन्न विधाओं के माध्यम से छात्रों का भावात्मक विकास हुआ। PO-8. छात्रों में हिंदी साहित्य के माध्यम से नैतिक मूल्य, राष्ट्रीय मूल्य तथा सामाजिक मूल्यों के प्रति आस्था निर्माण हुई। PO-9. छात्रों को सरकारी कार्यालयों में प्रयुक्त कार्यालयीन हिंदी भाषा का परिचय प्राप्त हुआ। PO-10. छात्रों को संचार माध्यम लेखन एवं हिंदी भाषा का परिचय प्राप्त हुआ।

Programme Specific Outcomes: B. A. Hindi

Department of Hindi	After successful completion of three year degree program in Hindi student should be able to
Programme Specific Outcomes	PSO-1. हिंदी भाषा का व्यवस्थित और यथोचित ज्ञान PSO-2. भावात्मक और सौंदर्यात्मक विकास PSO-3. निवेदक और सूत्र संचालक PSO-4. पटकथा लेखक, संवाद लेखक, विज्ञापन लेखक PSO-5. प्रकाशक, संपादक, संवाददाता PSO-6. दुभाषिया, अनुवादक, प्रूफ शोधक PSO-7. एम.ए., बी. एड., PSO-8. पत्रकारिता, अनुवाद और दूरसंचार : पदविका और पदवी PSO-9. मूल्य संवर्धन : नैतिक, राष्ट्रीय, सामाजिक मूल्यों का संवर्धन PSO-10. राष्ट्रीय एकात्मता, समानता, बंधुता, उत्तरदायित्व और वैज्ञानिकता का विकास

	PSO-11. नागरी सेवा परीक्षा PSO-12. वाचन, श्रवण, संवाद एवं लेखन कौशल का विकास PSO-13. माध्यम लेखन कौशल का विकास

Course Outcomes: B. A. Hindi

Semester - I	
Course Outcomes	After completion of these courses students should be able to:-
वैकल्पिक हिंदी प्रश्नपत्र – 1A (11091B)	CO-1. छात्रों को हिंदी काव्य साहित्य का परिचय प्राप्त हुआ। CO-2. साहित्य की विभिन्न विधाओं के माध्यम से छात्रों का भावात्मक विकास हुआ। CO-3. छात्रों में राष्ट्रीय ऐक्य, सामाजिक उत्तरदायित्व, वैज्ञानिकता आदि मूल्यों की प्रतिष्ठा हुई। CO-4. छात्र कहानी साहित्य से अवगत हुए। CO-5. छात्रों में हिंदी भाषा द्वारा संवाद कौशल विकसित हुआ। CO-6. छात्रों में मौलिक लेखन की ओर रुझान निर्माण हुआ। CO-7. छात्रों में अनुवाद कौशल विकसित हुआ। CO-8. छात्रों को हिंदी कम्प्युटिंग का परिचय प्राप्त हुआ।
Semester - II	
वैकल्पिक हिंदी प्रश्नपत्र – II (11092B)	CO-1.छात्रों को हिंदी के गद्य और पद्य रचनाकारों का परिचय प्राप्त हुआ। CO-2. साहित्य की विभिन्न विधाओं के माध्यम से छात्रों का भावात्मक विकास हुआ। CO-3. छात्रों में राष्ट्रीय ऐक्य, सामाजिक उत्तरदायित्व, वैज्ञानिकता आदि मूल्यों की प्रतिष्ठा हुई। CO-4. छात्रों में निबंध लेखन कौशल विकसित हुआ। CO-5. छात्रों में विज्ञापन लेखन कौशल विकसित हुआ। CO-6. छात्रों को भाषा के रचनात्मक पहलुओं का ज्ञान प्राप्त हुआ। CO-7. छात्रों में स्ववृत्त लेखन कौशल विकसित हुआ। CO-8. छात्रों में वाक्य शुद्धिकरण कौशल विकसित हुआ।
Semester - III	
DSE-1A काव्यशास्त्र (23091)	CO-1. छात्रों को भारतीय काव्यशास्त्र का परिचय प्राप्त हुआ। CO-2. छात्र काव्य की परिभाषा एवं तत्वों से अवगत हो गए। CO-3. छात्रों को काव्य हेतुओं एवं काव्य प्रयोजनों का परिचय प्राप्त हुआ। CO-4. छात्रों में भारतीय काव्यशास्त्र के प्रति रुचि निर्माण हो गई। CO-5. छात्र रस के स्वरूप एवं अंगों से अवगत हो गए। CO-6. छात्रों में आलोचनात्मक दृष्टि विकसित हो गई। CO-7. छात्र शब्दशक्तियों से परिचित हो गए।

DSE-2A मध्ययुगीन काव्य तथा उपन्यास साहित्य (23092)	CO-1. छात्रों को कबीर के साहित्य का परिचय प्राप्त हुआ। CO-2. छात्र मीरा के काव्य से अवगत हो गए। CO-3. छात्रों को भारतीय उपन्यास की अवधारणा का परिचय प्राप्त हुआ। CO-4. छात्रों में उपन्यास कृति के मूल्यांकन की कला विकसित हो गई। CO-5. छात्र मध्ययुगीन काव्य से अवगत हो गए। CO-6. छात्रों में साहित्य कृतियों में प्रस्तुत जीवनमूल्यों के प्रति रुचि निर्माण हो गई।
CC-1C आधुनिक काव्य, कहानी तथा व्यावहारिक हिंदी (23093)	CO-1. छात्र काव्य साहित्य से परिचित हो गए। CO-2. छात्रों को कहानी साहित्य का परिचय प्राप्त हुआ। CO-3. छात्र हिंदी भाषा की कारक व्यवस्था से अवगत हो गए। CO-4. छात्रों में शब्दयुग्मों के अर्थ और वाक्य में प्रयोग की कला विकसित हो गई। CO-5. छात्रों को संक्षेपण लेखन का प्रत्यक्ष बोध प्राप्त हुआ। CO-6. छात्रों में सर्जनात्मकता का विकास हो गया।
SEC-2A अनुवाद : स्वरूप एवं व्यवहार (23096)	CO-7. छात्रों में काव्य साहित्य के रसास्वादन की दृष्टि विकसित हो गई। CO-1. छात्रों में अनुवाद कौशल का विकास हुआ। CO-2. छात्र अनुवाद के स्वरूप से अवगत हो गए। CO-3. छात्रों को अनुवाद के विभिन्न क्षेत्रों का परिचय प्राप्त हुआ। CO-4. छात्रों को अनुवाद प्रक्रिया का परिचय प्राप्त हो गया। CO-5. छात्र अनुवादक के गुणों से अवगत हो गए। CO-6. छात्रों को मराठी से हिंदी में अनुवाद का प्रत्यक्ष अनुभव प्राप्त हुआ । CO-7. छात्रों में अनुवाद का कौशल विकसित हो गया।
MIL-1 हिंदी भाषा शिक्षण (23012)	CO-1. छात्रों में हिंदी भाषा वाचन कौशल विकसित हुआ। CO-2. छात्रों में हिंदी भाषा श्रवण कौशल विकसित हुआ। CO-3. छात्रों में हिंदी भाषा संवाद कौशल विकसित हुआ। CO-4. छात्रों में हिंदी भाषा लेखन कौशल विकसित हुआ। CO-5. छात्र हिंदी भाषा-विधि तथा व्यवहार से अवगत हो गए। CO-6. छात्रों में लघुकथा सृजन कौशल विकसित हुआ । CO-7. छात्रों को हिंदी भाषा के व्याकरण का परिचय प्राप्त हुआ।
Semester - IV	
DSE-1B साहित्य के भेद (24091)	CO-1. छात्रों को साहित्य के विभिन्न भेदों का परिचय प्राप्त हुआ। CO-2. छात्र पद्य के विभिन्न भेदों से अवगत हो गए। CO-3. छात्रों को प्रबंध काव्य, महाकाव्य, खंडकाव्य, गीतिकाव्य एवं मुक्तक काव्य का परिचय प्राप्त हुआ। CO-4. छात्रों में नाट्य अभिनय की रुचि विकसित हो गई।

DSE-2B मध्ययुगीन काव्य तथा नाटक साहित्य (**24092)**	CO-5. छात्र कथासाहित्य के स्वरूप एवं तत्वों से अवगत हो गए। CO-6. छात्रों को नाटक साहित्य का परिचय प्राप्त हो गया। CO-7. छात्रों में निबंध साहित्य के प्रति आलोचनात्मक दृष्टि विकसित हो गई। CO-1. छात्रों को रहीम के काव्य का बोध प्राप्त हुआ। CO-2. छात्र बिहारी के काव्य के अभिव्यंजना पक्ष से अवगत हो गए। CO-3. छात्रों को भारतीय उपन्यास की अवधारणा का परिचय प्राप्त हुआ। CO-4. छात्रों में नाटक साहित्य के मूल्यांकन की कला विकसित हो गई। CO-5. छात्र नाटक और रंगमंच से अवगत हो गए।
CC-1D आधुनिक हिंदी व्यंग्य साहित्य तथा व्यावहारिक हिंदी **(24093)**	CO-1. छात्र हिंदी व्यंग्य पाठ से परिचित हुए। CO-2. छात्रों को कहानी व्यंग्य पाठ का बोध प्राप्त हुआ। CO-3. छात्र साक्षात्कार कला से अवगत हुए। CO-4. छात्रों में व्यंग्य साहित्य के मूल्यांकन की कला विकसित हो गई। CO-5. छात्र भाषा के मोबाईल तंत्र से अवगत हो गए। CO-6. छात्रों में साहित्य के रसास्वादन की दृष्टि विकसित हो गई। CO-7. छात्र पल्लवन कला से अवगत हुए।
SEC-2B माध्यम लेखन **(24096)**	CO-1. छात्रों को माध्यम लेखन का परिचय प्राप्त हुआ। CO-2. छात्रों में सृजनात्मक लेखन कौशल विकसित हो गया। CO-3. छात्र माध्यम के स्वरूप तथा लेखन प्रकारों से अवगत हो गए। CO-4. छात्रों को श्रव्य-दृश्य माध्यमों की भाषा का परिचय प्राप्त हुआ। CO-5. छात्र फीचर लेखन कला से अवगत हो गए। CO-6. छात्रों को फीचर के तत्वों एवं गुणों का परिचय प्राप्त हुआ। CO-7. छात्रों में फीचर लेखन का कौशल विकसित हो गया। CO-8. छात्रों को फीचर के भेदों का परिचय प्राप्त हुआ।
MIL-2 हिंदी भाषा शिक्षण **(24012)**	CO-1. छात्र वाक्य के भेदों से अवगत हुए। CO-2. छात्र विशेष प्रकार के वाक्यों सेपरिचित हुए। CO-3. छात्रों में हिंदी भाषा वाचन कौशल विकसित हुआ। CO-4. छात्रों में हिंदी भाषा श्रवण कौशल विकसित हुआ। CO-5. छात्रों में हिंदी भाषा संवाद कौशल विकसित हुआ। CO-6. छात्रों में हिंदी भाषा लेखन कौशल विकसित हुआ। CO-7. छात्र हिंदी भाषा-विधि तथा व्यवहार से अवगत हो गए। CO-8. छात्रों को हिंदी भाषा के विरामचिह्नों का परिचय प्राप्त हुआ। CO-9. छात्रों में काव्य-गीत सृजन कौशल विकसित हुआ।
Semester - V	

DSE-1C हिंदी साहित्य का इतिहास **(35091)**	CO-1. छात्रों को हिंदी साहित्य के इतिहास का परिचय प्राप्त हुआ। CO-**2**. छात्रों को साहित्येतिहास लेखन का परिचय प्राप्त हुआ। CO-3. छात्र हिंदी साहित्य के इतिहास के काल विभाजन और नामकरण से अवगत हो गए। CO-4. छात्रों को आदिकालीन साहित्य की प्रवृत्तियाँ, रचनाएँ और रचनाकारों का परिचय प्राप्त हुआ। CO-5. छात्र भक्तिकालीन साहित्य की प्रवृत्तियाँ, रचनाएँ और रचनाकारों से अवगत हो गए। CO-6. छात्रों को रीतिकालीन साहित्य की प्रवृत्तियाँ, रचनाएँ और रचनाकारों का परिचय प्राप्त हुआ।
DSE-2C भाषा विज्ञान **(35092)**	CO-1. छात्रों को भाषा विज्ञान के स्वरूप का परिचय प्राप्त हुआ CO-2. छात्रों को भाषा विज्ञान की व्याप्ति समझ में आ गई। CO-3. छात्रों को भाषा विज्ञान के अध्ययन की दिशाओं का ज्ञान प्राप्त हुआ। CO-4. छात्र भाषाविज्ञान के अनुप्रयोगात्मक पक्ष से अवगत हो गए। CO-5. छात्रों को साहित्य के अध्ययन में भाषा विज्ञान की उपयोगिता समझ में आ गई। CO-6. छात्रों को भाषा विज्ञान का अन्य शाखाओं से सबंध का ज्ञान प्राप्त हुआ।
CC-1E कथेतर विधाएँ **(35093)**	CO-1. छात्रों को हिंदी संस्मरण साहित्य का परिचय प्राप्त हुआ। CO-2. छात्र हिंदी रेखाचित्र साहित्य से अवगत हो गए। CO-3. छात्रों में साहित्य के मूल्यांकन की दृष्टि विकसित हो गई। CO-4. छात्रों में संस्मरण और रेखाचित्र साहित्य के रसास्वादन की दृष्टि विकसित हुई। CO-5. छात्रों में सभा इतिवृत्त लेखन कौशल का विकास हुआ। CO-6. छात्रों में वार्ता लेखन कौशल का हुआ।
SEC-2C पटकथा लेखन **(35096)**	CO-1. छात्रों को स्क्रिप्ट लेखन का परिचय प्राप्त हुआ। CO-2. छात्र दृश्य-श्रव्य माध्यम लेखन के विभिन्न प्रकारों से अवगत हो गए। CO-3. छात्रों में पटकथा लेखन की दृष्टि विकसित हो गई। CO-4. छात्रों में ड्राफ्ट बनाने का कौशल विकसित हुआ। CO-5. छात्रों में कथा और संवाद लेखन कौशल का विकास हो गया। CO-6. छात्र वृत्तचित्र और शॉर्टफिल्म लेखन से परिचित हो गए। CO-7. छात्रों को पटकथा के प्रारुपों और सॉफ्टवेयरों का ज्ञान प्राप्त हुआ।
Semester - VI	
DSE-1D हिंदी साहित्य का इतिहास **(36091)**	CO-1. छात्र हिंदी साहित्य के आधुनिक काल की पृष्ठभूमि अवगत हो गए। CO-2. छात्रों को भारतेंदू युगीन काव्य की विशेषताओं का परिचय प्राप्त हुआ। CO-3. छात्रों को द्विवेदी युगीन काव्य की विशेषताओं का परिचय प्राप्त हुआ। CO-4. छात्र आधुनिक काल की रचनाओं एवं रचनाकारों से परिचित हो गए। CO-5. छात्र हिंदी गद्य साहित्य के उद्भव –विकास से अवगत हो गए।

DSE-2D हिंदी भाषा और उसका विकास **(36092)**	CO-1. छात्रों को हिंदी भाषा के स्वरूप का परिचय प्राप्त हुआ। CO-2. छात्र हिंदी भाषा के विविध रुपों से परिचित हो गए। CO-3. छात्रों को हिंदी भाषा की विभिन्न बोलियों का परिचय प्राप्त हुआ। CO-4. छात्र भाषा के अनुप्रयोगात्मक पक्ष से अवगत हो गए। CO-5. छात्रों को हिंदी भाषा के शब्दभंडार का परिचय प्राप्त हुआ। CO-6. छात्रों में शोध आलेख लेखन की दृष्टि विकसित हो गई।
CC-1F गजल विधा और पत्राचार **(36093)**	CO-1. छात्र हिंदी गजल साहित्य से अवगत हो गए। CO-2. छात्रों को गजल के स्वरूप एवं तत्वों का ज्ञान प्राप्त हुआ। CO-3. छात्रों में गजल साहित्य के मूल्यांकन की दृष्टि विकसित हो गई। CO-4. छात्रों में पत्र लेखन कौशल का विकास हो गया। CO-5. छात्र सरकारी पत्र लेखन अवगत हो गए।
SEC-2D साहित्य और **(36096)**	CO-1. छात्र सिनेमा के स्वरूप से अवगत हो गए। CO-2. छात्रों को हिंदी साहित्य और सिनेमा के अंतःसंबंध का परिचय प्राप्त हुआ। CO-3. छात्रों में साहित्य के फिल्मान्तरण की दृष्टि विकसित हो गई। CO-4. छात्र हिंदी उपन्यासों पर आधारित फिल्मों से अवगत हो गए। CO-5. छात्र हिंदी कहानियों पर आधारित फिल्मों से अवगत हो गए। CO-6. छात्रों को भारतीय सिनेमा के उद्भव एवं विकास का परिचय प्राप्त हुआ।

Programme Outcomes: M. A. Hindi

Department of Hindi	After successful completion of two year PG degree program in Hindi a student should be able to :
Programme Outcomes	PO-1. छात्रों हिंदी साहित्य के विभिन्न रुपों, विधाओं, प्रवृत्तियों, रचनाओं और रचनाकारों का परिचय प्राप्त हुआ। PO-2. भारतीय एवं पाश्चात्य साहित्यशास्त्र का सैद्धांतिक और अनुप्रयोगात्मक ज्ञान प्राप्त हुआ। PO.3. समीक्षात्मक दृष्टिकोन विकसित हुआ।

	PO-4. भाषा और साहित्य के अध्ययन, आस्वादन और मूल्यांकन की क्षमता का विकास हुआ। PO-5. साहित्य और युग जीवन का संबध विशद करने का दृष्टिकोन विकसित हुआ। PO-6. साहित्य की विभिन्न विधाओं के माध्यम से छात्रों का भावात्मक विकास हुआ। PO-7. छात्रों में हिंदी साहित्य के माध्यम से नैतिक मूल्य, राष्ट्रीय मूल्य तथा सामाजिक मूल्यों के प्रति आस्था निर्माण हुई। PO-8. छात्रों को सरकारी कार्यालयों में प्रयुक्त कार्यालयीन हिंदी भाषा का परिचय प्राप्त हुआ। PO-9. अनुसंधान करने की क्षमता निर्माण हुई। PO-10. अनुवादक, दुभाषिया बनने की क्षमता निर्माण हुई।

Programme Specific Outcomes: M. A. Hindi

Department of Hindi	After successful completion of two year PG degree program in Hindi a student should be able to :
Programme Specific Outcomes	PSO-1. हिंदी भाषा का व्यवस्थित और यथोचित ज्ञान। PSO-2. भावात्मक और सौंदर्यात्मक विकास। PSO-3. अनुसंधान कर्ता। PSO-4. निवेदक और सूत्र संचालक। PSO-5. पटकथा लेखक, संवाद लेखक, विज्ञापन लेखक। PSO-6. प्रकाशक, संपादक, संवाददाता। PSO-7. दुभाषिया, अनुवादक, प्रूफ शोधक। PSO-8. मूल्य संवर्धन : नैतिक, राष्ट्रीय, सामाजिक मूल्यों का संवर्धन। PSO-9. राष्ट्रीय एकात्मता, समानता, बंधुता, उत्तरदायित्व और वैज्ञानिकता का विकास। PSO-10. सृजनात्मक लेखन। PSO-11. **NET /SET** परीक्षा। PSO-12. अध्यापक, प्राध्यापक, हिंदी अधिकारी, हिंदी सलाहकार, हिंदी निदेशक PSO-13. प्रबोधक, उपदेशक। PSO-14. वाचन, श्रवण, संवाद एवं लेखन कौशल का विकास

