Maratha Vidya Prasarak Samaj's
Arts, Science and Commerce College, Ozar (Mig)
Tal-Niphad, Dist-Nashik 422206
Office: 02550-257219/275919 Email: ozarcollege@gmail.com
Affiliated with Savitribai Phule Pune University, Pune (ID No PU/NS/ASC/027/1984)
AISHE ID: C-41965

Programme Outcomes (PO) & Course Outcomes (CO) offered by the institution are stated and displayed on websites.

Department of Botany- Academic Year 2021-22

Programme Outcome : B.Sc. (Botany)	
PO1	• Students completing this course will have understanding of morphology and anatomy of various groups of plants
PO2	• Students know about different types of lower & higher plants their evolution infrom algae to angiosperm & also their economic and ecological importance.
PO3	• Student can describe morphological & reproductive characters of plant and alsoidentified different plant families and classification
PO4	• Use modern Botanical techniques and decent equipment's.
PO5	• To inculcates the scientific temperament in the students and outside the scientificcommunity
PO6	• They knows economic importance of various plant products & artificial methodsof plant propagation

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Course Outcomes: B.Sc. (Botany)

Class	Semester	Course Title with Subject Code	Outcome
F.Y. B.Sc.	**I**	BO 111: Plantlife and utilization I	• CO1: Learn plant diversity and life cycle of Algae, Lichen, Fungi and Bryophytes and welfare to human beings. • CO2: Review the economic importance.
F.Y. B.Sc.	**I**	BO 112: Plantmorphology and Anatomy	• CO1: Learn Morphological and Anatomical characters ofAngiosperms
F.Y. B.Sc.	**I**	BO 113: Practical basedon BO 111 & BO 112	• CO1: To acquire the practical knowledge of differentplant groups • CO2: To develop skills to study morphological characters and anatomical organization in differentgroups' of plants.
F.Y. B.Sc.	**II**	BO 121: Plantlife and utilization II	• CO1: To learn plant diversity and life cycle of Pteridophytes, Gymnosperms and Angiosperms. • CO2: To review the economic importance.
F.Y. B.Sc.	**II**	BO 122: Principles ofplant science	• CO1: To understand different plant cell organelles andCytological techniques. • CO2: Help to understand different Molecularprocesses.
F.Y. B.Sc.	**II**	BO 123: Practical basedon BO 121 & BO 122	• CO1: Acquire the practical knowledge of different plantgroups. • CO2: Help to develop skills to study Physiological, cytological and molecular processes of plant.
S.Y. B.Sc.	III	BO-231: Taxonomy of Angiosperms and Plant Ecology	• CO1: Know principals of taxonomy, methods in taxonomy • CO2: Types of taxonomy, Sources of data for taxonomy • CO3: Methods of preparation of Herbarium, EHerbarium
S.Y. B.Sc.	III	BO-232:Plant Physiology	• CO1: Applications of plant physiology, Mechanism of Absorption of water, Transpiration • CO2: Plant growth and growth regulators, Nitrogen Metabolism in plants • CO3: Physiology of flowering
S.Y. B.Sc.	III	BO-233:Practical	• CO1: Know practical knowledge of plant family of angiosperms • CO2: Study of different ecological groups and methods to study vegetations in forests • CO3: Study different parameters of plant physiology like WHC, DPD, Rate of transpiration and Different instruments used in physiology

Class	Semester	Course Title with Subject Code	Outcome
S.Y. B.Sc.	IV	BO-241: Plant Anatomy and Embryology	• CO1: Know different tissue systems in plants • CO2: Normal secondary growth and different types of anomalous secondary growth • CO3: Study of male and female gametes in angiosperms, Process of fertilization and types of endosperms and structure of embryo.
S.Y. B.Sc.	IV	BO-242: Plant Biotechnology	• CO1: Know various application of biotechnology like Enzyme technology, Fermentation technology • CO2: Single Cell Proteins and Environmental biotechnology Know Basics of Plant Genetic Engineering, Methods of gene transfer in plants and applications of plant genetic engineering in crop improvement • CO3: Knowledge about Nanotechnology and its applications in Agriculture
S.Y. B.Sc.	IV	BO-243:Practical	• CO1: Study of Different tissue systems and normal and anomalous secondary growth • CO2: Study of fermentation techniques, Spirullina cultivation for SCP

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Department of Chemistry- Academic Year 2021-22

Programme Outcomes: B.Sc. (Chemistry)	
PO1	• The students are expected to understand the fundamentals, principles, and recent developments in the subject area.
PO2	• It is expected to inspire and boost interest of the students towards chemistry as the main subject
PO3	• To impart practical skills and learn basics behind experiments
PO4	• To prepare background for advanced and applied studies in chemistry
PO5	• To inculcate the scientific temperament in the students and outside the scientific community.
PO6	• To inculcate the scientific temperament in the students and outside the scientific community
PO7	• Use modern techniques, decent equipment and Chemistry software

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Course Outcomes: B.Sc. (Chemistry)

Class	Semester	Course Title with Sub. Code	Outcome
F.Y. B.Sc.	I	Physical Chemistry CH-101	• Students will be able to apply thermodynamic principles to physical and chemical process • Calculations of enthalpy, Bond energy, Bond dissociation energy, resonance energy • Variation of enthalpy with temperature – Kirchoff's equation • Third law of thermodynamic and its applications
F.Y. B.Sc.	I	Organic Chemistry CH-102	• The students are expected to understand the fundamentals, principles, and recent developments in the subject area. • It is expected to inspire and boost interest of the students towards chemistry as the main subject. • To familiarize with current and recent developments in Chemistry. • To create foundation for research and development in Chemistry.
F.Y. B.Sc.	II	Inorganic Chemistry CH-201	• Various theories and principles applied to revel atomic structure • Origin of quantum mechanics and its need to understand structure of hydrogen atom • Schrodinger equation for hydrogen atom • Explain rules for filling electrons in various orbitals- Aufbau's principle, Pauli exclusion principle,Hund's rule of maximum multiplicity • Discuss electronic configuration of an atom and anomalous electronic configurations
F.Y. B.Sc.	II	Analytical Chemistry CH-202	• Calculations of mole, molar concentrations and various units of concentrations which will be helpful for preparation of solution. • Relation between molecular formula and empirical formula. • Basics of type determination, characteristic tests and classifications, reactions of different functional groups. • Basics of chromatography and types of chromatography • Theoretical background for Paper and Thin Layer Chromatography
S.Y. B.Sc.	III	CH-301 Physical & Analytical	• Introduction to Analytical Chemistry • Define / Explain concept of kinetics, terms used, rate laws, molecularity, order, factors affecting rate of reaction.

Class	Semester	Course Title with Sub. Code	Outcome
		Chemistry	• Classification of Adsorption Isotherms, to derive isotherms • Solve / discuss problems using theory. • Define, explain and compare meaning of accuracy and precision. • Apply the methods of expressing the errors in analysis from results • Perform calculations involved in volumetric analysis. • Explain why indicator show colour change and pH range of colour change.
S.Y. B.Sc.	III	CH-302 Inorganic & Organic Chemistry	• Define terms related to molecular orbital theory • Explain and apply LCAO principle for the formation of MO's from AO's. • Apply MOT to explain bonding in diatomic molecules other than explained in syllabus • Define different terms related to the coordination chemistry • Explain Werner's theory of coordination compounds • Give the mechanism of reactions involved. • To correlate reagent and reactions • Explain / discuss synthesis of alkyl / aryl halides. To correlate reagent and reactions • Able to differentiate between alcohols and phenols
S.Y. B.Sc.	III	CH-303 Organic & Inorganic Chemistry	• Verify theoretical principles experimentally. • Understand systematic methods of identification of substance by chemical methods • Perform organic and inorganic synthesis • Set up the apparatus / prepare the solutions - properly for the designed experiments. • Perform the quantitative chemical analysis of substances explain principles behind it. • Systematic working skill in laboratory will be imparted in student.
S.Y. B.Sc.	IV	CH-401 Physical & Analytical chemistry	• Discuss meaning of phase, component and degree of freedom. • Derive of phase rule. • Define various terms, laws, differentiate ideal and no-ideal solutions. • Explain distillation of liquid solutions from temperature – composition diagram. Solve problem by applying theory • Explain / define different terms in conductometry. • Explain / discuss conductometric titrations. • Explain / define different terms in Colorimetry • Apply colorimetric methods of analysis to real problem in analytical laboratory. • Solve problems based on theory / equations. • Explain properties of adsorbents, ion exchange resins, etc.
S.Y. B.Sc.	IV	CH-402 Inorganic & Organic Chemistry	• Isomerism in coordination complexes • Apply principles of VBT to explain bonding in coordination compound of different geometries. • Explain principle of CFT. • Explain spectrochemical series, tetragonal distortion / Jahn-Teller effect in Cu (II) Oh complexes only. • Identify and draw the structures aldehydes, ketones amines and carboxylic acids. • Explain / discuss synthesis of aldehydes, ketones, amines and

Class	Semester	Course Title with Sub. Code	Outcome
			carboxylic acids. • Perform inter conversion of functional groups.
S.Y. B.Sc.	IV	CH-403 Practical Course in Chemistry	• Verify theoretical principles experimentally • Interpret the experimental data on the basis of theoretical principles. • Understand systematic methods of identification of substance by chemical methods. • Write balanced equation for all the chemical reactions performed in the laboratory. • Set up the apparatus properly for the designed experiments. • Perform the quantitative chemical analysis of substances and able to explain principles behind it.
T.Y. B.Sc.	V	DSEC I CH - 501: Physical Chemistry	• Know historical of development of quantum mechanics in chemistry. • Understand and explain the differences between classical and quantum mechanics. • Understand the idea of wave function • Understanding of De Broglie hypothesis and the uncertainty principle. • Understanding the operators: Position, momentum and energy • Solving Schrodinger equation for 1D, 2D and 3D model • Physical interpretation of the ψ and $\psi 2$ and sketching the wave function • Applications to conjugated systems, zero-point energy and quantum tunnelling, Numerical Problems
T.Y. B.Sc.	V	DSEC I CH - 502: Analytical Chemistry- I	• Define 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, accuracy, Sensitivity, Selectivity, Robustness and Ruggedness, electromagnetic radiations, spectrophotometry, Beers law, absorbance, transmittance, molar absorptivity, monochromator, wavelength of maximum absorbance, metal ligand ration, qualitative analysis, group reagent, dry tests, wet test, confirmatory test, precipitation, thermogravimetry, thermogram, percent wt. loss, differential thermal analysis. • Identify important parameters in analytical processes or estimations. Example: minimum analyte concentration in particular method, reagent concentration in particular analysis (gravimetry, spectrophotometry, thermogravimetry), reagent for particular analysis, reaction condition to convert analyte into measurable form, drying and ignition temperature for ppt in gravimetry, heating rate thermogravimetry, wavelength in spectrophotometry, group reagent, removal borate and phosphate in qualitative analysis, etc. • Explain different principles involved in the gravimetry,

Class	Semester	Course Title with Sub. Code	Outcome
			spectrophotometry, parameters in instrumental analysis, qualitative analysis • Perform quantitative calculations depending upon equations student has studied in the theory. Furthermore, student should able to solve problems on the basis of theory. • Discuss / Describe procedure for different types analyses included in the syllabus. • Select particular method of analysis if analyte sample is given to him. • Differentiate / distinguish / Compare among the different analytical terms, process and analytical methods. • Demonstrate theoretical principles with help of practical. • Design analytical procedure for given sample. • Apply whatever theoretical principles he has studied in theory during practical session in laboratory.
T.Y. B.Sc.	V	DSEC-I CH-503: Physical Chemistry Practical - I	• To determine the specific refractivity's of the given liquids. • To determine the molecular refractivity of the given liquids. • To determine the molar refraction of homologues methyl, ethyl and propyl alcohol and show the constancy contribution to the molar refraction by -CH_2 group. • Determine the refractive index of a series of salt solutions and determine the concentration of a salt of unknown solution. • Spectrophotometry and colorimetry. To titrate Cu^{2+} ions with EDTA photometrically. • To determine the indicator constant of methyl red indicator. • To estimate of Fe^{3+} ions by thiocyanate method. Cobalt by using R-nitroso salt method. • To determine the order of reaction for the oxidation of alcohol by potassium dichromate and potassium permanganate in acidic medium calorimetrically. • Simultaneous determination of Cu2+ and Ni2+ ions by colorimetry/spectrophotometry method • Conductometry: Titration of a mixture of weak acid and strong acid with strong alkali. • To determine the normality of citric acid in given fruit by titrating it against standard NaOH solution by conductometric method. • To determine $\lambda\infty$ of strong electrolyte (NaCl or KCl) and to verify Onsager equation. • To estimate the amount of lead present in given solution of lead nitrate by conductometric titration with sodium sulphate. • To determine the relative strength of monochloro acetic acid and acetic acid conductometrically. • Viscosity: To determine the molecular weight of a high polymer by using solutions of different concentrations.
T.Y. B.Sc.	V	DSEC-II: CH-504: Inorganic Chemistry - I	• Explain electroneutrality principle and different types of pi bonding. • Able to explain Nephelauxetic effect towards covalent bonding. • Explain MOT of Octahedral complexes with sigma bonding.

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			• Able to explain Charge Transfer Spectra. • Able to compare the different approaches to bonding in Coordination compounds. • To understand about inert and labile complexes and stability of complexes in aqueous solutions • Classification of reactions of coordination compounds • The basic mechanisms of ligand substitution reactions. • Substitution reactions of square planer complexes. • Tran's effect and applications of Trans effect • Stereochemistry of mechanism • Gain the knowledge of inorganic reaction mechanisms available in the literature to solve chemical problems. • To know position of -block elements in periodic table • The meaning of term f-block elements, Inner transition elements, lanthanides, actinides. • Electronic configuration of lanthanides and actinides. • Oxidation states of lanthanides and actinides and common oxidation states. • Separation lanthanides by modern methods. • To know the general electronic configuration & electronic configuration of elements. • To know trends in periodic properties of these elements w.r.t. size of atom and ions,reactivity, catalytic activity, oxidation state, complex formation ability, color, magnetic properties, non-stoichiometry, density, melting point, boiling point.
T.Y. B.Sc.	V	DSEC-II CH-505: Industrial Chemistry	• Importance of chemical industry, Meaning of the terms involved, Comparison between batch and continuous Concept of basic chemicals, • Their uses and manufacturing process • Importance of sugar industry, • Manufacture of direct • Consumption (plantation white) sugar with flow diagram, Cane juice extraction by various methods • Different types of soap products, Chemistry of soap, Raw materials required for soap manufacture\ • Dyes: introduction, Dye intermediates, Structural features of a dye; Classification of dyes, Synthesis, Structures, properties and applications of dyes
T.Y. B.Sc.	V	DSEC-II CH-506: Inorganic Chemistry Practical - I	• Gravimetric estimations: Gravimetric estimation of Fe as Fe_2O_3. • Gravimetric estimation of Ba as $BaSO_4$ using homogeneous precipitation method. • Gravimetric estimation of Nickel as Ni – DMG. • Analysis of sodium bicarbonate from mixture by thermal decomposition method. • Determination of water of crystallization by thermal decomposition • Analysis of Food/Pharmaceutical sample for ash and sulphated ash example-Aspirin.

Class	Semester	Course Title with Sub. Code	Outcome
			• Inorganic preparation: Preparation of inorganic complexes and spot tests for metal ions and ligands: Preparation of hexamminenickel(II) chloride. Preparation of Potassium trioxalatoferrate (III). Preparation of Manganese (III) acetylacetonate. Preparation of tris(glycinato)nickelate(II), Preparation of Potassium dioxalatocuprate(II). • Inorganic qualitative Analysis: Inorganic qualitative analysis: simple water soluble mixture, mixtures containing borates and mixtures containing phosphates. • Limit test for iron, chloride and sulphate from pharmaceutical raw materials. • Qualitative and confirmatory tests of inorganic toxicants of any four ions (Borate, copper, hypochlorite or nitrate or nitrite, Sb or Bi, Iodate, H_2O_2).
T.Y. B.Sc.	V	DSEC-III: CH-507: Organic Chemistry - I	• Define and classify polynuclear and hetreonuclear aromatic hydrocarbons. • Write the structure, synthesis of polynuclear and hetreonuclear aromatic hydrocarbons. • Meaning of active methylene group • Reactivity of methylene group • Synthetic applications ethyl acetoacetate and malonic ester. • What is rearrangement reaction? • Different types of intermediate in rearrangement reactions 1,1 and 1,2 elimination • E1, E2 and E1cB mechanism with evidences of these reactions 4 • Understand stereochemistry by using models and learn reactivity of geometrical isomers
T.Y. B.Sc.	V	DSEC-III CH-508: Chemistry of Biomolecules	• The student will 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. Concepts of biomolecules, Bonds that link monomeric units to form. • The student will 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 • The student needs to know the types of lipids with examples, structure of lipids, properties of lipids • Basic concepts of Endocrinology. Types of Endocrine glands and their hormones. Biochemical nature of hormones. Mechanism of action of lipophilic and hydrophilic hormones.
T.Y. B.Sc.	V	DSEC-III: CH-509: Organic Chemistry Practical-I	• To develop skills required in chemistry such as the appropriate handling of apparatus and chemicals. • The student will learn the laboratory skills needed to design, safely conduct and interpret chemical research.

Class	Semester	Course Title with Sub. Code	Outcome
			• To expose the students to an extent of experimental techniques using modern instrumentation. • The student will develop the ability to effectively communicate scientific information and research results in written and oral formats. • Perform the quantitative chemical analysis of binary mixture, explain principles behind it. • Separate, purify and analyse binary water insoluble mixture. • Separate, purify and analyse binary water-soluble mixture. • Understand the techniques involving drying and recrystallization by various method. • Systematic working skill in laboratory will be imparted in student. • Learn the basic principles of green and sustainable chemistry. • Synthesis of various organic compounds through greener approach.
T.Y. B.Sc.	V	CH-510 (B) : Polymer Chemistry	• Know the different analytical techniques. • History of polymers, Difference between simple compounds and polymer, Names of polymers. • Various ways of nomenclature. • Difference between natural, synthetic, organic and inorganic polymers. • Terms-Monomer, Polymer, Polymerization, Degree of polymerization, Functionality, Number average, Weight average molecular weight. • Mechanisms of polymerization, Polymerization techniques. • Uses & properties of polymers. • Role of polymer industry in the economy. • Advantages of polymers
T.Y. B.Sc.	V	CH-511 (A) : Environmental Chemistry	• Importance and conservation of environment • Importance of biogeochemical cycles • Water resources • Hydrological Cycle • Organic and inorganic pollutants • Water quality parameters
T.Y. B.Sc.	VI	DSEC-IV CH-601: Physical Chemistry-II	• Electrochemical cells: Explanation of Daniell cell, Conventions to represent electrochemical cells • Thermodynamic conditions of reversible cell, Explanations of reversible and irreversible electrochemical cell with suitable example, • EMF of electrochemical cell and its measurement. • Distinguish between crystalline and amorphous solids / anisotropic and isotropic solids. • Explain the term crystallography and laws of crystallography. • Weiss and Millers Indices, determination of Miller Indices • Radioactivity, Types and properties of radiations: alpha,

Class	Semester	Course Title with Sub. Code	Outcome
			beta and gamma • Detection and Measurement of Radioactivity: Cloud chamber, Ionization Chamber, Geiger-Muller Counter, Scintillation Counter, Film Badges.
T.Y. B.Sc.	VI	DSEC-IV CH-602 : Physical Chemistry-III	• Meaning of the terms-Solution, electrolytes, nonelectrolytes and colligative properties, Lowering of vapour pressure of solvent in solution. • Factors affecting on solid state reactions • Rate laws for reactions in solid state • Applying rate laws for solid state reactions • Cohesive Energy of ionic crystals based on coulomb's law and Born Haber Cycle • Correspondence between energy levels in the atom and energy bands in solid • Band structure in solids – Na , Ca and diamond • History of polymers • Classification of polymers • Chemical bonding & Molecular forces in Polymer • Molecular weight of polymers • Practical significance of polymer molecular weights
T.Y. B.Sc.	VI	DSEC-IV: CH-603 : Physical Chemistry Practical-II	• To determine the PKa value of given monobasic weak acid by potentiometric titration • To determine the formal redox potential of Fe^{2+}/ Fe^{3+} system potentiometrically • To determine the amount of NaCl in the given solution by potentiometric titration against silver nitrate • To determine the solubility product and solubility of AgCl potentiometrically using chemical cell • Estimate the amount of Cl^-, Br^- and I^- in given unknown halide mixture by titrating it against standard $AgNO_3$ solution (mixture of any two ions) • To prepare standard 0.2 M Na_2HPO_4 and 0.1 M Citric acid solution, hence prepare four different buffer solutions using them. Determine the pH value of these and unknown solution • To determine the composition of Zinc ferrocyanide complex potentiometrically • To determine the standard electrode potentials of Cu and Ag electrodes and to determine the EMF of a concentration cell. • To determine the degree of hydrolysis of aniline hydrochloride. • To determine the dissociation constant of oxalic acid by pH-metric titration with strong base. • Determination of Pka of given weak acid by pH metry titration with strong base • To determine the acid and base dissociation constant of an amino acid and hence the isoelectric point of an acid. • pH metric titration of strong acid against strong base by

Class	Semester	Course Title with Sub. Code	Outcome
			pH measurement and hence determine the concentration and strength of strong acid. • To determine plateau voltage of the given G M counter. • To determine the resolving time of GM counter. • To determine Emax of beta particle.
T.Y. B.Sc.	VI	DSEC-V: CH-604 : Inorganic Chemistry -II	• To understand M-C bond and to define organometallic compounds • To define organometallic chemistry • To understand the multiple bonding due to CO ligand • To know methods of synthesis of binary metal carbonyls • Understand the phenomenon of catalysis, its basic principles and terminologies • Define and differentiate homogeneous and heterogeneous catalysis • Give examples and brief account of homogeneous catalyst • Understand the essential properties of homogeneous catalysts-Give the catalytic reactions • Identify the biological role of inorganic ions & compounds. • Know the abundance of elements in living system and earth crust • Give the classification of metals as enzymatic and non-enzymatic • Understand the role of metals in non-enzymatic processes.
T.Y.B.Sc	VI	DSEC-V: CH-605: Inorganic Chemistry -III	• Student will learn the concept of acid base and their theories. • They will also come to know different properties of acids and bases. • Strength of various types acids. • How acid and base strengths get affected in non-aqueous solvents. • Draw the simple cubic, BCC and FCC structures. • Identify the C.N. of an ion in ionic solid. Identify the type of void. • Know the effect of radius ratio in determining the crystal structure. • Be able to define Pauling's univalent radius and crystal radius. • Different Zeolite Framework Types and their classification • Zeolite synthesis and their structure • Application of zeolites • Various methods of nanoparticle synthesis • Stabilization of Nanoparticles in solution Properties and Application of Nanoparticles • Know about carbon nanotube and its application
T.Y.B.Sc	VI	DSEC-V: CH-606: Inorganic Chemistry Practical-II	• • Analysis of Phosphate (PO43-) from Fertilizer. • Analysis of Iodine from Iodized salt. • Strength of medicinal H2O2. • Analysis of Calcium from milk powder.

Class	Semester	Course Title with Sub. Code	Outcome
			• Analysis of Cu from Cu-Fungicide. • Estimation of Na by flame photometry by calibration curve method. • Estimation of Na by flame photometry by regression method. • Estimation of K by flame photometry by calibration curve method. • Estimation of K by flame photometry by regression method. • Purification of water using cation/anion exchange resin and analysis by qualitative analysis /conductometry. • Synthesis of Silver nanoparticles. • Synthesis of ZnO nanoparticles. • Verification of periodic trends using solubility of alkaline earth metal hydroxides Ca(OH)2, Mg(OH)2, Cr(OH)2, Ba(OH)2. • Synthesis of amine complexes of Ni(II) and its ligand exchange reaction (bidentate ligands like acac, DMG, Glycine) by substitution method. OR Determination of the Metal to ligand ratio (M : L) in complexes. • Solvent free microwave assisted one pot synthesis of pthalocynin copper (II) complex. OR Fenton reaction: Degradation of H2O2 using Fe catalyst.
T.Y.B.Sc	VI	DSEC-VI: CH-607: Organic Chemistry-II	• Students will learn the interaction of radiations with matter. They will understand different regions of electromagnetic radiations. They will know different wave parameters • Students will learn the principle of mass spectroscopy, its instrumentation and nature of mass spectrum. • Students will understand the principle of UV spectroscopy and the nature of UV spectrum. • They will learn types of electronic excitations. • 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. • 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
T.Y.B.Sc	VI	DSEC-VI: CH-608: Organic Chemistry-III	• Study the Disconnection, Synthons, Synthetic equivalence, FGI, TM, One group disconnection, Retrosynthesis. • To study Chemistry of reactive intermediates (carbocations, carbanions, free radicals, carbenes, nitrenes, benzynes) • Wolff rearrangement (Step up), • Hofmann rearrangement (Step down), • Simmons-Smith reaction, • Michael reaction, • Wittig reaction and McMurry reaction, • Diels-Alder reaction,

Class	Semester	Course Title with Sub. Code	Outcome
			• Functional group interconversions and structural problems using chemical reactions. • To understand the Oxidation ,reduction and oxidizing , reducing agents
T. Y. B.Sc	VI	DSEC-VI: CH-609: Organic Chemistry Practical-II	• Explain “fingerprint region” of an infrared spectrum can used in the identification of an • unknown compound. • Identify the functional group or groups present in a compound. • 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. • Understand use NMR spectra to determine the structures of compounds. • Interpret integration of NMR spectra • Calculate coupling constants from 1 H NMR spectra. • Interpret elemental analysis technique. • Practical knowledge of handling chemicals. • Achieve the practical skills required to estimations of glucose and glycine. • Achieve the practical skills required to Saponification value of oil. • Determine the molecular weight of given tribasic acids • Apply the principles of extraction • Understand the equipment for extraction • Defines the basic parameter of chromatography Explain the processes of a chromatography analysis • Describes the types and materials of column. • Explains the types of mobile phase and elution.
T. Y. B.Sc	VI	DSEC-VI: CH-610 (A): Chemistry of Soil and Agrochemicals	• To understand various components of soil and soil properties and their impact on plant growth, the classification of the soil. • Explores the problems and potentials of soil and decide the most appropriate treatment for land use. • The Reclamation and management of soil physical and chemical constraints. • Useful in making decisions on nutrient dose, choice of fertilizers and method of application etc. practiced in crop production. • Advanced analytical and instrumentation methods in the estimation of soil. • Various Nutrient management concepts and nutrient use efficiencies of major and micronutrients and enhancement techniques. • Proper understanding of chemistry of pesticides will be inculcated among the students, different pesticides, their nature and, mode of action and their fate in soil so as to monitor their effect on the environment
T. Y. B.Sc	VI	DSEC-VI: CH-	• Define basic terms in solvent extraction, basics of

Class	Semester	Course Title with Sub. Code	Outcome
		611(A): Analytical Chemistry-II	chromatography, HPLC, GC, and AAS and AES. • The solvent extraction, aqueous and organic phase, distribution ratio and coefficient, percent extraction, ion association complex, theoretical plate, HETP, retention time, selectivity, resolution, stationary phase, normal and reverse phase, ion exchange, column efficiency, carrier gas, split and spitless injection, packed column, tubular column. • Atomic absorption and emission spectroscopy, electronic excitation in atoms, nebulization, atomization, reduction of metal ions in flame, absorbance by atoms in flame, flame atomizers, furnace atomizers, interference in AES and FES, HCL, hydride generator, etc. • Identify important parameters in analytical processes or estimations. • The reagent concentration for particular analysis, reagent for particular analysis, reaction condition to convert analyte into measurable form, wavelength selection in HPLC with spectrophotometric and fluorometric detector, solvent or carrier gas in HPLC and GC, choice method for the sample preparation in atomic spectroscopic methods, choice of filter and HCL in atomic spectroscopic methods, etc. • Explain different principles involved in the analyses using solvent extraction, basics of instrumental chromatography, HPLC, GC, and atomic spectroscopic techniques. • Perform quantitative calculations depending upon equations students has studied in the theory. Furthermore, student should able to solve problems on the basis of theory. • Differentiate / distinguish / compare among the different analytical terms, process and analytical methods. • Demonstrate / explain theoretical principles with help of practical and design analytical procedure for given sample.

