

SCIENCE FACULTIES

PROGRAM OUTCOME

Program (B. Sc.) Outcomes

- Knowledge: Understand the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life.
- Programming Skills: Serve as the Programmers or the Software Engineers with the sound knowledge of practical and theoretical concepts for developing software.
- Instrumentation: Acquired the skills in handling scientific instruments, planning and performing in laboratory experiments.
- Ability to design, implement and evaluate computer-based system, process, component.
- Capability to design and conduct experiments, as well as analyze and interpret data
- Examine the impact of electronic solutions in global and environmental contexts and utilize the knowledge for sustained development.
- Ability to use and apply the techniques & skills in modern engineering practice.
- It helps to develop scientific temper and thus can prove to be more beneficial for the society as the scientific developments can make a nation or society to grow at a rapid pace.
- After the completion of this course students have the option to go for higher studies i.e. M. Sc and then do some research for the welfare of mankind.
- After higher studies students can join as scientist and can even look for professional joboriented courses.
- Ability to perform various experiments, handle laboratory instruments and use the knowledge for further studies.
- Ability to understand the experiments, design new methods, good working hand, observing skills , analyzing and interpreting the data.
- This helps to develop research interests, industrial approach and helps them to get motivated for higher studies.

PROGRAM SPECIFIC OUTCOME

Program (B. Sc.) Specific Outcomes

- The benefits of participating in this degree program include becoming qualified for rewarding careers working with electronics, mechanical systems, and all related systems.
- Graduates also enjoy the attention of qualified instructors, hands-on opportunities to put their developing skills to use, and exposure to the most current theories and practices used in the industry.
- After graduation, individuals can expect to find career opportunities in the automotive industry, the world of computers, and more specific fields such as digital signal processing, optoelectronics, and mobile electronics.
- This course also offers opportunities for serving in Indian Army, Indian Navy, Indian Air Force as officers.
- Students after this course have the option to join Indian Civil Services as IAS, IFS etc.
- Science graduates can go to serve in industries or may opt for establishing their own industrial unit.
- After the completion of the B. Sc. degree there are various other options available for the science students.

- Apart from the research jobs, students can also work or get jobs in Marketing, Business & Other technical fields.
- Science graduates also recruited in the bank sector to work as customer service executives.
- Students can also find employment in government sectors.
- Students are also eligible to work in institutions like BARC, DRDO, ONGC, IISC, IICT and civil services.

COURSE OUTCOME

DEPARTMENT OF ZOOLOGY

Sem - I

Paper: I - Nonchordate - Protozoa to Annelida (Core Paper - I)

Objective: Broad understanding of animal diversity including scientific classification and evolutionary relationships.

Desired Outcome: Understanding of complexity in animal structure develops from lower invertebrates to higher invertebrates.

Paper: II - Cell biology (Core Paper - II)

Objective: Broad understanding of cell structure and function.

Desired Outcome: Learners will understand the basics of structure and functioning of cell.

Sem - II

Paper : I - Nonchordate - Arthropoda to Hemichordate (Core Paper - III)

Objective: Broad understanding of animal diversity including scientific classification and evolutionary relationships.

Desired Outcome: understanding of complexity in animal structure develops from lower invertebrates to higher invertebrates.

Paper : II- Genetics & Evolution (Core Paper - IV)

Objective: To create curiosity of study of Genetics and evolution and how genetics and evolution are related.

Desired Outcome: Learners will understand genetics and evolution and how genetics has expanded beyond inheritance to study the function and behavior of genes.

Sem- III

SEC Paper I: Chordata (Core Paper – V)

Objective: To develop understanding of chordate animals and ignite curiosity about chordates and their evolution.

Desired outcome: Learners will understand chordate diversity and their role in ecosystem and how they evolve over the period of time scale.

Paper II: Embryology (Core Paper - VI)

Objective: To study developmental biology and embryonic processes

Desired Outcome: Learners will have clear understanding of basic developmental processes in animals like Gametogenesis, Fertilization, and Embryogenesis.

Sem IV

Paper I: Physiology (Core Paper - VII)

Objective: To learn important physiological processes

Desired Outcome: Learners will understand general functioning of body organs and their systems.

Paper: II Biochemistry(Core Paper -VIII)

Objective: To learn biochemical processes take place in body of organisms.

Desired Outcome: Learners will understand mechanisms of biochemical processes.

Sem V

DSE Paper I: Applied Zoology

Objective: To learn applications of zoology in fisheries, agriculture, poultry farming and dairy farming.

Desired Outcome: Learners will acquire useful skills of applied zoology.

DSE Paper II: Aquatic Biology

Objective: To learn freshwater and marine ecosystems.

Desired Outcome: Learners will understand different aquatic ecosystems like freshwater ecosystem, marine ecosystem, water pollution and lake biology.

Skill Enhancement Course (SEC): Apiculture

Objective:To learn Apiculture and techniques of beekeeping.

Desired Outcome: Learners will acquire skills of beekeeping and its different techniques.

SEM VI

DSE Paper I: Immunology

Objective: To study immunology and its processes.

Desired Outcome: Learners will understand basics of immunology, functions of immune system and various organs involving in immune system.

DSE Paper II: Micro-technique, Bioinformatics and Biostatistics

Objective: To study microscopy, microtomy, general bioinformatics and biostatistics.

Desired Outcome:Learners will acquire skills of micro-techniques, gain knowledge of basics of bioinformatics and biostatistics.

DEPARTMENT OF PHYSICS

Sem-I-Gravitation, Oscillation and Properties of Matter

The students will:

CO1: be able to understand the concept of Gravitation.

CO2: be able to understand the phenomenon of Oscillation and its application.

CO3: be able to understand the concepts of Elasticity and its applications in Industry.

CO4: be able to understand the principle behind the Viscosity.

CO5: be able to understand the concept of Surface tension.

Sem-I-Vector Analysis and electrostatics

The students will:

CO1: be able to understand the concept of Vector Analysis and its application in Physics.

CO2: be able to understand the concept of electric field and its application in devices.

CO3: be able to understand the concepts of Electric potential.

CO4: be able to understand the concept of electric field in dielectric and its applications.

Sem-II- Magnetostatics & Electromagnetic waves

The students will:

CO1: be able to understand the concept of Magnetostatics and its application in Physics.

CO2: be able to understand the phenomenon of Electromagnetic Induction and its applications in devices.

CO3: be able to understand various Maxwell's equations and propagation of Electromagnetic waves.

CO4: be able to understand the concept of steady electric current and its applications.

CO5: be able to understand the concept of Alternating electric current and its applications in devices.

Sem-III-USPHT05- Thermal Physics (Paper-I)

The students will:

CO1: be able to understand the concept of Kinetic Theory of Gases and its application in Physics.

CO2: be able to understand the transport phenomenon & Viscosity of gases.

CO3: be able to understand the concept and applications of Thermodynamics.

CO4: be able to understand the Law of Thermodynamics and its applications.

CO5: be able to understand the Thermodynamic functions and its applications.

SEM-III-USPHT06- Radiation and Statistical Physics (Paper-II)

The students will:

CO1: be able to understand the Radiation theories and its applications.

CO2: be able to understand the concepts of statistics used in Thermodynamics.

CO3: be able to understand the concept and applications of M-B statistics in Physics.

CO4: be able to understand the concept and applications of B-E and F-D statistics in Physics.

SEM-IV-USPHT07- Waves, Accoustics& LASERS (Paper-I)

The students will:

CO1: be able to understand the Concept of waves, Superposition of waves and Harmonic Oscillations and its applications.

CO2: be able to understand the various concepts of wave motion and its analysis with the help of Fourier's theorem.

CO3: be able to understand the concept and applications of Ultrasonic in Physics.

CO4: be able to understand the concept and applications of Acoustics in Physics.

CO5: be able to understand the principle behind the working of LASERS.

SEM-IV-USPHT08- OPTICAL PHYSICS (Paper-II)

The students will:

CO1: be able to understand the phenomenon of interference in thin films and its various applications.

CO2: be able to understand the applications of Newton's ring and Michelson's Interferometer.

CO3: be able to understand and apply the concepts of Diffraction to find the wavelength of monochromatic beam of light.

CO4: be able to understand and apply the concepts of Polarization in optics.

SEM-V-USDSEPHT09- ELEMENTS OF MODERN PHYSICS

The students will:

CO1: be able to understand the concept of Quantum theory and its various applications.

CO2: be able to understand the applications of Schrödinger's wave equations in Quantum Mechanics and its various applications to solve the problems associated with micro particles.

CO3: be able to understand the concepts related to Nucleus and its stability.

CO4: be able to understand the concepts of Radioactivity and its applications.

CO5: be able to understand the concepts of β -ray and γ -ray emissions its applications.

CO6: be able to understand the concepts of Fission and Fusion.

