

Rayat Shikshan Sanstha's
DADA PATIL MAHAVIDYALAYA, KARJAT
Dist. Ahmednagar, 414402.

Affiliated to
SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE

COURSE OUTCOMES (COs)
(UG AND PG)

ARTS, COMMERCE AND SCIENCE

2022-2023

COURSE OUTCOMES (COs)

(ARTS, COMMERCE AND SCIENCE)

INDEX

Sr. No.	Faculty	Department	Page No.
01	PREFACE		02
02	SCIENCE	PHYSICS	04-12
		CHEMISTRY	13-34
		BOTANY	35-45
		ZOOLOGY	46-58
		MATHEMATICS	59-64
		COMPUTER SCIENCE	65-68
		B.VOC. (MEDICINAL PLANTS GROWER)	69-75
03	ARTS	MARATHI	77-79
		HINDI	80-83
		ENGLISH	84-89
		ECONOMICS	90-94
		HISTORY	95-105
		POLITICAL SCIENCE	106-107
		GEOGRAPHY	108-111
04	COMMERCE AND MANAGEMENT	COMMERCE	113-127
		BBA/CA	128-137



PREFACE:

For every stream, broad expectations listed by the university as well as Institution. The goal of creating an academic program assessment plan is to facilitate continuous program level improvement. A program assessment plan should be developed collaboratively among faculty who teach the program. A program level outcome assessment plan provide faculty with a clear understanding of how their program is assessed.

Program Outcomes (POs) is a systematic method for collecting, analyzing, and using information to answer questions about projects, policies and programs particularly about their effectiveness and efficiency. In both the public and private sectors, stakeholders often want to know whether the programs they are funding, implementing, voting for, receiving or objecting to are producing the intended effect. While program evaluation first focuses around this definition, important considerations often include how much the program costs per participant, how the program could be improved, whether the program is worthwhile, whether there are better alternatives, if there are unintended outcomes, and whether the program goals are appropriate and useful. Evaluators help to answer these questions, but the best way to answer the questions is for the evaluation to be a joint project between evaluators and stakeholders

Programme Specific Outcomes (PSOs) are narrow statements that describe what the students are expected to know and would be able to do upon the graduation. Program outcomes represent broad statements that incorporate many areas of inter-related knowledge and skills developed over the duration of the program through a wide range of courses and experiences. They represent the big picture, describe broad aspects of behaviour, and encompass multiple learning experiences.

Course outcomes (Cos) also referred as learning outcomes are measurable statements that concretely formally state what students are expected to learn in a course. While goals or objectives can be written more broadly, learning outcomes describe specifically how learners will achieve the goals.



SCIENCE SECTION



DEPARTMENT OF PHYSICS

F.Y.B.Sc. COURSE OUTCOMES (CO) (Sem - I and II):

COURSE CODE AND TITLE: PHY-111 Mechanics and Properties of Matter

- CO1.** The student will be able to understand motion,
- CO 2.** The student understands the importance of Work and Energy
- CO 3.** The student knows Concept of viscous force and viscosity

COURSE CODE AND TITLE: PHY-112 PHYSICS PRINCIPLES AND APPLICATIONS

- CO1.** To understand the general structure of atom, spectrum of hydrogen atom.
- CO2.** To understand the atomic excitation and LASER principles.
- CO3.** To understand the bonding mechanism and its different types.
- CO4.** To demonstrate an understanding of electromagnetic waves and its spectrum..
- CO5.** Understand the types and sources of electromagnetic waves and applications.
- CO6 .** To demonstrate quantitative problem solving skills in all the topics covered.

COURSE CODE AND TITLE: PHY-121 HEAT AND THERMODYNAMICS

- CO1.** Learning outcomes for Concept of thermodynamic
- CO2.** The learner will understand the importance Applied Thermodynamics
- CO3.** The learner understands Heat Transfer Mechanisms
- CO4.** To understands Concept of heat & temperature

COURSE CODE AND TITLE: PHY-122 ELECTRICITY AND MAGNETISM

- CO1** To understand the concept of the electric force, electric field and electric potential for stationary charges
- CO2.** Able to calculate electrostatic field and potential of charge distributions using Coulomb's law and Gauss's law.
- CO3.** To understand the dielectric phenomenon and effect of electric field on dielectric.
- CO4.** To Study magnetic field for steady currents using Biot-Savart and Ampere's Circuital laws.
- CO5** To study magnetic materials and its properties



S.Y.B.Sc. COURSE OUTCOMES (CO) (Sem - III and IV):

COURSE CODE AND TITLE: PH211: MATHEMATICAL METHODS IN PHYSICS

- CO1.** After the completion of this course students will be able to
- CO2.** Understand the complex algebra useful in physics courses
- CO3.** • Understand the role of partial differential equations in physics.
- CO4.** Understand vector algebra useful in mathematics and physics
- CO5.** Understand the singular points of differential equation.

PH212: ELECTRONICS

- CO1.** Apply laws of electrical circuits to different circuits.
- CO 2.** Understand the relations in electricity • Understand the properties and working of transistors.
- CO 3.** Understand the functions of operational amplifiers
- CO 4.** Design circuits using transistors and operational amplifiers.
- CO 5.** Understand the Boolean algebra and logic circuits..

COURSE CODE AND TITLE: PH221: OSCILLATIONS, WAVES AND SOUND

- CO1:** Solve the equations of motion for simple harmonic, damped, and forced oscillators.
- CO2:** Formulate these equations and understand their physical content in a variety of applications,
- CO3:** Describe oscillatory motion with graphs and equations, and use these descriptions to solve problems of oscillatory motion.
- CO4:** Explain oscillation in terms of energy exchange, giving various examples.
- CO5:** Solve problems relating to undamped, damped and force oscillators and superposition of oscillations.
- CO6:** Understand the mathematical description of travelling and standing waves.
- CO7:** Recognise the one-dimensional classical wave equation and solutions to it.
- CO8 :** Calculate the phase velocity of a travelling wave.
- CO9:** Explain the Doppler effect, and predict in qualitative terms the frequency change that will occur for a stationary and a moving observer.
- CO10:** Define the decibel scale qualitatively, and give examples of sounds at various levels.
- CO11:** Explain in qualitative terms how frequency, amplitude, and wave shape affect the pitch, intensity, and quality of tones produced by musical instruments.

COURSE CODE AND TITLE: PH222: OPTICS

- CO1.** Describe how light can constructively and destructively interfere.
- CO2.** Explain why a light beam spreads out after passing through an aperture.
- CO3.** Summarize the polarization characteristics of electromagnetic waves.
- CO4.** Understand optical phenomena such as polarisation, birefringence, interference and diffraction in terms of the wave model.
- CO5.** Analyse simple examples of interference and diffraction phenomena.
- CO6.** Be familiar with a range of equipment used in modern optics.



T.Y.B.Sc. COURSE OUTCOMES (CO) (Sem - V and VI):

PHY-3510 SEC (I): ENERGY STUDIES:

CO 1. Students become capable of conducting energy audits and give consultancy in that field.

CO2. Students can design different types of solar heaters for small domestic as well as large scale community level applications.

CO3. Students acquire skills to implement solar P-V systems at domestic levels as well as for office premises and educational institutions. Students become able to start their own enterprise in net metering.

CO4. Students get ideas and hence become self-employed in the field of design , production, commissioning and implementation of bio-mass energy sources , bio-gas plants, gasifiers, wind mills, hybrid systems etc.