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Department of Physics - Academic Year 2021-22

Programme Outcome : B.Sc. (Physics)	
PO1	• Scientific attitude will be inculcated in students with in-depth knowledge of scientific andtechnological
PO2	• Student will be familiar with recent scientific and technological developments and solidfoundation will be created for research and development in Physics.
PO3	• Analytical abilities to address real world problems will be developed through variousexperimental and computational tools
PO4	• Students will be developed to build-up a progressive and successful career in Physics.
PO5	• Apply and demonstrate knowledge of concepts of physics, to analyze a variety of physical phenomena. Demonstrate the learned laboratory skills, enabling them to take • Measurements in a physics laboratory and analyze the measurements to draw valid conclusions
PO6	• Respond effectively to unfamiliar problems in scientific contexts
PO7	• Demonstrate the ability to translate a physical description to a mathematical equation, and conversely, explain the physical meaning of the mathematics, represent key aspects of • Physics through graphs and diagrams, and use geometric arguments in problem-solving.

Maratha Vidya Prasarak Samaj's
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Affiliated with Savitribai Phule Pune University, Pune (ID No PU/NS/ASC/027/1984)
AISHE ID: C-41965

Course Outcomes: B.Sc. (Physics)

Class	Semester	Course Title with Sub. Code	Outcome
F.Y. B.Sc.	I	PHY 111 - Mechanics and properties of matter	• Relative motion. Inertial and non-inertial reference frames. • Newton's laws of motion and its real-lifeapplications. • Motion and its types with examples. • Define and calculate Speed, Velocity, and Acceleration. • Energy, conservation of Energy. Define kinetic and Potential Energy. • Conservative and non-conservative force with examples. • Concept of viscous force, viscosity. Bernoulli's equations and its applications. • Different properties of matter such as Surface Tension, Elasticity. • Factors affecting surface tension and different methods for determining surface tension. • Applications of Surface Tension. • Concept of Stress, Strain and different elasticModuli • Using elasticity determination of Young's Modulus and Modulus of Rigidity. • Understanding of Poisson's Ratio. • Relation Between three elastic moduli.
F.Y. B.Sc.	I	PHY 112 Physics Principles and Applications	• To understand the general structure of atom,Spectrum of Hydrogen atom • To understand the atomic excitation and LASER principles • To understand the bonding mechanism and its different types • To demonstrate and understanding electro-magnetic waves and its spectrum • Understand the types and sources of electromagnetic waves and applications • To demonstrate quantitative problems solving skillsin all the topics covered
F.Y. B.Sc.	I	PHY 113 Physics Laboratory	A practical physics course enables students to do experiments on the fundamental laws and principles, and

Class	Semester	Course Title with Sub. Code	Outcome
		1A	gain experience of using a variety of measuring instruments. Practical work enhances basic learning skills. • Students get skills on handling measuring instrument and finding the percentage error inmeasurement • Enables students to understand Mechanics through experiments • Enables students to understand optics through performing experiments and skills get developed to handle optical instrument's
F.Y. B.Sc.	II	PHY 121 Heat and Thermodynamics	• To understand the basic concepts ofthermodynamics. • To be able to state First Law of thermodynamics and to define heat, work and thermal efficiency. • To calculate changes in Enthalpy, Entropy and Internal Energy. • To explain the classification of external and internal combustion engine and sketch the diagram of Processes involved in spark ignition and compression ignition. • Students will be able to read a thermometer. • Students will become familiar with and will beable to convert different temperature scales
F.Y. B.Sc.	II	PHY 122 Electricity and Magnetism	• To understand the concepts of electric field, electric force and electric potential for stationary charge • Able to calculate electrostatic field and potential of charge distributions using Coulombs Law and Guass law • To understand the dielectric phenomenon andeffect of electric field on dielectric. • To study magnetic field for steady current using Biot-Savarts and Ampere circuit Laws. • To understand Magnetic material and its properties • To demonstrate quantitative problems solving skills in all the topics covered
F.Y. B.Sc.	II	PHY 123 Physics Laboratory 1B	A practical physics course enables students to do experiments on the fundamental laws and principles, and gain experience of using a variety of measuring instruments. Practical work enhances basic learning skills. • Students well understand the concepts based on heat and thermodynamics. • Students well understand the concepts based on Electricity and magnetism through various experiments.
S.Y. B.Sc.	III	PHY-231 Mathematical	• Understand the complex algebra useful in physics courses. • Understand the concept of partial differentiation.

Class	Semester	Course Title with Sub. Code	Outcome
		Methods in Physics-I	• Understand the role of partial differential equations inphysics. • Understand vector algebra useful in mathematics and physics. • Understand the concept of singular points of differentialequations.
S.Y. B.Sc.	III	PHY-232(A) Electronics-I	• Apply different theorems and laws to electrical circuits. • Understand the relations in electricity. • Understand the parameters, characteristics and working oftransistors. • Understand the functions of operational amplifiers. • Design circuits using transistors and applications of operational amplifiers. • Understand the Boolean algebra and logic circuits.
S.Y. B.Sc.	III	PHY-233 Physics Laboratory-2A	• Use various instruments and equipment. • Design experiments to test a hypothesis and/or determine the value of an unknown quantity. • Investigate the theoretical background of an experiment. • Setup experimental equipment to implement an experimental approach. • Analyze the data, plot appropriate graphs and reach conclusions from data analysis. • Work in a group to plan, implement and report on a project/experiment. • Keep a well-maintained and instructive laboratory logbook.
S.Y. B.Sc.	IV	PHY-241 Oscillations,Waves and Sound	• To study underlying principles of oscillations and its scope in development. • To understand and solve the equations / graphical representations of motion for simple harmonic, damped,forced oscillators and waves. • To explain oscillations in terms of energy exchange withvarious practical applications. • To solve numerical problems related to undamped, damped, forced oscillations and superposition of oscillations. • To study characteristics of sound, decibel scales and applications.
S.Y. B.Sc.	IV	PHY-242 Optics	• Acquire the basic concept of wave optics. • Describe how light can constructively and destructivelyinterfere. • Explain why a light beam spread out after passing through an aperture • Summarize the polarization characteristics of electromagnetic wave • Understand the operation of many modern optical

Class	Semester	Course Title with Sub. Code	Outcome
			devices that utilize wave optics • Understand optical phenomenon such polarization, diffraction and interference in terms of the wave model • Analyze simple example of interference and diffraction.
S.Y. B.Sc.	IV	PHY-243 Physics Laboratory-2B	• Use various instruments and equipment. • Design experiments to test a hypothesis and/or determine the value of an unknown quantity. • Investigate the theoretical background of an experiment. • Setup experimental equipment to implement an experimental approach. • Analyze the data, plot appropriate graphs and reach conclusions from data analysis. • Work in a group to plan, implement and report on a project/experiment. • Keep a well-maintained and instructive laboratory logbook.
T.Y. B.Sc.		PHY-351: Mathematical methods in physics-II	• Define Cartesian, spherical and cylindrical co-ordinates, transformation and a general curvilinear co-ordinates system: Coordinate surface co-ordinate lineslength surfaces and volume elements in curvilinear co-ordinates system. • Generate equation for Orthogonal curvilinear co-ordinate system, gradient, divergence, Laplacian and curl, special case for gradient, divergence and curl in Cartesian, spherical polar and cylindrical co-ordinates system, • Introduction and applications, Newtonian relativity, Galilean Transformation equation. Michelson – Morley experiment • Postulate of special theory of relativity, Lorentz transformation, Kinematic effects of, Lorentz transformation. Define Length contraction, proper time • Convert commonly occurring partial differential equations in physics into ODE's Method of separation of variables in Cartesian, Spherical polar and cylindrical co-ordinates system (2-dimensional Laplace's equation, 1-D wave equation • Illustrate the problems on Frobenius method of series solution and to differentiate • Point of expansion of given differential equations. • Evaluate &plot Legendre polynomials, Hermit polynomials, Bessel function of first kind. • List the most important special functions in physics and to solve different properties related to special

Class	Semester	Course Title with Sub. Code	Outcome
			functions.
T.Y. B.Sc.	III	PHY-352: Electrodynamics	• Define the Biot-savart law, Amperes law, Coulombs law, Electric field, Electric susceptibility, Magnetic field &Faradays law. • Explain method of electrical images, equation of continuity, Magnetic vector potential, B.H curve, Maxwell's equation &wave equations. • Solve numerical problem on coulombs force, magnetic induction, magnetic permeability and induced voltage, magnitude of electric &magnetic vectors. • Determine work done by charges, total charge, force on the wire in different symmetry. • Summarize pointing vector, polarization, reflection &refraction. • Apply Biot-Savart law in different symmetry problem • List the applications of Amperes law, Biot-Savart law, and Poynting theorem • Elaborate magnetic properties of the material.
T.Y. B.Sc.	III	PHY-353: Classical Mechanics:	• Solve advanced problems involving the dynamic motion of classical mechanical systems with an intermediate knowledge of Newton's laws of motion • Apply the concept of center of mass and mechanics of system of particles and conservation of energy, linear and angular momentum to solve dynamics problems • Demonstrate an intermediate knowledge of central-force motion and the concept of converting two body problems to single body problem and apply advanced methods to complex central-force motion problems. • Demonstrate an intermediate knowledge of concept of laboratory frame and center of mass frame and their use to calculate results of scattering experiments • Apply the concept scattering to get important information regarding the nature of interaction between atomic and subatomic particles through experiments • Derive Lagrange and Hamilton's equations, and represent the equations of motion for simple mechanical systems such as: the Atwood's machine, Simple pendulum using these formulations of classical mechanics • Acquire working knowledge of the methods of Hamiltonian Dynamics and compute the Hamilton equations of motion for mechanical systems

Class	Semester	Course Title with Sub. Code	Outcome
			• Use calculus of variations to find the Euler-Lagrange equations and canonical transformations to find the constants of motion according to the Hamilton Jacobi theory. • Use Poisson brackets to find derivatives in phase space.
T.Y. B.Sc.	III	PHY-354: Atomic and Molecular Physics	• Derive the formulae for total energy of an atom so that energy level diagram can be drawn and also able to obtain the expression for spin orbit interaction energy. • State laws, postulates in atomic and molecular Physics and able to compare various models of atomic structure. • Calculate quantum state of electrons in an atom, spectral notation and electronic configuration of atom • Obtain formulae for Zeeman shift, wavelength of emitted X-ray s, Raman shift, rotational and vibrational energy for diatomic molecule and apply it. • Explain origin of line spectra and able to compare continuous spectra, characteristic spectra and can differentiate between rotational, vibrational, and electronic spectra. • Explain application of Duane and Hunt's rule, Moseley's law and its importance, applications of X-rays, Raman effect and Auger effect. • Draw and explain X-ray spectra, spectrum with and without magnetic field • (Zeeman effect),Raman spectra and molecular spectra using quantum treatment • Explain experimental arrangement to produce X-ray, to observe Raman effect and Zeeman effect.
T.Y. B.Sc.	III	PHY-355: Computational Physics	• Define types of programming languages and their uses; • Gain basic competency with a widely used C-language for both general and scientific programming; • Define operators and expression in C-programming and navigate commands; • Explain control statements and loops as well as capable of writing C-program to solve problems • Describe arrays and pointers and apply them in C program • Critically present different numerical methods to solve different types of physical and technical problems; • Implement numerical algorithms into C-program and

Class	Semester	Course Title with Sub. Code	Outcome
			visualize the results of the computations. • Demonstrate the ability to estimate the errors in the use of numerical methods.
T.Y. B.Sc.	III	PHY-356: Elective-I Elements of Materials science	• Define and outline the rules of solubility, deformation in metals, basic concepts in phase diagram, molecular phases and the concept of smart materials. • Explain the imperfections in solids, mechanism of plastic deformation by slip, properties of ceramic materials, the importance and objective of phase diagram • Calculate and solve problems on stress and strain of materials, CRSS of single-phase metals, weight in percentage of compositions using lever rule. • List the defects in solids, diffusion mechanisms and types of phase diagram. • Classify between elastic deformation and plastic deformation, linear polymers and cross-linked polymers • Derive the CRSS of metals and the lever rule for phase diagrams. • Discuss the types of smart materials, properties of smart materials and their applications • Summarize the concept of polymers and the process of polymerization.
T.Y. B.Sc.	IV	PHY-357: Physics Laboratory-3A	• Describe the underlying theory of experiments in the course. • Perform derivations of theoretical models of relevance for the experiments in the course. • Follow instructions to perform laboratory experiments in Optics, Thermodynamics, Mechanics, Modern Physics, Electronics and Electromagnetics. • Document their results, using correct procedures and protocols. • Perform a quantitative analysis of experimental data including the use of computational and statistical methods where relevant. • Interpret relationships in graphed data and develop an intuition for alternative plotting methods and communicate results from laboratory experiments, orally or in a written laboratory report. • Calculate permissible standard error in any physics experiment • Derive conclusions from the analysis of own data. • Assess the language used to describe physics experiments and how it can alter perceptions of the method and results.

Class	Semester	Course Title with Sub. Code	Outcome
T.Y. B.Sc.	IV	PHY-358: Physics Laboratory-3B	• Describe the underlying theory of experiments in the course. • Perform derivations of theoretical models of relevance for the experiments in the course. • Follow instructions to perform laboratory experiments in Optics, Thermodynamics, Mechanics, Modern Physics, Electronics and Electromagnetics. • Document their results, using correct procedures and protocols. • Perform a quantitative analysis of experimental data including the use of computational and statistical methods where relevant. • Interpret relationships in graphed data and develop an intuition for alternative plotting methods and communicate results from laboratory experiments, orally or in a written laboratory report. • Calculate permissible standard error in any physics experiment • Derive conclusions from the analysis of own data. • Assess the language used to describe physics experiments and how it can alter perceptions of the method and results.
T.Y. B.Sc.	IV	PHY-359: Physics Project-I	• Design and test hypothesis • Describe the underlying theory of experiments in the course. • Perform derivations of theoretical models of relevance for the experiments in the course. • Document their results, using correct procedures and protocols. • Perform a quantitative analysis of experimental data including the use of computational and statistical methods where relevant.
T.Y. B.Sc.	IV	PHY-3510(H): Energy Studies	• Students become capable of conducting energy audits and give consultancy in that field. • Students can design different types of solar heaters for small domestic as well as large scale community level applications • Students acquire skills to implement solar P-V systems at domestic levels as well as for office premises and educational institutions. Students become able to start their own enterprise in net metering. • Students get ideas and hence become self-employed in the field of design, production, commissioning and implementation of bio-mass energy sources, bio-gas plants, gasifiers, wind mills, hybrid systems etc. • Students can go for research in the fields of super-

Class	Semester	Course Title with Sub. Code	Outcome
			capacitors, battery technologies, fuel cells and material synthesis for implementation of these technologies. • Students become successful entrepreneurs in the energy field. Students strive to make the regions where they live and work self-sufficient in generating and fulfilling their own energy needs using different energy solutions.
T.Y. B.Sc.	IV	PHY-3511(K): Physics Workshop Skill	• Students understand the comparative aspects, advantages and disadvantages of various sources of energy. They understand the facts and myths regarding the energy sources. • Students learn the basic principles involved and technologies developed in the uses of solar energy, biomass energy, wind energy, fuel cells. • Students understand the challenges and opportunities in conversion of energy from one form to another, generation of electricity and mechanical work using different energy sources. • Students get acquainted with challenges and recent trends in energy storage devices and they learn more about super-capacitors and batteries, electrical vehicles. They can imagine about future road maps in the fields of energy conversion and storage technologies. • Students become capable of conducting energy audits and give consultancy in that field. • Students can design different types of solar heaters for small domestic as well as large scale community level applications. • Students acquire skills to implement solar P-V systems at domestic levels as well as for office premises and educational institutions. Students become able to start their own enterprise in net metering. • Students get ideas and hence become self-employed in the field of design, production, commissioning and implementation of bio-mass energy sources, bio-gas plants, gasifiers, wind mills, hybrid systems etc. • Students can go for research in the fields of super-capacitors, battery technologies, fuel cells and material synthesis for implementation of these technologies. • Students become successful entrepreneurs in the energy field. Students strive to make the regions where they live and work self-sufficient in generating and fulfilling their own energy needs using different energy solutions.

Class	Semester	Course Title with Sub. Code	Outcome
T.Y. B.Sc.	VI	PHY-361: Solid state physics.	• Define crystal structure to develop it in 2D as well as 3D and to determine Indices for 'Directions' and 'Planes' in a crystalstructure. • Give original examples of crystal structures and to analyze them with packing fraction, coordination number, number of atoms per unit cell etc. • Derive Bragg Diffraction condition in direct lattice and to relate it in reciprocal lattice using Ewaldconstruction. • Classify the crystal structure by XRD diffraction and to simplify formula for inter- planer distance. • Illustrate various experimental techniques for characterization of material. • Apply free electron theory to restate thermal and electrical properties • Explain superconductivity and Meissner-effect • Definemagneticpropertiesofmaterialandtoderivesusceptibilityformula for different magnetic materials using Lange veintheory.
T.Y. B.Sc.	VI	PHY-362: Quantum Mechanics	• Outline the historical aspects of development of quantum mechanics; • Explain the differences between classical and quantum mechanics; • Describe matter waves, wave function and uncertainty principle; • Describe Schrodinger's equation and its steady state form; • Solve Schrodinger's steady state equation for simple potentials to obtain Eigen functions and Eigen values • Apply Schrodinger's steady state equation for spherically symmetric potentials obtain Eigen functions and eigenvalues; • Interpret quantum numbers in atomic system; • Discuss operator algebra in quantum mechanics.
T.Y. B.Sc.	VI	PHY-363: Thermodynamics and Statistical Physics	• Describe transport phenomena and compute coefficient of thermal conductivity, viscosity and diffusion in terms of mean free path • Define and discuss the concepts and roles of thermodynamic functions from the view point of statistical mechanics • Derive Binomial distribution and Gaussian probability distribution using random walk problem and calculate mean values for a statistical system • Discuss the concepts of microstate and macro state, basic postulates and behavior of density of states for model system and calculate the number of microstates for different statistical systems

Class	Semester	Course Title with Sub. Code	Outcome
			• Differentiate thermal, mechanical and general interaction between statistical system • Derive and compare Maxwell Boltzmann, Bose-Einstein and Fermi-Dirac distributions; state where they are applicable and explain the connection between classical • Derive probability distribution formula for micro canonical, canonical ensemble and calculate mean values in canonical ensemble • Discuss applications for canonical ensemble
T.Y. B.Sc.	VI	PHY-364: Nuclear Physics	• Define threshold voltage, dead time and recovery time in GM counter, threshold energy, nuclear fission, nuclear fusion, critical size, critical mass. • Determine the basic properties of nucleus • Classify nuclear radiations, elementary particles and nuclear states, nuclear detectors. • Compose baryons and mesons with Quark model. • Derive expression for energy of ions and frequency of RF signal in cyclotron, Q- value equation, threshold energy, and decay constant. • Estimate binding energy from fission • Justify nuclear reactions using conservation laws • Explain the different processes by which energetic particles interact with matter, kinematics of various reactors and decay processes
T.Y. B.Sc.	VI	PHY—366: Elective- II	• Explain the interaction of radiation with matter, Quantum behavior of light, thermal equilibrium and population inversion • Illustrate the absorption, spontaneous and stimulated emission with appropriate diagrams. • Derive the Einstein's relation, conditions for largestimulated emission and light amplification. • Distinguish between ordinary light and laser light • Define the characteristics of laser light. • Classify between lifetime broadening, collision and Doppler broadening. • List the types of lasers • Discuss the applications of lasers in various fields.
		PHY-366 (R): Lasers	• Explain the interaction of radiation with matter, Quantum behavior of light, thermal equilibrium and population inversion • Illustrate the absorption, spontaneous and stimulated emission with appropriate diagrams. • Derive the Einstein's relation, conditions for largestimulated emission and light amplification.

Class	Semester	Course Title with Sub. Code	Outcome
			• Distinguish between ordinary light and laser light • Define the characteristics of laser light. • Classify between lifetime broadening, collision and Doppler broadening. • List the types of lasers • Discuss the applications of lasers in various fields.
		Physics Practical-I PHY-367: Physics Laboratory-4A	• Describe the underlying theory of experiments in the course. • Perform derivations of theoretical models of relevance for the experiments in the course • Follow instructions to perform laboratory experiments in Optics, Thermodynamics, Mechanics, Modern Physics, Electronics and Electromagnetics. • Document their results, using correct procedures and protocols. • Perform a quantitative analysis of experimental data including the use of computational and statistical methods where relevant. • Interpret relationships in graphed data and develop an intuition for alternative plotting methods and communicate results from laboratory experiments, orally or in a written laboratory report. • Calculate permissible standard error in any physics experiment • Derive conclusions from the analysis of own data. Assess the language used to describe physics experiments and how it can alter perceptions of the method and results.
		Physics Practical-II PHY-368: Physics Laboratory-4B	• Describe the underlying theory of experiments in the course. • Perform derivations of theoretical models of relevance for the experiments in the course. • Follow instructions to perform laboratory experiments in Optics, Thermodynamics, Mechanics, Modern Physics, Electronics and Electromagnetics • Document their results, using correct procedures and protocols • Perform a quantitative analysis of experimental data including the use of computational and statistical methods where relevant. • Interpret relationships in graphed data and develop an intuition for alternative plotting methods and communicate results from laboratory experiments, orally or in a written laboratory report. • Calculate permissible standard error in any physics experiment • Derive conclusions from the analysis of own data.

Class	Semester	Course Title with Sub. Code	Outcome
			• Assess the language used to describe physics experiments and how it can alter perceptions of the method and results.
		Physics Practical-III: Project PHY-369: Physics Project-II	• design and test hypothesis • Describe the underlying theory of experiments in the course. • Perform derivations of theoretical models of relevance for the experiments in the course. • Document their results, using correct procedures and protocols. • Perform a quantitative analysis of experimental data including the use of computational and statistical methods where relevant.
		PHY-3610: Skill Enhancement Course -III PHY-3610(H): Solar PV System: Installation, Repairing and Maintenance	• In this skill-oriented course, student will study basics of solar photovoltaic (PV) cells, modules, and system components. • Design and sizing of off-grid PV system for homes, apartments as well as commercial offices. • Understanding energy conversion from sunlight to electricity, and working with solar conversion equipment. • This Course will hand on experience needed to become self-employed. • Learn basics of light conversion in electricity. • Hands on training will motivate to use Solar PV system. • Become entrepreneur / self-employed • Analyzed of MSEB electricity bill and design and sizing of off-grid PV system • Participants will learn about solar PV module and batteries used in solar PV plant.
		PHY-3611: Skill Enhancement Course -IV PHY-3611(Z): Instrumentation for Agriculture	• Get knowledge of sensors used in agriculture field • Learn continuous and batch process • Learn greenhouse automation schemes • Learn Instrumentation in Irrigation • Able to test soil and water parameter • Able to develop their own juice extract plant • Able to developed their own green house

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Department of Mathematics - Academic Year 2021-22

Programme Outcome : B.Sc. (Mathematics)	
PO1	• Develop the critical thinking with scientific temper
PO2	• Engage in continuous reflective learning in the context of technological and scientificadvancements
PO3	• Understand and apply the fundamental principles, concepts and methods in key areas ofscience and multidisciplinary fields
PO4	• Provides basic knowledge on core concepts of Science.
PO5	• Empowered with analytical mind and critical thinking.
PO6	• To inculcate the scientific temperament in the students and outside the scientificcommunity.

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Course Outcomes: B.Sc. (Mathematics)

Class	Semester	Course Titlewith Sub. Code	Outcome
F.Y. B.Sc.	I	MT-111 Algebra	• Learn to find graphs, roots and primes integer using maxima software. • Introduction to complex analysis.
		MT-112 Calculus - I	• Introduction to sequence and series. • Learn to check function is continuous understand the consequences of the intermediate value theorem for continuous functions.
		MT-113 Mathematics Practical	• Learn Maxima software. • Problem solve on algebra and calculus by using maxima software. • Knowledge of application of mathematics
F.Y. B.Sc.	II	MT-121 Analytical Geometry	• Finding equation in various form of line, circle, ellipse, sphere, cones etc. • Give the knowledge of geometry using maxima software.
		MT-122 Calculus - II	• Student will be to understand differentiation and fundamental theorem in differentiation and various rules. • Introduction to Ordinary Differential Equation.
		MT-123 Mathematics Practical	• Learn Maxima software. • Problem solve on analytic geometry and calculus byusing maxima software. • Problem solving on geometry and calculus.
S.Y. B.Sc.	I	MT -231 Calculus of several variables	• Solve problems involving tangent planes and normal lines • Determine the extrema of functions of several variables • Use the Lagrange multiplier method to find extrema of functions with constraints.
		MT 232(A) Numerical Methods and its Applications	• Using appropriate numerical methods determine approximate solution of ODE and system of linear equation. • Compare different methods in numerical analysis w.r.t accuracy and efficiency of solution.
		MT232(B) Graph Theory	• Solve problems on Definition and some properties of trees, Distance and Centre in a tree, Definitions of Rooted and Binary trees, Spanning trees, Minimal Spanning trees, Directed graphs, some types of digraphs.
		MT233 Mathematics Practical	• Problem solving on calculus of several variable and Graph Theory and Numerical Methods and Its Applications using Maxima Software • Introduction to application of mathematics in real life.
S.Y. B.Sc.	II	MT 241 Linear Algebra	• Understand the concepts of vector spaces, subspaces, bases, dimensions and their properties.