SEM-V-USDSEPHT10- SOLID STATE PHYSICS

The students will:

CO1: be able to understand the various concepts related to Crystal Structure.

CO2: be able to understand the Magnetic properties of matter and its applications in devices.

CO3: be able to understand the Dielectric properties of matter and its applications in devices.

CO4: be able to understand the concepts of Band theory and its applications in conductor, semiconductor and insulators.

CO5: be able to understand the concepts of Superconductivity its applications.

SEM-VI-USDSEPHT13- NUCLEAR AND PARTICLE PHYSICS

The students will:

CO1: be able to understand the general properties of Nuclei.

CO2: be able to understand the Nuclear models and its applications in devices.

CO3: be able to understand the Nuclear Reactions and its applications in devices.

CO4: be able to understand the concepts of Nuclear Reactions and its interactions with matter.

CO5: be able to understand the concepts of Detectors of Nuclear Reactions.

CO5: be able to understand the principle and working of Particle Accelerators.

SEM-VI-USDSEPHT14- DIGITAL AND ANALOG CIRCUITS AND INSTRUMENTATIONS

The students will:

CO1: be able to understand the general concepts related to digital and analog circuits.

CO2: be able to understand the working of Semiconductor devices and its applications in Electronics.

CO3: be able to understand the Designing and functioning of Power Supply.

CO4: be able to understand the concepts related to BJT and its applications as an amplifier.

CO5: be able to understand the concepts of Operational Amplifiers and its applications in Electronics.

DEPARTMENT OF ELECTRONICS

B. Sc. I (CBCS) SEM - I

Paper I (Network Analysis & Digital Fundamentals)

Student will be able to understand

- Concept of energy sources and its applications.
- Concept of network, its analysis methods and network theorems
- Basic concept of number system, its type and its usefulness in digital electronics.
- Basic concept of logic gates and their utilities in implementing digital circuit.

Paper II (Semiconductor Diodes and Analog Electronics)

Student will be able to understand

- The basic of semiconductor diode and its applications.
- The basic of rectifiers and its applications for constructing DC power supplies.
- The Basic concept and working of transistor and it uses in the circuit.
- The Basic concept of amplifiers and its analysis.

B. Sc. I (CBCS) SEM - II

Paper I (Unipolar Device and Linear Integrated Circuit)

Student will be able to understand

- The basic concept and working of unipolar semiconductor component and its application.
- Classification of amplifiers.
- Need of Coupling of amplifier and how to couple one amplifier to other amplifier.
- Feedback concept, its types and effect in the amplifier circuit.
- Basic concept of oscillator circuit, different type of oscillator circuits and use of oscillator in different application.
- Operational amplifier and its applications.

Paper II (Digital Integrated Circuit)

Student will be able to understand

- Logic analysis and design of combinational circuit.
- Basic concept of clock, timer circuit & flip-flop and its applications.
- The concept of counter, its types and uses.
- The concept of Shift register and its applications.
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B. Sc. II (CBCS) SEM - III

Paper I (Power Amplifier, Oscillators and Power Supplies)

Student will be able to understand

- Basic concept of power amplifier and its types.

- The concept of oscillators and its types.
- The concept of DC regulated power supply, its types and constructions.

Paper II (Microprocessor)

Student will be able to understand

- The concept of Input/Output Devices, Data storages (Memories), Memory organization and addressing.
- 8085 Microprocessor Architecture and its features.
- Addressing modes of 8085 μ P and its instruction set.
- Programming of 8085 μ P.
- 8086 Microprocessor Architecture and its features.

B. Sc. II (CBCS) SEM - IV

Paper I (Communication Electronics)

Student will be able to understand

- Basic concept of Electronic communication: Block diagram, electromagnetic communication spectrum, band designations and usages, channels and base-band signals
- The concept of analog modulation and its types.
- Qualitative idea of super heterodyne receiver.
- Modulation and detection technique for PAM.
- Multiplexing.
- Digital pulse modulation: ASK, FSK & PSK.
- Satellite communications.
- Mobile telephony system.

Paper II (Interfacing, PPI and Microcontroller)

Student will be able to understand

- The concept of interfacing.
- Interfacing devices and its features.
- Basic concept of microcontroller.
 - 8051 microcontroller architecture and its programming.

B. Sc. III (CBCS) SEM - V

Paper I ()

Student will be able to understand

Paper II (C-Programming - I)

On completion of the course, students are able to:

- Develop their programming skills.
- Be familiar with programming environment with C Program structure.
- Declaration of variables and constants.
- Understand operators, expressions and preprocessors.
- Understand arrays, its declaration and uses.

B. Sc. III (CBCS) SEM - VI

Paper I ()

Students are able to understand

- I

Paper II (C-Programming - II)

On completion of the course, students are able to:

- Design programs using Functions, Pointers, Structures and Unions in C language.
- Write a program using File Handling.
- Writing programs for drawing different graphical shapes.

Develop programs using C to meet real world needs at primary level. This course provides platform to enhance student's basic skills required for advan

DEPARTMENT OF CHEMISTRY

B.Sc. (CBCS) Sem-I

PAPER-I (Inorganic chemistry)

Basics of Atomic Structure

- After completing the paper-I, Students are able to understand the basic concepts of atomic structure.
- Such as Quantum numbers, electronic configuration, quantum mechanical principles and equations, size of atoms and ions.
- It helps to describe their individual physical and chemical properties, reactivity and stability of atoms, nature of bonding, shape, size and geometry of molecules and molecular ions, molecular orbital theory, formation of homo nuclear and hetero nuclear molecules.

Physical and Chemical properties of s and p block elements

- This chapter helps to understand electronic configuration, atomic and ionic radii, ionization potential, electron affinities, ionization potentials, electronegativity, reducing, oxidation states, formation of hydrides, oxides and halides and oxyacids of 's' and 'p' block elements.

Significance of solvent systems and volumetric analysis.

- Nature of hydrogen bonding.
- Physical properties of solvent systems, nature of non-aqueous solvents and their general characteristics.
- Acid-base concept, choice of indicators, theories related to acid-base titrations, redox titrations, complexometric titrations, external and internal indicators.

PAPER- II (organic chemistry)

Formation of molecules and their physical and chemical properties and Stereochemistry

- Formation of molecule on the basis of hybridization concept, shape, size and geometry.

- Electronic effects such as inductive effect, resonance effect, electromeric effect, hyperconjugation effect, and tautomerism.
- Nature of reagents, reactive intermediates, energy profile diagram, types of reactions and strength of acids and bases.
- Basic concept of isomerism, structural isomerism, geometrical isomerism, optical isomerism and conformational isomerism.
- Formulae, molecular projections- Newman , Sawhorse, Fischer projections. Concept of chirality, R-S and E-Z nomenclature, Conformations of ethane, propane and cyclohexane

Aliphatic and aromatic hydrocarbons

- Definition, Nomenclature, Classification, Preparation methods, chemical and physical properties and uses. Orientation, effects in case of aromatic compounds.

B.Sc. (CBCS) Sem-II

PAPER-I (Organic chemistry)

Aliphatic and Aromatic halides

- Definition, Nomenclature, Classification, Preparation methods, chemical and physical properties.
- Chemical Reactions- Eliminations, substitutions and aromatic nucleophilic substitutions and some name reactions- Sandmeyer, Gattermann, Benzyne mechanism, uses.

Preparation and properties of various functional groups.

- Definition, classification, nomenclature, structure of functional groups (alcohols, ethers, phenols, aldehydes, ketones, acids and esters), preparation methods such as Oxidation, Reduction, Substitution (electrophilic and nucleophilic) , physical properties.
- Chemical reactions with respect to acids, base, metal, non-metals, oxidizing agents, reducing agents and external factors like pressure, temperature, heat and light.

Paper-II (Physical Chemistry)

Mathematical concepts

- Logarithmic relations, graphs, derivatives, integrations, permutations and combinations, concept of units(CGS and SI).

Ionic equilibria

- Basic concepts- nature of electrolytes, degree of ionization, ionization constant, ionic product, pH concept, Buffer solutions, solubility product.

Thermodynamics

- Basic concepts- system, surrounding, energy, enthalpy, entropy, variable functions and variable states, concept of heat and work, thermodynamic laws and thermodynamic scale of temperature.
- Thermochemistry, heat of reactions, standard states, hess's law, calculation of bond dissociation energy, Kirchoff's equation.

States of matter

- Gaseous state-Kinetic theory of gases, Gas equations, Maxwell- Boltzman distribution law, types of molecular velocities, different types of collisions, differentiation between ideal and real gases.

- Van der waals equation, Critical phenomenon, reduced equation of state. Liquids state- surface tension, viscosity, methods of determination, effect of temperature.
- Solid state- laws of crystallography, some fundamental parameters of crystals such as unit cell, space lattice, miller indices, Bragg's equation, determination of crystal structure.

