KTSPM'S

HUTATMA RAJGURU MAHAVIDYALAYA

PROGRAMME OUT COME

PROGRAMME SPECIFIC OUT COME

AND

COURSE OUTCOME

FOR ALL COURSES

Faculty of Science

Faculty of Science (B. Sc.)

Students taking admission to this program of B.Sc. are expected to get equipped with following outcomes

- ➢ Elucidating the basic scientific principles and methods.
- ➢ Inculcating scientific thinking and awareness among the student.
- ➢ Ability to communicate with others in regional language and in English.
- ➢ Ability to handle the unexpected situation by critically analyzing the problem.
- ➢ Understanding the issues related to nature and environmental contexts and sustainable development.
- ➢ Imbibed ethical, moral and social values in personal and social life leading to highly cultured and civilized personality.
- ➢ Developed different communication skills such as reading, listening, speaking, etc., which we will help in expressing ideas and views clearly and effectively.

DEPARTMENT OF CHEMISTRY

Programme Outcomes

After completing B.Sc. Chemistry Programme students will be able to

PO1 Transfer and apply the acquired fundamental knowledge of chemistry, including basic concepts and principles of 1) organic chemistry, Inorganic chemistry, Physical and Analytical Chemistry; (2) analytic techniques and experimental methods for chemistry to study different branches of chemistry;

PO2 Demonstrate the ability to explain the importance of the Periodic Table of the Elements and represent key aspects of it and its role in organizing chemical information.

PO3 Plan, execute of design experiment, make documentation of it, interpret data at entry level of chemical industry and report the results;

PO4 Integrate and apply these skills to study different branches of chemistry;

PO5 The student will acquire knowledge effectively by self-study and work independently, present information in a clear, concise and logical manner and apply appropriate analytical and approximation methods;

PO6 The student will learn professionalism, including the ability to work in groups and in society, and apply basic ethical principles.

Programme Specific Outcomes

After completing B. Sc. Chemistry, students will be able to

PSO1 Understand the nature and basic concepts of Physical, Organic and Inorganic chemistry.

PSO2 Analyze Organic and inorganic compounds qualitatively and quantitatively.

PSO3 Understand the applications of physical, organic, inorganic and analytical chemistry in pharmaceutical, agriculture and chemical industries.

PSO4 Able to perform experimental procedures as per laboratory manual in the area of physical, Inorganic and organic chemistry.

PSO5 Interpretation and synthesis of chemical information and data obtained from chemical and instrumental analysis.

Course Outcome
F.Y.B.Sc (Sem-I)
Chemistry paper I Physical and Inorganic Chemistry Term -I

At the end of semester, student should be able to

CO1 Behavior of gases, ideal gas as a model system and its extension to real gases. The dependence of physical state on pressure, volume and temperature is being realized.

CO2 The existence of liquid state, comparison of its properties with other states is to be perceived. Liquid crystal are essentials in all common and research devices and instruments hence they are introduced briefly.

CO3 Student should be able to solve problems regarding van der Waal's and Critical constant and regarding P-V-T relations.

CO4 Theoretical basis of adsorption phenomena is integrated. Understanding dynamic nature of surface and its applications in catalysis and in dispersed phases will lead to new area of nanoscience.

CO5 Mathematical background required for derivations, depictions and problem solving. This chapter strengthens these aspects.

CO6 Mole concept, GMV relationship.

CO7 Student should be able to solve problems based on GMV relationship.

CO8 Normality, Molarity, Normal solution, Molar solution, equivalent weight, ppm, %w/v, %v/v & related problems.

CO9 Standard solution, primary & secondary standard substances, standerdisation of solution & related problems.

CO10   Understand the concept of oxidation & reduction, oxidizing agent, reducing agent, redox reaction, oxidation number, Balance the equation by ion electron method & oxidation number method.

CO11   Calculation of Equivalent weight of oxidant & reductant.

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Course Outcome

F.Y.B.Sc (SEM – I)

PAPER - II ORGANIC & INORGANIC CHEMISTRY
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At the end of semester, student should be able to

CO1 The fundamental concepts which govern the structure, bonding, properties and reactivities of organic molecules such as covalent character, hybridization, bond angles, bond energies, bond polarities and shapes of molecules.

CO2 Drawing of organic molecules and arrow pushing concept.

CO3 Acid-base theories, pKa / pKb values for common organic acids and bases and factors affecting strength of acids and bases.

CO4 Structural effects and their applications in determining strength of acids and bases.

CO5 The common and IUPAC names of alkanes, alkenes, alkynes and homocyclic, polycyclic aromatic hydrocarbons.

CO6 Methods of preparation and chemical reactions of alkanes, alkenes, alkynes and homocyclic, polycyclic aromatic hydrocarbons.

CO7 Application of Huckel's rule to different organic compounds to find out aromatic /non aromatic characters, Skeleton of long form of periodic table.

CO8 Quantum numbers.

CO9 Shells, sub-shells, types of orbital and their shapes.

CO10 Afbau, Paulin's exclusion principle and Hunds rule.

CO11 Block, group, periodic law and periodicity.

CO12 Name, symbol, electronic configuration, trends and properties.

CO13 Crown ether and cryptans.

CO14 Separation of s-block elements with crown ethers.

CO15 Compounds of s-block elements oxides, hydroxides, peroxides and superoxides.

CO16 Application of s-block elements Industrial, biological and agricultural field.

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Course Outcomes

F.Y.B.Sc (Sem-II)
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Chemistry paper I Physical and Inorganic Chemistry

At the end of the semester, student should be able to

CO1 Atom being most important micro particle in construction of matter, modern developments of its structure is presented. The quantization of energy and duality of matter in this context is elaborated. Schrodinger equation is the basis of quantum chemistry that has been introduced for simplest system hydrogen atom.

CO2 Natural changes are understood with the help of second and third laws of thermodynamics. These laws are presented with the help of state function entropy. Entropy changes in various processes and under various conditions have been discussed.

CO3 Basic principle of overlapping of atomic orbital with specific shapes and sizes

CO4 Fundamental concepts of theories of overlapping of atomic orbital's

CO5 Concept of hybridization and differentiation with overlap

CO6 Concept of different types valence shell electron pairs and their contribution in bonding.

CO7 Application of non-bonded lone pairs in shape of molecule

CO8 Basic understanding of geometry and effect of lone pairs with examples.

Course Outcome
F.Y.B.Sc.(SEM-II)
PAPER - II ORGANIC & INORGANIC CHEMISTRY

At the end of semester, student should be able to

CO1 Structure, nomenclature, preparation and reactions of organic compounds.

CO2 The characteristic reactions of each functional group which can be used to identify and distinguish that compound from other compounds.

CO3 Predict the conversion of one functional group into other functional group involving one or more number of steps.

CO4 Conversion of the given compound into other compound containing more or less number of carbon atoms.

CO5 Prediction of possible products when reactants are given. In case there are more than one possible products, identify the major and minor products.

CO6 Suggest the possible reagents to bring about the given conversion.

CO7 Concept of isomerism, types of isomers and representation of organic molecules.

CO8 Conformational isomerism in alkanes with energy profile diagram.

CO9 Concept of geometrical isomerism with E/Z nomenclature.

CO10 Understanding of optical activity, isomer number, tetrahedral carbon atom, concept of chirality, enantiomerism, R/S nomenclature for single chiral centre.

CO11 To write electronic configuration of any element.

CO12 To give reasons for anomolous behavior of first element of IIIA to VII A groups with other elements in the same group.

CO13 To know the exact position p-block elements in the long form of the periodic table.

CO14 To know the allotropes of carbon. v) Basic compounds of boron, aluminum, silicon

CO15 Concept of oxyanions, different than mineral acids, oxyacids of phosphorous & sulphur

CO16 Overlpping of atomic orbitals of halogens, interhalogen compounds

Course Outcome
F.Y.B.Sc
Paper III Chemistry Practical

After completion of practical course student should be able to

CO1 Verify theoretical principles experimentally.

CO2 Interpret the experimental data.

CO3 Improve analytical skills and Correlate the theory and experiments.

CO4 Verify theoretical principles experimentally.

CO5 Acquire skill of crystallisation, record correct m. p. / b. p.

CO6 Perform the complete chemical analysis of the given organic compound and should be able to recognize the type of compound.

CO7 Write balanced equation for all the reactions, they carry in the laboratory.

CO8 Perform the given organic preparation according to the given procedure and the progress of the reaction by using TLC technique.

CO9 Set up the apparatus properly for the given experiments.

CO10 Perform all the activities in the laboratory with neatness and cleanness.

CO11 Verify theoretical principles experimentally.

CO12 Interpret the experimental data.

CO13 Improve analytical skills.

CO14 Maintaining records of quantitative and qualitative analysis.

CO15 Laboratory skills for the purpose of collecting, interpreting, analysing, and reporting (in written form) chemical data.

CO16 Mole concept and its application in the preparation of normal and molar solutions.

CO17   Prepare a various inorganic complexes and determine its % purity.

CO18 Study the gravimetric and volumetric analysis of ores and alloy.

CO19 To study binary mixture with removal of borate and phosphate. To understand the chromatographic techniques

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Course Outcomes

S.Y.B.Sc (Sem-I)

Physical & Analytical Chemistry (Paper-I)

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By the end of this course, the student should be able to

CO1   Thermodynamics & chemical kinetics , rate of reaction , molecularity & order of the reaction ,integrated rate law expression, factors affecting rate of reaction.

CO2 Difference between thermal & Photochemical reaction ,Laws of photochemistry & Photophysical process

CO3 Distribution Law, Nernst distribution law, its proof & application.

CO4 Chemical analysis & its application, Sampling, types of analysis, common techniques.

CO5 Error, accuracy, precision, significant figures & computations, reliability of results.

CO6 Inorganic Qualitative Analysis, Detection of acidic & basic radicals, removal of phosphate & borate.

CO7 Analysis of organic compounds.

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Course outcome

S.Y.B.Sc (Sem-I)

CH-212 Paper-II Organic and Inorganic Chemistry

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By the end of this course students will able to

CO1   Identify chiral centre in the given organic compounds, Define erythro threo meso diasteroisomers , R/S configuration in compound containing two chiral centers.

CO2   Bayers strain theory, heat of combustion relates stability of   cycloalkanes , Stability cyclohexane, the structure of boat and chair configuration of cyclohexane.

CO3   Draw the axial and equatorial bonds in cyclohexane, Draw structure of conformations of mono and disubstituted cyclohexanes.

CO4   Define and classify heterocyclic compounds, use Hukel rule to predict   aromaticity, predict product.

CO5   Difference between ore and minerals, calcinations roasting and smelting.

CO6   Different method for separation of gangue or matrix for metallic compounds, smelting and flux, difference between properties of pig iron and wrought iron.

CO7   Basic principles of different methods of preparation of steel, merits and demerits of different methods.

CO8 Corrosion types of corrosion, mechanism of corrosion factors affecting of corrosion passivity galvanizing tinning electroplating from corrosion.

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Course Outcomes

S.Y.B.Sc (Sem-II)

Physical & Analytical Chemistry (Paper-I)

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By the end of this course, the student will able to

CO1 State function, thermodynamics, Helmholtz free energy & its significance, Gibb's free energy & its significance ,free energy change for an ideal gas, standard free energy change ,Gibb's-Helmholtz equation, physical equilibrium, Application of Clausius- Clapeyron equation.

CO2 Types of solution, ideal solution, Rault's law, ideal & non-ideal solutions, Henry's law, azeotropes , partially immiscible liquids.

CO3 Methods of expressing concentration, primary & secondary standard solutions, apparatus & their calibration, Instrumental & non-instrumental analysis –principles & types.

CO4 Indicators –theory of indicators, acid base indicators, mixed & universal indicators ,Acid-Base titrations, Redox titrations, EDTA titrations, choice of indicators .

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Course outcome (Sem-II)

S.Y.B.Sc (Sem-II)

CH-222 Paper-II Organic and Inorganic Chemistry

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By the end of this course students will able to

CO1 Concept of different reagents used in the one type of conversion, Merits & demerits of different reagents, Reagent based mechanisms, Use of different hydrogen donors for hydrogenation.

CO2 Define and classify heterocyclic compounds. Use Huckel rule to predict aromaticity,synthetic route for preparation of various heterocyclic compounds.

CO3 Different bimolecular, the role of biochemistry, importance of biochemistry, Fischer projection and perspective formula, Killani Fischer synthesis.

CO4 Position of d-block elements in periodic table, general electronic configuration & electronic configuration of elements periodic properties of these elements.

CO5   M-C bond and to define organometallic compounds, organometallic chemistry, multiple bonding due to CO ligand, methods of synthesis of binary metal carbonyls,18 electron rule.

CO6   Define acids and bases according to Arrhenius theory Lowery Bronsted concept, Lewis concept, define the conjugate acid and base pairs, oxyacids, define hard and soft acids, the strength of hydra and oxyacids.

CO7   Toxic chemical in the environment, To know the impact of toxic chemicals on enzyme, the biochemical effect of Arsenic, Cd, Pb, Hg, biological methylation.

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Course Outcome

S.Y.B.Sc

Chemistry Practical Pepar III

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After completion of practical course student should be able to

CO1 Verify theoretical principles experimentally.

CO2 Interpret the experimental data.

CO3 Improve analytical skills. Correlate the theory and experiments.

CO4 Verify theoretical principles experimentally.

CO5 Acquire skill of crystallisation, record correct m. p. / b. p.

CO6 Perform the complete chemical analysis of the given organic compound and   should be able to recognize the type of compound.

CO7 Write balanced equation for all the reactions, they carry in the laboratory.

CO8 Perform the given organic preparation according to the given procedure. The progress of the reaction by using TLC technique.

CO9 Set up the apparatus properly for the given experiments.

CO10 Perform all the activities in the laboratory with neatness and cleanness.

CO11 Verify theoretical principles experimentally.

CO12 Interpret the experimental data.

CO13 Improve analytical skills.

CO14 Correlate the theory and experiments and understand their importance.

CO15 Prepare a various inorganic complexes and determine its % purity.

CO16 To study binary mixture with removal of borate and phosphate. To understand the chromatographic techniques.

Course outcome T. Y. B. Sc.

CH-331 Physical chemistry, Sem.-III

At the end of course students will able to

CO1 Define / recall various terms related to electrolytic conductance, molecular spectroscopy, chemical kinetics and phase diagram.

CO2 Write correct equation such as Ohms law, equivalent conductance, molar conductance, rate constant of first, second, third order reactions, Kohlarch law, Debye equation, transport number, molar polarization, force constant, energy of rotational, vibrational excitations, etc.

CO3 Derive equations for half-life of third order reaction, rate constant of third order reaction, transport number, dipole moment, molar polarization, reduced mass of diatomic molecule, etc.

CO4 Explain / describe various terms in electrolytic conductance, molecular spectroscopy, chemical kinetics and phase diagram. To derive relations between / among various terms / quantities in electrolytic conductance, molecular spectroscopy, chemical kinetics and phase diagram.

CO5 Differentiate between / among the terms / quantities with suitable example such as molecularity and order of reaction, conductance and resistance, equivalent and molar conductance, rotational and vibrational spectra, etc.

CO6 Apply his knowledge to explain / interpret spectra of simple diatomic molecule.

CO7 Describe facts and observations in electrolytic conductance, molecular spectroscopy, chemical kinetics and phase diagram.

CO8 Solve numerical related to electrolytic conductance, molecular spectroscopy, chemical kinetics and phase diagram.

Course Outcomes
T.Y.B.Sc (Sem-III)
Paper II Inorganic Chemistry

At the end of semester, student should able to

CO1   Know the theories of covalent bond formation.

CO2   Know the assumptions and limitations of VBT, Understand the need of concept of MOT.

CO3   Understand and show the formation of bonding and antibonding MO's

CO4   Draw the shapes of s, p, d orbital.

CO5   Give the comparison of a) Atomic orbital and molecular orbital b) BMO and ABMO c) Sigma and pi MO's d) VBT and MOT e) Comparison between BMO, ABMO and NBMO.

CO6   Draw the MO energy level diagrams for homonuclear diatomic molecules having interactions between 2s and 2p orbitals and having no interactions between 2s and 2p orbitals $H2$, H_2^+, He^{2+}, Li_2, Be_2, B_2, C_2, N_2, O_2, O_2^+, O^{2-}, O_2^{2-}, F_2, Ne_2. Draw the shapes of molecular orbitals.

CO7   Give the calculations of bond order, energy and explanation on stability of the above molecule and ions.

CO8   Draw the MO energy level diagrams for heteronuclear diatomic molecules CO, NO, HCl, HF and calculations of bond order, energy and explain the stability of the molecules.

CO9   Meaning of various terms involved in coordination chemistry, stereoisomerism in complexes with C.N. 4 and C. N. 6.

CO10   Explain structure and magnetic behavior of the complexes, identify the high spin and low spin complexes, Choose the correct geometry for complexes with C.N. 4 and C.N. 6 with the help of stereoisomerism.

CO11   Be able to draw crystal filled splitting diagrams of d orbital of metal ion in octahedral, tetrahedral, square planer of tetragonal ligand field. xxx. Interpret the spectra of complexes and calculate the 10 Dq.

Course Outcomes

T.Y.B.Sc (Sem-III)

CH -333 Paper III Organic chemistry

By the end of this course, students should be able to

CO1 Definition of organic acid and bases, factors affecting on strength of acids and bases. Know the concepts of pKa and pKb. Acid-base catalysis

CO2 Draw different types of disubstituted cyclohexane in chair form. Find out the stability, energy calculations with potential energy diagram and optical activity of these conformers.

CO3 Definitions of nucleophiles and leaving groups. Types of nucleophilic substitution reaction. The kinetics, mechanism and stereochemistry of SN1 and SN2 reaction. Comparison between SN1 and SN2 reaction.

CO4 Different Types of carbon-carbon unsaturated compounds. Orientation/rules in addition reactions. Mechanism of addition reaction. Reactivity of carbonyl compounds.

CO5 Definition and types of elimination reaction. Statement of Hoffmann and Saytzeff rule. Concept of good leaving and bad leaving group. The effect of structure, attacking and leaving group on reactivity of E1, E2 and E1cB reaction.

CO6 Types of aromatic substitution reactions. Classification of directing groups. Mechanism of aromatic electrophilic substitution reactions.

Course Outcome

T.Y.B.Sc (Sem-III)

CH -334 Paper IV Analytical Chemistry

By the end of this course students should be able to

CO1   Definition of Gravimetric analysis, Common ion effect, Solubility and Solubility product. Homogenous solution, Co-precipitation, Post-precipitation, Electrogravimetric Electrolytic separations of Cu and Ni,

CO2 Definition of Thermal analysis, TGA and DTA, instrumentation and applications, factors affecting the thermal analysis,

CO3 Definitions of Electromagnetic spectrum, Lamberts law, Beer law, Lambert-Beer law, Terminology involved in spectrophotometric analysis, , Instrumentation of single and double beam spectrophotometer, Spectrophotometric Titrations, Applications-Structure of organic compounds, Structure of complexes.

CO4 Definition of Polarography. Principles of polarographic analysis, Instrument and working of polarographic apparatusPolarogram and chemical analysis, Factors affecting polarographic wave, Quantitative Applications.

CO5 Definition of atomic absorption spectroscopy, single beam atomic absorption Spectrophotometer, Spectral and Chemical Interferences, Qualitative and Quantitative Applications of AAS.

CO6   Definition of atomic emission spectroscopy, Instrumentation of single beam flame emission spectrophotometer, Interferences in emission spectroscopy, Methods of analysis- calibration curve method, Standard addition method, Qualitative and Quantitative Analysis.

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Course Outcome

T.Y.B.Sc (Sem-III)

CH-335 Industrial chemistry

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By the end of this Course students should be able to

CO1 Know the role of industrial chemistry and its potential in life.

CO2 Understand the basic requirement for chemical industry and basic terms such as unit operation, unit process, chemical production, quality control, quality assurance.

CO3 Understand scope of agrochemicals, its synthesis and applications.

CO4 List of fertilizers, manures, herbicides, pesticides, insecticides and fungicides.

CO5 Understand manufacture of basic chemicals like Ammonia, Sulphuric acid and Nitric acid, it's flow sheet and Physico-chemical principles.

CO6 Know the petrochemicals and Eco-friendly fuels.

CO7 Classification and applications of fuel and Eco- friendly fuel.

CO8 Understand scope of food and starch industry and different terms related to starch and food industry like food additive, Enhancers and so on.

CO9 Know the different glasses and physical, chemical properties and importance.

CO10 Have the knowledge of various types of cement and different terms related to cement industry.

Course Outcome

T.Y.B.Sc (Sem-III)

CH 336E Chemistry (Paper-VI) Agriculture

By the end of this course students should be able to

CO1 Know the role of agriculture chemistry and its potential.

CO2 Understand the basic concepts of soli and terms involved in soil chemistry, properties of soil and its classification on the basis of pH, soil solution, soil reaction and ion exchange.

CO3 Identify the problematic soil and recommend method for their reclamation, Objective of soil testing, and method of soil testing.

CO4 List of fertilizers, manures, herbicides, pesticides, insecticides and fungicides.

CO5 Explain properties of soil, impurities in water, effect of environmental condition on nutrient uptake, roll of fertilizers and effect of different types of plant protecting chemicals.

CO6 Determine quality of irrigation water in terms of ppm meq/lit, epm, TSS, SAR, ESP and RSC.

CO7 Classification of soils, plant nutrients, herbicides, pesticides, insecticides and fungicides.

CO8 Analyze different types of impurities present in irrigation and drinking water.

CO9 Select appropriate fertilizer, which would be more suitable for cultivation of different variety of crop with, improve yield.

CO11 Know the different plant nutrients, their functions and deficiency symptoms.

CO12 Have the knowledge of various pesticides, insecticides, fungicides and herbicide

Course Outcome

CH-341 Physical chemistry, Sem.-II,

At the end of course students will able to

CO1   Define / recall various terms related to electrochemistry, nuclear chemistry and application of radioactivity, crystallography and basics of quantum chemistry.

CO2   Write / remember the correct equation such as Nernest equation, representation of cell and cell reactions, Bragg equation, half of radioactive materials, etc.

CO3   Derive equations for potentials of various types of cells and electrodes, Bragg equation, half of radioactive materials, kinetics of decay of radioactive materials, particle in 1D box, quantum tunneling, etc.

CO4   Explain / describe various terms related to electrochemistry, nuclear chemistry and application of radioactivity, crystallography and basics of quantum chemistry.

CO5   Derive relations between / among various terms / quantities related to electrochemistry, nuclear chemistry and application of radioactivity, crystallography and basics of quantum chemistry.

CO6   Apply his knowledge to explain experimental observation and should able to correlate theory and particle or observed facts.

CO7   Describe facts and observations related to electrochemistry, nuclear chemistry and application of radioactivity, crystallography and basics of quantum chemistry.

CO8   Solve numerical in in electrolytic conductance, molecular spectroscopy, chemical kinetics and phase diagram.

Course Outcomes
T.Y.B.Sc Sem-IV
Paper II Inorganic Chemistry

At the end of semester, student should be able to

CO1 The meaning of term f-block elements, Inner transition elements, lanthanides, actinides. Electronic configuration of lanthanides and actinides.

CO2 Transuranic elements, Preparation methods of transuranic elements, Nuclear fuels and their applications, IUPAC nomenclature for super heavy elements with atomic no. 100 onwards.

CO3 The difference between metal, semiconductor and insulator, Metallic bond on the basis of band theory, The energy band and energy curve, Draw n (E) & N (E) curves.

CO4 The difference between Na, Mg, and Al in terms of valence electrons and conductivity.

CO5 Know the crystal structures of solids, Draw the simple cubic, BCC and FCC structures, Identify the C.N. of an ion in ionic solid.

CO6 Homogeneous catalysis, give examples of homogeneous catalysts, Understand the essential properties of homogeneous catalysts-Give the catalytic reactions for Wilkinson's Catalysis, Zeigler Natta Catalysis, Monsanto acetic acid synthesis.

CO7 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.

Course Outcomes

T.Y.B.Sc Sem. IV

CH-343 Paper III Organic chemistry

By the end of this course students should be able to

CO1 Definition of carbanions. Methods for formation of carbanions. Mechanism of reactions involving carbanions. Definition of ylides and application in organic synthesis.

CO2 Definition of terms Disconnection, Synthons, Synthetic equivalence, functional group interconversion, Target molecule. Retrosynthesis of one functional group.

CO3 Definition of rearrangement reaction. Types of intermediate in rearrangement reactions. Mechanism of Hofmann, Beckmann, Bayer-Villiger, Pinacol-pincolone, Curtis, Favorski and Claisen rearrangement.

CO4 Meaning of spectroscopy and various terms used in spectroscopy, regions of electromagnetic radiations.

CO5 Beer's Law, Types of electronic excitations, Terms used in UV spectroscopy, Effect of conjugation on UV band. Calculation of λmax for dienes and enone systems.

CO6 IR spectroscopy, Calculation of fundamental modes of vibrations for liner and non-linear molecule. Factors affecting on IR frequencies. Determination of structure of compounds using IR spectrum.

CO7 Principle of PMR. Terminology used in PMR spectroscopy. Explain the Coupling constant and distinguish the compounds using PMR.

CO8 Meaning of terpenoids and alkaloids. Chemical methods for determination of structure. Isolation of natural products. Synthesis of Citral and Ephedrin.

Course Outcomes

T.Y.B.Sc Sem. IV

CH -344 Paper IV Analytical Chemistry

By the end of this course students should be able to

CO1 Definition of Distribution coefficient, distribution ratio, factors affecting solvent extraction, percentage extracted, separation factor, batch extraction, counter current extraction.

CO2 Definition of Chromatography, classification of chromatographic methods, Theoretical plates and column efficiency, Principle, technique and applications of-Column Chromatography, Ion exchange Chromatography, Thin layer Chromatography, Paper Chromatography.

CO3 Principle of GSC and GLC, Instrumentation of Gas chromatography, qualitative-quantitative analysis.

CO4 Definition of High Performance Liquid Chromatography, Instrumentation and working of HPLC, Applications of HPLC.

CO5 Definition of Electrophoresis, Principle of electrophoresis, types of electrophoresis techniques, Applications of electrophoresis.

CO6 Principles of Nephelometry and Turbidimetry, Choice between Nephelometry and Turbidimetry, Factors affecting Nephelometric and Turbidimetric measurements.

Course Outcome

T.Y.B.Sc Sem. IV

CH -335 Industrial chemistry

By the end of this course students should be able to

CO1 Know the role of polymer chemistry in daily life.

CO2 Understand the basic concepts for polymer industry ,commercial polymer , resin and it's importance.

CO3 Understand scope of agro based industry like sugar. Manufacture and flow sheet for sugar industry and by product of sugar industry, how it is related to fermentation industry.

CO4 Understand manufacture of industrial alcohol, wine, beer, whisky, rum, power alcohol and it's importance.

CO5 Know basic raw material for soap, detergents and cosmetics and basic terms and uses.

CO6 Classification of dyes, paints, pigments and it' properties, structure and applications.

CO7 Understand basic concepts of pharmaceutical industry, drug action ,synthesis and uses of different drugs.

CO8 Know the different terms like antibiotics, anti-inflammatory, anti –viral.

CO9 Have the knowledge of pollution preservation and waste management.