Class	Semester	Course Titlewith Sub. Code	Outcome
			• Relate matrices and linear transformations; compute Eigen values and Eigen vectors of linear transformations. • Linear properties of inner product spaces and determine orthogonality in inner product spaces
		MT 242(A) Vector Calculus II	• Understand the basic of surfaces in space. • Able to apply the basic concepts of partial derivatives. • Understand and able to apply the concepts of vector function, vector field, scalar field, gradient, divergence and curl.
		MT242(B) Dynamical Systems	• Will have information about the concepts related to dynamic systems • Be able to apply their knowledge about dynamic systems in a simulation environment and develop system analysis capability in the framework of linear and time-invariant systems
		MT243 Practical	• Problem solving on Linear Algebra and Dynamical Systems and Vector Calculus using Maxima Software.
T.Y. B.Sc.	III	MT 331 : Metric Spaces	• Deal with various examples of metric spaces. • Have some familiarity with continuous maps. • Work with compact sets in Euclidean space.
T.Y. B.Sc.	III	MT 332 : Real Analysis-I	• Explain the completeness of a system of real numbers: a least upper bound, a greatest lower bound. • Elaborate on the topological concepts of the real numbers: open sets, closed sets, accumulation points, closure, open covers, compact sets. • Define and utilize the following concepts: sequence, subsequence, monotone sequence, Cauchy sequence.
T.Y. B.Sc.	III	MT 333 : Problem Course on MT 331 and MT	• Appreciate how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.
T.Y. B.Sc.	III	332	• Problem solving on metric space and connected and contactless.
T.Y. B.Sc.	III	MT 334 : Group Theory	• Learn about the fundamental concepts of groups, subgroups, normal subgroups, isomorphism, cyclic and permutation groups.
T.Y. B.Sc.	III	MT 335 : Ordinary Differential Equations	• Recognize and solve a homogeneous differential equation. • Recognize and solve an exact differential equation. • Recognize and solve a linear differential equation by use of an integrating factor. • Make a change of variables to reduce a differential equation to a known form. • Find particular solutions to initial value problems
T.Y. B.Sc.	III	MT 336 : Problem Course on MT 334 and MT 334	• Demonstrate by solving various problem based on Symmetry using group theory • Application of ODE.
T.Y. B.Sc.	III	MT 337:A. Operations Research	• Students learn to calculate optimal solution of models through graphical and iterative methods. • Students study transportation and assignment models and methods to solve them. • This helps them to get optimum solutions within the

Class	Semester	Course Titlewith Sub. Code	Outcome
			given constraints to problems arising in industry.
T.Y. B.Sc.	III	MT 337:D. Lattice Theory	• to understand lattices as algebraic structures • homomorphisms between lattices and Boolean Algebra • polynomials, switching circuits
T.Y. B.Sc.	III	MT 338: Practical based on papers selected from 337A to 337F	• Develop a report that describes the model and the solving technique, analyze the results and propose recommendations in language understandable to the decision-making processes in Management Engineering
T.Y. B.Sc.	IV	MT 341: Complex Analysis	• Compute sums, products, quotients, conjugate, modulus, and argument of complex numbers · Define and analyze limits and continuity for complex functions as well as consequences of continuity · • Conceive the concepts of analytic functions and will be familiar with the elementary complex functions and their properties ·Determine whether a given function is differentiable, and if so find its derivative. Applies the theory into application of the power series expansion of analytic functions
T.Y. B.Sc.	IV	MT 342: Real Analysis-II	• Illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability, and integrability. • Study improper integration using Riemann integration
T.Y. B.Sc.	IV	MT 343: Problem Course on MT 341 and MT 342	• Applies the theory into application of the power series expansion of analytic functions · Understand the basic methods of complex integration and its application in contour integration. • To analyze sequences and series of analytic functions and types of convergence, · Evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem in its various versions, and the Cauchy integral formula
T.Y. B.Sc.	IV	MT 344: Ring Theory	• Study of various integral domains in ring. • Introduction to Ring.
T.Y. B.Sc.	IV	MT 345: Partial Differential Equations	• Apply specific methodologies, techniques and resources to conduct research and produce innovative result in the area of specialization. • Extract information form partial derivative models in order to interpret reality. • Identify real phenomena as models of partial derivative equations.
T.Y. B.Sc.	IV	MT 346: Problem Course on MT 344 and MT 345	• Problem on ring and PDE. • Application of PDE in real life. • Various structural study of ring.
T.Y. B.Sc.	IV	MT347F : Computational Geometry	• Students learn the representation of objects in 2D and 3D in the form of matrices • To study the transformations like reflection, rotation, scaling, shearing, translation of objects in 2D and 3D and their geometrical significance. • Students learn to generate plane curves by using parametric equation

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			• All the concepts help students to learn graphic display of objects on computer.
T.Y. B.Sc.	IV	MT 347: A Optimization Techniques	• Solve simple games using various techniques • Analyze economic situations using game theoretic techniques · Recommend and prescribe which strategies to implement.
T.Y. B.Sc.	IV	MT 348 : Practical based on papers selected from 347A to 347 F	• Solve optimal real life problem based on supply and demands. • Solve simple games using various techniques · Analyze economic situations using game theoretic techniques · Recommend and prescribe which strategies to implement

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Department of Statistics- Academic Year 2021-22

Programme Outcome : B.Sc. (Statistics)	
PO1	To understand the statistical methods and increase problem solving ability.
PO2	To acquire the strong foundation of statistical concepts which will benefit them in a master'sdegree
PO3	To use the knowledge of Statistical tools and techniques in solving real life problems/situations.
PO4	To acquire the knowledge of statistical software for problem solving.
PO5	To prepare students for entrance examinations.

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AISHE ID: C-41965

Course Outcomes: B.Sc. (Statistics)

Class	Semester	Course Title with Sub. Code	Outcome
F.Y. B.Sc.	I	ST – 111: Descriptive Statistics I	• To acquaint students with some basic concepts in Statistics • To compute various measures of central tendency, dispersion, skewness and kurtosis • To analyze data pertaining to attributes and theinterpret the results
		ST – 112: Discrete Probability and Probability distribution I	• To introduce to the students the basic concepts of probability, axiomatic theory of probability • To distinguish between random and non-random experiments • To find the probabilities of events • To obtain a probability distribution of random variable (one or two dimensional) in the given situation
		ST – 113 : PRACTICALS	• To use various graphical and diagrammatic techniques and interpretation. • to analyse data pertaining to discrete and continuous variables and to interpret the results, • to compute various measures of central tendency, dispersion, skewness and kurtosis. • to interpret summary statistics of computer output • to summarize and analyze the data using computer
F.Y. B.Sc.	II	ST - 121: Descriptive Statistics II	• Compute the correlation coefficient for bivariate data and interpret it. • Fit linear, quadratic and exponential curves to the bivariate data to investigate the relation between two variables. • To analyze data pertaining to attributes and to interpret the results
		ST – 112: Discrete Probability & Probability DistributionsII	• to apply standard discrete probability distribution to different situations. • To study properties of these distributions as well as interrelation between them
		ST – 123 : Practical	• to compute correlation coefficient, regression coefficients, • to compute probabilities of bivariate distributions, • to fit binomial and Poisson distributions • to compute probabilities of bivariate distributions. • to draw random samples from Poisson and binomial distributions

S.Y. B.Sc.	I	ST 231: Discrete Probability Distributions, Time Series	• Apply the discrete distributions in real life problem. • Understand the concept of time series with its components. • To understand the concept of truncated distribution, and its real life applications
		ST 232: Continuous Probability Distribution	• Obtain summary statistics of a continuous random variable. • Obtain probability of events related to continuous random variable. • Obtain correlation and regression lines, m.g.f. moments, probabilities for bivariate continuous random variable. • Explain probability distributions, nature of curve, properties of continuous uniform, exponential, normal, distributions and relations between them.
		ST-233 Statistics Practical	• To understand the fitting of different distribution • Applications of discrete distribution • To understand model sampling • Understand the concept of time series with its components.
S.Y. B.Sc.	II	ST-241 Tests of Significance and Statistical Methods	• Understand multiple linear regression models with applications. • Formulate the null and alternative hypotheses and apply small, large sample tests in real life problems. • Understand the different ways of summarizing the Vital Statistics. • Formulate M/M/1 queue and find its parameter also find the average waiting time in queue.
		ST 242: Sampling Distributions and exact tests	• Derive probability distribution function of chi-square, t, F distribution • Explains interrelation between the above distributions and their properties. • Get familiar with statistical tests of hypothesis and are able to apply in real life situations in various fields.
		ST 243: Practical	• To conduct various tests of significance like averages, population proportions, independence of attributes, variance etc. included in theory (using calculators, software). • To compute probabilities of discrete and continuous probability distributions using R software. • To use software for finding basic summary statistics.

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Department of ZOOLOGY- Academic Year 2021-22

Programme Outcome : B.Sc. Zoology	
PO1	• Demonstrate, solve and an understanding of major concepts in all disciplines of Zoology
PO2	• Solve the problem and also think methodically, independently and draw a logical conclusion.
PO3	• Understand the evolution, history of phylum
PO4	• Create an awareness of the impact of Zoology on the environment, society, and development outside the scientific community
PO5	• To study and understand the classification of whole phyla includes in Nonchordates with the help of charts/models/pictures.
PO6	• To inculcate the scientific temperament in the students and outside the scientific community.
PO7	• Use modern techniques, decent equipment's

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Course Outcomes: B.Sc. Zoology

Class	Semester	Course Title with Sub. Code	Outcome
F.Y. B.Sc.	I	ZO111 Animal Diversity I (CC)	• The student will be able to understand classify and identify the diversity of animals. • The student understands the importance of classification of animals and classifies them effectively using the six levels of classification. • 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.
F.Y. B.Sc.	I	ZO 112 Animal Ecology (CC)	• 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. • To understand anticipate, analyse and evaluate natural resource issues and act on a lifestyle that conserves nature. • The Learner understands and appreciates the diversity of ecosystems and applies beyond the syllabi to understand the local lifestyle and problems of the community. • 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. • The working in nature to save environment will help development of leadership skills to promote betterment of environment.
F.Y. B.Sc.	II	ZO 121 Animal Diversity II (CC)	• The student will be able to understand classify and identify the diversity of animals. • The student understands the importance of classification of animals and classifies them effectively using the six levels of classification. • 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.
F.Y. B.Sc.	II	ZO 122 Cell Biology. (CC)	• The learner will understand the importance of cell as a structural and functional unit of life. • The learner understands and compares between the prokaryotic and eukaryotic system and extrapolates the life to the aspect of development. • The dynamism of bio membranes indicates the dynamism of life. Its working mechanism and precision are responsible for

Class	Semester	Course Title with Sub. Code	Outcome
			our performance in life. • The cellular mechanisms and its functioning depend on endo-membranes and structures. They are best studied with microscopy.
S.Y. B.Sc.	III	ZO – 231: Animal Diversity - III	• The students will be able to understand, classify and identify the diversity of higher vertebrates. • The students will able to understand the complexity of higher vertebrates. • The students will be able to understand different life functions of higher vertebrates. • The students will be able to understand the linkage among different groups of higher vertebrates. • 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.
S.Y. B.Sc.	III	ZO 232 Applied Zoology I	• The learner understands the basics about beekeeping tools, equipment, and managing bee hives. • The learner understands the basic information about fishery, cultural and harvesting methods of fishes and fish preservation techniques. • The learner understands the biology, varieties of silkworms and the basic techniques of silk production. • The learner understands the types of agricultural pests, Major insect pests of agricultural importance and Pest control practices.
S.Y. B.Sc.	IV	ZO – 241: Animal Diversity - IV	• The students will be able to understand, classify and identify the diversity of higher vertebrates. • The students will able to understand the complexity of higher vertebrates. • The students will be able to understand different life functions of higher vertebrates. • The students will be able to understand the linkage among different groups of higher vertebrates. • 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.
S.Y. B.Sc.	IV	ZO 242 Applied Zoology II	• The learner understands the basics about beekeeping tools, equipment, and managing bee hives. • The learner understands the basic information about fishery, cultural and harvesting methods of fishes and fish preservation techniques. • The learner understands the biology, varieties of silkworms and the basic techniques of silk production. • The learner understands the types of agricultural pests, Major insect pests of agricultural importance and Pest control practices
T.Y. B.Sc.	V	ZO 351 Pest Maagement	• Describe morphological structure, various system of Calotes versicolor

Class	Semester	Course Title with Sub. Code	Outcome
			• Define pest management. • Describe the economic, ecological, and sociological benefits of IPM. • Distinguish positive and negative impacts of pesticide use. • Understand problems resulting from misuse, overuse and abuse of chemical pesticides. • Define and describe pesticide resistance and how it develops. • Identify ecological and biological characteristics important in development of pest populations. • Identify 10 tactics commonly used in IPM and be able to distinguish them. • Understand society's role in IPM decisions. • Describe different groups of pests and compare them to weeds and plant pathogens. • Analyse and compare management tactics to determine the best approach to reducing pest populations, weeds and disease presence. • Locate appropriate, scientifically valid sources of information on specific tactics to manage insect pests, weeds, and diseases. • Know and how to develop an IPM program.
T.Y. B.Sc.	V	ZY 352 Histology	• The students will be able to understand, classify and identify the different types of tissue. • The students will understand the complexity of various tissues in an organ. • The students will be able to learn structure & functions of various tissues. • The students will understand the various diseases related to organs • The student will be able to know the role of glands in mammals.
T.Y. B.Sc.	V	ZO 353 Biological Chemistry	• Outline concept of pH and buffer, its importance and explain types of bond and buffers in biological system. Describe structure and properties of water • Explain and Classify types of sugars and demonstrate Isomerism, stereochemistry, racemisation of carbohydrates, biological and clinical significance. • Explain and Classify Protein, amino acids on the basis of their structures function. • Differentiate structures of proteins, state examples and tell bonds responsible for protein structures • Explain, classify and illustrate properties of enzyme, learn factors influencing enzyme activity, Isoenzymes in detail. Introduction the knowledge to relate vitamins to the type of deficiency diseases. • Explain and Classify lipids based on the structure, and functions and explain triglycerides, saponification
T.Y. B.Sc.	V	ZO 354 Genetics	• Learners shall be able to understand basic concepts of gene, lethal alleles ,Multiple alleles, cistron, muton and recon • The students will learn Mendel's law, Incomplete and

Class	Semester	Course Title with Sub. Code	Outcome
			complete dominance, Concept of gene mutation. • The students will learn about the concepts of population genetics, Hardy Weinberg's law, Human population genetics, disorders and sex linked inheritance in human • The students will be able to understand, application of genetics in real life
T.Y. B.Sc.	V	ZO 355 Developmental Biology	• Learners shall be able to understand concept from developmental biology-growth, differentiation, cell communication, morphogenesis • Understand the theories of developmental biology • The students will learn about the concepts of Gametogenesis, Fertilization, cleavage and blastula • Understand the Morphogenesis and Organogenesis in Chicks
T.Y. B.Sc.	V	ZO 356 Parasitology	• The students will be able to learn about basics and scope of parasitology. • The students will be able to learn the types of host and parasite with examples. • The students will be able to learn about the morphology, life cycle, pathogenicity and treatment of common parasites (Protists and Platyhelminthes). • The students will be able to learn about host-parasite relationships and their effects on host body. • The students will be able to learn about the arthropod parasites and their role as vector
T.Y. B.Sc.	V	ZO 3510 Aquarium Management	• The students will be able to learn about basics of aquarium and fish keeping • The students will be able to learn the biology of aquarium fishes • The students will be able to learn about the food and feeding of aquarium fishes • The students will be able to learn about fish transportation, aquarium maintenance
T.Y. B.Sc.	V	ZO 3511 Poultry Management	• The students will be able to understand the Poultry farming practices. • The students will able to understand the poultry breeding techniques. • The students will be able to understand poultry rearing techniques. • The students will be able to understand feeding requirement and food ingredients. • The students will be able to understand the poultry disease and their pathogens. • The students will be able to understand market value of poultry products.
T.Y. B.Sc.	VI	ZO 361 Medical and Forensic Zoology	• The students will be able to understand the basics principles of Medical and Forensic Zoology. • The students will able to understand scientific methods in crime detection. • The students will be able to understand the advancements in the field of Medical and Forensic Zoology. • The students will be able to understand modern tools,

Class	Semester	Course Title with Sub. Code	Outcome
			techniques and skills in forensic investigations. • The students will be able to describe the fundamental principles and functions of forensic science and its significance to human society
T.Y. B.Sc.	VI	ZO 362 Animal Physiology	• The various physiological organ-systems and their importance to the integrative functions of the human body. • Understand Concept of energy requirements • Various aspects of Digestive physiology • Circulatory system with medical conditions • Understand Respiratory mechanism and gases transport. • Eliminations of waste materials from the body. • Develop understanding in Structure and functions of muscles • Understand formation of gametes and function of endocrine glands.
T.Y. B.Sc.	VI	ZO 363 Molecular Biology	• Learner shall get an insight into molecular mechanisms of various biological processes in cells and organisms • Learner shall get an insight into the Structure of DNA and RNA, DNA and RNA as genetic material • The course shall prepare learner to get insight into the Central Dogma of Molecular Biology • Learner shall also understand the concept of gene regulation • Learner shall get an insight into the DNA Damage and Repair
T.Y. B.Sc.	VI	ZO 364 Entomology	• Students will understand basic concepts in Entomology and its scope. • Learn morphology and anatomy of Insects. • Understand the concept of social organization in Insects. • Understand the development process of Insects. • Identify disease causing insect vectors. • Will be able to design and implement pest controlling methods against pests.
T.Y. B.Sc.	VI	ZO 365 Techniques in Biology	• The course shall explain in detail microscopy • Students shall get basic knowledge of and method used in micro-techniques • Students become aware about different haematological and Immunological techniques • Students will get the knowledge of PCR and DNA fingerprinting • Students will understand the methods used in Biodiversity and instruments used in field biology
T.Y. B.Sc.	VI	ZO 366 Evolutionary Biology	• 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. • Explain important processes, principles and concepts and critically evaluate theories and empirical research within evolutionary biology • Apply evolutionary theory and concepts to address empirical and theoretical questions in evolutionary biology. • Independently investigate evolutionary questions using literature and analyses of empirical data. • Communicate the principles, theories, problems and research

Class	Semester	Course Title with Sub. Code	Outcome
			results associated with questions that lie within the evolutionary framework to students
T.Y. B.Sc.	VI	ZO 3610 Environmental Impact Assessment	• Describe the concepts and division of environment • Students will be able to describe the meaning of pollution, its impact on living and non-living world. • Students can identify sustainable development • Students can learn environmental protection acts, EIA and EIA process. • Students can have an overview of Scheme for Accreditation of EIA Consultant Organizations (NABET / QCI)
T.Y. B.Sc.	VI	ZO 3611 Project	• Students have to complete the research project in the stipulated time and present the dissertation at the time of the examination in a proper format. Students should be encouraged to take up laboratory work, hands-on practical investigation and design experimental setup. • Field work to be carried out under proper supervision and permissions from the concerned authorities.

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Department of Economics - Academic Year 2021-22

Programme Outcome: BA Economics	
PO1	• Communication Skills: A graduate student in arts/social sciences/humanities shall be confident to speak, write, read, listen and understand the one or more Indian languages. Relate the ideas, knowledge, books, and people.
PO2	• Critical, logical and rational thinking: Acquire the ability for objective, rational, sceptical, logical, and unbiased analysis of factual evidences to form a judgment or conclusion. Enhance the process of rational thinking, problem solving and analytical evaluation from different perspectives.
PO3	• Values and Ethics: Recognizes the importance, worth and usefulness of principles and standards of behaviour, moral dimensions of one's own decisions ad judgment of what is important in life.
PO4	• Sustainable development: Understands, organizes and promotes the principle of human development goals by sustaining the ability of natural systems, natural resources and ecosystem services upon which the economy and society depends.
PO5	• Life-long process of Learning: Cultivates the proficiency to engage in independent, life-long and progressive learning abilities in the broadest context of changing socio-politico-economic-cultural and technological scenario.

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Course Outcomes: BA (Economics)

Class	Semester	Course Titlewith Sub. Code	Outcome
FYBA	I	Indian Economic Environment - I(11151)	• To familiarize the students with the recent developments in the Indian Economy • To provide the students with the background of the Indian Economy with focus on contemporary issues like economic environment. • To help the students to prepare for varied competitive examinations • To enable students to understand and comprehend the current business scenario, agricultural scenario and other sectorial growth in the Indian context. • To make the student aware of the developments such as MSMEs, Digital Economy, E-Banking, BPO & KPO, etc.
FYBA	II	Indian Economic Environment - I(11152)	• To familiarize the students with the recent developments in the Indian Economy • To provide the students with the background of the Indian Economy with focus on contemporary issues like economic environment. • To help the students to prepare for varied competitive examinations • To enable students to understand and comprehend the current business scenario, agricultural scenario and other sectorial growth in the Indian context. • To make the student aware of the developments such as • MSMEs, Digital Economy, E-Banking, BPO & KPO, etc.
SYBA	III and IV	Financial System G-2	• To understand fundamentals of modern financial system. • To understand the recent trends and developments in banking system. • To understand the role of the Reserve Bank of India in Indian financial system. • To provide the knowledge of various financial and non-financial institutions. • To provide the students the intricacies of Indian financial system for better financial decision making To understand fundamentals of modern financial system. To understand the recent trends and developments in banking system. • To understand the role of the Reserve Bank of India in Indian financial system. • To provide the knowledge of various financial and non-financial institutions.

Class	Semester	Course Titlewith Sub. Code	Outcome
			• To provide the students the intricacies of Indian financial system for better financial decision making.
SYBA	III and IV	Micro Economics (S1)	• Students will be able to understand the behaviour of different economic agents, markets, consumers and price fluctuations. • Understanding of different cost and revenue concepts will be given to students. • To understand linearity and non-linearity of micro economic variables. • Knowledge of different welfare concepts and their importance into social context will be imparted into students through this course.
SYBA	III and IV	Macro Economics, S2	• Understanding of macroeconomics and its different components. • Critical analysis of study different ideological schools and their theories of macro-economic development. • Understanding of saving and investment functions will be injected into their knowledge Different theories related to money will be studied by students. • Understanding different policies in macro terms.
SYBA	III and IV	Basic Concept of Research Methodology (SEC)	• Demonstrate his/her understanding of sampling methods and the ability to use collection of data • Identify the appropriate sample techniques for different kinds of research questions • Identify the appropriate source of data in relation to the collection of research data. • Able to classify and present the collected data in the form of graph, bar diagram, chart etc
SYBA	III and IV	Indian Economic Development (G3)	• To relate and recognize the concept and indicators of Economic Development. • To describe and analyze the concept and indicators of Human Development. • To explain the characteristics of Developing and Developed Countries. • To describe the constraints to the process of Economic Development To describe and explain the process of Economic Planning. • To describe and examine the changing structure of planning process in India. • To describe and explain the relation between Economic Development and Environment.
TYBA	V and VI	International Economics (S3)	• To relate and recall the concepts of International Economics and International Trade. • To describe and apply the theories of international trade • To explain and comprehend the issues relating to Terms of trade and Balance of Payment Ability to relate and explain the concept of Exchange Rate and Foreign Exchange Market. • Ability to describe the trends in Growth, Composition and Direction of India's Foreign Trade. • Ability to comprehend the issues relating to Foreign Capital and

Class	Semester	Course Titlewith Sub. Code	Outcome
			Regional and International Co-Operation.
TYBA	V and VI	Public Finance (S4)	• To relate and recognize the Nature and Scope of Public Finance. • To describe and analyze the concept of Public Revenue and its components. • To explain types of Public Expenditure and reasons for rising Public Expenditure. • To explain the types of Public Debt and its effects. To explain and assess the components and instruments of Fiscal Policy. • To relate to the concepts of Budget and its components. • To describe and analyze the concept of Deficit Financing and its effects. • To describe and explain the Centre and State Financial Relationship.
TYBA	V and VI	Business Management (SEC)	• Management of Business. • Business planning and decision making • Leadership Skills- Ability to work in teams at the same time, ability to show leadership qualities • Analytical Skills – Ability to analyze data collected and interpret in the most logical manner • Project Report Writing Skills- Ability to comprehend and illustrate/demonstrate findings • Presentation Skills – PPT/Poster- Ability to illustrate findings in the most appealing manner • Leadership Skills: Ability to show leadership skills with business ideas or work on business ventures as a practical example

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Programme Outcome: B.Com. (Business Economics)	
PO1	• To impart knowledge of business economics.
PO2	• To clarify micro economic concepts.
PO3	• To analyse and interpret charts and graphs.
PO4	• To understand basic theories, concepts of micro economics and their application.

Course Outcomes: B.Com. (Business Economics)

Class	Semester	Course Titlewith Sub. Code	Outcome
F.Y. B.Com.	I	Business Economics (Micro) – I 113	• Meaning, nature & scope of business economics will be given to all students. • Understanding of basic concept of micro economics. • Students will learn to analyse demand & supply its determinants. • Analysis of market structure & pricing under the same. • Remunerative structure of different factors of production will be studied.
F.Y. B.Com.	II	Business Economics (Micro) – II 123	• To understand the basic concepts of microeconomics. • To understand the tools and theories of economics for solving the problem of decision making by consumers and producers. • To understand the problem of scarcity and choices.
S.Y. B.Com.	III and IV	Business Economics (Macro)	• Information over Meaning nature & scope of macroeconomics. • Students will learn to calculate National income & its importance. • Use of money its functions and value of its value Analysis of trade cycles and their occurrence after certain specified period will be studied by students. • Learning the evolution of different Employment theories. • Information Public finance and its policy approached will be given to students.

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Department of English - Academic Year 2021-22

Programme Outcomes: BA (English)	
PO1	• Students Communicate in English language fluently and effectively.
PO2	• Students demonstrate the knowledge and understanding of English language and texts in English.
PO3	• Students understand literary texts in English.
PO4	• Students comprehend, interpret and apply critical theories and texts in English.
PO5	• Students understand the phonology, morphology, syntax, semantics and pragmatics of English language.

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Course Outcomes: BA (English)

Class	Semester	Course Title	Course Outcome
F.Y.B.A. 2019 Pattern	I	Compulsory English (11011)	After studying the paper successfully, the learners will be able to- • CO1. Expose to the best examples of prose and poetry in English so that they realize the beauty and communicative power of English. • CO2. Learn the prescribed prose and poetry students realize the beauty and communicative power of English. • CO3. Instill human values among them. • CO4.The character building of the students is developed. • CO5. prepare to be responsible citizens of the world.
F.Y.B.A. 2019 Pattern	II	Compulsory English (11012)	After studying the paper successfully, the learners will be able to- • CO1. Develop the abilities to appreciate ideas and think critically. • CO2. Develop their linguistic competence and communicative skills, the employability of the students are enhanced. • CO3. The structures already learnt in the previous stages of learning are revised and reinforced. • CO4. acquire the skills of understanding and using English language correctly by learning grammar. • CO5. Communicate in English in different situations.
F.Y.B.A. 2019 Pattern	I	Optional English (11331)	After studying the paper successfully, the learners will be able to- • CO1. Expose to the basics of literature and language. • CO2. Expose to develop an integrated view about language and literature in them. • CO3. Acquaint with minor forms of literature in English especially short stories, essay and poetry. • CO4. Appreciate the creative use of language in literature.
F.Y.B.A. 2019 Pattern	II	Optional English (12331)	• After studying the paper successfully, the learners will be able to- • CO1. Learn the basics of phonology of English. • CO2. Do the English pronunciation and speak English correctly. • CO3. Prepare for the detailed study and understanding of literature and language. • CO4. Enhance the job potential by improving their language skills.