CO5. Students can go for research in the fields of super-capacitors, battery technologies, fuel cells and material synthesis for implementation of these technologies.

CO6. Students become successful entrepreneurs in the energy field.

Students strive to make the regions where they live and work self-sufficient in generating and fulfilling their own energy needs using different energy solutions.

PHY-3510 SEC (J): INTRODUCTION TO ARDUINO:

Course Outcomes: After successful completion of this course, student will be able to

CO 1: Students will be able to understand and use various Arduino Boards, and its various components, Input / Output Pins, Input / Output Devices.

CO 2: Understand general concepts of Programming Arduino Boards.

CO 3: Apply the knowledge gain to design applications using Arduino in different domains.

CO 4: To analyze and evaluate the performance of various Arduino based devices.

CO 5: Learn and understand about any new IDE, compiler, and MCU chip in Arduino compatible boards or similar types.

PHY-3510 SEC (K): SMART SENSORS AND TRANSDUCER TECHNOLOGY:

Course Outcomes: At the end of the course, a student will be able to:

CO 1: Use concepts in common methods for converting a physical parameter into an electrical quantity

CO 2: Classify and explain with examples of transducers, including those for measurement of temperature, strain, motion, position and light

CO 3: Choose proper sensor comparing different standards and guidelines to make sensitive measurements of physical parameters like pressure, flow, acceleration, etc

CO 4: Predict correctly the expected performance of various sensors

CO 5: Locate different type of sensors used in real life applications and paraphrase their importance

CO 6: Set up testing strategies to evaluate performance characteristics of different types of sensors and transducers and develop professional skills in acquiring and applying the knowledge outside the classroom through design of a real-life instrumentation system.



PHY-3511 SEC (L): PHYSICS WORKSHOP SKILL:

CO: After completion of this course students will be able to handle and test various instruments.

PHY-3511 SEC (M): BIOMEDICAL INSTRUMENTS:

Course Outcomes

CO 1: Students will acquire basic knowledge of biomedical instrumentation.

CO 2: Students can handle and operate different equipment's like ECG, Oxymeter, and Glucometer.

CO 3: Students will be able to record the different health parameters using it.

CO 4: Student will also be able to analyze and interpret the recorded data.

PHY-3511 SEC (N): NONDESTRUCTIVE TESTING TECHNIQUES

CO : After completion of this course the students will be able to use NDT methods for defects and characterization of industrial components.

PHY-3511 SEC (O): ACOUSTICS APPLICATIONS

CO : After completion of this course the students will be able to use sound detection and characterization of sounds.

T.Y.B.Sc. (Physics) (Sem-VI)

PHY-3610 SEC (X): SOLAR PV SYSTEM: INSTALLATION, REPAIRING AND MAINTENANCE

CO 1: Learn basics of light conversion in electricity.

CO 2: Hands on training will motivate to use Solar PV system.

CO 3: Become entrepreneur / self-employed.

CO 4: Analyzed of MSEB electricity bill and design and sizing of off-grid PV system

CO 5: Participants will learn about solar PV module and batteries used in solar PV plant.

PHY-3610 SEC (Y): APPLICATIONS OF INTERNET OF THINGS (IOT)

CO 1: IOT concepts

CO 2: IOT Standards

CO 3: Components of IOT System.

CO 4: Relevance of IOT for the future.

CO 5: IOT Applications.

CO 6: IOT for smart cities (Case study Smart city Barcelona)

CO 7: IOT in Indian Scenario

CO 8: Challenges in IOT implementation.

PHY-3610 SEC (Z): CALIBRATION TECHNIQUES

Course Outcomes: At the end of the course, a student will be able to:



CO 1: Calibrate hydraulic, pneumatic and mechanical measuring and control equipment: setting, adjustment, validation or verification of mechanical, pneumatic, hydraulic, measuring and control instruments using reference standards in accordance with predetermined procedures.

CO 2: Calibrate electrical and electronic measuring and control equipment: setting, adjustment, validation or verification of electrical, electronic measuring and control instruments using reference standards in accordance with predetermined procedures.

CO 3: Carryout maintenance activities on instrumentation and control panel.

PHY-3611 SEC (AA): MICROCONTROLLER

CO : After successful completion of this course students are supposed to develop their own applications/ mini/ tiny projects using microcontroller.

PHY-3611 SEC (AB): INSTRUMENTATION FOR AGRICULTURE

Course Outcomes:

After completion of this course student will

CO 1: Able to test soil and water parameters.

CO 2: Able to develop their own juice extract plant.

CO 3: Able to developed their own green house

PHY-3611 SEC (AC): RADIATION PHYSICS

Course outcomes:

CO 1: Students can use the knowledge in the applications of Radiation Physics in the fields like radio carbon dating, medical diagnostic tools.

CO 2: Students acquire skill in operating different types of radiation detectors to detect and measure radiation levels in different places.

CO 3: Students can work as advisers in maintenance of radiation safety standards and following of strict protocols at various places like Hospitals, Industry, and Laboratories etc.

CO 4: Students become able to employ their skills to develop applications of radio activity in the fields like agriculture, industry, hospitals etc.

PHY-3611 SEC (AD): PHOTOGRAPHY

Course Outcomes: After successful completion of this course, student will be able to

CO 1: Understand the basic principle, structure and handling techniques in digital photography.

CO 2: Students will be able to develop and apply photographic skills using digital photography tools including digital editing, saving, sizing, and posting of the images

CO 3: Student gets proficient at the technical aspect of photographing with a digital camera.

CO 4: Students can identify and apply appropriate business practices specific to the self-employed professional photographer



POST-GRADUATE

Preamble of the Syllabus:

Master of Science (M.Sc.) in Physics is a post graduation course of University of Pune.

The credit system to be implemented through this curriculum, would allow students to develop a strong footing in the fundamentals and specialize in the disciplines of his/her liking and abilities. The students pursuing this course would have to develop in depth understanding various aspects of the subject. The principles in Physics will be studied in depth. Students will have deeper understanding of laws of nature through the subjects like classical mechanics, quantum mechanics, electrodynamics, statistical physics etc. Students' ability of problem solving will be enhanced. Students can apply principles in physics to real life problems.

➤ **COURSE OUTCOMES (COS)**

SEMESTER-I

COURSE CODE AND TITLE: PHYUT501: CLASSICAL MECHANICS

CO1: Define basic terms Constrained Motion and Lagrangian formulation

CO2: Explain the applications of Variational Principle and Hamilton's formulation.

CO3: Explain the structure and functions of Canonical Transformations and Poisson Brackets

CO4: Explain the importance of tools and techniques Non inertial frames of References , Central Force

COURSE CODE AND TITLE: PHYUT502: ELECTRONICS:

CO1: Label the Applications of special function ICs

CO2: Explain Regulated power supply

CO3: Explain the ultrastructure and functions of various cell organelles.

CO4: Explain the concepts Digital Logic circuits I: Combinational Logic

CO5: Illustrate the Digital Logic circuits II: Sequential Logic:

CO6: Illustrate the types, development and causes of Data Converters

COURSE CODE AND TITLE: PHYUT503: MATHEMATICAL METHODS IN PHYSICS:

CO1: Define the : Linear spaces and operators

CO2: Identify Matrix representation, Similarity transformations,

CO3: Discuss Special Function

CO4: Explain the principles Fourier series and Integral transforms

COURSE CODE AND TITLE: PHYUT504: ATOMS AND MOLECULES

CO1: Explain the Atomic structure and atomic spectra .:



CO2: Explain Molecular Spectra – Rotational and vibrational spectra for diatomic molecules, Electronics spectra of diatomic molecules.