Course Outcomes: M. A. Hindi

Course	Outcomes
	After completion of these courses students should be able to :
Semester –I	
HP 01 मध्ययुगीन काव्य (10501)	CO-1. छात्रों को मध्ययुगीन काव्य-प्रवृत्तियों का परिचय प्राप्त हुआ। CO-2. छात्रों को आदिकाल और भक्ति काल के साहित्य की प्रवृत्तियों की जानकारी प्राप्त हुई। CO-3. छात्रों में काव्य के प्रति समीक्षात्मक दृष्टि विकसित हुई। CO-4. छात्र मध्ययुगीन काव्य-भाषा से अवगत हुए। CO-5. छात्र मध्ययुगीन काव्य परंपरा से परिचित हुए। CO-6. छात्रों को मध्ययुगीन काव्य-कृतियों का परिचय प्राप्त हुआ। CO-7. छात्रों में काव्य मूल्यांकन की क्षमता विकसित हुई। CO-8. छात्रों में सर्जनात्मक कौशल का विकास हुआ।
HP 02 कथा साहित्य (10502)	CO-1. छात्रों को गद्य विधाओं के स्वरूप का परिचय प्राप्त हुआ। CO-2. छात्रों में गद्य साहित्य के मूल्यांकन की क्षमता निर्माण हुई। CO-3. छात्रों को गद्य विधाओं के विकासक्रम की जानकारी प्राप्त हुई। CO-4. छात्रों में विभिन्न मूल्यों का संप्रेषण हुआ। CO-5. छात्रों में आलोचनात्मक दृष्टि का विकास हुआ। CO-6. छात्रों में रचना के आस्वादन और समीक्षण की क्षमता विकसित हुई।
HP 03 भारतीय काव्यशास्त्र (10503)	CO-1. छात्रों को भारतीय काव्यशास्त्र के विकास का परिचय प्राप्त हुआ। CO-2. छात्रों को साहित्य और काव्यशास्त्र के सहसंबंधों का ज्ञान प्राप्त हुआ। CO-3. छात्रों में मौलिक चिंतन की क्षमता विकसित हुई। CO-4. छात्रों को काव्यशास्त्र के सिद्धांतों का ज्ञान प्राप्त हुआ। CO-5. छात्रों में आलोचनात्मक दृष्टि का विकास हुआ। CO-6. छात्रों में समीक्षात्मक दृष्टि विकसित हुई।
HP 04 नाटककार मोहन राकेश (10505)	CO-1. छात्रों को नाटक के स्वरूप एवं संरचना का परिचय प्राप्त हुआ। CO-2. छात्र नाटक के रचनाविधान और रंगमंच से परिचित हुए। CO-3. छात्रों को नाटक और रंगमंच के विकास का परिचय प्राप्त हुआ। CO-4. छात्रों में नाट्यास्वादन और मूल्यांकन दृष्टि का विकास हुआ। CO-5. छात्रों में नाट्याभिनय कौशल विकसित हुआ।
Semester - V	

HP 05 कथेतर गद्य साहित्य (20501)	CO-1. छात्र व्यंग्य, निबंध, रेखाचित्र और संस्मरण विधा से अवगत हुए। CO-2. छात्र गद्य की प्रमुख विधाओं के तात्त्विक स्वरूप से परिचित हुए। CO-3. छात्रों को गद्य विधाओं के विकासक्रम की जानकारी प्राप्त हुई। CO-4. छात्रों में समीक्षात्मक दृष्टिकोन विकसित हुआ। CO-5. छात्रों में रचना विशेष के महत्व को समझने और मूल्यांकन की क्षमता विकसित हुई। CO-6. छात्रों में मौलिक लेखन कौशल का विकास हुआ।
HP 06 शोध प्रविधि (20502)	CO-1. छात्र शोध प्रविधि से अवगत हुए। CO-2. छात्रों में शोध दृष्टि का विकास हुआ। CO-3. छात्र नवीन शोध प्रवाहों से परिचित हुए। CO-4. छात्रों को शोध प्रक्रिया का परिचय प्राप्त हुआ। CO-5. छात्रों में शोध प्रबंध लेखन का कौशल विकसित हुआ। CO-6. छात्रों में अनुसंधानात्मक दृष्टिकोन का विकास हुआ।
HP 07 पाश्चात्य काव्यशास्त्र (20503)	CO-1. छात्रों को पाश्चात्य साहित्यशास्त्र का परिचय प्राप्त हुआ। CO-2. छात्रों को पाश्चात्य साहित्यशास्त्र के विकासक्रम का ज्ञान प्राप्त हुआ। CO-3. छात्रों को पाश्चात्य साहित्यशास्त्र की समीक्षा का महत्व ज्ञात हुआ। CO-4. छात्रों को आलोचना की विभिन्न प्रणालियों का ज्ञान प्राप्त हुआ। CO-5. छात्रों में समीक्षात्मक दृष्टिकोन विकसित हुआ। CO-6. छात्र पाश्चात्य चिंतकों के चिंतन, सिद्धांत और प्रमुख आंदोलनों से अवगत हुए।
HP 08 हिंदी उपन्यास साहित्य (20505)	CO-1. छात्रों को उपन्यास विधा का तात्विक परिचय प्राप्त हुआ। CO-2. छात्र उपन्यास की विभिन्न प्रवृत्तियों से अवगत हुए। CO-3. छात्र हिंदी उपन्यासों में अभिव्यक्त मानवी जीवन से परिचित हुए। CO-4. छात्रों में उपन्यासों में अभिव्यक्त जीवन विषयक मूल्यांकन की क्षमता विकसित हुई। CO-5. छात्रों में उपन्यास के आस्वादन, अध्ययन और मूल्यांकन की क्षमता विकसित हुई। CO-6. छात्रों में विभिन्न मूल्यों का संप्रेषण हुआ।
Semester –III	
HP 09 आधुनिक काव्य (30501)	CO-1. छात्र आधुनिक काव्य से अवगत हुए। CO-2. छात्रों को आधुनिक हिंदी काव्य की प्रवृत्तियों का परिचय प्राप्त हुआ। CO-3. छात्रों को प्रबंध काव्य और मुक्तक काव्य के तात्विक स्वरूप का ज्ञान प्राप्त हुआ। CO-4. छात्रों को आधुनिक काव्य प्रकारों का परिचय प्राप्त हुआ। CO-5. छात्र काव्य-संवेदना और शिल्पगत अध्ययन से अवगत हुए। CO-6. छात्रों में काव्य-सर्जन कला का विकास हुआ। CO-7. छात्रों में काव्य के आस्वादन, अध्ययन और मूल्यांकन की यथोचित दृष्टि विकसित हुई।

HP 10 भाषा विज्ञान (30502)	CO-1. छात्रों को भाषा विज्ञान के स्वरूप, अंग एवं शाखाओं का ज्ञान प्राप्त हुआ। CO-2. छात्रों को भाषा विज्ञान के सैद्धांतिक पक्ष का परिचय प्राप्त हुआ। CO-3. छात्रों को भारतीय आर्य भाषाओं के विकास क्रम की जानकारी प्राप्त हुई। CO-4. छात्रों को भाषा विज्ञान की उपयोगिता की जानकारी प्राप्त हुई। CO-5. छात्रों में भाषा के प्रयोग के संबध में समुचित दृष्टिकोन विकसित हुआ।
HP 11 हिंदी साहित्य का इतिहास (30503)	CO-1. छात्रों को साहित्यिक प्रवृत्तियों का ज्ञान प्राप्त हुआ। CO-2. छात्रों को हिंदी साहित्य के इतिहास के काल विभाजन और नामकरण के संबंध में जानकारी प्राप्त हुई। CO-3. छात्र आदिकाल, भक्तिकाल तथा रीतिकाल के प्रतिनिधि कवियों से परिचित हुए। CO-4. छात्रों में साहित्य और युग जीवन का संबंध विशद करने की क्षमता निर्माण हुई। CO-5. छात्रों को हिंदी साहित्येतिहास लेखन का परिचय प्राप्त हुआ। CO-6. छात्रों को आधुनिक युग की सामाजिक, राजनीतिक, धार्मिक, साहित्यिक परिस्थितियों का ज्ञान प्राप्त हुआ।
HP 12 हिंदी आलोचना (30504)	CO-1. छात्रों को आलोचना के स्वरूप का परिचय प्राप्त हुआ। CO-2. छात्र आलोचना के विविध प्रकारों से अवगत हुए। CO-3. छात्रों को प्रमुख आलोचकों के आलोचनात्मक प्रतीमानों का परिचय प्राप्त हुआ। CO-4. छात्रों में साहित्यालोचन एवं व्यावहारिक समीक्षा दृष्टि विकसित हुई। CO-5. छात्रों में आलोचना की क्षमता एवं कौशल विकसित हुआ।
Semester –IV	
HP 13 आधुनिक कविता (40501)	CO-1. छात्रों को आधुनिक काव्य की विभिन्न प्रवृत्तियों का परिचय प्राप्त हुआ। CO-2. छात्रों को आधुनिक काल के काव्य के तात्विक स्वरूप का ज्ञान प्राप्त हुआ। CO-3. छात्रों को आधुनिक काव्य प्रकारों का ज्ञान प्राप्त हुआ। CO-4. छात्रों में काव्य के आस्वादन, अध्ययन और मूल्यांकन की दृष्टि विकसित हुई। CO-5. छात्रों में काव्य के प्रति रुचि वृद्धिंगत हुई। CO-6. छात्र सर्जनात्मक कौशल से अवगत हुए। CO-7. छात्रों में आलोचनात्मक दृष्टि का विकास हुआ।

HP 14 हिंदी भाषा का विकास (40502)	CO-1. छात्रों को हिंदी भाषा का उद्भव, विकास तथा ऐतिहासिक पृष्ठभूमि का परिचय प्राप्त हुआ। CO-2. छात्र आधुनिक आर्य भाषाओं के वर्गीकरण से अवगत हुए। CO-3. छात्र हिंदी की बोलियों के वर्गीकरण और क्षेत्र से परिचित हुए। CO-4. छात्रों को हिंदी के व्याकरणिक स्वरूप और विकास की जानकारी प्राप्त हुई। CO-5. छात्रों को हिंदी के प्रचार एवं प्रसार आंदोलनों की जानकारी प्राप्त हुई।
HP15 हिंदी साहित्य का इतिहास (40503)	CO-1. छात्रों को हिंदी गद्य के अविर्भाव के कारणों एवं परिस्थितियों का परिचय प्राप्त हुआ। CO-2. छात्रों को हिंदी गद्य के विकासक्रम का परिचय प्राप्त हुआ। CO-3. छात्रों को गद्य की विषयवस्तु, भाषा शैली, विचारधारा, प्रभाव आदि का ज्ञान प्राप्त हुआ। CO-4. छात्र आधुनिक काल के साहित्य की उपलाब्धियों तथा सीमाओं से अवगत हुए। CO-5. छात्रों को आधुनिक गद्यकारों एवं कवियों का परिचय प्राप्त हुआ।
HP 16 भारतीय लोकसाहित्य (40504)	CO-1. छात्र लोक साहित्य के स्वरूप तथा महत्व से परिचित हुए। CO-2. छात्रों को लोकसाहित्य की विभिन्न विधाओं का ज्ञान प्राप्त हुआ। CO-3. छात्र लोकसाहित्य की व्यापकता और उपयोगिता से अवगत हुए। CO-4. छात्र महाराष्ट्र के लोकसाहित्य से परिचित हुए। CO-5. छात्रों में लोकसाहित्य के मूल्यांकन की दृष्टि विकसित हुई।

DEPARTMENT OF HISTORY

Programme Outcomes: B.A. History

Department of History	After successful completion of three year degree program in History student should be able to
Programme Outcomes	PO-1. After graduation with B.Ed. course, student can choose teaching career. PO-2. Graduates can select Museum curator, Historians, Tourism, History Expertetc. as their career options. PO-3. Eligible to appear for any competitive exams conducted by UPSC, MPSC,Indian Railway Board, etc. for entering into the government services.

Programme Specific Outcomes: B.A. History

	After successful completion of three year degree program in History student should be able to
Programme Specific Outcomes	PSO-1. Jobs in Government: Policy analysts, government historians, intelligence analysts, administrative and programs specialists, communication specialists, and corporate communication managers. PSO-2. Travel and Tourism Expert: Work as a tourist guide at historical and religious places. PSO-3. School Teacher: Work as teacher in School and high school. PSO-4. College Teacher: Work as Assistant Professor in Colleges. PSO-5. Archivist: A History graduate can find employment with Archaeological Survey of India or with private firms related to archaeology. PSO-6. Researcher: Many Government and non-government institutes along with research center offer several career options for qualified geographers with numerous specializations. PSO-7. Competitive Examination: For History graduates, the option of public service and NET/SET is always open. PSO-8. Social Work: NGOs and Social Welfare Organizations also employ BA History Graduates. PSO-9. Journalist: Journalism is a common career for History Graduates.

Course Outcomes: B.A. History

Course	Outcomes
	After completion of these courses students should be able to :-
Semester-I	
Early India: From Pre-History to the Age of Mauryas Sem- I (11171)	CO-1. It provides a base for understanding the entire Indian history. CO-2. Helps the student to understand the history of early India from the prehistoric times to the age of Mauryas. CO-3. Emphasizes on the factors and forces behind the rise, growth and Spread of civilization and culture of India along with the dynastic history.
Semester-II	
Early India: Post Mauryan Age to the Rashtrakutas Sem-II (11172)	CO-1. It provides a base for understanding the entire Indian history. CO-2. Helps the student to understand the history of early India from the prehistoric times to the age of Rashtrakutas. CO-3. Emphasizes on the factors and forces behind the rise, growth and Spread of civilization and culture of India along with the dynastic history.
Semester-III	
History of the Marathas (1630 to1707) (Sem-III) (23174)	CO-1. Student will develop the ability to analyze sources for Maratha History. CO-2. Student will learn significance of regional history and political foundation of the region. CO-3. It will enhance their perception of 17th century Maharashtra and India in context of Maratha history. CO-4. Appreciate the skills of leadership and the administrative system of the Marathas.
Medieval India:- Sultanate Period Sem-III (23171)	CO-1. Provides examples of sources used to study various periods in history. CO-2. Relates key historical developments during medieval period occurring in one place with another. CO-3. Analyses socio - political and economic changes during medieval period. CO-4. Estimate the foreign invasion and the achievement of rulers.
Glimpses of the Modern World - Part I Sem-III (23172)	CO- 1. It will enable students to develop the overall understanding of the Modern World. CO-2. The students will get acquainted with the Renaissance, major political, socio-religious and economic developments during the Modern World. CO-3. It will enhance their perception of the history of the Modern World. CO-4. It will enable students to understand the significance of the intellectual, economic, political developments in the Modern

	World.
Tourism Management Sem- III (23178)	CO-1. Students will get an overall understanding of the process of Tourism Management. CO-2. They will learn to work in the Tourism Management with great potential. CO-3. They will be able to seek self-employment by starting their own tourism related business.
Semester-IV	
History of the Marathas (1707 to 1818) (Sem-IV) (24174)	CO-1. Students will be able to analyse the Marathas policy of expansionism and its consequences. CO-2. They will understand the role played by the Marathas in the 18^{th} Century India. CO-3. They will be acquainted with the art of diplomacy in the Deccan region.
Medieval India:- Mughal Period Sem- IV (24171)	CO-1. Draws comparisons between policies of different rulers. CO-2. Understanding role of Akbar in the consolidation of Mughal rule in India. CO-3. Understand Auraangzebs confict with Rajputas , Maratha and weakning Mughals age.
Glimpses of the Modern World - Part II Sem-IV (24172)	CO-1. It will enable student to develop the overall understanding of the modern World. CO-2. It will enhance their overall perception of the History of the modern World.CO-3. It will enable student to understand the significances of the strategic political development in the Modern World.
Travel Agency & Tour Business Sem- IV (24178)	CO-1. Students will get an overall understanding of the process of Travel Agency. CO-2. They student will understand the details of the business of Travel Agency CO-3. It will be enable student to seek self employment by starting their own Travel Agency related to business.
Semester-V	
Indian National Movement(1885-1947) Sem –V (35174)	CO-1. It will enable students to develop an overall understanding of modern India . CO-2. It will increase the spirit of healthy Nationalism Democratic Values and secularism among the students. CO-3. Students will understand various aspects of the Indian Independence Movement and the creation of Modern India

Introduction to Historiography Sem-V (35171)	CO-1. Students known source of history. CO-2. Students can study the interdisciplinary approach of History CO-3. Students will be introduces to the Information and importance of Historiography. CO-4 Students will iearn about the usefulness of history in the 21st century, its changing perspectives the new ideas that have been invented. Increased the knowledge of research in history.
Maharashtra in the 19th Century Sem- V (35172)	CO-1. Students will be develop the ability to analyze sources for 19th century century Maharashtra CO-2. It will enhance their perception of 19th & 20th Century Maharashtra CO-3. Student will learn significance of Regional History and Socio religious reformism foundation of the region. CO-4. Appreciate the skills of leadership and the Socio-Religious System of the Maharashtra.
Research Paper Writing (SEC) Sem-V (36177)	CO-1. Students understand basic concept of research. CO-2. Students understand basic framework of sampling and data collection. CO-3. Acquaint the students with various sampling methods and techniques O.-4 Student Develop the skill of report writing
Semester-VI	
Archaeology Sem –VI (SEC) (36177)	CO-1. Students will learn to understand the definition, aims and scope of Archaeology so as to understand its applications in interpreting the human past. CO-2 They will be understand the nature of the archaeological record and the unique role of science in archaeology. CO-3. They will have an overall understanding of the Archaeology.
Applied History Sem-VI (36171)	CO-1. Students will be introduced to the information and importance of applied History. CO-2. Students will be learn about the Historical significance of Archaeology and Archives and opportunities in the field of Archaeology and Archives. CO-3. Through this course, students will be informed about the opportunities in the field of Media, Museums. CO-4. Students will learn about the usefulness of history in the 21st Century, its changing perspectives, the new ideas that have been invented, and the importance of history in a Competitive World.
Maharashtra in the 20th Century Sem-VI (36172)	CO-1. Students will be develop the ability to analyze sources for 20th century century Maharashtra CO-2. It will enhance their perception of 20th Century Maharashtra CO-3. Student will learn significance of Regional History and Socio religious reformism foundation of the region
Indian After Independence- (1947-1991)	CO- 1. It will enable students to develop an overall understanding of the Contemporary India. CO-2 To increase the spirit of healthy Nationalism, Democratic Values

Sem-VI (36174)	and Secularism among the students. CO-3 Students will understand various aspects of India's domestic and foreign policies that shaped Post-Independence India.

Programme Outcomes: M.A. History

	After successful completion of three year degree program in History student should be able to:
Programme Outcomes	PO-1. Understand the Basic Skill of history Writing & research. PO-2. Tress out the Root of contemporary society from the past. PO-3. Realized the importance of Socio cultural moral value. PO-4. Understand the depth of subject of History from macro to micro level.

Programme Specific Outcomes: M.A. History

	After successful completion of three year degree program in History student should be able to
Programme Specific Outcomes	PSO-1. Sources of the reconstruction of Ancient Indian History, Literary, Archaeological, Numismatics and Epigraphy. PSO-2. Origin and Evolution of State- Manorial and Republican tradition. PSO-3. Different literary tradition and their important Vedic, Buddhist, and Jain. PSO-4. History-one of the popular option in competitive examination through its study the students becomes acquainted with his or her National heritage. PSO-5. Different Method of archaeological exploration and excavation visits of selective sites.

Course Outcomes: M.A. History

Course	**Outcomes**
	After completion of these courses students should be able to :-
Semester-I	
History: Theory & Method	CO-1. Gain the theoretical knowledge in subject of history. CO-2. Able to understand nature, scope and importance of history. CO-3. Developed conceptual knowledge in research methodology and formulated hypotheses.

	CO-4. Understand the relation between History and social sciences and increase their interdisciplinary approach.
Evolution of Ideas & Institutions in Early India	CO-1. Analyze Perception Limitations & range of Sources of Ancient India CO-2. Understand political ideas & institutions of Ancient India. CO-3. Able to illustrate emergence of caste based societies in Ancient India. CO-4. Able to explain emergence of state in ancient India
Maratha Polity	CO-1. Able to analyzed Administrative Systems of Marathas. CO-2. Able to identify Strength & weakness of Maratha Administrative system. CO-3. Understand the Socio- Political Power Structure of Maratha period.
History of the Deccan: Pre-History to Chalukaya	CO-1. Students understand of the social, economic and institutional bases of Deccan CO-2. It is based on the premise that an understand of Deccan history is crucial to understand Indian history as a whole.
Semester-II	
Approaches to History	CO-1. Understand the different approaches to history. CO-2. Understand Political, Social, Economic and cultural history. CO-3. Gain knowledge extreme field of the history writing. CO-4. Taking interest to find out local history.
Ideas and Institutions in Medieval India	CO-1. Able to analyze Perception Limitations & range of Sources of Medieval India. CO-2. Understand political ideas & institutions of Medieval India. CO-3. Able to illustrate emergence of caste based societies in Medieval India. CO-4. Able to explain emergence of state in Medieval India.
Socio-Economic History of the Marathas	CO-1. Understand Basic Term concept related Medieval Maratha. CO-2. Understand the Social Ideas & institutions of Medieval Maratha. CO-3. Understand the Economic Ideas & institutions of Medieval Maratha. CO-4. Understand the Cultural transformation of Medieval Maratha.
Marathas in 17th and 18th century Power Politics	CO-1. Students got knowledge of concept of Chh. Shivaji and his times. CO-2. Student view increased of Nationalism and Secularism. CO-3. Students got knowledge of administration of Shivaji Maharaj. CO-4. Introduced to student social, economic and religious condition.
Semester-III	
Cultural History of Maharashtra	CO-1. Write article and present their own view related the topic of modern Maharashtra.