Class	Semester	Course Title	Course Outcome
F.Y.B.A. 2019 Pattern	I	Functional English (11851)	After studying the paper successfully, the learners will be able to- • CO1. Get introduced to Spoken English. • CO2. Create awareness about using language according to the situation/context. • CO3. Create awareness about mispronunciation. • CO4. Reinforce grammar studied up to std. XII. • CO5. Acquire the basic skills of effective writing.
F.Y.B.A. 2019 Pattern	II	Functional English (12851)	After studying the paper successfully, the learners will be able to- • CO1. Get introduced to Spoken English. • CO2. Create awareness about using language according to the situation/context. • CO3. Create awareness about mispronunciation. • CO4. Reinforce grammar studied up to std. XII. • CO5. Acquire the basic skills of effective writing.
S.Y.B.A. Annual Pattern (2013 Pattern)	--	Compulsory English (23001)	After studying the paper successfully, the learners will be able to- • CO1. Develop competence for self-learning. • CO2. Familiarize with excellent pieces of prose and poetry in English. • CO3. Realize the beauty and communicative power of English. • CO4. Develop interest in reading literary pieces is developed.
S.Y.B.A. Annual Pattern (2013 Pattern)	--	Compulsory English (24001)	After studying the paper successfully, the learners will be able to- • CO1. Exposed to native cultural experiences and situations. • CO2. Develop humane values and social awareness. • CO3. Develop overall linguistic competence and communicative skills among them.
S.Y.B.A.	--	General English (G-2) Study of English	After studying the paper successfully, the learners will be able to- • CO1. Expose to the basics of short story, one of the literary forms. • CO2. Familiarize with different types of short stories in English. • CO3. Understand the literary merit, beauty and creative use of language.
Annual Pattern (2013 Pattern)		Language and Literature (23333)	
S.Y.B.A. Annual Pattern (2013 Pattern)	--	General English (G-2) Study of English Language and Literature (24333)	After studying the paper successfully, the learners will be able to- • CO1. Get introduced to some advanced units of language. • CO2. Become aware of the technical aspects and their practical usage • CO3. Prepare to go for detailed study and understanding of literature and language. • CO4. Develop integrated view about language and literature.

Class	Semester	Course Title	Course Outcome
S.Y.B.A. Annual Pattern (2013 Pattern)	--	Special Paper-I (S-1) Appreciating Drama (23331)	After studying the paper successfully, the learners will be able to- • CO1. Acquaint and familiarize the students with the terminology in Drama Criticism (i.e. the terms used in Critical Analysis and Appreciation of Drama). • CO2. Learn the broad concept of drama. • CO3. Learn elements of drama and types of drama. • CO4. Do the backgrounds study and the various terms related to drama.
S.Y.B.A. Annual Pattern (2013 Pattern)	--	Special Paper-I (S-1) Appreciating Drama (24331)	After studying the paper successfully, the learners will be able to- • CO1. Encourage to make a detailed study of a few sample masterpieces of English Drama from different parts of the world • CO2. Develop interest to appreciate and analyze drama independently. • CO3. Enhance awareness in the aesthetics of Drama. • CO4. Empower to evaluate drama independently.
S.Y.B.A. Annual Pattern (2013 Pattern)	--	Appreciating Poetry Special Paper-II (S-2) (23332)	After studying the paper successfully, the learners will be able to- • CO1. acquaint and familiarize with the terminology in poetry criticism (i.e. the terms used in critical analysis and appreciation of poems) • CO2. Learn the significant development in the art of poetry during major periods. • CO3. Learn various elements of poetry. • CO4. Learn different types of poetry. • CO5. Study figures of Speech, Symbols, Imagery, and other Poetic Devices like Repetition, Contrast, etc.
S.Y.B.A. Annual Pattern (2013 Pattern)	--	Special Paper-II (S-2) Appreciating Poetry (24332)	After studying the paper successfully, the learners will be able to- • CO1. Encourage to make a detailed study of a few sample masterpieces of English poetry. • CO2. Learn, interpret and appreciate ballads, sonnets, metaphysical poetry, romantic poetry, modern poetry, British poetry, American poetry as well as Indian poetry. • CO3. enhance awareness in the aesthetics of poetry and to empower them to read, appreciate and critically evaluate the poetry independently.
S.Y.B.A. Annual Pattern (2013 Pattern)	--	Functional English Paper III Advanced Writing Skills and Introduction to Electronic Media (23851)	After studying the paper successfully, the learners will be able to- • CO1. Enhance ability to communicate in written mode. • CO2. Train in extended writing in different formats. • CO3. Develop awareness about the need to change language according to situation is developed. • CO4. Recognize the need for reference work.

Class	Semester	Course Title	Course Outcome
S.Y.B.A. Annual Pattern (2013 Pattern)	--	Functional English Paper III Advanced Writing Skills and Introduction to Electronic Media (24851)	After studying the paper successfully, the learners will be able to- • CO1. Acquaint to career options in electronic media and equipping them to be prepared for the same. • CO2. Become aware about change in language use as per the nature of Media. • CO3. Initiate into research through scrape book, bibliography. • CO4. Build confidence in communicative English through active participation.
S.Y.B.A. Annual Pattern (2013 Pattern)	--	Functional English Paper IV Oral Communication in English: Intermediate & Key Competency Modules (Practical Paper) (23852)	After studying the paper successfully, the learners will be able to- • CO1. Learn through activities. • CO2. Introduce to a wide variety of conversational situations, both formal and informal. • CO3. Create awareness about what to say and when to say it.
S.Y.B.A. Annual Pattern (2013 Pattern)	--	Functional English Paper IV Oral Communication in English: Intermediate & Key Competency Modules (Practical Paper) (24852)	After studying the paper successfully, the learners will be able to- • CO1. Create awareness about developing voice quality for effective oral communication. • CO2. Be aware of proper use of body language during interaction or in video media. • CO3. Lead to overall development of personality through key competency modules.
T.Y.B.A. Annual Pattern (2013 Pattern)	--	Compulsory English (35001)	After studying the paper successfully, the learners will be able to- • CO1. Introduced to the best uses of language in literature. • CO2. Familiarize with the communicative power of English. • CO3. Become competent users of English in real life situations.
T.Y.B.A. Annual Pattern (2013 Pattern)	--	Compulsory English (36001)	After studying the paper successfully, the learners will be able to- • CO1. Expose to varied cultural experiences through literature. • CO2. contribute to the students' overall personality development by improving their communicative and soft skills • CO3. Learn transformation of sentences. • CO4. Acquire pivotal components of communication skills. • CO5. Study different presentation skills.

Class	Semester	Course Title	Course Outcome
T.Y.B.A. Annual Pattern (2013 Pattern)	--	General English (G-3) Advanced Study of English Language and Literature (35333)	After studying the paper successfully, the learners will be able to- • CO1. Expose to some of the best samples of Indian English Poetry • CO2. Learn how Indian English poetry expresses the ethos and culture of India • CO3. Understand creative uses of language in Indian English Poetry
T.Y.B.A. Annual Pattern (2013 Pattern)	--	General English (G-3) Advanced Study of English Language and Literature (36333)	After studying the paper successfully, the learners will be able to- • CO1. Introduce to some advanced areas of language study • CO2. Prepare to go for detailed study and understanding of literature and language. • CO3. Develop integrated view about language and literature among the students is developed.
T.Y.B.A. Annual Pattern (2013 Pattern)	--	Special Paper III (S-3) Appreciating Novel (35331)	After studying the paper successfully, the learners will be able to- • CO1. Introduce the basics of novel as a literary form. • CO2. Expose to the historical development and nature of novel. • CO3. Be aware of different types and aspects of novel.
T.Y.B.A. Annual Pattern (2013 Pattern)	--	Special Paper III (S-3) Appreciating Novel (36331)	After studying the paper successfully, the learners will be able to- • CO1. Learn literary terms related to novel/fiction for background study. • CO2. Develop literary sensibility and sense of cultural diversity. • CO3. Expose to some of the best examples of novel.
T.Y.B.A. Annual Pattern (2013 Pattern)	--	Special Paper IV(S-4) Introduction to Literary Criticism (35332)	After studying the paper successfully, the learners will be able to- • CO1. Introduce to the basics of literary criticism. • CO2. Learn definition, origin, principles, types, and functions of literary criticism. • CO3. Study the nature and historical development of criticism.
T.Y.B.A. Annual Pattern (2013 Pattern)	--	Special Paper IV(S-4) Introduction to Literary Criticism (36332)	After studying the paper successfully, the learners will be able to- • CO1. Be familiar with the significant critical approaches and terms. • CO2. Encourage to interpret literary works in the light of the critical approaches. • CO3. Develop the aptitude for critical analysis.

Class	Semester	Course Title	Course Outcome
T.Y.B.A. Annual Pattern (2013 Pattern)	--	Functional English Paper V Introduction to Print Media and Writing for Mass Media & Key Competency Modules (35851)	• After studying the paper successfully, the learners will be able to- • CO1. Get acquainted to new career options and equipping them to be prepared for the same. • CO2. Learn elements, characteristics and types of news and also learn difference between writing for Newspaper and Radio & TV with reference to Language. • CO3. Prepare for various careers in language like translation, technical writing, writing for mass media, advertising, free lancing • CO4. Create awareness about language change from one media to the other. • CO5. Encourage to observe, compare and analyze the language activities of media through exposure. • CO6. Providing with basic data required for skills like translation especially related to media.
T.Y.B.A. Annual Pattern (2013 Pattern)	--	Functional English Paper VI Entrepreneurship development, Project Report & Oral Communication in English: advanced (Practical Paper) (36852)	After studying the paper successfully, the learners will be able to- • CO1. Encourage to thrash out the possibility of self-employment. • CO2. Provide basic sources of information regarding SSI. • CO3. Promote the idea of self-employment through field work, study reports and interviews. • CO4. Lead to overall development of personality through key competency modules. • After studying the paper successfully, the learners will be able to- • CO5. Initiate into research through project report. • CO6. Furnish basic information about ethics, business ethics, role of an individual in society so as to develop a value-base among students through Key Competency Modules. • CO7. Expose to work environment and work experience through visits and field work. • CO8. Create possibility of focused writing in the field of their interest.

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Programme Outcome : F. Y. B. Com. (English)	
PO1	• Students of Commerce faculty communicate in English language fluently and effectively.
PO2	• Students demonstrate the knowledge and understanding of English language and texts in English and do the practical application.
PO3	• Students understand literary texts in English reflecting socio-economic and cultural life.
PO4	• Students develop oral and written communication skills for availing employment opportunities.
PO5	• Students develop overall linguistic and communicative competence.

Course Outcomes: F. Y. B.Com. (English)

Class	Semester	Course Title	Course Outcome
F.Y.B.Com. 2019 Pattern	I	Compulsory English (111)	After studying the paper successfully, the learners will be able to- • CO1. Learn selected pieces of prose and poetry to students so that they not only get to know the beauty and communicative power of English but also its practical application. • CO2. Expose students to a variety of topics that dominate the contemporary socio- economic and cultural life. • CO3. Develop oral and written communication skills so that their employability enhances. • CO4. Develop overall linguistic competence and communicative skills of students.
F.Y.B.Com. 2019 Pattern	II	Compulsory English (121)	After studying the paper successfully, the learners will be able to- • CO1. Learn selected pieces of prose and poetry to students so that they not only get to know the beauty and communicative power of English but also its practical application. • CO2. Expose students to a variety of topics that dominate the contemporary socio-economic and cultural life. • CO4. Develop oral and written communication skills so that their employability enhances. • CO5. develop overall linguistic competence and communicative skills of students.

Programme Outcomes: S.Y. B.Sc. (English)	
PO1	• Students Communicate in English effectively.
PO2	• Students demonstrate the knowledge and understanding of English language and literary forms of English Literature
PO3	• Students understand and appreciate literary pieces or forms in English.
PO4	• Students understand, interpret and also apply English structures in their day today conversation.
PO5	• Students learn Soft skills and develop their written and oral Communication.

Course Outcomes: S.Y. B.Sc. (English)

Class	Semester	Course Title	Course Outcome
S.Y. B.Sc.(REGULAR) Annual Pattern 2013 Pattern	--	ENGLISH (23321)	• CO1. Students demonstrate an understanding of literary forms and they appreciate the use of language in Literary Writings. • CO2. By learning the prescribed prose and poetry students realize the beauty and communicative power of English language. • CO3. Students absorb and inculcate human values on reading the literary forms. • CO4. Students develop their personality by learning Soft Skillsailing with Oral and Written Communication Skills. • CO5. Students demonstrate an understanding of literary forms and they appreciate the use of language in Literary Writings.
S.Y. B.Sc.(REGULAR) Annual Pattern 2013 Pattern	--	ENGLISH (24321)	• CO1. Students demonstrate an understanding of literary forms and they appreciate the use of language in Literary Writings. • CO2. By learning the prescribed prose and poetry students realize the beauty and communicative power of English language. • CO3. Students absorb and inculcate human values on reading the literary forms. • CO4. Students develop their personality by learning Soft Skillsailing with Oral and Written Communication Skills. • CO5. Students demonstrate an understanding of literary forms and they appreciate the use of language in Literary Writings.

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Department of Geography-Academic Year 2021-22

Programme Outcome : BA (Geography)	
PO1	• The basic concepts in Physical Geography, Human Geography, Climatology, Economic Geography, Regional Geography of India and Practical Geography areintroduced to the students.
PO2	• Understand the Theory of demographic transition & Composition of Indianpopulation
PO3	• The students acquired the information about Climatology in modern times.
PO4	• The students aware regarding the Impact of Green Revolution in Indianagriculture
PO5	• The students understand basic concepts related to surveying and traditional surveymethods
PO6	• The students understand the details about various policies in India.
PO7	• The students familiar with the weather instruments and their applications inGeographical phenomena

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Course Outcomes: BA (Geography)

Class	Semester	Course Title with Sub. Code	Outcome
FYBA (2019)	I	GG- 110 (A) Physical Geography (G1)	• The students acquired the knowledge about Development of Physical Geography and its nature and scope. • Understand the Earth system and Interior of the earth. • Understand the Wegner's Continental Drift Theory & Davis Concept of Cycle of erosion. • Acquired basic knowledge of atmosphere andhydrosphere.
FYBA (2019)	II	GG- 110 (B) Human Geography (G1)	• The students acquired the knowledge about Development of Human Geography and itsnature and scope. • Acquired knowledge about factors affecting on distribution of population. • Understand the Theory of demographic transition & Composition of Indian population. • Identify characterize and explain Types and pattern of rural settlements. • Acquainted with Problems of Indian agriculture..
SYBA (2019)	III	GG 210 (A): Environmental Geography I (G1)	• The students acquired the information about the Ecosystem. • The students understand the Economic Value and Potential of biodiversity. • The students aware about the environmental problems (pollution) • The students acquired information Loss of biodiversity and hotspot in India
SYBA (2019)	IV	GG 210 (B): Environmental Geography II (G2)	• The students aware about the environmental problems (Global Warming, Climate Change, Acid rain) • The students acquired the information about the Environment planning and Management. • The students understand the details about various policies in developed and Developing countries • To create awareness about the major environmental disaster in India and efforts to resolve them.
SYBA (2019)	III	GG 220 (A): Geography of Maharashtra (S1)	• The students understand the Geographical Location of the Maharashtra State. • The students aware about Major physiographic divisions & Major rivers of Maharashtra State. • The students acquired information regarding climatic condition of Maharashtra State. • The students understand details about soil types, soil problems and soil conservation in Maharashtra State.
SYBA (2019)	IV	GG 220 (B): Geography of	• The students acquired comprehensive Knowledge about Population growth, distribution and its major

Class	Semester	Course Title with Sub. Code	Outcome
		Maharashtra (S2)	characteristics of Maharashtra State. • The students received details information about agriculture types and their problems in Maharashtra State. • The students well aware about the types of Tourism. • The students acquired details information about rural development in Maharashtra State.
SYBA (2019)	III	Scale and Map Projection	• Understand the map scale and its uses. • Acquired the knowledge of conversion scale. • Developed skill to draw and use of Zenithal Projection, Conical Projection & Cylindrical Projection. • Aware of the new techniques, accuracy and map making skills
SYBA (2019)	IV	Cartographic Techniques, Surveying and Excursion/ Village/ Project Report	• The students acquired the knowledge about Development of Development of cartography and its use. • Understand the various techniques of representation of data. • Acquired surveying and plotting skills about land with help of Plane Table Survey and GPS Survey. • Acquired the knowledge of conversion of area (hector into Acer, Square km into square meter, and Square meter to Square feet). • Understand how to write study tour and village survey report.
SYBA (2019)	III	SEC A Introduction to Geographic Information System	• The The students acquired the knowledge about stages of GIS development and its components of GIS • The students understand details about data types and models • Developed skill to geo-referencing of toposheet map
SYBA (2019)	IV	SEC B Introduction to Remote Sensing	• The students acquired the knowledge about stages in remote sensing. • The students understand image interpretation. • Developed skill to image downloading through bhuvan USGS, image enhancement.
TYBA (2019)	V	GG. 310 (A) CCIE Geography of Tourism- I (G-3)	• The students understand the history of Tourism • Students understand the basic concepts in Tourism Geography. • The students able to understand the types of Tourism • The Students gain knowledge different aspects of Tourism Geography • The students aware about Determinants of Tourism Development • The students understand the Mode of Transportation
TYBA (2019)	VI	GG: 310(B) CC1EF Geography of Tourism- II (G3)	• The students understand the Role of Accommodation in Tourism • The students able to understand Economic impact of Tourism • The Students gain knowledge different aspects of Tourism Geography • The Students gain knowledge the Planning and Polices of

Class	Semester	Course Title with Sub. Code	Outcome
			tourism development • Students understand the Case studies of Major Tourist Centers in India
TYBA (2019)	V	GG: 320(A) V DSE 1 C Geography of India –I (S3)	• The students aware about Major physiographic divisions & Major rivers in India. • The students understand with geography of our Nation. • The students aware to help understand the inter relationship between the subject and the society • The students aware and understand the recent trends in regional studies • The students understand with Significance of agriculture in Indian Economy
TYBA (2019)	VI	GG: 320(B) DSE Geography of India –II (S3)	• The students aware the magnitude of problems and Prospects at National level. • The students understand the details about various policies in India. • The students understand details about soil types, soil problems and soil conservation in India. • The students aware about the Vegetation: Types and distribution, Methods of forest conservation used in India
TYBA (2019)	V	GG: 301(A) V DSE 2 C Practical Geography – I (Techniques of Spatial Analysis (S4)	• The students understand acquires the students with IMD weather maps and to gain the knowledge of weather map Reading and interpretation. • The students understand details about elementary statistics as an essential part of geography. • The students able to read SOI Toposheets Arial Photographs & Satellite Image to acquire the knowledge physical & cultural features • The students acquired information regarding about GIS. • The students familiar with the weather instruments and their applications in Geographical phenomena
TYBA (2019)	VI	GG: 301(B) VI DSE 2D Practical Geography – II (Techniques of Spatial Analysis, Surveying and Excursion/ Village/ Project Report)	• The students understand details Geographical Data & its Basic Analysis • The students understand details Introduction & Application of GIS & Remote Sensing Techniques • The students acquired Knowledge Calculation of Central Tendency, & Dispersion • The students could write report about study tour and village survey after visit to Geographical place and village
TYBA (2019)	V	SEC 2 C Value/Skill based Course Research Methodology - I	• The Student understand of the basic concept of research • The students acquired Knowledge of the basic framework of sampling and data collection • The students acquired Knowledge Research Problem
TYBA (2019)	VI	SEC 2 D Value/ Skill based Course Research Methodology – II	• The Student understand of various sampling methods and techniques • The students identify various sources of information for data collection. • The Student understand the conducting survey on various issues and develop the Report writing skill of students

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Course outcomes: B.Sc. (Geography)

Class	Semester	Course Title with Sub. Code	Outcome
F.Y. B.Sc. (2019)	I	GG- 111 Introduction to Physical Geography–I (Geomorphology)	• Students will understand the basic concepts of PhysicalGeography. • Students will understand the applications ofGeomorphology. • Students will understand the theories regarding Origin ofContinents and oceans. • Students will be sensitizing with urgent need of protectionand conservation of different aspects of Earth and its environment. • Students will be able to understand various geographicalphenomenon, their origin, distribution and effect on life.
F.Y. B.Sc. (2019)	I	GG-121 Introduction to Human Geography	• The students' understanding of basic concepts of HumanGeography would help them for application of the same to local issues. • Students will acquire knowledge of the history andevolution of humans and their races. • Students will learn and respect cultural diversity throughvarious theories. • Students will explore man-environment relationship orman within environment in different geographical regions.
F.Y. B.Sc. (2019)	I	Gg-112 Introduction to Physical Geography II (Geography of Atmosphere and Hydrosphere)	• Students will gain knowledge of the fundamentals of theAtmosphere so that they will be able to understand its uniqueness in among the planets in the galaxy. • Students will understand insolation and heat budget of the Earth. This is essential to understand causes and effects ofglobal warming. • Students will be acquainted with atmospheric pressure and wind system. With this scientific knowledge they would understand intricacies of monsoon system that effects on Indian economy and polity. • Students will gain knowledge of hydrosphere toappreciate how water resource is precious.
F.Y. B.Sc. (2019)	II	GG-122 Population and Settlement Geography	• With a knowledge base of Population Geography students would be able to understand issues related to population growth and related issues. • Students would understand the applications and sources of Population data.

Class	Semester	Course Title with Sub. Code	Outcome
			• Students would familiarize with the different types of Man-Environment relationship in different periods and areas. • Students would be able to understand the issues and solutions related to settlements using concepts in Settlement Geography. • Students would understand the concept and process of urbanisation in view of problems related to urban sprawl, rural urban divide and conflicts between human beings and environment.
F.Y. B.Sc. (2019)	II	Gg-113 Practicals in Physical Geography	• Students will get acquainted with basics of maps. • Students will understand map scales and its types. • Students will acquire skills of drawing various map projections with their advantages and limitations. • The students would develop the skills of representing geographical, meaning thereby spatial and temporal, data. • Exposure will be given to students about the field-based studies and data collection.
F.Y. B.Sc. (2019)	II	GG-123 Practical in Human Geography	• Students would understand the Population Indices and Projection with appropriate examples. • Students would be able to understand and apply notions of Population Geography in various field. • Students would develop their skills for using techniques used in Agriculture Geography. • Students would acquire the skills of computer aided presentation techniques. • They would get the idea of conducting social survey project which could surface the issues of particular social and economic sections of the society.