CO3: Explain the concept ESR- Principles of ESR, ESR spectrometer

CO4: Explain Crystal Diffraction and Lattice Vibrations of Solids.

COURSE CODE AND TITLE: PHYUT505: EXPERIMENTAL TECHNIQUES IN PHYSICS I

CO1 : Signal and Signal Analysis

CO2 : important and fields applications of vacuum

CO3 : Principles of pumping concept,

CO4 : Vacuum Measurements and Low Temperature Technique

SEMESTER-II

COURSE CODE AND TITLE: PHYUT601: ELECTRODYNAMICS

CO1: : Multipole expansions and time varying fields

CO2: Energy, force, momentum relations and electromagnetic wave equations 1

CO3: : Inhomogeneous wave equations.

CO4: Relativistic Mechanics and Covariance

COURSE CODE AND TITLE: PHYUT602: SOLID STATE PHYSICS

CO1: : Band Theory of Solids

CO2 Diamagnetism and Paramagnetism

CO3: Ferromagnetism, Antiferromagnetism and Ferrimagnetism 1 C

CO4: Superconductivity.

COURSE CODE AND TITLE: PHYUT 603: QUANTUM MECHANICS I

CO1 To do Revision and general formalism

CO2: to understand Representation of States – Dirac notation.

CO3: To study and verify Approximation Methods

CO4: To Introduction to WKB approximation,

COURSE CODE AND TITLE: PHYUT604: LASERS

CO1: To understand Interaction of radiation with matter

CO2 To study Different types of gas lasers

CO3: To discuss industrial applications:

COURSE CODE AND TITLE: PHYUT605: EXPERIMENTAL TECHNIQUES IN PHYSICS II

CO1: To understand Radiation Sources, Detectors and Sensors

CO2: To discuss Structural Characterization and Thermal Analysis.

CO3: To verify Morphological and Magnetic Characterization

CO4: To discuss Spectroscopic Analysis



COURSE CODE AND TITLE: PHCT-111: MATHEMATICAL METHODS IN PHYSICS

CO1: Explain Complex Analysis

CO2: Explain Vector Space and Matrix Algebra

CO3: Explain the concept Special Functions and Fourier Series and Integral Transforms

COURSE CODE AND TITLE: PHCT-112: CLASSICAL MECHANICS

CO1: To do Analytical Dynamics (Lagrangian and Hamiltonian Dynamics)

CO2: To understand Lagrangian formulation of motion under central forces. Kepler problem.

CO3: To study and verify Moment of inertia tensor. Euler angles. Euler equation of motion for rigid body motion,

COURSE CODE AND TITLE: PHCT-113: QUANTUM MECHANICS

CO1 Inadequacy of classical Physics, wave packets and uncertainty relations

CO2: To understand Representation of States – Dirac notation.

CO3: To study Angular Momentum

CO4: To Introduction Approximation Methods

COURSE CODE AND TITLE: PHCT-114 ELECTRONICS

CO1 To understand Semiconductor Devices and its Applications

CO2: To understand Special Function ICs and their Applications.

CO3: To study Digital Logic Circuits I: Combinational Logic

CO4: To Introduction Data Converters

COURSE CODE AND TITLE: PHCT-121, ELECTRODYNAMICS

CO1 Inadequacy of Multiple expansions and time varying fields

CO2: To understand Energy, Force, Momentum relations and Electromagnetic wave equations

CO3: To study Inhomogeneous Wave Equations

CO4: To Introduction Relativistic Mechanics and Covariance

COURSE CODE AND TITLE: PHCT-122 SOLID STATE PHYSICS

CO1 : Inadequacy of Crystal Structure of Solids

CO2: To understand Electronic Structure of Solids

CO3: To study Magnetism and Superconductivity

CO4: To Introduction Dielectric Properties of Solids



COURSE CODE AND TITLE: PHCT-123 STATISTICAL MECHANICS

- CO1** : Brief discussion on probability distributions
- CO2**: To understand Classical Statistical Mechanics
- CO3**: To study Applications of Statistical Mechanics and Quantum Distribution Functions
- CO4**: To Introduction Ideal Bose and Fermi Systems

COURSE CODE AND TITLE: PHCT-124 :ATOMS AND MOLECULES

- CO1** : Brief discussion on Atomic models, Hydrogen atom, and quantum numbers.
- CO2**: To understand Molecules
- CO3**: To study Spectroscopic Techniques
- CO4**: To study Resonance spectroscopy

COURSE CODE AND TITLE: PHCT-231 PHYSICS OF SEMICONDUCTOR DEVICES

- CO1** : Brief discussion Properties of semiconductor
- CO2**: To understand Types of semiconductor, direct and indirect band gap semiconductors
- CO3**: To study : Junction Transistor and Field Effect Devices
- CO4**: To study Metal and Metal Insulator semiconductor devices

COURSE CODE AND TITLE: PHCT-232 LASER FUNDAMENTALS AND APPLICATIONS

- CO1** : Brief discussion Interaction of radiation with matter
- CO2**: To understand Types Three and four level system and rate equations
- CO3**: To study Principle, Construction, Energy level diagram and working
- CO4**: To study Industrial applications

COURSE CODE AND TITLE: PHCT-233: EXPERIMENTAL TECHNIQUES IN PHYSICS-I

- CO1** : Inadequacy of Signal, Signal Analysis and Sensors
- CO2**: To understand Vacuum Physics and Vacuum Techniques
- CO3**: To study Vacuum Measurement and Low Temperature Techniques

COURSE CODE AND TITLE: PHOP234-L: PHYSICS OF THIN FILMS

- CO1** : To overview Introduction to Thin Films
- CO2**: To understand Deposition Techniques and Measurement of Thickness
- CO3**: To study Properties of Thin Films
- CO4**: To study Applications of Thin Films



DEPARTMENT OF CHEMISTRY

F. Y. B. Sc (Sem. I and II)

Sr No.	Course	Outcomes
1	F. Y. B. Sc. Chemistry Semester-I (Theory and practical)	<p>CH- 101: Physical Chemistry</p> <p>Chemical Energetics CO 1: Students will be able to apply thermodynamic principles to physical and chemical process CO 2: Calculations of enthalpy , Bond energy, Bond dissociation energy , resonance energy CO 3: Variation of enthalpy with temperature –Kirchoff's equation CO 4: Third law of thermodynamic and its applications</p> <p>Chemical Equilibrium CO 1: Relation between Free energy and equilibrium and factors affecting on equilibrium constant. CO 2: Exergonic and endergonic reaction CO 3: Gas equilibrium, equilibrium constant and molecular interpretation of equilibrium constant CO 4: Van't Haff equation and its application</p> <p>Ionic equilibria CO 1: Concept to ionization process occurred in acids, bases and pH scale CO 2: Related concepts such as Common ion effect hydrolysis constant, ionic product, solubility product CO 3: Degree of hydrolysis and pH for different salts , buffer Solutions</p>
2	CH- 102: Organic Chemistry	<p>CO 1: The students are expected to understand the fundamentals, principles, and recent developments in the subject area. CO 2: It is expected to inspire and boost interest of the students towards chemistry as the main subject. CO 3: To familiarize with current and recent developments in Chemistry. CO 4: To create foundation for research and development in Chemistry.</p>
3	CH- 103: Chemistry Practical Course I	<p>CO 1: Importance of chemical safety and Lab safety while performing experiments in laboratory CO 2: Determination of thermochemical parameters and related concepts</p>