Course Outcomes

T.Y.B.Sc Sem. IV

CH 346E Dairy Chemistry (Paper-VI)

By the end of this course, the student should be able to

CO1 Definitions of market milks, special milks, milk protein, carbohydrates, vitamins, died milk, butter, cheese, enzymes and adulterants in milk.

CO2 Major and minor constituent of milk, properties of milk constituents and factors affecting on composition of milk.

CO3 Cream and methods for cream separation, pasteurization and its objective, methods for pasteurization, standards for pasteurization of milk.

CO4 Discuss about common dairy products, special milks, milk protein, carbohydrates and vitamins, adulterants in milk, cream, butter, cheese and dried milk.

CO5 Explain properties of market milks, common dairy products, special milks, milk protein, carbohydrates and vitamins, cream, butter, cheese and dried milk products.

CO6 Know about common dairy products.

CO7 Analyze different types of adulterations in milk, milk products and dried milk powders

Course Outcomes

T.Y.B.Sc

CH-348 Practical Paper-I, Physical Chemistry Practical

CO1 Student are trained to different instrumental technique in physical chemistry like, pH metry, colorimeter, conductometry, potentiometry etc.

CO2 Student are made aware of safety technique & handling of chemicals.

CO3 Students are made aware different types of technique are used to determine viscosity, partial molar volume, and rate of reactions.

CO4 This practical course is designed to understand the various techniques in physical chemistry.

Course Outcomes

T.Y.B.Sc

CH-348 Practical Paper-II, Inorganic Chemistry Practical

By the end of this course students will able to

CO1 Maintaining records of quantitative and qualitative analysis.

CO2 Laboratory skills for the purpose of collecting, interpreting, analysing, and reporting (in written form) chemical data.

CO3   Mole concept and its application in the preparation of normal and molar solutions, and use of mole concept in quantitative calculations for inorganic analysis.

CO4   Prepare a various inorganic complexes and determine its % purity

CO5   Study the gravimetric and volumetric analysis of ores and alloy.

CO6   To study binary mixture with removal of borate and phosphate.

CO7   To understand the chromatographic techniques.

Course Outcomes

T.Y.B.Sc

CH -333 Paper III Organic chemistry Practicals

By the end of this course students will able to

CO1 Qualitative & Quantitative analysis of organic compounds

CO2 To determine nature, type of the mixture. Separation of mixture into two components. Purification of compounds & to find out functional group of two components.

CO3 Identification of copound is Aliphatic or Aromatic , Saturated or Unsaturated.

CO4 Estimation of different compounds given

CO5   Preparation of complexes , Purification of Complex.

CO6 TLC plate preparation, To calculate Rf values.

CO7 Identification of components.

CO8 To develop laboratory skill for analysis of different compounds.

Program Outcomes Physics

PO1   The T. Y. B. Sc., students learn most of the science concepts.

PO2   The students perform the practicals and hence students can apply practical knowledge.

PO3   The knowledge gained by T. Y. B. Sc. students can be beneficial in their future studies and jobs.

PO4   The T. Y. B. Sc. students may do the research in specific branch.

Specific Program Outcomes

(Physics)

Specific Program Outcomes

PSO1   After completion of T. Y. B. Sc.(Physics), students learn about different branches in physics like classical mechanics, quantum mechanics, electrodynamics , nuclear physics, electronics, thermodynamics and statistical physics, solid state physics, mathematical methods in physics, atomic and molecular physics, laser, renewable energy sources etc.

PSO2   The students understand and perform practical's on surface tension, viscosity, modulii of elasticity, computer interfacing , optics, thermodynamics, electronics, C-programming , lasers etc.

PSO3   The projects performed by the students can be beneficial in their future studies and jobs.

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Class- F. Y. B. Sc.

Semester 1 Mechanics and Properties of matter

Subject- Physics Paper PH-111 (Mechanics and Properties of matter)

Course Outcomes -

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CO1   Understand the basic Newton's laws of motion and its applications.

CO2   Understand the basic concepts of the work done, Potential energy etc.

CO3   Understanding of basic terms of viscosity, Bernoulli's Theorem and its applications.

CO4   Understand the stress, strain, Hooke's law etc.

CO5   Basic knowledge of the Young's Modulus, Bulk modulus, Modulus of rigidity.

CO6   Aware about the problem solving.

<div align="center">

Class- F. Y. B. Sc.

Semester 1 Physics Principles and Applications

Subject- Physics Paper PH-112 (Physics Principles and Applications)

Course Outcomes -

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CO1   Understand the basic structure of atom and spectrum of hydrogen atom.

CO2   Understand LASER and its properties.

CO3   Understand bonding mechanism of molecules and its types.

CO4   Understand the Electromagnetic waves and its spectrum.

CO5   Understand the applications of EM waves.

CO6   Develop problem solving skills.

<div align="center">

Class- F. Y. B. Sc.

Semester 1 Practical Paper

Subject- Physics Paper PHY-113 (Practical Paper)

Course Outcomes-

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CO1   Understand the basic Knowledge of Vernier caliper, micro screw gauge.

CO2   Study of Young's Modulus, Modulus of rigidity.

CO3   Students know about the Poisson's ratio.

CO4   Students know about practical Knowledge of LASER.

CO5   Students know about IV characteristics of solar cell.

<p align="center">Class- F. Y. B. Sc.</p>

<p align="center">Semester 2 Heat and Thermodynamics</p>

<p align="center">Subject- Physics Paper PH-121 (Heat and Thermodynamics)</p>

<p align="center">Course Outcomes -</p>

CO1   Understand the Zeroth of thermodynamics, equation of state, Van der waal's equation.

CO2   Understand the Thermodynamic processes such as Adiabatic, Isothermal, Isobaric and Isochoric processes and its applications.

CO3   Students know about First and second law of thermodynamics.

CO4   Understand the Cornot Cycle and its efficiency

CO5   Knowledge about otto engine and diesel engine and its applications.

CO6   Basic knowledge about various thermometers such as gas filled thermometers, bimetallic thermometers, Platinum resistance thermometer etc.

<p align="center">Class- F. Y. B. Sc.</p>

<p align="center">Semester 2 Electricity and Magnetism</p>

<p align="center">Subject- Physics Paper PH-122 (Electricity and Magnetism)</p>

<p align="center">Course Outcomes-</p>

CO1   Understand the basic concept of the electric force, electric field and electric potential etc.

CO2   Understand Coulomb's law and Gauss's law and its applications.

CO3   Understand Biot-Savart and Ampere's Circuital laws and its applications for problem solving.

CO4   Understand Diamagnetic materials, Paramagnetic materials, Ferromagnetic materials and Antiferromagnetic materials.

CO5   Problem solving ability for Electricity and Magnetism.

<p align="center">Class- F. Y. B. Sc.</p>

<p align="center">Semester 2 Electricity and Magnetism</p>

<p align="center">Subject- Physics Paper PHY-123 (Practical Paper)</p>

<p align="center">Course Outcomes-</p>

CO1   Understand the concept of temperature coefficient using thermistor and thermal conductivity using Lee's method,

CO2   Obtain the specific heat of Graphite.

CO3   Students know how to calculate the solar constant.

CO4   Basic knowledge of charging and discharging of capacitor.

CO5   Understand LR, LCR Circuits.

CO6   Students know about Kirchhoff's laws and its applications

S.Y.B.Sc.

Physics (Sem- I Paper –I)

Course Code and Title PH-211 Mathematical Methods in Physics I

Course Outcomes

CO1   Understand the basic knowledge of the mathematics such as trigonometric functions, exponential functions etc.

CO2   Understand the concept of partial differentiation.

CO3   Students know the dot product cross product, scalar triple product, Vector triple product etc.

CO4   Students also understand the divergence, gradient, curl concepts etc.

CO5   Solve the problems on each and every topic.

S.Y.B. Sc.

Physics (Sem- I Paper –II)

Course Code and Title PH-212 Electronics

Course Outcomes

CO1   Understanding of Kirchhoff's laws and Thevinin's & Norton's theorems, maximum power transfer theorem.

CO2   Learning of construction, working and applications of BJT and UJT.

CO3   Understanding Operational amplifiers and applications.

CO4   Understanding concept of Oscillators.

| CO5 | Learning basics of power supply and regulators. |
| CO6 | Learning of number systems, logic gates and De Morgan's theorems. |

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Class- S. Y. B. Sc.

S.Y.B.Sc. Physics (Sem- II Paper –I)

Subject- Physics Paper PH-221 (Oscillations, Waves and Sound)

Course Outcomes

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CO1	To understand the Oscillations types according to variations of amplitude, velocity and frequency.
CO2	To study the Energy and quality of oscillations.
CO3	To understand the electrical oscillations and applications of oscillations.
CO4	To understand the types and formation of waves, energy of wave.
CO5	To understand the Doppler Effect and its applications.
CO6	To understand properties of sound.
CO7	To demonstrate problem solving skills in all covered topic.

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Class- S. Y. B. Sc.

S.Y.B.Sc. Physics (Sem- II Paper –II)

Subject- Physics Paper PH-222 (Optics)

Course Outcomes

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CO1	Students get the knowledge of lenses and aberration in lenses.
CO2	Students also understand about optical instruments such as simple microscope, compound microscope, Ramdens eyepiece, Huygens eyepiece etc.
CO3	Understand the difference between interference and diffraction ,types of diffractions , Newton's rings etc.
CO4	Understand the basic concepts of the polarization, law of Malus, Brewster's law Nicol Prism etc.

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S.Y.B. Sc.

Physics (Paper –III)

Practical Course Code and Title PH-223

Course Outcomes

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| CO1 | Student can get technical knowledge laboratory instruments. |

CO2 Drawing of graphs and analysis from graphs

CO3 Analysis from calculations and get the expected results.

CO4 Students understand the basic concepts and get knowledge

CO5 Student can get experimental knowledge.

T. Y. B. Sc. (Physics)

Course code and title PH-331(Sem III)

Title Mathematical Methods in Physics II

Course Outcomes

CO1 Understand the Cartesian, Spherical, Cylindrical co ordinate system, Orthogonal Curvilinear co-ordinate system etc.

CO2 Students know about Newtonian theory of relativity, Galilean transformation equation.

CO3 Understand the Michelon Morley Experiment and energy mass relation.

CO4 Students know about differential equations, Bessel's differential equations, Hermite differential equations etc.

CO5 Understand the concepts of Legendre, Hermite Polynomials and concept of orthogonality.

T. Y. B. Sc. (Physics)

Course code and title PH-332(Sem III)

Title Solid State Physics

Course Outcomes

CO1 Understanding of Lattice, Translational vectors, symmetry operations, 2D&3D lattices, Miller Indices, Some crystal structures and reciprocal lattice.

CO2 Understanding of x ray diffraction and experimental methods, and characterization techniques like TGA, UV-Visible spectroscopy, SEM etc.

CO3 Learning of Free electron and Band theory, Origin of band gaps.

CO4 Understanding magnetism and its types as well as concept of superconductivity.

T. Y. B. Sc. (Physics)
Course code and title PH-333(Sem III)
Title Classical Mechanics
Course Outcomes

CO1 Understand the Newton's laws, Rocket Motion, Projectile Motion.

CO2 Understand the Motion of a charged particle in constant electric field, magnetic field and electromagnetic field.

CO3 Students know the concept of center of mass concept.

CO4 Understand the concept of central force, Kepler's laws.

CO5 Understand the concept of elastic and inelastic scattering in Lab and CM frame.

CO6 Students know Langrangian and Hamiltonian method for problem solving.

CO7 Understand the concept of Canonical Transformation and Poisson's Bracket.

T. Y. B. Sc. (Physics)
Course code and title PH-334(Sem III)
Title Atomic and Molecular Physics
Course Outcomes

CO1 To understand the composition of atom and atomic spectra.

CO2 To understand the one and two valence electron system also getting ideas about spectral terms and coupling system.

CO3 To understand the Zeeman Effect and its types.

CO4 To understand the nature of X-ray and its applications.

CO5 To understand the Molecular spectroscopy and its energy levels.

CO6 To demonstrate problem solving skills in all covered topic.

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T. Y. B. Sc. (Physics)

Course code and title PH-335(Sem III)

Title Computational Physics

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Course Outcomes

CO1   Understand basic concepts of flowchart and algorithm.

CO2   Write the algorithm and to draw the flowchart of simple problems

CO3   Know about the basic concepts and syntax of C programming language.

CO4   Understand the graphics in C programming language.

CO5   Students know that how to write C program in Physics Problems.

CO6   Students aware about the C programming language.

CO7   Students are able to write any C program and apply in many applications.

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T. Y. B. Sc. (Physics)

Course code and title PH-336(Sem III)

Title Renewable Energy Sources

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Course Outcomes

CO1   Students know that Conventional and non-conventional energy sources .

CO2   Understand the concept of Photovoltaic and Photothermal, working of liquid flat plate collector and photovoltaic cell.

CO3   Understand the biomass energy and advantages and disadvantages of biomass energy.

CO4   Understand the wind energy and solar energy as alternative energy sources.

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T. Y. B. Sc. (Physics)

Course code and title PH-341(Sem IV)

Title Classical Electrodynamics

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Course Outcomes

CO1   To understanding of the electric force, field and potential. Work out electrostatic field and potential of simple charge distributions using Coulomb's law and Gauss's law.

CO2 To understanding of the dielectric and effect on dielectric due to electric field.

CO3 Demonstrate an understanding of the magnetic field for steady currents using Biot-Savart and Ampere's laws and magnetization of materials.

CO4 Demonstrate quantitative problem solving skills in all the topics covered.

T. Y. B. Sc. (Physics)

Course code and title PH-342(Sem IV)

Title Quantum Mechanics

Course Outcomes

CO1 Understanding Matter Waves, DeBroglie hypothesis, Wave Particle duality, Heisenberg's Uncertainty Principle, Electron Diffraction Experiment.

CO2 Understanding Schrödinger's time and independent Equation, Probability current density and Equation of continuity.

CO3 Studying a few applications of Schrodinger's steady state Equation.

CO4 Studying Rigid Rotator and Hydrogen atom Problems

CO5 Understanding concept of operators in Quantum Mechanics.

T. Y. B. Sc. (Physics)

Course code and title PH-343(Sem IV)

Title Thermodynamics and Statistical Physics

Course Outcomes

CO1 Understand assumptions of Kinetic Theory of gases.

CO2 Understand Transport Phenomena of Viscosity, Thermal conductivity and Diffusion.

CO3 Know the students about enthalpy, Entropy, Internal Energy, Helmholtz Functions.

CO4 Understand the Maxwell's relations and basic concepts of Joule – Thomson's effect and its applications.

CO5 To understand the basic concepts of probability and its problems, Gaussian probability distribution.

CO6 The students know about the ensembles. To understand the microcananical, canonical and grandcananical ensembles and its applications.

CO7 The students know about the how to apply the statistics. To understand the Various statistics like Maxwell-Boltzmann Statistics, Bose-Einstein Statistics and Fermi-Dirac Statistics.

CO8 How to solve the problems in Thermodynamics and Statistical Physics.

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T. Y. B. Sc. (Physics)

Course code and title PH-344(Sem IV)

Title Nuclear Physics

Course Outcomes

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CO1 To understand Basic properties of nucleus and its classification.

CO2 To understand concept of natural and artificial radioactivity and properties of radioactive material.

CO3 Students also get ideas of properties of nuclear forces, nuclear reactions and nuclear energy.

CO4 Students understand basic idea of nuclear accelerator and detector. Students also know the type of accelerator and detector.

CO5 Acquire the corresponding skills of mutual learning and teamwork in laboratory settings.

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T. Y. B. Sc. (Physics)

Course code and title PH-345(Sem IV)

Title Electronics

Course Outcomes

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CO1 Learning about Special Purpose Diodes Photodiodes Varactor and Optocoupler

CO2 Understanding Transistor Amplifier and Classification of Amplifiers like class A,B,C.

CO3 Understanding Field Effect Transistor, MOSFET ,Applications of JFET (Variable Resistor, Electronic Switch Analog Multiplexer)

CO4 Study of Operational Amplifier, Applications like Opamp as Integrator, Differentiator, Integrator, Instrumentation Amplifier.

CO5 Learning about concepts in digital electronics.

T. Y. B. Sc. (Physics)

Course code and title PH-346(Sem IV)

Title LASER

Course Outcomes

CO1   Students understand the difference between ordinary and laser.

CO2   Understand the basic conditions of laser and charecteristics of laser.

CO3   Students know the types of lasers such as ruby laser, Diode Laser HeNe Laser, CO_2 Laser etc.

CO4   Students learn the applications of laser.

T. Y. B. Sc. (Physics)

Course code PH-347

Title Practical Paper -I

Course Outcomes

CO1   Performing the practical's related to surface tension by different methods.

CO2   Performing the practical's related to Thermal conductivity by different methods.

CO3   Performing the practical's related to Optics like Interference by Lloyd's mirror, Resolving power.

CO4   Performing the practical's like Obtaining Planck's constant, e/m by Thompson's method, Resistivity by four probe method.

CO5   Performing the practical of finding the band gap of a diode.

CO6   Overall developing the practical skills.

T. Y. B. Sc. (Physics)

Course code PH-348

Title Practical Paper -II

Course Outcomes

CO1   Understand the basic concepts in electronics.

CO2   Perform the practicals in computer interfacing.

CO3   Write algorithm, flowchart and C-Program for Bi-section method, Newton Raphson method, Trapezoidal rule, Simpson's 1/3rd rule etc.

CO4   The Students know to how to write any C-Program.

CO5   The T.Y.B.Sc students learn the Turbo-C Software.

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T. Y. B. Sc. (Physics)

Course code PH-349

Title Practical Paper –III

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Course Outcomes

CO1   The Students know the research in physics.

CO2   The students have scope to select project in liking area of Physics.

CO3   The students know how to make the referencing and students also prepare the research paper.

CO4   The students can take the observations and make the analysis of the observations.

CO5   The students find the result and conclusion of the project.

CO6   Students know about how to write the project report.

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B.Sc. ZOOLOGY DEGREE PROGRAM

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Courses Offered

B. Sc. I, B. Sc. II& B. Sc. III

Zoology Program Outcomes, Program Specific Outcomes

PO1   Students gain knowledge and develop skill over animal sciences, understands the interactions among various living organisms.

PO2   Students are able to study animals of different phyla, their distribution and their relationship with the environment.

PO3   Students are able to understand internal structure of cell, functions of various cellular organelles.

PO4   Understand the complex evolutionary processes and behavioural pattern of various animals.

PO5   Students are able to correlate the physiological and biochemical processes of animals.

PO6   Understanding of ecological factors, environmental conservation processes and its importance, pollution control and biodiversity and protection of threatened species.

PO7   Gain knowledge about applied fields like sericulture, fisheries, apiculture, poultry and dairy farms along with tissue preparation, molecular and statistical techniques.

PO8   Understanding about various concepts of genetics and its importance in human health.

PO9   Apply ethical principles and commit to professional ethics and responsibilities in delivering his duties.

PO10   Apply the knowledge and understanding of Zoology to one's own life and work.

PO11   Develops empathy and love towards the animals

Program Specific Outcomes

PSO1   Understand the nature and basic concepts of cell biology, genetics, taxonomy, physiology, ecology and applied Zoology.

PSO2   Analyze the relationships among animals with their ecosystems.

PSO3   Perform procedures as per laboratory standards in the areas of Taxonomy, Physiology, Ecology, Cell biology, Genetics, Applied Zoology, Clinical science, tools and techniques of Zoology, Toxicology, Sericulture, Biochemistry, Fish biology, Animal biotechnology, Immunology and research methodology.

PSO4   Understand the applications of Zoology in Agriculture, Medicine and daily life.

PSO5   Gains knowledge about research methodologies, effective communication and skills of problem solving methods.

PSO6   Contributes the knowledge for Nation building.

Department of Zoology

Course out come

F.Y.B.Sc., Term- I.

Paper I Animal Systematics and Diversity –I

CO1   Ability to love and understand the fascinating world of invertebrates.

CO2   Get a concrete idea of the evolution, hierarchy and classification of invertebrate phyla.

CO3   Understand the basics of Systematics by learning the diagnostic and general Characters of various groups.

CO4   Getting an overview of typical examples in each phyla.(Salient features and classification up to classes).

CO5   Aware the economic importance of Earth worm.

CO6   Understanding of general taxonomic rules on animal classification.

Paper II Fundamentals of Cell Biology

CO1   Gives basic Knowledge of Cell Biology along with various cellular functions.

CO2   Students gives knowledge about basic difference in Prokaryotic andEukaryotic cell .

CO3   Students gives knowledge about basic different types of stain.

CO4   Gives basic concepts cell aging and different cell organelles.

CO5   Students gain knowledge of different biomolecules and biochemical processes of cells.

CO6   Gives basic concepts cell division and it's significance.

F.Y.B.Sc., Term- II.

Paper I Animal Systematics and Diversity –II

CO1   Knowledge of classification of protochordates and chordates along with studies on various physiological functions and interactions of chordate organisms with examples.

CO2   Inculcate in the student a fascination for nature and learn the bionomics of Vertebrates.

CO3   Learn the evolution, hierarchy and classification of different classes of chordates.

CO4   Imparts conceptual knowledge of vertebrate adaptations in relation to their environment.

CO5	Knowledge of classification of chordates along with studies on various physiological functions and comparative anatomy of organs of chordate with examples.
CO6	Familiars the adaptations and economic importance of specific vertebrates.

Paper II Genetics

CO1	Distinguish Classical Genetics and Molecular Genetics.
CO2	Students gives knowledge about Gene Interaction.
CO3	Imparts conceptual knowledge of Lethal genes.
CO4	Gives basic concepts of Sex-determination.
CO5	Students gives knowledge about Human genetics.
CO6	Gives basic concepts cytoskeleton and Chromosomes.

Paper III, First and Second Term Practical

CO1	First-hand knowledge about identification of non-chordate and chordate specimens (fresh and preserved) along with larval forms and study of endoskeleton of vertebrates.
CO2	Students are able to handle microscopes for observation& study of cell organ lies.
CO3	Students are able to conduct Blood grouping and immunological techniques.
CO4	Field visits to various ecological areas like sea-shore, tea plantations, zoological gardens allowed students to prepare reports on them.
CO5	Students will gain skill about slide preparation, staining and mounting.
CO6	Identifications of non-chordate and chordate specimens (fresh and preserved) along with larval forms and sections.

Department of Zoology

Course out come

S.Y.B.Sc., Sem I.

Paper I Animal Systematics and Diversity – III

CO1	Ability to love and understand the fascinating world of invertebrates.
CO2	Get a concrete idea of the evolution, hierarchy and classification of invertebrate phyla.

CO3   Understand the basics of Systematics by learning the diagnostic and general Characters of various groups.

CO4   Getting an overview of typical examples in each phyla.

CO5   Aware the economic importance of invertebrates.

CO6   Understanding of general taxonomic rules on animal classification.

Paper II Applied Zoology-I

CO1   Understands concepts of fisheries, Agriculture pest management along with tissue and cell culture techniques.

CO2   Aware the economic importance of Fish with the special reference to IMC, Crustacean, Mollusca etc.

CO3   Gives basic concepts of Fisheries and fishing technology.

CO4   Students gain fundamental knowledge Agricultural Pests and their control.

CO5   Awareness of Students Hazards of pesticides on human and antidotes.

CO6   Students gives basic knowledge of Crafts and gears& Fish preservation technique.

Course out come

S.Y.B.Sc., Sem II.

Paper I Animal Systematics and Diversity – IV

CO1   Inculcate in the student a fascination for nature and learn the bionomics of vertebrates.

CO2   Learn the evolution, hierarchy and classification of different classes of chordates.

CO3   Get an overview of the morphology and physiology of typical examples.

CO4   Familiars the adaptations and economic importance of specific vertebrates.

CO5   Students gain fundamental knowledge of identification of Poisonous and Non poisonous Snakes.

CO6   Students gives basic knowledge of Beak and feet modifications in birds& Migration in birds.

Paper II Applied Zoology-II

CO1   Understands concepts of Sericulture & Apiculture along with Economics important.

CO2   Identify various methodology and perspectives of applied branches of zoology for the possibilities of self-employment.

CO3   Learn the basic principles involved in the Bee keeping and seasonal management.

CO4   Students gives basic knowledge Silk worm rearing.

CO5   Students gives basic knowledge of byproducts of Honey bee.

CO6   Students gives basic knowledge of different types of silk moths, their Distribution and varieties of silk produced.

Paper III, First and Second Semester Practical

CO1   Experience in anatomy through simple dissections.

CO2   Familiarize organ system.

CO3   Aware about economically important specimen (preserved).

CO4   Understands Practical skill of fisheries, sericulture, apiculture, poultry, dairy along with crop pest management techniques.

CO5   Identifications of non-chordate and chordate specimens (fresh and preserved) along with larval forms and sections.

CO6   Field visits to various ecological areas like sea-shore, tea plantations, zoological gardens allowed students to prepare reports on them.

Department of Zoology

Course out come

T.Y.B.Sc. , Sem I,

Paper I Animal Systematic and Diversity V

CO1	To gives knowledge of classification of Non chordates & Chordates.
CO2	Knowledge to gives information of locomotion, nutrition, skeleton, polymorphism and affinities of Non- Chordates.
CO3	Gives knowledge of Basic comparative study of anatomy of chordates.
CO4	Gives information about evolutionary study on the base of comparative anatomy.
CO5	To gives knowledge of type study of Non- Chordates.
CO6	To gives knowledge of modification in Pisces, Reptiles and Mammals.

Paper II Mammalian Histology

CO1	Gives knowledge about Anatomy and Histology of mammalian organ.
CO2	Study of different structural development of different organ.
CO3	Study of Microtomy along with different staining methods.
CO4	Basic concepts of histology of various organs of body.
CO5	Gives knowledge about different types of tissues.
CO6	Study of different structural development of endocrine glands.

Paper III Biological Chemistry

CO1	Students gain knowledge of different biomolecules and biochemical processes of cell.
CO2	Imparts knowledge to the student regarding Carbohydrates, Protein and Lipids.
CO3	Imparts knowledge to the student regarding various Types of Carbohydrates, Protein and Lipids.
CO4	Imparts knowledge to the student regarding significance of Carbohydrates, Protein and Lipids.
CO5	Gives knowledge about Classification and properties of enzymes, Enzyme kinetics, MM equation and its importance and LB plot.
CO6	Gives knowledge about Factors influencing enzyme activity, isoenzymes, allosteric enzymes, immobilized enzymes and ribozymes.

Paper IV Environmental Biology &Toxicology

CO1	Gives knowledge about Environmental biology and animal diversity.

CO2   Imparts knowledge to the student regarding various laws of ecology, types of ecosystem, population and community characteristics and dynamics.

CO3   Students gain fundamental knowledge of environmental pollutions due to toxic materials and their effects over ecosystem and learns about sustainable development.

CO4   Students gives knowledge about basic concept of toxicology with lethal dose and lethal concentration.

CO5   Students gives knowledge about Natural Resources and Conservation.

CO6   Students gives knowledge about Toxicants of Public Health and Hazards.

Paper V Parasitology

CO1   Gives knowledge about Parasitology and Branches of Parasitology.

CO2   Students gain fundamental knowledge of types of host and parasites.

CO3   Students gives knowledge about basic concept of Host-Parasite relationship.

CO4   Imparts knowledge to the student regarding various parasites , Arthropod vectors and human diseases.

CO5   Students gives knowledge about Parasitological significance of Zoonosis.