	CO-2. Discuss and summaries current issue in the area of social religious reform movement in Maharashtra.
Intellectual History of the Modern World	CO-1. Understand the Renaissance, Scholasticism & it's Impact of the world. CO-2. Understand the intellectual revolution in 17^{th} & 18^{th} Century. CO-3. Understand the major concepts & ideology in modern west. CO-4. Understand Progress of Science & technology.
Economic History of Modern India	CO-1. 'History of Modern India' topic as a part of History is a very important section as far as the Syllabus of any competitive examination is possible, especially Civil Services exams. CO-2. Modern Indian history Importance For competitive examination.
East Asia : Japan (1853-2000)	CO-1. The course is designed to help the students to know Japanese history especially afterthe opening up of Japan. CO-2. Japan's modernization and its impact; post World War II developments and Japan's role in world politics.
Semester-IV	
Modern Maharashtra: History of Ideas	CO-1. Understand Meaning of the Micro to Macro history. CO-2. Understand the conceptual difference between of the Indian Modernity &Europeanmodernity and also Indian Renaissance & European Renaissance. CO-3. Visit Library and take interest to read the biographies and original literature ofimminent personalities related to 19 century Maharashtra.
World after World War II (1945-2000)	CO-1. Understand the political development in the world after Second World War. CO-2. Developed the understanding of new military and political ideas and institutions. CO-3. Understand the process and impact of globalization.
Debates in Indian Historiography	CO-1. The course is designed to introduce the student to some of the issues that have been debated by historians and to introduce some perspectives with reference to Indian History.
History of Modern India (1857-1971)	CO-1. Understand of various term, Key concept related to Economic History of India. CO-2. Understand the change & continuity of Indian Economics System from Ancient to colonial period. CO-3. Take interest to read various book related to British policy and ideology to ruling India. CO-4. Discuss the contemporary Economical issues in classroom and its related to be history.

DEPARTMENT OF PHYSICS

Programme Outcomes: B. Sc. Physics

Department of Physics	After successful completion of three-year degree program in Physics student should be able to:
Programme Outcome	PO-1. Understand of major concepts in all disciplines of Physics. PO-2. Solve the problem and think methodically, independently and draw a logical conclusion. PO-3. Employ critical thinking and scientific knowledge to design, carry out, record and analyze the results of Physics experiments. PO-4. Create an awareness of the impact of Physics on the society and development outside the scientific community. PO-5. Inculcate scientific temperament in the students. PO-6. Use modern techniques, equipment's and Software's PO-7. Students would perform basic experiments related to mechanics and also get familiar with various measuring instruments

Programme Specific Outcomes: B. Sc. Physics

Department of Physics	After successful completion of three-year degree program in Physics student should be able to:
Programme Specific Outcomes	PSO-1. Gain the knowledge of Physics through theory and practical's PSO-2. Understand good laboratory practices and safety. PSO-3. Develop research-oriented skills. PSO-4. Make aware and handle the sophisticated instruments.

Course Outcomes: B. Sc. Physics

Course	**Outcomes**
	After completion of these courses students should be able to:
Semester-I	
PHY111: Mechanics and Properties of Matter	CO-1. Understand Newton's Laws and its applications in simple systems. CO-2. Understand basic concepts of energy, work and power. CO-3. Understand physical properties like elasticity, viscosity and surface tension. CO-4. Understand use of Bernoulli's theorem in real life
PHY112: Physics principles and applications	CO-1. Understand of electromagnetic spectrum and waves. CO-2. Understand of structure of atom and hydrogen atom spectrum. CO-3. Understand the atomic excitation and laser principles. CO-4. Demonstrate quantitative problem-solving skills in all the topics covered.
PHY-113 :Physics Laboratory-IA	CO-1. Acquire technical and manipulative skills in using laboratory equipment's, tools and materials. CO-2. Understand of lab procedures including safety and scientific techniques**.**

	CO-3. Skill development in collaborative learning and teamwork in lab setting.
Semester-II	
PHY121: Heat and Thermodynamics	CO-1. Understand of concepts of thermodynamics and equation of state CO-2. Applications of Laws of thermodynamics for a process CO-3. Understand of refrigerators, heat pumps and thermometers CO-4. Know the concept of entropy and latent heat
PHY122: Electromagnetics	CO-1. Understand of electric force field and potential for stationary charges CO-2. Knowledge of Coulombs, Gauss, Biot-Savart and Amperes law CO-3. Understand of magnetization of materials CO-4. To develop problem solving skills
PHY123: Physics Laboratory-IB	CO-1. Acquire technical and manipulative skills in using laboratory equipment's, tools and materials. CO-2. Understand of lab procedures including safety and scientific techniques**.** CO-3. Skill development in collaborative learning and teamwork in lab setting.
Semester-III	
PHY231: Mathematical Methods in Physics	CO-1. Understand of complex Algebra CO-2. Understand of partial differentiation and its use in physics. CO-3. Understand of vector algebra and singular points of physics.
PHY232: Electronics/ Instrumentations	CO-1. Understand of Laws of electrical circuits. CO-2. Understand of solid-state semiconductor devices like transistors, OPAMP. CO-3. Understand of Boolean Algebra and logic circuits.
PHY233: Physics Laboratory-2A	CO-1. Design experiments to test hypothesis and /or determination of unknown quantities. CO-2. Develop skill of data analysis, plotting graphs and drawing conclusions. CO-3. Investigate theoretical background of an experiment.
Semester-IV	
PHY241: Oscillations, Waves and sound	CO-1. Understand of equation of motion in different types of oscillations CO-2. Understand of basic concepts of energy exchange in oscillations. CO-3. Understand of Doppler effect and its applications in real life.
PHY242: Optics	CO-1. Acquire basic concepts of wave-optics. CO-2. Understand of optical phenomenon such as interference, diffraction, polarization, birefringence etc. CO-3. Learn optical instruments like microscopes and IP's.
PHY243: Physics Laboratory-2B	CO-1. Design experiments to test hypothesis and /or determination of unknown quantities. CO-2. Develop skill of data analysis, plotting graphs and drawing conclusions. CO-3. Investigate theoretical background of an experiment.
Semester-V	
PH331: Mathematical	CO-1. Know the Cartesian, Spherical polar and Cylindrical co-ordinate systems.

methods of Physics	CO-2. Solve of Legendre, Hermite and Bessel differential equations. CO-3. Understand the special theory of relativity. CO-4. Discuss the Michelson-Morley Experiment.
PH332: Solid State Physics:	CO-1. Understand the crystal structure and types of Bravais lattices. CO-2. Study of X-ray diffraction technique. CO-3. Introduced to band theory of metals. CO-4. Study of magnetic properties of solids.
PH333: Classical Mechanics:	CO-1. Understand of mechanics of system of particles and scattering of particles. CO-2. Understand of Motion of object in central force field. CO-3. Set up Lagrangian and Hamiltonian formulation.
PH334: Atomic and Molecular Physics	CO-1. Understand of atomic structure and spectra. CO-2. Study of one and two electron systems. CO-3. Introduction to various spectroscopies.
PH335: Computational Physics	CO-1. Develop skills of C-language programming for solving physics problems.
PH336: Elements of Material Science	CO-1. Basic knowledge of Material Science. CO-2. Understand the properties of material science. CO-3. Discuss the type of Phase Diagram.
Semester-VI	
PH341: Classical Electrodynamics:	CO-1. Understand fundamentals of Electrostatics. CO-2. Understand fundamentals of Magnetostatics. CO-3. Understand fundamentals of Electrodynamics. CO-4. Know the different Potentials in EM field.
PH342: Quantum Mechanics:	CO-1. Introduction to modern physics and development of quantum mechanics. CO-2. Setting up Schrodinger's steady state equation. CO-3. Problems like potential well, potential barrier, step, hydrogen atom CO-4. Introduction to operators.
PH343: Thermodynamics and statistical physics:	CO-1. Introduction of Kinetic theory of gases. CO-2. Importance of Maxwell's relation CO-3. Knowledge of Random walk problem. CO-4. Types of ensembles. CO-5. Introduction to Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics.
PH344: Nuclear Physics:	CO-1. Understand properties of nucleus. CO-2. Study of Radioactivity. CO-3. Knowledge of types of nuclear forces and nuclear reactions. CO-4. Knowledge of types of particle accelerators.
PH345: Electronics:	CO-1. Know basic components like diode and its types, BJT, FET CO-2. Study of amplifiers and its types. CO-3. Introduction to power supplies.

	CO-4. Details of Digital electronics.
PH346: Lasers	CO-1. Know the about LASER. CO-2. Understand the properties of LASER. CO-3. Understand different type of LASER.
PH347: Laboratory course I	CO-1. Handling of optical and measuring instruments CO-2. Learn to verify basic constants in physics CO-3. Verify laws of physics experimentally
PH348: Lab. course II	CO-1. C-programming Skills. CO-2. Knowledge of programming.
PH349: Laboratory course III (Project)	CO-1. Develop skills of independent working CO-2. Learn Literature survey CO-3. Designing of physics/electronics experiments CO-4. Develop writing and presentation skills
PH350: Laboratory course IV	CO-1. Introduction to process control. CO-2. Basics of discrete state process control. CO-3. Understand the controller principles and types. CO-4. Introduction to modeling, simulation and MATLAB programming.

Programme Outcomes: M.Sc. Physics

Department of Physics	After successful completion of two-year degree program in Physics student should be able to:
Programme Outcome	PO-1. Apply the skill and knowledge in the design and development of electronic circuit to fulfil the needs of small-scale electronic industry. PO-2. Become professionally trained in areas like material science, electronics, lasers and nonlinear circuits. PO-3. They will have a sense of academic and social ethics. PO-4. They will be able to recognize the need for continuous learning and develop throughout for the professional career. PO-5. They will be prepared to take up challenges as globally competitive physicists/researchers. PO-6. They will be technically and analytically skilled enough to pursue their further studies.

Programme Specific Outcomes: M.Sc. Physics

Department of Physics	After successful completion of two-year degree program in Physics student should be able to:
Programme Specific Outcomes	PSO-1. Introduce advanced techniques and ideas required in developing areas of Physics. PSO-2. Enhance students' ability to develop mathematical models for physical systems. PSO-3. Gain the knowledge of Physics through theory and practicals. PSO-4. Understand good laboratory practices and safety. PSO-5. Develop research-oriented skills. PSO-6. Make aware and handle the sophisticated instruments. PSO-7. Understand and apply principles of Physics for understand the scientific phenomenon in classical and quantum Physics. PSO-8. Understands and apply statistical methods for describing the classical and quantum particle phenomenon in various physical systems.

Course Outcomes: M.Sc. Physics

Course	Outcomes
	After completion of these courses students should be able to:
Semester – I	
PHCT-111: Mathematical methods of physics:	CO-1. Get familiar with Matrix Algebra. CO-2. Introduction to operators. CO-3. Uses of Special functions like Legendre, Bessel. CO-4. Uses of Fourier series, Fourier and Laplace transforms.
PHCT-112: Classical Mechanics	CO-1. **S**et up Lagrangian and Hamiltonian formulation. CO-2. Introduction to Canonical transformations and Poisson brackets. CO-3. Basics of Non-inertial frame of reference. CO-4. Information of Central force field problems.
PHCT-113: Electronics	CO-1. Know basic of Semiconductor Devices and its Applications. CO-2. Know basic of Special Function ICs and their Applications. CO-3. Know basic of Digital Logic Circuits I: Combinational Logic. CO-4. Know basics of analog to digital and digital to analog converter types.
PHOT-114C4: Laser-Fundamentals and Applications	CO-1. Understand principles of Interaction of radiation with matter, Einstein's coefficients. CO-2. Know basics of two, three and four level laser systems. CO-3. Study of various laser systems like He-Ne, N2, CO2, Nd:YAG, Ruby, Excimer, Dye lasers. CO-4. Know applications of lasers.
PHCP-115 Physics Lab I	CO-1. Design skills of electronic circuits. CO-2. Handling of electronic instruments. CO-3. Understand of basic concepts of electronic devices.
Semester – II	

PHCT-121: Electrodynamics:	CO-1. Understand fundamentals of Multiple expansions and time varying fields CO-2. Understand the Reflection and refraction of electromagnetic waves. CO-3. Understand Wave equations in terms of electromagnetic potentials. CO-4. Know Relativistic Mechanics and Covariance.
PHCT-122: Atoms and Molecules:	CO-1. Know basics of Atomic structure and atomic spectra. CO-2. Understand of molecular spectra. CO-3. Get familiar with ESR, NMR and X-ray diffraction techniques.
PHCT-123: Quantum Mechanics I:	CO-1. Representation of state of system. CO-2. Using Dirac and Delta notations. CO-3. Concept of Angular Momentum. CO-4. Introduction to types of approximation methods.
PHOT-124D4: Physics of Semiconductor devices:	CO-1. Understand Properties of semiconductors. CO-2. Working principles and construction of p-n junction diode. CO-3. Working principles and construction of junction transistor and field-effect devices. CO-4. Working principles and construction of Metal and MIS devices.
PHCP-125 Physics Laboratory-II	CO-1. Perform Experiments. CO-2. Develop skills of independent working. CO-3. Designing of physics/electronics experiments.
Semester-III	
PHCT-231: Physics of Semiconductor devices:	CO-1. Understand Properties of semiconductors. CO-2. Working principles and construction of p-n junction diode. CO-3. Working principles and construction of junction transistor and field-effect devices. CO-4. Working principles and construction of Metal and MIS devices.
PHCT-232: Laser-Fundamentals and Applications	CO-1. Understand principles of Interaction of radiation with matter, Einstein's coefficients. CO-2. Know basics of two, three and four level laser systems. CO-3. Study of various laser systems like He-Ne, N2, CO2, Nd:YAG, Ruby, Excimer, Dye lasers. CO-4. Know applications of lasers.
PHCT-233: Experimental Techniques in Physics - I	CO-1. Introduction to vacuum physics. CO-2. Study of various types of vacuum pumps. CO-3. Study of vacuum measuring gauges.
PHOP-234-K-Energy Studies – I	CO-1. Know Energy Sources. CO-2. Understand the Solar Radiation and Its Measurements. CO-3. Understand the Heat and Thermodynamics. CO-4. Know the types of energy storage systems.
PHCT-235 Physics Laboratory - III	CO-1. Know how to write program. CO-2. Develop skills of independent working. CO-3. Know how to execute program.

Semester-IV	
PHCT-241 **Nuclear Physics**	CO-1. Understand general properties and concepts of nuclei. CO-2. Know about radiation detectors and nuclear models. CO-3. Understand basics of reaction dynamics, nuclear reactors and accelerators. CO-4. Knowledge of nuclear interactions and particle physics.
PHCT-242 **Materials Science**	CO-1. Understand properties of materials and defects in solids. CO-2. Know Basics of solid solutions and diffusion in solids. CO-3. Know metallurgical thermodynamics. CO-4. Get knowledge of phase diagrams.
PHCT-243 **Experimental Techniques in Physics - II**	CO-1. Know Radiation Sources, Detectors and Sensors. CO-2. Understand Structural Characterization and Thermal Analysis. CO-3. Understand Optical Microscopy, Morphological and Magnetic Characterization**.** CO-4. Get knowledge of Spectroscopic Analysis.
PHOP-244-K **Energy Studies – II**	CO-1. Know about Solar photovoltaic (SPV) Conversion. CO-2. Understand Photo-thermal Applications of Solar Energy**.** CO-3. Get knowledge of Hydrogen Energy.
PHCT-245 **Project**	CO-1. Develop skills of independent working CO-2. Learn Literature survey CO-3. Designing of physics/electronics experiments CO-4. Develop writing and presentation skills

DEPARTMENT OF MARATAHI

Programme Outcomes: B. A. Marathi

Department of Marathi	After successful completion of three-year degree program in Marathi a student is able to:
Programme Outcomes	PO-1. विशिष्ट कालखंडाच्या पाश्वभुमीवर साहित्यामागील प्रेरणा प्रवृत्तींचे ज्ञान करून घेतो. PO-2. चिकित्सक अभ्यासाची क्षमता विकसित होते. PO-3. जागतिकीकरणात विविध क्षेत्रांना सामोरे जाण्यासाठी भाषिक क्षमता विकसित करणे. PO-4. विविध प्रकारची लेखनकौशल्ये विकसित करणे. PO-5. स्वाद घेण्याची डोळस क्षमता विकसित करणे. PO-6. वाङ्मयीन व्यवहार व प्रकाशन व्यवसायाचे स्वरूप समजते. PO-7. समीक्षा करण्याची दृष्टी व क्षमता विकसित होते. PO-8. दोन भाषामधील वाङ्मय व्यवहार समजून घेणे.

Programme Specific Outcomes: B. A. Marathi

Department of Marathi	After successful completion of three-year degree program in Marathi a student is able to:
Programme Specific Outcomes	PSO-1. मराठी साहित्यातील भिन्न प्रवाह आणि प्रकार लक्षात घेणे. PSO-2. विद्यार्थ्यांच्या वाङ्मयीन अभिरूचीचा विकास करणे. PSO-3. संशोधनाची संकल्प , प्रयोजने आणि विविध संशोधन पध्दती समजून घेणे. PSO-4. व्यक्तिमत्त्व विकासासाठी भाषिक कौशल्ये विकसित करणे. PSO-5. प्रसारमाध्यमांसाठी विविध प्रकारची लेखन कौशल्ये आत्मसात करणे.

Course Outcomes: B. A. Marathi

Course	Outcomes After completion of these courses' students should be able to:
Semester-I	
मराठी साहित्य कथा आणि : एकांकिका किंवा व्यवहारिक व उपयोजित मराठी	CO-1. मराठी साहित्यासंबंधी रुची निर्माण झाली. CO-2. भाषिक क्षमता विकसित झाली. CO-3. भाषिक व लेखन कौशल्य विकास झाला.
Semester-II	
भाषिक कौशल्य विकास आणि आधुनिक मराठी साहित्य प्रकार:कांदबरी / ललित गद्य व व्यावहारिक उपयोजित मराठी	CO-1. कांदबरी या साहित्य प्रकारांच्या तात्विक घटकांचे ज्ञान झाले. CO-2. आधुनिक मराठी साहित्यातील निवडक चरित्र-आत्मचरित्र यांचे आकलन व आस्वाद क्षमता विकसित करण्यात आली. CO-3. पारिभाषिक संज्ञाची ओळख करून दिली.
आधुनिक मराठी साहित्य सत्र : पहिले प्रकाशवाटा DSE 1A	CO-1. मराठी साहित्यप्रकारांच्या तात्त्विक घटकांचे ज्ञान झाले. CO-2. साहित्याचे आकलन व मूल्यमापन करण्याची दृष्टी निर्माण करण्यात आली. CO-3. साहित्याचा सूक्ष्म पातळीवर अभ्यास करण्याची क्षमता विकसित झाली.
Semester-III	
सत्र दुसरे - मध्ययुगीन मराठी साहित्य निवडक मध्ययुगीन : गद्य, पद्य]DSE 2A[	CO-1. मराठी साहित्य परंपरेचे स्थूल ज्ञान प्राप्त झाले. CO-2. विशिष्ट कालखंडाच्या साहित्यामागील प्रेरणा आणि प्रवृत्ती ज्ञात झाल्या. CO-3. साहित्याची पार्श्वभूमी आकलन झाली.
साहित्यविचार DSE 1B **साहित्य समीक्षा DSE 2B**	CO-1. साहित्यनिर्मिती प्रक्रिया समजली. CO-2. साहित्याच्या भाषेचे स्वरूप समजले. CO-3. साहित्यसमीक्षा संकल्पना समजली. CO-4. साहित्य आणि समीक्षा यांचा परस्पर संबंध समजून घेण्यास मदत झाली.

Semester-IV	
प्रकाशनव्यवहार आणि संपादन **SEC 2 A**	CO-1. प्रकाशन व्यवहार आणि संपादन प्रक्रिया समजण्यास व विकसित होण्यास मदत झाली. CO-2. प्रात्यक्षिक आणि संदर्भीय लेखन समजण्यास मदत झाली. CO-3. जाहिरात व मुलाखत लेखन कौशल्ये विकसित झाली.
मराठी भाषिक संज्ञापन कौशल्ये त्र नवमाध्यमे आणि समाज माध्यमांसाठी मराठी	CO-1. प्रगत भाषिक कौशल्ये विकसित होण्यास मदत झाली. CO-2. प्रसार माध्यमांचे स्वरूप समजले. CO-3. समाजमाध्यमावर लेखन करण्याचे सामर्थ्य प्राप्त झाले.
Semester-V	
आधुनिक मराठी साहित्य आणि उपयोजित मराठी (G-3)	CO-1. आधुनिक मराठी साहित्यातील विविध वाङ्मयप्रकारांचा परिचय झाला. CO-2. भाषिक कौशल्ये विकसित झाली आणि संपर्क माध्यमे यांचा वाप करण्याचे कौशल्य प्राप्त झाले. CO-3. भाषेचे यथोचित आकलन व वापर करण्याची क्षमता विकसित झाली.
Semester-VI	
साहित्यविचार (S3)	CO-1. साहित्याचे स्वरूप व निर्मितीची प्रयोजने समजली. CO-2. साहित्याचा आस्वाद आणि अभिरुची प्रक्रिया विकसित झाली. CO-3. साहित्य आणि समाज यातील परस्पर संबंध समजला.
भाषाविज्ञान (S4)	CO-1. भाषाकुलाची संकल्पना व उत्पत्तीचा अभ्यास झाला. CO-2. मराठी भाषेचा उत्पत्ती काळ आणि स्थितीगती याविषयीचे ज्ञान प्राप्त झाले. CO-3. भाषा म्हणून मराठीच्या वाटचालीचा आढवा समजला. CO-4. स्वनिम संकल्पना आणि रुपिम व्यवस्था समजली.