B.Sc. (CBCS) Sem-III

PAPER-I (Inorganic chemistry)

Chemistry of Boron, Sulphur and Silicates

- Classification, structure and bonding, preparations and properties. Basic properties of Iodine and Interhalogen compounds (preparations, structure and classification)

Ionic solids

- Ionic structure, radius ratio effect, coordination number and lattice energy, Born-Haber cycle, polarizing power and Fajan's rule.
- Metallic bonding- Free electron theory, properties of metal, valence bond theory, band theory to explain conductors, insulators and semiconductors.
- Acids and bases- Bronsted lowry concept, lux flood solvent system and lewis concept

d-block elements

- Properties of elements with respect to their electronic configuration, atomic and ionic radii, ionization potential, variable oxidation states, colors, complex formation, catalytic activities, comparative treatment with 3d analogue with respect to oxidation state, magnetic behavior and stereochemistry

Chemistry of lanthanides and actinides

- Position in periodic table, electronic configuration, atomic and ionic radii, lanthanide contraction, complex formation tendency, occurrence, isolation of lanthanides.

PAPER-II (Physical chemistry)

Phase equilibria

- Phase rule and its applications, degree of freedom, clausiusclapeyron equation and its applications.
- Ideal liquid mixtures, raoults law, henrys law, non ideal systems and azeotropes, partial miscible liquids and immiscible liquids, Nernst distribution law.

Thermodynamics II

- Second law of thermodynamics, concept of entropy, free energies of system, effect of temperature on free energy and its applications, system of variable compositions, partial molar quantities, chemical potential, standard free energy.

Chemical kinetics

- Rate of reaction and factors affecting it, derivation of specific rate constant of zero, first and second order reactions and their characteristics, half life, mean life, order of reaction and its determination, conductometry, polarimetry, Arrhenius equation, collision theory, transition state theory, catalysis and catalysed reactions.

Solution and colligative properties

- Different modes of concentrations, Raoult's law of relative lowering of vapour pressure, osmosis, osmotic pressure and its measurement, elevation of boiling point, depression of freezing point, determination of molecular mass from lowering of vapour pressure, elevation of boiling point, osmotic pressure and depression of freezing point, van't Hoff factor, degrees of dissociation and association.
- Magnetic properties- Electron spin angular momentum, spin quantum number, electron as magnetic dipole, magnetic moment of electron, Bohr magneton, diamagnetism, paramagnetism, ferromagnetism, determination of magnetic susceptibility and its application.

B.Sc. (CBCS) Sem-IV

PAPER-I (Inorganic chemistry)

Coordination compounds

- Simple salts, double salts, coordination compounds, Werner's coordination theory, EAN rule, nomenclature, classification of chelates and their applications, valence bond theory of transition metal complexes, isomerisms.

Hard and Soft, acids and bases

- Classification, Pearson's HSAB concept and its applications, Acid-Base strength of hardness and softness, symbiosis.
- Oxidation and Reduction- Use of redox potential data: analysis of redox cycle, Redox stability in water (Pourbaix, Latimer and Frost diagrams), Principle involved in extraction of element.

Metal complexes:

- Limitation of Valence bond theory, Crystal field theory, Crystal field stabilization energy of octahedral and tetrahedral complexes.
- Factors affecting magnitude of $10Dq$. Jahn Teller effect, selection rules, Hole formalism principle, electronic spectrum of some metal complexes. Thermodynamic and kinetic stability of metal complexes, stepwise and overall stability constant and their relationship, Factors affecting stability of complex.

Colorimetry and spectrophotometry

- Principles of photometry, Beer-Lambert's law and its derivation.
- Types of colorimeter and spectrophotometer and their applications in quantitative analysis.

PAPER-II (Organic chemistry)

Nitrogen containing compounds

- Nomenclature, classification, structure, preparations, physical properties- (basic), chemical reactions and mechanisms of nitroalkanes, nitroarenes, amines and diazonium salts.
- Factors affecting basicity of amines

Organometallic compounds

- Synthesis structure and chemical reactions of organo magnesium, zinc, sulphur and lithium compounds.
- Heterocyclic compounds- MO picture and aromaticity of Furan, Thiophene, Pyrrole and Pyridine and its reactions, condensed 5 and 6 membered heterocycles.

Amino acids, peptides, and proteins.

- Nomenclature, classification, preparations and reactions of amino acids, Zwitterion, Isoelectric point and electrophoresis.
- Classification of proteins and synthesis of simple peptides. Quantitative analysis- Estimation of C, H, N, S and X by Kjeldahl's and carius method, Calculation of empirical molecular formula.

Carbohydrates, Dyes and Drugs

- Classification and general properties of glucose and fructose. Determination of configuration of monosaccharides, absolute configuration, mutarotation. Structure of disaccharides and polysaccharides.
- Synthetic dyes- color and constitution, classification, synthesis And uses of methyl orange, congoed, Phenolphthalein, indigo dye and Alizarin.
- Drug-Definition and qualities of ideal drugs, basic concepts, synthesis, applications and side effects of drugs. Composition and uses of detol, Chloramin-T, Calmpose, classification of antibiotics with examples.

B.Sc. (CBCS) Sem-V

PAPER-I (Organic chemistry)

Spectroscopy

- Principle of NMR, equivalent and nonequivalent proton, shielding and deshielding effect, coupling constant, chemical shift value, splitting of signals, intensity of signals and elucidation of structure of organic molecule

Organic synthesis via enolates

- Compounds having active methylene group (aceto-acetic ester), acidic protons and its utilization in organic synthesis

Polymers

- Introduction and classification, reactions (hydrolysis, hydrogenation, addition and substitution), cross linking polymers, natural and synthetic fibers.

Green chemistry and Technology for sustainable development

- Basic principle of green chemistry and application of new methodologies.

PAPER-II (Physical chemistry)

Electrochemistry-I

- Electrical transport (conduction of electricity), conductance, its measurement and factors affecting it, application of Kohlrausch's law and conductance, Arrhenius theory and Debye-Huckel theory

Electrochemistry-II

- Reversible and irreversible cells, cell EMF and its measurement, thermodynamic quantities of cell reactions, electrodes, mobility of ions, transport and transference number,

Electrodes

- Types of electrodes, cell reactions, Nernst equation, electrode potential, cells, cell EMF and its measurement,

Quantum Mechanics

- Foundation of quantum mechanics and its applications,

B.Sc. (CBCS) Sem-VI

PAPER-I (Inorganic chemistry)

Qualitative and quantitative aspects of analysis and Photometry

- Sampling, evaluation of data and its analysis, data statistics, basic concept of flame photometry, instrumentation and its limitations and applications.

Separation techniques, Fertilizers and Soil chemistry

- Classification, principle and applications of Chromatographic techniques, classification, advantage, disadvantages of chemical fertilizers, manures and compost, soil, its types, chemical analysis of soil.

Organometallic chemistry and Nano materials

- Foundation of organometallic compounds and its applications as a nucleophilic reagent and catalyst, foundation of nano material, and preparation of some nano materials.

Water pollution

- Eco system, water resources, hydrological cycle and techniques to measure water pollution, different water purification methods and industrial waste management.

B.Sc. (CBCS) Sem-VI

PAPER-II (Physical chemistry)

Photochemistry

- Foundation of photochemistry, applications of photochemical reactions, electrical dipole moment and its applications about molecular bond nature and geometry

Spectroscopy

- Foundation and applications of rotational spectroscopy and vibrational spectroscopy

Surface and colloidal chemistry

- Different types of adsorption processes, theories and their applications, types and classification of colloids, preparation and properties of colloidal particles, different phenomenon related to the colloidal particles

Nuclear Chemistry

- Foundation of nuclear chemistry, characteristic and measurement of radioactivities, its applications in different fields of chemical sciences

DEPARTMENT OF BOTANY

COURSE OUTCOMES

B.Sc. I SEM I (CBCS)

Plant Diversity- I (Micro-organisms, Algae, Fungi and Plant Pathology)

UNIT I • Students learn general characteristics of life. • Students learn general characteristics & nature of viruses, understand structure of T4 and TMV, and learn economic importance. • Students understand structure Mycoplasma, pathogenicity • Students learn Bacteria, Classification of on the basis of Gram Staining Bacteria, and economic importance. • Students understand General character, ultrastructure and reproduction of Nostoc

UNIT II • Students understand concept of plant kingdom. • Students learn General characters, Classification (G.M. Smith, 1955) and Economic importance of algae • Students learn Life history of – Chlorophyceae e. g. Oedogonium • Students learn Life history of – Charophyceae e. g. Chara • Students learn Life history of- Xanthophyceae e. g. Vaucheria • Students learn life history of -Phaeophyceae e. g. Ectocarpus . • Students learn life history of – Rhodophyceae e. g. Batrachospermum