			<p>CO 3: Techniques of pH measurements</p> <p>CO 4: Preparation of buffer solutions</p> <p>CO 5: Elemental analysis of organic compounds (non instrumental)</p> <p>CO 6: Chromatographic Techniques for separation of constituent.</p>
4	F. Y. B. Sc Chemistry. Semester-II (Theory and practical))	CH-201: Inorganic Chemistry	<p>Atomic Structure</p> <p>CO 1: Various theories and principles applied to reveal atomic structure</p> <p>CO 2: Origin of quantum mechanics and its need to understand structure of hydrogen atom</p> <p>CO 3: Schrodinger equation for hydrogen atom</p> <p>CO 4: Radial and angular part of hydrogenic wave functions</p> <p>CO 5: Significance of quantum numbers</p> <p>CO 6: Shapes of orbitals</p> <p>Periodicity of Elements</p> <p>CO 1: Explain rules for filling electrons in various orbitals- Aufbau's principle, Pauli exclusion principle, Hund's rule of maximum multiplicity</p> <p>CO 2: Discuss electronic configuration of an atom and anomalous electronic configurations.</p> <p>CO 1: Describe stability of half-filled and completely filled orbitals.</p> <p>CO 3: Discuss concept of exchange energy and relative energies of atomic orbitals</p> <p>CO 4: Design Skeleton of long form of periodic table.</p> <p>CO5: Describe Block, group, modern periodic law and periodicity.</p> <p>CO 6: Classification of elements as main group, transition and inner transition elements</p> <p>CO 7: Write name, symbol, electronic configuration, trends and properties.</p> <p>CO 8: Explain periodicity in the following properties in details.</p> <p>Chemical Bonding</p> <p>CO 1: Attainment of stable electronic configurations.</p> <p>CO 2: Define various types of chemical bonds- Ionic, covalent, coordinate and metallic bond</p> <p>CO 3: Explain characteristics of ionic bond, types of ions, energy</p> <p>CO 4: consideration in ionic bonding, lattice and solvation energy and their importance in the context of stability and solubility of ionic compounds</p> <p>CO 5: Summarize Born-Lande equation and Born-Haber cycle,</p>



			<p>CO 6: Define Fajan's rule, bond moment, dipole moment and percent ionic character.</p> <p>CO 7: Describe VB approach, Hybridization with example of linear, trigonal, square planer, tetrahedral, TBP, and octahedral.</p> <p>CO 8: Discuss assumption and need of VSEPR theory.</p>
5	CH- 202: Analytical Chemistry	<p>Introduction to Analytical Chemistry</p> <p>CO 1: Calculations of mole, molar concentrations and various units of concentrations which will be helpful for preparation of solution</p> <p>CO 2: Relation between molecular formula and empirical formula</p> <p>CO 3: Stoichiometric calculation</p> <p>CO 4: Define term mole, millimole, molar concentration, molar equilibrium concentration and Percent Concentration.</p> <p>CO 5: SI units, distinction between mass and weight</p> <p>CO 6: Units such as parts per million, parts per billion, parts per thousand, solution-dilatant volume ratio, function density and specific gravity of solutions.</p> <p>Qualitative Analysis of Organic Compounds</p> <p>CO 1: Separation of binary mixtures and analysis</p> <p>CO 2: Elemental analysis -Detection of nitrogen, sulfur, halogen and phosphorous by Lassaigne's test.</p> <p>CO 3: Purification techniques for organic compounds.</p> <p>Chromatographic Techniques – Paper and Thin layer Chromatography</p> <p>CO 1: Basics of chromatography and types of chromatography</p> <p>CO 2: Theoretical background for Paper and Thin Layer Chromatography</p> <p>pH metry</p> <p>CO 1: pH meter and electrodes for pH measurement</p> <p>CO 2: Measurement of pH</p> <p>CO 3: Working of pH meter</p> <p>CO 4: Applications of pH meter</p>	
6	CH- 203: Chemistry Practical –II	<p>CO 1: Inorganic Estimations using volumetric analysis</p> <p>CO 2: Synthesis of Inorganic compounds</p> <p>CO 3: Analysis of commercial products</p> <p>CO 4: Purification of organic compounds</p> <p>CO 5: Preparations and mechanism of reactions involved</p>	



S.Y.B.Sc. (CHEMISTRY)

Sr .No.		Course	Outcomes
1	S.Y.B.Sc Chemistry Semester-I (Theory)	CH-211: Physical and Analytical Chemistry	<p>Elementary Chemical Kinetics CO 1: Concept of kinetics , terms used , rate laws , types of order CO 2: Discuss examples of first order and second order reaction CO 3: Pseudo molecular reactions CO 4: Factors affecting on rate of reaction CO 5: Techniques of measurement of rate of reaction CO 6: To solve problems</p> <p>Photochemistry CO 1: Know about photochemistry CO 2: Understand difference between thermal and photochemical reactions CO 3: Understand laws of photochemistry CO 4: Learn what is quantum yield and it's measurement CO 5: Know Types of photochemical reactions and photophysical process CO 6: Know about quenching and chemiluminescence CO 7: To solve numerical</p> <p>Distribution law CO 1: Concept of distribution of solute amongst pair of immiscible solvents CO 2: Distribution law and it's thermodynamic proof CO 3: Distribution law and nature of solute in solution state CO 4: Application – Solvent extraction CO 5: To solve numerical</p> <p>Introduction to Analytical Chemistry CO 1: What is Analytical Chemistry CO 2: analysis and its applications CO 3: Sampling CO 4: Common techniques CO 5: Instrumental methods and other techniques CO 6: Choice of method</p> <p>Inorganic Qualitative Analysis CO 1: Basic principles in qualitative analysis CO 2: Meaning of common ion effect CO 3: Role of common ion effect and solubility product CO 4: Different groups for basic radicals CO 5: Group reagent and precipitating agents CO 6: Interfering anions and its removal CO 7: Separation for basic radicals CO 8: Method of detection of acidic radicals</p>