Programme Outcomes: M. A. Marathi

Department of Marathi	After successful completion of two-year degree program in Marathi astudent is able to:
Programme Outcomes	PO-1. विद्यार्थ्याला आपल्या आवडीचे संशोधनाचे क्षेत्र निश्चित करना येते. PO-2. मराठी भाषा आणि वाङ्मयाचे प्रगत ज्ञान प्राप्त होते. PO-3. समकालीन वाङ्मयीन प्रवाहांचे नीट आकलन होते. PO-4. वाङ्मयीन प्रश्नांविषयी विचार करण्याची जाण निर्माण होते. PO-5. वाङ्मयीन आणि जीवन विषयक जाणीव प्रौढ होते. PO-6. चिकित्सक अभ्यासाची क्षमता विकसित होते. PO-7. विद्यार्थ्याच्या लेखनगुणांना उत्तेजन मिळते.

Programme Specific Outcomes: M. A. Marathi

Department of Marathi	After successful completion of two-year degree program in Marathi astudent is able to:
Programme Specific Outcomes	PSO-1. विशिष्ट कालखंडातील साहित्याच्या व्याप्तीबद्दल जाण निर्माण होण्यास मदत करणे. अशा विषयाच्या चिकित्सेची समज वाढविणे. PSO-2. साहित्यकृतीच्या साहित्यप्रकाराच्या तौलनिक अभ्यासाबाबत दिशा, व्याप्ती आणि मर्यादा यांची समज निर्माण होण्यास मदत करणे, अशा अभ्यासाची क्षमता वाढविणे. PSO-3. साहित्याच्या व्यवच्छेदक लक्षणाबाबत विचारांची आणि वाङ्मयीन मूल्यमापनाच्या दृष्टीची समज वाढते. PSO-4. भाषेचे विविध व्यवहार आणि साहित्याच्या संदर्भातील भाषाव्यवहार याविषयी आकलनाची क्षमता वाढविणे. PSO-5. साहित्याभ्यासाच्या संदर्भातील विषयांची, त्यांच्या प्रस्तुताप्रस्तुततेची जाण निर्माण करणे.

Course Outcomes: M. A. Marathi

Course	Outcomes
	After completion of these courses students should be able to:
Semester – I	
भाषा व्यवहार आणि भाषिक कौशल्य भाग १/ भाग २	CO-1. विविध स्तरावरील भाषिक कौशल्य व क्षमता विकसित झाल्या. CO-2. मुलाखत लेखन व भाषांतर या कौशल्याचा विकास झाला. CO-3. जनसंपर्क कौशल्याची आवशकता व तंत्रे समजली.
अर्वाचीन मराठी वाङ्मयाचा इतिहास (इ.स. १८१८ ते इ.स. २०१०)	CO-1. मराठी साहित्य परंपरेचे स्थूल ज्ञान प्राप्त झाले. CO-2. विशिष्ट कालखंडाच्या साहित्यामागील प्रेरणा आणि प्रवृत्ती ज्ञात झाल्या. CO-3. साहित्याची पार्श्वभूमी आकलन झाली.
ऐतिहासिक भाषाविज्ञान आणि सामाजिक	CO-1. भाषाकुलाची संकल्पना व उत्पत्ती समजली. CO-2. मराठी भाषेचा उत्पत्ती काळ आणि स्थितीगती समजली. CO-3. समाजातील भाषा उपयोजनातील विविधतेचे आकलन झाली. CO-4. सामाजिक भाषाविज्ञान संकल्पना, स्वरूप व व्याप्ती समजली.
Semester-II	
ऐच्छिक : ग्रामीण / दलित साहित्य	CO-1. ग्रामीण आणि दलित साहित्याची निर्मिती व कारण परंपरा समजली. CO-2. ग्रामीण साहित्याचे स्वरूप व कार्य यांची माहिती मिळाली. CO-3. दलित साहित्यातील वेदना, विद्रोह याचे स्वरूप समजले. CO-4. ग्रामीण व दलित साहित्याचे योगदान, गती आणि दिशा यांचे आकलन झाले.
Semester – III	
प्रसारमाध्यमे आणि साहित्यव्यवहार	CO-1. प्रसारमाध्यमासाठीचे लेखन कौशल्य आत्मसात झाले. CO-2. प्रसारमाध्यमासाठी भाषिक क्षमता विकसित झाल्या. CO-3. प्रसारमाध्यमे आणि साहित्यव्यवहार यातील परस्पर संबंध स्पष्ट झाला.
साहित्य : समीक्षा व संशोधन	CO-1. साहित्य समीक्षा व्यवहाराची समज व संकल्पना समजली. CO-2. मराठी साहित्य समीक्षकांची परंपरा व क्षमता विकसित झाल्या. CO-3. संशोधनाची संकल्पना, प्रयोजने व पद्धती समजल्या.
Semester-IV	
विशेष लेखकाचा	CO-1. एका लेखकाची वाङ्मयीन जडण-घडण समजली.

अभ्यास (मध्ययुगीन / अर्वाचीन)	CO-2. लेखकाच्या लेखनातील परिवर्तन वौविध्य आकलन झाले. CO-3. लेखकाचे स्थान व जीवननिष्ठा विशद झाल्या.
ऐच्छिक : लोकसाहित्याची मूलतत्त्वे आणि मराठी लोकसाहित्य	CO-1. लोकसाहित्याची संकल्पना, स्वरूप व व्याप्ती आकलन झाली. CO-2. लोकसाहित्यातील विविध प्रकार समजले. CO-3. मराठी लोकसाहित्यातील सामाजिक, सांस्कृतिक, धर्मिक जाणिवा स्पष्ट झाल्या.

DEPARTMENT OF MATHEMATICS

Programme Outcomes: B. Sc. Mathematics

Department of Mathematics	After successful completion of three year degree program in Mathematics a student will be able to:
Programme Outcomes	PO-1. Gain sound knowledge on fundamental principles and concepts of Mathematics and computing with their applications related to Industrial, Engineering, Biological and Ecological problems. PO-2. Exhibit in depth the analytical and critical thinking to identify, formulate and solve real world problems of science and engineering. PO-3. Get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning. PO-4. A student should get adequate exposure to global and local concerns that explore them many aspects of Mathematical Sciences. PO-5. Apply their skills and knowledge, that is, translate information presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion. PO-6. Be capable of undertaking suitable experiments/research methods while solving the real-life problem and would arrive at valid conclusions based on appropriate interpretations of data and experimental results. PO-7. Develop written and oral communications skills in order to effectively communicate design, analysis and research results. PO-8. Demonstrate appropriate inter-personal skills to function effectively as an individual, as a member or as a leader of a team and in a multi-disciplinary setting. PO-9. Acquire competent positions in industry and academia as well.

Programme Specific Outcomes: B. Sc. Mathematics

Department of Mathematics	After successful completion of three year degree program in Mathematics a student will be able to:
Programme Specific Outcomes	PSO-1. Give the students a sufficient knowledge of fundamental principles, methods and a clear perception of innumerous power of mathematical ideas and tools and know how to use them by modeling, solving and interpreting. PSO-2. To equip the students sufficiently in both analytical and computational skills in Mathematical Sciences. PSO-3. To develop a competitive attitude for building a strong academic – industrial collaboration, with focus on continuous learning skills. PSO-4. Enhancing student's overall development and to equip them with mathematical modeling abilities, problem solving skills, creative talent and power of communication necessary for various kinds of employment.

	PSO-5. Enabling students to develop a positive attitude towards mathematics as an interesting and valuable subject of study. PSO-6. Enabling students to Gauge the hypothesis, theories, techniques and proofs provisionally.

Course Outcomes: B. Sc. Mathematics

Course	Outcomes
	After completion of these courses students should be able to:
Semester-I	
MT-111 Algebra	CO-1. Solve problems on equivalence relations, functions, inverse functions, composition of functions. CO-2. Solve various problems on properties of integers and use the basic concepts of divisibility, congruence and their applications in basic algebra. CO-3. Solve problems on basic properties of complex numbers, different forms of complex numbers, algebraic equations and regions in the complex plane.
MT-112 Calculus - I	CO-1. Identify algebraic and order properties of real numbers. CO-2. Identify and apply the function properties of real number system such as the completeness property. CO-3. Verify the values of limit of a function at a point using the definition of a limit.
Semester-II	
MT 121 Analytical Geometry	CO-1. Able to transform old co-ordinate system to new co-ordinate system by translation and rotation, reduce the general equation of second degree into standard form of conic. CO-2. Solve the problems of lines in three dimension, planes, spheres, and cylinders and how geometry is related to algebra by using their algebraic equations.
MT -122 Calculus -II	CO-1. Students will be familiar with the techniques of integration and differentiation of function with real variables CO-2. Identify and apply the intermediate value thm, Mean value thm and L'Hospital's rule CO-3. Identify types of differential equations and solve differential equations such as Exact, homogeneous, non-homogeneous, and linear and Bernoulli differential equations etc.
Semester-III	
MT -231 Calculus of Several Variables	CO-1. Students learn analysis of multivariable functions, continuity, and differentiability. CO-2. Learn the concepts of multiple integrals and their Application to area and volumes.

MT -232 (A) Numerical Methods and its Applications	CO-1. Find the solution of Algebraic and Transcendental equations CO-2. Find the polynomials for equal and unequal intervals by using interpolation. CO-3. Evaluate definite integrals using different techniques numerically. CO-4. Find the numerical solution of first order ordinary differential equations
Semester-IV	
MT -241 Linear Algebra	CO-1. Solve the system of homogeneous and non-homogeneous linear of m equations in n variables by using concept of rank of matrix CO-2. Use the concept of basis and dimension of vector spaces linear dependence and linear independence, to solve problems. CO-3. Apply the properties of linear transformations to linearity of transformations, kernel and rank of linear transformations, inverse transformations to solve the problems of matrix transformations, change of basis.
MT -242(A) Vector Calculus	CO-1. Students develop knowledge in the limit, continuity, differentiation of vector functions. CO-2. Use the various techniques of solving Integral problems of vector valued functions.
Semester-V	
MT-331 Metric Spaces	CO-1. Determine whether given function is a metric in X. CO-2. Solve the numerical problems based on distance function on X. CO-3.Understand the basic terms such as dense set, boundary and frontier points, cluster points etc. CO-4. Know the difference of completeness, compactness and connectedness. CO-5. Prove various mathematical statements.
MT -332 Real Analysis-I	CO-1. Know the meaning of various terms involved in Sequences and series of Real numbers. CO-2. To identify the types of various sequences and standard series. CO-3. Apply various Tests of convergence. CO-4. Know the Rearrangement of series. CO-5. Understand Leibnitz's theorem for an alternating series.
MT -334 Group Theory	CO-1. Identify the various algebraic structures with their corresponding binary operations. CO-2. Generalize the groups on the basis of their orders, elements, order of elements and group relations. CO-3. Compare two groups of same orders on the basis of isomer. Criterion. CO-4. Compute the possible subgroups of given group of specific orders and will recognize them. CO-5. Compare between two groups of finite orders.
MT -335 Ordinary Differential Equations	CO-1. Distinguish between linear, non-linear, partial and ordinary differential equations. CO-2. Recognize and solve homogeneous diff. equations, exact diff. equations, linear diff. equations by using Integrating factors.

	CO-3. Solve Linear Differential Equations with constant coefficients. CO-4. Solve Non-Homogeneous Differential Equations by using the Method of Undetermined coefficients, Method of Variation of parameters and Method of Reduction of Order. CO-5. Find power series solution about ordinary point and a power series solution about singular points.
MT -337-A Operations Research	CO-1. Formulate and model a LPP from a word problem and solve them graphically in 2-D. CO-2. Modify a primal problem and use the LPP to identify the new solution. CO-3. Understand basic notions like feasibility, infeasibility, basic solutions, unbounded solutions etc. CO-4. Solve LP Model by using the Simplex method. CO-5. Solve the Assignment Model by using the Hungarian method.
MT -337-F Number Theory	CO-1. Know the role of the Fundamental theorem of Arithmetic. CO-2. Understand the basic properties of congruence. CO-3. Understand the Fermat's theorem, Euler's theorem, and the Wilson's theorem. CO-4. Identify the Arithmetic functions. CO-5. Have the knowledge of Diophantine equations.
Semester-VI	
MT -341 Complex Analysis	CO-1. Understand the basic algebraic properties of complex numbers. CO-2. Solve the numerical problems based on Cauchy-Riemann equations. CO-3. Understand the theorems on analytic functions and sufficient conditions for differentiability. CO-4. Compute integrals by using Cauchy integral formulae. CO-5. Identify the convergence of sequences and series.
MT -342 Real Analysis-II	CO-1. Know the meaning of various terms involved in Sequences and series of functions. CO-2. Use various tests for Absolute and Conditional convergence of series of functions. CO-3. Derive consequences of uniform convergence. CO-4. Understand the notions of integration and differentiation of series of functions.
MT -344 Ring Theory	CO-1. Identify the various algebraic structures with their corresponding binary operations. CO-2. Generalize the rings on the basis of their binary operations. CO-3. Compare two rings on the basis of isomorphism criterion. CO-4. Compute the possible homomorphism's of given rings. CO-5. Analyze and demonstrate examples of ideals and quotient rings.
MT -345 Partial Differential Equations	CO-1. Distinguish between linear, non-linear, partial differential equations. CO-2. Solve Pfaffian differential forms and equations. CO-3. Classify the integrals.

	CO-4. Solve Compatible systems. CO-5. Solve examples on the Charpit's method and the Jacobi's method.
MT -347- A Optimization Techniques	CO-1. Formulate the Network Models and give Network representation. CO-2. Solve examples on Critical path, CPM and PERT. CO-3. Distinguish the types of Failure. CO-4. Solve Sequencing problems of various types. CO-5. Understand Classical Optimization Theory.
MT -347-F Computational Geometry	CO-1. Design, analyze and develop algorithm and method for solving geometric problems efficiently. CO-2. Assess theoretical and practical problems that involves geometry. CO-3. Generalize basic notions of reflection, rotation, projection with real life examples.

Programme Outcomes: M. Sc. Mathematics

Department of Mathematics	After successful completion of three year degree program in Mathematics a student will be able to:
Programme Outcomes	PO-1. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results implemented in the theorem. PO-2. Solve the problem and also think methodically, independently and draw a logical conclusion. PO-3. Understand and Make application of major concepts in all disciplines of Mathematics. PO-4. Relate correlation between various courses of Mathematics with standard mathematical proofs. PO-5. To inculcate the scientific temperament in the students and outside the scientific community. PO-6. Create an awareness of the impact of Mathematics according to various geometrical shapes and patterns on the environment and development outside the scientific community.

Programme Specific Outcomes: M. Sc. Mathematics

Department of Mathematics	After successful completion of three year degree program in Mathematics a student will be able to:
Programme Specific Outcomes	PSO-1. Understand the proof techniques in Mathematics and importance of theorems for sorting out typical examples. PSO-2. Gain the knowledge of Mathematics through applied and pure theories. PSO-3. Develop research oriented skills. PSO-4. To explain nomenclature of Mathematical proof techniques and structures. PSO-5. Identify Mathematical formulae and solve numerical problems.

Course Outcomes: M. Sc. Mathematics

Course	Outcomes
	After completion of these courses' students should be able to:
Semester-I	
MTUT 111 : Linear Algebra	CO-1. Solve examples on Vector spaces and its subspaces. CO-2. Know Basis and Dimension of a Vector space. CO-3. Understand Linear mappings and Matrices. CO-4. Find the Eigenvalues and Eigenfunctions of a Matrix. CO-5. Solve for the Jordon canonical forms and Rational canonical forms.
MTUT112 : Real Analysis	CO-1. Understand basic theorem on Lebesgue measure CO-2. Understand basic theory of measurable set, measurable functions, Measurability. CO-3. Determine the Riemann integrability. CO-4. Distinguish between Riemann and Lebesgue integrals.
MTUT113 : Group Theory	CO-1. Generalize the groups on the basis of their orders, elements, order of elements and group relations. CO-2. Identify the various algebraic structures with their corresponding binary operations. CO-3. Use various canonical types of groups including cylic groups and groups of permutations. CO-4. Compute the possible subgroups of given group of specific orders and will recognize them. CO-5. Apply Sylow theorems for groups of finite orders.
MTUT114 : Advanced Calculus	CO-1. Compute double integrals, applications to area and volume, Green's theorem in the plane and the change of variables in double integrals. CO-2. Understand basic notions such as derivative of the scalar field w.r.to vector field, gradient of scalar field, paths and line integrals. CO-3. Recognize fundamental vector product, area of various parametric surfaces.
MTUT115 : Ordinary Differential Equations	CO-1. Distinguish between linear, non-linear, partial and ordinary differential equations. CO-2. Recognize and solve homogeneous diff. equations, exact diff. equations, linear diff. equations by using Integrating factors. CO-3. Identify ordinary and singular points. CO-4. Find power series solution about ordinary point and a power series solution about singular points.
Semester-II	
MTUT121 : Complex Analysis	CO-1. Understand the basic algebraic properties of complex numbers. CO-2. Compute integrals by using Cauchy integral formulae. CO-3. Understand the theorems on analytic functions and sufficient conditions for differentiability. CO-4. Solve the numerical problems based on Cauchy-Riemann equations.

	CO-5. Identify the convergence of sequences and series.
MTUT122 : General Topology	CO-1. Understand various basic topologies. CO-2. Understand the core ideas of accountability and unaccountability. CO-3. Understand the theory of compactness, connectedness and completeness. CO-4. Understand the hereditary topological properties. CO-5. Understand the thms on normal spaces, regular spaces and relation between them.
MTUT123 : Rings and Modules	CO-1. Assess properties implied by the definitions of rings and modules. CO-2. Generalize the rings on the basis of their binary operations. CO-3. Compare two rings on the basis of isomorphism criterion. CO-4. Use the concept of isomorphism and homomorphism for rings. CO-5. Analyze and demonstrate examples of ideals and quotient rings.
MTUT124 : Numerical Analysis	CO-1. The students will not only learn how to use the finite element method, but also how to formulate and code a finite element method for any given set of partial differential equations. Thus, the finite element method is developed as a tool for the numerical solution of partial differential equations, and not confined only to structural mechanics applications the way it is typically taught. CO-2. The students will learn how to Solve the Ordinary differential equation by various methods CO-3. The students will learn how to find the Integration & Derivative by various methods CO-4. The students will learn how to find the roots of the equation by various methods
MTUT125 : Partial Differential Equations	CO-1. Solve examples on Charpit's and Jacobi's method CO-2. Solve wave equations, heat equations, boundary value problems, Laplace equations, Cauchy problem, Dirichlet and Neumann problem for different regions. CO-3. Classify the various second order partial differential equations. CO-4. Know the Families of Equipotential Surfaces.
Semester-III	
MTUT131 : Functional Analysis	CO-1. A student learns the basics of functional analysis. CO-2. They learn to treat the vector spaces which have the additional property of being topological spaces. CO-3. Blending of these two structures brings them an exposure to higher mathematics. Important theorems like the Hahn-Banach theorem is taught here. These theorems stand a student in good stead throughout his mathematical life. CO-4. The student having seen basic analysis and linear algebra is expected to learn how these topics play a significant role, first in multi-variate calculus which then naturally leads to calculus on manifolds.

	CO-5. The intimate relationship between analysis and geometry should become apparent at the end of this course.
MTUT132 : Field Theory	CO-1. Understand basic notions in the theory of field extensions CO-2. Apply the theorems of algebraic extensions, splitting fields, Separable and Inseparable Extensions to find the various examples of extensions. CO-3. Relate the group theory and Galois Theory in finding the Galois extension and Galois group. CO-4. Understand basic theory of composite extensions, simple extensions and cyclotomic extensions.
MTUT133 : Introduction to Data Science	CO-1. The student will be able to explain the steps involved in data science process. CO-2. The student will implement object oriented concepts. CO-3. Demonstrate the use of Python in Data Science. CO-4. Study graphics and design and implement a python program on big data. CO-5. The students will implement the concepts of data with python and database connectivity. CO-6. Gain knowledge about basic concepts of Machine Learning and identify machine learning techniques suitable for a given data problem.
MTUTO134 : Discrete Mathematics	CO-1. Know the basic terms paths, cycles, trees. CO-2. Understand the language of graphs and model. CO-3. Understand the use of graphs as model. CO-4. Solve real world problems using graphs and trees. CO-5. Understand the ideas of permutations and combinations. CO-6. Understand the addition and multiplication principles for counting. CO-7. Understand how to apply combinatorial ideas to real life problems. CO-8. Use generating functions to solve variety of combinatorial Problems.
MTUTO137 : Integral Equations	CO-1. Explain the Fundamental concepts of the Theory of Integral Equation. CO-2. Distinguish the difference between Differential Equations and Integral Equations, singular integral equation. Convert he differential equation into an integral equation and vice versa CO-3. Solve the problems on Fredholm integral equations by Adomian decomposition method direct computation method, and on Volterra integral equations by Adomian decomposition method, series solution method successive approximation method. CO-4. Find the solution of the problems on Fredholm Integro differential equation, Volterra Integro differential equation. CO-5. Learn the methods to solve singular integral equation.
Semester-IV	
MTUT141 : Fourier Analysis and Boundary Value Problems.	CO-1. Find the Fourier series representation of a function of one variable. CO-2. Find the solution of Wave equation, Laplace equation, Heat equation using the Fourier series. CO-3. Know how to solve Boundary value problems.