UNIT III • Students understand general characteristics Classification (G. C. Ainsworth, 1971) and economic importance. • Students learn Life history of- Mastigomycotina e. g. Albugo. • Students learn Life history of- Zygomycotina e. g. Mucor. • Students learn Life history of- Ascomycotina e. g. Penicillium. • Students learn Life history of- Basidiomycotina e. g. Puccinia • Students learn Life history of - Deuteromycotina e. g. Cercospora

UNIT IV • Students understand general characteristics, Types (Crustose, Foliose, Fruticose) and economic importance. • Students understand Plant Pathology, • Students understand viral Disease: Mosaic of Tobacco (TMV) • Students understand Red rot of Sugarcane (*Colletotrichum fulcatum*). • Students understand Brown spot of rice (*Helminthosporium oryzae*) • Students understand loose smut of wheat (*Ustilago hordei*) • Students understand bacterial disease: Bacterial Blight of Cotton (*Xanthomonas compestris*)

Plant Diversity- II (Bryophyta, Pteridophyta, Gymnosperm and Paleobotany)

UNIT I • Understand general characteristics, Classification (G. M. Smith) and Economic importance of Bryophytes. • Learn life history of Hepaticopsida e. g. Riccia • Learn life history of Anthocerotopsida e. g. Anthoceros • Learn life history of Life Bryopsida e. g. Funaria

UNIT II • Students fascinate by gaining the knowledge the Pteridophyta, General characteristics, classification (G. M. Smith) and Economic importance • Understand telome theory and Types of stele. • Learn External Morphology and Reproduction of Psilophyta e. g. Rhynia, Lycophyta e. g. Selaginella, Arthophyta e. g. Equisetum, and Filicophyta e. g. Marsilea. • Students get idea about Concept of Heterospory and seed habit telome theory and Types of stele.

UNIT – III • Students learn general characteristic Gymnosperm, classification (Sporne, 1965) and Economic importance. • Students understand external Morphology and Reproduction of Cycadales e. g. (Cycas) and Coniferales (Pinus).

UNIT – IV • Students fascinate by gaining the knowledge Paleobotany and Geological time scale. • Understand the process of fossilization (Replacement theory, Infiltration theory) • Learn types of fossils (Impression, Compression and Petrification) • Students learn Fossil gymnosperm *Glossopteris* (Pteridospermatophyta) and *Cycadeoidea* (Cycadopsida).

(Semester II) Paper – I

(Morphology and Anatomy of Angiosperms)

UNIT – I • Learn vegetative morphology of Angiosperm, Mode of living Autotrophic • And Heterotrophic • Understand habit erect forms, weak forms. • Learn about normal root, modified root and its types. • Learn about stem and its modification. • Learn leaf, its parts and lamina (shape, margin, apex, base, surface, texture, venation). • Learn types of leaves, its modification and phyllotaxy.

UNIT – II • Understand definition and types Inflorescence • Understand flower is a modified shoot and types of flower. • Learn Parts of flower perianth, Calyx, Corolla, Androecium, Gynoecium. • Understand and acquired skill to write Floral formula and Floral diagram • Learn about fruit and its types.

UNIT – III • Understand terminology of Meristems and classification (based on origin and position) • Learn Newman Theory of Root apical Meristem • Learn Tunica-Carpus Theory of Shoot apical Meristem • Learn tissue and its types • Understand the arrangement of vascular Bundle and types. • Learn structure and function Xylem, Phloem, Cambium, Periderm.

UNIT – IV • Learn comparative study the primary structure of Dicot root (Sunflower) and monocot root (Maize). • Learn comparative study the primary structure of Dicot stem (Sunflower) and monocot root (Maize). • Learn comparative study the primary structure of Dicot leaf (Sunflower) and monocot root (Maize). • Understand secondary growth in Dicot stem e. g. Moringa • Understand anomalous secondary growth in stem Bignonia, Boerhaavia • Dracaena • Learn anomalous secondary structure in root Beta vulgaris (Beet).

Paper – II (Taxonomy & Diversity of Angiosperms)

UNIT – I • Learn origin of Angiosperms according to Bennettite theory • Learn primitive angiosperm – Magnolia. • Fascinated by gaining the knowledge of fossil Angiosperms (Flower Saharianthus and fruit – Enigmocarpon). • Students enjoyed Botanical nomenclature (principles, rules, taxonomic ranks, typification). • Created interest by History of Theophrastus and Linnaeus taxonomic work.

UNIT – II • Learn classification of Angiosperms and types of classification (Artificial, Natural and Phylogenetic). • Learn System proposed by Bentham and Hooker and its Merits & Demerits. • Understand skill of Herbarium Techniques.

UNIT – III • Learn diversity of flowering plants dicot families (Ranunculaceae, Malvaceae Fabaceae (Pappilionaceae), aesalpiniaceae, Mimosaceae, Solanaceae).

UNIT – IV • Learn diversity of Dicot families (Lamiaceae, Apocynaceae, Asclepiadaceae, Asteraceae, Euphorbiaceae). • Diversity of flowering plants Monocot families Liliaceae, Poaceae, Orchidaceae.

B. Sc. BOTANY CBCS (Semester III)

Paper – I (Reproductive Biology of Angiosperms, Plant Growth and Development)

UNIT – I • Students learn structure of Stamen, Microsporogenesis and Male gametophyte. • Understand the Structure of Pistil, Megasporogenesis and Polygonum type female gametophyte. • Learn the types of Embryo sac (Mono, bi and tetrasporic). • Learning the structure and types of Ovules. • Gain knowledge about Pollination types, contrivances of self and cross pollinations, also attractions and rewards.

UNIT – II • Students will learn the information about Double fertilization and Triple fusion • Get knowledge about Seed; Endosperm and its types; Embryo and its types. • Information about Development of Dicot embryo (Onagrad type). • Learn the Significance of seed: Ecological adaptations. • Learn Seed dormancy; Suspended animation; causes and role of dormancy. • Learn various methods to break seed dormancy and seed dispersal strategies.

UNIT – III • Students understand about growth and development and phases of growth. • Students get idea about plant regulators like Auxin, Cytokinin, Gibberelin, Absciscic acid and Ethylene • Understand Plant Movements.

UNIT – IV • Students learn the process of Photoperiodism. • Learn about Physiology of flowering and process of Vernalization. • Learn about phytochromes. • Get idea about senescence and abscission.

Paper – II (Plant Biochemistry and Physiology)

UNIT – I • Learn the definition, structure and classification of Carbohydrates. • Learn structure of Aldoses and Ketoses, monosaccharides (glucose), disaccharides (sucrose), polysaccharides (cellulose and starch). • Learn the definition and classification of lipids, fatty acids, oils and waxes, phospholipids, sphingolipids, sterols. • Understand structure of Protein, classification amino acids and peptide bond.

UNIT – II • Students understand terminology of Enzymology and about mechanism action. • Students understand nitrogen Metabolism. • Acquire knowledge of properties of water, process of diffusion, osmosis and plasmolysis. • Understand the Ascent of sap, Root pressure theory, • Understand the process of transpiration. Types of Stomata and their mechanism, guttation. • Learn about Phloem transport: Bulk flow theory (Munch hypothesis). • Understand the theories of absorption of solute in plants. • Learn active absorption, passive absorption.

UNIT – IV: • Learn the process of Photosynthesis, photosynthetic pigments, cyclic and Non- cyclic photophosphorylation. • Learn C₃, C₄ and CAM pathway, • Terminology respiration, its types, structure of ATP, respiratory substrates and respiratory quotient (R. Q.) • Understand glycolysis, citric acid cycle, ETS, oxidative phosphorylation, factors affecting respiration.

B.Sc. Semester – IV (CBCS)

Paper – I (Cell Biology, Genetics and Biotechnology)

UNIT – I • Students learn about all cell Biology and plant cell organelles (Cell wall, Plasma Membrane; General structure of Nucleus, Mitochondria, Plastids, Endoplasmic Reticulum, Golgi Complex, Vacuole, Lysosome, Peroxysome, Glyoxisome). • Students learn Mitosis, Meiosis with respect plant cells. • Learn about structure and replication of DNA. • Students get knowledge about Plant Tissue culture.

UNIT – II • Students learn Mendel History and his Laws of inheritance (Dominance, Segregation and Independent Assortment). • Understand Allelic and Non-allelic interaction of genes with reference to plants. • Understand cytoplasmic inheritance.

UNIT – III • Learn linkage and its types. • Understand crossing over. • Learn Variation in Chromosome number, Polyploidy and Aneuploidy • Learn chromosome abnormality (Deletion and Deficiency, Duplication, Inversion and Translocation). • Understand terminology Mutation and its types.

UNIT – IV • Learn various techniques of Genetic Engineering. • Tools and techniques of Recombinant DNA technology. • Learn process of Protein synthesis-transcription and translation. • Understand the Jumping genes in Maize. • Learn Regulation of gene action in Prokaryotes.