2	CH-212: Organic and Inorganic Chemistry	<p>Chapter 1: Stereoisomerism CO 1: Identify chiral center in the given organic compounds. CO 2: Define Erythro, threo, meso, diastereoisomers with suitable Examples. CO 3: Able to find R/S configuration in compounds containing two Chiral centers. CO 4: Explain Bayer's strain theory, Heat of combustion and relates stability of cycloalkanes. CO 5: Explain the stability of cyclohexanes. CO 6: Draw the structure of boat and chair configuration of cyclohexanes.</p> <p>Chapter 2: Organic reaction Mechanism CO 1: Define and classify heterocyclic compounds. CO 2: Use Huckel rule to predict aromaticity. CO 3: Suggest synthetic route for preparation of various heterocyclic compounds. CO 4: Write and complete various reactions of heterocyclic Compounds. CO 5: Predict product</p> <p>Chapter 3: General Principles of Metallurgy. CO 1: To differentiate between ore and minerals. CO 2: To differentiate between calcination and roasting and smelting. CO 3: To know the different methods for separation of gangue or matrix from metallic compounds. CO 4: To know the terms smelting, flux.</p> <p>Chapter 4: Metallurgy of Aluminium (Electrometallurgy) CO 1: To know physico-chemical principles involved in electrometallurgy. CO 2: To understand electrolysis of alumina and its refining. CO 3: To explain the uses of Aluminum and its alloys. CO 4: To know purification of bauxite ore.</p> <p>Chapter 5: Metallurgy of Iron and Steel (Pyrometallurgy) CO 1: To explain the term pyrometallurgy and to explain the physico chemical principles involved in the reduction process by carbon monoxide. CO 2: To know different reactions in the blast furnace. CO 3: To differentiate between properties of pig iron and wrought iron. CO 4: To explain the basic principles of different methods for preparation of steel.</p> <p>Chapter 6: Corrosion and Passivity CO 1: Definition of corrosion. CO 2: Types of corrosion.</p>
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			<p>CO 3: Mechanism of corrosion. CO 4: Factors affecting corrosion. CO 5: Methods of prevention of metal from corrosion. CO 6: Meaning of passivity</p>
3	S.Y.B.Sc Chemistry Semester-II (Theory)	CH-221: Physical and Analytical Chemistry	<p>Chapter 1: Free Energy and Equilibrium CO 1: Free energy concepts, types and its variation CO 2: Free energy change for chemical reaction and physical transition CO 3: Free energy change for ideal gases CO 4: Gibb's Helmholtz equations and its properties & significance CO 5: van't Hoff reaction isotherm and thermodynamic equilibrium constants, CO 6: Chemical and physical equilibrium CO 7: Clausius –Clapeyron equation and its applications</p> <p>Chapter 2: Solutions of Liquids in Liquids CO 1: Ideal and non ideal solutions and laws governing these solutions CO 2: Interpretation of vapor pressure–composition diagram CO 3: Interpretation of temperature composition diagram. CO 4: Distillation from temperature – composition diagram. CO 5: Partially immiscible liquids. CO 6: To solve numerical</p> <p>Chapter 3: Introduction to volumetric analysis CO 1: Meaning of equivalent weight, molecular weight, normality, molality, primary and secondary standards. CO 2: Different way to express concentrations of the solution. CO 3: Preparation of standard solution. CO 4: To solve numerical problems. CO 5: Calibrate various apparatus such as burette, pipette, volumetric flask, barrel pipette etc. CO 6: Types instrumental and non instrumental analysis</p> <p>Chapter 4: Non Instrumental volumetric analysis CO 1: Explain role of indicators. CO 2: Know mixed and universal indicators. CO 3: Know neutralization curves for various acid base titration CO 4: Know principle of complexometric precipitation and redox titrations. CO 5: Know the definitions and difference between iodometry and iodimetry. CO 6: To know standardization of sodium thiosulphate and EDTA. CO 7: Reactions between CuSO₄ and Iodine and liberated I₂ and Na₂S₂O₃ CO 8: Choice of suitable indicator. CO 9: Estimate copper from CuSO₄ and available chlorine in bleaching powder.</p>



5		CH-222: Organic and Inorganic Chemistry	<p>Chapter 1: Reagents in Organic Synthesis CO 1: Concept of different reagents used in the one type of conversion CO 2: Merits & demerits of different reagents CO 3: Reagent based mechanisms CO 4: Use of different hydrogen donors for hydrogenation</p> <p>Chapter 2: Chemistry of heterocyclic compounds with one hetero atom. CO 1: Define and classify heterocyclic compounds. CO 2: Use Huckel rule to predict aromaticity. CO 3: Suggest synthetic route for preparation of various heterocyclic compounds. CO 4: Write and complete various reactions of heterocyclic compounds. CO 5: Predict products</p> <p>Chapter 3: Introduction of Bio-molecules CO 1: Know different biomolecules. CO 2: Appreciate the role of biochemistry in the day to day life. CO 3: Understand the importance of biochemistry. CO 4: Define carbohydrates. CO 5: Classify carbohydrates giving suitable examples. CO 6: Write and complete various reactions of glucose. CO 7: Explain optical activity in carbohydrates.</p> <p>Chapter 4: Chemistry of d-block elements CO 1: To know position of d-block elements in periodic table. CO 2: To know the general electronic configuration & electronic configuration of elements. CO 3: To know trends in periodic properties of these elements w.r.t. size of atom and ions, reactivity, catalytic activity, oxidation state, complex formation ability, colour, magnetic properties, non-stoichiometry, density, melting point, boiling point.</p> <p>Chapter 5: Organometallic Chemistry CO 1: To understand M-C bond and to define organometallic compounds CO 2: To define organometallic chemistry CO 3: To understand the multiple bonding due to CO ligand. CO 4: To know methods of synthesis of binary metal carbonyls. CO 5: To understand the structure and bonding using valence electron count (18 electron rule)</p> <p>Chapter 6: Acids, Bases and Solvents CO 1: To define acids and bases according to Arrhenius theory Lowery- Bronsted concept, Lewis concept. CO 2: To explain the merits and demerits of different theories of acids and bases.</p>
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			<p>CO 3: To define the conjugate acid and base pairs. CO 4: To explain the leveling effect of solvents. CO 5: To demonstrate the trends in the strength of hydracids, oxyacids. CO 6: To define hard and soft acids.</p> <p>Chapter 7: Chemical Toxicology CO 1: To know toxic chemical in the environment. CO 2: To know the impact of toxic chemicals on enzyme. CO 3: To know the biochemical effect of Arsenic, Cd, Pb, Hg. CO 4: To explain biological methylation</p>
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T. Y.B.Sc.

DSEC-I: CH-501: PHYSICAL CHEMISTRY- I

1. Quantum Chemistry [10 L]

Expected learning Outcome:

After successfully completion, students will be able to:

- CO 1:** Know historical of development of quantum mechanics in chemistry.
 - CO 2:** Understand and explain the differences between classical and quantum mechanics.
 - CO 3:** Understand the idea of wave function
 - CO 4:** Understanding of De Broglie hypothesis and the uncertainty principle
 - CO 5:** Understanding the operators: Position, momentum and energy
 - CO 6:** Solving Schrodinger equation for 1D, 2D and 3D model
 - CO 7:** Physical interpretation of the ψ and ψ^2 and sketching the wave function
 - CO 8:** Applications to conjugated systems, zero-point energy and quantum tunnelling,
- Numerical Problems

Raman Spectroscopy:

Expected learning Outcome: After studying this chapter, the student will be able to:

- CO 1:** Understand the term additive and constitutive properties.
- CO 2:** Understand the term specific volume, molar volume and molar refraction.
- CO 3:** Understand the meaning of electrical polarization of molecule, induced and orientation polarization.
- CO 4:** Dipole moment and its experimental determination by temperature variation method.
- CO 5:** Electromagnetic spectrum, Nature of wave and its characteristics such as wavelength, wave number, frequency and velocity, Energy level diagram,
- CO 6:** Classification of molecules on the basis of moment of Inertia,
- CO 7:** Rotational spectra of rigid diatomic molecules, selection rules, nature of spectral lines.



3. Photochemistry [10 L]

Expected learning Outcome:

After studying this chapter, the student will be able to know and understand:

CO 1: Difference between thermal and photochemical processes.