CO6   Gives knowledge about Epidemic diseases.

Paper VI Cell Biology

CO1   Gives basic concepts of Cell Biology along with various cellular functions.

CO2   Students gives knowledge about basic difference in Prokaryotic and Eukaryotic cell .

CO3   Students gain knowledge of different biomolecules and biochemical processes of cells.

CO4   Gives basic concepts of normal cell and cancer cell.

CO5   Gives basic concepts Cytoskeleton and Cell division.

CO6   Gives basic concepts cell aging and different cell organelles.

Department of Zoology
Course out come

T.Y.B.Sc. , Sem II.

Paper I Biological Techniques

CO1   Students gain knowledge of biological techniques.

CO2   Basic concepts of Molecular Biology along with functions of DNA and RNA and study of Genetic Engineering.

CO3   Students gives knowledge about basic concept Haematological Techniques.

CO4   Students gives knowledge about basic concept Micro technique.

CO5   Students gives knowledge about basic concept Microtomes and Knives.

CO6   Imparts knowledge to the student regarding various Histochemical staining Stains and Staining.

Paper II Mammalian Physiology & Endocrinology

CO1   Imparts knowledge to the student regarding various scope of Mammalian Physiology.

CO2   Students are taught the detailed concepts of circulation, respiration, the functioning of nerves of animals.

CO3   Gain knowledge about hormones and endocrine mechanisms.

CO4   This paper gives an idea about the glands which works inside the body and secretes a chemical called hormone.

CO5   Gives an idea about how it is classified, how it works and the regulation of these hormones is discussed here.

CO6   It gives a clear picture Of Glands & its function.

Paper III Genetics and Molecular Biology

CO1   Students are taught the detailed concepts Genetics and Molecular Biology.

CO2   Distinguish Classical Genetics and Molecular Genetics.

CO3   Familiar with the tools and techniques of Genetics and Biotechnology.

CO4   Students gives knowledge about basic concept of Gene Mutation.

CO5   Students gives knowledge about basic concept of Population Genetics.

CO6   Students gives knowledge about basic concept of Central Dogma of Molecular Biology, Concept of operon & Recombinant DNA Technology.

Paper IV Organic Evolution

CO1	Enable the students to understand the evolution of universe and life.

CO1   Enable the students to understand the evolution of universe and life.

CO2   Understanding on the process and theories in evolutionary biology.

CO3   Develop an interest in the debates and discussion taking place in the field of evolutionary biology.

CO4   Students gives knowledge about basic concept Theories of organic evolution.

CO5   Students gives knowledge about basic concept Animal Distribution, Speciation, Geological Time Scale.

CO6   Students gives knowledge about Evidences in favour of organic evolution.

Paper V General Embryology

CO1   Students gives knowledge about basic concept Theories of Developmental biology.

CO2   Expose to concepts and process in developmental biology.

CO3   Understand and appreciate the genetic mechanisms and the unfolding of the same during development.

CO4   Expose the learner to the new developments in embryology and its relevance to man.

CO5   Imparts the knowledge about developmental processes of different animals along with teratology.

CO6   Students gives knowledge about developmental biology on the role model of chick embryology.

Paper VI Medical Entomology

CO1   Understanding on the basic Fundamentals of Agricultural, Forest, Medical and Veterinary Entomology.

CO2   Gain critical understanding on human disease and Insect.

CO3   Students gives knowledge about, Insects as social groups.

CO4   Students gives knowledge about, House hold insects in relation to human.

CO5   Students gain knowledge about various disease related vectors and their impact on human.

CO6   Students gain knowledge about disease causing insect with their classification up to family, appearance, habit, brief life history, distribution, diseases caused and control measures.

Department of Zoology

Course out come

T.Y.B.Sc. , Sem II.

Practical Course I

Section I, Animal Systematics and Diversity V

CO1   Understand the basics of Systematics by learning the diagnostic and general characters of various groups.

CO2   Experience in anatomy through simple demonstration.

CO3   Thorough understanding in the principles and practice of Systematics.

CO4   Demostration of different systems of invertebrate animals are to be studied such as Calotes, Pila etc.

Section II, Mammalian Histology

CO1   Students will gain skill about slide preparation, staining and mounting.

CO2   Students are able to identify histological sections.

CO3   In this part we teaches about differentiation and organization of cells and maintenance of tissues. It helps to get a better idea about their structure and function.

CO4   Study of different dye and stains help the student to get a practical knowledge of handling the tissues for microtomy studies. It helps them for laboratory preparations and expertise in laboratory techniques.

Section III, Biological Techniques

CO1   Biological studies needs some equipments for it analysis of different functions.

CO2   Students will gain skill about Genetic Engineering.

CO3   Students will gain skill about Chromatography.

CO4   Gives Knowledge Principle and applications of colorimeter and spectrophotometer.

Section IV, Mammalian Physiology & Endocrinology

CO1   Students gain skill about determination of pH and quantitative analysis of blood cells.

CO2   The syllabus covers the practical knowledge about blood and its analysis which helps a student for a laboratory technician course.repared slides are studied in this part to understand the structures and arrangement of different muscular regions.

CO3   Co4 Gain knowledge about hormones and endocrine mechanisms.

Practical Course II

Section I, Biological Chemistry

CO1   Students performed biochemical and statistical techniques.

CO2   All the biochemical components of the body system are studied.

CO3   It helps the student to get a view about the chemical compositions of different chemical compounds such as enzymes, hormones and other secretions.

CO4   It Gives Knowledge includes the pathway and chemical which are responsible for the energy production in our body.

Section II, Environmental Biology and Toxicology

CO1   Dissertation works on the biodiversity resources in and around the college made students aware of the biodiversity of their locality.

CO2   Field visits to various ecological areas like sea-shore, tea plantations, zoological gardens allowed students to prepare reports on them.

CO3   Students gain fundamental skill of environmental pollutions due to toxic materials and their effects over ecosystem and learns about sustainable development.

CO4   Imparts knowledge to the student regarding various laws of ecology, types of ecosystem, population and community characteristics and dynamics, and devlope calculation skill of lethal dose or concentration.

Section III, Genetics and Molecular Biology

CO1   Develop idea about Mendelian, non-Mendelian inheritance, genetic disorder, gene mutations and sex determination.

CO2   Students are able to study meiosis along with pedigree analysis.

CO3	Students are able to conduct Paramoecium culture, tissue preparation, isolation and estimation of DNA.
CO4	Students are able to study of Hardy- Weinberg law with suitable recording of genetic traits.

Section IV, Organic Evolution

CO1	Students are able to study types of fossils.
CO2	Develop the skill about to record Zoogeographical distribution of animals to respective zoogeographical realms on the world map.
CO3	Students are able to Study of evidences of evolution- embryological, palaentological, connecting links, morphology and comparative anatomy.
CO4	Students are able to Study of successive stages of evolution of man.

Practical Course III

Section I, Parasitology

CO1	Students are able to parasites from rectal and fecal contents of animals.
CO2	Students Develops the skill of whole mounts of life stages of *Plasmodium vivax* and *Entamoeba histolytica* (Parasites).
CO3	Students gives information about morphology and pathogenicity vector of parasites.
CO4	Students gain knowledge about various disease related vectors and their impact on human.

Section II, Cell biology

CO1	Students will gain skill about slide preparation, staining and mounting.
CO2	Gather basic practical concepts of Cell Biology along with various cellular functions.S
CO3	Students are able to study meiosis along with grasshopper testis /Tradescantia/ Onion floral bud.
CO4	Students are able to study mitosis along with onion root tip analysis.

Section III, General Embryology

CO1	Student gain knowledge about sections of chick embryo--24hr, 33hr and 48 hr with observation of permanent slides.

CO2   Students gain skill to prepare different stages of embryos of chick.

CO3   Students gain skill to Ex-ovo culture of chick embryo.

CO4   Student gain knowledge about different process of development like egg, sperm, Cleavage, Blastula &Gastrula with observation of permanent slides.

Section IV, Medical Entomology

CO1   Students give information about interrelationships of insects and man.

CO2   Student gain knowledge about household insects in relation to human health& social insects- honey bee and termites.

CO3   Students gain skill Temporary preparation of mouth parts of harmful insects.

CO4   Student gain knowledge about control methods of harmful insects with suitable examples.

Department of Botany

B.Sc. Botany

Program Specific outcome

Student will acquire core knowledge in the subject.

PSO1   Students will get thorough knowledge about various plant groups from primitive to highly evolved.

PSO2   Students will be aware of application of plant in various industries.

PSO3   Students will get awareness about conservation and sustainable use of plants.

PSO4   Students will learn the experimental techniques in the area of specialization in Botany.

PSO5   Students will able to understand the research and address practical problem.

PSO6   Enable the students to become entrepreneur.

PSO7   Equip students with skill related to laboratory and industry based studies.

Course outcome

F.Y.B.Sc. Botany Term-I

Paper-I Plant Diversity

On completion of the course, students are able to

CO1   Understand the diversity among plant kingdom and their classification.

CO2   Know about morphological diversity, characters, classification and systematic position of Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms.

CO3   Learn the life cycle of *Spirogyra, Cystopus, Riccia, Nephrolepis and Cycas*.

CO4   Understand the characters and types of Lichens.

CO5   Know about the evolutionary success of Angiosperms.

CO6   Know the characters of Dicotyledons and Monocotyledons and able to distinguish them.

F.Y.B.Sc. Botany Term-I;

Paper-II Industrial Botany

Students should

CO1   Understand the concept and scope of Industrial Botany.

CO2   Gain thorough knowledge about sustainable use of plants and their applications in various industries.

CO3   Acquire skills related to industries and laboratory based studies.

CO4   Learn about open and closed cultivation practices and equip them with cultivation and marketing skills.

CO5   Know about concepts and types of plant nurseries and the various methods of plant propagation.

CO6   Understand the concept, techniques and significance of plant tissue culture technology.

CO7   Learn about organic farming system, seed processing and the importance of seed industries.

CO8   Acquire skills of Oyster mushroom cultivation and their marketing.

F.Y.B.Sc. Botany Term-II;

Paper-I Morphology and Anatomy

Students should

CO1   Understand plant morphology with reference to habit and vegetative as well as reproductive characters of Angiosperms and their importance.

CO2   Know about the morphology, functions, types and modifications of root, stem and leaf.

CO3   Understand morphology and types of Inflorescence, flower and fruits.

CO4   Know about parts of flower, fruit and seeds and about seed dispersal.

CO5   Understand anatomy and its importance.

CO6   Know about types of tissues and their functions and the internal organization of dicot and monocot root, stem and leaf.

F.Y.B.Sc. Botany Term-II

Paper-II Industrial Botany

The students should be able to

CO1   Understand the concept, advantages and significance of biofuels.

CO2   Identify different plants used in biofuel production and acquire knowledge about the techniques to produce biodiesel.

CO3   Understand the concept and significance of biocontrol, IPM and biopesticides.

CO4   Learn about the types and preparation of biopesticides and their advantages.

CO5   Know about concept, need and significance of Industrial mycology, biofertilizer and fruit processing industry.

CO6   Understand the preparation and application of Nitrogen fixing and Phosphate solubilizing biofertilizers.

CO7   Know about cold storage and types of fruit processing.

CO8   Understand the concept, types, advantages and significance of pharmaceuticals, nutraceuticals and cosmeceuticals.

CO9   Know about the manufacture of Churna, Asava and Arishta, and source, active principles and uses of *Adathoda*, *Tinospora*, *Asparagus*, Amla and *Aloe*.

F.Y.B.Sc. Botany

Paper-III Practicals

The students should understand

CO1   Morphology of root and stem with its modifications.

CO2   Morphology and types of leaves, inflorescence, fruits and seeds.

CO3   Flower morphology.

CO4   Internal primary structure of dicot and monocot root, stem and leaf.

CO5   Morphology and lifecycle of *Spirogyra*, *Cystopus*, *Riccia*, *Nephrolepis* and *Cycas*.

CO6   Plant resources in food, fodder, fiber, medicine, timber and gum.

CO7   Techniques of artificial plant propagation namely Stem cutting, Air layering, Approach grafting and T-budding.

CO8   Techniques of plant tissue culture and oyster mushroom cultivation.

CO9   Resources in biopesticides and various fungal products.

CO10 Types of biofertilizers and green manure.

CO11 Preparation of Jam and Squash.

S.Y.B.Sc. Botany Semester-I; Paper-I
Taxonomy of Angiosperms and Plant community

The students should

CO1   Understand concept of plant taxonomy and systematics and about identification, classification and nomenclature.

CO2   Know about the types, with merits and demerits of artificial, natural and phylogenetic system of classification.

CO3   Learn about taxonomic literatures like flora, monograph, revisions, manuals, journals, periodicals and reference books.

CO4   Know about the use of various sources of data for systematic, history and principles of ICBN, rules of coining of generic and specific epithets and taxa names.

CO5   Understand the comparative account, distinguishing features and economic importance of angiosperm families and about the use of computers in taxonomy.

CO6   Know the definition and concept of ecology and about the components of ecosystem.

CO7   Learn about food chain, food web and ecological pyramids.

CO8   Understand plant communities and ecological adaptations in plants.

S.Y.B.Sc. Botany Semester-I; Paper-II
Plant Physiology

The students must be able to

CO1   Understand the definition, importance, scope and applications of plant physiology and contributions of various plant physiologists.

CO2   Understand plants and plant cells in relation to water and various processes like diffusion, osmosis, plasmolysis and imbibition.

CO3   Learn about absorption of water, movement of sap and transpiration in plants.

CO4   Understand growth and development of plants and its regulations.

CO5   Understand nitrogen metabolism, seed dormancy and flowering physiology.

S.Y.B.Sc. Botany Semester-II; Paper-I

Plant Anatomy and Embryology

Students must

CO1   Understand the definition and scope of plant anatomy and about types of tissues.

CO2   Learn about structure, function, types and distribution of epidermal, mechanical and vascular tissue system.

CO3   Know about the process of normal secondary growth and structures like annual rings, periderm, bark, tyloses and lenticels.

CO4   Understand the causes and process of anomalous secondary growth in *Bignonia* and *Dracaena*.

CO5   Know the definition and scope of Plant embryology and about the structure of microsporangium, process of microsporogenesis and male gametophyte development.

CO6   Understand structure of megasporangium, types of ovules, megasporogenesis and female gametophyte.

CO7   Learn about the process of pollination and fertilization, types of endosperm and process of seed formation and structure of monocot and dicot embryo.

S.Y.B.Sc. Botany Semester-II; Paper-II

Plant Biotechnology

Students should

CO1   Learn about the definition, concept, scope and interdisciplinary nature of biotechnology.

CO2   Understand definition, properties, classification and industrial applications of enzymes.

CO3   Know about the production of amylase, protease and lipase enzyme and about the concept and techniques of enzyme immobilization.

CO4   Know about process, types, media composition and industrial applications of fermentation.

CO5   Understand the principles of microbial growth and about the structure and functions of stirred tank, tubular tower and digestive tank bioreactors.

CO6   Understand the downstream processing for citric acid production.

CO7   Know about SCP, their need, economic implications and acceptability and their production from *Spirulina* and yeast.

CO8   Know the definition, concept and methods of phytoremediation and about environmental sustainability.

CO9   Understand the structure of DNA and gene and methods of gene isolation, gene cloning and gene transfer.

CO10 Know about applications of plant genetic engineering and nanotechnology in agriculture.

S.Y.B.Sc. Botany Paper-III Practicals

The students should be able to

CO1   Describe flowering plants in botanical terms and identify the distinguishing characters of plant families.

CO2   Distinguish Hydrophytes and Xerophytes based on the external and internal characters and identify their adaptive characters.

CO3   Survey the vegetation by list count quadrant method.

CO4   Identify and use different taxonomic tools and ecological instruments.

CO5   Know how to find out WHC and pH of Soil.

CO6   Learn the processes like plasmolysis, DPD, transpiration, curling and imbibition in different plants.

CO7   Know the use and functions of Arc Auxanometer, auxins, Transpiration pull, Spectrophotometer, Portable leaf area meter, Conductivity meter and Centrifuge.

CO8   Assess the viability of seeds by TTC method.

CO9   Prepare slides, observe and understand epidermal tissues, mechanical tissues and their distribution and the process of normal and anomalous secondary growth in different plants.

CO10 Know about tetrasporangiate anther, ovules and embryo in monocots and dicots.

CO11 Estimate the amount of citric acid in fermented and unfermented broth.

CO12 Understand the technique of production of SCP from Spirulina and Yeast and their commercial products.

CO13 Learn the process of production of alcohol through fermentation.

CO14 Know the DNA separation process through Agarose gel electrophoresis.

CO15 Understand the process of enzyme immobilization.

T.Y.B.Sc. Botany Semester-III; Paper-I

Cryptogamic Botany

The students should be able to

CO1   Understand meaning, types and examples of Cryptogams.

CO2   Understand the general characters, economic importance and Classification of Algae, Fungi, Bryophytes and Pteridophytes.

CO3   Study the life cycle of *Nostoc, Chara, Sargassum, Batrachospermum, Rhizopus, Saccharomyces, Puccinia, Cercospora, Marchantia*, *Anthoceros*, *Polytrichum, Psilotum*, *Selaginella* and *Marsilea* with reference to taxonomic position, morphology, anatomy, reproduction, gametophytes and sporophyte.

T.Y.B.Sc. Botany Semester-III; Paper-II

Cell and Molecular Biology

The students should

CO1   Know about the definition and history of Cell biology and about other biological sciences.

CO2   Understand the unit of measurement of cells.

CO3   Differentiate between Prokaryotic and Eukaryotic cells.

CO4   Learn the physical nature and chemical organization of cytoplasmic matrix.

CO5   Understand the morphology, Ultrastructure, Chemical composition and functions of Cell, cell organells, Chromosomes and its type.

CO6   Know about the definition, scope, importance and history of molecular biology and about the concept of central dogma.

CO7   Learn about genetic material, structure and forms of DNA and replication, damage and repair of DNA.

CO8   Understand about gene organization, transcription, translation and gene regulation.

T.Y.B.Sc. Botany Semester-III; Paper-III

Genetics and Evolution

The students should be able to understand

CO1   Definition and concept of heredity and variations, and the branches and applications of genetics.

CO2   Mendelism – about mono and dihybrid cross, laws of inheritance, backcross and test cross and about Incomplete dominance.

CO3   Gene interactions, multiple alleles, linkage and crossing over, quantitative and qualitative inheritance and sex-linked inheritance.

CO4   Euploidy and aneuploidy and chromosomal abberations.

CO5   Definition and concept of organic evolution.

CO6   Theories and evidences of evolution.

CO7   Concept of Mendalian population, gene pool, Hardy-Weinberg's law and genetic polymorphism.

T.Y.B.Sc. Botany Semester-III; Paper-IV

Spermatophyta and Palaeobotany

Students should

CO1   Know about Gymnosperms, their general characters, economic importance and classification according to Chamberlain.

CO2   Study the life cycle of *Pinus* and *Gnetum* with reference to distribution, morphology, anatomy, reproduction, gametophyte, sporophyte, seed structure and alternation of generations.

CO3   Learn the theories on origin of angiosperms.

CO4   Understand a general account on artificial, natural and phylogenetic system of classifications and about assumptions, merits and demerits of Hutchinson's system of classification and APG system.

CO5   Learn about Plant families, plant identification and preparation of artificial keys.

CO6   Understand geological time scale, fossil formation and types of fossils.

CO7 Learn about the salient features of fossil groups and external and internal morphology of *Rhynia*, *Lepidodendron*, *Calamites*, *Lyginopteris, Pentoxylon* and *Nipaniophyllum*.

T.Y.B.Sc. Botany Semester-III; Paper-V
Horticulture and Floriculture

Students should

CO1 Understand definition, branches and scope of horticulture and economic importance of horticultural crops.

CO2 Understand the classification of Vegetables, Fruits, Ornamental plants, Spices and Flowers.

CO3 Apply the concept of propagation method for improvement of plant.

CO4 Learn about different types of gardens.

CO5 Understand the method of cultivation of cut flowers.

CO6 Know the packaging and preservation of cut flowers.

T.Y.B.Sc. Botany Semester-III; Paper-VI
Computational Botany

The students should

CO1 Recognize the terminologies of biostatistics and its relation with the other sciences.

CO2 Know various sampling methods like Random and non-random.

CO3 Able to represent data graphically using Histogram, frequency polygon, line diagram.

CO4 Identify type of distribution pattern related to variables and interpret the data.

CO5 Apply hypothesis testing to the data and make statistical decision.

CO6 Use the knowledge of statistic in experiments of seed testing and to study vegetation data.

T.Y.B.Sc. Botany Semester-IV; Paper-I
Plant Physiology and Biochemistry

CO1   Know about Photosynthesis and Respiration in plants.

CO2   Understand the process of translocation of solutes in plants.

CO3   Effect of biotic and abiotic stress on plant growth.

CO4   Understand the properties of carbohydrates and its significance.

CO5   Understand the lipid metabolism in plants, Beta Oxidation.

CO6   They will be able to understand Brief outline of biosynthesis of amino acid, structure and function of protein.

CO7   Know about the Enzymes- Classification and nomenclature of enzymes, Enzyme as biocatalyst, properties and function.

CO8   They will learn about the role of secondary metabolites.

T.Y.B.Sc. Botany Semester-IV; Paper-II
Plant Ecology and Biodiversity

CO1   Will acquaint the students to understand the Environmental impact assessment, Concepts, Basic data collection for EIA.

CO2   Study of Ecology will help the students to understand air, water and soil Pollution.

CO3   Students will be able to identify causes of environmental toxicology Eutrophication, bioaccumulation and biomagnifications.

CO4   Able to explain Environmental audit, need and audit Protocol.

CO5   Get knowledge in planning solutions for environmental protection issues and its conservation; Ex situ and In situ.

T.Y.B.Sc. Botany Semester-IV; Paper-III
Plant Pathology

CO1   Familiar with the terminologies used in pathlogy i.e Host, Parasite, Pathogen, Inoculum, Penetration, Infection, Incubation, Disease.

CO2   Know the contribution of National institute (IARI), International Crop Research Institute for Semi Arid Tropics (ICRISAT) in plant pathology.

CO3   Gain the knowledge of methods of Studying Plant Diseases i.e Macroscopic study, Microscopic study, Koch"s postulates and Culture technique.

CO4   Know about organisms and causal factor responsible for plant diseases & methods of studying plant diseases.

CO5   Familiarize with some common Fungal Plant Diseases, Bacterial Plant Diseases, Mycoplasma Plant Diseases, Nematodal Plant Diseases, Viral Plant Diseases, Non Parasitic Diseases.

CO6   Gain knowledge on Host parasite interaction process, Disease Development, Defence Mechanisms and control measures.

CO7   Learn molecular techniques to diagnostics and preventive measure.

T.Y.B.Sc. Botany Semester-IV; Paper-IV
Medicinal and Economic Botany

CO1   Learn about Ayurvedic formulations i.e Asava, arishta, churn.

CO2   Know the method of Collection, processing and extraction of phytochemical drugs.

CO3   Study of medicinally important drugs.

CO4   Know about the major and minor ethnic societies in India.

CO5   Know about history and relevance of herbal drugs in Indian system of medicine.

CO6   Learn the macroscopic and microscopic characters, chemical constituents, adulterants, therapeutical and pharmaceutical uses of medicinal plants.

CO7   Understand the techniques for drug evaluation

T.Y.B.Sc. Botany Semester-IV; Paper-V
Plant Biotechnology

CO1 Understand the principle and basic protocols for Plant Tissue Culture. i.e micropropagation, meristem culture, embryo culture, somatic embryogenesis, development of haploid plants, somaclonal variation.

CO2 Know the mechanism of nitrogen fixation and gene responsible it.

CO3 Conservation of germplasm and genetically engineered product.

CO4 Use of databases tools BLAST, FASTA, Entrez for searching, analysis of biological molecules and to study phylogeny.

CO5 Genomics, proteomics and their application in crop improvement

T.Y.B.Sc. Botany Semester-IV; Paper-V
Plant Breeding and Seed Technology

CO1 Get aware with branch of plant breeding.

CO2 Can produce of new superior crop verities using plant breeding techniques.

CO3 Get the detail knowledge about modern strategies applied in Plant Breeding for crop improvement i.e. Mass selection, Pureline Selection and Clonal selection.

CO4 Know about exploitation of Heterosis, hybrid and variety development and their release through artificial hybridization.

CO5 Can learn testing of seed quality.

CO6 Learn the main steps in seed production, certification and marketing.

T.Y.B.Sc. Botany Semester-IV; Practical - I

CO1 To understand Systematic position, Morphology, and reproduction of *Nosotc, Chara, Sargassum, Batrachospermum, Rhizopus, Saccharomyces, Puccinia, Marchantia, Anthoceros, Polytrichum, Psilotum, Selaginella* and *Marsilea.*

CO2 To learn the techniques of maceration and preparation of fixatives and stains.

CO3 To study morphology of chromosomes, polytene chromosomes and various stages of mitosis and meiosis.

CO4 To know the techniques of extraction and estimation of plant DNA and RNA.

CO5 To learn the techniques of separation of photosynthetic pigments and amino acids by TLC/Paper chromatography.

CO6   To understand estimation of chlorophyll-a and chlorophyll-b by spectrometric or colorimetric method.

CO7   To know the process of estimation of soluble proteins by Lowery *et. al.* method.

CO8   To know about demonstration of Ringing experiment, Hill reaction, catalase enzyme activity and qualitative tests for alkaloids, tannins, glycosides, starch, lipids and proteins.

CO9   To learn to determine diurnal fluctuation in TAN values of CAM plants.

CO10   To know about the preparation of MS medium.

CO11   To demonstrate callus induction using maize embryo.

CO12   To study the application of biofertilizers and organic fertilizers and transgenic plants like Bt Cotton, Bt Brinjal, Bt Tomato and Golden Rice.

CO13   To understand the estimation of Nitrate Reductase from legume nodules.

CO14   To study the biodiversity of various places and collection of specimens through study tours.

T.Y.B.Sc. Botany Semester-IV; Practical – II

CO1   To study structural heterozygotes in *Rhoeo.*

CO2   To know about the preparation of salivary gland chromosomes in **Chironomous** larvae.

CO3   To understand the technique of induction of tetraploidy and preparation of squash for tetraploid cells.

CO4   To know about estimation of frequency of PTC taste sensitivity, earlobe and rolling tongue in known population.

CO5   To study genetic problems on gene mapping using three point test cross data.

CO6   To study *Pinus* and *Gnetum* with respect to External morphology, T. S. of stem, leaf, Structure of male cone, female cone, pollen grains and ovules.

CO7   To study the details of plant families and identification of plants using flora and about preparation of artificial keys.

CO8   To study fossils with the help of suitable slides or specimens.

CO9   To study physicochemical properties of water and polluted water body.

CO10   To know about acquisition of ecological data using GPS/altimeter/maps etc. and study of ecosystem and biodiversityT.

CO11   To demonstrate hybridization techniques, chlorophyll mutation and seed sampling equipments.

CO12   To study the effect of chemical mutagens on seed germination and seedling growth and colchicines induced polyploidy in Onion.

CO13   To learn seed moisture testing by hot air oven method.

T.Y.B.Sc. Botany Semester-IV; Practical – III

CO1 To study phenology of fruit, vegetables and flowering crops and garden tools and implements like Sprayer, Duster, Pruning knife, Sprinkler and micro-irrigation system, garden containers and filling of pots and pits and plantation any plants.