Paper – II (Plant Ecology)

UNIT – I • Students acquire knowledge of their environment. • Learn Ecology, branches of ecology and significance. • Learn climatic Factors and edaphic factors. • Learn interactions between plants and animals, community and soil organisms.

UNIT – II • Students understand structure and function of Ecosystem. • Learn Biotic and Abiotic components, food chains, food web, ecological pyramid. • Learn Biogeochemical Cycles (Water, Carbon, Nitrogen). • Learn Environmental Pollution (Air, Water) and its control.

UNIT – III • Learn terminology of Autecology and Synecology; understand community dynamics.

UNIT – IV • Understand Plant Succession, climax. • Fascinate about Phytogeography and also concept of continental drift • Get idea about Phytogeographical studies of Chandrapur and Gadchiroli districts. • Western Himalaya, Eastern Himalaya, Indus plane, Gangatic plane, Central India, Western coast, Deccan, Assam.

B. Sc.Semester V(CBCS) Discipline Specific Elective-I (DSE-I)

Paper-I (Molecular biology I)

UNIT – I □ Students learn nature and types of nucleic acid. □ Students understand history of nucleic acid and nucleic acid as carrier of genetic information.

UNIT-II □ Students learn Watson and Crick model of DNA. □ Students learn A,B,C,D & Z type of DNA. □ Understand concept of Cot curves. □ Students learn structure and types of RNAs. □

UNIT-III □ Students learn chromosomal & plasmid DNA of prokaryotes □ Students learn organization of eukaryotic DNA. □ Students learn viral DNA.

UNIT-IV □ Students learn conservative, semiconservative & discontinuous type of replication. □ Students learn different models of replication like rolling circle, theta & ds linear DNA.

Discipline Specific Elective-I (DSE-I) Paper-II

(Molecular biology II)

UNIT - I • Students learn adapter hypothesis and discovery of mRNA template • Students learn concept of genetic code and its salient features.

UNIT - II • Students learn process of prokaryotic and eukaryotic transcription. • Students learn lactose and tryptophan operon model. • Students learn about transcription factors, heat shock proteins, steroids and peptide hormones and gene silencing. • Students learn inhibitors and transcription.

UNIT - III • Students understand the concept of introns and exons. • Students learn eukaryotic mRNA processing.

UNIT - IV • Students understand ribosome structure and assembly. • Student learn charging of tRNA, amino acyl transfer RNA synthetases. • Students learn various steps of translation in prokaryotes and eukaryotes.

B.Sc. Sem VI Discipline specific elective I (DSE I)

Paper I Plant Biotechnology-I

Unit I □ Students understand introduction about plant tissue culture and their historical background. □ Students learn about the composition of media, nutrients and hormones. □ Students understand the various type of tissue culture media like M.S. , B5 and N6

Unit II □ Students understand about totipotency . □ Students understand dedifferentiation, redifferentiation, Regeneration , organogenesis and embryogenesis.

Unit III □ Students understand about various tissue culture techniques like micro propagation, virus elimination and protoplast isolation. □ Students understand about secondary metabolites production.

Unit IV □ Students understand about anther culture, pollen culture and ovary culture. □ Students understand about production of haploid, triploid and hybrid. □ Students learn about cryopreservation and germplasm conservation.

Paper II Plant Biotechnology – II

Unit I □ Students understand the method of gene transfer like electroporation, microinjection, micro projectile bombardment.

Unit II □ Students learn about agrobacterium mediated gene transfer, selected marker and reportable gene.

Unit III □ Students learn about application of plant biotechnology. □ Students learn about pest resistance plant, herbicide resistance plants, transgenic crops with improve quality trait.

Unit IV □ Students learn and understand about transgenic plant producing edible vaccine, biodegradable plastic, chloroplast transformation and biosafety measures.

DEPARTMENT OF MATHEMATICS

Course Outcomes (COs) of Mathematics = Student able to understand Application of Mathematics

Sem-I-

Differential and Integral Calculus

[1] to Solve Height and Distance Problems .,

[2] to Solve Problem of Quadrature.,

[3] to Solve Mensuration Problem .,

[4] to Solve Apollonius Theorem .,

[5] to Solve Kelvins Theorem , ... etc.

Differential Calculus and Trigonometry .,

[1] to Solve Equation .,

[2] to find nth root of Complex Number .,

[3] to optimization Problem .,

[4] Physics .,

[5] Mean Value Theorem , ... etc.

Sem-II-

Ordinary Differential Equation and Difference Equation .,

[1] to Solve Problem in Simple Harmonic Motion .,

[2] to solve Problem of Projectile.,

[3] to solve System of Ordinary Differential Equation .,

[4] To solve the Problem of Singularity .,

[5] to solve Fuchson theory , ... etc.

Partial Differential Equation .,

[1] to solve Problem in Acoustics .,

[2] to solve Problem in Fluid Dynamics .,

[3] to solve Problem in Electrodynamics .,

[4] to solve Problem in Heat Transfer , ... etc.

Sem III

Set Theory and Laplace Transform .,

[1] to solve the problem in Differential and integral Calculus .,

[2] to solve the problem in Limit and Continuity .,

[3] to solve the problem in Boolean Algebra .,

[4] to solve the problem in Mathematical Analysis , Topology , Abstract Algebra , Discrete Mathematics , ... etc .

[5] to solve the problem in Improper Integral , Nuclear Physics , Complex Impedance of Capacitor. ... etc.

Real Analysis .,

[1] to solve the problem in Construction of Real Number.,

[2] to solve the problem in Order Property of real number .,

[3] to solve the problem in topological property of real number.,

[4] to solve the problem in Limit and Convergence.,

[5] to solve the problem in Compactness , ... etc.

Sem-IV

Elementary Number Theory

- [1] to solve the problem of Discrete Mathematics .,
- [2] to solve the problem of Numerical Analysis.,
- [3] to solve the problem of Cryptology.,
- [4] to solve the problem of Arithmetic.,
- [5] to solve the problem of Computer Science, ... etc .

Algebra

- [1] to solve the Problem in Engineering , Science , Medicine , Economics.,
- [2] to solve Specific Properties of linear equation , Vector Spaces , and Matrices , ... etc .

Sem V

Probability

- [1] To solve the problems in Assessment and Modeling , Insurance , Reliability Theory of Aging and longevity , Financial regulation , ...etc.

Mathematical Modeling

- [1] To solve the problems of Unknown World .,
- [2] To solve the problems Natural Science , Engineering and Social Sciences .,

Linear Algebra

- [1] Some application in Modern Presentation of Geometry , Functional Analysis , Non linear Systems , First order Approximation , ... etc.

Mechanics

- [1] to solve the problem related to Behavior of Physical bodies .,
- [2] Clasical Mechanics .,
- [3] Quantum Mechanics .,
- [4] Engg. Mechanics .,
- [5] Biophysics , ... etc.

Matrices and Theory of Equation

- [1] to solve the problems of Optics , Electromagnetism , Quantum Electrodynamics , Clasical Mechanics , Quantum Mechanics .

Special Relativity I

- [1] to attempt the problems related to Space and Time , Length Contraction , Time dilation , ... etc.

Sem VI

Graph Theory

[1] To solve the Problem of Discrete Mathematics , Network Science , Computer Science , Linguistics , Physics and Chemistry

Boolean Algebra

[1] To solve the problems of Boolean Operations , Computers , Two valued logic , Solid Modeling etc.

Numerical Methods

[1] to solve the Problems of Computing Values of functions , Interpolation , Extrapolation , Regression , optimization , Differential Equation , evaluating Integrals etc.

Complex Analysis and Vector Calculus

[1] Algebraic Geometry , Number theory , Analytic combinatorics , Nuclear, aerospace , Mechanical and Electrical Engg.

Linear Programming and Transportation Problem

[1] Food and Agriculture , Transportation optimization , Military application , Production and Environmental Protection .

Special Relativity II .

[1] to attempt the problems related to Space and Time.

ARTS FACULTY

PROGRAM OUTCOMES

After completion of the programme the students should be able to.-

- * Students will be able to understand the history, politics, sociology and economics of the world.
- * Students will be able to enroll themselves in higher education.
- * They will also be able to appear for competitive exams like UPSC, MPSC, staff selections, etc.

SPECIFIC OUTCOMES

- * Work as teacher in schools, high schools and colleges.
- * For history Graduates, the option of public service is always open.
- * History graduates can find employment with Archeological survey of India and museology or work as a Musiumcarator.
- * Students can research in economics, tourism, archeological, world economics,etc.
- * They can work in NGO's , social activities, encourage people for social awareness,etc.

COURSE OUTCOME

DEPARTMENT OF POLITICAL SCIENCE

B.A. I SEM I

Subject: Indian Democracy

Gondwana University constituted a syllabus on Indian Democracy, which achieves following objective.