MTUT142 : Differential Geometry.	CO-1. Recognize different types of graphs and its level sets. CO-2. Understand basic notions related vector fields, tangent spaces and Surfaces. CO-3. Understand core ideas of orientation, geodesics, parallel transport, Weingarten map and Curvatures CO-4. Solve examples on curvatures, arc lengths and line integrals, curvature of surfaces
MTUT143 : Programming with Python	CO-1. The student will be able to explain basic principles of Python programming language. CO-2. The student will implement object oriented concepts. CO-3. Demonstrate the use of Python in Mathematics such as operations research and computational Geometry etc. CO-4. Study graphics and design and implement a program to solve a real world problem. CO-5. The students will implement the concepts of data with python and database connectivity.
MTUTO144 : Number Theory	CO-1. Solve various problems on properties of integers and use the basic concepts of divisibility, congruence and their applications in basic algebra. CO-2. The students are able to Free Open Learn course, Introduction to number theory, as well as becoming proficient at modular arithmetic, you should find that you are increasingly able to communicate mathematical ideas and apply your knowledge and understanding to mathematics in everyday life, in particular to applications, such as the prevention of errors in ID numbers
MTUTO148 : Probability and Statistics	CO-1. Use basic concepts of probability including independence and conditional probability. CO-2. Determine the appropriate probability distributions based on experiment conditions and assumptions. CO-3. Students should able to know basic concepts of continuous, univariate, bivariate probability distributions. CO-4 Calculate, interpret and communicate the correlation coefficient and linear regression equation.

DEPARTMENT OF MICROBIOLOGY

Programme Outcomes: B.Sc. Microbiology

Department of Hindi	After successful completion of three year degree program in Microbiology student should be able to
Programme Outcomes	PO-1 Acquired knowledge and understanding of the microbiology concepts as applicable to diverse areas such as medical, industrial, environment, genetics, agriculture, food and others. PO-2 Demonstrate key practical skills/competencies in working with microbes for study and use in the laboratory as well as outside, including the use of good microbiological practices. PO-3 Competent enough to use microbiology knowledge and skills to Analyze problems involving microbes, articulate these with peers/ team members/ other stake holders, and undertake remedial measures/studiesetc. PO-4 Developed abroade rperspective of the discipline of Microbiology to enable him to identify challenging societal problems and plan his professional career to develop innovative solutions for such problems.
Programme Specific Outcomes	PSO1- For the subject of Microbiology the outcomes are defined in terms of the understanding and knowledge of the students in microbiology and the practical skills the students are required to have to be competitive microbiologist so that They are able to play their role as microbiologist where we required in the society such as the diseases caused by the microbes, their diagnosis and remedies; the role of microbiologists in the biotechnology industry and how they may be able of it the bill in the industry. PSO2-The students are also trained in such a way that they develop critical Thinking and problem solving as related to the microbiology. PSO3 - The curriculum envisions that the student, once graduate as specialists in a discipline have animportantroleto play in thenewer developments and innovations in the future in the subject for advancement of the discipline. PSO4-The students graduating in this degree must have through understanding of basic knowledge or understanding of the fundamentals of Microbiologyast Applicable to wide ranging contexts.

Course Outcomes: Microbiology

Semester-I

Course Outcomes	After completion of these courses students should be able to:-
MB111- Introduction to Microbial World	CO-1 Development of microbiology as a discipline Golden Era of Microbiology Modern Era of Microbiology CO-2 Types of Microorganism and their differentiating characters CO-3. Beneficial and Harmful effects of microorganisms
MB112-Basic Techniques in Microbiology	CO-1 Introduction to Modern SI units CO-2 Principles and Working of different types of Microscopes CO-3 Staining Techniques CO-4 Sterilization and Disinfection Checking of efficacy of chemical disinfectant
MB113- Practical Course based on theory paper I and II	CO-1 Safety measures and Good Laboratory Practices in microbiology laboratory CO- Introduction, operation, precautions and use Of common microbiology laboratory instruments CO-3 Checking of efficacy of chemical disinfectant working and care of bright field microscope. CO-4 Observation of Microorganisms CO-5 Introduction and use of common laboratory glasswares CO-6 Basic staining techniques CO-7 Observation of motility in bacteria CO-8 Checking of efficacy of chemical disinfectant
Semester-II	
MB121 - Bacterial Cell and Biochemistry	CO-1 Bacterial Cytology: Structure, chemical composition and functions of the components in bacterial cell CO-2 Chemical Basis of Microbiology CO-3 Chemistry of Biomolecules: Structure, organization and functions Carbohydrates: Definition, classification CO-4 Classification of Bacteria and Viruses

MB122 Microbial cultivation and growth	CO-1 Cultivation of Microorganisms: nutritional classification, Design and preparation of media, Isolation and Enumeration and maintenance of bacteria, Role of Culture collection centres and National Biodiversity Authority for culture collection. CO-2 Bacterial growth: Kinetics, Growth curve and Generation time, Methods of enumeration of bacterial growth
MB123- Practical Course based on theory paper I and II	CO- Preparation of simple laboratory nutrient media CO-2Checking sterilization efficiency of autoclave CO-3 Preparation of Winogradsky's column CO-4 Special staining techniques CO-5 Isolationand Enumeration of bacteria CO-6 Study of normal flora ofskin CO-7 Effect of different parameters on growth of E.coli CO-8 Preservation of cultures

DEPARTMENT OF PHYSICS

Programme Outcomes: B. Sc. Physics

Department of Physics	After successful completion of three-year degree program in Physics student should be able to:
Programme Outcome	PO-1. Understand of major concepts in all disciplines of Physics. PO-2. Solve the problem and think methodically, independently and draw a logical conclusion. PO-3. Employ critical thinking and scientific knowledge to design, carry out, record and analyze the results of Physics experiments. PO-4. Create an awareness of the impact of Physics on the society and development outside the scientific community. PO-5. Inculcate scientific temperament in the students. PO-6. Use modern techniques, equipment's and Software's PO-7. Students would perform basic experiments related to mechanics and also get familiar with various measuring instruments

Programme Specific Outcomes: B. Sc. Physics

Department of Physics	After successful completion of three-year degree program in Physics student should be able to:
Programme Specific Outcomes	PSO-1. Gain the knowledge of Physics through theory and practical's PSO-2. Understand good laboratory practices and safety. PSO-3. Develop research-oriented skills. PSO-4. Make aware and handle the sophisticated instruments.

Course Outcomes B.Sc. Physics

Semester I	
Course	**Outcomes** After completion of these courses' students should be able to;
PHY111: Mechanics and Properties of Matter	CO1: understand Newton's Laws and its applications in simple systems. CO2: understand basic concepts of energy, work and power. CO3: understand physical properties like elasticity, viscosity and surface tension. CO4: understand use of Bernoulli's theorem in real life.
PHY112: Physics principles and applications	CO1: understand of electromagnetic spectrum and waves. CO2: understand of structure of atom and hydrogen atom spectrum. CO3: understand the atomic excitation and laser principles.

	CO4: demonstrate quantitative problem-solving skills in all the topics covered.
PHY-113 :Physics Laboratory-IA	CO1: acquire technical and manipulative skills in using laboratory equipment's, tools and materials. CO2: understand of lab procedures including safety and scientific techniques**.** CO3: skill development in collaborative learning and teamwork in lab setting.
Semester II	
PHY121: Heat and Thermodynamics	CO1: understand of concepts of thermodynamics and equation of state CO2: applications of Laws of thermodynamics for a process CO3: understand of refrigerators, heat pumps and thermometers CO4: know the concept of entropy and latent heat
PHY122: Electromagnetics	CO1: understand of electric force field and potential for stationary charges CO2: knowledge of Coulombs, Gauss, Biot-Savart and Amperes law CO3: understand of magnetization of materials CO4: To develop problem solving skills
PHY123: Physics Laboratory-IB	CO1: acquire technical and manipulative skills in using laboratory equipment's, tools and materials. CO2: understand of lab procedures including safety and scientific techniques**.** CO3: skill development in collaborative learning and teamwork in lab setting.

Semester-III	
PHY231: Mathematical Methods in Physics	CO1: understand of complex Algebra CO2: understand of partial differentiation and its use in physics. CO3: understand of vector algebra and singular points of physics.
PHY232: Electronics/ Instrumentations	CO1: understand of Laws of electrical circuits. CO2: understand of solid-state semiconductor devices like transistors, OPAMP. CO3: understand of Boolean Algebra and logic circuits.
PHY233: Physics Laboratory-2A	CO1: design experiments to test hypothesis and /or determination of unknown quantities. CO2: develop skill of data analysis, plotting graphs and drawing conclusions. CO3: investigate theoretical background of an experiment.
Semester-IV	
PHY241: Oscillations, Waves and sound	CO1: understand of equation of motion in different types of oscillations CO2: understand of basic concepts of energy exchange in oscillations. CO3: understand of Doppler effect and its applications in real life.
PHY242: Optics	CO1: acquire basic concepts of wave-optics. CO2: understand of optical phenomenon such as interference, diffraction, polarization, birefringence etc. CO3: learn optical instruments like microscopes and IP's.
PHY243: Physics Laboratory-2B	CO1: design experiments to test hypothesis and /or determination of unknown quantities. CO2: develop skill of data analysis, plotting graphs and drawing conclusions. CO3: investigate theoretical background of an experiment.
Semester-V	
PHY351: Mathematical methods of Physics	CO1: know the Cartesian, Spherical polar and Cylindrical co-ordinate systems. CO2: solve of Legendre, Hermite and Bessel differential equations. CO3: understand the special theory of relativity. CO4: discuss the Michelson-Morley Experiment.
PHY352: Electrodynamics	CO1: know the basic laws of Electrostatics. CO2: solve of problem based on electrostatics and magnetostatics. CO3: understand the physical significance of Maxwell equation. CO4: discuss the theory of electrodynamics.

PHY353: Classical Mechanics:	CO1: understand of mechanics of system of particles and scattering of particles. CO2: understand of Motion of object in central force field. CO3: set up Lagrangian and Hamiltonian formulation
PHY354: Atomic and Molecular Physics	CO1: understand of atomic structure and spectra. CO2: study of one and two electron systems. CO3: introduction to various spectroscopies.
PHY355: Computational Physics:	CO1: develop skills of C-language programming for solving physics problems.
PHY356: Elements of Material Science	CO1: basic knowledge of Material Science. CO2: understand the properties of material science. CO3: discuss the type of Phase Diagram.
PHY357: Physics Laboratory 3A	CO1: handling of optical and measuring instruments CO2: learn to verify basic constants in physics CO3: verify laws of physics experimentally
PHY-358 **Physics Laboratory-3B**	CO1: handling of optical and measuring instruments CO2: learn to verify basic constants in physics CO3: verify laws of physics experimentally
Project PHY-359	CO1: develop skills of independent working CO2: learn Literature survey CO3: designing of physics/electronics experiments CO4: develop writing and presentation skills
PHY-3510(I) **Energy studies**	CO1: Introduction to energy sources CO2: Solar thermal applications CO3: Applications of solar photovoltaic systems CO4: Study of biomass and wind energy
PHY-3511(L) **Physics Workshop Skill**	CO1: study principle and working of digital multimeter CO2: learn electronic voltmeter CO3: detail study of cathode ray oscilloscope CO4: study of impedance bridges and Q-meters
Course Outcomes T.Y.B.Sc. Physics Sem-VI	
PHY361: Solid State Physics:	CO1: understand the crystal structure and types of Bravais lattices. CO2: Study of X-ray diffraction technique. CO3: Introduced to band theory of metals. CO4: Study of magnetic properties of solids.
PHY362: **Quantum Mechanics**	CO1: introduction to modern physics and development of quantum mechanics. CO2: setting up Schrodinger's steady state equation. CO3: problems like potential well, potential barrier, step, hydrogen atom CO4: introduction to operators.
PHY363:	CO1: introduction of Kinetic theory of gases. CO2: importance of Maxwell's relation

Thermodynamics and statistical physics	CO3: knowledge of Random walk problem. CO4: types of ensembles. CO5: introduction to Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics.
PHY364: **Nuclear Physics:**	CO1: understand properties of nucleus. CO2: study of Radioactivity. CO3: knowledge of types of nuclear forces and nuclear reactions. CO4: knowledge of types of particle accelerators.
PHY365: Electronics	CO1: know basic components like diode and its types, BJT, FET CO2: study of amplifiers and its types. CO3: introduction to power supplies. CO4: details of Digital electronics.
PHY-366(S): **Lasers**	CO1: know the about LASER. CO2. Understand the properties of LASER. CO3: understand different type of LASER.
PHY-367 **Physics Laboratory-4A**	CO1: handling of optical and measuring instruments CO2: learn to verify basic constants in physics CO3: verify laws of physics experimentally CO1: handling of optical and measuring instruments CO2: learn to verify basic constants in physics CO3: verify laws of physics experimentally
PHY-369 Projects	CO1: develop skills of independent working CO2: learn Literature survey CO3: designing of physics/electronics experiments CO4: develop writing and presentation skills
PHY-3610(X): **Solar PV Systems**	CO1: Introduction to solar PV system CO2: Study of solar radiation and measurement CO3: learn basic solar PV system CO4:Alalysis of MSEB bill
PHY-3611(AC): **Radiation Physics**	CO1: Study of interaction of radiation with matter CO2: understand radiation detectors CO3: Learn to radiation units and measurement of radiation exposure CO4: To understand radiation protection and their applications

Programme Outcomes: M.Sc. Physics.

Department of Physics	After successful completion of two-year degree program in Physics student should be able to:
Programme Outcomes	PO-1: apply the skill and knowledge in the design and development of electronic circuit to fulfil the needs of small-scale electronic industry.

	PO-2: become professionally trained in areas like material science, electronics, lasers and nonlinear circuits. PO-3: they will have a sense of academic and social ethics. PO-4: they will be able to recognize the need for continuous learning and develop throughout for the professional career. PO-5: they will be prepared to take up challenges as globally competitive physicists/researchers. PO-6: they will be technically and analytically skilled enough to pursue their further studies.
Programme Specific Outcomes	PSO-1: introduce advanced techniques and ideas required in developing areas of Physics. PSO-2: enhance students' ability to develop mathematical models for physical systems. PSO-3: gain the knowledge of Physics through theory and practicals. PSO-4: understand good laboratory practices and safety. PSO-5: develop research-oriented skills. PSO-6: make aware and handle the sophisticated instruments. PSO-7: understand and apply principles of Physics for understand the scientific phenomenon in classical and quantum Physics. PSO-8 understand and apply statistical methods for describing the classical and quantum particle phenomenon in various physical systems.
Course Outcomes M.Sc. Physics	
Semester-I	
PHCT-111: Mathematical methods of physics:	CO1: get familiar with Matrix Algebra. CO2: introduction to operators. CO3: uses of Special functions like Legendre, Bessel. CO4: uses of Fourier series, Fourier and Laplace transforms.
PHCT-112: Classical Mechanics	CO1**: s**et up Lagrangian and Hamiltonian formulation. CO2: introduction to Canonical transformations and Poisson brackets. CO3: basics of Non-inertial frame of reference. CO4: information of Central force field problems.
PHCT-113: Electronics	CO1: know basic of Semiconductor Devices and its Applications. CO2: know basic of Special Function ICs and their Applications. CO3: know basic of Digital Logic Circuits I: Combinational Logic. CO4: know basics of analog to digital and digital to analog converter types.
PHOT-114C4: **Laser-Fundamentals and Applications**	CO1: understand principles of Interaction of radiation with matter, Einstein's coefficients. CO2: know basics of two, three and four level laser systems. CO3: Study of various laser systems like He-Ne, N2, CO2, Nd:YAG, Ruby, Excimer, Dye lasers.

	CO4: know applications of lasers.
PHCP-115 Physics Lab I	CO1: design skills of electronic circuits. CO2: handling of electronic instruments. CO3: understand of basic concepts of electronic devices.
Semester II	
PHCT-121: Electrodynamics:	CO1: understand fundamentals of Multipole expansions and time varying fields CO2: understand the Reflection and refraction of electromagnetic waves. CO3: understand Wave equations in terms of electromagnetic potentials. CO4: know Relativistic Mechanics and Covariance.
PHCT-122: Atoms and Molecules:	CO1: know basics of Atomic structure and atomic spectra. CO2: understand of molecular spectra. CO3: get familiar with ESR, NMR and X-ray diffraction techniques.
PHCT-123: Quantum Mechanics I:	CO1: representation of state of system. CO2: using Dirac and Delta notations. CO3: concept of Angular Momentum. CO4: introduction to types of approximation methods
PHOT-124A4: Physics of Thin Films	CO1: understand synthesis method of thin film. CO2: properties of thin film.
PHCP-125 Physics Laboratory-II (General Lab)	CO1: perform Experiments. CO2: develop skills of independent working. CO3: designing of physics/electronics experiments.
Semester III	
PHCT-231 Statistical Mechanics	CO1: Study of probability theory CO2: To understand classical statistical mechanics CO3: Study applications of statistical mechanics CO4: Learn to ideal bose
PHCT-232 Solid State Physics	CO1: Introduction to crystal structure and band theory of solids CO2: To understand dimagnetism and paramagnetism CO3: To understand ferromagnetism and antiferromagnetism CO4: Learn superconductivity properties of solid
PHCT-233 Experimental Techniques in Physics - I	CO1: introduction to vacuum physics. CO2: study of various types of vacuum pumps. CO3: study of vacuum measuring gauges.
PHOT-234H4 Energy Studies – I	CO1: know Energy Sources. CO2: understand the Solar Radiation and Its Measurements. CO3: understand the Heat and Thermodynamics. CO4: know the types of energy storage systems.
PHCP-235 Physics Laboratory III	CO1: know how to write program. CO2: develop skills of independent working. CO3: know how to execute program.
Semester IV	

PHCT-241 Nuclear Physics	CO1: understand general properties and concepts of nuclei. CO2: know about radiation detectors and nuclear models. CO3: understand basics of reaction dynamics, nuclear reactors and accelerators. CO4: knowledge of nuclear interactions and particle physics.
PHCT-242 Experimental Techniques in Physics - II	CO1: know Radiation Sources, Detectors and Sensors. CO2: understand Structural Characterization and Thermal Analysis. CO3: understand Optical Microscopy, Morphological and Magnetic Characterization**.** CO4: get knowledge of Spectroscopic Analysis.
PHOT-243B4 Physics of Nanomaterials	CO1: understand properties of Nanomaterials. CO2: Study synthesis method of nanomaterials CO3: Properties of nanomaterials CO4: get knowledge of phase diagrams.
PHOT-244H4Energy Studies – II	CO1: know about Solar photovoltaic (SPV) Conversion. CO2: understand Photo-thermal Applications of Solar Energy**.** CO2: get knowledge of Hydrogen Energy.
PHCP-245 Project	CO1: develop skills of independent working CO2: learn Literature survey CO3: designing of physics/electronics experiments CO4: develop writing and presentation skills

DEPARTMENT OF POLITICS

Programme Outcomes: B.A. Politics

Department of Politics	After successful completion of three year degree program in Politics student should be able to
Programme Outcomes	PO-1. To able to understand basic concepts of Political Science PO-2. To able to analyze Political behavior in practice. PO-3. To Understand the Socio Political Structure Of Society. PO-4. To Develop the ability to analyze historical and current events from Political perspective. PO-5. To Develop ability to write clearly expressing Political point of view. PO-6.To create student's ability to suggest of the various Socio – Political problems.

Programme Specific Outcomes: B.A. Politics

Department of Politics	An Honors graduate of Political Science of the college should possess the capability to:
Programme Specific Outcomes	PSO-1. Understanding the nature and developments in national and international politics PSO-2. Analyzing the Indian constitutional provisions, major legislations and reforms. PSO-3. Critical evaluation of social, economic and political variables for a proper understanding of the plurality of Indian society PSO-4. Building overall consciousness regarding national political history, international relations and present Indian and Western political thinkers. PSO-5. Encouraging a comprehensive, comparative understanding of specific world constitutions such as UK, USA, China, Russia, Switzerland and France. PSO-6. Developing knowledge of administrative studies with special reference to Indian administrative structures and practices. PSO-7. Examining India's foreign relations with her neighbors and great powers. PSO-8. Use of case study method for analyzing the working of important international and regional organizations like UN, EU, ASEAN etc.