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Department of Hindi- Academic Year 2021-22

Programme Outcomes: B.A. (Hindi)	
PO1	• हिंदी भाषा और संस्कृति की वृद्धि को मनोबल मिलेगा।
PO2	• राष्ट्रभाषा के कारण छात्रों में राष्ट्रीय एकात्मता बढ़ती है।
PO3	• हिंदी साहित्य के अध्ययन से आकलन, परिक्षण बढ़ता हैं।
PO4	• हिंदी साहित्य के अध्ययन से लिखने की क्षमता विकसित होती है।
PO5	• प्रसार माध्यमों में समाचार लेखन, विज्ञापन लेखन, घोषणा पत्र आदि ज्ञान प्राप्त होने से हिंदी भाषा को उपयोग में लाना सहज होता है।
PO6	• कार्यक्रम संयोजन कौशल विकसित होने से कार्यक्रम की संकल्पना, उद्देश्य, कार्यक्रम की प्रस्तावना सुत्र संचालन, अभिमत, आभार ज्ञापन आदि प्रभावी होने से कार्यक्रम सफल होने में मदद मिलती है।
PO7	• हिंदी भाषा का ज्ञान प्राप्त करने से राजभाषा अधिकारी पद का अवसर प्राप्त होता है।

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Course Outcomes: B.A. (Hindi)

Class	Semester	Course Title with Sub. Code	Outcome
F.Y. B.A.	I	**वैकल्पिक हिंदी प्रश्नपत्र**	• छात्रों को हिन्दी के गदय एवं पदय के प्रतिनिधि रचनाकारों का परिचय होगा। • हिन्दी सहित्य के प्रति छात्रों कि रुचि बढाना तथा सहित्य कि विविध विधाओं से परिचित होंगे। • कहानी, कविता, एकांकी, साक्षात्कार, रेखाचित्र आदि विधाओं के माध्यम से छात्रों का भावात्मक विकास होगा। • छात्रों में राष्ट्र के प्रति एवं सामाजिक प्रतिबद्धता की भावना विकसित होगी। • राष्ट्रीय ऐक्य सामाजिक उत्तरदायित्व, वैज्ञानिकता अदि मूल्यों के प्रतिछात्रों का ध्यान आकर्षित होंगे। • छात्रों में नैतिक मूल्य, राष्ट्रीय मूल्य, सामाजिक मूल्यों के प्रति आस्था निर्माण होगी। • पारिभाषिक शब्दावली के माध्यम से छात्रों को प्रयोजनमूलक हिंदी से परिचित होंगे। • पत्रलेखन, अनुवाद अदि के माध्यम से छात्रों को भाषा के रचनात्मक पहलू से परिचित होंगे। सारांश लेखन, निबंध अदि के माध्यम से छत्रों की विचार क्षमता तथा कल्पना -शक्ति को बढ़ावा मिलेगा। • वाक्य शुद्धिकरण अदि के माध्यम से छात्रों कों वर्तनी के नियमों, विरामचिन्हों से अवगत होंगे। • छात्रों को मानक लिपि एवं भाषा का महत्त्व स्पष्ट होगा। • छत्रों की सर्जनात्मक शक्ति एवं संभाषण कला को विकसित होगी। • छात्रों में राष्ट्रभाषा हिंदी का प्रचार – प्रसार करने की क्षमता विकसित होगी।
S.Y.B.A.	III and IV	**आधुनिक काव्य, कहानी तथा व्यावहारिक हिंदी**	• छात्रों कों व्यंग पाठ से परिचित कराना I • छात्रों कों कहानी व्यंग पाठ का बोध कराना I

Class	Semester	Course Title with Sub. Code	Outcome
			• छात्रों कों साक्षात्कार कला से अवगत कराना I • छात्रों कों भाषा का मोबाइल तंत्र समझाना I • छात्रों कों पल्लवन कला से अवगत कराना I
S.Y.B.A.	III and IV	**काव्यशास्त्र / साहित्य के भेद**	• छात्रों कों काव्य, साहित्य की परिभाषाओं द्वारा काव्य के स्वरूप के साथ काव्य हेतु तथा काव्य के प्रयोजनों का ज्ञान कराना। • छात्रों कों काव्य काव्य के भेद तथा शब्दशक्ति का ज्ञान कराना। • छात्रों कों अलंकार, छंदों के स्वरूप के साथ उनका सोदाहरण परिचय कराना। • छात्रों कों गद्य – भेदों के साथ नाटक, एकांकी और निबंध के स्वरूप एवं तत्त्वों की जानकारी देना। • छात्रों कों रस का स्वरूप, रस के अंगों एवं भेदों का परिचय देना। • छात्रों कों आलोचना का स्वरूप, अलोचना की उपयोगिता और आलोचक के गुणों से परिचित कराना।
S.Y.B.A.	III and IV	**मध्ययुगीन काव्य तथा उपन्यास साहित्य / मध्ययुगीन काव्य तथा नाटक साहित्य**	• छात्रों कों कबीर के साहित्य का परिचय देना I • छात्रों कों मीराबाई काव्य से अवगत कराना • छात्रों कों मूल्यांकन की दृष्टि विकसित कराना I • छात्रों की सभा- इतिवृत्त लेखन कौशल वृद्धी का विकास कराना I • छात्रों की वार्ता लेखन कौशल वृद्धी का विकास कराना I • छात्रों कों रहीम के तथा बिहारी के साहित्य का परिचय देना I • हिंदी नाटक और रंगमंच का परिचय देना I
S.Y.B.A.	III and IV	**अनुवाद स्वरूप एवं व्यवहार / माध्यम लेखन**	• अनुवाद कौशल से छात्रों को अवगत कराना। • अनुवाद का स्वरूप समझाना। • अनुवाद क्षेत्र से परिचय कराना। • हिंदी से मराठी में प्रत्यक्ष अनुवाद कार्य कराना। • अंग्रेजी से हिंदी, मराठी में अनुवाद कौशल का विकास कराना। • छात्रों को माध्यम लेखन से परिचित कराना। • सृजनात्मक लेखन से अवगत कराना। • श्रव्य-दृश्य माध्यमों की भाषा से अवगत कराना। •
S.Y.B.A.	III and IV	**हिंदी भाषा शिक्षण (अ तथा ब)**	• छात्रों में हिंदी भाषा श्रवण कौशल विकसित करना। • छात्रों में हिंदी भाषा संवाद कौशल विकसित करना।

Class	Semester	Course Title with Sub. Code	Outcome
			• छात्रों में हिंदी भाषा वचन कौशल विकसित करना। • छात्रों में हिंदी भाषा लेखन कौशल विकसित करना। • हिंदी भाषा-विधि तथा भाषा-व्यवहार से अवगत करना। • लघुकथा सृजन कौशल विकसित करना।
T.Y.B.A.	V and VI	**कथेतर विधाएं / गजल विधा और पत्राचार**	• छात्रों को हिंदी संस्मरण साहित्य का परिचय देना। संस्मरण के विकास तथा उसके स्वरूप का परिचय देना • छात्रों को रेखाचित्र साहित्य से अवगत कराना। • छात्रों के मूल्यांकन दृष्टि का विकास करना। • सभा-इतिवृत्त लेखन कौशल वृद्धि का विकास करना। • वार्ता लेखन कौशल दृष्टि निर्माण करना। • छात्रों को गजल साहित्य से अवगत करना। • छात्रों को गजलकर के व्यक्तित्व से अवगत करना। • छात्रों को सरकारी पत्र लेखन से अवगत करना।
T.Y.B.A.	V and VI	**हिंदी साहित्य का इतिहास (एस.3) / हिं. सा. इति. (आधुनिक काल)**	• छात्रों कों हिंदी साहित्येतिहास लेखन का परिचय देना I • छात्रों कों हिंदी साहित्येतिहास के कालविभाजन तथा नामकरण का परिचय देना I • छात्रों कों आदिकालीन, भक्तिकालीन, रीतिकालीन प्रमुख साहित्यिक प्रवृत्तियों, रचनाकारों, रचनाओं से परिचित कराना I • छात्रों को आधुनिक काल का परिचय देना।
T.Y.B.A.	V and VI	**भाषाविज्ञान (एस.4) / हिंदी भाषा और उसका विकास**	• छात्रों को भाषा की परिभाषा, विशेषताएँ तथा भाषा के विविध रूपों की जानकारी देना I • छात्रों को हिंदी ध्वनि विज्ञान, ध्वनि यंत्र, ध्वनि गुण, परिवर्तनन का परिचित कराना I • छात्रों को रूप विज्ञान तथा उसके भेद से परिचित कराना I • छात्रों में भाषा के वैज्ञानिक अध्ययन की दृष्टि निर्माण करना I • भाषाविज्ञान के अंगों तथा भाषाविज्ञान की शाखाओं का परिचय देना I • भाषाविज्ञान का अन्य विज्ञानों से संबंध विशद करना I • अर्थ विज्ञान का स्वरूप, दिशा, कारण की जानकारी देना I • हिंदी की बोलियाँ, नागरी लिपि की जानकारी देना।
T.Y.B.A.	V and VI	**पटकथा लेखन / साहित्य और**	• छात्रों को स्क्रिप्ट लेखन, अर्थ, परिभाषा से अवगत कराना।

Class	Semester	Course Title with Sub. Code	Outcome
		फिल्मातरण	• छात्रों को कथा, पटकथा और संवाद से परिचित कराना। • छात्रों को ड्राफ्ट बनाने से परिचित कराना। • छात्रों को सिनेमा का स्वरूप से परिचित कराना। • छात्रों को हिंदी साहित्य और सिनेमा के अंतसंबंध से परिचित कराना। • छात्रों को हिंदी उपन्यासों/ कहोनियों पर आधारित फिल्मों से अवगत कराना ।

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Department of History- Academic Year 2021-22

Programme Outcomes: B.A. (History)	
PO 1	Program provides the students, the base to be the responsible citizen.
PO 2	The student acquires knowledge in the field of social science, literature and humanities, which make them sensible enough.
PO 3	The students will be familiar with the social, economic, historical, geographical, political and philosophical tradition and thinking
PO 4	The program also empowers the students to appear for various competitive examinations or choose the post graduate programme of their choice.
PO 5	It enables the students to acquire the knowledge with the human values, mount the base to deal with various problems in life with courage and humanity.
PO 6	The students will be ignited enough to think and act over for the solution of various issues prevailed in the human life.

Program Specific outcome: B.A. (History)	
PSO 1	Enable the students to understand background of our religion.
PSO 2	Enable the students to produce their own historical analysis of documents and develop the ability to think critically and historically.
PSO 3	It will help students in discussion and to understand different peoples and cultures in past environments and how those cultures changed over the course of the centuries.
PSO 4	To develop students interests in the study of history and activities relating to history. They are: • Collect ancient arts, old coins and other historical materials; • Participate in historical drama and historical occasions; • Visit places of historical interests, archaeological sites, museums and archives; • Read historical documents, maps, charts etc. • Play active roles in activities of the historical organizations and associations; and • Write articles on historical topics
PSO 5	Enables the students to research on unidentified topics related to history.

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Course Outcomes: B.A. (History)

Class	Semester	Course	Course Outcomes
F.Y.B.A. General	I	11171 Early India :From Prehistory to the Age of the Maury's	• Learn innovative study techniques in the study of History of Ancient India to make it value based, conceptual and thought Provocative. • Understand the importance of past in Exploration of present context. • Understand the Socio –economic, cultural and architecture background of age of the Mauryas. • Acquire the spirit of healthy Secularism among the student.
F.Y.B.A.			• Learn innovative study techniques in the study of History of Ancient India to make it value based, conceptual and thought Provocative. • Understand the importance of past in Exploration of present context. • Understand the Socio –economic, cultural and political and architecture background of Post Mauryan to the Age of the Rashtrakuta. • Acquire knowledge of various Empire after the age of Mouryas.
S.Y.B.A. GeneraI	III	23174: History of the Marathas (1630-1707)	• Student will develop the ability to analyses sources for Maratha History. • Student will learn significance of regional history and political foundation of the region. • It will enhance student's perception of 17th century Maharashtra and India in context of Maratha history. • Appreciate the skills of leadership and the administrative system of the Marathas.
S.Y.B.A. History Special	III	23171: Medieval India- Sultanate Period	• Provides examples of sources used to study various periods in history. • Relates key historical developments during medieval period occurring in one place with another. • Analyses socio - political and economic changes during medieval period • Estimate the foreign invasion and the achievement of rulers
S.Y.B.A. History Special	III	23172: Glimpses of the Modern World. Part-1	• It will enable students to develop the overall understanding of the Modern World. • The students will get acquainted with the Renaissance, major political, socio-religious and economic developments during the Modern World. • It will enhance their perception of the history of the Modern World. • It will enable students to understand the

Class	Semester	Course	Course Outcomes
			significance of the intellectual, economic, political developments in the Modern World.
S.Y.B.A. Skill Enhancement Course	III	23178: Tourism Management	• Students will get an overall understanding of the process and development of the Tourism Management • They will learn to work in the Tourism Management. • They will be able to seek self-employment by starting their own tourism related business.
S.Y.B.A. GeneraI	IV	24174: History of the Marathas (1707-1818)	• Students will be able to analyze the Marathas policy of expansionism and its consequences. • They will understand the role played by the Marathas in the 18th century India. • They will be acquainted with the art of diplomacy in the Deccan region. • It will help to enrich the knowledge of the administrative skills and profundity of diplomacy
S.Y.B.A. History Special	IV	24171: Medieval India-Mughal Period	• Draws comparisons between policies of different rulers. • Understanding Role of Akbar in the consolidation of Mughal rule in India. • Understand Aurangzeb's conflict with Rajput as, Maratha and weakening Mughals age. • Analyses factors which led to the emergence of new religious ideas and movements (bhakti and Sufi
S.Y.B.A. History Special	IV	24172: Glimpses of the Modern World. Part-1I	• It will enable students to develop the overall understanding of the Modern World. • Students will get acquainted with the major nationalist movements, the World War II and its consequences, the Cold War and its Consequences. • It will enhance students overall perception of the history of the Modern World. • It will enable students to understand the significance of the strategic political developments in the Modern World.
S.Y.B.A. Skill Enhancement Course	IV	24178: Travel Agency & Tour Business	• Students will get an overall understanding the details of the business of Travel Agency. • They will be trained on both theory and Practical aspect Travel agency and Tourism Industry. • They will enable to seek self-employment by starting their own business.
T.Y.B.A. Gen-3	V	35174: Indian National Movement (1885-1947)	• It will enable students to develop an overall understanding of Modern India. • It will increase the spirit of healthy Nationalism, Democratic Values and Secularism among the Students. • Students will understand various aspects of the Indian Independence Movement and the creation of Modern India
T.Y.B.A. Special Paper 3	V	35171: Introduction to Historiography	• Students will be introduced to the information and importance of Historiography. • Students will be introduced to the different Methods and Tools of data collection.

Class	Semester	Course	Course Outcomes
			• Students can study the interdisciplinary approach of History. • 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. • This curriculum develops Research ability and process of Research Methodology in History.
T.Y.B.A. Special Paper 4	V	35172: Maharashtra in the 19th Century	• Student will develop the ability to analyse sources for 19th century Maharashtra History. • Student will learn significance of Regional History and Socio- religious reformism foundation of the region. • It will enhance their perception of 19th Century Maharashtra. • Appreciate the skills of leadership and the Socio-religious System of the Maharashtra
T.Y.B.A. Skill Enhancement Course	V	35178: Museology	• The Students will understand the Concepts of Museum ad learn the basic Principles of Museology • The Students will gain Comprehensive Knowledge of the Process of Cringe and Conserving Museum of objects
T.Y.B.A. Gen-3	VI	36174: India After Independence-(1947-1991)	• It will enable students to develop an overall understanding of the Contemporary India. • To increase the spirit of healthy Nationalism, Democratic Values and Secularism among the students. • Students will understand various aspects of India's domestic and foreign policies that shaped post-Independence India.
T.Y.B.A. Special Paper 3	VI	36171: Applied History	• Students will be introduced to the information and importance of applied history. • Student will learn about the Historical significance of Archaeology and Archives and opportunities in the field of Archaeology and Archives. • Through this course, students will be informed about the opportunities in the field of Media, Museums. • 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.
T.Y.B.A. Special Paper 4	VI	36172: Maharashtra in the 20th Century	• Student will develop the ability to analyses sources for 20th Century Maharashtra History. • Student will learn significance of regional history and Socio- Religious Reformism foundation of the region. • It will enhance their Perception of 20th Century Maharashtra. • Appreciate the skills of leadership and the Socio-Religious System of the Maharashtra.

Class	Semester	Course	Course Outcomes
S.Y.B.A. Skill Enhancement Course	VI	36177: Archaeology	• Students will learn to understand the definition, aims and scope of Archaeology so as to understand its applications in interpreting the human past. • They will be able to understand the nature of the archaeological record and the unique role of science in archaeology. • They will have an overall understanding of the Archaeology.

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Department of Marathi- Academic Year 2021-22

Program Outcomes: B.A. (Marathi)	
1	PO1: Know • Program develops communication skills in Marathi of the students. • Program enriches Linguistic skills of the Marathi. • Graduate students acquire Global knowledge through Marathi literatures and Language. • Graduate students are acquainted to National cultures through literatures in Marathi • Graduate students study various styles of writing of writers.
2	PO2: Do • Graduate students can become good communicator of Marathi language at the platform. • Graduate students can become good writer, poet, dramatist and journalist, etc. • Graduate students can become good translator and Mediator. • Graduate students can become good Teacher and can be recruited in firms where Marathi is required.
3	PO3: Feel • Graduate students express their emotions through fluent communication skills & writing • Graduate students can achieve emotional and intellectual maturity • Graduate students can feel self-esteemed and acquires soft skills • Graduate students can become aware of Humanity, Human Values, Ethics, Liberty, Equality, Fraternity, etc. by studying English Language and Literatures, (Various Genres of Literature) • Graduate Students feel responsible citizens with acquisition of good manners.

Program Specific Outcomes: B.A. (Marathi)	
PSO1	The Programme will develop competence of the students in four major skills of Marathi language: Listening skill, Speaking skill, Reading Skill , Writing Skill
PSO2	Students will develop an appreciation of how the formal elements of language and genre shape meaning. They will develop a facility at writing in appropriate genres for a variety of purposes and audiences.
PSO3	Students will gain knowledge of the major traditions of literatures written in Marathi and an appreciation for the diversity of literary and social voices within–and sometimes marginalized by–those traditions. They will develop an ability to read texts in relation to their historical and cultural contexts, in order to gain a richer understanding of both text and context, and to become more aware of themselves as situated historically and culturally.
PSO4	Students will develop the ability to read works of literary, rhetorical, and cultural criticism, and deploy ideas from these texts in their own reading and writing.
PSO5	They will express their own ideas and understand how their own approach compares to the variety of critical and theoretical approaches.

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Course Outcomes: B.A. (Marathi)

Class	Course	Course Outcomes
F.Y.B.A. (Sem-I & II) G-I	मराठी साहित्य कथा/ एकांकिका आणि भाषिक कौशल्यविकास (CC - 1A)	• The students were introduced to the literary genres of stories, dramas and one-act plays. • The form, elements and classification of literary forms such as stories, dramas and one-act plays were identified. • Students learned about stories, dramas and one-act plays in various literary streams. • Applied skills were developed in relation to Marathi language
F.Y.B.Com. (Sem-I & II) Opt. Marathi Opt. [AEC-117]		• Students are aware of the nature and application of language practice in various fields. • Students develop practical, applied and written language skills. • Ethical, professional and ideological values are inculcated in the students. • The students were introduced to the works and thoughts of accomplished persons in various fields of work.
SYBA (Sem-III & IV) G-II	भाषिक कौशल्यविकास आणि आधुनिक मराठी साहित्यप्रकार कादंबरी /ललितगद्य (CC -1C (3))	• The students were introduced to the concept, form, type and history of the literary genre of novel and prose. • The student learned to enjoy and understand the assigned textbook. • Applied skills were developed in relation to Marathi language.
SYBA (Sem-III & IV) Marathi Spl.-I [DSE 1 A (3)] & [DSE 2 A (3)]	आधुनिक मराठी साहित्य : प्रकाशवाटा / मध्ययुगीन मराठी साहित्य : निवडक मध्ययुगीन गद्य, पद्य	• The students were introduced to the concept, form, type and history of the literary genre of Autobiography and Literary History • The student learned to enjoy and understand the assigned textbook. • Applied skills were developed in relation to Marathi language.
SYBA (Sem-III & IV) Marathi Spl.-I [DSE 1 B (3)] & [DSE 2 B (3)]	साहित्यविचार / साहित्य समीक्षा	• The students were introduced to the concept, form, type and literary concepts, genre , Literary terms, Criticism and literary History • To introduce students to the basics of literary Terms & criticism • To make them aware of the nature and historical development of literary Terms & criticism. • To make them familiar with the significant critical approaches and terms • To encourage students to interpret literary works in the light of the critical approaches • To develop aptitude for critical analysis
SYBA	मराठी भाषिक संज्ञापन	• Students develop advanced modern language skills.

Class	Course	Course Outcomes
(Sem-III & IV) MIL (Marathi) [MIL 2 (2) & [MIL 2 (2)]	**कौशल्ये / नवमाध्यमे आणि समाजमाध्यमांसाठी मराठी**	• The students got a detailed introduction to various modern media as well as New media and social media. • Students become familiar with the correlation between language and personality development. • To prepare students to go for detailed study and understanding of New media and social media MIL language • Students have developed media literacy skills.
SYBA (Sem-III & IV) (SEC) Skill Enhancement Course [SEC 2 A (2) & SEC 2 B (2)]	**प्रकाशन व्यवहार आणि संपादन / उपयोजित लेखनकौशल्ये**	• Students acquire skills in publishing transactions and editing/applied writing skills. • Students are imparted necessary training in publishing practices and Editing/applied writing skills. • To create opportunities to access exposure of Publishing transactions and editing/applied writing skills Contest • Students were imparted essential training in publishing business and editing/applied writing skills, advertising, interview writing.
SY.B.Sc. (Sem-III & IV) Opt. Marathi	**उपयोजित मराठी** (AECC-2 A)/ मराठी साहित्य मराठी (AECC-2 B)	• Students have got information about Marathi language and literature and have realized their interrelationship. • Applied skills of Marathi language were developed among the students.\ • Literary taste has developed among the students and through these students have tried to understand science literature. • On the basis of literature, the students developed an understanding of life.
T.Y.B.A. (Sem-V & VI) Gen-III	आधुनिक मराठी साहित्य आणि व्यावहारिक उपयोजित मराठी (Sub Code-35023/36023)	• Students were introduced to different types of literature. Based on that, his literary taste was formed and from that he developed the ability to enjoy literary works. • The students were introduced to the literature tradition in the form of various literature types. • The students got theoretical knowledge about essays and travelogues. • To expose students to varied cultural experiences through literature • To contribute to their overall personality development by improving their communicative and soft skills
T.Y.B.A. (Sem-V & VI) Marathi Spl -III-	साहित्यविचार (Sub Code-35021/36021)	• To develop students' understanding of literature, its form, inspiration and creation • The students were introduced to the literature tradition in the form of various literature types. • Students gained an understanding of the relationship between literature and society. • The students gained scientific knowledge about what is literature.
T.Y.B.A. (Sem-V & VI) Marathi Spl -IV-	भाषाविज्ञान (भाषाविज्ञान :वर्णनात्मक आणि ऐतिहासिक) (Sub Code-35022/36022)	• Students got scientific knowledge of language and linguistics. • The students were introduced to the literature tradition in the form of various literature types. • Students gained an understanding of the

Class	Course	Course Outcomes
		relationship between literature and society. • The students gained scientific knowledge about what is literature.
T.Y.B.A. (Sem-V & VI) Marathi – SEC	कार्यक्रम संयोजन कौशल्य (Sub Code- 35022/36022	• Students acquire skills in organize programmer skills. • Students are imparted necessary training in ancaring practices and applied writing skills. • To create opportunities to access exposure of programme organize and editing/applied writing skills Contest • Students were imparted essential training in Anchoring and editing/applied writing skills, interview writing.

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Department of Political Science - Academic Year 2021-22

Programme Outcome: BA (Political Science)	
PO1	• Students understand the political process of India along with its constitutional structure and institutions.
PO2	• Make students learn about western political thinkers of the ancient and medieval period.
PO3	• Efforts are being made to appraise the global and regional politics along with the interstate relationship.
PO4	• To develop and be able to demonstrate skills in conducting and presenting research in political science
PO5	• To analyze political and policy related problems and formulate policy options.
PO6	• Enable students to discuss the major theories and concepts of political science and its subfields, and also deliver thoughtful and well-articulated presentations of research findings.

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Course Outcomes: BA (Political Science)

Class	Semester	Course Title with Sub. code	Outcome
FYBA	I	11161 CC-1 A Introduction to Indian Constitution I	• Students will be able to understand the making of Indian Constitution. • Students will understand their Fundamental Rights, Fundamental Duties and Directive Principles of State. • Students can understand the Salient features of Indian Constitution. • Students will able to compare Federal System in the world and can examine the Federal System of India. • Students will be able to understand the constitutional provisions and can analyze Constitutional Amendments. • Students will be able to understand the Basic Structure of Indian Constitution. • Students will be able to understand the structure, powers and functions of three organs of government and their mutual relationship and engagements.
FYBA	II	12161 CC-1B Introduction to Indian Constitution II	• Students will be able to explain Judicial System of India. • Students will be able to understand the concept of Judicial Review and Judicial Activism. • Students will be able to explain Electoral System & Reforms of India. Examine political thought through the Classical, Renaissance, and Enlightenment periods based on the works of Plato, Aristotle, Machiavelli, Locke, Rousseau, and Marx; Compare and contrast the concepts of justice, freedom, equality, citizenship, and sovereignty in the works of Machiavelli, Hobbes, Locke, and Rousseau.

Class	Semester	Course Title with Sub. code	Outcome
SYBA	III	23161 Western Political Thought (S-1)	• Major traditions of thought that have shaped political discourse in different parts of the world. • The great diversity of social contexts and philosophical visions. • The history of political thought as a series of critical, interconnected and open-ended conversations about the ends and means of the good life. • Explain different versions, and importance of the state of nature to political thought; Explain Karl Marx's worldview with particular regard to his critique of democracy and the modern, politically liberal state; how it came into being; and its fundamental link to capitalism; and Explain John Stuart Mill's theory on utilitarianism and how he applies it to society and the state. • Have good knowledge about main issues and topics in Political Sociology. • Be able to understand basic principles of the exercise of power, of the state relations with civil society; individual and group interactions in the political realm.
SYBA	III	23162 Political Journalism (S-2)	• Students will learn to establish the complex relationship between the communication, media and power politics. • Students will be able to make a Critical appraisal of practices adopted in political image management, campaigns, propaganda and censorship.. • The Students will be aware of Political Journalism their Definitions and Meaning. • The Students will understand about Political journalism Nature Scope. • The Students will learn about agencies to Political Journalism like Print, Electronic, Web • The Students will be aware of History of Political Journalism. • The Students will understand about Pre-Independence, Post-Independence and World History. • The Students will be able to understand about Methods of Political Journalism, Reporting of Political Events, Political Interview, Commentary of Legislation

Class	Semester	Course Title with Sub. code	Outcome
SYBA	III	23164 CC-1C An Introduction To Political Ideologies (G-2)	• Students are enabled to understand the nature and scope of Political Ideologies. • Students are acquainted with the theories and approaches to Political Ideologies. • Students will understand Nationalism and the difference between Progressive and Reactionary nationalism. • Students are enabled to understand Internationalism. • Students are enabled to evaluate the Achievements and Limitations of Democratic Socialism. • Role of different political ideologies and their impact on politics like Fascism and factors responsible for its rise.
SYBA	III	23165 SEC- 2A Basics of Indian Constitution	• To familiarize students with the working of the Constitution of India. • To acquaint students with the important features of the Constitution of India and with the basic framework of Indian Government. • The Students will able to know the Importance of Fundamentals Duties. • Explaining the Concept and Nature of Fundamental Duties. • The Students will able to know how Directive Principles work for State. • The Students will able to know the importance of Directive Principles for State Policy.
SYBA	IV	24161 DSE-1B Western Political Thought (S-1)	• The students will be able to make a distinction among Locke and Rousseau on the state of nature, the law of nature, nature and form of contract and the emergence of state from the contract. • The Students will be able to understand Bentham's Utilitarianism; and John Stuart Mill's views on liberty and representative government. • The students will be able to understand Hegel idealism & theory of State. • The students will be able to discern the meaning of Utilitarianism and how Bentham and Mill differed from each other. • The students will be able to understand Marxian Theory of Historical Materialism, class Struggle and theory state.