CO 2: photochemical laws: Grothus - Draper law, Stark-Einstein law,

CO 3: Quantum yield and reasons for high and low quantum yield,

CO 4: factors affecting the quantum yield,

CO 5: Experimental method for the determination of quantum yield

CO 6: Photochemical reactions: photosynthesis, photolysis, photocatalysis, photosensitization

CO 7: Various photochemical phenomena like fluorescence and phosphorescence, Chemiluminescence,

4. UV-Visible spectroscopy (10 L)

Course outcome: After completion of the course student should be able to

CO 1: Define basic terms in gravimetry, spectrophotometry, qualitative analysis and parameters in instrumental analysis. Such as: Gravimetry, precipitation, solubility product, ionic product, common ion effect, precipitating agent, washing of ppt., drying and ignition of ppt., linearity range, detection limit, precision, accuracy, Sensitivity, Selectivity, Robustness and Ruggedness, electromagnetic radiations, spectrophotometry, Beers law, absorbance, transmittance, molar absorptivity, monochromator, wavelength of maximum absorbance, metal ligand ration, qualitative analysis, group reagent, dry tests, wet test, confirmatory test, precipitation, thermogravimetry, thermogram, percent wt. loss, differential thermal analysis, etc.

CO 2: Identify important parameters in analytical processes or estimations. Example: minimum analyte concentration in particular method, reagent concentration in particular analysis (gravimetry, spectrophotometry, thermogravimetry), reagent for particular analysis, reaction condition to convert analyte into measurable form, drying and ignition temperature for ppt in gravimetry, heating rate thermogravimetry, wavelength in spectrophotometry, group reagent, removal borate and phosphate in qualitative analysis, etc.

CO 3: Explain different principles involved in the gravimetry, spectrophotometry, parameters in instrumental analysis, qualitative analysis.

CO 4: Perform quantitative calculations depending upon equations student has studied in the theory. Furthermore, student should able to solve problems on the basis of theory.

CO 5: Discuss / Describe procedure for different types analyses included in the syllabus.

CO 6: Select particular method of analysis if analyte sample is given to him.



DSEC-II: CH-504: INORGANIC CHEMISTRY – I

1. Molecular Orbital Theory of Coordination Compounds (8L)

Aims and objective/Learning Outcomes: A student should know:

CO 1: Explain electroneutrality principle and different types of pi bonding.

CO 2: Able to explain Nephelauxetic effect towards covalent bonding.

CO 3: Explain MOT of Octahedral complexes with sigma bonding.

CO 4: Able to explain Charge Transfer Spectra.

CO 5: Able to compare the different approaches to bonding in Coordination compounds.

2. Inorganic Reaction Mechanism (6L)

Aims and objective: A student should know:

CO 1: To understand about inert and labile complexes and stability of complexes in aqueous solutions

CO 2: Classification of reactions of coordination compounds

CO 3: The basic mechanisms of ligand substitution reactions.

CO 4: Substitution reactions of square planer complexes.

CO 5: Tran's effect and applications of Trans effect

CO 6: Stereochemistry of mechanism

CO 7: Gain the knowledge of inorganic reaction mechanisms available in the literature to solve chemical problems.

3. Chemistry of Transition elements [6L]

Aims and objective: A student should know:

CO 1: To know position of d-block elements in periodic table.

CO 2: To know the general electronic configuration & electronic configuration of elements.

CO 3: To know trends in periodic properties of these elements w.r.t. size of atom and ions, reactivity, catalytic activity, oxidation state, complex formation ability, color, magnetic properties, non-stoichiometry, density, melting point, boiling point.

II. Actinides:

Aims and objective: A student should know:

CO 1: The meaning of term f-block elements, Inner transition elements, lanthanides, actinides.

CO 1: Electronic configuration of lanthanides and actinides.

CO 2: Oxidation states of lanthanides and actinides and common oxidation states.

CO 3: Separation lanthanides by modern methods.

CO 4: Lanthanide contraction and effects of lanthanide contraction on post-lanthanides.

CO 5: Use of lanthanide elements in different industries.

CO 6: Transuranic elements.

CO 7: Preparation methods of transuranic elements.



5. Metals, Semiconductors and Superconductors [8L]

Aims and Objectives: A student should be able –

- CO 1: The meaning of metal & semiconductor.
- CO 2: The difference between metal, semiconductor and insulator.
- CO 3: Metallic bond on the basis of band theory.
- CO 4: The energy band and energy curve.
- CO 5: Draw $n(E)$ & $N(E)$ curves.
- CO 6: Explain the electrical conductivity of metals with respect to valence electrons.

DSEC-II: CH-505: INDUSTRIAL CHEMISTRY – I

1. Modern Approach to Chemical Industry (6 L)

Aims and Learning objectives: The students are expected to learn;

- CO 1: Importance of chemical industry,
- CO 2: Meaning of the terms involved,
- CO 3: Comparison between batch and continuous process,
- CO 4: Knowledge of various industrial aspects

2 Manufacture of Basic Chemicals (7 L)

Aims and Learning objectives: The students are expected to learn

- CO 1: Concept of basic chemicals,
- CO 2: Their uses and manufacturing process.
- CO 3: They should also know the physico-chemical principals involved in manufacturing process

3. Sugar and Fermentation Industry (7 L)

Aims and Learning objectives: The students are expected to learn

- CO 1: Importance of sugar industry,
- CO 2: Manufacture of direct Consumption (plantation white) sugar with flow diagram.
- CO 3: Cane juice extraction by various methods,
- CO 4: Clarification by processes like carbonation, vi. Sulphitation, vii. Phosphatation, etc.
- CO 5: Concentration of juice by using multiple effect evaporator system,
- CO 6: Crystallization of sucrose by using vacuum pan.

4. Soap and detergents (8 L)

Aims and Learning objectives: The students are expected to learn

- CO 1: Different types of soap products,
- CO 2: Chemistry of soap.
- CO 3: Raw materials required for soap manufacture
- CO 4: Meaning of the term's Surfactants, Types of surfactants
- CO 5: Raw materials for detergents
- CO 6: Detergent builders, additives
- CO 7: Washing action of soap and detergents



5. Dyes and Pigments (8 L)

Aims and Learning objectives: The students are expected to learn

CO 1: Dyes: introduction,

CO 2: Dye intermediates,

CO 3: Structural features of a dye;

CO 4: Classification of dyes,

CO 5: Synthesis, Structures, properties and applications of dyes

CO 6: Classification and general properties of pigment

CO 7: Production processes of zinc oxide and iron oxide

DSEC-III: CH-507: ORGANIC CHEMISTRY – I

Learning Outcomes

After studying the polynuclear and heteronuclear aromatic compounds, students will be able to

CO 1: Define and classify polynuclear and heteronuclear aromatic hydrocarbons.

CO 2: Write the structure, synthesis of polynuclear and heteronuclear aromatic hydrocarbons.

CO 3: Understand the reactions and mechanisms

CO 4: Explain the reactivity of polynuclear and heteronuclear aromatic hydrocarbons.

CO 5: Describe the synthesis of chemical reactions of polynuclear and heteronuclear aromatic Hydrocarbons.

DSEC-III: CH-508: CHEMISTRY OF BIOMOLECULES

Learning Outcome:

CO 1: Introduction to molecular logic of life. The student will understand of Cell types, Difference between a bacterial cell, Plant cell and animal cell. Biological composition and organization of cell membrane, structure and function of various cell organelles of plant and animal cell. Concepts of biomolecules, Bonds that link monomeric units to form macromolecules

CO 2: Carbohydrates: The student will understand the types of carbohydrates and their biochemical significance in living organisms, structure of carbohydrates and reactions of carbohydrates with Glucose as example. Properties of carbohydrates.