CO2 To learn the techniques of cutting, layering, budding, grafting, training and pruning.

CO3 To know the methods of harvesting of cut flowers and their preservation methods and making dry flowers.

CO4 To know about the statistical problem solving of mean, mode, median, variance and standard deviation and correlation and regression and student's 't' test and c2 test.

CO5 To understand the representation of data by various graphical methods.

CO6 To analyse the data of seed germination indices, vegetation data obtained from list count quadrat method for frequency, density, abundance, relative dominance and importance value index and satellite data collected on biomass for RVI, DVI, NDVI, NDVI, and PVI.

CO7 To study the preparation of any one culture media for isolation of plant pathogens and various culture techniques like Streak plate methods, Pour plate methods and Spread plate and serial dilution method for preparation of pure culture.

CO8 To study any two of each fungal, bacterial, mycoplasma diseases, viral and non-parasitic diseases.

CO9 To study any two of each fungicides and microbial pesticides.

CO10 To study any six drug plants.

CO11 To know Plant extraction methods -Cold and Soxhlet extraction and TLC and study and preparation of ayurvedic formulations - Asav, Arishtha, Churna.

CO12 To conduct the qualitative analysis of Alkaloid, Glycoside and Tannin.

CO13 To study the stomatal index and vein islet number using suitable plant material using micrometer and camera Lucida.

CO14 To survey the local flora with respect their medicinal and economic importance.

Department of Mathematics

Course outcome

F.Y.B.Sc.

MT- 101 Paper - I Algebra and Geometry

By the end of this course students will able to

CO1   Know the basic properties of integers, equivalence classes, division algorithm.

CO2   Find g.c.d. of given integers and express it an linear combination of given integers.

CO3   Know the congruence relation and properties of congruence relation, residue classes modulo n.

CO4   Know basis properties of prime number and Euclid lemma.

CO5   Find g.c.d. of polynomials and know the relation between roots and coefficient of polinomial.

CO6   Reduce the matrix to row echelon and reduce row echelon form.

CO7   Solve the system of linear equation and finding eigenvalue and eigenvector of matrix.

CO8   Translate and rotate the axes and reduce the conic to standard form.

CO9   Find the equation of plane in one point form, normal form, perpendicular distance of point from plane, joint equation of plane and bisector plane.

CO10   Find equation of line in symmetrical and unsymmetrical form, coplanerity of two lines and shortest distance between two lines.

CO11   Know the equation of sphere in different form, intersection on sphere and plane, intersection of sphere.

CO12   Equation of tangent plane, equation of cone , cylinder and right circular cone and right circular cylinder.

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Course outcome

F.Y.B.Sc.

MT- 102 Paper - I Calculus and Differential Equation

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By the end of this course students will able to

CO1   Know properties of real numbers.

CO2   Definition of limit and continuity, properties of continuous function on closed and bounded interval.

CO3   Definition of derivative, geometric interpretation on derivative.

CO4   Find derivative of composite and inverse function.

CO5   Apply mean value theorems,

CO6   Find derivative of higher order, Taylor's and Maclaurin series of function.

CO7   Find integration by using partial methods, irrational functions and reduction formulae.

CO8   Find solution of homogeneous and non homogeneous differential equation.

CO9   Find solution of non exact differential equation using integrating factor.

CO10   Linear differential equation and Bernoulli differential equation.

CO11   Know orthogonal trajectories and Kirchhoff's law of electricity.

CO12   Find the solution of differential equation of first order and higher degree.

Course outcome (Sem-I)

S. Y. B. Sc.

MT- 211 Paper - I Multivariable Calculus I

By the end of this course students will able to

CO1   Know the domain and range of function.

CO2   Find level curve and plot a graph of function.

CO3   Find simultaneous and repeated limits.

CO4   Calculate partial derivative of higher order.

CO5   Know the concept of differentiability , tangent plane , normal line.

CO6   Apply Lagrange's method for finding extreme vales.

CO7   Calculate Double and triple integral and find area and volume of different surfaces.

Course outcome (Sem-I)

S. Y. B. Sc.

MT- 212 (B) Paper - II Laplace Transform and Fourier Series

By the end of this course students will able to

CO1 Calculate Laplace Transform of elementary functions.

CO2 Know the basic properties of Laplace Transform.

CO3 Calculate Laplace Transform of derivative and integration.

CO4 Use Laplace Transform to find integration.

CO5 Find inverse Laplace Transform of functions.

CO6 Apply convolution theorem.

CO7 Use Laplace Transform for solving differential equation.

CO8 Find Fourier series of given function.

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Course outcome (Sem-II)

S. Y. B. Sc.

MT- 221 Paper - I Linear Algebra

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By the end of this course students will able to

CO1 Know the concept of Vector Space, subspace, linear dependence and independence.

CO2 Check whether given set is basis or not of vector space.

CO3 Find basis for row space, column space, null space.

CO4 Know the concept of inner product, orthogonal and orthonormal set.

CO5 Apply Gram- Schmidt process for finding orthonormal basis.

CO6 Check linear transformation of function.

CO7 Calculate rank and nullity of linear transformation.

CO8 Find inverse of linear transformation and matrix of linear transformation.

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Course outcome (Sem-II)

S. Y. B. Sc.

MT- 222(B) Paper - II Numerical Methods And Its Applications

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By the end of this course students will able to

CO1   Rounding off number to n significant digits and n decimal places.

CO2   Calculate absolute, relative and percentage error.

CO3   Apply Bisection, False position, Newton Raphson and iteration methods for finding approximate solution.

CO4   Know the finite difference operators and their relations.

CO5   Apply Newton forward difference, Backward difference interpolation, Lagrange's interpolation and Newton divided difference formulae.

CO6   Feet straight line, quadratic equation, power function and exponential function.

CO7   Use Trapezoidal rule, Simpson's $(1/3)^{rd}$ and Simpson's $(3/8)^{th}$ rule.

CO8   Find numerical solution of differential equation by using Euler's method , modified Euler's method and Runge Kutta methods.

Course outcome (Sem-III)
T. Y. B. Sc.
MT- 331 Paper - I Metric Spaces

By the end of this course students will able to

CO1 Know the metric space, open sphere, closed sphere, neighborhood, interior points, limit points.

CO2 Closure of set, open set, closed set, equivalent metric, subspace of metric space, product of metric space.

CO3 Check convergence of sequence, complete metric space, Cauchy sequence, dense and nowhere dense set.

CO4 Uniform continuity and homeomorphism of two metric spaces.

CO5 Compact metric space, sequentially compact, finite intersection property.

CO6 Identify connected and disconnected set.

Course outcome (Sem-III)
T. Y. B. Sc.
MT-332 Paper-II Real Analysis

By the end of this course students will able to

CO1   Perform operations on sets and function.

CO2   Know the concept of Equivalence countability, Real numbers, Cantor set, Least upper bounds.

CO3   Check the convergence of sequence, monotonic sequence, Cauchy sequence.

CO4   Find limit superior and limit inferior of sequence.

CO5   Check the convergence of series, divergence of series, alternating series, absolute convergence of series.

Course outcome (Sem-III)
T. Y. B. Sc.
MT-336 Paper-VI Problem Course on Metric Spaces
and Real Analysis-I

By the end of this course students will able to solve the problem based on MetricSpaces and Real Analysis.

Course outcome (Sem-III)
T. Y. B. Sc.
MT-334 Paper-IV Group Theory

By the end of this course students will able to

CO1   Know binary operations, Isomorphic Binary Structures, Groups.

CO2   Group and their subgroup.

CO3   Find Cosets , Direct Product Groups of Permutations, Orbits, Cycles, Alternating Groups, Cosets.

CO4   Know the Lagrange theorem.

CO5   Check Homomorphisms, Factor Groups, and calculate Factor Group and Simple Groups.

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Course outcome (Sem-III)

T. Y. B. Sc.

MT-335 Paper-V Ordinary Differential Equation

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By the end of this course students will able to

CO1   Find solution of linear differential equation with constant coefficient.

CO2   Find solution of non homogeneous differential equation by using various methods.

CO3   Find solution of differential equation by using power series.

CO4   Identify ordinary, singular and regular singular points.

CO5   Find solution of system of first order differential equation with distinct, repeated and complex roots.

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Course outcome (Sem-III)

T. Y. B. Sc.

MT-336 Paper-VI Problem Course on Group Theory and

Ordinary Differential Equation

</div>

By the end of this course students will able to solve the problem based on Group Theory and Ordinary differential equation.

<div align="center">

Course outcome (Sem-I)

T. Y. B. Sc.

MT-337A Paper-VII Operations Research

</div>

By the end of this course students will able to

CO1   Use graphical method for LPP, graphical sensitivity analysis.

CO2   Apply simplex method, understand the concept of surplus variable , slack variable and artificial variable.

CO3   Convert the problem in dual form.

CO4   Solve the transportation problem.

CO5   Solve assignment problem.

<h3 style="text-align:center">Course outcome (Sem-III)</h3>

<h3 style="text-align:center">T. Y. B. Sc.</h3>

<h3 style="text-align:center">MT-337F Paper-VIII Number Theory</h3>

By the end of this course students will able to

CO1   Calculate g.c.d. and l.c.m. of given numbers.

CO2   Identify Mersene prime numbers and Fermat numbers.

CO3   Find residue classes, complete residue classes, reduce residue classes modulo

   n.

CO4   Apply Chinese remainder theorem.

CO5   Know the concept of greatest integer function.

CO6   Quadratic reciprocity.

CO7   Solve Diophantine Equations $ax + by = c$ and Pythagorean triplets.

<h3 style="text-align:center">Course outcome (Sem-III)</h3>

<h3 style="text-align:center">T. Y. B. Sc.</h3>

<h3 style="text-align:center">MT-338 Practical</h3>

By the end of this course students will able to solve the problem based on Operations Research and Number Theory.

<h3 style="text-align:center">Course outcome (Sem-IV)</h3>

<h3 style="text-align:center">T. Y. B. Sc.</h3>

<h3 style="text-align:center">MT-341 Paper-I Complex Analysis</h3>

By the end of this course students will able to

CO1   Find sum, product, quotient, arguments and modulus of complex numbers.

CO2   Find limit, continuity, derivative and integration of complex numbers.

CO3   Use Cauchy Riemann equation. Identify harmonic function.

CO4   Convert polar, exponential and logarithmic form of complex number.

CO5   Apply Liouville's theorem.

CO6   Find Taylors and Laurent series.

CO7   Find residue and poles of function.

Course outcome (Sem-IV)

T. Y. B. Sc.

MT-342 Paper-II Real Analysis-II

By the end of this course students will able to

CO1   Identify set of measure zero.

CO2   Check the existence of Riemann Integration.

CO3   Know the fundamental of integral calculus.

CO4   Solve the improper integral of first and second type.

CO5   Find Cauchy Principle Value.

CO6   Check point wise and uniform convergent of sequences.

CO7   Find integration and differentiation of series of function.

Course outcome (Sem-IV)

T. Y. B. Sc.

MT-343 Paper-III Problem Course on Complex Analysis and

Real Analysis

By the end of this course students will able to solve the problem based on Complex Analysis

and

Real Analysis.

Course outcome (Sem-IV)

T. Y. B. Sc.

MT-344 Paper-IV Ring Theory

By the end of this course students will able to

CO1   Check the conditions for ring and field.

CO2   Find the integral domain, quotient function.

CO3   Factorize the polynomial over given field.

CO4   Find prime and maximal ideal.

CO5   Know the concept of Unique Factorization Domains , Euclidean Domain Euclidean Domains, Gaussian Integers and Multiplicative Norm.

Course outcome (Sem-IV)

T. Y. B. Sc.

MT-345 Paper-V Partial Differential Equation

By the end of this course students will able to

CO1   Draw surface and curve in three dimension.

CO2   Find solution of equation $\frac{dx}{P} = \frac{dx}{Q} = \frac{dx}{R}$

CO3   Find Orthogonal Trajectories of a System of curves on a Surface.

CO4   Solve Pfaffian Differential equation.

CO5   Classify integrals.

CO6   Check compatibility of system of equation.

CO7   Use Charpit's method and Jacobi method to solve non linear differential equation.

CO8   Solve Quasi linear equation.

Course outcome (Sem-IV)

T. Y. B. Sc.

MT-346 Paper-VI Problem Course on Ring Theory and

Partial Differential Equation

By the end of this course students will able to solve the problem based on Ring Theory and Partial Differential Equation.

Course outcome (Sem-IV)

T. Y. B. Sc.

MT-347(A) Paper-VII Optimization Technique

By the end of this course students will able to

CO1   Draw network CPM and PERT , find critical path.

CO2   Form linear programming problem.

CO3   Understand the optimal strategy of player.

CO4   Understand the concept of mixed strategy, graphical method to solve game theory.

CO5   Understand the concept of running cost, resale value, total cost and average cost.

CO6   Solve machine problem.

CO7   Solve assignment problem and calculate elapse time and ideal time for the machine.

CO8   Find stationary point of extreme value function.

Course outcome (Sem-IV)

T. Y. B. Sc.

MT-347(F) Paper-VIII Computational Geometry

By the end of this course students will able to

CO1   Form rotation, reflection, scaling, shearing matrix in two dimension.

CO2   Understand Geometric Interpretation of Homogeneous Coordinates, Overall Scaling, Points at Infinity.

CO3   Form rotation, reflection, scaling, shearing matrix in three dimension.

CO4   Represent parametric curve, circle, ellipse, parabola and hyperbola.

CO5   Find Space curve and Beizer curve.

Course outcome (Sem-IV)

T. Y. B. Sc.

MT-338 Practical

By the end of this course students will able to solve the problem based on Optimization Technique and Computational Geometry.

Course outcome

F.Y.B.Sc. (Comp.Sci.)

MT- 101 Paper - I Discrete Mathematics

By the end of this course students will able to

CO1   Predicate, *n*-Place and *n*-ary.

CO2   Identify Universal Quantifier, Existential Quantifier.

CO3   Know the Rules of Inference.

CO4   Draw Hasse diagram.

CO5   Distinguish between Complemented lattice, Bounded lattice and Distributive lattice.

CO6   Understand Boolean function, Represent Boolean function.

CO7   Understand the Inclusion-Exclusion Principle and Pigeonhole Principle.

CO8   Use Permutation and combination.

CO9   Use Recurrence Relations to find homogeneous solution, particular and total solution.

CO10   Understand basic terminologies and results of Graphs.

CO11   Calculate Adjacency and Incidence Matrix of a Graph.

CO12   Find Subgraphs, induced subgraphs of graph.

CO13   Perform vertex deletion and edge deletion operation on graph.

CO14   Understand the concept of union, intersection, product and complement of graph.

CO15   Understand various properties of connected graph, tree and Eulerian and Hamiltonian Graphs

Course outcome

F.Y.B.Sc. (Comp.Sci.)

MT- 102 Paper - II Algebra and Calculus

By the end of this course students will able to

CO1   Understand basic properties of set.

CO2   Identify one-one and onto function.

CO3   Understand the concept of equivalence relation on set.

CO4   Understand binary operations and its properties.

CO5   Understand the basic properties of group, subgroup, cyclic group.

CO6   Use principle of Mathematical Induction.

CO7   Calculate g.c.d. and l.c.m. of given numbers.

CO8   Understand the concept of congruence and its properties.

CO9   Understand the continuity and properties of continuity.

CO10   Understand Rolles theorem, Lagranges mean value theorem and Cauchy mean value theorem.

CO11   Calculate n^{th} derivative of function.

CO12   Find Taylor's and Maclaurin's Series.

CO13   Reduce the matrix to row echelon form, Find row space and column space of matrix.

Course outcome
F. Y. B. Sc.(Computer Science)
Paper III Practical

By the end of this course students will able to solve the problem based on Algebra and Calculus and Discrete mathematics.

Course outcome
S.Y.B.Sc. (Comp. Sci.)
MT- 211 Paper - I Applied Algebra

CO1   Know the concept of Vector Space, subspace, linear dependence and independence.

CO2   Check whether given set is basis or not of vector space.

CO3   Find basis for row space, column space, null space.

CO4   Check linear transformation of function.

CO5   Calculate rank and nullity of   linear transformation.

CO6   Find inverse of linear transformation and matrix of linear transformation.

CO7   Know about group, abelian group Check Homomorphism, Factor Groups, and calculate Factor ,Group and Simple Groups.

CO8   Know about coding and encoding

<div align="center">

Course outcome (Sem-I)

S. Y. B. Sc. (Computer science)

Paper - II Numerical Analysis

</div>

By the end of this course students will able to

CO1   Rounding off number to n significant digits and n decimal places.

CO2   Calculate absolute, relative and percentage error.

CO3   Apply Bisection, False position, Newton Raphson and iteration methods for finding approximate solution.

CO4   Know the finite difference operators and their relations.

CO5   Apply Newton forward difference, Backward difference interpolation, Lagrange's interpolation and Newton divided difference formulae.

CO6   Use Trapezoidal rule, Simpson's $(1/3)^{rd}$ and Simpson's $(3/8)^{th}$ rule.

CO7   Find numerical solution of differential equation by using Euler's method , modified Euler's method and Runge Kutta methods.

<div align="center">

Course outcome (Sem-II)

S. Y. B. Sc. (Computer science)

Paper - I computational Geometry

</div>

By the end of this course students will able to

CO1   Form rotation, reflection, scaling, shearing matrix in two dimension.

CO2   Understand Geometric Interpretation of Homogeneous Coordinates, Overall Scaling, Points at Infinity.

CO3   Form rotation, reflection, scaling, shearing matrix in three dimension.

CO4   Represent parametric curve, circle, ellipse, parabola and hyperbola.

CO5   Find Space curve and Beizer curve.

<p align="center">**Course outcome (Sem-II)**</p>
<p align="center">**S. Y. B. Sc. (Computer science)**</p>
<p align="center">**Paper - II Operation Research**</p>

By the end of this course students will able to

CO1   Use graphical method for LPP, graphical sensitivity analysis.

CO2   Apply simplex method, understand the concept of surplus variable , slack variable and artificial variable.

CO3   Convert the problem in dual form.

CO4   Solve the transportation problem.

CO5   Solve assignment problem.

CO6   Form linear programming problem.

CO7   Understand the optimal strategy of player.

CO8   Understand the concept of mixed strategy, graphical method to solve game theory.

<p align="center">**Course outcome (Sem-II)**</p>
<p align="center">**S. Y. B. Sc.(Computer Science)**</p>
<p align="center">**Paper III Practical**</p>

By the end of this course students will able to

CO1   Know about coding and encoding.

CO2   Apply simplex method, understand the concept of surplus variable, slack variable and artificial variable.

CO3   Convert the problem in dual form.

CO4   Solve the transportation problem.

CO5   Solve assignment problem.

CO6   Use of scilab software.

CO7   Find eigenvalue and eigenvector by using scilab

CO8   Plot 2D and 3D graph using scilab.

CO9   Solve numerical integration by using scilab.

CO10   Find numerical solution of differential equation by using Euler's method , modified Euler's method and Runge Kutta methods. by using Scilab software.

Course outcome (Sem-III)
S. Y. B. B.A.(Computer Application)
Business mathematics

By the end of this course students will able to

CO1   Solve basic problems based on gcd ,ratio ,proportion etc

CO2   Solve problems of simple interest ,compound interest.

CO3   Know about shares and annuity.

CO4   Know about matrices and their operations such as inverse, applications.

CO5   Solve the transportation problem.

Course outcome (Sem-I)
F.Y.B.Com. (Computer Application)
Business mathematics

By the end of this course students will able to

CO1   Understand basic concepts in finance.

CO2   Know application of Mathematics and Statistics in Business.

CO3   Understand Statistical methods to analyze data.

Department of Statistics

Course Outcomes

Course Descriptive Statistics I (F.Y.B.Sc Sem-I)

At the end of this course students are expected to

CO1   Acquire basic concepts of Statistics.

CO2   Understand various sampling methods.

CO3   Compute various measures of central tendency.

CO4   Identify the nature of data using skewness and kurtosis measure.

CO5   Analyze data pertaining to attributes and interpret the results.

F.Y.B.Sc Sem-I

Discrete probability and probability distributions I

At the end of this course students are expected to

CO1   Understand basic concepts of probability.

CO2   Understand concept of conditional probability.

CO3   Compute probabilities of various events.

CO4   Obtain a probability distribution of random variable in the given situations.

F.Y.B.Sc Sem-II

Descriptive Statistics II

At the end of this course students are expected to

CO1   Understand the concept of bivariate data.

CO2   Compute and interpret the Correlation coefficient.

CO3   Understand the concept of Regression analysis.

CO4   Able to fit linear and non linear curves for bivariate data.

CO5   Compute and interpret the various index numbers

<center>**F.Y.B.Sc Sem-II**</center>

<center>**Discrete probability and probability distributions II**</center>

At the end of this course students are expected to

CO1   Understand various discrete probability distributions and its real life situations.

CO2   Understand the properties of discrete distributions.

CO3   Link interrelations between discrete distributions

<center>**F.Y.B.Sc Sem-II)**</center>

<center>**Practical**</center>

At the end of this course students are expected to

CO1   Do graphical representation and interpretation of data sets.

CO2   Do graphical representation of data sets using Ms-Excel.

CO3   Compute summary statistics.

CO4   Compute of summary statistics using Ms-Excel.

CO5   Interpret summary statistics of computer output.

CO6   Able to fit regression lines using Ms-Excel.

CO7   Able to generate random sample.

<center>**S.Y.B.Sc Sem-I**</center>

<center>**Discrete Probability Distributions , Time series and R Software**</center>

At the end of this course students are expected to

CO1   Identify the situations where Negative Binomial and Multinomial distribution used.

CO2   Find probabilities related to Negative Binomial and Multinomial distribution.

CO3   Understand the concept of truncated distribution.

CO4   Understand the forecasting and data analysis techniques for time series data.

S.Y.B.Sc Sem-I

Continuous probability distributions-I

At the end of this course students are expected to

CO1   Understand the concept and properties of univariate and bivariate continuous probability distributions.

CO2   Identify the situations where Uniform, Normal, Exponential and Gamma distribution can be used.

CO3   Compute probabilities corresponding to Uniform, Norma, Exponential and Gamma distribution.

CO4   Understand the interrelations between continuous distribution

S.Y.B.Sc Sem-II

Statistical methods and use of R Software

At the end of this course students are expected to

CO1   Understand applications of multiple linear regression.

CO2   Test the hypothesis for means and proportions for large sample.

CO3   Test of hypothesis for means and proportions using R software.

CO4   Understand applications of statistics in the field of demography.

CO5   Understand applications of queuing theory

S.Y.B.Sc. Sem-II

Sampling Distributions and Inference

At the end of this course students are expected to

CO1   Understand applications of Chi-square, t and F distributions.

CO2   Compute Probabilities for Chi-square, t and F distributions.

CO3   Understand interrelations between Chi-square, t and F distributions.

CO4   Test the hypothesis for small sample based on Chi-square, t and F distributions

S.Y.B.Sc. Sem-II

Practical

At the end of this course students are expected to

CO1   Compute partial and multiple correlation coefficient using calculators and Ms-Excel.

CO2	Fit various discrete and continuous distributions using calculators and Ms-Excel.
CO3	Test hypothesis using calculators and R software.
CO4	Analyze time series data

F.Y.B.Sc. Computer Science, Sem-I
Descriptive Statistics I

At the end of this course students are expected to

CO1	Acquire basic concepts of Statistics.
CO2	Compute various measures of central tendency.
CO3	Identify the nature of data using skewness and kurtosis measure.
CO4	Analyze data pertaining to attributes and interpret the results.

F.Y.B.Sc Computer Science, Sem-I
Methods of Applied Statistics

At the end of this course students are expected to

CO1	Understand basic concepts of probability.
CO2	Understand concept of conditional probability.
CO3	Compute probabilities of various events.
CO4	Understand various discrete probability distributions and its real life situations.
CO5	Understand applications of discrete distributions.

F.Y.B.Sc. Computer Science, Sem-II
Mathematical Statistics

At the end of this course students are expected to

CO1	Understand the concept of bivariate data.
CO2	Compute and interpret Correlation coefficient.
CO3	Understand the concept of Regression analysis.
CO4	Understand the applications of multiple linear regression.
CO5	Analyze time series data.

F.Y.B.Sc Computer Science, Sem-II

Continuous probability distributions and testing of hypothesis

At the end of this course students are expected to

CO1   Understand the concept and properties of univariate and bivariate continuous probability distributions.

CO2   Identify the situations where Uniform, Normal, Exponential and Parato distribution used.

CO3   Compute probabilities corresponding to Uniform, Normal, Exponential and Parato distribution.

CO4   Test the hypothesis related to means and proportions.

CO5   Generate a random sample from Uniform, Exponential and Normal distribution

F.Y.B.Sc Computer Science, Sem-II

Practical

At the end of this course students are expected to

CO1   Do graphical representation and interpretation of data sets.

CO2   Do graphical representation of data sets using Ms-Excel.

CO3   Compute summary statistics.

CO4   Compute of summary statistics using Ms-Excel.

CO5   Interpret summary statistics of computer output.

CO6   Able to fit regression lines using Ms-Excel.

CO7   Able to generate random sample.

CO8   Understand the concept of Fitting of Binomial and Poisson distribution.

CO9   Test of hypothesis related to means and proportions.

CO10   Analyze time series data.

F.Y.B.B.A (C.A)

Business Statistics

At the end of this course students are expected to

CO1   Understand the role and importance of statistics in various business situations.

CO2   Compute various measures of central tendency and dispersion.

CO3   Understand concept of correlation and regression analysis.

F.Y.B.Com.

Business Mathematics and Statistics I

At the end of this course students are expected to

CO1   Acquire basic concepts in finance.

CO2   Understand application of Mathematics and Statistics in business.

CO3   Understand statistical methods to analyze data.

<div align="center">**Department of Computer Science**</div>

Program Specific outcomes (PSOs)

The curriculum and syllabus for Bachelor degrees (2018) conform to outcome based teaching learning process. In general, FOURTEEN STUDENT OUTCOMES (a-n) have been identified; the curriculum and syllabus have been structured in such a way that each of course meets one or more of these outcomes. Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire as they progress through the program. Further, each course in the program spells out clear instructional objectives which are mapped to the student outcomes.

CO1	Ability to apply knowledge of computing, mathematics, and basic sciences that may be relevant and appropriate to the domain.
CO2	Ability to analyze a problem, identify and define the computing requirements, which may be appropriate to its solution.
CO3	Ability to design, implements, and evaluate computer-based system, process, component, or program to meet desired needs.
CO4	An ability to function effectively on teams to accomplish a common goal.
CO5	Understanding of professional, ethical, legal, security, social issues and responsibilities.
CO6	Ability to communicate effectively among a range of audiences g. Ability to analyze the local and global impact of computing on individuals, organizations, and society.
CO7	Recognition of the need for and an ability to engage in continuing professional development.
CO8	Ability to use current techniques, skills, and tools necessary for computing practices.