1. Awareness about the structure of Indian Democracy like
 - a) Legislature b) Executive c) Judiciary
2. Role of people they played in Indian political system.
3. A good and responsible citizen's can develop through this syllabus.
4. To achieve constrictive work from society.
5. Study of Indian Democracy proves very useful for competitive Examinations.

B.A. I SEM II

Subject: Local Self Government

1. It explains Democracy means participation of people of various bodies of Government.
2. To understand local self Government.
3. To encourage participation at local level to national level.
4. To enhance political participation.
5. In 4th units of the syllabus focus on Human Rights which valuable for human being.it also teaches how to protect them.
6. There is another chapter about Right to Information Act-2005 in 4th unit which is also showing transparency in governmental bodies is necessity of Democracy.
7. Decentralization helps in proper inculcation of Democracy and democratic values.
- 8.

B.A. II SEM III

Subject- political Theory

1. It helps to understand basic of Political Science.
2. It teaches theories like Origin of State, Sovereignty, Social Change

B.A. II SEM IV

Subject -Political Analysis

It is also useful understand the basic concept of Political system. Like Power law, rights, Authority, legitimacy. It help student understand the basic of political science and to understand the actual meaning of various concept which we use generally having depth meaning behind in it

B.A. III SEM V

Having Indian political thoughts

1. To Know beot of political thought for related to India.
2. To enrich moral values among student by giving devoted thoughts of devoted thinker.
3. To create a patriotic thinking among students.

B.A. III SEM VI

Western political thoughts

To aware, motivates student to read the thoughts of western thinker which responsible to revolution in many countries. Like karl Marx, Lenin, Mill, Betham

DEPARTMENT OF ENGLISH

B. A. SEM I and II (2019-20 onwards)

Name of the Course: Compulsory English

Prescribed Text book: Roots – A Course in English Language and Literature

Course Outcomes

1. The course will train the would-be graduates in various levels of communication skills in English – listening skills, speech skills, reading skills, writing skills and other related skills.
2. The carefully selected poems and prose passages will not only serve the purpose of studying language skills and building vocabulary but will also provide enjoyment and application
3. The grammar exercises and the drills of linguistic skills will raise their level of proficiency in using certain patterns of expression.
4. The selected situational communication samples will make students aware of the speaking and writing skills necessary for communicating fluently in English in social, academic and profession situations, both in written and spoken modes.
5. Besides, being a broad based subject, it also aims at developing the personality of the young under-graduates and turn them into self-sufficient and self-reliant individuals.

B. A. SEM I and II (2019-20 onwards)

Name of the Course : English Literature

Prescribed Text book: Footprints

Course Outcomes

1. Students will get acquainted with the major English and Indian poets writing in English.
2. Students will learn the nuances of vocabulary and linguistic expressions through the study of poems spanning over a period of about four hundred years.
3. They will be acquainted with the various poetic devices used in the prescribed poems, as also the values and philosophy embedded in them.
4. Students will gain knowledge of the major poetic trends and movements in English literature as well as in India and Africa; and they will also know the diversity of literary and social voices within and outside those movements.
5. Students will develop an ability to read texts in relation to their historical and cultural context, in order to gain a richer understanding of both text and context.
6. Students will learn various poetic types, stanza forms and literary terms to enhance their ability of close analysis of the prescribed poetic texts.
7. Students will develop a taste for literature and language.
8. Students will appreciate literature's ability to evoke feelings, cultivate imagination and initiate philosophical discourse.

B.A. SEM III and IV (2019-20 onwards)

Subject: Compulsory English

Prescribed book: New Dawn (An Anthology of Prose and poetry)

Course Outcomes

1. The course will train the would-be graduates in various levels of communication skills in English – listening skills, speech skills, reading skills, writing skills and other related skills.
2. The carefully selected poems and prose passages will not only serve the purpose of studying language skills and building vocabulary but will also provide enjoyment and application
3. The grammar exercises and the drills of linguistic skills will raise their level of proficiency in using certain patterns of expression.
4. The selected situational communication samples will make students aware of the speaking and writing skills necessary for communicating fluently in English in social, academic and profession situations, both in written and spoken modes.
5. Besides, being a broad based subject, it also aims at developing the personality of the young undergraduates and turn them into self-sufficient and self-reliant individuals.
6. Will encourage the students to read various types of texts on their own and discuss them among peers.

B. A. SEM III and IV (2019-20 onwards)

Name of the Course : English Literature

Prescribed Text book: Creative Minds

Course Outcomes

1. Students will get acquainted with two genres of the prose form in English Literature viz. Novel and Essay, and will experience the flavour of prose from Indian and British writers of novels, essays, biographies, autobiographies, and short stories.
2. Students will learn the nuances of vocabulary and linguistic expressions through the study of prose written by English and Indian authors.
3. They will be acquainted with the various prose styles, as also the values and thoughts expressed in the prescribed prose pieces.
4. Students will gain knowledge of the historical development and growth of the English novel, essay, short story, biography and autobiography; and their technical specifications.
5. Students will learn various technicalities involved in writing prose and the literary terms used for them, to enhance the ability of close analysis of the prose texts.
6. Students will understand the life-values put forward in the prescribed texts and develop a taste for literature and language.
7. Students will appreciate literature's ability to evoke feelings, cultivate imagination and initiate philosophical discourse.

B.A. SEM V and VI (2019-20 onwards)

Subject: Communicative English

Prescribedbook: Synergy: Communication in English and Study Skills

Course Outcomes

1. The course will enhance the communicative abilities of the learners.
2. Will broaden the knowledge of English language of the learners.
3. Will make the students self-expressive.
4. Will develop writing skills among the learners.
5. Will enable the learners to acquire linguistic and soft skills necessary for dealing with interviews, presentations, speeches and other such public communications.
6. Will expand the learners' ability of using correct and appropriate expressions.

B.A. SEM V & SEM VI (2019-20 onwards)

Name of the Course : English Literature

Names of the Books Prescribed:

- i) King Lear (for Sem. V) by William Shakespeare & Dance like A Man (for Sem VI) by Mahesh Dattani
(For Detailed Study)

- ii) Tughlaq (for Sem V) by Girish Karnad & Ghashiram Kotwal by Vijay Tendulkar (for Sem VI) (For Non-Detailed study)
- iii) Background to the Study of English Literature by B. Prasad
- iv) Literary Terms by M.H. Abrams
- v) Poetics (Character and Plot) by Aristotle
- vi) Classical Indian Drama: Theory and Practice

Course Outcomes

- 1) Students will get acquainted with the life and dramatic art of William Shakespeare, Girish Karnad, Mahesh Dattani and Vijay Tendulkar.
- 2) They will learn about the technical structure of drama and the various dramatic types, in English literature.
- 3) They will also know about various dramatic devices and literary terms connected with drama writing.
- 4) Students will gain knowledge of the theory of dramatic art as propounded by Aristotle in the West, and that we find in Classical Indian Drama.
- 5) Students will know about the philosophy put forward by the English dramatist William Shakespeare and those of the Indian dramatists like Girish Karnad, Mahesh Dattani and Vijay Tendulkar.
- 6) Students will understand the life-values put forward in the prescribed texts and develop a taste for literature and language.

B.Com. SEM I and II (2019-20 to Onwards)

Subject: Compulsory English

Prescribed textbook: Prelude

Course Outcomes

1. The course will inspire the students to read various types of texts and discuss among them about the great achievers in the social, political and corporate field.
2. Reading of poetry will instil in them the life-values of sincerity, honesty, self-control, patriotism and family relations.
3. Will upgrade students' grammatical sense and help master the basic the basic grammatical aspects of English language.
4. Will equip students with the practical business communication skills and develop among them the ability to communicate effectively in English.
5. Will inspire students to learn various soft skills necessary for thriving in the competitive business world.
6. Students will acquire the skills of writing effectively for a variety of professional and social settings.

B.Com. SEM I and II (2019-20 to Onwards)

Subject: Supplementary English

Prescribed textbook: Literary Landscapes: An Anthology of Prose and Poetry

Course Outcomes

1. The course will inspire the students to read various types of texts, enrich vocabulary and understand men and manners.
2. Reading of poetry will instil among them the poetic sense.
3. Will upgrade students' grammatical sense and help master the basic the basic grammatical aspects of English language.
4. Will provide an opportunity to learn language elements and their application in practice.

B.Com SEM III and IV (2019-20 onwards)

Subject: Compulsory English

Name of the book: Overture: A textbook for College Students

Course Outcomes

1. Students will be acquainted with the success stories of stalwarts in business industries.
2. Life-values will be inculcated in the students.
3. Will develop communicative competency in English, among the students.
4. Will inspire the students to adopt various soft skills in order to better their communication and develop their personality.
5. Will upgrade students' grammatical sense and help master the basic the basic grammatical aspects of English language.