CO 3: Lipids: The student needs to know the types of lipids with examples, structure of lipids, properties of lipids



CO 4: Amino acids and proteins: The student will understand the structure and types of amino acids. Reactions of amino acids. Properties of amino acids. Peptide bond formation. Types of proteins. Structural features in proteins. Effect of pH on structure of amino acid, Determination of N and C terminus of peptide chain.

CO 5: Enzymes: The student know the classes of enzymes with subclasses and examples. Enzyme specificity, Equations of enzyme kinetics K_m and its significance, features of various types of enzyme inhibitions, industrial applications of enzymes.

CO 6: Hormones: Basic concepts of Endocrinology. Types of Endocrine glands and their hormones. Biochemical nature of hormones. Mechanism of action of lipophilic and hydrophilic hormones.

DSEC-III: CH-509: ORGANIC CHEMISTRY PRACTICAL-I

Learning Outcomes:

A) Separation of Binary Mixtures and Qualitative Analysis The students will be able to

CO 1: Perform the quantitative chemical analysis of binary mixture, explain principles behind it.

CO 2: Separate, purify and analyse binary water insoluble mixture.

CO 3: Separate, purify and analyse binary water-soluble mixture.

CO 4: Understand the techniques involving drying and recrystallization by various method.

CO 5: Familiarize the test involving identification of special elements.

CO 6: Learn the confirmatory test for various functional groups.

B) Preparations The students will be able to

CO 1: Systematic working skill in laboratory will be imparted in student.

CO 2: Learn the basic principles of green and sustainable chemistry.

CO 3: Synthesis of various organic compounds through greener approach.

CO 4: Do and understand stoichiometric calculations and relate them to green process metrics.

CO 5: Learn alternative solvent media and energy sources for chemical processes.

CO 6: Learn the preparations of derivative various functional groups aspects of electrical experiments.

CO 7: Understand the techniques involving drying and recrystallization by various method

CH-510 (A) : INTRODUCTION TO MEDICINAL CHEMISTRY

Learning Outcomes:

Upon completion of the course the student shall be able to understand,



CO 1: The basics of medicinal chemistry, biophysical properties, overview of basic concepts of traditional systems of medicine.

CO 2: Over view of the overall process of drug discovery, and the role played by medicinal chemistry in this process.

CO 3: Biological activity parameters and importance of stereochemistry of drugs and receptors.

CO 4: Knowledge of mechanism of action of drugs belonging to the classes of infectious and non-infectious diseases.

CO 5: Enhancement of practical skills in synthesis, purification and analysis.

CH-510 (B): POLYMER CHEMISTRY

Course Outcome: The students are expected to learn the following aspects of Polymer Chemistry:

CO 1: History of polymers.

CO 2: Difference between simple compounds and polymer.

CO 3: Names of polymers.

CO 4: Various ways of nomenclature.

CO 5: Difference between natural, synthetic, organic and inorganic polymers.

CO 6: Mechanisms of polymerization.

CO 7: Polymerization techniques.

CO 8: Uses & properties of polymers.

CO 9: Role of polymer industry in the economy.

SEC-II: CH-511: SKILLS ENHANCING COURSE-II

Aims and objectives: -Students should know:

CO 1: Importance and conservation of environment.

CO 2: Importance of biogeochemical cycles

CO 3: Water resources

CO 4: Hydrological Cycle

CO 5: Organic and inorganic pollutants

CO 6: Water quality parameters

CH-511 (B): CHEMINFORMATICS

Learning Outcomes:

CO 1: Students should understand the significance of cheminformatics in the modern practices of chemical science

CO 2: Students should learn the necessity of cheminformatics in chemical science



2. Representation of Molecules and Chemical Reactions : [10L]

Learning Outcomes:

CO 1: Students should learn the basic concepts about these representation methods.

CO 2: Students should understand the significance of different representation methods for their specific applications.

CO 3: Students should be able to identify these representation methods with understanding.

CO 4: Students should be able to read these representation methods for basic examples.

3. Searching Chemical Structures: [06L]

Learning Outcomes:

CO 1: Students should learn the basic concepts of referencing

CO 2: Students should understand the significance of structural data in the process of referencing

CO 3: Students should be able to correlate the necessity of input methods and the expected outcomes for the set of chemicals

CO 4: Students should be able to understand data interpretation using these methods for basic or representative molecules.

4: Applications of Cheminformatics: [18 L]

Learning Outcomes:

CO 1: Students should learn the basic idea about how to apply cheminformatics tool for variety of applications.

CO 1: Students should understand the significance of database for the specific purpose of application.

CO 2: Students should be able to correlate the content of data with the possible applications for the set of chemicals.

CO 3: Students should get aware with the principle and the basic operational methods of well-practiced software used in the data interpretation in cheminformatics.

CO 4: Students should learn the basic concepts of Machine Learning and Artificial intelligence.

DSEC-IV: CH-601 : PHYSICAL CHEMISTRY-II

Expected learning Outcomes:

After studying this chapter, the student will be able to know and understand:

CO 1: Electrochemical cells: Explanation of Daniell cell, Conventions to represent electrochemical cells

CO 2: Thermodynamic conditions of reversible cell, Explanations of reversible and irreversible electrochemical cell with suitable example,



CO 3: EMF of electrochemical cell and its measurement.

CO 4: The Weston standard cell

CO 5: The primary reference electrode: The standard hydrogen electrode (SHE) with reference to diagram, Construction, representation, working and limitation,

CO 6: Secondary reference electrodes: (a) The calomel electrode, (b) The glass electrode (c) The silver-silver chloride electrode. Understanding of these electrodes with reference to diagram, representation, Construction, working

DSEC-IV: CH-602 : PHYSICAL CHEMISTRY-III

Expected learning Outcomes:

After studying this topic students are expected to know

CO 1: Meaning of the terms-Solution, electrolytes, nonelectrolytes and colligative properties,

CO 2: Lowering of vapour pressure of solvent in solution,

CO 3: Elevation of B.P. of solvent in solution, Landsberger's method,

CO 4: freezing point depression, Beckmann's method Osmosis and Osmotic pressure, Berkeley and Hartley method,

CO 5: Application of colligative properties to determine molecular weight of nonelectrolyte, abnormal molecular weight,

CO 6: Relation between Vant Hoff's factor and degree of dissociation of electrolyte by colligative property,

DSEC-V: CH-604 : INORGANIC CHEMISTRY –II

Aim and Objectives: Students should be able:

CO 1: To understand M-C bond and to define organometallic compounds

CO 2: To define organometallic chemistry

CO 3: To understand the multiple bonding due to CO ligand.

CO 4: To know methods of synthesis of binary metal carbonyls.

CO 5: To understand the structure and bonding using valence electron count (18 ele. rule)

CO 6: To understand the catalytic properties of binary metal carbonyls.

CO 7: To understand the uses of organometallic compounds in the homogenous catalysis.

DSEC-V: CH-605: INORGANIC CHEMISTRY –III

Aims and objectives: A student should:

CO 1: Student will learn the concept of acid base and their theories.

CO 2: They will also come to know different properties of acids and bases.

CO 3: Strength of various types acids.

CO 4: How acid and base strengths get affected in non-aqueous solvents.