CO9	Ability to use and apply current technical concepts and practices in the core development of solutions in the form of Information technology.
CO10	Ability to identify and analyze user needs and take them into account in the selection, creation, evaluation, and administration of computer-based systems.
CO11	Ability to incorporate effectively integrate IT-based solutions to applications

Course Outcome

F.Y.B.Sc.(Computer Science)

CS-101- Computer Science Paper-I - Problem Solving Using Computers and 'C' Programming

By the end of this course students will be able to

CO1	Illustrate the flowchart and design an algorithm for a given problem and to develop I C programs using operators.
CO2	Develop conditional and iterative statement to write C programs.
CO3	Exercise user defined function to solved real time problems.
CO4	Inscribe C Programs that use pointers to access arrays, strings and functions.
CO5	Exercise user defined datatypes including structures and union to solve problems.
CO6	Inscribe C Programs using pointers and to allocate memory using dynamic memory management functions.
CO7	Exercise files concepts to show input and output of files in C.

Course Outcome

F.Y.B.Sc. (Computer Science)

CS-102 -Computer Science Paper-II–File Organization and Fundamental of Databases

By the end of this course students will be able to

CO1	The ability to apply the concepts of engineering i.e. collecting data, organize the data in the systematic form ,arrange the data in a computational way and this the way in applying mathematics.
CO2	Able to design the ER diagrams as well as interpret the Design of database.
CO3	Able to design the data base system due to inferring the knowledge
CO4	Participating in projects, workshops encourage multidisciplinary teams.
CO5	Formulate the queries required to solve the issues in data base.
CO6	The subject learnt by students can be implemented in real time systems whenever it is necessary

Course Outcome

F.Y.B.Sc. (Computer Science)

CS-103-Computer Science Paper-III–Computer Science Practical Paper I

By the end of this course, students will be able to

CO1	Read, understand and trace the execution of programs written in C language.
CO2	Write the C code for a given algorithm.
CO3	Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
CO4	rite programs that perform operations using derived data types.

Course Outcome

F.Y.B.Sc. (Computer Science)

CS-104 – Computer Science Paper-IV -Computer Science Practical Paper II

By the end of this course students will be able to

CO1	Ability to define a problem at the view level & ability to understand the physical structure of the database to handle data.
CO2	Students would be able to implement the logic by using tools like ERD.
CO3	Ability to normalize the database & understand the internal data structure
CO4	Students would clearly understand the transaction system & could extract data efficiently

Course Outcome

F.Y.B.Sc. (Computer Science)

ELC-101-Electronics Science Paper-I – Principles of Analog Electronics

By the end of this course, students will be able to

CO1	Understand Basic Circuits using Active Devices.
CO2	Learn functions of basic circuit components used in linear circuits.
CO3	Understand basic construction, equivalent circuits and characteristics of basic electronics devices.
CO4	Students understand basic linear electronics circuits and their working principle.

Course Outcome

F.Y.B.Sc. (Computer Science)

ELC-102 -Electronics Science Paper-II– Principles of Digital Electronics

By the end of this course, students will be able to

CO1	Understand basic digital electronic systems.
CO2	To learn function of basic digital circuits and use of transistors to create logic gates in order to perform Boolean logic.
CO3	To learn different theorems for simplification of basic Digital electronics circuits.
CO4	Student understand symbols, Truth tables, Boolean equations, & working principle

Course Outcome

F.Y.B.Sc. (Computer Science)

ELC-103 -Electronics Science Paper-III–Electronics Practical

By the end of this course, students will be able to

CO1   Have a thorough understanding of the fundamental concepts and techniques used in digital electronics.

CO2   To understand and examine the structure of various number systems and its application in digital design.

CO3   The ability to understand, analyze and design various combinational and sequential circuits.

CO4   Ability to identify basic requirements for a design application and propose a cost effective solution.

CO5   The ability to identify and prevent various hazards and timing problems in a digital design.

CO6   To develop skill to build, and troubleshoot digital circuits.

CO7   Acquire a basic knowledge in solid state electronics including diodes, MOSFET, BJT, and operational amplifier.

CO8   Develop the ability to analyze and design analog electronic circuits using discrete components.

CO9   Observe the amplitude and frequency responses of common amplification circuits

Course outcome

F.Y.B.Sc. (Comp.Sci.)

MT- 101-Paper - I Discrete Mathematics

By the end of this course students will able to

CO1   Predicate, n-Place and n-ary.

CO2   Identify Universal Quantifier, Existential Quantifier.

CO3   Know the Rules of Inference.

CO4   Draw Hasse diagram.

CO5   Distinguish between Complemented lattice, Bounded lattice and Distributive lattice.

CO6   Understand Boolean function, Represent Boolean function.

CO7   Understand the Inclusion-Exclusion Principle and Pigeonhole Principle.

CO8   Use Permutation and combination.

CO9   Use Recurrence Relations to find homogeneous solution, particular and total solution.

CO10   Understand basic terminologies and results of Graphs.

CO11   Calculate Adjacency and Incidence Matrix of a Graph.

CO12   Find Subgraphs, induced subgraphs of graph.

CO13   Perform vertex deletion and edge deletion operation on graph.

CO14   Understand the concept of union, intersection, product and complement of graph.

CO15   Understand various properties of connected graph, tree and Eulerian and Hamiltonian Graphs

Course outcome

F.Y.B.Sc. (Comp.Sci.)

MT- 102-Paper - II Algebra and Calculus

By the end of this course students will able to

CO1   Understand basic properties of set.

CO2   Identify one-one and onto function.

CO3   Understand the concept of equivalence relation on set.

CO4   Understand binary operations and its properties.

CO5   Understand the basic properties of group, subgroup, cyclic group.

CO6   Use principle of Mathematical Induction.

CO7   Calculate g.c.d. and l.c.m. of given numbers.

CO8   Understand the concept of congruence and its properties.

CO9   Understand the continuity and properties of continuity.

CO10   Understand Rolles theorem, Lagranges mean value theorem and Cauchy mean value theorem.

CO11   Calculate n^{th} derivative of function.

CO12   Find Taylor's and Maclaurin's Series.

CO13   Reduce the matrix to row echelon form, Find row space and column space of matrix.

Course outcome

F. Y. B. Sc.(Computer Science)

Mathematics Paper III -Practical

By the end of this course students will able to

CO1   To solve the problem based on Algebra and Calculus andDiscrete mathematics.

Course outcome

F. Y. B. Sc. (Computer Science)

Paper I -Statistical Methods I

By the end of this course students will able to

CO1   Organize, manage and present data.

CO2   Analyze statistical data graphically using frequency distributions and cumulative frequency distributions.

CO3   Analyze statistical data using measures of central tendency, dispersion and location.

CO4   Use the basic probability rules, including additive and multiplicative laws, using the terms, independent and mutually exclusive events.

CO5   Translate real-world problems into probability models.

CO6   Derive the probability density function of transformation of random variables.

CO7   Calculate probabilities, and derive the marginal and conditional distributions of bivariate random variables.

CO8   Analyze Statistical data using MS-Excel.

Course outcome

F. Y. B. Sc. (Computer Science)

Paper II-Statistical Methods II

By the end of this course students will able to

CO1   Use discrete and continuous probability distributions, including requirements, mean and variance, and making decisions.

CO2   Define binomial outcomes and compute probability of getting X successes in N trials.

CO3   Identify the characteristics of different discrete and continuous distributions.

CO4   Identify the type of statistical situation to which different distributions can be applied.

CO5   Use Poisson, exponential distributions to solve statistical problems.

CO6   Use the normal probability distribution including standard normal curve calculations of appropriate areas.

CO7   Use different distributions to solve simple practical problems.

Course outcome
F. Y. B. Sc. (Computer Science)
Paper III –Statistics Practical

By the end of this course students will able to

CO1   To solve the problem based on Statistical method 1 and Statistical method 2.

Course Outcome (SEM-1)
S.Y.B.Sc. (Computer Science)
CS-211- Computer Science Paper-I - Data Structures Using 'C'

By the end of this course students will be able to

CO1   Ability to analyze algorithms and algorithm correctness.

CO2   Ability to summarize searching and sorting techniques.

CO3   Ability to describe stack, queue and linked list operation.

CO4   Ability to have knowledge of tree and graphs concepts.

Course Outcome (SEM-1)
S.Y.B.Sc. (Computer Science)
CS-212-Computer Science Paper- II - Relational Database Management System

By the end of this course students will be able to

CO1   Students can apply knowledge of computing and mathematics appropriate to the discipline.

CO2   Students can analyze a problem, and identify and define the computing requirements appropriate to its solution CO3-Ability to describe stack, queue and linked list operation.

CO3   Students can design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

CO4   Students can use current techniques, skills, and tools necessary for computing practice.

CO5   An ability to use and apply current technical concepts and practices in the core information technologies.

CO6   An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.

CO7   Master concepts of stored procedure and triggers and its use.

CO8   Learn about using PL/SQL for data management & Understand concepts and implementations of transaction management and crash recovery.

Course Outcome (SEM-1)

S.Y.B.Sc. (Computer Science)

MT-211-Mathematics Paper I- Applied Algebra

By the end of this course students will be able to,

CO1   Recognise technical terms and appreciate some of the uses of algebra.

CO2   Collect like terms and simplify expressions term by term.

CO3   Multiply out brackets.

CO4   Simplify some formulas.

CO5   Solve simple linear equations.

Course Outcome (SEM-1)

S.Y.B.Sc. (Computer Science)

MT-212-Mathematics Paper-II - Numerical Analysis

By the end of this course, students will be able to

CO1 Understand numerical techniques to find the roots of nonlinear equations and solution of system of linear equations.

CO2 Understand the difference operators and the use of Interpolation.

CO3 Understand numerical Differentiation and Integration and numerical solutions of ordinary and partial differential equations.

<div align="center">

Course Outcome (SEM-1)

S.Y.B.Sc. (Computer Science)

ELC-211-Electronics Science Paper-I - Digital System Hardware

</div>

By the end of this course, students will be able to

CO1 Develop a digital logic and apply it to solve real life problems.

CO2 Analyze, design and implement combinational logic circuits.

CO3 Classify different semiconductor memories.

CO4 Analyze, design and implement sequential logic circuits.

CO5 Analyze digital system design using PLD.

CO6 Simulate and implement combinational and sequential circuits using VHDL systems.

<div align="center">

Course Outcome (SEM-1)

S.Y.B.Sc. (Computer Science)

ELC-212-Electronics Science Paper-II - Analog Systems

</div>

By the end of this course, students will be able to

CO1 Students will be able to explain principle of. operation for various sensors.

CO2 Students will be able to describe functional.2 blocks of data acquisition system.

CO3 Develop innovative design for practical applications in various fields.

CO4 Students will be able to draw frequency response of various filters and understand filter related concept.

<div align="center">

Course Outcome (SEM-2)

S.Y.B.Sc. (Computer Science)

CS-221- Computer Paper I-Object Oriented Concepts using C++

</div>

By the end of this course students will be able to

CO1	To understand how C++ improves C with object-oriented features.
CO2	To learn how to write inline functions for efficiency and performance.
CO3	To learn the syntax and semantics of the C++ programming language.
CO4	To learn how to design C++ classes for code reuse.
CO5	To learn how to implement copy constructors and class member functions.
CO6	To understand the concept of data abstraction and encapsulation.
CO7	To learn how to overload functions and operators in C++.
CO8	To learn how containment and inheritance promote code reuse in C++.
CO9	To learn how inheritance and virtual functions implement dynamic binding with polymorphism.

Course Outcome (SEM-2)
S.Y.B.Sc. (Computer Science)
CS-222-Computer Paper II-Software Engineering

By the end of this course students will be able to

CO1	Adapt the basic software engineering methods and practices in their appropriate applications.
CO2	Distinguish the various software process models such as waterfall model, evolutionary models, etc.
CO3	Compose the requirements document by understanding the software requirements.
CO4	Relate the software architectural styles to the suitable applications.
CO5	Determine the need for, and an ability to engage in, life-long learning.
CO6	Analyze, design and maintain software Systems.

Course Outcome (SEM-2)
S.Y.B.Sc. (Computer Science)
CS-223 - Computer Science Paper-III - Data Structure Practical and C++ Practical

By the end of this course students will be able to

CO1	Choose appropriate data structures to represent data items in real world problems.

CO2   Analyze the time and space complexities of algorithms.

CO3   Design programs using a variety of data structures such as stacks, queues, hash tables, binary trees, search trees, heaps, graphs, and B-trees.

CO4   Analyze and implement various kinds of searching and sorting techniques.

Course Outcome (SEM-II)

S.Y.B.Sc. (Computer Science)

CS-224 - Computer Science Paper-IV - Database Pract. & mini project using software engg. techniques.

By the end of this course students will be able to

CO1   To describe a sound introduction to the discipline of database management systems.

CO2   To give a good formal foundation on the relational model of data and usage of Relational Algebra.

CO3   To introduce the concepts of basic SQL as a universal Database language.

CO4   To enhance knowledge to advanced SQL topics like embedded SQL, procedures connectivity through JDBC.

CO5   To demonstrate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization.

CO6   To provide an overview of physical design of a database system, by discussing Database indexing techniques and storage techniques.

Course Outcome (SEM-II)

S.Y.B.Sc. (Computer Science)

ELC 221-Electronics Paper-I-The 8051 Architecture,Interfacing& Programming

By the end of this course students will be able to

CO1   Gain comprehensive knowledge about architecture and addressing modes of 8051.

CO2   Write assembly language program in 8051 for various embedded system applications.

CO3   Implement the middle level programming and interfacing concepts in 8051.

CO4   Use external interfaces in various embedded system projects.

CO5   Create the memory interfacing techniques with 8051.

CO6   Create the IO interfacing techniques with 8051

Course Outcome (SEM-II)
S.Y.B.Sc. (Computer Science)
ELC 222-Electronics Paper-II-Communication Principles

By the end of this course students will be able to

CO1   Analyse communication systems in both the time and frequency domains.

CO2   Describe the principles of amplitude modulated and angle modulated communication systems and is able to analyse their performance in the presence of noise.

CO3   Explain source coding, its relations to information theory and cite Shannon's theorem.

CO4   Describe the principles of various digital modulation systems and their properties,including bandwidth, channel capacity, transmission over bandlimitedchannels, inter-symbol interference (ISI), demodulation methods, and errorperformance in the presence of noise.

CO5   Explain and analyse error correcting codes, including block codes.

By the end of this course, students will be able to

CO1   Analysis of Resistive Circuits and Solution of resistive circuits with independent sources.\

CO2   To acquire the knowledge about the characteristics and working principles of optocoupler, R-2R ladder network.

CO3   Acquire knowledge about electronic components, measuring instruments, assembling, etc.

CO4   Understand nature of experimental errors and practical means to estimate errors in acquired data.

CO5   Develop skills for team work and technical communication and discussions.

Course outcome (Sem-II)

S. Y. B. Sc.(Computer science)

MTC 221- Mathematics Paper - I -Computational Geometry

By the end of this course students will able to

CO1   Form rotation, reflection, and scaling, shearing matrix in two dimensions.

CO2   Understand Geometric Interpretation of Homogeneous Coordinates, Overall Scaling, Points at Infinity.

CO3   Form rotation, reflection, and scaling, shearing matrix in three dimensions.

CO4   Represent parametric curve, circle, ellipse, parabola and hyperbola.

CO5   Find Space curve and Beizer curve.

Course outcome (Sem-II)

S. Y. B. Sc.(Computer science)

MTC 222- Mathematics Paper – II- Operation Research

By the end of this course students will able to

CO1   Use graphical method for LPP, graphical sensitivity analysis.

CO2   Apply simplex method, understand the concept of surplus variable, slack variable and artificial variable.

CO3   Convert the problem in dual form.

CO4   Solve the transportation problem.

CO5   Solve assignment problem.

CO6   Form linear programming problem.

CO7   Understand the optimal strategy of player.

CO8   Understand the concept of mixed strategy, graphical method to solve game theory.

Course outcome (Sem-II)

S. Y. B. Sc. (Computer Science)

MTC 223- Mathematics Paper III -Practical

By the end of this course students will able to

CO1   Know about coding and encoding.

CO2   Apply simplex method, understand the concept of surplus variable , slack variable and artificial variable.

CO3   Convert the problem in dual form.

CO4   Solve the transportation problem.

CO5   Solve assignment problem.

CO6   Use of scilab software.

CO7   Find eigenvalue and eigenvector by using scilab.

CO8   Plot 2D and 3D graph using scilab.

CO9   Solve numerical integration by using scilab.

CO10   Find numerical solution of differential equation by using Euler's method, modified Euler's method and RungeKutta methods. by using Scilab software.

Course Outcome (SEM-II1)

T.Y.B.Sc. (Computer Science)

CS 331-Paper I-System Programming

By the end of this course students will able to

CO1	Understand design structure of a simple editor.
CO2	Understand design structure and working of Assembler through simulation.
CO3	Understand design structure and working of macro processor through simulated program.
CO4	Gain an understanding and working of linkers and loaders.
CO5	Study development utilities.
CO6	Study structure of operating system.

Course Outcome (SEM-III)

T.Y.B.Sc. (Computer Science)

CS 332-Paper II- Theoretical Computer Science

By the end of this course students will able to

CO1	Analyze and design finite automata, pushdown automata, Turing machines, formal languages, and grammars.
CO2	Distinguish different computing languages and their respective types.
CO3	Understand the relation between regular language, context free language and corresponding recognizers.
CO4	Demonstrate the understanding of key notions, such as algorithm, computability, decidability, and complexity through problem solving.

Course Outcome (SEM-III)

T.Y.B.Sc. (Computer Science)

CS 333-Paper III- Computer Networks- I

By the end of this course students will able to

CO1	Students g to know how machines communicate with each other and how internet work.
CO2	Several communication mediums involved in transmission of data.
CO3	Protocols, their respective layers and their usage for day to day life.
CO4	Security concerns regarding different scenarios and different layers.

By the end of this course students will able to

CO1 Students learn various recent web technologies viz. PHP, XML, AJAX etc used for client side and server side scripting.

CO2 Design of dynamic and interactive web sites.

CO3 Use of advanced web techniques to build effective web pages.

CO4 Be familiar with the readymade frameworks and environments used for web designing.

CO5 Learn styling, formatting and various XML parsers used for websites.

Course Outcome (SEM-III)

T.Y.B.Sc. (Computer Science)

CS 335-Paper V- Programming in JAVA – I

By the end of this course students will able to

CO1 To learn the basic concept of Java Programming.

CO2 To understand how to use programming in day to day applications.

CO3 Understanding of the principles and practice of object oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements;

CO4 Implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.

CO5 Demonstrate the principles of object oriented programming;

CO6 Use simple data structures like arrays in a Java program.

CO7 Understand the concept of package, interface, multithreading and File handling in java.

CO8 Use members of classes found in the Java API (such as the Math class).

CO9 Employ various types of selection constructs in a Java program. Employ a hierarchy of Java classes to provide a solution to a given set of requirements.

Course Outcome (SEM-III)

T.Y.B.Sc. (Computer Science)

CS 336-Paper VI- Object Oriented Software Engineering

By the end of this course students will able to

CO1   Develop an organized methodology for implementing larger scale software systems.

CO2   Be familiar with the application of the Unified Modeling Language (UML) towards analysis and design.

CO3   Be familiar with alternative development processes.

CO4   Be familiar with group/team projects and presentations.

CO5   Be exposed to technical writing and oral presentations.

Course Outcome (SEM-IV)

T.Y.B.Sc. (Computer Science)

CS 341-Paper I- Operating Systems

By the end of this course students will able to

CO1   Gain an understanding of design issues related to process scheduling.

CO2   Understand design issues related to process management.

CO3   Study of design issues related to memory management.

CO4   Gain an understanding of deadlock and techniques to prevent, avoid, detect and recover system from deadlock.

CO5   Study file system management.

Course Outcome (SEM-IV)

T.Y.B.Sc. (Computer Science)

CS 342-Paper II- Compiler Constructions

By the end of this course students will able to

CO1   Gain an understanding of how compilers translate source code to machine executable.

CO2   Comprehend how to perform parsing (top down and bottom up).

CO3   Understand how compilers generate code to manage memory during runtime.

CO4   Be familiar with techniques for simple code optimizations.

CO5   To understand design issues of a lexical analyzer and use of Lex tool.

CO6   To understand design issues of a parser and use of Yacc tool

Course Outcome (SEM-IV)

T.Y.B.Sc. (Computer Science)

CS 343-Paper III- Computer Networks- II

By the end of this course students will able to

CO1   Learned mechanisms of network layer and security concerns relating to it.

CO2   Several devices used in network layers and routing basics.

CO3   Addresses needed in different layers for communication.

CO4   Regarding Cyber Security and cyber laws.

CO5   Do's and don'ts that one should practice to be secure and away from threats in the world of internet.

Course Outcome (SEM-IV)

T.Y.B.Sc. (Computer Science)

CS 344-Paper IV- Internet Programming – II

By the end of this course students will able to

CO1   Students learn various recent web technologies viz. PHP, XML, AJAX etc used for client side and server side scripting.

CO2   Design of dynamic and interactive web sites.

CO3   Use of advanced web techniques to build effective web pages.

CO4   Be familiar with the readymade frameworks and environments used for web designing.

CO5   Learn styling, formatting and various XML parsers used for websites.

Course Outcome (SEM-IV)

T.Y.B.Sc. (Computer Science)

CS 345-Paper V- Programming in JAVA – II

By the end of this course students will able to

CO1   To learn the basic concept of Java Programming.

CO2   To understand how to use programming in day to day applications.

<div align="center">

Course Outcome (SEM-IV)

T.Y.B.Sc. (Computer Science)

CS 346-Paper VI- Computer Graphics

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By the end of this course students will able to

CO1   Ability to find & combine relevant sources and synthesize designs.

CO2   Detailed knowledge of the graphics pipeline.

CO3   Detailed knowledge of shading and texture mapping algorithms.

CO4   Broad knowledge of 3D modelling and rendering techniques.

CO5   Ability to understand, design and implement scene graphs.

CO6   Practical skills in graphics programming including scene graph programming and I/O processing

<div align="center">

Course Outcome (SEM-IV)

T.Y.B.Sc. (Computer Science)

CS 347-Practical Based on System Programming and Operating Systems

(Using C language on Linux OS)

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By the end of this course students will able to

CO1   Implementation of line editor and various operations supported by line editor.

CO2   To illustrate design of simple instruction computer.

CO3   Implementation of hypothetical assembler program.

CO4   Implementation of hypothetical macro processor program.

CO5   Implementation of Deterministic Finite Automata.

CO6   Study and implementation of Shell command prompt.

CO7   Implementation of different CPU scheduling algorithms.

CO8   Study and implementation of resource-request and safety algorithms.

CO9   Illustrate working of several page-replacement algorithms.

CO10   Simulate various File allocation Methods.

<div align="center">**Course Outcome (SEM-IV)**</div>

<div align="center">**T.Y.B.Sc. (Computer Science)**</div>

<div align="center">**CS 348-Practical's on Java, PHP and Computer Graphics**</div>

By the end of this course students will able to

CO1	Understand, analyze and apply the role languages like HTML, CSS, XML, JavaScript and protocols in the workings of web and web applications.
CO2	Create a static website using HTML and add dynamic functionality to it by using java Script.
CO3	Gain confidence to create dynamic website on real world problems.

<div align="center">**Course Outcome (SEM-IV)**</div>

<div align="center">**T.Y.B.Sc. (Computer Science)**</div>

<div align="center">**CS 349-Project using JAVA/PHP**</div>

By the end of this course students will able to

CO1	To learn the how to develop systems using JAVA.
CO2	To learn the how to develop systems using PHP.

POs, PSOs and Cos for Post Graduate Department in Science Faculty

M. Sc. Organic Chemistry

Programme Outcomes

After completing M.Sc. Organic Chemistry Programme students will be able to

PO1 Develop the knowledge and understanding of essential facts, concepts, principles and theories of the organic chemistry.

PO2 Do literature survey and apply it to enhance their conceptual knowledge that will be apply for solving problems in day to day life or chemical industry or at place of work.

PO3 Improve the ability to define the problem and find out its solution.

PO4 Use research based knowledge and research methods including design of experiment, analysis, interpretation of data and make conclusions.

PO5 Select and apply appropriate method of chemical analysis and understand the limitations of methods.

PO6 Apply scientific knowledge to perform laboratory experiments and its documentation, able to write effective report, make and give its effective presentation.

PO7 Explain the impact of chemical pollutants on environment and ecosystem.

PO8 Effectively use Good Laboratory Practices (GLPs)and understand laboratory safety precautions.

PO9 Plan, execute of design experiment, make documentation of it, interpret data at entry level of chemical industry and report the results.

PO10 Integrate and apply these skills to study different branches of chemistry.

PO11 The student will acquire knowledge effectively by self-study and work independently, present information in a clear, concise and logical manner and apply appropriate analytical and approximation methods.

PO12 The student will learn professionalism, including the ability to work in groups and in society, and apply basic ethical principles.

Programme Specific Outcomes

After completing M. Sc. Organic Chemistry, students will be able to

PSO1 Demonstrate knowledge and understanding of molecular spectroscopy for molecular structure determination.

PSO2 Apply theoretical and practical understanding of advanced analytical instruments for analysis of inorganic materials, biological substances, micronutrients, pollutants.

PSO3 Formulate hypotheses, proposals and predictions and design and undertake experiments and projects in a safe and responsible.

PSO4 Take research work at the higher degree level in the field of nanotechnology, Organic synthesis and material science.

Course Outcomes

M.Sc. Part-I [Organnic Chemistry] Semester-I

CHP-110 Basic Fundamentals of Physical Chemistry

At the end of course student should able to

CO1 Describe discovery of atom with different models and physical properties of matter and its study and rate of reaction.

CO2 Relate classical mechanics and quantum mechanics. And differentiation between order of reactions.

CO3 Illustrate the difference between molecular thermodynamics and classical thermodynamics.

CO4 Solve the derivations regarding quantum mechanics, thermodynamics, chemical kinetics and molecular thermodynamics.

CO5 Interpret and discuss about the numerical based on theory.

CO6 Recall the concepts of quantum mechanics, thermodynamics, chemical kinetics and molecular thermodynamics.

CO7 Derive the statistical and kinetics equations.

CO8 Present the quantum mechanical based problems.

CHI -130 Molecular Symmetry and chemistry of p-block elements

At the end of course student should able to -

CO1 Recall symmetry, group multiplication table, periodic table, periodic properties/ trends.

CO2 List symmetry elements, types of planes, allotropes and their uses.

CO3 Describe symmetry operations, hydrides, solutions in liq. Ammonia, organometallic compounds, intercalation compounds.

CO4 Discuss character table, SALC, molecular sieves, crown ethers, oxoanions of nitrogen, inter-halogen.

CO5 Explain point group, boron hydrides, oxy-acids and oxoanions of halogen,structure and bonding.

CO6 Classify molecules into point groups and planes, hydrides, carboranes.

CO7 Derive the character table and SALC equation for different point groups.

CO8   Draw structures of different compounds of s & p block elements.

CHO-150 Basic Organic Chemistry

By the end of this course students will able to

CO1   Define the terms related to Organic Reactions such as Aliphatic Nucleophilic, Aromatic electrophilic and Nucleophilic Substitution Reactions.

CO2   List Different factors responsible for reactivity of organic compounds in Addition reactions to Unsaturated compounds.

CO3   Recall the information about acidity Basicity and Aromaticity.

CO4   Explain the Elimination reactions.

CO5   Solve the chemical Reactions for Aliphatic Nucleophilic, Aromatic electrophilic and Nucleophilic Substitution Reaction.

CO6   Classify the organic reactions like substitution, Addition and elimination Reactions.

CO7   Categorize different nucleophiles Electrophiles and Bases.