Class	Semester	Course Title with Sub. code	Outcome
SYBA	IV	24162 DSE-2B Political Journalism (S-2)	• The Students will aware about Indian Political Process & Journalism like Role of Social Media in Political Process. • The Students will understand about Role of • Election and Media: Loksabha and Maharashtra Vidhansabha 2014 and 2019 General Elections, Political Parties and Social Media. • The Students will learn about Mediatisation of Politics, Definition and Meaning, Practices, Mediums. • The Students will about Media & Public Opinion, Definition and Meaning, Practices, Mediums. • The Students will Understand Challenges before Political Journalism like Increase of paid News. • The Students will Aware Party Spirited News Papers & Commercialization, Media Saturation
SYBA	IV	24164 CC-1D An Introduction To Political Ideologies (G-2)	• Students will be able to understand Marxism and its significance in the study of Political Ideologies. • Students will know about various Marxian theories like Historical Materialism and Marxian State. • The students are enabled to learn Phule-Ambedkarism and the principles of Equality, Democracy, Cast and religion through their perspective. • The students will be able to know Gandhism and its noble ideals of Truth & Non-Violence, Satyagraha and the theory of Gram Swaraj as put forth by Mahatma Gandhi. • Students are enabled to understand Feminism along with liberal feminism and feminism in India with Caste system and patriarchy as its major challenges. • The students will be able to analyse the role of Political ideologies in course of a history of nation.
SYBA	IV	24165 SEC- 2B Basics of Indian Constitution	• The Students will able to know basic knowledge of Constitution. • The Students will understand the features of fundamentals Duties. • The Students will able to know the Relations between Directive Principles and Fundamental Duties. • The Students will learn how Directive Principles and Fundamental Duties work together.
TYBA	V	35161 DSE-1C Public Administration (S3)	• The Students will able to know about Meaning, Nature, Scope and Significance of Public administration. • The Students will understand about Evolution of New Public Administration. • The Students will aware about Salient Features & Goals of New Public Administration. • The Students will come to know Approaches to Public Administration like Traditional Approach. • The Students will aware about Approaches to

Class	Semester	Course Title with Sub. code	Outcome
			Public Administration like Behavioural Approach, System Approach. • The Students will understand Concept of Governance, Idea of Good Governance, E-Governance, Public-Private Partnership.
TYBA	V	35162 DSE-2C International Relations (S4)	• Familiarization with the key concept of the Discipline of IR • The Students will able to understand & Explain Approaches to International Relations (Idealism. Realism – Neo realism, System approach, Marxism) • The Students will able to understand & explain World War II and the Cold War. • The Students will able to understand & Explain International Organizations (The United Nations, International Financial institutions & Regional Organizations) • Comprehensive understanding of the key assumptions and arguments of the mainstream IR.
TYBA	V	35164 CC-2E Local Self Government of Maharashtra	• The students will know the background of Panchayati Raj and its evolution and working till date. • Students will learn about Various Committees of Local self-Government in Maharashtra like Vasantrao Naik Committee etc. • The students will be enabled to understand 73rd Amendment and rural bodies. • The students will be able to explain the working of Gram Sabha and Gram panchayat. • The students will be able to explain the working of Panchayat samiti and Zilla Parishad. • Students will learn about the 9th Schedule of Indian Constitution in this regard.
TYBA	V	35165 SEC- 2C Samyukta Maharashtra Movement	• It's helps to know what the Regional aspiration in India and concept of Regionalism. • Students will able to know Genesis of Regionalism in India, they will study Indian National Congress & Regionalism. • Student Will Able to understand & explain Samyukta Maharashtra Movement.
TYBA	VI	36161 DSE-1D Public Administration (S3)	• The Students will come to know Bureaucracy & their Meaning and Definitions, Administrative Reform. • The Students will aware about Personnel Administration & their Recruitment, Training, Promotion. • The Students will understand about Budgeting Meaning and types, Principles of Sound Budget. • The Students will understand Budgetary Process in India, Gender Budgeting. • The Students will come to know concept of Accountability The Students will come to know Bureaucracy & their Meaning and Definitions, Administrative Reform. • The Students will aware about Personnel

Class	Semester	Course Title with Sub. code	Outcome
			Administration & their Recruitment, Training, Promotion. • The Students will understand about Budgeting Meaning and types, Principles of Sound Budget. • The Students will understand Budgetary Process in India, Gender Budgeting. • The Students will come to know concept of Accountability and Control. • The Students will aware about Administrative Accountability, Legislative Control, and Judicial Control.and Control. • The Students will aware about Administrative Accountability, Legislative Control, and Judicial Control.
TYBA	VI	36162 DSE-2D International Relations (S4)	• The Students will able to understand The theory of Non- Alignment & meaning and basic principles of Non- Alignment. • The Students will able to understand Emergence of Non- Alignment, Non-Alignment as a Movement, Relevance of NAM In Post-Cold War period. • Students will able to understand Globalization, meaning of Globalization, Evolution and impacts of Globalization. • Students will be aware about Limits of Globalization & Role of the Nation State. • Students will be aware about Neo-Colonialism, New International Economic Order, North – South Divination, South – South Co-operation. • Students will be able to understand International Contemporary Issues : Like Terrorism, Environmental Issues, Poverty, Hunger & Development, Human Rights Issues
TYBA	VI	36164 CC-2F Local Self Government of Maharashtra	• The students will be enabled to understand 74rd Constitutional Amendment and Urban bodies before the amendment. • The students will learn about the working of Nagar Panchayat, Municipal Council, Municipal Corporation. • Students will learn about the 12th Schedule of Indian Constitution in this regard. • Students will be able to explain State election commission, State Finance Commission and challenges before them. • Students will be enabled to understand the Limitations and Challenges before Local Self Government in Maharashtra.

Class	Semester	Course Title with Sub. code	Outcome
TYBA	VI	36165 SEC- 2D Samyukta Maharashtra Movement	• Students will able to know the basic Concept of Sub – Regionalism. • Student will able to understand & analyse the Emergence & Development of Regional Consciousness in Maharshtra.

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Department of Psychology- Academic Year 2021-22

Programme Outcomes : B.A. (Psychology)	
PO1	• Develop an understanding of the basic concepts in Psychology.
PO2	• Understanding various psychological disorders, classify them and know the treatment.
PO3	• Know characteristic features of the human developmental stages.
PO4	• To develop a sense of responsibility of one's own actions as a part of society at large.
PO5	• Help the youth to make better adjustment in life and inculcating the same in the members of society.
PO6	• Develop listening skills and empathy with others.

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Course Outcomes: B.A. (Psychology)

Class	Semester	Course title	Outcome
F.Y. B.A.	I	11221 DSC-PSY- 1A: Foundations of Psychology	• Understand the basic psychological processes and their applications in day to day life. • Develop the ability to evaluate cognitive processes, learning and memory of an individual. • Understand the importance of motivation and emotion of the individual. • Understand the personality and intelligence of the individuals by developing their psychological processes and abstract potentials. Application of "SWOT Analysis" for personal growth • Understanding of the concept of intelligence and its various facets as well as the individual differences in intelligence • Knowledge of various Intelligence Scales • Know the types of thinking and use of 'Six Thinking Hats Technique' for better decision making
F.Y. B.A.	II	11221 DSC-PSY- 1B: Introduction to Social Psychology	• Understand the basics of social psychology. • Understand the nature of self, concept of attitude and prejudice of the individual. • Assess the interactional processes, love and aggression in our day today life. • Understand group dynamics and individual in the social world. • Understanding the effect of others' direct and indirect presence on our thinking, feeling and behavior • Knowledge of social psychological research in areas of family, law, health and industry • Skill to develop healthy communication and avoid unhealthy communication
S.Y. B.A.	III	23223 CC/SEC- 1A: Health Psychology	• Acquire the knowledge about the symptoms, diagnostic criteria, and causes of various psychological disorders • Examine multiple probable causes and correlates of behaviour. • Understand critiques, limitations, and implications of diagnosis and classification of psychological diseases. • Create awareness about mental health problems in society. • Understand health psychology and arrive at the introduction to the role of psychology in health. • Understand the nature of stress and coping • Understand various factors related to health and diseases. • Understand quality of life and promoting the good health.
S.Y. B.A.	IV	24223 CC/SEC- 1B: Positive Psychology	• Understand how the positive psychology as the science of happiness, human strengths, positive aspects of human behavior and 'psychology of well-being.' • How we lead our lives, find happiness and satisfaction, and

Class	Semester	Course title	Outcome
			face life's challenges. • How positive psychology has become an evolving. • Understand basic concepts of positive psychology and implement it to solve our day to day problems of life.
T.Y. B.A.	V	35223 SEC- 1C: Industrial and Organizational Psychology	• Describe the concept of industrial and organizational psychology, selection and training, evaluation and motivation at workplace. • Explain job profile, job analysis, recruitment techniques and employee training. • Identify and classify the appraisal rating system. • Compare different theories of motivation. • Evaluate the training programme and job performance.
T.Y. B.A.	VI	36223: SEC- 1D: Applied Psychology	• Describe the concept of applied psychology, educational psychology, family structure and developmental patterns. • Know the clinical psychology related mechanisms, social issues, and criminal behavior. • Classify the intellectual ability, abnormality, criminal behavior. • Identify the problems and solutions in the field of education • Evaluate the interpersonal relations. • Apply psychological remedies to assess abnormal behaviour, to tackle the social issues and to rectify the problematic behaviour.

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Department of Commerce- Academic Year 2021-22

Programme Outcome: B.Com.	
PO1	• Practical Exposure that would equip the students to face the challenges in the modern era in commerce and business.
PO2	• The course offers a number of values based and job oriented Skills to ensure that students become enabled on two feet for every challenging situation.
PO3	• Proficiency for completing various professional courses like management, CA.,CMA.,CS.,MBA and Law
PO4	• Ability to recognize the role of businessman, entrepreneurs, consultants etc.
PO5	• Thorough knowledge of fundamentals of Commerce, Trade, Economics, Management etc.
PO6	• Expertise in way to contribute towards the development of new practices and procedures of Administration, Banking and finance, Entrepreneurship, Marketing, Insurance, Computers, Laws, Accountancy etc.
PO7	• Students become competent to demonstrate the role of Accountant, Manager, Advisor, Analyzer etc. in society and business.
PO8	• Learners will be able to do higher education and advance research in the field of commerce and finance.

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Course Outcomes: B.Com.

Class	Semester	Course Title with Sub. Code	Outcome
FYBCOM	I	112 Financial Accounting- I	• Students acquainted with the knowledge of various accounting concepts. • Students become knowledgeable about accounting procedures, methods and techniques. • Acquaint them with a practical approach to accounts writing by using software packages e.g. Tally ERP-9, SAP etc.
FYBCOM	I	114 (A) Business Mathematics and Statistics - I	• Students are prepared for competitive examinations by inculcating them with the concept of Simple interest, compound interest and the concept of EMI. • Imparted the concept of shares and to calculate Dividend, concept of population and sample. • They knew how to calculate various types of averages and variations along with the application of profit and loss in business.
FYBCOM	I	115 (A) Organisational Skill Developments - I	• On successful completion of this subject the students acquire the Knowledge about the various types of business organisations, office management and related practices.
FYBCOM	I	116 (C) Marketing and Salesmanship (Fundamentals of Marketing) - I	• On successful completion of this course the students should get the practical knowledge and the tactics in the marketing.
FYBCOM	I	116 (D) Consumer Protection and Business Ethics - I	• The students have understood consumer motivation and perception, Learnt consumer protection act 1986.
FYBCOM	II	112 Financial Accounting- II	• Students acquainted with the knowledge of various accounting concepts. • Students become knowledgeable about accounting procedures, methods and techniques. • Acquaint them with a practical approach to accounts writing by using software package e.g. Tally ERP-9, SAP etc.
FYBCOM	II	114 (A) Business Mathematics and Statistics - II	• Students are prepared for competitive examinations by inculcating them with the concept of Simple interest, compound interest and the concept of EMI. • Imparted the concept of shares and to calculate Dividend, concept of population and sample. • They knew how to calculate various types of averages

			and variations along with the application of profit and loss in business.
FYBCOM	II	115 (A) Organizational Skill Developments - II	● On successful completion of this subject the students acquire the Knowledge about the various types of business organisations, office management and related practices.
FYBCOM	II	116 (C) Marketing and Salesmanship (Fundamentals of Marketing) - II	● On successful completion of this course the students should get the practical knowledge and the tactics in the marketing.
FYBCOM	II	116 (D) Consumer Protection and Business Ethics – II	● The students have understood consumer motivation and perception, Learnt consumer protection act 1986.
S.Y.B.Com. (Annual Pattern)	-	201 Business Communication	● Students will be able to communicate in the language of business. ● Developing intellectual, personal and professional abilities through effective communication skills; ensuring high standard of behavioural attitude through literary subjects and shaping the students' socially responsible citizens.
S.Y.B.Com. (Annual Pattern)	-	202 Corporate Accounting	● To enable the students to be aware of Corporate Accounting in conformity with the provision of the Companies Act 2013. ● After the successful completion of the course the student should have a thorough knowledge on the accounting practice prevailing in the corporate world.
S.Y.B.Com. (Annual Pattern)	-	204 Business Management	● The students get the understanding of Principles & functions of Management, Process of decision making, and modern trends in management process.
S.Y.B.Com. (Annual Pattern)	-	205 Elements of Company Law	● Enlighten the students' knowledge on Companies Act 2013 and Secretarial practices.
S.Y.B.Com. (Annual Pattern)	-	206 (A) Business Administration - I	● Students are inculcated with the basic knowledge about various forms of business organisations, business environment and its implications thereon. ● They will be able to be aware of the latest trends in business.
S.Y.B.Com. (Annual Pattern)	-	206 (H) Marketing Management - I	● Enable the student to understand the Principles of marketing management, market segmentation Product life cycle, pricing, branding etc.
S.Y.B.Com. (Annual Pattern)	-	206 (K) Insurance Transport and Tourism - I	● Aquatint skills needed to manage insurance business, the importance of insurance and tourism to a business.
T.Y.B.Com. (Annual Pattern)	-	301 Business Regulatory Framework	● Enables to inculcate knowledge on various laws relating to business such as law of contract, law of sale of goods, law of agency, Negotiable Instruments Act etc.
T.Y.B.Com. (Annual	-	302 Advanced	● Providing entire coverage of advanced accountancy.

Pattern)		Accounting	• Acquired knowledge on preparation of departmental accounts with respect to Apportionment of overheads.
T.Y.B.Com. (Annual Pattern)	-	304 Auditing and Taxation	• Creating basic conceptual knowledge about the auditing principles. • Understanding the basic concepts and to acquire knowledge about Computation of Income, Submission of Income Tax Return, Advance Tax, and Tax deducted at Source, Tax Collection Authorities under the Income Tax Act, 1961.
T.Y.B.Com. (Annual Pattern)	-	305 (A) Business Administration - II	• Acquaint the students with basic concepts & functions of HRD and nature of Marketing functions of a business enterprise.
T.Y.B.Com. (Annual Pattern)	-	305 (H) Marketing Management - II	• Enable the students to understand the Principles of marketing management, market segmentation Product life cycle, pricing, branding, advertising, sales promotions, marketing research and CRM.
T.Y.B.Com. (Annual Pattern)	-	306 (A) Business Administration – III	• Acquaint the students with basic concepts & functions of HRD and nature of Marketing functions of a business enterprise.
T.Y.B.Com. (Annual Pattern)	-	306 (E) Cost and Works Accounting. Special Paper - III	• The students get a thorough knowledge on the cost accounting principles and the methods of cost accounting.
T.Y.B.Com. (Annual Pattern)	-	306 (G) Business Entrepreneurship - III	• Acquainted the students with the basic concepts of entrepreneurship and preparing a business plan to start a small industry and developed the Knowledge and understanding in creating and managing new ventures.
T.Y.B.Com. (Annual Pattern)	-	306 (H) Marketing Management - III	• Enable the students to understand the Principles of marketing management, market segmentation Product life cycle, pricing, branding, advertising, sales promotions, marketing research and CRM.

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Affiliated with Savitribai Phule Pune University, Pune (ID No PU/NS/ASC/027/1984)
AISHE ID: C-41965

Department of B. Voc.- Academic Year 2021-22

Program outcome: B. Voc.	
PO 1	Ability to apply the knowledge of science and engineering principles for analyzing and solving electrical and electronics engineering problems.
PO 2	Ability to identify, analyze real life electrical and electronics engineering problems.
PO 3	Ability to develop solutions for real life electrical and electronics engineering problems.
PO 4	Ability to develop sophisticated equipment and experimental system for carrying out detailed investigation to multifaceted electrical and electronics engineering problems.
PO 5	Ability to develop and utilize modern tools for modelling, analyzing, and solving electrical and electronics engineering problems.
PO 6	Dedication to work as an electrical or electronics engineer who is capable of identifying solutions to various local and global problems faced by the society.
PO 7	Ability to design and develop modern systems for the up keep of pollution free environment.
PO 8	Ability to express ideas clearly and communicate orally as well as in writing with others.

Program Specific outcomes: B. Voc.	
1	Provide effective solutions in the fields of Electrical Power system, Electrical machine Switchgear and protection.
2	Design and Develop various Electrical and Electronics Systems, particularly renewable energy systems.
3	Install and maintain different Electrical Equipment.
4	Demonstrate the overall knowledge and contribute for the betterment of the society.

Course Outcomes of First Year B. Voc.

Semester I

Year	Course	Course Outcome
FY (Sem-I) Communication Skills	BVET 11.1	To acquired knowledge about office correspondence in Marathi as well as in English language.
	BVET 11.2	To learn about Appearance and layout of Business letter such as Equiry, Sales, administrative, complaint, order letter.
	BVET 11.3	To learn about Writing and comprehensive
	BVET 11.4	To prepare Resume, to acquired knowledge about Job application letter.
FY (Sem-I) Basic Electrical Engineering-I	BVET12.1	Impart a basic knowledge of electrical quantities such as current, voltage, power, energy and frequency to understand the impact of technology in a global and societal context.
	BVET12.6	Obtain solution for electrical network analytically
	BVET12.7	Demonstrate the awareness on social issues like conservation of electrical energy, electrical safety.
FY (Sem-I) Basic Electrical Engineering-II	BVET13.1	Understand and demonstrate the fundamental of electromagnetism
	BVET13.2	Differentiate between electric and magnetic circuits.
	BVET13.3	Apply concept of electromagnetism for the working of transformer.
	BVET13.4	Explain Three Phase delta and star connection

Semester II

Year	Course	Course Outcome
FY (Sem-II) Applied Mathematics	BVET 21.1	Evaluate higher order linear differential equations using appropriate techniques for modelling and analysing electrical circuits.
	BVET 21.2	Solve problems related to trigonometric functions and limits.
	BVET 21.3	Perform vector differentiation and integration.
	BVET 21.4	Identify logic gates and application to switching circuit.
FY (Sem-II) Electrical Appliances-I	BVET 22.1	Acquire necessary skills/hand on experience/ working and testing knowledge on mustimeters, galvanometers, ammeters, voltmeters.
	BVET 22.2	To Acquire knowledge about construction and working of various Appliances Iron, Room heater, Toaster, Kettle, coffee percolator, stoves, Water heaters, Water purifiers.
	BVET 22.3	To acquire knowledge about practical testing (SC, OC, Earth Fault) and fault finding of above appliances.
	BVET 22.4	To acquire knowledge about practical repairing (for electrical & mech. Fault) of above appliances.
FY (Sem-II) Electrical Machines I	BVET 23.1	To study the working principle of transformer
	BVET 23.2	Discussion of single-phase transformer
	BVET 23.3	Detailed construction of D.C. machine
	BVET 23.4	Study of starter and speed control of DC machine
	BVET 23.5	Explain the Rotating Magnetic Field in AC machines
	BVET 23.6	Distinguish between Starters for slip-ring and cage rotor induction motors

Course Outcomes of Second Year B. Voc.

Semester I

Year	Course	Course Outcome
SY (Sem-I) Computer Technology	BVET 31.1	Understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
	BVET 31.2	Demonstrated a basic understanding of computer hardware and software.
	BVET 31.3	Understand the difference between an operating system and an application program, and what each is used for in a computer.
	BVET 31.4	Understand the difference between hardware and software.
	BVET 31.5	Demonstrate computer architecture concepts related processors, memories and I/Os
SY (Sem-I) Electrical Appliances-II	BVET 32.1	Acquire necessary skills/hand on experience/ working and testing knowledge about testing equipment and basic control equipment.
	BVET 32.2	To Acquire knowledge about construction and working of various non – motorised and motorised Appliances such as Tube light, Water heater, geyser,

Year	Course	Course Outcome
		hair dryer, fan regulator, table lamp, torch, doorbell.
	BVET 32.3	To acquire knowledge about practical testing (SC, OC, Earth Fault) and fault finding of above appliances.
	BVET 32.4	To acquire knowledge about practical repairing (Trouble shooting) of above appliances.
SY (Sem-I) Electrical Machines II	BVET 33.1	Explain construction & working principle of three phase synchronous machines
	BVET 33.2	Demonstrate operation of synchronous motor at constant load and variable excitation (v curves & ∧ curves) & constant excitation and variable load.
	BVET 33.3	Explain Speed control methods of three phase induction motor.
	BVET 33.4	Discussion of three phase transformer
	BVET 33.5	Develop equivalent circuit of single-phase induction motor by performing no load & blocked rotor test.

Semester II

Year	Course	Course Outcome
SY (Sem-II) Environment Awareness	BVET 40.1	Articulate the interconnected and interdisciplinary nature of environmental studies.
	BVET 40.2	Demonstrate an integrative approach to environmental issues with a focus on sustainability.
	BVET 40.3	Use critical thinking, problem-solving, and the methodological approaches of the social sciences, natural sciences, and humanities in environmental problem solving;
	BVET 40.4	Communicate complex environmental information to both technical and non-technical audiences
	BVET 40.5	Understand and evaluate the global scale of environmental problems
	BVET 40.6	Reflect critically on their roles, responsibilities, and identities as citizens, consumers and environmental actors in a complex, interconnected world.
SY (Sem-II) Entrepreneurship and Employable Skill	BVET 41.1	Appreciate the concept of Entrepreneurship.
	BVET 41.2	Identify entrepreneurship opportunity.
	BVET 41.3	Develop entrepreneurial values and attitude.
	BVET 41.4	Collect and use the information to prepare project report for business venture.
	BVET 41.5	Develop awareness about enterprise management
SY (Sem-II) Basic Electronics	BVET 42.1	Develop characteristics of different power electronics switching devices.
	BVET 42.2	Express the design and control of rectifier and filters.
	BVET 42.3	Explain working principle of power electronics Semiconductor diodes.
	BVET 42.4	Analyse switching technologies implemented in recent technologies.
SY (Sem-II) Electrical	BVET 43.1	Examine various characteristics of measuring instruments, their classification and range extension technique.

Year	Course	Course Outcome
Measurements and Instrumentation	BVET 43.2	Classifies resistance, apply measurement techniques for measurement of resistance, inductance.
	BVET 43.3	Explain construction, working principle and use of dynamometer type wattmeter for measurement of power under balance and unbalance condition.
	BVET 43.4	Explain Construction, working principle of 1-phase and 3-phase induction, static energy meter and calibration procedures.
	BVET 43.5	Use of CRO for measurement of various electrical parameters, importance of transducers, their classification, selection criterion and various applications.
	BVET 43.6	Measurement of various physical parameters using transducers

Course Outcomes of Third Year B. Voc.

Semester I

Year	Course	Course Outcome
TY (Sem-I) Testing and Maintenance of Electrical Equipment	BVET 51.1	Classify distribution systems, its types and substations
	BVET 51.2	Design of different earthing systems for residential and industrial premises
	BVET 51.3	Understand the practical aspects of condition monitoring and testing of various Electrical Equipment's
	BVET 51.4	Explain the different types of maintenance of Electrical Machines.
	BVET 51.5	Estimating and Costing of residential and industrial premises.
	BVET 51.6	Explain the Importance of Electrical safety.
TY (Sem-I) Power System & Switchgear Protection	BVET 52.1	Describe arc interruption methods in circuit breaker.
	BVET 52.2	Describe Construction, and working of different high Voltage circuit breakers such as ABCB, SF6 CB, and VCB.
	BVET 52.3	Classify and describe different type of relays such as over current relay, Reverse power relay.
	BVET 52.4	Demonstrate a protection scheme used for transformer, alternator and busbar.
	BVET 52.5	Express transmission line protection schemes.
TY (Sem-I) Power Electronic Drives	BVET 53.1	Analyse the operation of the converter, chopper fed dc drive.
	BVET 53.2	Classify the operation of both classical and modern induction motor drives.
	BVET 53.3	Design current and speed controllers for different drives.
	BVET 53.4	Select the drives for any particular application.
	BVET 53.5	Describe different operation of DC motor speed control using converters and choppers.
	BVET 53.6	Analyse the operation of Permanent magnet synchronous motor and Brushless DC Motor.

Semester II

Year	Course Outcome No.	Course Outcome
TY (Sem-II) Illumination Engineering	BVET 61.1	Explain lighting fixtures and its applications.
	BVET 61.2	Design commercial and residential illumination schemes
	BVET 61.3	Describe Quantification and Measurement of light. .
	BVET 61.4	Demonstrate the basics of lighting and illumination and its parameters
	BVET 61.5	Describe modern trends in illumination, street lighting and flood lighting.
TY (Sem-II) Electric & Hybrid Vehicle	BVET 62.1	Explain the basics of electric and hybrid electric vehicles, their Characterisation,
	BVET 62.2	Battery based energy storage and analysis used in hybrid electric vehicles.
	BVET 62.3	Discuss different Battery Management Systems for hybrid electric vehicles.
	BVET 62.4	Discuss Concept & Architecture of Hybrid Electric Vehicles.
	BVET 62.5	Discuss the various drive system for various motors. Analysis of vehicle to grid system.
TY (Sem-II) Special Purpose Machine	BVET 63.1	Evaluate the basic operation and performance of special machines and can select special machines for different purpose
	BVET 63.2	Acquire knowledge about the constructional details and principle of operation of PM synchronous machines.
	BVET 63.3	Acquire knowledge about the working of Reluctance motors.
	BVET 63.4	To learn about Construction, working, characteristics and application of stepper motor
	BVET 63.5	Acquire the knowledge of fundamentals, construction details and classification of linear and Ultrasonic motor.
TY (Sem-II) Project	BVET 64.1	Analyze the given problem.
	BVET 64.2	Generate alternative solutions to the problem
	BVET 64.3	Compare & select feasible solutions amongst alternative generated.
	BVET 64.4	Develop and manufacture new/modified equipment.
	BVET 64.5	Acquire technical knowledge beyond curriculum

ARTS, SCIENCE & COMMERCE COLLEGE OZAR (MIG) 275219

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Programme Outcomes (PO) & Course Outcomes (CO) offered by the institution for Post Graduate Programmes

Department of Chemistry- Academic Year 2021-22

Programme Outcome: M.Sc. Analytical Chemistry	
PO 1	Learn the terms, theories, assumptions, methods, principles, theorem statements and classification, Disciplinary knowledge
PO 2	Fix out the problem and resolve it using theories and practical knowledge, Critical thinking and Problem solving
PO 3	Inculcate his knowledge for carrying projects and advanced research related skills, Research related skill
PO 4	Actively participate in team on case studies and field-based situations, Cooperation/Team work
PO 5	Analyse and interpret ideas, evidences and experiences with learned scientific reasoning, Scientific reasoning
PO 6	Aware and implement the subject facts that can be applied for the personal and social development, Reflective thinking
PO 7	Use digital literacy to retrieve and evaluate subject related information, Information/Digitally literacy
PO 8	Get moral and ethical values for society as well as in research, Moral and ethical awareness
PO 9	Give analytical reasoning to interpret research data, Analytical Reasoning
PO 10	Improve their managerial skills and abilities in subject related activities, Leadership readiness/qualities
PO 11	Inculcate continuous learning habit through all available resources, Lifelong readiness/qualities

Program Specific Outcomes: M.Sc. Chemistry	
PSO 1.	PSO-1: Disciplinary knowledge Demonstrate a comprehensive knowledge of all disciplines.
PSO 2.	PSO-2: Critical thinking To assess and evaluate facts, claims and arguments using their scientific knowledge
PSO 3.	PSO-3: Research-related skills To define a problem, analyse, interpret and draw conclusion by planning, implementing and reporting the results of an experiment.
PSO 4.	PSO-4: Information/digital literacy To access, evaluate and apply a variety of useful sources
PSO 5.	PSO-5: Multicultural competence To participate in multicultural society and communicate the subject knowledge for the betterment of society
PSO 6.	PSO-6: Lifelong learning To acquire knowledge and skills including "Learning how to learn" that are necessary in learning activities throughout life

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Course Outcomes: M.Sc. Analytical Chemistry

Semester I

Class	Course	Outcomes
M. Sc. -I	CHE-501 Physical Chemistry-I	• CO1: Students should be able to remember the concepts of thermodynamic parameters, quantum mechanical postulates, rate laws of chemical reactions and computation of macroscopic properties of matter. • CO2: Students should understand the basics like state function and path function, Schrodinger wave equation, kinetics of fast reactions, partition functions and ensembles. • CO3: Students should be able to apply the knowledge of various quantum mechanical methods to determine the different molecular properties and built the concept of the relation between thermodynamics and quantum mechanics. • CO4: Students should be able to analyze the rates of various chemical reactions both theoretically and experimentally and also observe the effect of catalyst and determine energies of activation of such reactions. • CO5: Students should be able to evaluate variation of thermodynamic parameters for multi component systems and their variation with other extensive properties, Schrodinger wave equation and its application to hydrogen and hydrogen like atoms. • CO6: Students should be able to create the solutions to avoid excess use of energy in chemical reactions by applying their knowledge of thermodynamics and chemical kinetics.
	CHE-502 Inorganic Chemistry-I Section I- Molecular Symmetry and its applications to Inorganic chemistry	• CO-1: Define symmetry elements and symmetry operations, classes, properties of a group, group multiplication table, etc. • CO-2: Classify symmetry elements, point group, Group, sub-group and classes. • CO-3: Use wave function as basis for determination of irreducible representations and the Great Orthogonality theorem and its consequence. • CO-4: Solve problem based on point group, matrix representation and character table • CO-5: Construct character table of various point group • CO-6: Justify which can take part in bonding on the basis of SALCs and point group of molecules.
	CHE-502 Inorganic Chemistry-I Section-II: Chemistry of Main Group Elements	• CO-1: Define electron deficient, electron precise and electron rich species, Pseudohalogens, Oxoacids and Oxidation state. • CO-2: Describe special properties of fluorine, Nitrogen activation, Oxo acids of nitrogen, sulphur and phosphorous, synthesis and structure of xenon fluorides. • CO-3: Explain term metal sulfides, selenides, tellurides, polonide, inter-halogens, Halogen oxides, Graphene, fullerenes and carbon nanotube.