B.Com. SEM III and IV (2019-20 to Onwards)

Subject: Supplementary English

Prescribed textbook: A Pathway to Success

Course Outcomes

1. The course will inspire the students to read various types of texts, enrich vocabulary and understand men and manners.
2. Reading of poetry will insist among them the poetic sense.
3. Will upgrade students' grammatical sense and help master the basic the basic grammatical aspects of English language.
4. Will provide an opportunity to learn language elements and their application in practice.
5. Will equip students with the practical business communication skills and develop among them the ability to communicate effectively in English.
6. Will inspire students to learn various soft skills necessary for thriving in the competitive business world.

B.Sc. SEM I and II (2019-20 to Onwards)

Subject: Compulsory English

Prescribed textbook: Prelude

Course Outcomes

1. The course will inspire the students to read various types of texts and discuss among them about the great achievers in the social, political and corporate field.
2. Reading of poetry will instil in them the life –values of sincerity, honesty, self-control, patriotism and family relations.
3. Will upgrade students’ grammatical sense and help master the basic the basic grammatical aspects of English language.
4. Will equip students with the practical business communication skills and develop among them the ability to communicate effectively in English.
5. Will inspire students to learn various soft skills necessary for thriving in the competitive business world.
6. Students will acquire the skills of writing effectively for a variety of professional and social settings.

B.Sc. SEM I and II (2019-20 to Onwards)

Subject: Supplemetary English

Prescribed textbook: Literary Landscapes: An Anthology of Prose and Poetry

Course Outcomes

7. The course will inspire the students to read various types of texts, enrich vocabulary and understand men and manners.
8. Reading of poetry will instil among them the poetic sense.
9. Will upgrade students’ grammatical sense and help master the basic the basic grammatical aspects of English language.
10. Will provide an opportunity to learn language elements and their application in practice.

DEPARTMENT OF HISTORY

Course outcomes

Semester – I

Indian History (Earliest times to 1351 A.D)

- * Ancient Indian History is very important for UPSC Examination.
- * Students got knowledge of sources of the ancient Indian History.
- * When students doing study of Ancient Indian History that time they know about original culture, religion, society and polity.

- * Student capable for discuss any related issue.

Semester II

Indian History [1526 to 1761]

- * Students got knowledge of mughal history and culture.
- * Students got knowledge Of rise of Marth Power in Maharashtra.
- * Maratha History is very important in MPSC Examination.
- * Students got knowledge of Chatrapati Shivaji his administration and his contribution in making of modern Maharashtra.
- * Students got knowledge of Sambhaji Rajaram, Tarabai and Contributions of Peshwas.

Semester III

Modern India (1757 to 1920)

- * History of modern India is very important for competitive examinations.
- * Students got knowledge of rise and establishment of british power in India and their policies.
- * Student understand the Impact of british rule in India especially on our culture, society, economy and our political system.
- * Student understand How to rise of Indian Nationalism and its impact.

Semester IV

Modern India [1920-1971]

- * Student got knowledge of freedom movement in India and Indian independence and constitution of India.
- * Student understand post independence major events and issues.

Semester V

Modern World.

- * Students got knowledge of modern political revolutions and foreign policies of major European Nations.

Semester VI

Modern World [1920 to 2000]

- * Students got knowledge of concept in world History.
- * World trend of thinking, **Nationalism**, Marxism, Racism, Nazism , Fascism, Globalisation, Communication and Information Technology, etc. introduced is students.
- * Students got knowledge of modern world.

DEPARTMENT OF SOCIOLOGY

B.A.I	Sem-I	Introduction to Sociology	Compulsory
	Sem-II	Introduction to Sociology	Compulsory
B.A.II	Sem-III	Indian Society: The Structural Issues	Compulsory
	Sem-IV	Social Problems in Contemporary India	Compulsory
B.A.III	Sem-V	Sociology of Tribal Society	Compulsory
	Sem-VI	Sociology of Tribal Society	Compulsory

Program Name	Course code	Name of the course	Course objectives
B.A.I		Introduction to Sociology	<ol style="list-style-type: none"> 1 .Students are Introduced the basic concepts in Sociology. 2. Students are familiarized with the theoretical aspect of different concepts. 3. Students understand the scope and importance of Sociology, which increase their interest in Sociology. 4. Students will understand the relationship of Sociology with other social Sciences. 5.The study of all basic concepts develops the sociological approach in the students.
B.A.Sem-III		Indian Society: The Structural Issues	<ol style="list-style-type: none"> 1. Students are awarded towards contemporary issues. 2 .Students inculcate responsibilities and promote equality. 3. Students familiar with the problems of Poverty and Unemployment. 4. Students will understand Structural issues and problems like Inequality on the basis of Caste, also Understand the discrimination on the basis of Socio, Economic, Cultural and Religious factor. 5. Students will understand the correlation of various problems with the population issue. they also get knowledge about population policy, Family planning , and importance of

			population education for development.
B.A.Se m-IV		Social Problems in Contemporary India	<ol style="list-style-type: none"> 1. Students will know the meaning of social problems, and real common causes of various social problems. So they get insight about reality of Indian society. 2. Students understand the complexities and multifaceted contemporary issues and problems of Indian Society. 3. Students prepare for various competitive examinations, Major role of this syllabus in various important examination, improve their interest in Study.
B.A. B.A.Se m-V & VI	Sociology of Tribal Society		<ol style="list-style-type: none"> 1. Students will aware about the reality of Tribal society. so they will be more conscious about tribal society. 2. Students understand the major problems of Tribal society in India, and try to find out the remedies on these problems, which develop diagnostic approach in them. 3. Students familiar with the Social Mobility and change in tribal society. 4. Students familiar with the major tribes in India. 5. Students will understand the nature and functions of various Tribal social institutions like Family, Marriage and Kinship.

Subject Wise Course Outcomes (Arts)
Department of Marathi
Course Outcomes

अभ्यासक्रमाचा उद्देश

बी. ए. भाग 1

साहित्य सरिताभाग 1 (आवश्यक मराठी)

- विद्यार्थ्यांना भाषा व साहित्य याची ओळख होते
- मानवी मूल्यांची गणपणूक अभ्यासक्रमातून होते
- राष्ट्रप्रेम वाढीस लागते.
- पर्यावरणाची गणपणूक होते.

बी. ए. भाग 2

साहित्य सरिताभाग 2 (आवश्यक मराठी)

- सर्व धर्मसमभावाची शिकवण मिळते, यातून निकोप समाज निर्मिती होते.
- स्वयंउद्योग प्रेरणा मिळते.
- वैज्ञानिक दृष्टिकोण वाढीस लागतो.
- लोकसाहित्याची ओळख होते.
- सेवाभावाची प्रेरणा मिळते.

बी. ए. भाग 3

साहित्य सरिताभाग 3 (आवश्यक मराठी)

- प्रसारमाध्यमांमध्ये वार्ताहर निवेदक म्हणून काम करण्याची संधी.
- लेखन कौशल्य वाढीस लागते.
- व्यावहारिक जीवनात उदरनिर्वाहासाठी अभ्यासक्रमाचा उपयोग
- बातमी लेखन सांपादन मूळीत शोधन यामध्ये संधी.

Subject Wise Course Outcomes (Arts)
Department of Marathi
Course Outcomes

अभ्यासक्रमाचा उद्देश

बी. ए. भाग 1

मराठी वाङ्मय भाग 1 (कथा, कादंबरी व समिक्षा)

- अभ्यासक्रमातून विविध वाङ्मय प्रकारांची ओळख होते.
- समिक्षेचे आकलन होते.
- कथा, कादंबरीचा अभ्यास होतो.
- विशिष्ट भूप्रदेश, त्यांची बोलीभाषा, परंपरा व संस्कृतीची ओळख होते.

बी. ए. भाग 2

मराठी वाङ्मयभाग 2 (नाटक आणि आधुनिक कविता)

नाटक : नटसम्राट, मी गिंकली मी हरली

- नाटय निर्मिती क्षेत्र, त्रातअभिनय,लेखन, संवाद, दिग्दर्शन, नेपथ्य व संगीत इ. क्षेत्रात संधी
- नवसामाजनिर्मितीची प्रेरणा मिळते.
- नाटय परंपरेची माहिती मिळते.
- आदिवासींचे लोकजीवन, संस्कृती व परंपरा यांची ओळख होते.
- राष्ट्रप्रेम वाढीस लागते.

बी. ए. भाग 3

मराठी वाङ्मयभाग 3 (प्राचीन मराठी वाङ्मयाचा इतिहास)

प्रवासवर्णन: अपूर्वाई

- संतसाहित्य, पंडितिकाव्य, शाहिरी व बखर वाङ्मय यांची ओळख होते
- तत्कालीन सामाजिक जीवन, भाषा, संस्कृती, धर्मपरंपरा व मूल्य यांची ओळख होते
- वाङ्मयाची वाचनाची आवड निर्माण होते.
- साहित्य लेखनाला प्रेरणा मिळते.
- संशोधनाला चालना मिळते.