CO8   Judge what type of reagent need for the organic Conversion.

CHA-190 Safety in Chemical Laboratory and Good laboratory practices

By the end of this course students will able to

CO1   List importance of safety and health in Laboratory.

CO2   Establish Effective chemical safety and security management.

CO3   Categorize different Personnel protective and other safety equipment's.

CO4   Classify the different Assessing routes of exposer for toxic chemicals, assessing hazards and risk in the laboratory, Managing Chemicals.

CO5   Illustrate scientific procedures and data for determining the safety of chemicals and chemical products.

CO6   Define efficient handling of hazardous chemicals.

CO7   Determine Protection guidelines to work in safe and healthy environment.

CO8   Learn all safety measurement to handle laboratory equipment.

CHP-210 Fundamental of Physical chemistry-II

By the end of this course students will able to

CO1 Recognize spectroscopy in microwave, IR, Raman, electronic spectroscopy of molecules and nuclear chemistry.

CO2 Discuss the different interactions between matter and electromagnetic radiation as well as with gamma radiation.

CO3 Illustrate the difference between rotational, vibrational, raman, electronic spectra and radiolysis of water.

CO4 Derivations regarding diatomic molecules shows rotation and vibrations and also derive the half-life equations.

CO5 Determine and discuss about the numerical based on theory.

CO6 Recall the Concepts of molecular spectroscopy and nuclear chemistry.

CO7 Describe nuclear fission, four factor formula, detection and measurement of radioactivity, electronic spectroscopy of molecules, nuclear waste management, classification of reactors.

CO8 Interpret the electron spin resonance, Mossbauer spectroscopy and applications of NMR spectroscopy as well as radiolysis of water, reactions involved in preparation of radioisotopes, reprocessing of spent fuels, neutron activation analysis, radiometric titrations.

CHI-230 Coordination and Bioinorganic chemistry

At the end of course student should able to -

CO1 Identify complex ions showing same R.S. terms, degeneracy of ground state terms of metal ions.

CO2 Define ferromagnetic and antiferromagnetic substances, curie and Neel temperature, photosynthesis, metallo-eznymes.

CO3 Match the given pairs.

CO4 Describe spin multiplicities of different configurations, selection rules, micro states, electronic transitions in the complexes, point groups, Fe-S proteins, model compounds and spontaneous self-assembly, metals in medicine, structures of proteins, Na/K pumps, blood coagulation.

CO5 Explain concept of hole equivalency with examples, electornic spectrum of complexes, quenching of orbital magnetic moment by crystal field, role of metals in biological system, nitrogen fixation, detoxification of mercury, structure of RNA, cis-platin, dioxygen transport, amino acids, siderophore, calmoduline zinc finger proteins.

CO6 Calculate degeneracy for terms/states, frequencies of absorption spectrum, 10Dq, Racah and nepholauxetic parameter for a complex, magnetic moments of complexes, spin orbital coupling constant.

CO7 Classify magnetism, metalloproteins, DNA, RNA.

CO8 Draw a diagram of correlation, Tanabe-Sugano and Orgel, and structures of proteins, DNA, RNA, cyanocobalamine, flavin, Fe-S cluster, chlorophyll, metal containing medicines, corrin and porphyrin ring, Metalloproteins.

CHO-250 Organic chemistry

By the end of this course students will able to

CO1 Define the terms related to Organic Reactions such as Oxidation, Reduction, Rearrangement Reactions and Spectroscopic methods of structure determination.

CO2 Recall the information about reactivity of organometallic compounds.E

CO3 Explain the Rearrangement reactions.

CO4 Solve the chemical Reactions for Oxidation, Reduction, Rearrangement Reactions.

CO5 Calculate Wavelengths of Organic compounds.

CO6 Identify different functional groups in organic compounds.

CO7 Judge the structure of organic compounds

CHA-290 General Chemistry

By the end of this course students will able to

CO1 Define the basic principle of different method used for analysis.

CO2 Discus the Principle, Instrumentation of Mass Spectrometry, HPLC, GC.

CO3 Explain the Application of Mass Spectrometry, HPLC, GC.

CO4 Solve the numerical problems related to Mass Spectrometry, HPLC, GC, Chemistry Practical.

CO5 Determine data sheet in analytical chemistry with error measurement in analysis.

CO6 Predict Gaussian curve and standard deviation of each term.

CO7 Present the all separation techniques including sample preparation and sampling and sample handling and ion exchange chromatography.

CO8 Recall and solve the numerical based on data analysis.

CHP-107 Practical Course-I -Physical Chemistry

By the end of this course students will able to

CO1 Create the preparation of solution and calibration of the instrument according to respective practicals.

CO2 Determine the concentration of sample by conductometry, potentiometry,pH metry colorimetry and spectrophotometrically.

CO3 Illustrate the experiment of non instrumental methods like chemical kinetics, viscosity, partial molar volume and steam distillation.

CO4 Perform experiment on statistcal methods as well as XRD interpretation.

CO5 Paraphrase the different examples of same technique.

CO6 Recognize instrumental methods and non instrumental methods of analysis.

CO7 Justify the Preparation of Solutions.

CO8 Identify the needs of every experiment including instrumental and non-instrumental.

CHI-147 Inorganic Chemistry Practical

By the end of this course students will able to

CO1 Learn the principles in qualitative and quantitative determination of ore and alloy analysis.

CO2 Synthesize co-ordination complexes, studied composition, structure, properties, and reactions and checked their Purity with respect to metal.

CO3 Explain the principles, the method involved and reactions in the solvent extraction, ion exchange chromatography.

CO4 Interpret UV-visible spectra.

CO5 Calculate percentage composition of metal and minerals in alloy.

CO6 Perform photochemistry and kinetics experiments.

CHO-247 Organic Chemistry Practicals

By the end of this course students will able to

CO1   Recognize the handling of laboratory glassware's, hazardous chemicals, and safety in laboratory.

CO2   Summarize the purification technique, separation and identification technique i.e. Recrystallization, distillation fractional distillation, chromatography and solvent extraction are used for all types of organic compound.

CO3   Demonstrate the assembling of different glass apparatus such as soxhlet apparatus. Distillation unit, column of chromatography Rota evaporator.

CO4   Analyze the preparation process such as nitration, oxidation and reduction, esterification, and chalcone formation.

CO5   Evaluate the preparation of organic molecule, this is the combination of the unit operation to handle the synthesis task, when a flow sheet superstructure has been established.

CO6   Judge the reaction mechanism and synthesis process.

CO7   Defend the Separation of ternary mixture of organic compound and their identification by chemical methods

M. Sc. II(Organic Chemistry)

CHO350 Organic reaction mechanism

By the end of this course students will able to

CO1   Learn and understand the basic concept in reaction mechanism.

CO2   CO2 Understand the role of recent reagent and catalyst in mechanism.

CO3   Improve the thinking ability of students towards reaction mechanism.

CHO351 Spectroscopic method in structure determination

By the end of this course students will able to

CO1   Learn the basic spectroscopic method like UV,1H-NMR,13C-NMR,IR mass spectrometry and their application.

CO2   Understand structure determination of non and un none organic molecule by using spectroscopic data.

CHO352 Organic stereochemistry

By the end of this course students will able to

CO1   Learn the stereochemistry of alicycli9c rings,fused,bridge and cage rings.

CO2   Understand the stereochemistry of organic reaction.

CO3   Get the ablity to predict the steriochemstry of organic compound.

CO4   Improve their imagination power.

CHO353 Photochemistry, Pericyclic reaction &Heterocyclic Chemistry

By the end of this course students will able to

CO1   Understand synthesis of different heterocyclic derivatives.

CO2   Master fundamental and theoretical understanding of heterocyclic chemistry.

SEMISTER IV

CHO450 Chemistry Of Natural product.

By the end of this course students will able to

CO1   Learn the different pathways of synthesis of natural products it also helps stereochemistry and structure determination of some natural products.

CO2   Develop the synthetic strategies to prepare different important natural compounds in the laboratory.

CO3   Get the ablity to predict the steriochemstry of organic compound.

CO4   Improve their imagination power.

CHO451Advanced Synthetic Organic Chemistry.

By the end of this course students will able to

CO1   Master multistep synthesis of coumarins, flavonoids, isoflavonoids and terpenoids.

CO2   Develop students' ideas in organic synthesis.

CHO452 Carbohydrates and Chiron Approach, Chiral Drugs and Medicinal Chemistry

By the end of this course students will able to

CO1   Become aware of the chemistry of biomolecules and basic concept of retrosynthetic strategy and synthesis of chiral drugs.

CO2   Understands pharmacokinetics and pharmacodynamics of the drugs and drug targets.

CO3   Know the use of cram rule, felkinanh rule, cram chelate model, use of chiral auxillary and chiral reagents in organic synthesis.

CO4   Ability to predict the chiral products in organic synthesis.

CHO453 Designing organic synthesis and Asymmetric Synthesis

By the end of this course students will able to

CO1   Understand the designing of organic synthesis.

CHO347 Signal stage preparation

By the end of this course students will able to

CO1   Develop the skilled practical hand of the students in laboratory.

CO2   Improve practical skill and practice of micro scale preparation.

CHO447 Two stage preparation.

By the end of this course students will able to

CO1   Develop the skilled practical hand of the students in laboratory.

CO2   Master multistep synthesis of organic compounds and heterocycles Improve the techniques like workup of reactions, purification, TLC, M.P / B.P etc.

CHO448 Green Chemistry

By the end of this course students will able to

CO1   Become aware of roll of green chemistry in organic synthesis.

CO2   Develops the sense of curiosity and courage to question theexisting information and knowledge.

Faculty of Commerce

PROGRAMME OUTCOMES FOR BACHELOR OF COMMERCE (B.COM)

After successfully completion of Bachelors of Commerce (B.Com), the students will be able to;

PO1	Acquire in-depth knowledge about commerce stream.
PO2	Get the opportunities to apply their accounting knowledge in real life situations.
PO3	Groom their personality and business correspondence.
PO4	Get himself and the society acquainted about the business laws.
PO5	Analyze the business environment around them.
PO6	Understand the functioning of banking sector.
PO7	Use new trends in technology which is beneficial for business.
PO8	Apply ethics while doing any business.
PO9	Understand the new trends in commerce and business.
PO10	Get jobs in the field of service sector, banking, insurance, finance, accounting, Front desk, operations, BPO, KPO, Law, Teaching etc,.

PROGRAMME SPECIFIC OUTCOMES FOR BACHELORS OF COMMERCE
(B.COM)

COST & WORKS ACCOUNTING

After successfully completion of this course, the students will be able to

PSO1   Develop analytical skills.

PSO2   Get job opportunities in the field of cost accounting.

PSO3   Prepare budgets in real life situations.

PSO4   Use cost control techniques like marginal costing, standard costing, budgetary control etc. for the purpose of controlling cost.

PSO5   Utilize cost accounting standards while analyzing cost statements.

PSO6   Identify different cost accounting record rules u/s 148 of the companies act 2013

BUSINESS ADMINISTRATION - I

After successfully completion of this course, the students will be able to

PSO1   Study the Conceptual Business Environment.

PSO2   Study the concept of Administration, Management & Organisation.

PSO3   Grab Various Opportunities available in Small Business and Advertising field.

PSO4   Improve the performance or management of the business.

PSO5   Improve decision making.

PSO6   Bring out the hidden leader among them.

PSO7   Organize the people or other resources

COURSE OUTCOMES FOR F.Y.B.COM
BUSINESS MATHEMATICS AND STATISTICS -

After successfully completion of this course, the students will be able to

CO1	Apply concepts of interests and annuities to calculate EMI.
CO2	Prepare amortization schedule, calculate insurance premiums.
CO3	Calculate dividend, brokerage on shares and mutual funds.
CO4	Identify the contribution of Shares and mutual funds in systematic investment plans and to select best investment options.
CO5	Recognize and classify different types of data.
CO6	Calculate measures of central tendency and measures of dispersion

FINANCIAL ACCOUNTING

After successfully completion of this course, the students will be able to

CO1	Knowledge about various Accounting Concept, convention and Principle.
CO2	Understanding emerging trend in accounting and its effect on Accounting Practice.
CO3	Knowledge about process of dissolution of Partnership firm.
CO4	Purpose and advantages of double entry system.
CO5	Knowledge about various components of G.S.T.
CO6	Registration process of under G.S.T for Business Establishment.

BANKING AND FINANCE

After successfully completion of this course, the students will be able to

CO1	Study evolution of Banking in world.
CO2	Study the fundamentals of Banking.
CO3	Create awareness about various banking concepts.
CO4	Get Acquainted different methods of remittance.
CO5	Conceptualize banking operations

CONSUMER PROTECTION AND BUSINESS ETHICS-

After successfully completion of this course, the students will   be able to

CO1   Develop General Awareness of the consumerism.

CO2   Understand the consumer rights, responsibility and role of Unite Nations.

CO3   Get acquainted   about Existing law on consumer protection in India.

CO4   Study   the Dispute Redressal   Machinery   and basic procedure for handling consumer dispute.

CO5   Get acquainted   about   the issues relating to e-commerce, e-banking emerging issues and internet regulation.

CO6   Study the consumer education –Need and Importance.

ORGNISATIONAL SKILL DEVELOPMENT

After successfully completion of this course, the students will be able to

CO1   Study the modern office factors affecting on office layout.

CO2   Understand the office management functions.

CO3   Understand flow of work in office.

CO4   Get acquainted about scientific office management.

CO5   Learn Office organization and management.

BUSINESS ENVIRONMENT AND ENTERPRENEURSHIP

After successfully completion of this course, the students will be able to

CO1   Study the Importance of Business & Aspect of Environment.

CO2   Get acquainted about policies, procedure & Code of ethics.

CO3   Study the Concept of pollution, conservation of natural resources.

CO4   Know the Problem of Growth.

CO5   Get acquainted about Evolution of Entrepreneur & its Characteristics.

CO6   Distinction between - a) Entrepreneur and Manager b) Entrepreneur and Enterprise.

COURSE OUTCOMES FOR S.Y.B.COM

CORPORATE ACCOUNTING

After successfully completion of this course, the students will be able to

CO1   Study the importance of Accounting Standard 5, 6, 10, 14, & 21.

CO2   Get acquainted about the company final account, specially revised schedule VI.

CO3   Analyze statement of Balance Sheet & Statement of Profit & Loss.

CO4   Study the procedure of company liquidation and the duties & responsibilities of liquidator.

CO5   Apply computerized accounting concepts like Inventory Accounting, Payroll Accounting and MIS.

CO6   Differentiate between Internal & External Reconstruction

CO7   Calculate value of shares by using methods like Net Asset Method, Yield Basis Method, Fair value Method

ELEMENTS OF COMPANY LAW

After successfully completion of this course, the students will be able to

CO1   Study the Types, Formation, and Incorporation of a company.

CO2   Get acquainted about the documents relating to Incorporation and raising of capital.

CO3   Analyzes the concept of capital of company.

CO4   Study about forfeiture, surrender & transfer of shares.

CO5   Analyzes E-Governance & E - Filling.

CO6   Get acquainted the company meetings & concept of key managerial personnel.

BUSINESS MANAGEMENT

After successfully completion of this course, the students will be able to

CO1   Apply conceptual learning skill in today Business Environment.

CO2   Analyze Financial Performance of an Organisation.

CO3   Evaluate organisational decision with consideration of the political legal and ethical aspect of Business.

CO4   Study the Assess Strengths, weakness, opportunities and threats of the Business Environment.

CO5   Study will be able to common techniques used to manage group decision making.

CO6   Differentiate between leadership and management.

CO7   Explain barrier to effective Communication.

BUSINESS COMMUNICATION.

After successfully completion of this course, the students will   be able to

CO1   Understand the meaning and nature of business communication.

CO2   Get acquainted about   Methods and Channels of Communication.

CO3   Study the various types of soft skills.

CO4   Application the different types of business letter.

CO5   Prepare the Resume , Bio-data and Curriculum Vitae.

CO6   Study the internal and other correspondence such as office memo, office circulars.

CO7   Know the new technologies in Business communication

COST AND WORKS ACCOUNTING

After successfully completion of this course the students will   be able to

CO1   Understand the concept of cost Accounting.

CO2   Acquired the knowledge about material accounting.

CO3   Understanding the inventory control system.

CO4   Understand the labor cost remuneration and incentives.

CO5   Understand the concepts of labor turnover, job analysis & job evolution key.

CO6   Understand the concept of direct cost.

CO7   Get acquainted about collection and allocation.

BUSINESS ADMINISTRATION - I

After successfully completion of this course the students will be able to

CO1   Study the concept of Administration, Management & Organisation.\

CO2   Get acquainted about the productivity.

CO3   Grab Various Opportunities available in Small Business and Advertising field.

CO4   Demonstrate an ability to Integrate the concept of the core areas of Business.

CO5   Analyzes the Forms of Business organisation.

COURSE OUTCOMES FOR T.Y.B.COM

AUDIT AND TAXATION

After successfully completion of this course the students will be able to

CO1   Study the principles of auditing and audit process.

CO2   Get acquainted about the checking, vouching and audit report.

CO3   Know about the Valuation of Assets and Liabilities.

CO4   Difference between Audit Report and Audit Certificate.

CO5   Study of the Qualification ,Disqualification and Appointment of Company Auditor.

CO6   Know Rights ,Duties and Liabilities of Company Auditor.

BUSINESS   REGULATORY   FRAMEWORK

After successfully completion of this course, the students will   be able to

CO1   Study the Indian Contract Act 1872.

CO2   Get acquainted about the Law of Partnership Act 1932 and LLP Act 2008.

CO3   Study the concept of Contract of sale ,Condition and Warranties.

CO4   Get acquainted about the E-Contract/E-Transaction/E-Commerce.

CO5   Study the salient features of Consumer Protection Act 1986.

CO6   Study   the difference types of Negotiable Instrument .

ADVANCED ACCOUNTING

After successfully completion of this course, the students will be able to

CO1   Study the concept of Accounting standard and financial reporting.

CO2   Solve the problems on financial accounts of banking companies.

CO3   Understand the concept of insurance claim accounts.

CO4   Solve the problems of financial accounts of co-operative societies.

CO5   Study the concept of computerized Accounting.

CO6   Analysis of the types of branches.

CO7   Understand the concept of single entry system.

CO8   Understand the concept of Ratio analysis.

COST AND WORKS ACCOUNTING II

After successfully completion of this course the students will be able to

CO1   Understand cost accounting standards and their importance.

CO2   Prepare budgets in real life situations.

CO3   Understand the legal provisions of cost audit like cost audit report, and Annexure to cost audit report.

CO4   Use cost control techniques like process costing ,job costing,. for the purpose of controlling cost.

CO5   Classified overheads and its advantages.

CO6   Understand the concept of accounting of overheads.

COST AND WORKS ACCOUNTING III

After successfully completion of this course the students will be able to

CO1   Understand the legal provisions of cost audit like cost audit report, and Annexure to cost audit report.

CO2   Use cost control techniques like marginal costing, standard costing, budgetary control etc. for the purpose of controlling cost.

CO3   Understand the meaning and concept of Fixed cost, Variable cost and contribution ,BEP ,MOS etc.

CO4   Get acquainted about Budget and Budgetary control.

CO5   Understand the concept of Farm Costing.

BUSINESS ADMINISTRATION - II

After successfully completion of this course the students will be able to

CO1   Study the Conceptual Business Environment.

CO2   Analyzes the Concept of Business promotion.

CO3   Create awareness about various Ill Industries.

CO4   Understanding of the entire Marketing Process.

CO5   Study the concept of finance and importance of finance.

BUSINESS ADMINISTRATION - III

After successfully completion of this course the students will be able to

- Understanding of the entire Marketing Process
- Study the concept of finance and importance of finance.
- Get acquainted about steps in financial planning
- Know the concept of capitalization and capital Structure.
- Study the production management functions.
- Get knowledge about inventory management

PO, PSO and CO for Post Graduate Course in Commerce

Course – M.Com. (P.G.)

Program OutCome

PO1 The student who will complete M.Com. Course they will be gating jobs in company as an accountant.

PO2 M.Com. students have another opportunity in the field of teaching.

PO3 M.Com students can start their own business in the field of account writing and consultancy services.

PO4 The students who have passed M.Com course can appear for competitive exam and Bank recruitment exam.

Program Specific OutCome – Special subject

In our college only one special subject has been started i.e Advance Accounting . The following are specific program out comes.

PSO1 The students of Accountancy can develop there basic concept in Accountancy.

PSO2 The students develop competences with their usage in managerial decisions making control.

PSO3 The students can gate the basic knowledge of Income Tax Act 1961 and can start there own practice in field of Accountancy.

PSO4 The student can know about business Research and they can prepare project report for various business.

CourseOut Come of M.Com Degree.

Semester I

[101] Management Accounting.

CO1 The student can develop their ability regarding management accounting and its significance it business.

CO2 This course is useful to learner to ales financial statement.

CO3 With develop and apply a techniques of management accounting in financial decision making in the business corporate.

CO4 The student can develop compute with the usage in managerial decision making & control.

[102] Strategic Management.

CO1 The student can identified the encouraging changes in the modern business Environment.

CO2 The analytical technical and managerial skill of student in various areas of business administration.

CO3 On the basis of this course the students strategic, analytical and development & managerial skill can be developed.

CO4 The students can understand the Internal & External business Enviroment.

[103] Advanced Accounting

CO1 Gating familiar with the Advanced concept in accounting.

CO2 It helps to prepare the consolidation of financial statement of holding companies and there subsidiary companies.

CO3 It Becomes useful to solve problem relating to corporate accounting.

CO4 It helps to prepare statement of affairs of the companies in liquidations.

[104] Income Tax

CO1 The students become able to compute taxable income of an individual, HUF and companies.

CO2 The students can start there own practice in taxation.

CO3 They can understand the concept of different head of income and compute income under each head.

CO4 The student will be aware the concept of deductions and provisions.

Semester II

[201] Financial Analysis & Control

CO1 The student can develop their knowledge regarding Budget and Budgetary control.

CO2 This course is useful to investor short term & long term investment.

CO3 With develop and apply methods and techniques in business.

CO4 The student can develop compute with the usage in managerial decision making & control.

[202] Industrial Economics

CO1 The student can identified the encouraging changes in the industry.

CO2 The analytical technical and managerial skill of student in various areas of Industrial Economics.

CO3 On the basis of this course the students industrial economics development & managerial skill can be developed.

CO4 The students can understand the industry economic policy.

[203] Specialized Area in Accounting

CO1 Gating familiar the student with procedure of accounting and taxation.

CO2 The student can understanding of financial reporting practices.

CO3 It Becomes useful to solve problem special area in accounting including for services sector.

CO4 It helps to prepare statement of affairs of the companies in liquidations.

[204] Business Tax Assessment & Planning

The students become able to

CO1 The students can start there own practice in taxation.

CO2 They can understand the concept of different head of income and compute income under each head.

CO3 The student will be aware the concept of deductions and provisions.

Semester III

[301] Business Finance

CO1 The student can identified the financial planning in the modern business.

CO2 The analytical technical and managerial skill of student in various areas of Business finance.

CO3 On the basis of this course the students know about financial planning and Development & managerial skill can be developed.

CO4 The students can understand Corporate Securities, long term finance & Short term finance.

[302] Research Methodology

CO1 Familiar with the area of Business Research Activities.

CO2 It helps to prepare the project report of various companies.

CO3 It Becomes useful to search new information related to business.

CO4 It helps to prepare and apply new development in the business.

[303] Advanced Accounting

CO1 Gating familiar with the Advanced concept in accounting.

CO2 It helps to prepare the consolidation of financial statement of holding companies and there subsidiary companies.

CO3 It Becomes useful to solve problem relating to corporate accounting.

CO4 It helps to prepare statement of affairs of the companies in liquidations.

[304] Advance Auditing.

CO1 The students become able to Audit Under Tax Laws.

CO2 The students can start there own practice in Auditing & taxation.

CO3 They can understand the concept of Audit.

CO4 The student will be aware Audit of Bank, Audit of Cooperative societies, Government System of Audit etc

Semester IV

[401] Capital Market & Financial Services.

CO1 The student can develop their knowledge regarding capital market and financial services.

CO2 This course is useful to investor investment in stock market.

CO3 It develop and apply methods and techniques in business.

CO4 The student can develop compute with the usage in managerial decision making & control.

[402] Industrial Economics Environment

CO1 The student can identified the encouraging changes in the industry.

CO2 The analytical technical and managerial skill of student in various areas of Industrial Economics.

CO3 On the basis of this course the students industrial economics development.

CO4 The students can understand the industry economic policy.

[403] Recent Advances in Accounting, Taxation & Auditing

CO1 Gating familiar the student with procedure of accounting and taxation.

CO2 The student can understand of financial reporting practices.

CO3 It Becomes useful to solve problem special area in accounting including services sector, manufacture sector.

CO4 It helps to prepare statement of affairs of the companies in liquidations.

[404] Project Report

CO1 The students become able to prepare project report.

CO2 The students can start research oriented practices.

CO3 They can understand the concept of project & research work.

CO4 The student will be aware the business research..

CO5 The student can undertake any type of project on his own risk.

Department Of BBA(CA)

FYBBA(CA)   SEM I

Paper: Financial Accounting

Upon completion of this course, students will be able to

CO1   Learn basic concepts of accounting.

CO2   Getting the knowledge about recording of transactions and preparation of final accounts.

CO3   To acquaint the students about accounting software packages

Paper: Modern Operating Environment & MS Office

Upon completion of this course, students will be able to

CO1   Studied about fundamental knowledge of computers.

CO2   Learned about Input and Output Devices.

CO3   Studied about MS Office.

CO4   Learned concept regarding Operating System,LAN,WAN.

Paper: Programming Principles & Algorithms

Upon completion of this course, students will be able to

CO1   Students get the knowledge of developing algorithms which develops the logical ability of the students.

CO2   It is the basic requirement of programming as students learns basics of Algorithms, Flowcharts etc.

Paper: Business Communication

Upon completion of this course, students will be able to

CO1   Become adept to communicate and write effectively.

CO2   Developing and delivering effective presentations.

CO3   Create awareness among students about Methods and Media of communication.

CO4   Make students familiar with information technology and improve job seeking skills.

Paper: Principles of Management

Upon completion of this course, students will be able to

CO1   Practice the process of management's four functions planning, organizing, leading, and controlling.

CO2   Evaluate leadership styles to anticipate the consequences of each leadership style.

CO3   Understand the working of business organization

CO4   inculcate Entrepreneurial skills

FYBBA(CA)   SEM II

Paper: Procedure Oriented Programming Using C

Upon completion of this course, students will be able to

CO1 To understand how to use programming in day to day Applications.

CO2 Improve the problem solving ability.

CO3 Understand and develop well-structured programs using C language.

CO4 Learn how to apply logic for problems.

CO5 Enhance their programming skills.

Paper: Database Management System

Upon completion of this course, students will be able to

CO1 To understand the file structure and its organization.

CO2 An introduction about Database management system.

CO3 Helps student to learn different types of data models.

CO4 Student gets knowledge about designing relational database.

CO5 Understand database concepts and structures.

CO6 Understand the objectives of data and information management.

CO7 Construct and normalize conceptual data models. .

Paper : Organizational Behavior

Upon completion of this course, students will be able to

CO1 Helps the students to understand the impact that individual, group & structures have on their behavior within the organizations.

CO2 Enhance and apply the knowledge they have received for the betterment of the organization.