Class	Course	Outcomes
		• CO-4: Determine Oxidation states of nitrogen and their interconversion and application of crown ether in extraction of alkali and alkaline earth metal. • CO-5: Differentiate between diamond and graphite, Pseudohalogens and interhalogens. • CO-6: Classify the hydrides, borides and oxyacids and draw their structure.
	CHEPIA-503 Organic Chemistry-I	• CO1: Understand the concepts of aromaticity, stereochemistry, and oxidation-reduction reactions • CO2: Learn the concepts of stereochemistry. • CO3: Predict the product and mechanism of the reactions. • CO4: Advance knowledge of various stereochemical aspects. • CO5: Apply the concepts of oxidations and reduction to solve the advance problems. • CO6: Develop problem solving ability
	CHE- 504 Physical Chemistry Practical I	• CO1: Students will grasp the concept of reaction rate and its significance in Chemical Kinetics. • CO2: Students will learn how to use experimental data to deduce rate laws and rate constants. • CO3: Students will be familiar with the fundamental principles of colorimetry and spectrophotometry including Beer's law, Lambert- Beer's law and the relationship between absorbance and concentration. • CO4: Students will able to operate the instruments like spectrophotometer and colorimeter. • CO5: Students will be able to determine the densities of the solutions and can calculate molar volumes
	CHE-505 Inorganic Chemistry Practical-I	• CO-1: Prepare solution of required conc. and handle the laboratory equipment properly. • CO-2: Perform experiment accurately and able to perform calculation. • CO-3: Explain experiment and principal of experiment in detail. • CO-4: Perform calculations and discuss results and write conclusions of the experiment. • CO-5: Apply knowledge to a) design experiment for given aim or modify experiment to enhance results. b) to find out lacuna in experimental procedure. • CO-6: Solve problem/ numerical depending on given experimental data / information.
	CHE-506 Organic Chemistry Practical I	• CO1: Understand the theoretical aspects behind separation, purification and synthesis of organic compounds. • CO2: Acquire the experimental skills for separation, purification, identification and synthesis of organic compounds. • CO3: Design experimental set up for performing the organic reactions. • CO4: Monitor the organic reactions. • CO5: Describe the mechanistic aspects of organic reactions. • CO6: Develop problem solving ability.
	CHEPIA-507 (D) Basic Organic Chemistry	• CO1: Understand the concepts of chemical bonding, various structural effects, acids and bases, and types of reactions • CO2: Basic knowledge of aliphatic and aromatic substitutions, elimination and addition reactions • CO3: Understand and identify the types of organic reactions. • CO4: Write the mechanism of aliphatic and aromatic substitutions, elimination and addition reactions and oxidation-reduction reactions

Class	Course	Outcomes
		• CO5: Solve the problems involving multiple steps. • CO6: Develop problem solving ability of the students
	CHE-508 Research methodology	• CO1: Develop a comprehensive understanding of different research methodologies and their applications in mathematics. • CO2: Cultivate critical thinking and analytical skills necessary for identifying research problems and formulating research questions. • CO3: Provide practical experience in designing experiments, collecting and analyzing data, and interpreting research results. • CO4: Foster effective communication skills for presenting research findings orally and in written form. • CO5: Promote ethical research practices and awareness of responsible conduct in mathematical research • CO5; Develop problem solving ability.

Semester-II

Class	Course	Outcomes
MSc-I	CHE- 551 Physical Chemistry-II	• CO1: Remember basic concepts of molecular spectroscopy, selection rules, intensity of spectral lines, radioactive decay and decay kinetics. • CO2: Understand principles and applications of rotational, vibrational, Raman, electronic and Mossbauer spectroscopy. Understand concepts of nuclear and radiation Chemistry. Applications of Radioisotopes • CO3: Apply various spectroscopic techniques for gaining insights into molecular structure • CO4: Analyse vibrating diatomic molecule, simple harmonic and anharmonic oscillator, Scattering of light, Raman Spectrum, interaction of γ radiation with matter and radiation dosimetry. • CO5: Evaluate bond length, vibrational frequency, force constant and dissociation energy using spectral data. • CO6: Able to create theoretical rotational and vibrational spectra of simple molecules. Identify and define various types of nuclear changes or processes including fission, fusion and decay reactions
	CHE-552: Inorganic Chemistry-II SECTION-I: Coordination Chemistry	• CO-1: Define R. S. term, configuration, microstate, paramagnetic, diamagnetic ferromagnetic, antiferromagnetic, Curie and Neel temperature. • CO-2: Identify complex ions showing same R.S. terms, degeneracy of ground state terms of metal ions, and spin multiplicities of different configurations. • CO-3: Interpret electronic spectra for spin allowed Oh and Td complexes using Orgel diagram, Magnetic properties of A, E and T ground terms in complexes and selection rules. • CO-4: Calculate frequencies of absorption spectrum, 10Dq, Racah and nepholauxetic parameter for a complex, and magnetic moments of complexes • CO-5: Construct microstate table for various configuration and prepare correlations diagram and Tanabe-Sugano diagram for various configurations in Td an Oh ligand field. • CO-6: Assess appropriate full spectroscopic terms for various configuration/ion/term.
	CHE-552: Inorganic Chemistry-II	• CO-1: Define metalloproteins, metallo-eznymes, photosynthesis, HSAB concept, nucleic acids, metalloregulation, Biopolymer effects and acetylcholine receptor.

Class	Course	Outcomes
	SECTION-II: Bioinorganic Chemistry	• CO-2 : Explain chelate effect and Irving-William series, pKa values of coordinated ligands, Tuning of redox potential, and Reactions of coordinated ligands. • CO-3: Describe Fe-S clusters, model compounds and spontaneous self-assembly, metals in medicine, blue copper proteins, and cytochromes, and Na/K pumps. • CO-4: Express nitrogen fixation, detoxification of mercury, structure of RNA, cis-platin, amino acids, siderophore,and calmoduline zinc finger proteins. • CO-5: Distinguish between hemoglobin and myoglobin, transferrin and ferritin, photosystem-I and photosystem-II. • CO-6: Decide role of metals in biological system, medicine, blood coagulation, oxygen storage and transport, photosynthesis and uptake and transport of iron
	CHEPIA-553 Organic Chemistry-I I	• CO1: Understand the concepts of molecular rearrangements • CO2: Basic knowledge of Organic Spectroscopy such as UV, IR and NMR. • CO3: Solve the problems based on molecular rearrangement reactions. • CO4: Deduce the structure from the spectral data and justify the findings. • CO5: Apply the concepts of oxidations and reduction to solve the advance problems. • CO6: Develop problem solving ability.
	CHE- 554 Physical Chemistry Practical II	• CO 1: Students will grasp the fundamental principles of Conductometry, Polarography, Potentiometry and pH metry. • CO 2: Students will familiar with the operation of Conductometer, Polarimeter, Potentiometer and pH meter. • CO 3: Students will understand the concepts of conductance, resistance and learn how to calculate and interpret these values. • CO 4: Students will learn to interpret polarographic waves and understand their significance in identifying electroactive species and determining their concentration. • CO 5: Students will explore the applications of Potentiometry in various fields such as acid- base titrations, determination of pH and analysis of ionic concentration
	CHE-555: Inorganic Chemistry Practical-II	• CO1: Define coordination complex, cell constant, resistance, specific conductance, equilibrium constant, absorbance, Beers law, solubility product, chromatography, etc. • CO2: Discuss photochemistry of potassium trioxalatoferrate complex, kinetics of formation of Cr(III)-EDTA, Determination of Cu(II)and Fen(II) by solvent extraction technique. • CO3: Outline the flow-chart for synthesis of [Mn(acac)3], Chloropentaamminecobalt(III) chloride, Nitro pentaamminecobalt(III) chloride, Bis[TrisCu(I)thiourea complexes. • CO4: Estimate purity of the [Mn(acac)3], Chloropentaamminecobalt (III) chloride, Nitro pentaamminecobalt (III) chloride, Bis[TrisCu(I)thiourea complexes. • CO5: Determine equilibrium constant of M–L systems Fe(III)–Sulphosalicylic acid, magnetic susceptibility (χg and χm) of mercury tetracyanato cobalt or Fe(acac) and magnetic susceptibility (χg and χm) of mercury tetracyanato cobalt or Fe(acac). • CO6: Calculate the quantity from observation of the experiments and Interpret the result obtained respective experiments.

Class	Course	Outcomes
	CHE-556 Organic Chemistry Practical II	• CO1: Understand the theoretical concepts behind organic synthesis. • CO2: Acquire the experimental skills for separation, purification, identification and synthesis of organic compounds. • CO3: Design experimental set up for performing the organic reactions. • CO4: Monitor the organic reactions and analyse the products using spectral results. • CO5: Describe the mechanistic aspects of organic reactions. • CO6: Develop problem solving ability.
	CHE-557(A) Organometallic Compounds and Inorganic Reaction	• CO1: Define various terms in organometallic chemistry and inorganic reaction mechanism etc. • CO2: Explain/Discuss various reaction mechanisms such as ligand insertion, inner and outer sphere mechanism, ligand substitution reaction. • CO3: Discuss 1. Structure and bonding in carbonyl and organometallic complexes, 2: Trans effect, 3. Ligand field effects, catalytic cycles, 4. Inert and labile complexes, 5. Synthesis methods of organometallic compounds, etc. • CO4: Apply 18 electron rule. Applications of organometallic compounds and mechanism of these reactions. • CO5: Demonstrate IR spectra of carbonyl complexes, deduce structure of carbonyl complexes • CO6: Justify structures of organometallic compounds from spectral data

Semester III

Class	Course	Outcomes
M. Sc. - II	CHA-390: Electrochemical and Thermogravimetric Methods of Chemical Analysis	• CO1: Define various terms in electrochemistry and thermogravimetry. • CO2: Explain instrumentation in electrochemistry and thermogravimetry • CO3: Describe basic principles of electrochemistry and thermogravimetry
	CHA-391: Analytical Method Development and Extraction Techniques	• CO-1 Define / understand various terms in analytical extraction and method development and validation. • CO-2: Explain instrumentations and methodology in analytical extraction. • CO-3: Explain / describe basic principles of analytical extraction method development and validation.
	CHA-392: Advanced Chromatographic Methods of Analysis	• CO-1: Define / understand various terms in chromatography (GC and HPLC) and mass spectroscopy. • CO-2: Explain instrumentations in chromatography (GC and HPLC) and 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.
	CHA-393: Analysis of Food and Controlled Substances	• CO1: Define / understand various terms in food analysis techniques and methods, forensic science and drug substances. • CO2: Explain methods and principles of analysis of i) Food - carbohydrates, proteins, preservatives, ii) drug substances.

Class	Course	Outcomes
		• CO3: Select appropriate methods of food analysis for its quality.
	CCPP-3: Practical I: Basics of Instrumental Methods of Chemical Analysis	• CO1: Maintain proper record of analytical data in notebook. Observer personal safety in laboratory and able handle all chemicals, instruments, etc safely in laboratory. • CO2: Define / understand various terms involved practical methods of quantitative analysis. • CO3: Explain instrumentations of colorimeter, spectrophotometer, photoflurometer, TGA, HPLC, GC, Flame-photometer, CV, AAS, etc. • CO4: Explain / describe basic principles of chromatography different instrumental methods of analysis. Able to handle particular instrument according to SOP.

Semester-IV

Class	Course	Outcomes
MSc-II	CHA-490: Advanced Analytical Spectroscopic Techniques	• CO1: Define / understand various terms in atomic absorption, atomic emission, fluorescence, ESR and electron spectroscopy. • CO2: Explain instrumentation of atomic absorption, atomic emission, ICPAES, ICPAES-MS, fluorescence, ESR and electron spectroscopy. • CO3: To describe basic principles of atomic absorption, atomic emission, ICPAES, ICPAESMS, fluorescence, ESR and electron spectroscopy. • CO4: Select appropriate methods for sample treatment in AAS / AES, ICPAES, ICPAES-MS.
	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.
	CHA-492: A) Laboratory Automation and Environmental Analytical Chemistry	• CO-1: Define / understand various terms in – i) Laboratory automation and sensors, ii) environmental pollution, analysis water and air. • CO-2: Explain instrumentation of automated laboratory analysis and sensors. • CO-3: To describe basic principles of automated laboratory analysis and sensors. • CO-4: Explain importance of automated laboratory analysis and sensors.
	CHA-492: B) Analytical Chemistry of agriculture, Polymer and Detergents	• CO1: Define / understand various terms in soil analysis, pesticide residue analysis, detergent analysis and polymer analysis. • CO2: Explain / describe techniques / methods of soil analysis, pesticide residue analysis, detergent analysis and polymer analysis. • CO3: To describe basic principles techniques / methods soil analysis, pesticide residue analysis, detergent analysis and polymer analysis.

Class	Course	Outcomes
	CHA-493: A) 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: Perform analysis of sample with described procedure. Able to handle analytical instruments.
	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.

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Department of Physics- Academic Year 2023-24

Program outcome: M.Sc. (Physics)	
1.	PO1: Demonstrate and understanding of principles and theories of physics. These include: Classical Mechanics, Statistical and thermodynamics, atomic and Molecular physics, Communication physics, electrodynamics, electronics, optics, Laser, nuclear physics and quantum mechanics.
2.	PO2: Demonstrate ability to apply knowledge learned in classroom to set and perform simple laboratory experiments
3.	PO3: Solve physics problems using the appropriate methods in mathematical, theoretical and computational physics

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Course Outcomes: M.Sc. Physics

Semester I

Class	Course	Outcome
MSc (Paper-I)	PHY 501 MJ: Mathematical Methods in Physics	• CO1: To understand the concept of the Revision on Vector space: Vectors (dependent and independent), Vector space, Hilbert space, Dimension of vector space, Matrix representation, Similarity transformation, Eigen values and Eigen vectors, Inner product, Orthogonality • CO2: To understand the concept of the Gramm-Schmidt orthogonalization procedure, Self-adjoint and unitary transformation, Eigen values and Eigen vectors of Hermitian and Unitary transformation, Diagonalization • CO3: Explain the Fourier series: Definition, Dirichlet's Condition, Convergence, Fourier Integral and Fourier Transform • CO4: State and Explain convolution theorem • CO5: State and prove Parseval's identity • CO6: Solve numerical problems on Application to the solution of differential equations • CO7: Explain the Laplace transform and its properties, Fourier transform and Laplace transform of Dirac Delta function
MSc (Paper-II)	PHY 502 MJ Statistical Mechanics	• CO1: Describe transport phenomena and compute coefficient of thermal conductivity, viscosity and diffusion in terms of mean free path. • CO2: Define and discuss the concepts and roles of thermodynamic functions from the view point of statistical mechanics. • CO3: Derive Binomial distribution and Gaussian probability distribution using random walk problem and calculate mean values for a statistical system. • CO4: Discuss the concepts of microstate and macro state, basic postulates and behavior of density of states for model system and calculate the number of microstates for different statistical systems. • CO5: Differentiate thermal, mechanical and general interaction between statistical system. • CO6: Derive and compare Maxwell Boltzmann, Bose-Einstein and Fermi-Dirac distributions; state where they are applicable and explain the connection between classical. • CO7: Derive probability distribution formula for micro canonical, canonical ensemble and calculate mean values in canonical ensemble. • CO8: Discuss applications for canonical ensemble.

Class	Course	Outcome
MSc (Paper-III)	PHY 503 MJ: Classical Physics	• CO1: To know the Lagrangian approach in classical mechanics and applications of Lagrangian formulation • CO2: To understand the Hamiltonian approach in classical mechanics and applications • CO3: To know about Variational principle and its applications • CO4: The students will introduce about the newton's laws of motion and knowledge about the applications of newton's laws of motion. • CO5: This paper enables the students to understand the Lagrangian approach in classical mechanics. • CO6: The students should be able to understand Hamiltonian formulation with applications • CO7: The paper also enables the students to know about Variational principle with applications

Semester II

Class	Course	Outcome
MSc (Paper-IV)	PHY 504 MJ: Quantum Physics	• CO1: Utilize the postulates of quantum mechanics to describe quantum systems and determine their properties, including the results of measurements. • CO2: Use operator techniques to solve relevant problems. • CO3: Use the properties of angular momentum and spin to describe quantum systems such as the hydrogen atom and an electron in a magnetic field. • CO4: Use perturbation theory to find approximate solutions to more complex quantum mechanical systems • CO5: Understand various quantum mechanical features by solving various potentials: example, Finite and infinite well, Harmonic oscillator. • CO6: Learn Eigen values and Eigen functions of operators and computation of Clebsch–Gordan coefficients. • CO7: Application of Time-independent and time Dependent perturbation theory. • CO8: Apply the knowledge of Variational Methods for particle in box, Harmonic oscillator and Delta Function along with WKB approximation for classical Region and Tunneling. • CO9: Familiarizing students with the theoretical framework of non-relativistic quantum mechanics and its applications to simple problems.
MSc (Paper-V)	PHY 514 MJP (Elective): Communicatio n Physics	• CO1: Describe the underlying theory of experiments in the course. • CO2: Perform derivations of theoretical models of relevance for the experiments in the course. • CO3: Follow instructions to perform laboratory experiments in Modern Physics, Optical communication and Electronics • CO4: Document their results, using correct procedures and protocols. • CO5: Interpret relationships in graphed data and develop an intuition for alternative plotting methods and communicate results from laboratory experiments, orally

Class	Course	Outcome
		or in a written laboratory report. • CO6: Calculate permissible standard error in any physics experiment • CO7: Derive conclusions from the analysis of own data. • CO8: Assess the language used to describe physics experiments and how it can alter perceptions of the method and results
MSc (Paper-V)	PHY 514 MJ (Elective): Communicatio n Physics	• CO1: To study the basic concepts regarding Digital Communication • CO2: To impart knowledge about Satellite Communication • CO3: Understand Digital Communication. • CO4: Identify Network organization. • CO5: Satellite Communication and their significance • CO6: Apply the knowledge of Digital Communication systems.
MSc (Paper-VI)	PHY 505 MJP: Basic Physics Laboratory-I (BPL-I)	• CO1: Describe the underlying theory of experiments in the course. • CO2: Perform derivations of theoretical models of relevance for the experiments in the course. • CO3: Follow instructions to perform laboratory experiments in Optics, Thermodynamics, Mechanics, Modern Physics, Electronics and Electromagnetics, Laser and Solar energy. • CO4: Document their results, using correct procedures and protocols. • CO5: Perform a quantitative analysis of experimental data including the use of computational and statistical methods where relevant. • CO6: Interpret relationships in graphed data and develop an intuition for alternative plotting methods and communicate results from laboratory experiments, orally or in a written laboratory report. • CO7: Calculate permissible standard error in any physics experiment • CO8: Derive conclusions from the analysis of own data.
MSc (Paper-VII)	PHY 541 MNP (Research Methodology)	• Apply the discrete distributions in real life problem. • Understand the concept of time series with its components. • Understand basics of R environment. • Perform various operations on data in R
MSc (Paper-VII)	PHY 541 MN (Research Methodology)	• Obtain summary statistics of a continuous random variable. • Obtain probability of events related to continuous random variable. • Identify whether variables are independent. • Obtain correlation and regression lines, m.g.f., moments, probabilities for bivariate continuous random variable. • Explain probability distributions, nature of curve, properties of continuous uniform, exponential, normal, gamma distributions and relations between them.
MSc (Paper-VIII)	Cyber Security I	• CO1: To study cyber security laws. • CO2: To study ethical hacking. • CO3: To study cyber security protection. • CO4: To study week /Strong password and password

Class	Course	Outcome
MSc (Paper-IX)	Human Rights I	• CO1: To understand the meaning and concept of vulnerable and this advantage. • CO2:TO understand the socioecomonic and cultural problems of vulnerable and dis advantage group. • CO3: TO understand social status of human and children in national and international level. • CO4: To understand human rights of vulnerable group such as stateless persons, Migrent workers,HIV /AIDS victims

Semester II

Class	Course	Outcome
MSc (Paper-I)	PHY 551 MJ: Solid State Physics	• CO1: Understand characteristic physical properties of different categories of solid materials, with an emphasis on the crystalline state. • CO2: How a wide spectrum of theoretical approaches to model the mechanical, thermal and electrical properties of solid materials. • CO3: Do quantitative calculations based on established theoretical models to describe the properties of materials. • CO4: Use of Fourier Transform methods, including reciprocal space, as an analytical tools to perform and analyze basic diffraction experiments to gain information about atomic scale structures. • CO5: Analyze solid-state problems using mathematical and numerical methods. • CO6: Account for the role of solid-state physics for technology and society as well as links between solid state physics and other main branches of physics.
MSc (Paper-II)	PHY 552 MJ Electrodynamics	• CO1: Define the Biot-savart law, Amperes law, Coulombs law, Electric field, Electric susceptibility, Magnetic field &Faradays law. • CO2: Explain method of electrical images, equation of continuity, Magnetic vector potential, B.H curve, Maxwell's equation &wave equations. • CO3: Solve numerical problem on coulombs force, magnetic induction, magnetic permeability and induced voltage, magnitude of electric &magnetic vectors. • CO4: Determine work done by charges, total charge, force on the wire in different symmetry. • CO5: Summarize pointing vector, polarization, reflection &refraction. • CO6: Apply Biot-Savart law in different symmetry problem. • CO7: List the applications of Amperes law, Biot-Savart law, Poynting theorem. • CO8: Elaborate magnetic properties of the material.
MSc (Paper-III)	PHY 553 MJ: Atomic and Molecular Physics	• CO1: To understand the basic physics concepts of atomic and molecular spectroscopy. • CO2: To impart knowledge about different spectroscopic techniques. • CO3: Understand the interaction of atoms in strong and weak magnetic field. • CO4: Identify the different bonding mechanisms in strong and weak magnetic field. • CO5: Understand different spectroscopic techniques and their significance

Class	Course	Outcome
MSc (Paper-IV)	PHY 554 MJ: Basic Electronics	• CO1: To study the basic knowledge of basic electronics. • CO2: To impart knowledge about latest competent used in appliances. • CO3: Understand power electronic devices and special function ICs • CO4: Apply the knowledge of course in industry
MSc (Paper-V)	PHY 564 MJ (Elective): Laser Physics	• CO1: To study the basic concepts regarding properties and applications of lasers. • CO2: To impart knowledge about identifying the types and its uses in industries. • CO3: Use of knowledge in Laser physics and Laser devices to analyze and quantify complex problems in the field of nanotechnology • CO4: The course will enable students to understand and appreciate the properties, application and their significance of the Lasers materials problem.
MSc (Paper-V)	PHY 564 MJP (Elective): Laser Physics	• CO1: Describe the underlying theory of experiments in the course. • CO2: Perform derivations of theoretical models of relevance for the experiments in the course. • CO3: Follow instructions to perform laboratory experiments in Optics and Lasers. • CO4: Document their results, using correct procedures and protocols. • CO5: Interpret relationships in graphed data and develop an intuition for alternative methods and communicate results from laboratory experiments, orally or in a written laboratory report. • CO6: Calculate permissible standard error in any physics experiment • CO7: Derive conclusions from the analysis of own data. • CO8: Assess the language used to describe physics experiments and how it can alter perceptions of the method and results.
MSc (Paper-VI)	Cyber Security II	• CO1: Overview of cyber security. • CO2: Overview of security threads and vulnerabilities • CO3: To study Crypteogtaphy/ Encraption/ • CO4: To Study security manegments. • CO5: To study server manegment and firewalls
MSc (Paper-VII)	Human Rights I	• CO1: To understand the meaning and concept of vulnerable and this advantage. • CO2:TO understand the socioecomonic and cultural problems of vulnerable and dis advantage group. • CO3: TO understand social status of human and children in national and international level. • CO4: To understand human rights of vulnerable group such as stateless persons, Migrent workers,HIV /AIDS victims

Class	Course	Outcome
MSc (Paper-VIII)	PHY 564 MJ (Elective): Laser Physics	• CO1: To study the basic concepts regarding properties and applications of lasers. • CO2: To impart knowledge about identifying the types and its uses in industries. • CO3: Use of knowledge in Laser physics and Laser devices to analyze and quantify complex problems in the field of nanotechnology • CO4: The course will enable students to understand and appreciate the properties, application and their significance of the Lasers materials problem.

Semester III

Class	Course	Outcome
MSc (Paper-I)	PHCT-231 Statistical Mechanics	• CO1: Describe transport phenomena and compute coefficient of thermal conductivity, viscosity and diffusion in terms of mean free path • CO2: Define and discuss the concepts and roles of thermodynamic functions from the view point of statistical mechanics • CO3: Derive Binomial distribution and Gaussian probability distribution using random walk problem and calculate mean values for a statistical system • CO4: Discuss the concepts of microstate and macro state, basic postulates and behavior of density of states for model system and calculate the number of microstates for different statistical systems • CO5: Differentiate thermal, mechanical and general interaction between statistical system • CO6: Derive and compare Maxwell Boltzmann, Bose-Einstein and Fermi-Dirac distributions; state where they are applicable and explain the connection between Classical • CO7: Derive probability distribution formula for micro canonical, canonical ensemble and calculate mean values in canonical ensemble • CO8: Discuss applications for canonical ensemble.