Course Outcomes: B. A. Politics

Course	Outcomes
	After completion of these courses students should be able to :-
F. Y. B. A.	
Introduction To Indian Constitution (G -1)	CO-1. Students enable to understand the philosophy of Indian constitutions. CO-2. Students enable to identify the causes, impact of British colonial rule. CO-3. Students enable to appreciate the various phases of Indian national movement. CO-4. Students enable to create value in young youth regarding the patriotism. CO-5. Students enable to understand the various Government of Indian acts their provision and reforms. CO-6. Students enable to know the salient features in making of Indian constitution CO-7. Students enable to appreciate the socio-economic political factors which lead to the freedom struggle. CO-8. Students enable to appreciate the fundamental rights and duties and the directive principle of state policy CO-9. Students enable to evaluate the evolution, functioning and consequences of political parties in India. CO-10. Students enable to identify how electoral rules and procedure in India effect election outcomes. CO-11. To acquaint students with the important features of the Constitution of India and with the basic framework of Indian government. CO-12. To familiarize students with the working of the Constitution of India. CO-13. Glimpses of the background of the Indian Constitution, federal features, judicial review, parliamentary supremacy, concept of basic structure. CO-14. Covers the preamble, fundamental rights, directive principles of state policy, fundamental duties and amendment procedure. CO-15. Deals with federalism, Centre-state relations, Centre-state conflicts, regionalism, secularism. CO-16. Delineates the structure of government namely executive, legislature and judiciary. CO-17. Highlights the political parties, electoral process and voting

	behavior.
S. Y. B. A.	
An Introduction To Political Ideologies	CO-1. Students of politics are concerned about and interested in the various principles of that intellectual discipline. It may never be known conclusively whether humans alone are capable of formulating and then utilizing abstract ideas to govern their behavior. CO-2. None can dispute however that ideas about politics constitute most important element in that realm. While ideas are not in and of themselves Ideologies, they are part of the raw material needed to produce a Full-fledged ideology. CO-3. As will be seen below ideologies have special qualities that them apart from other political entities. When combined with other factors such as effective leadership, persuasive rationale', timely development, and popular appeal political ideology goes a considerable distance in the direction of comprehending things political. Nature of Political Ideologies been called "immaculate perceptions" of an imperfect reality. CO-4. This may also be applicable to the concept of political ideologies. The students of political science will get enriched by studying Ideologies as it enhances their analytical skills of public phenomenon.
Western Political Thought	CO-1. Providing an insight into the dominant features of Ancient Western Political Thought: Ancient Greek political thought with focus on Aristotle and Plato; Roman Political Thought: its contributions with special emphasis on the emergence of Roman law. CO-2. Examining the features of Medieval Political Thought. CO-3. Evaluating the Renaissance; political thought of Reformation; and Machiavelli. CO-4. Critically examining Bodine's contributions to the theory of Sovereignty; Hobbes as the founder of the science of materialist politics; Locke as the founder of Liberalism with focus on his views on natural rights, property and consent; and Rousseau's views on Freedom and Democracy; Bentham's Utilitarianism; and John Stuart Mill's views on liberty and representative government. CO-5.Taking an insight into the following: Hegel's views on Civil Society and State Utopian and Scientific socialism: basic characteristics. CO-6. Examining the varieties of non-Marxist socialism: Fabians, Syndicalism, Guild Socialism, German Revisionism.

Political Journalism	CO-1. Complex relationship between the communication, media and power politics. CO-2. Critical appraisal of practices of political image management, campaigns, Propaganda and censorship. CO-3. Indian context of political Journalism.
Basics of Indian Constitution	CO-1. To acquaint students with the important features of the Constitution of India and with the basic Framework of Indian government. CO-2. To familiarize students with the working of the Constitution of India.
T. Y. B. A.	
Evaluation of Local Government in Maharashtra (G-3)	CO-1. Students enable to explain the role of British imperial on local government in India. CO-2. Students enable to understand the contributions of various committees on local government. CO-3. Students enable to describe the features and provisions of Constitutional Amendment Acts regarding Local Government Institutions. CO-4. Students enable to equip the learner to play an active and responsible leadership role in the functioning of Local Government Institutions. CO-5. Students enable to describe the significance and role of Grama Sabha in Maharashtra.
Public Administration (S-3)	CO-1. Clarifies the meaning, scope, nature and importance of public administration, public and private administration and new public administration. CO-2. Highlights bases of organization, line and staff, chief executive, forms of organization, Government Corporation, independent regulatory commission, principles of organization, scalar principle, unity of command, span control. CO-3. Covers recruitment, methods of recruitment, promotion, principle of promotion, moral, training, union public service commission. CO-4. Explains process and principle of budget, audit, accounting system in India, public estimate committee and public accounts committee. CO-5. Deals with people's participation in administration-its importance and problems, machinery for redressal of citizens grievances, ombudsman, Lokpal and Lokayuktas.
International Politics (S-4)	CO-1. Acquaints with the origin and growth of International Relations (IR) as an academic discipline, meaning and scope of IR, theories of IR-liberal and realist theories. CO-2. Covers the history of IR and highlights the great power

	system, imperialism, nationalism, the two world wars, the cold war and the post-cold war era. CO-3. Explains the concept of IR like national power, national security, human security, diplomacy, conflict and conflict resolution. CO-4. Underlines the working of UN system, collective security, peace keeping machinery, regional organization (case studies of SAARC and EU) CO-5. Deals with contemporary issues like environment, feminism, self-determination, globalization and terrorism.
Modern Political Analysis (G-3)	CO-1. Discusses the development of political science as an academic discipline, approaches to the study of political science. CO-2. Delineates the normative and Marxist ways of defining state, origin of state, divine origin, social contract, utilitarian perspective and the decline of state. CO-3. Points out the concepts of liberty, equality, sovereignty, power and authority. CO-4. Highlights the variants of democracy, and authoritarian and totalitarian governments. CO-5. Covers issues of welfare state, globalization, Gandhism. CO-6. Student enables to understand the difference between ideology and thought as well as between theory and ideology. CO-7. Students enable to understand the relationship between ideas and politics.

Programme Outcomes: M.A. Politics

Department of Politics	After successful completion of two year degree program in Politics student should be able to :
Programme Outcomes	PO-1. Understanding the inter relationship between policy decisions and its effects on society. PO-2. To develop the ability to analyze and predict socio political phenomena based on the study of existing socio political determinants and past experiences. PO-3. The course curriculum inculcates among students a basic understanding of the rights and duties of citizenship PO-4. Establishment of linkages between academics and civil society at large so as to successfully address socio political problems. PO-5. Understanding the nature and developments in national and international politics PO-6. Critical evaluation of social, economic and political variables for a proper understanding of the plurality of Indian society PO-7. Building overall consciousness regarding national political history, international relations and present Indian and Western

	political thinkers. PO-8. Examining India's foreign relations with her neighbors and great powers. PO-9. Use of case study method for analyzing the working of important international and regional organizations like UN, EU, ASEAN etc. PO-10. To develop comprehensive and interdisciplinary knowledge by emphasizing inter-linkages between various political, economic and social issues and challenges. PO-11. To generate socially-informed knowledge and cater to the educational upliftment of marginalized communities through papers like Human Rights, Political Ideas in Modern India and Women and Politics in India

Programme Specific Outcomes: M.A. Politics

Department of Politics	After successful completion of two year degree program in Politics student should be able to
Programme Specific Outcomes	PSO-1. Political Sciences as 'Master Science' had spawned International Relations, later emerging as an autonomous discipline, Comparative Politics later shifting to Area Studies and Public Administration which again became an autonomous discipline though taking a turn to management and policy studies. This Masters programme provides a broad view of this disciplinary development. PSO-2. The programme provides a balanced treatment between the Western and the Indian political thought and theory. PSO-3. The programme provides a balanced treatment to both empirical and normative aspects of the discipline of Political Science. The students get a balanced footing on concepts and methodology as the programme has made Research Methodology and Field Research compulsory. PSO-4. The programme draws inputs from allied disciplines and empowers the students with an interdisciplinary focus and understanding. PSO-5. The Programme draws on research thrust areas of the Department like India's state and sub-state politics, public policy, India's foreign policy, women and politics and social movements, to name a few. PSO-6. The programme supports problem solving skills, thinking, creativity through assignments, project work, both individual and group based. PSO-7. The programme empowers and motivates students for research in Political Science and related fields. PSO-8. Since the Department has its own dedicated library students

	get enough opportunity to prepare for competition examinations.

Course Outcomes: M.A. Politics

Course	Outcomes
	After completion of these courses students should be able to :-
Semester-I	
PO-C1: Traditions of Political Thought	CO-1. At the end of the course the students will be able to understand the theories and concepts of Political Science. CO-2. The students will be able to think and make an inquiry into the socio-economic and political problems. CO-3. The awareness will be created among the students about the changing nature of the international relations. CO-4. Students will acquire the knowledge about the Indian constitution and they will follow the ethics, values and duties prescribed by the constitution. They will understand the nature and working procedure of Government India and will be well acquainted with the politics of India. CO-5. Student will be able to understand and explain the political ideologies and ideas which are broadly considered as political creeds usually termed Political Ideology
PO-C2: Administrative Theory	CO-1. Student enable to understand important concepts, approaches and theories of public administration CO-2. Student enable to equip students with understanding of the latest developments in the field of Public Administration. CO-3. Student enables to understand and analyze broad transformations in the study of public administration in the course of changes in socio-economic and political life.
PO-C3 : Political Institutions in India	CO-1. Students enable to introduce the leading institutions of the Indian political system and to the changing nature of these institutions. Apart from explaining the structure and functions of the main institutions. CO-2. Student enable to understanding the institutional balance of power as discussed in the Indian constitution and as developed during the functioning of Indian democracy over the past decades.
PO-O4: Party System in India	CO-1. Student understand the nature of party system in India. CO-2. Student understand the functioning of main political parties operating in the system. CO-3. Student focused on analytical perspectives on party politics in India.

Semester-II	
PO-C4 : Comparative Political Analysis	CO-1. Students enable to understand the trajectory of the sub-discipline. CO-2. Student enable to understand the significance of the comparative methodology CO-3. Student enable to understand the dynamics of domestic politics across the Countries.
PO – C5: Theory of International Politics	CO-1. Explaining scope and subject matter of International Relations as an Autonomous academic discipline. CO-2. Approaches and methods to study the discipline through Political realism, Pluralism and Worlds System's Model. CO-3. Examining the issues of Underdevelopment, Terrorism, Regionalism and Integration that characterizes the Post second world war order. CO-4. Studying the role of Diplomacy, Propaganda and Military capabilities in the Making of foreign policy. CO-5. Explaining certain basic concepts like Globalization in contemporary world order.
PO-C6 : Public policy	CO-1. The focus of the discipline shifted from study of institutions to study of forces influencing the functioning of institution and their activities. As a result, inter-disciplinary approach gained prominence to study social phenomena comprehensively. Courses on Public Policy emerged in this context. CO-2. In contemporary times, to address complex and dynamic issues governments are formulating policies find solutions to societal problems from different ideological perspectives. A lot of technical expertise is becoming a necessity to understand and analyze issues and to suggest possible alternative solutions based on cost benefit analysis. In this context there is a need to conduct serious research on public issues by policy experts from Policy Science perspective. CO-3. Public Policy course aims at providing a comprehensive view of issues, policy making processes, decision making related to policy matters. It also aims at producing experts who can advise the government or who can provide inputs to government in policy making.
PO-O5- Politics and the Media	CO-1. The course takes a broader view of media as part of larger communication processes. It discusses media's relationship with the economic processes that brought politics closer. Media, politics and economy brought major changes in political

	communications leading to the emergence of television, print media, internet, and social media. Lastly the course discusses the crucial role of media in politics particularly in the domains such as public sphere, political mobilization, populist politics and legitimation. CO-2. The course is significant in Political Science discourses when we look at the crucial role of media in all political processes. On the one hand media brings larger section of people into the political processes by disseminating various kinds of information to them. On the other hand, the media appears to monopolize all communication processes leading to constriction of democratic processes and monopolizing public sphere. The course is designed to understand the fundamental roots of this phenomenon. And its implications for democracy, public sphere and legitimation. CO-3. The course is taught with its interdisciplinary character bringing inputs from economic, political, social and cultural spheres.
Semester-III	
PO-C7 Modern Political Thought	CO-1. Political ideas are basis for the strength of any political system. They reflect diverse spectrum of times in a country. India is no exception to this. CO-2. The course on Indian Political Thought provides an opportunity a student to know the political ideas in ancient, medieval and modern periods reflecting India's diversity, pluralism in social, political and economic spheres. CO-3. The ideas contain classical as well as modern approaches to the issues in existence in the Indian society. These ideas aim at realizing socio-political transformation. CO-4. The ideas of m modern Indian thinkers also resemble western political ideas also. At the same time, they are reflecting a critique of older native system that had been in existence for centuries and articulate the ideals of equality and justice.
PO-C8: Political Sociology	CO-1. Studying the concepts of Power, Authority and Legitimacy in the context of society. CO-2. Examining social stratification through the index of class, caste and elite. CO-3. Evaluating the impact of Religion on society. CO-4. Relating Gender and Politics CO-5. Creating awareness among students about Nationalism and State building process in Western Europe and third world CO-6. Establishing State –society interrelationship. CO-7. Classifying the different types of Political systems. CO-8. Discussing the approaches to the study of Political Culture.

	Evaluating the different agents of Political Socialization and their interrelationships. CO-9. Evaluating the concept and types of Political Participation. CO-10. Discussing the relation between Military and Politics with reference to conditions and types of intervention CO-11. Studying groups in politics: political parties and pressure groups. CO-12. Assessing the approaches to Political Communication; Electoral Behavior CO-13. Evaluating the concept of Political Development and Social Change- Role of Tradition and Modernity.
PO-C9 World Politics-New Developments	CO-1. Explaining scope and subject matter of International Relations as an autonomous academic discipline. CO-2. Approaches and methods to study the discipline through Political realism, Pluralism and Worlds System's Model. CO-3. Examining the issues of Underdevelopment, Terrorism, Regionalism and Integration that characterizes the Post second world war order. CO-4. Studying the role of Diplomacy, Propaganda and Military capabilities in the making of foreign policy. CO-5. Explaining certain basic concepts like Globalization in contemporary world order. CO-6. Describing the Cold War phases and understanding the post Cold War era. CO-7. Discussing the developments in European Ethno-nationalism since 1990's. Tracing the growth of European Union CO-8. Examining Indian Foreign Policy: Basic Principles, Evolution and Bilateral Relations. CO-9. Evaluating the working of UN and its organs; Peace keeping Function and Human Rights. CO-10. Analyzing the Foreign Policy of USA and China. CO-11. Studying the developments in third world countries in post world war II era like NAM: Relevance, ASEAN, SAFTA and SAARC, OPEC, OAU, West Asia-Palestine problem after Cold War
PO-O9 Indian Administration – Structure and Organization	CO-1. To introduce the students to the evolution of Indian Administration. CO-2. To acquaint them with the Principles and structure of Indian Administration. CO-3. To provide comprehensive understanding of administrative development. CO-4. Discussing the Ecological approach to Indian Adm.
Semester-IV	

PO-C10 Fundamentals of Political Theory	CO-1. Analyzing what is Politics and explaining the approaches to the Study of Political Science – Normative, Behavioral, Post Behavioral, Feminist. CO-2. Assessing the theories of State (Origin, Nature, Functions): Contract, Idealist, Liberal and Neo-Liberal Theories. CO-3. Explaining the Concept of State Sovereignty: Monistic and Pluralistic Theories. Analysing the changing concept of Sovereignty in the context of Globalization. CO-4. Classification of David Held's Democratic Theories. CO-5. Understanding basic concepts of Liberty, Equality, Rights, Law and Justice. CO-6. Assessing Empirical Political Theory: System's Analysis, Structural Functionalism. CO-7. Explaining Dialectical Materialism and Historical Materialism with special reference to relationship between base and superstructure. CO-8. Analysing the theory of class and class struggle. CO-9. Describing the Marxist Approach to politics. CO-10. Analysing Marx's concept of Freedom and Democracy: Nature, Features and Critique. CO-11. Discussing Marx's Theory of State with special reference to Relative Autonomy of the State. CO-12.Explaining Marxian theory of Revolution. CO13. Evaluating the major debates in Marxism: Lenin- Rosa Luxemburg debate on Political party.
PO-C11 Political Process in India	CO-1. This course emphasizes on processes such as Party Politics, Electoral Politics, Identity Politics and so on. CO-2. The course opens up the debate on nature of the Indian State to understand political process. CO-3. The course maps the Indian Political process with major issues such as Communalism, Extremism, Regionalism and issues revealed to autonomy. It also attempts to capture the changing State- Civil Society relations. CO-4. The course also discusses small parties that emerged in the context of rise of civil society. Another major development that occurred in the political process has been a significant change in the leadership and its association with media. CO-5. The leader centric politics and its association with media has become a ubiquitous phenomenon across the country. CO-6. The course is also sensitive to the factors that led to intense competitive electoral politics. The course runs through the perspective that the Indian Political Processes should be understood in the way that the sphere of politics expanded so as to

	incorporate the aspirations of marginal groups. The institutions and processes have grown enormously with the rise of civil society, to enable the expansion of Indian Democracy. CO-7. The development of Indian political processes can be seen broadly in two phases, in the first phase we experience the dominant presence of the Indian state emerging from its welfarism and in the second phase we experienced the Indian state undergoing a radical transformation with the emergence of private market and the civil society.
PO-C12 Politics and Society	CO-1. It promotes knowledge on basic concepts such as politics, power, gender, civil society, citizens, culture and behavior of individuals, how they developed over time and where they stand today. It also helps formulate independently generated and theoretically based research questions within political sociology. CO-2. It helps students in gaining knowledge about how political cultures are formed & shaped, the importance of political socialization process, the causes behind political participation & non-participation, the influence of political parties & the pressure groups in a political system and, further, the concepts of change and political development and how it's being shaped in developing countries.
PO-O15 Election Studies	CO-1. This course has a dual purpose. It seeks to introduce to the students the methods of studying elections. It also seeks to acquaint the student with the practice of studying elections in India and issues involved in it. CO-2. The course expects students to understand the different methods of election study. Taking off from the history and evolution of election studies, the course further dwells on key issues in India's electoral politics.

DEPARTMENT OF PSYCHOLOGY

Programme Outcomes: B. A. Psychology

Department of Psychology	After successful completion of three year degree program in Psychology a student should be able to
Programme Outcomes	PO-1. Able to understand basic concepts of Psychology. PO-2. Understand the impact of environment, society, heredity on persons Behaviour. PO-3. Understand the human social behavior. PO-4. Awareness of self and social wellbeing. PO-5. Think scientifically about surrounding human behavior. PO-6. Understand human development. PO-7. To write study tour report. PO-8. Social Interaction elicits views of others, mediate disagreements and help reach conclusions in group setting. PO-9. Recognize different value systems including your own, understand the moral dimensions of your decisions and accept responsibility for them. PO-10.Understand the issues of environmental contexts and sustainable development. PO-11. Acquire the ability to engage in independent and life-long learning in the broadest socio-technological changes.

Programme Specific Outcomes: B. A. Psychology

Programme Specific Outcomes	PSO-1. To impact knowledge and understanding of the basic concepts, systems theories of psychology and psychopathology. PSO-2. An ability to apply the theoretical principles of psychology demonstrating an understanding of behaviour thoughts and feeling of the individuals and the individual in group setting. PSO-3. Basic professional skills pertaining to psychological testing assessment and counselling. PSO-4. To recognize understand and respect the complexity of multiculturalism in the practice and application of counselling and psychotherapy. PSO-5. To get admission post-graduation course in Psychology. PSO-6. To interpretation of data and make project research. PSO-7. To write scientific case study report.

	PSO-8. To use of basic psychological tests and experiments. PSO-9. Identify and Think on the various psychological problems. PSO-10. Make use of personality theories in daily practice. PSO-11. Make Use of Industrial theories while preparing for professional interviews. PSO-12. Analyze and understand abnormal human behavior in practice.

Course Outcome: B.A. Psychology

Course	Outcomes
Semester-I	
Foundations of Psychology	CO-1. To able to understand the Basic Psychological Processes and their applications in day to day life. CO-2. To able to understand develop the ability to evaluate cognitive processes, learning and memory of an individual. CO-3. To able to understand the importance of motivation and emotion of the individual. CO-4. To able to understand the personality and intelligence of the individuals by developing their psychological processes and abstract potentials. CO-5. To able to understand Behavior through Method in Psychology. CO-6. To able to understand application conflict skills. CO-7. To able to understand applications testing and enhancing Emotional Intelligence.
Semester-II	
Introduction to Social Psychology	CO-1. To able to understand the basic Psychological process and their applications in day to day life. CO-2. To able to develop the ability to evaluate cognitive process, learning and memory of an individual. CO-3. To able to understand the importance of motivation and emotion of the individual. CO-4. To able to understand the personality and intelligence of the individuals by developing their psychological process and abstract potentials.
Semester-III	
Health Psychology	CO-1. To able to understand health psychology and arrive at the introduction to the role of psychology in health. CO-2. To able to understand the nature of stress and coping. CO-3. To able to understand various factor related to health and dieses. CO-3. To able to understand quality of life and promoting the good health.