CO3 Helps in understanding the basics related to individual behavior and its impact on their performance

Paper :Computer Application in Statistics

Upon completion of this course, students will be able to

CO1 To understand the power of excel spreadsheet in computing summary statistics.

CO2 To understand the concept of various measures of central tendency and variation and their importance in business.

CO3   To understand the concept and applications of probability, probability distributions in real life situations.

CO4   To understand simulations in business world and decision making.

Paper E: Commerce Concepts

Upon completion of this course, students will be able to

CO1   Studied about concepts of E-Commerce, E-com application, Website and hosting website domain name.

CO2   Electronic fund transfer and e-cash, paper less bill concepts studied.

CO3   Studied about intranet, extranet and internet.

CO4   Learned security in e- com- encryption types.

SYBBA(CA)   SEM III

Paper – Relational Database management System

Students will be able to

CO1 Develop a clear understanding of the conceptual frameworks and definitions of specific terms that are integral to the Relational Database Management Systems.

CO2 Develop clear concepts about Relational Model.

CO3 Understand the basic concepts of Concurrency Control & database security.

CO4 Understand the basic concept how storage techniques are used to backup data and maintain data access performance in peak hours.

CO5 Evaluate options to make informed decisions that meet data storage, processing, and retrieval needs.

CO6 Able to build, populate, and document a secure, normalized database that meets business requirements using industry standards and best practices.

CO7 Able to develop structured query language (SQL) queries to create, read, update, and delete relational database data

Paper – Data Structure using 'C'

Students will be able to

CO1 To understand different methods of organizing large amounts of data.

CO2 To efficiently implement different data structure.

CO3 Ability to summarize searching and sorting techniques.

CO4 Ability to describe stack, queue and linked list operation.

CO5 Ability to have knowledge of tree and graphs concepts.

Paper – Introduction to Operating System

Students will be able to

CO1 Gain extensive knowledge on principles and modules of operating systems.

CO2 Understand key mechanisms in design of operating systems modules.

CO3 Understand process management, concurrent processes and threads, memory management, virtual memory concepts, deadlocks.

CO4 Compare performance of processor scheduling algorithms - produce algorithmic solutions to process synchronization problems.

Paper – Business Mathematics

Students will be able to

CO1   Develops formal reasoning.

CO2   Creates habit of raising questions.

CO3   Helpful in formulating questions.

Paper – Software Engineering

Students will be able to

CO1   Know about the software product and process.

CO2   Know about software characteristics, components and applications, methods and tools.

CO3   Understand the software development paradigms.

CO4   Know about the software process and lifecycle models.

SYBBA(CA)   SEM IV

Paper - Object Oriented Programming Using C++

Students will be able to

CO1   Familiarization with a widely used programming concept – Object Oriented Programming.

CO2   Develop logical thinking.

CO3   Skill to write codes in C++ by applying concept of OOP, such as Objects, Classes, Constructors, Inheritance etc., to solve mathematical or real world problems .

CO4   Ability to isolate and fix common errors in C++ programs.

Paper - Programming in Visual Basic

Students will be able to

CO1   To learn properties and events, methods of controls and how to handle events of different controls.

CO2   To understand the use of active controls and how to design VB application.

CO3   To learn connectivity between VB and databases**.**

Paper - Computer Networking

Students will be able to

CO1   To know about computer network.

CO2   To understand different topologies used in networking.

CO3   To learn different types of network.

CO4   To understanding the use of connecting device used in network.

Paper -Enterprise Resource Planning and Management

Students will be able to

CO1   To know what is ERP.

CO2   To learn different ERP technologies.

Paper -Human Resource Management

Students will be able to

CO1   To acquaint the students with the Human Resource Management its differentfunctions in an organization and the Human Resource Processes that are concerned withplanning, motivating and developing suitable employees for the benefit of the organization.

Department Of BBA(CA)

TYBBA(CA)   SEM V

Paper – Object Oriented Software Engineering

Upon completion of this course, students will be able to

CO1   Know about the software product and process.

CO2   Know about software characteristics, components and applications, methods and tools.

CO3   Understand the software development paradigms.

CO4   Know about the software process and lifecycle models.

CO5   Have a working ability and grasping attitude to design and conduct object-oriented analysis and design experiments using UML, as well as to analyze and evaluate their models.

CO6   Have a capacity to analyze and design software systems, components to meet desired needs.

CO7   Show an ability to use the graphical UML representation using tools.

Paper   .NET Programming

Upon completion of this course, students will be able to

CO1   Understand .NET Framework and describe some of the major enhancements to the new version of Visual Basic.

CO2   Describe the basic structure of a Visual Basic.NET project and use main features of the integrated development environment (IDE).

CO3   Create applications using Microsoft Windows® Forms.

CO4   Create applications that use ADO. NET.

CO5   Work with XML Documents.

CO6   Using Crystal Reports e-government programs.

CO7   This course will give students the opportunity to learn how to create applications using Visual Basic programming in the .NET framework.

CO8   This course will show the students how to develop professional looking and deployable Visual Basic .NET applications

Paper : Software Project

Upon completion of the course, students will be able to

CO1 Learn critical thinking skills and inquiring skills through application-oriented project.

CO2 Development in CS & IT in a team-work environment.

CO3 Learn literature survey skills.

CO4 Refine communications skills and public speaking skills through written and oral presentations.

CO5 Learn problem solving skills.

CO6 Learn proposal development skills to initiate an application-oriented project in the areas of CS & IT

Paper : Web Technology

Upon completion of this course, students will be able to

CO1 Understand the various steps in designing Creative and dynamic website.

CO2 Write HTML, JavaScript, CSS and PHP.

CO3 Understand hierarchy of object oriented programming.

CO4 Create PHP scripts that use object-oriented PHP

Paper: JAVA Programming

Upon completion of this course, students will be able to

CO1 Understand the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading.

CO2 Identify classes, objects, members of a class and the relationships among them needed for a specific problem.

CO3 Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifies, automatic documentation through comments, error exception handling).

CO4 Use testing and debugging tools to automatically discover errors of Java programs as well as use versioning tools for collaborative programming/editing.

CO5 Develop programs using the Java Collection API as well as the Java standard class library.

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TYBBA(CA)   SEM VI

Paper : Advanced Web Technologies

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Upon completion of this course, students will be able to

CO1   Give students the basic understanding of how things work in the Web world from the technology point of view as well as to give the basic overview of the different technologies.

CO2   Understand the concepts of XML and AJAX.

CO3   Students are able to develop a dynamic webpages

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Paper : Advanced Java

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Upon completion of this course, students will be able to

CO1   Learn the Internet Programming, using Java Applets.

CO2   Create a full set of UI widgets and other components, including windows, menus, buttons, checkboxes, text fields, scrollbars and scrolling lists, using Abstract Windowing Toolkit (AWT) & Swings.

CO3   Apply event handling on AWT and Swing components.

CO4   Learn to access database through Java programs, using Java Data Base Connectivity (JDBC) .

CO5   Create dynamic web pages, using Servlets and JSP.

CO6   Make a resusable software component, using Java Bean.

CO7   Invoke the remote methods in an application using Remote Method Invocation (RMI)

CO8   Understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB).

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Paper: Recent Trends in IT

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Upon completion of this course, students will be able to

CO1   This subject helps students to get knowledge of recent trends in IT.

CO2   Students will learn the concept of Network Security ,Cloud Computing etc.

Paper Software Testing

Upon completion of this course, students will be able to

CO1 One of the Imp. Phase of SDLC, Students can get job as a Tester in software company.

CO2 This subject has wide scope in every MNC's as Testing process is required from the starting of every project.

CO3 Manual and Automation Testing both covers here, students can go for Certifications also which helps to get better opportunities in M.N.C's.

POs, PSOs and COs For Undergraduate Courses in Arts Faculty

Programme Outcomes (Undergraduate Level)

After completing the graduation in the faculty of Arts the students will able to

PO1   Acquired the knowledge with facts and figures concerned with the subjects such as Marathi, English, Economics, Geography, Political sciences and History.

PO2   Understood the basic concepts, fundamental principles and various theories in Languages and mental and moral sciences.

PO3   Realization of human values.

PO4   Comprehended the importance of literature in terms of aesthetic, mental, moral, and intellectual development of an individual.

PO5   Sense of social service.

PO6   Responsible and dutiful citizen.

PO7   Critical ability and temper.

DEPARTMENT OF ENGLISH
PROGRAMME SPECIFIC OUT COME

Students offering special and functional at UG level

PSO1   Realize the significance of the English language in context of globalization.

PSO2   Use English in formal and informal situations.

PSO3   Acquire the dynamics of communication in English.

PSO4   Think independently and imbibe core human values.

PSO5   Understand, interpret and criticize English literature.

PSO6   Use English creatively.

PSO7   Be a master phonetics and phonology

COURSE OUT COME
F.Y.B.A. COMPULSORY ENGLISH

Completion of this course will enable the students to

CO1   Realize the beauty and communicative power of English language.

CO2   Seek human values to become responsible citizens.

CO3   Seek employment by developing linguistic competence and communicative skills.

CO4   Revise and reinforce the skills already acquired.

CO5   Think independently and critically

F.Y.B.A. OPTIONAL (ADDITIONAL) ENGLISH

Completion of this course will enable the students to

CO1   Understand the basics of language and literature.

CO2   Get acquainted with minor forms of English literature.

CO3   Speak English paying attention to proper pronunciation.

CO4   Seek jobs by improving language skills.

CO5   Develop integral view of language and literature

F.Y. B.A. FUNCTIONAL ENGLISH   PAPER I
AN INTRODUCTION ENGLISH LANGUAGE AND WRITING SKILLS IN ENGLISH

Completion of this course will enable the students to

CO1   Be aware of the features of spoken English.

CO2   Use English according to the situations and contexts.

CO3   Overcome common problems of Indian speakers of English.

CO4   Use grammatically correct language.

CO5   Write effectively

F.Y. B.A. FUNCTIONAL ENGLISH   PAPER II
ORAL COMMUNICATION IN ENGLISH

Completion of this course will enable the students to

CO1   Know the dynamics of oral communication in English

CO2   Describe familiar things, persons ,pictures

CO3   Describe/ narrate simple events routine activities of one self and others

CO4   Use computer in learning English and written communication

CO5   Prepare power point presentations

S.Y.B.A.   COMPULSORY ENGLISH

Completion of this course will enable the students to

CO1   Develop competence for self learning.

CO2   Study and analyze excellent pieces and poetry to realize the beauty and communicative power of English.

CO3   Develop interest in reading literary pieces.

CO4   Expose themselves to native cultural experiences and situations in order to develop human values and social awareness.

CO5   Develop overall linguistic competence and communicative skills.

S.Y.B.A. GENRAL ENGLISH PAPER II
STUDY OF ENGLISH LANGUAGE AND LITERATURE

Completion of this course will enable the students to

CO1   Understand the basics of short story as a form of literature

CO2   Know various types of short story in English

CO3   Understand literary merits, beauty and creative use of language

CO4   Understand technical aspects of language and their practical usages

CO5   Develop integrated view of language and literature

S.Y.B.A. SPECIAL ENGLISH PAPER I
A PPRECIATING DRAMA

Completion of this course will enable the students to

CO1   Understand the basics of Drama as a form of literature

CO2   Apply the terminology used in appreciating and analyzing Drama

CO3   Interpret and analyze plays independently

CO4   Understand aesthetics of drama

CO5   Differentiate between   various types of drama

S.Y.B.A. SPECIAL ENGLISH PAPER II
APPRECIATING POETRY

Completion of this course will enable the students to

CO1   Understand the basics of poetry as a form of literature

CO2   Apply proper terminology while analyzing poetry

CO3   Appreciate the aesthetics of poetry

CO4   Differentiate between various types of poetry

CO5   Appreciate and evaluate poetry independently

S.Y. B.A. FUNCTIONAL ENGLISH   PAPER III
ADVANCED WRIING AND INTRODUCTION TO MEDIA

Completion of this course will enable the students to

CO1   Enhance their ability to communicate in written mode

CO2   Write in different formats

CO3   Improve their reference work

CO4   Know career potions in Media

CO5   Change language according to Media.

CO6   Improve research abilities

S.Y. B.A. FUNCTIONAL ENGLISH   PAPER IV
ORAL COMMUNICATION IN ENGLISH AND KEY COM PETENCY
MODULES

Completion of this course will enable the students to

CO1   Be confident in communication in English

CO2   Use proper English in formal and informal situations

CO3   Develop voice quality for effective oral communication

CO4   Use proper body language during oral interactions in visual media

CO5   Improve overall personality through key competency modules

T.Y.B.A. COMPULSORY ENGLISH

Completion of this course will enable the students to

CO1   Know the best use of language in literature

CO2   Enhance the communicative power

CO3   Become competent users of English in real situations

CO4   Understand various cultural experiences expressed through literature

CO5   Improve the soft skills

GENRAL ENGLISH   PAPER III

ADVANCED STUDY OF ENGLISH LANGUAGE AND LITERATURE

Completion of this course will enable the students to

CO1   Be acquainted with the best samples of Indian English poetry

CO2   Improve analytical ability getting exposed to the Indian ethos and culture

CO3   Understand creative use of English in Indian English poetry

CO4   Know the advanced areas of language studies

CO5   Realize the integration between language and literature

T.Y.B.A. SPECIAL PAPER III

APPRECIATING NOVEL

Completion of this course will enable the students to

CO1   Understand the basics of novel as a form of literature

CO2   Know the historical development and nature of novel

CO3   Get exposed to various types and aspects of novel

CO4   Develop literary sensibility and realize cultural diversity

CO5   Analyze some of the best examples of novel

T.Y.B.A.   SPECIAL PAPER IV
INTRODUCTION TO LITERARY CRITICISM

Completion of this course will enable the students to

CO1   Know the basics of literary criticism

CO2   Understand nature and historical development of literary criticism

CO3   Expose themselves to significant critical approaches and literary terms

CO4   Interpret literary works in English in the light of various critical approaches

CO5   Develop critical aptitude

T .Y. B. A.   FUNCTIONAL ENGLISH PAPER V
INTRODUCTION TO PRINT MEDIA AND WRITING FOR MASS MEDIA &KEY COMPETENCY MODULES

Completion of this course will enable the students to

CO1   Find careers in language like translations, technical writing. Writing for mass media ,advertising , free lancing

CO2   Know the changes in writing skills according to various media

CO3   Improve their analytical abilities

CO4   Collect basic data required for media

T.Y. B.A. FUNCTIONAL ENGLISH PAPER VI
ENTREPRENEURSHIP, PROJECT &   COMMUNICATION IN ENGLISH ADVANCED

Completion of this course will enable the students to

CO1   Find out the possibility of self –employment

CO2   Shape them up for self employment

CO3   Achieve over all personality development through key competency modules

CO4   Do independent research

CO5   Get exposed to work environment through visits and field visits

F.Y.B.COM. ENGLISH

Completion of this course will enable the students to

CO1   Realize the beauty and communicative power of English language along with its practical application

CO2   Realize socio-economic ethos of contemporary life by being exposed to variety of topics prescribed

CO3   Develop oral and written communicative skills to improve employability

CO4   Improve overall linguistic competence

S.Y.B.Sc. ENGLISH

Completion of this course will enable the students to

CO1   Improve English language skills as means of oral and written communication

CO2   Understand and analyze English prose ,poetry and short stories

CO3   Enrich vocabulary

CO4   Improve presentations skills

S.Y. B.C.S. ENGLISH

Completion of this course will enable the students to

CO1   Improve English language skills as means of oral and written communication

CO2   Understand and analyze English prose poetry and short stories

CO3   Enrich vocabulary

CO4   Improve presentations skills

Department of Economics
Programme Outcomes and Course Outcomes

Programme Outcomes (B.A.)

PO1   Students will be able to possess a broad, liberal arts foundation and understanding of how developments in social and intellectual history shape and affect human values and institutions.

PO2   Students will be able to analyse human behavior, problems or situations from social science, cross-cultural and global perspectives.

PO3   Students will be able to evaluate how theories and models within the social sciences have been established and maintained through systems of power and oppression.

PO4   Enable the students to apply knowledge and skills to contemporary problems and issues.

Program Specific Outcome

PSO1   Economics subject enables the learners to build up a professional carrier as economists, financial analysts, financial advisors, economics planners and policy makers. It prepares them to cope up with the stress and strain involved in the process of economic development. Department support and motivate the students to study and research in Economics.

PSO2   Students will be able to understand the impact of government policies and will be able to assess the consequences of the policies on the parties involved.

PSO3   Through organizing guest lectures, workshops, seminars, industrial visit and extension activities it enables students to learn Economics, particularly its applications and foster the development of their own skills in economic reasoning and understanding.

Course Outcome

Course Economics (B.A.)

Class F.Y.B.A.

Indian Economic Environment

CO1   Develop ideas of the basic characteristics of Indian economy, its potential on natural resources.

CO2   Understand the importance, causes and impact of population growth and its distribution, translate and relate them with economic development.

CO3   Grasp the importance of planning undertaken by the government of India, have knowledge on the various objectives, failures and achievements as the foundation of the ongoing planning and economic reforms taken by the government.

CO4   Understand agriculture as the foundation of economic growth and development, analyse the progress and changing nature of agricultural sector and its contribution to the economy as a whole.

CO5   Understand the challenges faced by Indian economy.

Class S.Y. B.A.

.Micro Economics (Spl-1)

CO1   Demonstrate marginal productivity theory of distribution, theory of wages, identify different types of rent, and illustrate different theories of interest and profits.

CO2   Understand how factor market works, identify the various determinants of firm's demand for factor services, bilateral monopoly, demonstrate monopsony in factor market and factor market equilibrium.

CO3   Understand how factor market works, illustrate basic tools in welfare economics, and illustrate the concept of social welfare functions and compensation principles.

CO4   Identify the various types of investment function analysis and understand the elements of social cost benefit analysis.

CO5   Understand distribution theories. Understand theories of Wages, Interest, Rent and Profit.

Macro Economics (Spl.2)

CO1   Define and explain the process of calculating national income, identify its components, demonstrate circular flow of income, analyse the various income identities with government and international trade, define the concept of green accounting.

CO2   Understand Say's law of market, classical theory of employment and Keynes objection to the classical theory, demonstrate the principle of effective demand and income determination.

CO3   Explain the meaning of consumption function, relationship between APC and MPC, consumption and income, concept of multiplier and analyse the theories of absolute and relative income hypotheses.

CO4   Understand the relationship between investment and savings, demonstrate investment multiplier, and understand the meaning and functions of acceletor.

CO5   Illustrate the meaning of interest, analyse the various theories of interest.

CO6   Analyze different phases of trade cycle, demonstrate various trade cycle theories, understand the impact of cyclical fluctuation on the growth of business, and lay policies to control trade cycle.

CO7   Illustrate the meaning of inflation, deflation and stagflation and identify different kinds of inflation, causes and effects of inflation on different sectors of the economy, describe different measures to control inflation.

Modern Banking (G.2)

CO1   Clear understanding of the operations of banking.

CO2   Explain the broad features of Indian banking system with its apex banks' objectives and purview.

CO3   Understand the instruments to control credit in the country.

CO4   Effectively narrate the kinds and components of money with its regulatory system, be aware of the functions, objectives and limitations of commercial banks.

CO5   Identify the existence and development of Indian banking system, know the important role of Co-operative banks.

CO6   Understand the conditions of financial markets and its impact in the economy.

CO7   Demonstrate the role and significance of foreign exchange rate and its markets with its impact on various sectors in the economy.

T.Y.B.A.

International Economics (Spl3)

CO1   Identify the basic difference between inter-regional and international trade, understand how international trade has helped countries to acquire goods at cheaper cost and explain it through the various international trade theories.

CO2   Show the benefits of international trade in a way how nations with strong international trade have become prosperous and have the power to control world economy and how global trade can be one of the major contributors of reducing poverty.

CO3   Explain how restrictions to international trade would limit a nation in the services and goods produced within its territories and at the same time explain that a rise in international trade is essential for the growth of globalization.

CO4   Show the importance of maintaining equilibrium in the balance of payments and suggests suitable measures to correct disequilibrium as well.

CO5   Be aware of the changes in the composition as well as direction of foreign trade after international trade and know the causes and effects of deficits in the balance of payments, measures adopted to correct the deficits and identify the need for having trade reforms.

Public Finance (Spl.4)

CO1   Understand the role and functions of the Government in an economy.

CO2   Understand the sources of finance both public and private; demonstrate the role of government to correct market failures and possible advantage of public financing.

CO3   Attain the advantages and knowledge of public investments and other government expenditures. Understand the causes of growing public

expenditures for various programmes and policies within and outside the country.

CO4   Understand the possible burden, benefits and distribution of various types of taxes among various classes of people, know the general trend and impact on general welfare and arouse them to suggest good and bad tax system.

CO5   Understand the needs of public borrowing from all possible sources to meet necessary public investment/expenditures. Also be alerted to find sources for repayment.

CO6   Deliver effectively the preparation of budget and how they are passed in the house. Understand the changes in size and flexibility of state and central budget along with the role played by Finance Commission.

Economic Development & Planning (G.-3)

CO1   Understand the concepts of economic development and indicators of development.

CO2   It makes the students to understand the aspect of development process in low income counties. Its focus is on improving the potential for the mass of population through health and education.

CO3   Understand the process of Economic Planning and critical evaluation of Planning.

CO4   Attain the knowledge of recent changes and development in the field of Economic Planning.

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Course Economics (B.Com.)

F.Y.B.Com.

Business Economics (Micro Economics)

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CO1   Understand how factor market works, identify the various determinants of firm's demand for factor services, bilateral monopoly, demonstrate monopsony in factor market and factor market equilibrium.

CO2   Understand how factor market works, illustrate basic tools in welfare economics, and illustrate the concept of social welfare functions and compensation principles.

CO3   Identify the various types of investment function analysis and understand the elements of Business Economics.

CO4   Understand distribution theories. Understand theories of Wages, Interest, Rent and Profit.

CO5   Attain the practical knowledge of Business Economics.

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S.Y.B.Com.

Business Economics (Macro Economics)

</div>

CO1   Define and explain the process of calculating national income, identify its components, demonstrate circular flow of income, analyse the various income identities with government and international trade, define the concept of green accounting.

CO2   Understand Say's law of market, classical theory of employment and Keynes objection to the classical theory, demonstrate the principle of effective demand and income determination.

CO3   Analyze different phases of trade cycle, demonstrate various trade cycle theories, understand the impact of cyclical fluctuation on the growth of business, and lay policies to control trade cycle.

CO4   Illustrate the meaning of inflation, deflation and stagflation and identify different kinds of inflation, causes and effects of inflation on different sectors of the economy, describe different measures to control inflation.

CO5   Understand the possible burden, benefits and distribution of various types of taxes among various classes of people, know the general trend and impact on general welfare and arouse them to suggest good and bad tax system.

CO6   Attain the practical knowledge of Business Economics.

T.Y.B.Com.

Indian & Global Economic Development

CO1   Understand the features of Indian Economy as LDCs and as emerging economy.

CO2   Identify the constraints in the Agricultural Development.

CO3   Understand problems of Rural Indebtedness and suggest measures to solve the indebtedness problems

CO4   Analyse India's Industrial Policy since 1991.

CO5   Understand challenges of LPG.

CO6   Identify the role and problems of foreign capital

CO7   Understand India' recent position of foreign trade.

CO8   Identify the objectives, functions and performance of international organizations such as SAARC, IMF, World Bank. WTO, BRICS.

International Economics

CO1   Identify the basic difference between inter-regional and international trade, understand how international trade has helped countries to acquire goods at cheaper cost and explain it through the various international trade theories.

CO2   Understand the benefits of international trade in a way how nations with strong international trade have become prosperous and have the power to control world economy and how global trade can be one of the major contributors of reducing poverty.

CO3   Identify how restrictions to international trade would limit a nation in the services and goods produced within its territories and at the same time explain that a rise in international trade is essential for the growth of globalization.

CO4 Understand the importance of maintaining equilibrium in the balance of payments and suggests suitable measures to correct disequilibrium as well.

CO5 Be aware of the changes in the composition as well as direction of foreign trade after international trade and know the causes and effects of deficits in the balance of payments, measures adopted to correct the deficits and identify the need for having trade reforms.

CO6 Attain the knowledge of recent development and trends in International Organizations.

Department of Geography

Programme Outcome of BA Geography Program Specific Outcomes On Completion the BA (Geography) Students are able to:

PSO1   Serve as a Geographer.

PSO2   Work as a surveyor in various Govt. Departments.

PSO3   Work as a teacher in schools and high schools.

PSO4   Serve as conservator in forest, Soil, Agri, Departments.

PSO5   Work in disaster and water resources management.

PSO6   Serve in forest department as forest conservator.

PSO7   Serve in cartographer in map making divisions of Government.

PSO8   Work in NGOs.

PSO9   Can Prepare for Competitive exams.

PSO10 Aware about Remote Sensing and GIS Technology

GENERAL PAPER 1 FOR FYBA (G1) FYBA
Elements of Geomorphology Gg- 110

Course Out Come

CO1   The student develops theoretical, applied and computational skills.

CO2   Describe what Geography and Physical Geography are.

CO3   Understand the physical principles and processes governing the circulation and characteristics of the atmosphere and climates on Earth.

CO4   Understand the principles of geomorphology and the processes that shape the landscape.

CO5   Understand the directional and location systems employed on the surface of the Earth

CO6   Be able to use and analyze maps.

CO7   The broad objective of the course is to introduce to the students the fundamentals of atmospheric phenomena, global climate systems and climate change.

CO8   The atmosphere and climate are a critical part of the earth system, and climatic variability and change are central to the issue of current and future global environmental change.

CO9   To understand the dynamics of the atmosphere, the ocean and the overall climatologically system.

CO10 On successful completion of this course, students should be able to understand the mean global atmospheric circulations and disturbances, world climate systems, climatic variability and change.

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Commercial Geography

Title of Course B.Com. (Geography)

Elements of Commercial Geography – I

</div>

Course Outcome

The geographical maturity of students in their current and future courses shall develop.

CO1   To make students of the Commerce faculty aware of the correlations between Economic activities and Geographical factors.

CO2   To acquaint the students with various economic activities in Geographical Environment.

CO3   To acquaint the students with the dynamic aspects of resources and need for their conservation.

CO4   To make the students aware about the role and dynamics of population in Commerce.

CO5   To understand the human resources and concepts of population.

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Title of Course B.Com. (Geography)

Elements of Commercial Geography – II

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Course Outcome

CO1   To make students of the Commerce faculty aware of the correlations between Economic activities and Geographical factors.

CO2   To acquaint the students with the Industrial sector and the pollution associated with it.

CO3   To make the students aware of the changing role of transport and communication in Trade and Commerce.

CO4   To make the students aware of the role of tourism in development.

CO5   To acquaint students with basic cartographic techniques.

GENERAL PAPER 2 FOR SYBA (G2)

Gg-210 Geography of Disaster Management

Course Outcome

CO1   To recognize the difference between hazards and disaster and its type.

CO2   To know the basic concept in disaster management and its terminology.

CO3   To understand the measures of disaster management.

CO4   Student can understand the climatic disaster and its management.

CO5   Student can know the Geological and Geomorphic disaster and its management.

CO6   Student can be aware of the anthropogenic disaster and its management.

CO7   To comprehend the global issues and movements regarding disaster.