Class	Course	Outcome
MSc (Paper-II)	PHCT-232 Solid State Physics	• CO1: Understand characteristic physical properties of different categories of solid materials, with an emphasis on the crystalline state. • CO2: How a wide spectrum of theoretical approaches to model the mechanical, thermal and electrical properties of solid materials. • CO3: Do quantitative calculations based on established theoretical models to describe the properties of materials. • CO4: Use of Fourier Transform methods, including reciprocal space, as an analytical tools to perform and analyze basic diffraction experiments to gain information about atomic scale structures. • CO5: Analyze solid-state problems using mathematical and numerical methods. • CO6: Account for the role of solid-state physics for technology and society as well as links between solid state physics and other main branches of physics.
MSc (Paper-III)	PHCT-233 Experimental Techniques in Physics-I	• CO1: Students are able to know signal and signal Analysis. • CO2: Student will able to take measurement errors and analysis. • CO3: Explain the Optical Tweezers (basic principle, force detection and applications). • CO4: what is vacuum? Important and fields applications of vacuum. • CO5: Principles of pumping concept, Types of vacuum pumps: Rotary, Molecular drag, Diffusion, Cryogenic, Getter, Titanium sublimation, Sputter ion, Orbiton. • CO6: Explain Vacuum Measurements and Low Temperature Technique. • CO7: What Vacuum Gauges: Mc Leod, Thermocouple (Pirani), Penning, Hot cathode ionization (triode type), Bayard-Alpert Leak detection, Vacuum system design. • CO8: Discuss the concepts of Low temperatures techniques: Refrigeration principle (including thermos dynamical aspects) and low temperature production techniques (Throttling process)
MSc (Paper-IV)	PHOT 234 H2: Energy Studies-I	• CO1. Students become capable of conducting energy audits and give consultancy in that field. • CO 2. Students can design different types of solar heaters for small domestic as well as large scale community level applications. • CO3. Students acquire skills to implement solar P-V systems at domestic levels as well as for office premises and educational institutions. Students become able to start their own enterprise in net metering. • CO4. Students get ideas and hence become self-employed in the field of design, production, commissioning and implementation of bio-mass energy sources, bio-gas plants, gasifiers, wind mills, hybrid systems etc. • CO5. Students can go for research in the fields of super-capacitors, battery technologies, fuel cells and material synthesis for implementation of these technologies. • CO6. Students become successful entrepreneurs in the energy field. Students strive to make the regions where

Class	Course	Outcome
		they live and work self-sufficient in generating and fulfilling their own energy needs using different energy solutions.
MSc (Paper-IV)	PHOP 234H2: Energy Studies-I	• CO1: To study of Determination of Calorific value of Wood/Cow dung. • CO2: To Study of Optical Properties of selective coatings. • CO3: Determine the I-V and P-V characteristics of PV module with varying intensity of solar radiation. • CO4: To Study of Study of power versus load characteristics of Solar Power Photovoltaic Systems. • CO5: To Study of Study of Series and Parallel Combination of Solar Photovoltaic panels. • CO6: To Study of Study of Solar Collector (Efficiency versus ΔT/I).
MSc (Paper-V)	PHCP-235 Physics Laboratory III	• CO1: Describe the underlying theory of experiments in the course. • CO2: Perform derivations of theoretical models of relevance for the experiments in the course. • CO3: Document their results, using correct procedures and protocols. • CO4: Perform a quantitative analysis of experimental data including the use of computational and statistical methods where relevant. • CO5: Interpret relationships in graphed data and develop an intuition for alternative plotting methods and communicate results from laboratory experiments, orally or in a written laboratory report. • CO6: write a project report with literature review. • CO7: defend the outcome of project work in scientific
MSc (Paper-VI)	Skill Development-I	• CO1: To understand the basic concept of human values. • CO2: To understand the meaning and significance of human rights education. • CO3: To understand the perspectives of rights and duties. • CO4: To understand terminology of various legal instruments. • CO5: To understand the final provision (art30)
MSc (Paper-VII)	Cyber Security III	• CO1: To study cyber security laws. • CO2: To study ethical hacking. • CO3: To study cyber security protection. • CO4: To study week /Strong password and password

Semester IV

Class	Course	Outcome
MSc (Paper-I)	PHCT -241 Nuclear Physics	• CO1: Define threshold voltage, dead time and recovery time in GM counter, threshold energy, nuclear fission, nuclear fusion, critical size, critical mass. • CO2: Determine the basic properties of nucleus. • CO3: Classify nuclear radiations, elementary particles and nuclear states, nuclear detectors. • CO4: Compose baryons and mesons with Quark model.

Class	Course	Outcome
		• CO5: Derive expression for energy of ions and frequency of RF signal in cyclotron, Q- value equation, threshold energy, and decay constant. • CO6: Estimate binding energy from fission • CO7: Justify nuclear reactions using conservation laws • CO8: Explain the different processes by which energetic particles interact with matter, kinematics of various reactors and decay processes.
MSc (Paper-II)	PHCT 242 Experimental Techniques in Physics-II	• CO1: What are Sources of Electromagnetic Radiations and what are Different types of radiations (-rays, X-rays, UV-VIS, IR, microwaves and nuclear) and their sources. • CO2: What are Detectors: -rays, X-rays, UV-VIS, IR, microwaves and nuclear Detectors. • CO3: what are Structural Characterization and Thermal Analysis have been studied like what is x-ray and production of x-rays and its types • CO4: Explain Techniques used for XRD like Laue's method, rotating crystal method, Powder (Debye-Scherrer) method, • CO5: Explain Neutron Diffraction: Principle, Instrumentation and Working • CO6: What is Morphological and Magnetic Characterization have been studied. • CO7: what is Optical Microscopy and electron Microscopy? • CO8: Explain Electron Microscopy: Principle, Instrumentation and Working of Scanning Electron Microscope (SEM), Field Emission Scanning Electron Microscope (FESEM) Advantages over SEM, Transmission Electron Microscope (TEM), Selected Area Electron Diffraction (SAED). • CO9: What is Probe Microscopy and its Principle, Instrumentation and Working of Scanning Tunneling Microscope (STM) and Atomic Force Microscope (AFM) have been explained. • CO10: What is Magnetic Characterization and its Principle, Instrumentation and Working of Vibrating Sample Magnetometer (VSM), Analysis of Hysteresis loop, SQUID Technique: Principle, Instrumentation and Working and Numericals has been studied. • CO11: What is Spectroscopic Analysis and Spectroscopic characterization (principle, instrumentation and working): Infra-Red (IR), Fourier Transform Infra-Red (FTIR), Ultraviolet-Visible (UV-VIS), Diffused Reflectance Spectroscopy (DRS), X-ray Absorption (XPS), Electron Spin Resonance (ESR), Nuclear Magnetic Resonance (NMR). Numerical has been explained.
MSc (Paper-III)	PHOTC2-244: Laser and Applications	• CO1: Explain the interaction of radiation with matter, Quantum behavior of light, thermal equilibrium, and population inversion. • CO2: Illustrate the absorption, spontaneous and stimulated emission with appropriate diagrams. • CO3: Derive the Einstein's relation, conditions for large stimulated emission and light amplification. • CO4: Distinguish between ordinary light and laser light. • CO5: Define the characteristics of laser light.

Class	Course	Outcome
		• CO6: Classify between lifetime broadening, collision and Doppler broadening. • CO7: List the types of lasers. • CO8: Discuss the applications of lasers in various fields.
MSc (Paper-III)	PHOPC2-244: Laser and Applications	• CO1: To determine wavelength of He-Ne laser using grating element. • CO2: To determine wavelength of He-Ne laser using measuring scale. • CO3: To determine spot size of laser using knife edge. • CO4: To determine divergence of laser beam. • CO5: To determine energy and power of laser beam. • CO6: To determine diameter of wire using laser. • CO7: To measure contamination in liquid sample using laser beam. • CO8: Use of laser in optical fiber communication.
MSc (Paper-IV)	PHOT-244 Energy Studies II	• CO1. Students become capable of conducting energy studies. • CO2: Explain the concept of Solar Dryer and Solar Still. • CO2: Explain basic principle of wind energy conversion, Vertical axis wind mills and Horizontal axis wind mills (Performance, Merits and Demerits). • CO3: Explain the application of street light, water pumps, Radio/TV, Small capacity power generation SPV Systems • CO4: To Designing the load estimation, selection of inverters, battery sizing, array sizing. • CO5: Hydrogen Fuel: Importance of Hydrogen as a future fuel, Sources of Hydrogen. Production of Hydrogen by various • methods (Direct electrolysis of water, Direct thermal decomposition of water).
MSc (Paper-IV)	PHOP-244 Energy Studies II	• CO1: To study of determination of overall heat Loss Coefficient in Evacuated Tube Collector. • CO2: To study of determination of overall heat Loss Coefficient in Flat Plate Collector. • CO3: To study of Solar Dryer. • CO4: To Study of Solar Still. • CO5: To Study of Performance Evaluation of Box Type solar cooker. • CO6: To Study of Parabolic Type Solar Cooker. • CO7: To Study of determination of Energy content in wind using anemometer. • CO8: To Study of evaluate the performance of Fresnel lens solar concentrator.
MSc (Paper-V)	Cyber security-IV	• CO1: Overview of cyber security. • CO2: Overview of security threads and vulnerabilities • CO3: To study Cryptography / Encryption / • CO4: To Study security managements.

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Department of Hindi- Academic Year 2023-24

Program outcome: M.A. (Hindi)	
PO 1	छात्रों को आधुनिक काव्य से अवगत कराना I
PO 2	छात्रों को कविता का विकासात्मक अध्ययन कराना।
PO 3	छात्रों में आधुनिक काव्य अध्ययन की दृष्टि विकसित करना।
PO 4	काव्य मूल्यांकन दृष्टि विकसित करना।
PO 5	काव्य-संवेदना एवं शिल्पगत अध्ययन से छात्रों को अवगत करना।
PO 6	छात्रों में काव्य-सर्जन कला का विकास करना। कविता में जिन समस्याओं दिखाना चाहता है उसे समझाना।
PO 7	महाकाव्य तथा खंडकाव्य की जानकारी देना। आधुनिक कवियों का परिचय देना।

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Course Outcomes: M.A. Hindi

Class	Course	Course Outcomes
• M.A. I	• भाषाविज्ञान	• छात्र भाषाविज्ञान के स्वरूप, व्याप्ति और उसकी दिशाओं को समझते है। • समाज भाषाविज्ञान का सामान्य परिचय होता है। • स्वनिम विज्ञान के स्वरूप, वागावयव और उसके कार्यों को समझते है। • स्वन वर्गीकरण, स्वनगुण, स्वनिम परिवर्तन का अध्ययन करते है। • रूपीम विज्ञान के प्रक्रिया,स्वरूप, भेद,प्रकार्य और शाखाओं को समझते है। • पदबंध और उपवाक्य के स्वरूप, भेद को स्पष्ट करते है। • अर्थ विज्ञान के स्वरूप शब्द और अर्थ का संबंध, अर्थ परिवर्तन की दिशाएं और कारण बताते है। • प्रोक्ति विज्ञान के अर्थ, स्वरूप, वर्गीकरण तथा आधार को समझते है। • प्रोक्ति की अशुद्धियों को बताते है।
• M.A. I	• प्राचीन एवं मध्यकालीन काव्य	• छात्र पृथ्वीराज रासो तथा आमिर खुसरो के पद, पहेलियों एवं मुकारियों को समझते है। • कबीर की काव्यकला, भाषा, समन्वय, मानवता को समझते है। • जायसी के पद्मावत, काव्यकला,भाषा,विरह वर्णन,लोकतत्व को समझते है। • सूरदास के भ्रमरगीत, तुलसीदास के रामचरितमानस को आत्मसात तथा विश्लेषण करते है। • मीरा तथा भूषण की काव्यकला, भाषा, नीतितत्व, समन्वय, राष्ट्रप्रेम को समझते है।
• M.A. I	• हिंदी कहानी साहित्य	• छात्र हिंदी कहानी का उद्भव एवं विकास को समझते है। • छात्र प्रेमचंद के समग्र कहानी साहित्य का अध्ययन करता है। • छात्र सत्यवती मलिक के समग्र कहानी साहित्य का अध्ययन करता है। • राजा राधिका रमन प्रसाद सिंह के समग्र कहानी साहित्य का अध्ययन करता है। • फणीश्वरनाथ रेणु के समग्र कहानी साहित्य का अध्ययन करता है। • अज्ञेय के समग्र कहानी साहित्य का अध्ययन करता है। • शेखर जोशी के समग्र कहानी साहित्य का अध्ययन करता है। • ज्ञानरंजन के समग्र कहानी साहित्य का अध्ययन करता है। • कृष्णा सोबती के समग्र कहानी साहित्य का अध्ययन करता है। • मैत्रेयी पुष्पा के समग्र कहानी साहित्य का अध्ययन करता है। • नसीरा शर्मा के समग्र कहानी साहित्य का अध्ययन करता है। • गीतांजलि श्री के समग्र कहानी साहित्य का अध्ययन करता है। • मोहनदास नैमिशराय, जयप्रकाश कर्दम, जैनेन्द्र, अरविन्द मिश्र के समग्र कहानी साहित्य का अध्ययन करता है।
• M.A. I	• हिंदी व्यावहारिक व्याकरण	• छात्र हिंदी शब्द साधन को समझते है। • छात्र हिंदी लिंग, भेद, निर्णय, परिवर्तन, वचन आदि की जानकारी देते है।

Class	Course	Course Outcomes
		• हिंदी कारक के स्वरूप, भेद, विभक्ति आदि को समझते है। • हिंदी सर्वनाम की परिभाषा, भेद आदि को समझते है। • विशेषण, क्रिया, संधि, समास की परिभाषा, भेद, स्वर, व्यंजन भाव आदि को समझते है। • हिंदी व्याकरण को समझते है।
• M.A. I	• हिंदी नाटक और रंगमंच	• भारतीय नाट्य परंपरा को समझते है। • महाराष्ट्र के नाट्य परंपरा को समझते है। • छात्र हिंदी नाटक और रंगमंच तथा उसके स्वरूप एवं संरचना को समझते है। • छात्र हिंदी रंगमंच के विकासक्रम को बताते है। • रंगमंच की विभिन्न शैलियाँ तथा नाटक की भारतीय परंपरा को समझते है। • पारसी थिएटर, मराठी नाट्य परंपरा को समझते है। • नाटक की पाश्चात्य परंपरा को समझते है। • अभिनय, रंगसंकेत, रंगभाषा, ध्वनि योजना, प्रकाश योजना, संगीत योजना आदि को समझते है। • आषाढ का एक दिन नाटक का कथ्यगत अध्ययन, रंगमंचीय अध्ययन तथा तात्विक मूल्यांकन करते है। • काली बर्फ नाटक का रंगमंचीय अध्ययन तथा तात्विक मूल्यांकन करते है।
• M.A. I	• शोध प्रविधि	• शोध के स्वरूप को समझते है। • शोध की विभिन्न परिभाषाएं, उनका विश्लेषण करते है। • शोध के उद्देश्य, शोध की विवेचन पद्धति को समझते है। • शोध के मूलतत्व की जकरी प्राप्त करते है। • शोध के विविध भेद स्पष्ट करते है। • शोध प्रक्रिया को समझते है। • शोध प्रबंध लेखन प्रणाली की जानकारी बताते है। • युनिकोड, पुस्तक समीक्षा, साहित्तिक चोरी का जानकारी प्राप्त होती है।
• M.A. I	• भारतीय एवं पाश्चात्य काव्यशास्त्र	• छात्र भारतीय काव्यशास्त्र का विकासक्रम बताते है। • रस सिद्धांत के स्वरूप, अंग, रस निष्पत्ति के सिद्धांत, साधारणीकरण की अवधारणा को समझते है। • अलंकार सिद्धांत की परिभाषा, स्वरूप, भेद, महत्वों को समझते है। • वक्रोक्ति सिद्धांत की अवधारणा, भेद, ध्वनि सिद्धांत का स्वरूप एवं भेद बताते है। • टी. एस. इलियट का सिद्धांत, परंपरा की परिकल्पना और वैयक्तिक प्रज्ञा, आई. ए. रिचर्ड्स का मूल्य सिद्धांत, सम्प्रेषण सिद्धांत, काव्यभाषा सिद्धांत, व्यवहारिक आलोचना को समझते है।
• M.A. I	• भारतीय लोक साहित्य	• छात्र लोकसाहित्य के स्वरूप को बताते है। • लोकसाहित्य के महत्व को स्पष्ट करते है। • लोकसाहित्य का इतिहास बताते है। • लोकगीत के प्रेरणा स्त्रोत बताते है। • लोकगीतों का परिचय तथा वर्गीकरण करते है। • लोकगाथा का सामान्य परिचय बताते है। • लोककथा का सामान्य परिचय बताते है। • लोकनाट्य का इतिहास बताते है। • महाराष्ट्र के लोकनाट्य का स्वरूप, इतिहास, भेद बताते है।

Class	Course	Course Outcomes
		• प्रकीर्ण लोकसाहित्य को समझते है। • लोकसाहित्य के कलापक्ष को स्पष्ट करते है।
• M.A. I	• हिंदी उपन्यास साहित्य	• छात्र हिंदी उपन्यास साहित्य का विकासक्रम को समझते है। • प्रेमचंद पूर्व युग, प्रेमचंद युग तथा प्रेमचंदोतर युग को समझते है। • स्वर्णमृग उपन्यास के संवेदना एवं शिल्पगत अध्ययन करते है। • भटको नहीं धनंजय उपन्यास के संवेदना एवं शिल्पगत अध्ययन करते है। • धरती धन न अपना उपन्यास के संवेदना एवं शिल्पगत अध्ययन करते है।
• M.A. I	• हिंदी आलोचना	• छात्र हिंदी आलोचना का विकासक्रम को समझते है। • कलावाड का खंडन और लोकमंगल की स्थापना तथा साहित्य के समजशास्त्रीय अध्ययन की आवश्यकता को समझते है। • मनोवैज्ञानिक आलोचना, शैलिवैज्ञानिक आलोचना, सौन्दर्यशास्त्रीय आलोचन, स्वच्छंदतवादी आलोचना का अध्ययन करते है। • हिंदी के प्रमुख आलोचकों का अध्ययन करते है।
• M.A. I	• आधुनिक हिंदी कविता	• छात्र आधुनिक हिंदी कविता के विकासक्रम को समझते है। • समकालीन कविता, नई कविता, अकविता, जनवादी कविता का विश्लेषण करते है। • हरिवंशराय बच्चन, केदारनाथ सिंह, कैलाश वाजपेयी के कविताओं का संवेदना एवं शिल्पगत अध्ययन से परिचित होते है। • ज्ञानेद्रपति, शैल चतुर्वेदी, निर्मल पुतुल, वंदना टेटे के कविताओं का समीक्षात्मक अध्ययन करते है। •
• M.A. I	• ओ. जे. टी.	• छात्र प्रशासनिक कार्यालयों / संस्थाओं में जाकर वहाँ की कार्य पद्धति से परिचित होता है। • छात्र बैंक सेवा कार्यालय से सारी जानकारी प्राप्त करता है। • बीमा कार्यालय और डाकघर की सारी जानकारी प्राप्त करता है। • दूर संचार कार्यालय तथा रेल संचार कार्यालय से अवगत होता है। • व्यावसायिक संस्थाएं / रंगमंच / नाट्य संस्थाएं की सारी जानकारी प्राप्त करता है। • हिंदी प्रचार प्रसार संस्थाएं / अनुवाद केंद्र / मुद्रणालय। पर्यटन विभाग कार्यालय से अवगत होता है। • व्यक्तित्व विकास केंद्र / पत्र-पत्रिकाओं के / केंद्र सरकार के कार्यालय कार्यालय से अवगत होता है। • मीडिया के कार्यालय/आकाशवाणी। प्रिन्ट मीडिया की कार्य पद्धति से परिचित होता है।
• M.A. II	• आधुनिक काव्य (आदर्शवादी, छायावादी तथा अन्य काव्य) •	• आधुनिक काव्य के अध्ययन से खड़ी बोली के विकसित होते रूप को समझ पाएगा। • आदिकाल एवं मध्यकाल के बाद आधुनिक काल तक आते-आते हिंदी साहित्य कविता एवं काव्य लेखन शैली में आए हुए परिवर्तनों को समझ पाएंगे। • मैथलीशरण गुप्त, जयशंकर प्रसाद के काव्य का अध्ययन से महिलाओं की स्थिति एवं उनके योगदान को समझ पाएगा। • तत्कालीन धार्मिक, सामाजिक, राजनीतिक, सांस्कृतिक परिस्थितियों को समझते हुए वर्तमान परिप्रेक्ष्य में समाज के प्रति अपने दायित्व एवं कर्तव्यों को समझने में सक्षम होगा। • कवि द्वारा उपस्थित विविध समस्याओं को समझना।

Class	Course	Course Outcomes
		• बच्चे, गरीबी, दलित, महिला शोषण के बारे में अधिक जानना।
• M.A. II	• भाषाविज्ञान	• भाषा की संरचना को छात्र पहचानना| भाषा की परिभाषा को याद रखना। भाषा की विशषताओ को स्पष्ट करना। भाषा के विविध रूपों को सारणीबद्ध करना। • भाषा के वैज्ञानिक अध्ययन का प्रयोग करना। भाषा के विविध रूपों जाँच करना। भाषा के उच्चारण को व्यवस्थित बनाना। • भाषाविज्ञान का अन्य ज्ञान-विज्ञान की शाखाओं से सबंध जोड़कर विश्लेषण करना। भाषाविज्ञान की शाखाओं के भेद को स्पष्ट करना। वर्णनात्मक भाषाविज्ञान, तुलनात्मक भाषाविज्ञान आदि की व्याख्या करना। भाषाविज्ञान के अंगों तथा भाषाविज्ञान की शाखाओं का आकलन होना। • भाषा के प्रमखु अंग ध्वनि, शब्द, अर्थ,वाक्य और प्रोक्ति से अवगत वर्गीकृत करना। स्वर तथा व्यंजनों को स्पष्ट करना। उच्चारण अवयवों का अनुमान करना। • अर्थ परिवर्तन की दिशाओं को जाँचना। भाषा के वैज्ञानिक अध्ययन की दृष्टि को प्रदर्शित करना। भाषा के अंगों को वर्गीकृत करना। शब्द के अर्थ का सही अनुमान लगाना। • अर्थ परिवर्तन की दिशाओं के निष्कर्ष निकालना। शब्द के भेदों का मूल्यांकन करना। भाषा का मानकीकरण करना। वाक्य के भेदों का परीक्षण करना। • भाषाविज्ञान की नवीन परिभाषा का आविष्कार करना। भाषाविज्ञान के प्रमखु अंगों को निर्दिष्ट करना। अर्थ परिवर्तन की दिशाओं को संशोधित करना। स्वर और व्यंजन आदि के उच्चारण की वैज्ञानिकता और उनके स्थानों को संश्लेषित करना और लिखना। • भाषाविज्ञान की शाखा स्वन विज्ञान, स्वनिम विज्ञान, वाक्य विज्ञान, रूप विज्ञान की जानकारी देना।
• M.A. II	• हिंदी साहित्य का इतिहास	• छात्रों को हिंदी साहित्य के इतिहास से अवगत करना। आदिकाल की पृष्ठभूमि का विश्लेषण करना। रासो साहित्य की विशषताओ को उद्धरत करना। आदिकालीन रचनाकारों का परिचय देकर उनके रचनाओं को सारणीबद्ध कर बताना।
• M.A. II	• संचार माध्यम : सिद्धांत और स्वरूप	• संचार माध्यम और सम्प्रेषण अवधारणाओं का परिचय देना I • संचार माध्यम की अवधारणा और स्वरूप का परिचय देना। • संचार माध्यम की बहुआयामी भूमिका का परिचय देना। • संचार माध्यम कौशल विकसित करना।
• M.A. II	• आधुनिक कविता	• छात्र प्राचीन, मध्यकालीन और आधुनिक कविता के विशेषताएं समझते है। • भारतेन्दु युगीन काव्य शैली से 21 वीं सदी के काव्य साहित्य का परिचय होता है। • नागार्जुन का कविताओं का समीक्षा करते है। • मुक्तिबोध की कविताओं में आए समस्याओं का चित्रण करते है। • अज्ञेय की कविताओं का शिल्पगत अध्ययन करते है। • धर्मवीर भारती की कविताओं का संवेदना एवं शिल्पगत अध्ययन करते है। • आदिवासी कवयित्री निर्मला पुतुल के काव्य में व्यक्त आदिवासियों की समस्याओं का विवेचन करते है। • अनामिका की कविताओं में चित्रित महिला समस्याओं को चित्रित करते है।

Class	Course	Course Outcomes
		• लीलाधर मंडलोई की कविताओं में व्यक्त प्रकृति का चित्रण तथा शिल्पगत अध्ययन करते है। • जयप्रकाश कर्दम की कविताओं में दलित पीड़ा का चित्रण करते है।
• M.A. II	• हिंदी भाषा का विकास	• हिंदी भाषा की एतिहासिक पृष्टभूमि को समझते है। • प्राचीन भारतीय आर्य भाषाओं को स्पष्ट करते है। • मध्यकालीन आर्य भाषाओं की जानकारी प्राप्त होती है। • आधुनिक भारतीय आर्य भाषाओं की समीक्षा करते है। • हिंदी की स्वनिम व्यवस्था को समझते है। • हिंदी ध्वनियों का वर्गीकरण करते है। • हिंदी शब्द रचना को समझते है। • हिंदी की रूप रचना की जानकारी प्राप्त होती है।
• M.A. II	• हिंदी साहित्य का इतिहास (आधुनिक काल)	• हिंदी गद्य की एतिहासिक पृष्टभूमि को समझते है। • भारतेन्दु पूर्व गद्य की जानकारी प्राप्त होती है। • 1857 की क्रांति और सांस्कृतिक पुनर्जागरण की चर्चा करते है। • 19 वी शताब्दी की हिंदी पत्रकारिता जानकारी प्राप्त होती है। • द्विवेदी युग के साहित्य से परिचित होते है। • हिंदी नवजागरण और सरस्वती पत्रिका का ज्ञान होता है। • राष्ट्रीय काव्यधारा के कवियों का परिचय होता है। • स्वच्छंदतावाद और उसके कवियों का अध्ययन होता है। • छायावादी कवि और उनके साहित्य का परिचय होता है। • प्रयोगवाद और नई कविता की विशेषताओं की जानकारी प्राप्त होती है।
• M.A. II	• भारतीय लोकसाहित्य	• छात्र लोकसाहित्य के स्वरूप को बताते है। • लोकसाहित्य के महत्व को स्पष्ट करते है। • लोकसाहित्य का इतिहास बताते है। • लोकगीत के प्रेरणा स्त्रोत बताते है। • लोकगीतों का परिचय तथा वर्गीकरण करते है। • लोकगाथा का सामान्य परिचय बताते है। • लोककथा का सामान्य परिचय बताते है। • लोकनाट्य का इतिहास बताते है। • महाराष्ट्र के लोकनाट्य का स्वरूप, इतिहास, भेद बताते है। • प्रकीर्ण लोकसाहित्य को समझते है। • लोकसाहित्य के कलापक्ष को स्पष्ट करते है।

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