Abnormal Behaviour	CO-1. To able to understand acquire the knowledge about the symptoms, Diagnostic criteria, and causes of various psychological disorders. CO-2. To able to understand examine multiple probable causes and correlates of behavior. CO-3. To able to understand critiques limitations, and implications of diagnosis and classification of psychological diseases. CO-4. To able to understand awareness about mental health problems in society. CO-5. To able to understand the ways of communication and its applications. CO-6. To able to understand the leadership and its characteristics. CO-7. To learn various applications and techniques of Social Behavior.
Developmental Psychology	CO-1. To able to understand the importance, characteristics and concern in lifespan development. CO-2. To able to understand biological, cognitive and socio-emotional process. CO-3. To able to understand the periods of development the significance age and discuses developmental issues. CO-4. To able to understand Psychoanalytic, cognitive Behavioral and socio Cognitive Ethological Ecological and Eclectic theories of development. CO-5. To able to understand methods of data collection and research design used in Life –span developmental research. CO-6. To understand physical, motor and development of relations. CO-7. To learn Physical and mental changes in Adolescence. CO-8. To learn all stages of life span and understand its good and bad impact on life.
Semester-IV	
Positive Psychology	CO-1. To able to understand how the positive psychology as the science of happiness, human strength, positive aspects of human behavior and psychology of well-being. CO-2. To able to understand how we lead our lives, find happiness and satisfaction, and face life's challenges. CO-3. To able to understand how positive psychology has become an evolving mosaic of research and theory from many different areas of psychology.

Abnormal Behaviour	CO-1. To able to understand learn descriptions, and theories underlying diagnostic oncology of psychiatric disorder. CO-2. To able to learn and understand benefits critiques, limitations, and implications of diagnosis and classification. CO-3. To able to help students to acquire the knowledge about the symptoms, diagnostic criteria and causes of various psychological disorders. CO-4. To able to understand examine multiple probable causes and correlates of behavior. CO-5. To able to understand create awareness about mental health problem in society.
Theories of Personality	CO-1. To able to understand the concept of personality with various theories of personality on the basis of personality psychology. CO-2. To able to understand different framework and theoretical aspects of personality. CO-3. To able to understand and observe, interpret individual differences in behavior in the light of sound theoretical systems of personality. CO-4. To able to understand comprehensive overview of the major theories personality.
Skill Enhancement Course	CO-1. To able to understand types of hygienic behavior. CO-2. To able to understand prevent infectious diseases. CO-3. To able to understand competencies dealing with self-management. CO-4. To able to understand interpersonal relationship.
Skill Enhancement Course	CO-1. To able to understand know the applications of counseling at educational and career setting. CO-2. To able to understand the counseling at workplace setting. CO-3.To able to understand engage with the counseling at clinical setting. CO-4. To able to understand study the counseling in special situations. CO-5. To able to understand different types of counseling areas.
Semester-V	
Industrial Psychology	CO-1. To able to understand describe the concept of industrial and organizational Psychology, selection and training. CO-2. To able to understand explain job profile, job analysis, recruitment and employee training. CO-3. To able to understand identify and classify the appraisal rating system. CO-4. To able to understand compare different theories of motivation. CO-5. To able to understand evaluate the training programmed and job performance. CO-6. To understand leadership, leadership qualities and functions of leaders on industry.

	CO-7. To learn new concept 'engineering psychology' for easier work for workers.
Scientific Research and Experimental Psychology	CO-1. To acquire basic skills and understand basic concept of Research Methodology. CO-2. To understand how to make small research project. CO-3. To learn making group report/project. CO-4. To able to understand theory of research. CO-5. To understand Psychophysics. CO-6. To understand the perceptual processes. CO-7. To learn psychological testing. CO-8. To understand thinking processes. CO-9. To understand problem solving concept.
Psychology Practical Test and Experiments	CO-1. To able to understand describe mapping of human behavior. CO-2. To understand explain general ability testing, personality, adjustment and attitude. CO-3. To able to understand identify and classify the intellectual ability and personality patterns. CO-4. To able to understand conduct testing and evaluate intellectual ability, personality traits, adjustment and attitudes of participant. CO-5. To able to understand analyze statistical method employed in behavior analysis.

Programme Outcomes: M. A. Psychology

Department of Psychology	After successful completion of two year post degree program in Psychology a student should be able to
Programme Outcomes	PO-1. To go further higher education. PO-2. Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions from different perspective. PO-3. Speak, read, write and listen clearly in person and through election media in English and one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology. PO-4.Demonstrate empathetic social concern and equity centered national development and the ability to act with an informed awareness of issues and participate in civic life through volunteering. PO-5. To provide the students with a unique opportunity of obtaining a professional qualification in Psychology focusing on the advanced Skills.

	PO-6. To able to understand basic concepts of Psychology and to analyse behaviour in practice. PO-7. Understand the Psychological way of thinking. PO-8. The ability to write clearly Project reports. PO-9. To develop comprehensive understanding of interdisciplinary issues and aspects of society. PO-10. To do scientific research in Psychology. PO-11. Collaboration, cooperation and acknowledging the dynamic of groups and communities. PO-12. Identifying and evaluating social problems from a mental health perspective.

Programme Specific Outcome: M.A. Psychology

Programme Specific Outcomes	PSO-1. The ability to analyse Symptoms and able to diagnose. PSO-2. Students will be able to effectively communicate with psychological illness. PSO-3. Be exposed to alternative approaches to Psychological problems through exposure to coursework in allied fields. PSO-4. To identify upcoming psychological hazards. PSO-5. To suggest remedy for the various psychological abnormal behaviour. PSO-6. To prepare the students for scientific Psychological Testing. PSO-7. To prepare the students for scientific Counselling. PSO-8. To prepare the students for Proper Prognosis. PSO-9. To prepare the students for appropriate news breaking, and able to take sessions. PSO-10. Social and Ecological responsibility towards society and learning reflected through social participations. PSO-11. Including strong ethical values in psychological practice. PSO-12. Incollating multicultural approach by working with groups and communities. PSO-13. Instilling ethical practices in counselling process.

Course Outcomes: M. A. Psychology

Course	Outcomes
	M.A (Part – I) Semester I
Cognitive Psychology Understanding	CO-1. To able to understand the origin of cognitive psychology. CO-2. To able to understand explore the knowledge of cognitive psychology. CO-3. To able to understand make students aware with the recent trends in cognitive psychology. CO-4. To able to understand help students in relating subject matter of

	cognitive psychology to daily life. CO-5. To able to understand nature and scope cognitive psychology. CO-6. To able to understand Artificial Intelligence.
Psychometrics The science of Psychological Assessment	CO-1. To able to understand create critical measurement issues and techniques in psychological inquiry. CO-2. To able to understand enable students to develop skills & competences in test construction & standardardization. CO-3. To able to understand the various biases in psychological testing and assessment. CO-4. To able to understand scientific method, truth and psychology. CO-5.To able to understand ethical issues in psychological testing. CO-6. To able to understand norm-referenced and criterion referenced testing. CO-7. To able to understand algebraic and graphical normalization. CO-8. To able to understand statistical models of intrinsic test bias. CO-9. To able to understand computerization in psychological testing.
Research Methodology –I Issues and Essential Techniques in Statistics and Experimental Design	CO-1. To able to understand inform students about the basics of scientific research in applied psychology. CO-2. To able to understand make learn the statistical regroups in designing and processing data. CO-3. To able to understand ethical problems and principles. CO-4. To able to understand measures of central tendency and variability. CO-5. To able to understand Correlation and Regression. CO-6. To able to understand Qualitative and Quantitative research. CO-7. To able to understand ANOVA.
Psychology Practical Testing	CO-1. To understand the administration of standardized psychological tests, rapport establishment, interpretation of scores and report writing. CO-2. To understand the criteria's of evaluating psychological tests. CO-3. To understand certain counselling skills on the basic of psychological results. CO-4. To learn Psychological skills for counsellor. CO-5. To understand personality tests. CO-6. To able to understand Thematic Apperception test. CO-7. To able to administer stress and social skill test. CO-8. To able toadminister Special Ability Test.
M.A (Part – I) Semester II	
Cognitive Psychology Advances and Application	CO-1. To able to understand the advances in cognitive psychology. CO-2. To able to understand study and application of cognitive psychology different fields. CO-3. To able to understand Thought and Language. CO-4. To able to understand Sex differences and Cognitive Abilities.

	CO-5. To understand Reading, Writing, Speaking and cognitive phenomenon. CO-6. To able to understand applications in Forensic Psychology. CO-7. To able to understand applications in Computer Science. CO-8. To able to understand application Develop Critical Thinking.
Psychometrics Applications	CO-1. To understand how psychological tests are used for the purpose of assessment, guidance and enhancing the effectiveness of Teaching-Learning process. CO-2. To understand the use and interpretation of various psychological tests used in Educational fields. CO-3. To understand the use of psychological tests are used for better health, adjustment and related counseling. CO-4. To understand the use of psychological tests in Clinical and Organizational setting. CO-5. To able to understand application Career Interest Inventory. CO-6. To able to understand application Family Environment Scale. CO-7.To able to understand HRD Function Questionnaire. CO-8. To understand Group Testing. CO-9. To understand the MMPI, DAT, WISC, 16 PF, etc.
Research Methodology –II Qualitative Method and Contemplative Analysis	CO-1. To learn about the philosophical foundations, goals and scope of Qualitative Methodology. CO-2. To develop an understanding about the relationship between paradigms of science and method of Qualitative inquiry. CO-3. To understand basic procedure of using Qualitative Methodology. CO-4. To make learn the Statistical rigors in multivariate analysis. CO-5. To understand Importance role of research in Psychology. CO-6. To able to understand MANOVA, ANCOVA CO-7. To able to understand using computer program for Statistical analysis. CO-8. To understand the Empathy and reflexivity in Qualitative data analysis.
Psychological Practical: Experiments	CO-1. To provide a thorough practical knowledge about the administration of Psychological Experiments. CO-2. To make the students aware about Psychological Experiments and Testing. CO-3. To impart the knowledge of various skills of conducting experiments in psychology. CO-4. To make the applications of experimental research design. CO-5. To understand Cognitive process experiments. CO-6. To understandLearning experiments. CO-7. To understandMeasures Memory of individuals through using proper experiments. CO-8. To understandand measure of Motivation and emotion state of

	Individuals.
M.A (Part –II) Semester III	
Counselling Process and Skills	CO-1. To able to understand the nature of the counseling skills. CO-2. To able to know the groundwork for understanding the use of b basic and specialized skills. CO-3. To able to engage with different models of counseling skills. CO-4. To able to Manage Counseling Stages. CO-5. To able to difference with counseling and psychotherapy. CO-6. To able to correlation with counseling & psychotherapy. CO-7. To able to various types of different counseling.
Psychopathology	CO-1. To able to understand concept of Mental disorder. CO-2. To understand the latest DSM-5. CO-3. To able to understand Neurodevelopmental Disorders. CO-4. To able to understand Schizophrenia Disorder. CO-5. To able to understand OCD and related disorders. CO-6. To understand symptoms of disorders. CO-7. To able to make Prognosis. CO-8. To learn various paradigm of Psychopathology
Psycho-diagnostics	CO-1. To understand Nature, structure and role of testing in Psychology. CO-2. To able to understand diagnostic procedure. CO-3. To understand importance of various tools of diagnostic. CO-4. To able to make diagnosis. CO-5. To able to understand Structured clinical interview for DSM. CO-6. To understand cognitive assessment process. CO-7. To understand and able to make Clinical report. CO-8. To understand Role of Projective techniques in diagnosis
Project Clinical Base	CO-1. To Understand Process of research. CO-2. To able to understand able to implies appropriate statistical method. CO-3. To understand and able to select proper sampling technique. CO-4. To understand and able to analyze collected data. CO-5. To able to use proper review of previous research. CO-6. To able to present data through using appropriate graph. CO-7. To able to make appropriate conclusion. CO-8. To understand the whole process of research by doing practical work. CO-9. To able to make project report in APA style.
M.A (Part –II) Semester IV	
Areas of Counselling	CO-1. To able to understand know the applications of counseling at educational and career setting. CO-2. To able to understand the counseling at workplace setting. CO-3. To able to understand engage with the counseling at clinical setting.

	CO-4. To able to understand study the counseling in special situations. CO-5. To able to understand different types of counseling areas.
Psychopathology	CO-1. To Understand Sexual disorders and its effect on life. CO-2. To able to understand disruptive and impulse behavior. CO-3. To understand substance and its related disorders. CO-4. To understand the personality disorders and able to distinguish with each other. CO-5. To able to recognize various symptoms and able to diagnose and prognosis,
Psychotherapies	CO-1. To understand the concept of Psychotherapy. CO-2. To learn various Psychotherapies. Co-3. To learn applications of Psychotherapies. CO-4. To able to applications of Psychotherapy. CO-5. To understand the transactional analysis. CO-6. Able to understand the Process of Psychotherapy. CO-7. To able to understand Behavior Therapy.
Practicum Clinical Base	CO-1. Students will be able to observe individuals behaviour in proper way. CO-2. To understand the Process of case study. CO-3. To understand the taking history of an Individual. CO-4. To understandand able toAssessment and diagnosis. CO-5. Students will be able toProper Prognosis. CO-6. To understand concept of News breaking and able to break the news.

DEPARTMENT OF STATISTICS

Programme Outcomes: B. Sc. Statistics

Department of Statistics	After successful completion of three year degree program in Statistics a student will be able to;
Programme Outcomes	PO-1 Gain sound knowledge on fundamental principles , concepts and application of Statistics and handling data related to Industrial, Engineering, Biological and Ecological problems. PO-2 Exhibit in depth the analytical and critical thinking to identify, formulate and solve real world problems in various fields PO-3 Gain adequate knowledge of statistical software. PO-4 A student should be able to collect, present and analyze the big data. PO-5 Apply their skills and knowledge to interpret results in statistical as well as simple language of analysed data PO-6 Be capable of undertaking suitable experiments/research methods while solving the real-life problem and would arrive at valid conclusions based on appropriate interpretations of data and experimental results. PO-7 Develop written and oral communications skills in order to effectively communicate design, analysis and research results. PO-8 Demonstrate appropriate inter-personal skills to function effectively as an individual, as a member or as a leader of a team and in a multi disciplinary setting. PO-9 Acquire competent positions in IT sector, Government sector and Academia as well.
Programme Specific Outcomes	PSOs-1 Give the students a sufficient knowledge of fundamental principles, methods and a clear perception of Statistical tools and know how to use them by modelling, solving and interpreting. PSOs-2 To equip the students sufficiently in both analytical and computational skills in Statistics PSOs-3 To develop a competitive attitude for building a strong academic – industrial collaboration, with focus on continuous learning skills. PSOs-4 Enhancing students overall development and to equip them with Statistical modelling abilities, problem solving skills, creative talent and power of communication necessary for various kinds of employment. PSOs-5 Enabling students to develop a positive attitude towards Statistics as an interesting and valuable subject of study. PSOs-6 Enabling students to Gauge the hypothesis, theories, and techniques provisionally.

Course	**Outcomes** After completion of these courses' students should be able to;
Semester-I	

ST. 111 Discreptive Statistics -I	CO-1. Understand Meaning and importance of Statistics as a Science. CO-2. Know Types of characteristics Types of data CO- 3. Learn Frequency Classification, various measures of central tendency and Measures of Dispersion CO-4. Analyze data pertaining to attributes and to interpret theresults CO-5 Understand Moments, Skewnessand Kurtosis
ST.112 Discrete Probability and Probability Distributions-I	CO-1. Understand Basics of probability and its defination CO-2. Understand defination of Conditional Probability and Bayes' theorem CO-3. Know concept of Univariate Probability distributios and its mathematical expectation CO-4. learn some standard discrete probability distributions CO-5. learn Uniform and Binomial distributiond and their applications
ST-113 Practical Paper	CO-1.use various graphical and diagrammatic techniques and interpretation CO-2. analyse data pertaining to discrete and continuous variables and to interpret the results CO-3. Compute various measures of central tendency, dispersion, skewness and kurtosis. CO-4. Interpret summary statistics of computer output. CO-5. Summarize and analyze the data using computer
Semester-II	
ST. 121 Discreptive Statistics -II	CO-1 Understand the concept of Correlation,Types of correlation CO-2 Draw scatter plot, know meaning of regression and draw line of regression CO-3 Understand necessity and importance of drawing second degree curve CO-4. know the importance of Index Nomber,Study differnt index numbers and their uses
ST.122 Discrete Probability and Probability Distributions-II	CO-1 write pmf of some standard disrcete probability distributions CO-2. understand Geometric distribution and its applications CO-3. know Bivariate disrcete probability distributions CO-4 know meaning of marginal and conditional probability distributions CO-5 Calcuate mathematical expectationof Bivariate Random variable
ST-123 Practical Paper	CO-1. compute correlation coefficient, regressioncoefficients CO-2. compute probabilities of bivariatedistributions CO-3.fit binomial and Poissondistributions CO-4 compute probabilities of bivariatedistributions. CO-5 draw random samples from Poisson and binomial distributions
Semester-III	
Course Outcomes	After completion of these courses students should be able to;
ST . 231 Discrete probability distributions and Time Series	CO-1. Understand some standard discrete probability distributions CO-2 .Write pmf of Negative Binomial Distribution,Multinomial distribution Truncated Distributions CO- 3. Understand meaing and utility of time series and its uses CO-4. Know R-Software , write commands in R CO-5 Do programes using various commands in R
ST.232 Continuous	CO-1.Understand Continuous Univariate Distributions Expectation, variance, M.G.F.,mode, median, Quartiles e tc. CO-2. understand Continuous Bivariate distributions Expectation,M.G.F.,and its properties

Probability Distributions-I	CO-3. know Uniform distributios and its mathematical expectation,C.D.F. And applications CO-4. learn Normal distribution its pdf,mean variance distribution function applications etc. CO-5. learn exponetial Distribution their pdf,mean variance distribution function applications etc.
ST 233 Practical paper	CO-1 Do fitting of NBD, Normal distributions also using MS-EXCEL CO-2. draw model sample from exponential, normal distributions CO-3 Apllication of NBD ,Normal,Multinomial distribution. CO-4 plot time series graph ,exponential smoothing also using MS-EXCEL
Semester IV	
ST. 241 Test of significance and Statistical methods	CO-1 Understand the concept of Multiple linear Regression Model Partial correlation Coefficient, residual CO-2 Do testing of Hypothesis test of means,Propertions also using R software CO-3 Understand Meaning of Demography Death rate and Fertility rate CO-4. Know Queng Model,queue,M/M/1 : FIFO
ST.242 Sampling distributions and exact tests	CO-1 write pdf of Gamma, Chi-square distribution,Normal approximation and transformations CO-2.Understand t-distribution ,write its pdf,mean ,variance etc. CO-3. write pdf of F- distribution its derivation mean variance etc. CO-4 know meaning of Sampling distributions CO-5 learn tests based on Chi-square,t,F distributions
ST 243 Practical paper	CO-1 Compute GRR, NRR CO-2 write test for proportions CO-3. write tests based on Chi-square,t, and F distributions CO-4 Use basic R-Software commands CO-5 Do project based on data and do analysis of that data

DEPARTMENT OF ZOOLOGY

Programme Outcomes: B. Sc. Zoology

Programme outcomes: B.Sc. Zoology	
Department of Zoology	**After successful completion of three-year program in Zoology a student is able to-**
Programme outcomes	PO-1 The students are expected to acquire the knowledge of basic science such as physics, Chemistry, Zoology. PO-2 The students are expected to understand scientific terms, concepts, facts, phenomenons, and their interrelationship. PO-3 The students develops ability to apply scientific methods, collection of scientific data, problem solving, organize scientific exhibitions, curiosity, thinking etc. PO-4 Students develops scientific outlooks in science and other subjects. PO-5 Students will develops interest in subject and scientific hobbies. PO-6 The students will appreciate the subject contribution of the scientists, scientific methods, scientific programs etc. PO-7 The students will develop skills in practical work, experiment and laboratory materials instruments.
Program specific outcome	
Program specific outcome	PSO-1. Students could understand the applications of Zoology PSO-2. Students could run the apiculture, poultry, dairy, vermitechnique, prawn culture and goat farming. PSO-3. Students could acquire basic knowledge of sex- determination in man. PSO-4. Students could acquire knowledge of inherited human diseases. PSO-5. Students could acquire basic knowledge of histology of human organs which will be the foundation for pathology. PSO-6.Students could acquire knowledge of complete B.Sc. Programme they could start additional source of income instead of running behind job. PSO-7.The students get develops skills in laboratory, experiments in laboratory which would be benefited in their future carrier.
Course Outcome	
SEM-I	
	CO-1. The student will be able to understand classify and identify the diversity of animals. CO-2. The student understands the importance of classification of

ZO-111:Animal Diversity I	animals and classifies them effectively using the six levels of classification. CO-3. The student knows his role in nature as a protector, preserver and promoter of life which he has achieved by learning, observing and understanding life.
ZO-112:Animal Ecology	CO-1. The learners will be able to identify and critically evaluate their own beliefs, values and actions in relation to professional and societal standards of ethics and its impact on ecosystem and biosphere due to the dynamics in population. CO-2. To understand anticipate, analyse and evaluate natural resource issues and act on a lifestyle that conserves nature. CO-3. The Learner understands and appreciates the diversity of ecosystems and applies beyond the syllabi to understand the local lifestyle and problems of the community. CO-4. The learner will be able to link the intricacies of food chains, food webs and link it with human life for its betterment and for non-exploitation of the biotic and abiotic components. CO-5. The working in nature to save environment will help development of leadership skills to promote betterment of environment.
SEM-II	
ZO-121:Animal Diversity II	CO-1. The student will be able to understand classify and identify the diversity of animals. CO-2. The student understands the importance of classification of animals and classifies them effectively using the six levels of classification. CO-3. The student knows his role in nature as a protector, preserver and promoter of life which he has achieved by learning, observing and understanding life.
ZO-122:Cell Biology	CO-1. The learner will understand the importance of cell as a structural and functional unit of life. CO-2. The learner understands and compares between the prokaryotic and eukaryotic system and extrapolates the life to the aspect of development. CO-3.The dynamism of bio membranes indicates the dynamism of life. CO-4. Its working mechanism and precision are responsible for our performance in life. CO-5. The cellular mechanisms and its functioning depends on endo membranes and structures. They are best studied with microscopy.
SEM-III	
	CO-1. The students will be able to understand, classify and identify the diversity of higher vertebrates. CO-2. The students will able to understand the complexity of higher vertebrates

ZO-231:Animal Diversity III	CO-3. The students will be able to understand different life functions of higher vertebrates. CO-4. The students will be able to understand the linkage among different groups of higher vertebrates. CO-5. The student will become aware regarding his role and responsibility towards nature as a protector, to understand his role as a trustee and conservator of life which he has achieved by learning, observing and understanding life.
ZO-232:Applied Zoology I	CO-1. The learner understands the basics about beekeeping tools, equipment, and managing beehives. CO-2. The learner understands the basic information about fishery, cultural and harvesting methods of fishes and fish preservation techniques. CO-3. The learner understands the biology, varieties of silkworms and the basic techniques of silk production. CO- 4. The learner understands the types of agricultural pests, Major insect pests of agricultural importance and Pest control practices.
SEM-IV	
ZO-241:Animal Diversity IV	CO-1. The students will be able to understand, classify and identify the diversity of higher vertebrates. CO-2. The students will able to understand the complexity of higher vertebrates CO-3. The students will be able to understand different life functions of higher vertebrates. CO-4. The students will be able to understand the linkage among different groups of higher vertebrates. CO-5. The student will become aware regarding his role and responsibility towards nature as a protector, to understand his role as a trustee and conservator of life which he has achieved by learning, observing and understanding life.
ZO-242:Applied Zoology II	CO-1. The learner understands the basics about beekeeping tools, equipment, and managing beehives. CO-2. The learner understands the basic information about fishery, cultural and harvesting methods of fishes and fish preservation techniques. CO-3. The learner understands the biology, varieties of silkworms and the basic techniques of silk production. CO- 4. The learner understands the types of agricultural pests, Major insect pests of agricultural importance and Pest control practices.