SYBA SPECIAL PAPER 1 (S1)

Gg-220 Tourism Geography

Course Outcomes

CO1   Students will able to understand the Background of Tourism

CO2   Analysis of tourism practices for their implications locally and globally.

CO3   To understand and evaluate tourism as a phenomenon and as a business system.

CO4   To clarify the diverse nature of tourism, including culture and place, global/local perspectives, and experience design and provision.

CO5   To Plan, lead, organize and control resources for effective and efficient tourism operations.

CO6   To Develop and evaluate tourism policy and planning initiatives.

CO7   Students will be able to understand the commitment to ethical practices of tourism.

CO8   To understand the forms of oral, written, digital, and graphic communication.

CO9   Work collaboratively in groups, both as a leader and a team member, in diverse environments, learning from and contributing to the learning of others.

SPECIAL PAPER 2 FOR SYBA (S2)

Gg-201 Fundamentals of Geographical Analysis

Course Outcomes

CO1   To Introduce the Students with Map and to acquire the Knowledge of Map Reading/Interpretation.

CO2   To familiarize the students with the Map Projection and their applications in Geographical phenomena.

CO3   Students can recognize the Data representation by various techniques.

CO4   Students will able to understand the methods of statistical data representation.

CO5   Students will understand surveying techniques and their application.

CO6   To train the students in elementary statistics as an essential part of geography.

CO7   To understanding about the Field work among the students.

GENERAL PAPER 3 FOR TYBA (G3)

Gg-310 Regional Geography of India

Course Outcomes

CO1   To know the physical characteristics of India.

CO2   To be familiar with the cultural characteristics of India.

CO3   To sensitize the students with development issues and policies and programmes designed for regional development.

CO4   Students can understand the drainage system of India.

CO5   To understand the climatic zone, Characteristics, Origin and Mechanism of Monsoon.

CO6   Students can know the soils and forestry of India.

CO7   Understand uses and location of the Mineral Resources and Energy Resources

CO8   Student can be aware of the agricultural pattern and recent trends in agricultural of India.

SPECIAL PAPER 3 FOR TYBA (S3)

Gg. 320 Population and Settlement Geography

Course outcome

CO1   To provide an understanding of spatial and structural dimensions of population.

CO2   To familiarizing the students with global and regional level problems.

CO3   To acquaint the students with the spatial, political and structural characteristics of human settlement under varied environmental conditions.

CO4   Students can understand the various sources of population data.

CO5   Students are able to understand the population dynamics and spatial pattern of population distribution.

CO6   They will be on familiar terms with the models and theories of population and settlement study.

CO7   Student can classify the man and environment relationship.

CO8   Students can also understand the new concepts of settlement and urbanization with respect to modern era.

SPECIAL PAPER 4 FOR TYBA (S4)

Gg. 301 Techniques of Spatial Analysis (S-4)

Course outcome

CO1   To Introduce the Students with SOI Toposheets and to acquire the Knowledge of Toposheet Reading/Interpretation.

CO2   To familiarize the students with the weather instruments and their applications in Geographical phenomena.

CO3   Students can understand the morphology of topography.

CO4   Students will able to understand the methods of relief representation.

CO5   Students will understand the Uses and Application of RS and GIS.

CO6   To acquaint the students with IMD weather maps and to gain the knowledge of weather map Reading / interpretation.

CO7   To train the students in elementary statistics as an essential part of geography.

CO8   To awareness about GIS among the students.

POLITICAL SCIENCE DEPARTMENT

Program Specific Outcome

PSO1   To create awareness about Indian Constitution, rules and laws.

PSO2   To develop responsible citizenship.

PSO3   To create a pool of academia with in-depth understanding of national as well as international political scenario.

PSO4   To make students learn political scenario at regional and local level.

PSO5   To promote an understanding about local state as well as central level governance.

PSO6   To develop an understanding of democracy and democratic values.

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FYBA – G-1

Indian Constitution

Course Outcome

CO1   To understand the history of Indian Constitution.

CO2   To study Indian Political Process.

CO3   To understand the fundamental Rights.

CO4   To understand the structure of union & state government

CO5   To understand the role of caste & Religion in Indian politics

SYBA

Special Paper - S-1

Western Political Thought

CO1 This paper studies to understand the classical tradition in political theory from Plato to Marx.

CO2 To understand the western political thought.

CO3 To understand how the masters explained and analyzed political exists and problems of their time & prescribed solutions.

CO4 To understand the universality of the enterprise of political theorizing.

CO5 To understand the limitations of the classical theory.

Special Paper-S-2

Political sociology

CO1 To understand the interface of politics with social structures and processes

CO2 To understand how the nature of power is shaped by social factor

CO3 To understand how the political culture is shaped

CO4 To understand the continuity in political development

CO5 To understand attitude and beliefs which affect the nature of political participation

General Paper-G-2

Political theory& concepts

CO1 To understand the evolution and usage of Political theories & concepts.

CO2 To understand the different ideological perspectives.

CO3 To understand the continuity and changes in political theory.

CO4 To understand the relevance of political theory in contemporary era.

TYBA

General Paper- G-3

Political Ideologies

CO1 To understand the different political ideologies.

CO2 To understand the impact of political ideologies on contemporary politics

CO3 To understand the historical context of each ideology

CO4 To understand the link between an idea and its actual realization in public policy

Special Paper- S-3

Public Administration

CO1 To acquaint the students with the discipline of public administration.

CO2 To sensitize the students on the changing concerns of public administration.

CO3 To understand the Indian administration.

CO4 To understand the POSDCORB.

CO5 To understand the financial administration

CO6 To understand the public policy.

Special Paper- S-4

International Politics

CO1 To understand the concepts, theories and dimensions of international relation

CO2 To understand the various debates in I.R.

CO3   To understand the concept of 'Power' in international perspective

CO4 To understand the aspects of balance of power in International Politics

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Department of History

Course Outcomes

F.Y.B.A. General Paper-1 (G1) (1177)

Chhatrapati Shivaji and His Times (1630- 1760)

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CO1   Introduce innovative study techniques in the study of History of Maratha to make it value based, conceptual and thought provocative.

CO2   Introduce International elements in the study of Marathas to facilitate comparative analysis of this history.

CO3   Highlight the importance of past in exploration of present context.

CO4   Understand the Socio –economic, cultural and political background of 17th century Maharashtra.

CO5   Increase the spirit of healthy Nationalism & Secularism among the student.

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S.Y.B.A. General Paper-II (G2)(2177)

Modern India (1857 -1950)

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CO1 Help students to know- History of freedom movement of India, aims, objectives, problems and progress of Independent India.

CO2 Enable students to understand the processes of rise of modern India.

CO3 Acquaint students with fundamental aspects of Modern Indian History.

CO4 Explain the basic concepts/ concerns/ frame work of Indian History

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Special Paper-I (S1) (2178)

Ancient India (3000 B.C. to 1206 AD)

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CO1 Survey the sources of History of Ancient India.

CO2 Provide an understanding of the social, economic, religious and institutional bases of Ancient India.

CO3 Study an ancient Indian agriculture, Industry, trade.

CO4 Study the development of the concept of Nation- State background of political history.

CO5 Study ancient Indian Art & Architecture.

Special Paper-II (S2) (2179)
History of Modern Maharashtra (1818-1960)

CO1 Enable the students to study the history of modern Maharashtra.

CO2 Highlight the ideas, institutions, forces and movements that contributes to the modern Maharashtra.

CO3 Introduce the students with various interpretative perspectives.

CO4 Introduce the student to the regional history within a broad national framework.

T.Y.B.A.
General Paper III (G3)(3177)
History of the World in 20th Century (1914-1992)

CO1 Help students to know Modern World and acquaint with the Socio- economic & Political developments in other countries and understand the contemporary world in the light of its background History.

CO2 To orient the students with political history of Modern World.

CO3 Acquaint with the main developments in the Contemporary World (Understand the important development in the 20th century World.)

CO4 Impart knowledge about world concepts.

CO5 Enable students to understand the economic transition in World during the 20th Century.

POs, PSOs, and Cos for Post-Graduate Courses in Arts

M. A.   ENGLISH

PROGRAMME SPECIFIC OUT COME

Students offering special and functional at PG level

Completion of this course will enable the students to

PSO1 Know the major movements and authors, poets of the periods prescribed for study.

PSO2 Enhance their literary sensibilities

PSO3 Analyze the literary texts from post colonial perspectives.

PSO4 Recognize distinctive ways in which the writers differ in ideological positions from their contemporary authors.

PSO5 Know England's political, social and cultural developments during prescribed period.

PSO6 Respond to universal values reflected in literature.

PSO7 Explain canonical relevance of texts.

PSO8 Identify research areas.

PSO9 Enhance proficiency in English.

PAPER I   ENGLISH LITERATURE FROM 1550 TO 1798

Completion of this course will enable the students to

CO1 Know the major movements and authors, poets and movements from the Renaissance to the Romantic period of English literature

CO2 Relate the literature of the period to the ideological and political developments of the period

CO3 Understand development of various literary forms such as drama, prose and poetry**.**

CO4 Appreciate different styles of expression

PAPER II   ENGLISH LITERATURE FROM 1798 TO THE PRESENT

Completion of this course will enable the students to

CO1   Know the major movements and authors, poets and movements from the Victorian period to the present

CO2   Relate the literature of the period to the ideological and political developments of the period.

CO3   Understand development of various literary forms such as drama, prose and Poetry, novel. Appreciate different styles of expression.Realize various ways of interpretation of the texts

PAPER III CONTEMPORARY STUDIES IN ENGLISH LANGUAGE

Completion of this course will enable the students to

CO1   Know the basic tools of systematic study of language

CO2   Understand and use the basic concepts in Linguistics

CO3   Get acquainted with sub disciplines of Linguistics

CO4   Apply the linguistic skills in real life situations

CO5   Know the syntactic features of the English language

CO6   Know the regional features of English pronunciation

PAPER IV LITERARY CRITICISM AND THEORY

Completion of this course will enable the students to

CO1 Know the nature , function and relevance of literary criticism and theory

CO2 Know various important critical approaches and their tenets

CO3 Deal with highly intellectual and radical content and develop their logical thinking and analytical ability

CO4 Develop sensibility and competency in them for practical applications

M.A. ENGLISH PART II

PAPER V INDIAN WRITING IN ENGLISH

Completion of this course will enable the students to

CO1 Understand major movements and figures of Indian Writing in English

CO2 Be sensible to respond to and appreciate literary texts

CO3 Understand and appreciate artistic and innovative use of language employed by the writers

CO4 Imbibe human values

CO5 Enhance their literary and linguistic competence

PAPER VI ENGLISH LANGUAGE AND LITERATURE TEACHING

Completion of this course will enable the students to

CO1 Know various theoretical and practical aspects of language & literature teaching

CO2 Know various approaches methods and techniques of teaching English language and literature

CO3 Get acquainted with the major issues in ELLT in the Indian context

PAPER VII DRAMA IN ENGLISH

Completion of this course will enable the students to

CO1 Know major movements, related to drama ,works and dramatists

CO2 Be sensible enough to appreciate artistic and innovative use of language by various authors and their world views

CO3 Get exposed to literary texts and develop human values

CO4 Enhance literary and linguistic competence

PAPER VIII RESEARCH METHODOLOGY

Completion of this course will enable the students to

CO1 Know and understand the concept of research

CO2 Understand various of research

CO3 Learn the procedures of research

CO4 Know the importance of cohesion, coherence & continuous composition in research

CO5   Learn to be systematic in planning and execution in research

CO6   Know various tools and techniques of research

CO7   Be able to carry out research independently.

M.A. Part 1 Sem.Ist

Micro Economics Analysis- I (EC-1001)

CO1 Ability to apply the concepts of micro economics such as demand, supply, revenue, cost, elasticity, etc.

CO2 Ability to analyze and demonstrate knowledge of the basic theories/laws in economics- law of demand, law of supply, production function, etc.

CO3 At the end of the course, the student should be able to evaluate microeconomic concepts, models and its use in real life situations.

Public Economics - I

(EC-1002)

CO1 Ability to recognize, apply and analyze concepts and theories in public economics.

CO2 Ability to appraise and assess the theory of public economics in real life situations.

International Trade

(EC-1003)

CO1 Ability to understand the concepts of international economics such as comparative cost, terms of trade, trade policies and trade agreements.

CO2 Ability to interpret and apply theory relating to understand international trade.

CO3 Ability to discuss and debate the effects of trade policy, trade agreements.

CO4 Ability to discuss exchange rate policies on the world economy/trade.

Agricultural Economics

(EC-1004)

CO1 Ability to analyze and evaluate the subject with reference to various aspects of agrarian economies.

CO2 Ability to develop an understanding of agriculture with its intricacies and imperfections and to be able to construct intellectual dialogue on the challenges of agriculture.

M.A. Part 1 Sem. IInd

Micro-Economic Analysis–II

(EC-2001)

CO1   Ability to apply the concepts of micro economics such as demand, supply, revenue, cost, elasticity, etc.

CO2   Ability to compare and contrast various market structures and understand concept of equilibrium, price determination.

CO3   At the end of the course, the student should be able to evaluate microeconomic concepts, models and its use in real life situations.

Public Economic II

(EC-2002)

CO1   Ability to understand, apply and analyze concepts-public debt, budget, fiscal policy in public economics.

CO2   Ability to interpret the theories relating to public economics in real life situations.

CO3   Ability to discuss and debate on the public finance and policies.

International Finance

(EC-2003)

CO1   Ability to understand and interpret the concepts such as Balance of Payments, Exchange Rates, Foreign Exchange transactions, International capital flows, etc.

CO2   Ability to critically analyze the effects of deficits, exchange risk, role of foreign capital on the world economy/trade.

CO3   Ability to discuss and debate on subjects related to international trade and finance w.r.t the Indian Economy.

Labour Economics

(EC-2004)

CO1   Ability to analyze and evaluate the subject with reference to various aspects of Labor economics.

CO2   Ability to develop an understanding of the labor with its intricacies and imperfections and to be able to construct intellectual dialogue on them challenges of labor the Indian Economy.

<div align="center">

M.A. Part 2 Sem. IIIrd

Macro Economics I

(EC-3001)

</div>

CO1 Ability to analyze and evaluate concept of National Income, Saving, Investment, Government Expenditure, Taxes, Imports & Exports.

CO2 Ability to develop an understanding of the Aggregate Supply & Aggregate Demand, IS-LM Model, Fiscal policy.

CO3 Ability to interpret the theories relating to . New Classical Macroeconomics & Open Economy Issues, Mundell-Fleming Model, Lucas critique.

<div align="center">

Growth and Development – I

(EC-3002)

</div>

CO1 Ability to apply the concepts of growth and Development, Alternative measures of development gap, Per- capita income as an index of development.

CO2 Ability to analyze and demonstrate knowledge of the basic theories Economic Growth and Development.

CO3 At the end of the course, the student should be able to evaluate Poverty and inequality.

<div align="center">

EC-3003 Modern Banking

(EC-3003)

</div>

CO1 Understand the financial system of India. Define and explain the liquidity, safety, profitability, Money market ,capital market.

CO2 Ability to apply the concepts of E-Banking, Provident Fund, Small Savings, Mutual Funds, Pension fund.

CO3 Ability to analyze and evaluate International Financial Markets.

<div align="center">

Demography

(EC-3004)

</div>

CO1 Ability to apply the concepts of Demography, GFR - ASFR – TFR – GRR – NRR – Child-woman ratio, Population distribution, Population Policy.

CO2 Understand the Population theories.

CO3 Understand India's Population Policy.

CO4 Migration, Population distribution by geographic areas , Labour force,

M.A. Part 2 Sem. IVth

Macro-Economic II

(EC-4001)

CO1	To Understand the Money and Liquidity, Liquidity measures, Nominal, Real Cash Balance, High powered money, Money Supply, Inflation.
CO2	Understand the Theory of Money Supply, Neo Classical theory, Keynes's Theory, Friedman's Theory, The Quantity Theory of Money Approach, Fishers QTM. Tobin theory Issues regarding endogenous and exogenous supply of money.
CO3	To understand the Money Multiplier Process.
CO4	To Understand Real and monetary theories of the interest rate Loanable funds theory, Keynesian theory- Wicksellian theory, Fisher's theory, Hicksian theory.

Growth and Development –II

(EC-4002)

CO1	To understand The role of agriculture and Industry in development, unemployment, Role of industry, The Role of Infrastructure.
CO2	Ability to apply the Policy Environment for growth and development.
CO3	To understand The concept of foreign borrowing and debt, international capital flows.
CO4	Understand the Trade as an engine of growth.
CO5	Understand the role of the government.

Research Methodology

(EC-4003)

CO1	To Understand meaning and types of research.
CO2	To Understand Social Science Research.
CO3	Ability to apply the Various Research Techniques, like Hypothesis, Objectives, Data Collection, Data Analysis.
CO4	To Understand Sampling Technique - Types of Samples, Size of Samples.

CO5   Ability to apply the various technique for Analysis of Data.

CO6   To Understand Information Systems & report writing.

Rural Development
(EC-4004)

CO1   To understand meaning Concept, Scope, Objectives and Importance of Rural Development.

CO2   To Understand various approaches to Rural Development.

CO3   To study and understand the Aspects of Rural Development.

CO4   To understand Problems of Rural Development.

CO5   Ability to apply Objectives and critical assessment of rural development programs as a part of inclusive and sustainable growth.

हुतात्मा राजगुरू महाविद्यालय राजगुरूनगर

ता. खेड, जि. पुणे

मराठी विभाग

अभ्यासक्रम परिणाम (आऊटकम)

प्रथम वर्ष कला

विषयाचे नाव – मराठी साहित्य : कथा आणि भाषिक कौशल्यविकास

अभ्यासक्रम परिणाम :

१. विद्यार्थ्यांनी मराठी भाषा, मराठी साहित्य आणि मराठी संस्कृती यांचे अध्ययन केले.
२. विद्यार्थ्यांची साहित्यविषयक आकलन, आस्वाद आणि मूल्यमापन क्षमता विकसित झाली.
३. विद्यार्थ्यांची साहित्याभ्यासातून जीवनविषयक समज विकसित झाली.
४. मराठी भाषेची लेखन, श्रवण, संभाषण आदि उपयोजनात्मक कौशल्ये विकसित झाली.

प्रथम वर्ष वाणिज्य

विषयाचे नाव – भाषा, साहित्य आणि कौशल्यविकास

अभ्यासक्रम परिणाम :

१. विविध क्षेत्रातील भाषा व्यवहाराचे स्वरूप व गरज समजावून घेतले.
२. या व्यवहार क्षेत्रातील मराठी भाषेचे स्थान स्पष्ट करून त्यातील मराठीच्या प्रत्यक्ष वापराचा अभ्यास केला.
३. विविध क्षेत्रीय मराठी भाषेच्या वापराची कौशल्ये विद्यार्थ्यांमध्ये विकसित झाली.
४. विविध लेखनप्रकारांचा अभ्यास व प्रत्यक्ष लेखनाची कौशल्ये वापरण्यास सक्षम झाले.
५. विविध क्षेत्रातील कर्तृत्ववान व्यक्तींच्या कार्याची व विचारांची ओळख करून देण्यात आली.
६. विद्यार्थ्यांमध्ये नैतिक, व्यावसायिक व वैचारिक मूल्यांची जोपासना केली.

द्वितीय वर्ष कला (सामान्य स्तर २)

विषयाचे नाव – आधुनिक मराठी साहित्य आणि उपयोजित मराठी

अभ्यासक्रम परिणाम : :

१. विद्यार्थ्यांनी शुद्धलेखनाची ओळख करून घेतली.
२. विद्यार्थ्यांनी पारिभाषिक संज्ञांची ओळख करून घेतली.
३. चरित्र–आत्मचरित्र या साहित्यप्रकारांच्या तात्त्विक घटकांचे ज्ञान करून घेतले.
४. आधुनिक मराठी साहित्यातील निवडक चरित्र– आतमचरित्रात्मक वेच्यांचे आकलन, आस्वाद आणि मूल्यमापन करण्याची क्षमता विद्यार्थ्यांमध्ये निर्माण झाली.

द्वितीय वर्ष कला (विशेषस्तर १)

विषयाचे नाव – मराठी साहित्यातील विविध साहित्यप्रकार

अभ्यासक्रम परिणाम : :

१. विद्यार्थ्यांनी मराठी साहित्यप्रकारांच्या तात्त्विक घटकांचे ज्ञान करून घेतले.
२. विद्यार्थ्यांमध्ये वेगवेगळ्या कालखंडातील मराठीतील अभिजात साहित्यकृतींचा संस्कार घडवून साहित्याविषयीची अभिरूची निर्माण केली.
३. विद्यार्थ्यांमध्ये साहित्यकृतीला मुक्त प्रतिसाद देण्याची क्षमता विकसित झाली.
४. साहित्याचा सूक्ष्म पातळीवर अभ्यास करण्याची क्षमता विकसित झाली.
५. विद्यार्थ्यांची पदव्युत्तर अभ्यास करण्याची पूर्वतयारी पूर्ण झाली.

द्वितीय वर्ष कला (विशेषस्तर २)

विषयाचे नाव – अर्वाचीन मराठी वाङ्मयाचा इतिहास (इ.स.१८१८ ते १९६०)

अभ्यासक्रम परिणाम :

१. विशेषस्तरावर अभ्यासाचा प्रारंभ होत असताना, मराठी साहित्याच्या ऐतिहासिक परंपरेचे स्थूल ज्ञान विद्यार्थ्यांनी करून घेतले.
२. विद्यार्थ्यांनी विशिष्ट कालखंडाच्या पार्श्वभूमीवर साहित्यामागील प्रेरणा, प्रवृत्तींचे ज्ञान करून घेतले.
३. विद्यार्थ्यांना साहित्यप्रकारांच्या विकसनशील परंपरेचे स्थूल ज्ञान झाले.
४. विद्यार्थ्यांची पदव्युत्तर अभ्यास करण्याची पूर्वतयारी पूर्ण झाली.

द्वितीय वर्ष विज्ञान

विषयाचे नाव – मराठी विज्ञानसाहित्य आणि व्यावहारिक मराठी –

अभ्यासक्रम परिणाम :

१. विद्यार्थ्यांमध्ये मराठी विज्ञानसाहित्याची आवड निर्माण झाली.
२. विद्यार्थ्यांमध्ये वैज्ञानिक जाणिवा निर्माण झाल्या.
३. विद्यार्थ्यांना विज्ञान, उद्योगातील विविध प्रवाह, संधी यांचा परिचय करून दिला.
४. विद्यार्थ्यांमध्ये लेखन, वाचन, आकलन आणि संभाषण ही भाषिक कौशल्ये अधिकाधिक विकसित झाली.
५. भाषिक कौशल्यांचे विविध आविष्कार आणि प्रसारमाध्यमे यांच्या परस्परसंबंधाचे ज्ञान विद्यार्थ्यांना झाले.
६. वैज्ञानिक, कार्यालयीन, व्यावसायिक आदि कामकाजात मराठीच्या होणा–या वापराची माहिती देत पारिभाषिक संज्ञांची ओळख विद्यार्थ्यांनी करून घेतली.

तृतीय वर्ष कला (सामान्य स्तर ३)

विषयाचे नाव – आधुनिक मराठी साहित्य आणि व्यावहारिक व उपयोजित मराठी

अभ्यासक्रम परिणाम :

१. विद्यार्थ्यांनी आधुनिक मराठी साहित्यातील विविध साहित्यप्रकारांचा परिचय तसेच त्यांचे आकलन करून घेतले. साहित्याबद्दलची अभिरूची विकसित करून कलाकृतींचा आस्वाद घेण्याची क्षमता वाढली.

२. विद्यार्थ्यांनी नेमलेल्या कलाकृतींच्या संदर्भात साहित्यपरंपरेचा स्थूल परिचय करून घेतला.

३. विद्यार्थ्यांमध्ये भाषेचे येथोचित आकलन करण्याची व वापर करण्याची यथायोग्य क्षमता विकसित झाली.

४. विद्यार्थ्यांनी निबंध व प्रवासवर्णन या साहित्यप्रकारांचे तात्त्विक विवेचन केले.

५. विद्यार्थ्यांमध्ये वाचन व लेखन क्षमता विकसित होऊन त्यांच्यात ग्रंथपरीक्षणाची आवड निर्माण झाली.

तृतीय वर्ष कला (विशेषस्तर स्तर ३)
विषयाचे नाव — साहित्यविचार
अभ्यासक्रम परिणाम : :

१. विद्यार्थ्यांनी साहित्याचे स्वरूप समजावून घेतले.
२. विद्यार्थ्यांनी साहित्याची प्रयोजने समजावून घेतली.
३. विद्यार्थ्यांनी साहित्याची निर्मितीप्रक्रिया समजावून घेतली.
४. विद्यार्थ्यांनी साहित्याची भाषा समजावून घेतली.
५. विद्यार्थ्यांनी साहित्याची आस्वाद प्रक्रिया समजावून घेतली.
६. विद्यार्थ्यांनी साहित्यिक अभिरूची समजावून घेतली.
७. विद्यार्थ्यांनी साहित्य आणि समाज यातील परस्परसंबंध समजावून घेतला.
८. विद्यार्थ्यांनी साहित्यप्रकाराची संकल्पना समजावून घेतली.
९. विद्यार्थ्यांनी वाङ्मयीन मूल्ये समजावून घेतली.

तृतीय वर्ष कला (विशेषस्तर स्तर ४)
विषयाचे नाव — भाषाविज्ञान — वर्णनात्मक आणि ऐतिहासिक
अभ्यासक्रम परिणाम :

१. विद्यार्थ्यांनी भाषेचे स्वरूप व कार्य, भाषेच्या अभ्यासाचे महत्त्व, भाषेच्या अभ्यासाची प्रमुख अंगे जाणून घेतली.

२. भाषा म्हणजे काय व तिचे मानवी जीवनातील कार्य व महत्त्व जाणून घेतले.

३. विद्यार्थ्यांना वेगवेगळ्या भाषाभ्यास पद्धतींचे वेगळेपण व महत्त्व समजले.

४. विद्यार्थ्यांना स्वननिर्मितीची प्रक्रिया समजली.

५. विद्यार्थ्यांना वर्गिंद्रियांची रचना व कार्ये समजले.

६. विद्यार्थ्यांनी स्वनविज्ञान, स्वनिम संकल्पना आणि मराठीची स्वनिम व्यवस्था जाणून घेतली.

७. विद्यार्थ्यांना मराठीची रूपिमव्यवस्था समजली.

८. विद्यार्थ्यांचा वाक्यविन्यास व अर्थविन्यास या भाषावैज्ञानिक संकल्पनांशी मराठीच्या संदर्भात स्थूल परिचय झाला.

९. विद्यार्थ्यांनी ऐतिहासिक भाषाभ्यासपद्धतींचे स्वरूप व महत्त्व समजून घेतले.

१०. भाषाकुलाची संकल्पना जाणून घेऊन तत्कालीन भाषिक स्थित्यंतरांचा आढावा घेतला.

११. मराठी भाषेचा उत्पत्तीकाळ जाणून घेऊन तत्कालीन भाषिक स्थित्यंतरांचा आढावा घेतला.

१२. टप्प्याटप्प्याने भाषा म्हणून मराठीच्या वाटचालीचा ऐतिहासिक आढावा विद्यार्थ्यांनी घेतला.

डॉ. संजय शिंदे
मराठी विभाग प्रमुख