Subject Wise Course Outcomes (Arts)

Department of Marathi

Course Outcomes

अभ्यासक्रमाचा उद्देश

बी.कॉम/बी.एस्सी भाग 1

- अभ्यासक्रमातून मातृभाषेसोबतच प्रमाणभाषेचे आकलन होते.
- लोकशाही मूल्यांचे ओळख होते.
- लेखन, वाचन व भाषिक कौशल्यात वाढ होते.
-

बी.कॉम भाग 2

- वैज्ञानिक दृष्टिकोण वाढीस लागतो.
- व्यावहारिक मराठीची ओळख होते.
- मराठी भाषेविषयी आवड निर्माण होते.

Department of Economics

Course Outcomes

बी. ए.

अर्थशास्त्र अभ्यासक्रमाचे महत्व

सेम १

- अर्थशास्त्र हा विषय दैनंदिन व्यवहारात प्रत्यक्ष वापर करता येतो. सेम १ चा अभ्यासक्रम विद्यार्थ्यांच्या जीवनात महत्वाचे आहे.
- मागणीचा नियम, पुरवठ्याचा नियम, उपभोक्ता वर्ग, भांडवलदार वर्ग यांच्यादुष्टीने अभ्यासक्रम महत्वाचा वाटतो.

सेम २

- विद्यार्थ्यांना बाजारपेठ, मक्तेदारी, बाजारातील स्पर्धा यांचे ज्ञान प्राप्त होते.
- बाजाराची ओळख पटते.
- सांख्यिकीची तोड ओळख होते.
- नफाकसामिळवायचा

सेम ३

- अर्थव्यवस्थेमध्ये तेजी, मंदी, निर्देशांक, बेरोजगारी, गुंतवणूक, रोजगार इत्यादी बददलमाहीती विद्यार्थ्यांना होते.
- रोजगारकसामिळवावा आणि कसरोजगारनिर्माण होतो याची कल्पना येते.
- शेअरबाजाराची कल्पना येते.

सेम ४

- वेगवेगळे प्रकारचे प्रकार, बचत, राजकोषीय धोरण याचा अभ्यास होतो.
- मौद्रिक धोरण, सांख्यिकी इत्यादी माहीती विद्यार्थ्यांना होते.

- अधिकोषाबददलपुर्णमाहीतीविद्यार्थ्यांनाहोते.
- सरकारचे धोरण

सेम ५

- विकसनशीलअर्थव्यवस्था,विकसीतअर्थव्यवस्था,अल्पविकसीत यांची कल्पना येते.
- लोकसंख्या वाढ,गरीबी, बेरोजगारीइत्यादीअभ्यासहोतो.
- आर्थिकविषमता, शेतक.याच्याआत्महत्याइत्यादीज्वलंतसमस्यावरती अध्ययन विद्यार्थीकरतात.

सेम ६

- जागतिकीकरण,खाजगीकरण,उदारीकरण यांची माहीतीहोते.
- शेतीचीउत्पादकता,हरितक्रांती याबददलउपाययोजना व माहीतीहोते.
- पंचवार्षिक योजना,श्रमीकाचीसौदाशक्ती,उद्योगाचीभरभराटइत्यादी घटकांचीविद्यार्थ्यांनामाहीतीहोते.

अर्थशास्त्र या विषयाचाप्रत्यक्ष जिबनातफायदा

१. जिवनजगण्याची कलानिर्माणहोते.
२. वेगवेगळ्यापदावरविराजमानहोता येते.
३. कौटूंबिकअदाजपत्रक तयारकरता येते.
४. उत्पन्नात वाढकशीकरता येईल यांची कलाअवगतहोते.
५. रोजगारप्राप्तकरता येते.
६. बचतकरण्याची वेगवेगळेउपाय निर्माणहोतात.
७. अर्थव्यवस्थेतवस्तुचीकिंमतकशीठरते यांचाअभ्यासकरता येतो.
८. स्वयंउद्योगप्रेरणामिळते.

FACULTY OF COMMERCE

Department of Commerce Course outcum

Sr no.	Class	Subject	Name of Teacher	No of units	Teaching aids	Course out-come
		STATISTICAL TECHNIQUE & BUSINESS MATHEMATICS	Prof. Sandip Tajne	Unit I to IV		The students learn how to arrange data in tabulation form with use of Statistics and Business mathematics They learn averages. Correlation test, chi square test They also learn profit loss calculation and simple and compound interest.
		BUSINESS ECONOMICS	Prof. Mrs. K. K. Kale	Unit I to IV		The students understand the rules of demand and supply Student learns various type of market competition. Student learns basic knowledge of Economics. Students understand theory of rent students

1	B.CO M - I	Marketing Management	Prof. M. R. Chaudhari	Unit I to IV	Black Board,Chalks,Charts Short Notes and sometime PPT	understand theory of cost.
		FINANCIAL ACCOUNT	Prof. M. R. Chaudhari	Unit I to IV		student Acquired the basic knowledge of marketing. Students aware about the modern trends in marketing. Student aware with the basic concepts of principles of marketing. They know about distribution channels, Functions of saleing agencies,
		PRINCIPAL OF MANAGEMENT	Prof. C. K. Jiwane	Unit I to IV		Students have acquired knowledge about accounting terminology. They learnedhow to maintain financial records. They have developed financial approaches. They have obtained the knowledge of accounting rules. They learned various books of accounts. The students learn discipline they learn management. They learn social responsibility, and motivation factors and its principle Importance of disaster managemen

Anand Niketan College of Arts Science and Commerce
Department of Commerce
Course out-cum

Sr no.	Class	Subject	Name of Teacher	No of units	Teaching aids	Course out-come
2	B.COM - II	COMPANY LAW & SECRETARIA L PRATICE	Prof. C. K. Jiwane	Unit I to IV	Black Board,Chalks,Charts Short Notes and sometime PPT	The students learn how to communicate with public as a company secretary, and they learn various types of company laws.Formation of company, raise in capital, types of company, function of directors. Function of secretary. Qualification of secretary. Types of company meeting. Agenda' motion and resolution.
		MONETARY ECONOMICS	Prof. C. K. Jiwane	Unit I to IV		It provides a frame work for analyzing money in its function as a medium of exchange. They learn types of money, currency, qualityand quantity monetary technique by RBI. They learn statutory liquidity ratio. Cash reserve ratio.
		Marketing Management (Sales and Distribution Management)	Prof. Mrs. K. K. Kale	Unit I to IV		The student understood the conceptual framework of marketing ,and its application in decision making under various environmental constraints. They learn marketing skills and consumer behavior. They know about selling and distribution techniques of Marketing.They know importance communication in Marketing
		CORPORATE ACCOUNT	Prof. M. R. Chaudhari	Unit I to IV		Students have learned accounting knowledge about corporate. Students have obtained knowledge about banking institution Students obtained knowledgeabout capital formation in the industryStudents learned accounting about shares and liquidation of the companyStudents have obtained knowledge about promoting of company
		COST ACCOUNT &	Prof. Mrs. K. K. Kale	Unit I to IV		The students understand elements of cost in production and also

		MANAGEMENT ACCOUNT				calculating the profit in cost sheet, process costing, contract costing. And also understand take the decision of financial assessment on the basis of no loss no profit. And sources of fund and its application.
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Anand Niketan College of Arts Science and Commerce
Department of Commerce
Course out-cum

Sr no.	Class	Subject	Name of Teacher	No of units	Teaching aids	Course out-come
3	B.COM - III	AUDITING & INCOME TAX	Prof. Sandip Tajne	Unit I to IV	Black Board, Charts, Short Notes and sometime PPT	Students learn fundamental principles of auditing students understand Types of auditing students understand Auditing procedure students understand direct taxation theory Students learn how to calculate Income Tax from salary, Income from house property, Students learn calculate Income from other sources etc
		URBAN ECONOMICS & RURAL ECONOMICS	Prof M.R. Chaudhari	Unit I to IV		Students learn Indian economy policies, scope of agriculture, rural finance, role of enterprises, scope of international economics, protection policy, structure of balance of payment & importance of foreign exchange.
		INDUSTRIAL & SERVICE MARKETING	Prof. C. K. Jiwane	Unit I to IV		Students learn importance of service sector, scope of services in India, consumer rights. They learn marketing skills and consumer behavior. They learn about banking services, insurances services, and transportation. Communication industry services.
		ADVANCE ACCOUNTING	Prof. Mrs. K. K. Kale	Unit I to IV		Students learn how to maintain financial records. . And they learn various types of accounts. They learn Amalgamation .Absorption and external reconstruction.
		COMMERCIAL LAW/CORPORATE LAW	Prof. M. R. Chaudhari/ Prof. Mrs. K. K. Kale	Unit I to IV		Students learn various Indian commercial law as well as corporate law. In various corporate sector. They learn factory act 1948, labour welfare Compensation, leave, minimum wages rate Contract Act, etc.