SEM-V	
ZO-351:Pest Management	CO-1.Define pest management, Describe the economic, ecological, and sociological benefits of IPM. CO-2. Distinguish positive and negative impacts of pesticide use, Understand problems resulting from misuse, overuse, and abuse of chemical pesticides. CO-3. Define and describe pesticide resistance and how it develops and Identify ecological and biological characteristics important in development of pest populations. CO-4. Identify 10 tactics commonly used in IPM and be able to distinguish them. CO-5. Understand society' s role in IPM decisions and different groups of pests and compare them to weeds and plant pathogens.
ZO-352:Histology	CO-1.The students will be able to understand, classify and identify the different types of tissue. CO-2. The students will understand the complexity of various tissues in an organ. CO-3. The students will be able to learn structure & functions of various tissues. CO-4. The students will understand the various diseases related to organs. CO-5. The student will be able to know the role of glands in mammals.
ZO-353:Biological Chemistry	CO-1.Learners shall be able to understand basic concepts and significance of biochemistry CO-2. The students will learn about the pH and Buffers. CO-3. The students will learn about the chemical structures of carbohydrate, and their biological and clinical significance. CO-4. The students will be able to understand, interpret structure and importance of proteins, carbohydrates and lipids CO-5. Learners will be able to comprehend variations in enzyme activity and kinetics
	CO-1.The students will be able to learn about basics and scope of parasitology.

ZO-356:Parasitology	CO-2. The students will be able to learn the types of host and parasite with examples. CO-3. The students will be able to learn about the morphology, life cycle, pathogenicity and treatment of common parasites (Protists and Platyhelminthes). CO- 4. The students will be able to learn about host -parasite relationships and their effects on host body. CO-5. The students will be able to learn about the arthropod parasites and their role as vector.
SEM-VI	
ZO-3511:Poultry Management	CO-1.The students will be able to understand the Poultry farming practices. CO-2. The students will able to understand the poultry breeding techniques. CO- 3. The students will be able to understand poultry rearing techniques. CO-4. The students will be able to understand feeding requirement and food ingredients. CO- 5. The students will be able to understand the poultry disease and their pathogens. CO-6. The students will be able to understand market value of poultry products.
ZO-361: Medical & Forensic Zoology	CO-1.The students will be able to understand the basics principles of Medical and Forensic Zoology. CO-2. The students will able to understand scientific methods in crime detection. CO-3. The students will be able to understand the advancements in the field of Medical and Forensic Zoology. CO-4. The students will be able to understand modern tools, techniques and skills in forensic investigations. CO-5. The students will be able to describe the fundamental principles and functions of forensic science and its significance to human society.

ZO-362:Animal Physiology	CO-1. The various physiological organ-systems and their importance to the integrative functions of the human body. CO-2. Understand Concept of energy requirements CO-3. Various aspects of Digestive physiology. CO-4. Circulatory system with medical conditions CO-5. Understand Respiratory mechanism and gases transport. CO-6. Eliminations of waste materials from the body. CO-7. Develop understanding in Structure and functions of muscles CO-8. Understand formation of gametes and function of endocrine glands.
ZO-363:Molecular Biology	CO-1. Learner shall get an insight into molecular mechanisms of various biological processes in cells and organisms CO-2. Learner shall get an insight into the Structure of DNA and RNA, DNA and RNA as genetic material CO-3. The course shall prepare learner to get insight into the Central Dogma of Molecular Biology CO-4.Learner shall also understand the concept of gene regulation CO-5. Learner shall get an insight into the DNA Damage and Repair
ZO-364:Entomology	CO-1. Understand basic concepts in Entomology and its scope. CO-2. Learn morphology and anatomy of Insects. CO-3. Understand the concept of social organization in Insects. CO-4. Understand the development process of Insects. CO-5. Identify disease causing insect vectors. CO-6. Will be able to design and implement pest controlling methods against pests.

ZO-366: **Evolutionary Biology**	CO-1. Students will be able to learn most of the essential aspects of Evolutionary Biology in detail which will help them in acquiring better understanding regarding the subject. CO-2. Explain important processes, principles and concepts and critically evaluate theories and empirical research within evolutionary biology CO-3. Apply evolutionary theory and concepts to address empirical and theoretical questions in evolutionary biology. CO-4. Independently investigate evolutionary questions using literature and analyses of empirical data. CO-5. Communicate the principles, theories, problems and research results associated with questions that lie within the evolutionary framework to students.

Programme Outcomes: M. Sc. Zoology

Department of Zoology	After successful completion of two-year degree program in Zoology a student is able to:
Programme Outcomes	PO-1. Zoology knowledge: Apply the knowledge of Zoology, Life Sciences and allied subjects to the understanding of complex life processes and phenomena. PO-2. Problem analysis: Identify, review research literature, and analyze complex situations of living forms. PO-3. Design/development of solutions: Design processes/strategies that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. PO-4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions in real situations. PO-5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and ICT tools for understanding of the subject. PO-6. The Postgraduate and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the

	professional engineering practice. PO-7. Environment and sustainability: Understand the impact of the natural and anthropogenic activities in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. Identify a range of invertebrates and vertebrates and justify their conservation. PO-8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the work/research practice. PO-9. Project management and finance: Demonstrate knowledge and understanding of Zoology and management principles and apply these to one's own work, as a member and leader in a team.

Programme Specific Outcomes: M. Sc. Zoology

Department of Zoology	After successful completion of two-year degree program in Zoology a student is able to:
Programme Specific Outcomes	PSO-1. Students could understand the basic concepts of an Entomology PSO-2. Students could understand the applications of basic zoology and applied zoology. PSO-3. Students could run the Economic Zoology. PSO-4. Students could acquire basic knowledge of Biochemical Techniques. PSO-5. Students could acquire knowledge of genetical disorders; Students could acquire basic knowledge of Physiology of human organs. PSO-6. Students could acquire knowledge of complete M.Sc. programme they could start additional source of income instead of running behind job. PSO-7. The students get develops skills in laboratory, experiments in laboratory which would be helpful in their future carrier.

Course Outcomes: M. Sc. Zoology

Course	**Outcomes**
	After completion of these courses students should be able to;
Semester – I	
ZOUT-111: Biochemistry and Biochemical Techniques	CO-1. Define basic terms in biochemistry and biochemical techniques. CO-2. Explain the applications of the various biochemical techniques. CO-3. Explain the structure and functions of various biomolecules. CO-4. Explain the importance of tools and techniques in biology. CO-5. Illustrate the importance of pH, buffer and water in living systems. CO-6. Illustrate the principle, working and applications of basic techniques

	used in biology
ZOUT-111: Biochemical techniques	CO-1. Explain the importance and applications of techniques in biochemistry. CO-2. Explain the principle and applications of various chromatographic techniques with examples. CO-3. Explain the principle, working, materials used and applications of electrophoresis. CO-4. Describe the concept of light, electromagnetic spectrum and its application in absorption spectroscopy. CO-5. Justify the applications of radioactivity compounds in biology.
ZOUT-112: Cell Biology and Developmental Biology	CO-1. Label the various cell parts CO-2. Sketch and label various types of cells and cell organelles. CO-3. Explain carbon as backbone of biomolecules. CO-4. Explain the ultrastructure and functions of various cell organelles. CO-5. Explain the concepts of cell signaling. CO-6. Illustrate the chemistry and organization of cytoskeleton. CO-7. Illustrate the types, development and causes of tumor. CO-8. Diagrammatically represent the cell cycle phases and its regulation. CO-9. Define the terms in developmental biology CO-10. Explain the significance of model organism for developmental studies.
ZOUT-113: Genetics and English in Scientific Communication	CO-1. Define the basic terminologies in genetics. CO-2. Identify genetic disorders based on Karyotypes and traits. CO-3. Explain the concept of Mendelian genetics, gene, gene regulation and multiple alleles. CO-4. Discuss Linkage and crossing with their types and significance. CO-5. Explain the principles of Population genetics. CO-6. Illustrate the modified Mendelian laws of inheritance. CO-7. Justify the inheritance of qualitative and quantitative traits.
ZODT-114: Freshwater Zoology	CO-1. Enlist the diagnostic features of shrimps. CO-2. Explain the types of aquatic habitats. CO-3. Discuss the aquatic adaptations of common freshwater forms. CO-4. Explain the adaptations in freshwater Turtles and Crocodiles. CO-5. Illustrate the physicochemical properties of water. CO-6. Demonstrate the effect of pollutants on freshwater bodies CO-7. Justify the presence of zooplanktons and aquatics forms in freshwater bodies.
ZOUP-115: Basic Zoology Lab-1. (Practical)	CO-1. Identify the developmental stages of chick embryo, cell structures and phases of cell division CO-2. Identify the grammatical mistakes from the given paragraph and common errors in written and spoken presentations. CO-3. Write a scientific project and research article along with its

	proof reading. CO-4. Demonstrate the working of different microscopes, colorimetric and spectrophotometric methods, cell fractionation and ligature in Drosophila larvae CO-5. Determine the gene distance and order, genotype and phenotype ratios and allelic frequencies from the given data. CO-6. Estimate sugar and protein by suitable biochemical method, and isolate protein from biological source. CO-7. Prepare acid and base solutions of desired strength, buffers, bacterial Culture, chick embryo culture and Drosophila culture. CO-8. Prepare temporary slide of various cells to demonstrate the cell morphology and cell division, giant chromosome and pedigree analysis chart. CO-9. Calculate % retention and % elution of amino acids on given ion exchanger.
ZODP-114: Practical Freshwater Zoology	CO-1. Identify commercially important freshwater fish. CO-2. Identify the aquatic adaptations in common freshwater forms. CO-3. Prepare the culture of Paramecium and Daphnia. CO-4. Estimate the hardness and chloride content in water samples. CO-5. Analyze the Zooplanktons from local freshwater bodies. CO-6. Evaluate the bio-indicators of pollution in freshwater.
Semester – II	
ZOUT-121- Molecular Biology and Bioinformatics	CO-1. Explain the DNA structure & types, topology, Physical properties; chromatin structure and organization. CO-2. Discuss genome organization, DNA and Protein sequencing with their application in evolutionary studies. CO-3. Explain the mobile DNA elements. CO-4. Explain mechanism of DNA damage and repair. CO-5. Illustrate the process of DNA replication, transcription, translation and their regulations. CO-6. Illustrate the database tools with their significance. CO-7. Schematically represent the processes of central dogma. CO-8. Justify the post translational and post transcriptional modifications.
ZOUT-122: Endocrinology	CO-1. Discuss the roles of Pituitary gland and pineal body. CO-2. Explain hormonal regulation of biomolecules and mineral metabolism. CO-3. Describe the role of osmoregulatory and gastrointestinal hormones. CO-4. Explain the role of hormones in moulting, change in body colour of crustaceans; yolk synthesis in amphibians; insect development. CO-5. Explain the hormonal regulation of metabolism.

and Parasitology	CO-6. Illustrate the mechanism of hormone action and role of hormone receptors. CO-7. Justify hormones as coordination molecules. CO-8. Justify the significance of biological clocks and rhythms.
ZOUT-123: Comparative Animal Physiology & Environmental Biology	CO-1. Explain the physiology of processes like digestion, respiration, muscle contraction and excretion. CO-2. Describe the mechanism of thermoregulation in both poikilotherms and homeotherms. CO-3. Explain the mechanism of chemical communication in vertebrates. CO-4. Comment on the structure and functions of various sense organs. CO-5. Illustrate the concept of osmotic regulation in various animals with suitable examples. CO-6. Compare the physiology of regulatory mechanisms in various groups of animals. CO-7. Justify the survival strategies of organism in varied climatic conditions CO-8. Justify the evolution of various life processes in living forms.
ZODT-124: Metabolic Pathways	CO-1. Define basic terminologies of metabolic pathways. CO-2. Explain the laws of thermodynamics, concept of free energy a ATP as currency molecule. CO-3. Describe the Concepts and regulation of metabolism. CO-4. Discuss the oxidation of fatty acids and its significance. CO-5. Illustrate the electron transport chain and oxidative phosphorylation. CO-6. Illustrate the reactions, energetics and regulation of glycolysis, glycogen biosynthesis, TCA cycle, Purine and Pyrimidine metabolism CO-7. Write the general reactions of various metabolic pathways. CO-8. Justify the role of enzymes in metabolism
ZOUP-125: Basic Zoology Lab-2 (Practical)	CO-1. Identify the various parasites and parasitic stages of common parasites, nitrogenous wasteproducts of animals, freshwater planktons and slides of endocrine glands. CO-2. Explain the principle and significance of gonadectomy, Thyroidectomy and pancreactomy. CO-3. Demonstrate the role of eye stalk and insulin in sugar level in crab. CO-4. Demonstrate the retro cerebral complex in cockroach. CO-5. Demonstrate the RBCs of common vertebrates and effect of various osmolarities. CO-6. Demonstrate the effect of body size, oxygen consumption and Insulin on aquatic animal.

	CO-7. Determine the bleeding and clotting time, heartbeat of crab, species richness in selected area, physico-chemical properties of soil and water. CO-8. Perform Sterilization of lab equipment, prepare microbial culture, Isolate Bacterial, liver DNA and RNA from given sample, quantify and resolve them using electrophoretic procedures, analyze protein sample by PAGE and SDS PAGE and construct phylogenetic tree using tools in bioinformatics.
Semester – III	
ZOUT-231:Entomology- I (Special Paper)	CO-1. Define entomology and Insects and understand origin and evolution of insects and their relation to other arthropods. CO-2. Give outline of Classification of insects up to family with distinguishing characters and examples of each order and family. CO-3. Explain the structure, chemical composition and functions of Integument and Derivatives of Integument. CO-4. Explain the structure, modifications of insect body regions and their appendages. CO-5. Explain the Comparative anatomical and histological structure of various body systems. CO-6. Explain the location structure and functions of various Endocrine and Exocrine glands. CO-7. Explain the location and structure of Light and Sound producing organs in various insects
ZOUT-232:Fundamentals of Systematics and Economic Zoology	CO-1. Explain principles, methods of biological classification and diversity in kingdom Animalia. CO-2. Explain the importance of taxonomic keys and taxonomic characters. CO-3. Explain the principles of zoological classification and nomenclature CO-4. Discuss the various taxonomic procedures and molecular phylogenetics & phylogeography
ZOUT-232:Economic Zoology	CO-1. Illustrate the lac culture, apiculture, prawn culture, vermiculture Poultry, dairy industry and Piggery. CO-2. Explain the role of insects of economic importance. CO-3. Explain parasitic roundworms of animal and plants. CO-4. Signify the role of parasitic and soil protozoan in human welfare. CO-5. Justify the use of animals in pharmaceutical research. CO-6. Explain coral reef and its significance
ZOUT-233:Research Methodology and	CO-1. Demonstrate knowledge of research processes (reading, evaluating, and developing) CO-2. Perform literature reviews using print and online databases.

Insect Physiology and Biochemistry	CO-3. Select and define appropriate research problem and parameters to prepare a project proposal. CO-4. Identify, explain, compare, and prepare the key elements of a research proposal/report. CO-5. Compare and contrast quantitative and qualitative research paradigms CO-6. Use sampling methods, measurement scales and instruments, and appropriate uses of each. CO-7. Justify the rationale for research ethics,
ZOUT-233:Insect Physiology and Biochemistry	CO-1. Explain the structure, Chemistry of integument and sclerotization. CO-2. Describe the process of digestion and metabolism CO-3. Explain the characteristics of haemolymph and types of haemocytes. CO-4. Illustrate the structure, physiology and biochemistry of flight muscle. CO-5. Demonstrate the process of excretion, detoxification and water balance CO-6. Justify the role of insect hormones in physiological processes.
ZODT-233:Immunology	CO-1. List the primary and secondary immune organs. CO-2. Explain the concepts of immunity, self-nonself immune response, autoimmune disease. CO-3. Explain the theories of antibody synthesis and generation of antibody diversity. CO-4. Explain the principle and application of the common techniques used in Immunology CO-5. Illustrate the events and dynamics of inflammation CO-6. Compare the MHC molecules and diseases associated with HLA. CO-7. Differentiate between active and passive immunization CO-8. Compare the three pathways of complement fixation pathway.
Semester – IV	
ZOUT-241: Entomology- II	CO-1. Explain Gametogenesis, Fertilization and ovipositional. CO-2. Explain embryonic developmental stages such as Cleavage, Blastoderm and Germ band formation; Gastrulation, Blastokinesis, differentiation of germ layers, Segmentation and Appendages formation and organogenesis. CO-3. Explain post-embryonic developmental stages such as Nymph, Naiad, larva, Pupa and Metamorphosis. CO-4. Explain specialized reproductive mechanisms. CO-5. Explain Hadorns experiments with imaginal disc, Regeneration and Aging. CO-6. Explain Occurrence, Initiation, Preparations for diapauses

	and its Controls.
ZOUT242: Mammalian Reproductive Physiology and Aquaculture	CO-1. Explain the male and female reproductive systems and sexual dimorphic characteristics CO-2. Explain the sexual cycles with examples CO-3. Illustrate the reproductive dysfunctions CO-4. Diagrammatically represent the hormonal regulation of reproductive processes like pregnancy, lactation and parturition. CO-5. Prepare the flow chart to demonstrate the hormonal coordination of reproductive Processes CO-6. Justify the artificial control of reproduction.
ZOUT-242: Aquaculture	CO-1. Identify the fish diseases and the causative organisms CO-2. Mention the various composite fish culture with significance of each type. CO-3. Describe the methods of freshwater prawn culture and its management. CO-4. Explain the methods of pearl culture and pearl harvesting. CO-5. Illustrate the preparation and management of fish culture ponds. CO-6. Demonstrate the methods of packaging and transport of fish and brood fish. CO-7. Illustrate techniques of fish harvesting, preservation & processing. CO-8. Compare the techniques used in fishery development.
ZODT-243: Pest Control	CO-1. Explain the Pest, nature of damage caused by pests and pest control. CO-2. Explain medical, veterinary, Household and stored grain pests. CO-3. Explain the Principles and methods of pest control including Biological control measures CO-4. Explain the Integrated pest management (IPM)
ZODT-244: Apiculture	CO-1. Explain the basic concepts of apiculture like systematics, colony organization, polymorphism, morphology and foraging. CO-2. Explain the tools and management of apiary. CO-3. Explain the importance of institutions pertinent to apiculture. CO-4. Discuss the setup of beekeeping business. CO-5. Illustrate the bee keeping as occupation.