DSEC-VI: CH-607: ORGANIC CHEMISTRY-II

Students will learn the interaction of radiations with matter. They will understand different regions of electromagnetic radiations. They will know different wave parameters.

CO 1: Students will learn the principle of mass spectroscopy, its instrumentation and nature of mass spectrum.



CO 2: Students will understand the principle of UV spectroscopy and the nature of UV spectrum. They will learn types of electronic excitations.

CO 3: Students will be able to calculate maximum wavelength for any conjugated system. And from the value of λ -max they will be able to find out the extent of conjugation in the compound.

CO 4: Students will understand the principle of IR spectroscopy, types of vibrations and the nature of IR spectrum.

CO 5: From the IR spectrum, they will be able to find out IR frequencies of different functional groups. And thus, they will be able to find functional groups present in the compound.

CO 6: Students will understand the principle of NMR spectroscopy and will understand various terms used in NMR spectroscopy. They will learn measurement of chemical shift and coupling constants.

CO 7: Students will be able to interpret the NMR data and they will be able to use it for determination of structure of organic compounds.

CO 8: Students will be able to determine the structure of simple organic compounds on the basis of spectral data such as λ max values, IR frequencies, chemical shift (δ values).

DSEC-VI: CH-609: ORGANIC CHEMISTRY PRACTICAL-II

Learning Outcomes:

CO 1: Explain “fingerprint region” of an infrared spectrum can used in the identification of an unknown compound.

CO 2: Identify the functional group or groups present in a compound.

CO 3: Identify the broad regions of the infrared spectrum in which occur absorptions caused by N–H, C–H, and O–H, C=C and C≡N, C=O, C=N, and C=C.

CO 4: Understand use NMR spectra to determine the structures of compounds.

CO 5: Interpret integration of NMR spectra

CO 6: Calculate coupling constants from ¹H NMR spectra.

CO 7: Interpret elemental analysis technique

B) Organic Estimations The students will be able to

CO 1: Practical knowledge of handling chemicals.

CO 2: Achieve the practical skills required to estimations of glucose and glycine.

CO 3: Achieve the practical skills required to Saponification value of oil.

CO 4: Determine the molecular weight of given tribasic acids.

C) Organic Extractions The students will be able to

CO 1: Apply the principles of extraction

CO 2: Understand the equipment for extraction.

CO 3: Gain practical hands-on experience of modern Extraction.

CO 4: Develop basic design of extractor

CO 5: Describe the extraction separation process.

D) Column chromatography The students will be able to

CO 1: Defines the basic parameters in chromatography

CO 2: Explain the processes of a chromatography analysis



CO 3: Describes the types and materials of column.

CO 4: Explains the types of mobile phase and elution.

CO 5: Realize the selection of appropriate mobile phase, column and detector

SEC-III: CH-610: SKILL ENHANCING COURSE-III

Course Outcomes:

After studying this course, student is expected to

CO 1: Understood various components of soil and soil properties and their impact on plant growth.

CO 2: Understood the classification of the soil.

CO 3: Explores the problems and potentials of soil and decide the most appropriate treatment for land use.

CO 4: Understood the Reclamation and management of soil physical and chemical constraints.

CO 5: Useful in making decisions on nutrient dose, choice of fertilizers and method of application etc. practiced in crop production.

CO 6: Got experience on advanced analytical and instrumentation methods in the estimation of soil.

CO 7: Understood various Nutrient management concepts and Nutrient use efficiencies of major and micronutrients and enhancement techniques.

CO 8: Proper understanding of chemistry of pesticides will be inculcated among the students.

CO 9: Imparts knowledge on different pesticides, their nature and, mode of action and their fate in soil so as to monitor their effect on the environment.

CH-610 (B) INTRODUCTION TO FORENSIC CHEMISTRY

Learning Objectives: After studying this paper the students will know –

CO 1: The significance of forensic science to human society.

CO 2: The fundamental principles and functions of forensic science.

CO 3: The work nature in a forensic science laboratory.

CO 4: Encourage academic students towards the noble career



POST-GRADUATE: M.SC.PART I (ORGANIC CHEMISTRY):

Sr .No.		Course	Course Outcomes (COs)
1	M.Sc.Part I Organic Chemistry. Semester-I (Theory)	CHP-110 Physical Chemistry	<ul style="list-style-type: none"> *Realize the terms ionic strength, activity coefficient, DHO equation. *Know the eign function, eign value, operator and postulates of quantum mechanics. *Learn two and three dimensional box, mechanics of particle. * Understand the adsorption of gases by solid type of isotherms * Recognized the Fricke and cerric sulphate Dosimeter. * Learn parent-daughter relationship, application of radioactivity, NAA, IDA. Effect of radiation and units of radiation.
2		CHI-130 Inorganic Chemistry	<ul style="list-style-type: none"> *Determine and Learn about Dipole moment and bond order of the inorganic molecule. *Learn about geometry and shape of the molecule. *Known the preparation and properties of transition metal carbonyls * To understand the 18 electron rule and its application. * Find out the point group of inorganic molecules. * Learn molecular orbital and its orientation. *learn concept of symmetry elements in molecules.
3		CHO-150 Organic Chemistry	<ul style="list-style-type: none"> *Learn SN1, SN2 and SNi Mechanism and stereochemistry. *Learn classical and non-classical carbocation, NGP by pi and sigma bonds. *Solve the elimination problems. *Distinguish between type of addition, elimination and substitution reaction. Learn E and Z nomenclature in C,N,S,P containing compound ,Stereo chemical principal, enantiomeric relationship R and S.
4		CHA-190 General Chemistry	<ul style="list-style-type: none"> *study the importance of safety and security, responsibility types of hazards and risk in chemical laboratory. *Understand the use of personal protective and other safety equipments, handling of chemical in laboratory. *Understand the route of exploser for toxic chemicals. *Learn good laboratory practices and its applications.
5	M.Sc.Part I Organic Chemistry. Semester-I (Practical's)	CH-P-1 Physical chemistry practical's	<ul style="list-style-type: none"> *Calculate molar and normal solution of various concentrations. *determine specific rotations and percentage of to optically active substances by polarimetrically. * Study the energy of activation and second order reaction. *study the stability of complex ion and stranded free energy change and equilibrium constant by potentiometry. Find out the acidity, Basicity and PKa Value on pH meter.
6		CH-I-1 Inorganic chemistry practical's	<ul style="list-style-type: none"> *Study the gravimetric and volumetric analysis of ores and alloy. *Prepare a various inorganic complexes and determine its % purity. *Preparation of nonmaterial. *To understand the chromatographic techniques.
7		CH-O-1 Organic chemistry practical's	<ul style="list-style-type: none"> *perform the ternary mixtures. *Preparation of organic compounds, their purifications and run TLC. * Determination of physical constant: Melting point, Boiling point. * Different separation techniques.



Sr.No.		Course	Course Outcomes (COs)
1	M.Sc.Part I Organic Chemistry. Semester-II (Theory)	CHP-210 Physical Chemistry	<ul style="list-style-type: none"> *Learn the thermodynamic description of exact, inexact differential and state function. *Know the qualitative properties of solution, the depression in freezing point, elevation in boiling point and osmotic pressure. *Know the statistical thermodynamics and various partition function. *Study the steady state approximation michaelis-menten mechanism, linde-mann-hinshelwood mechanism, chain reaction, Rate determining steps and consecutive elementary reactions. *Learn the molecular spectroscopy, R.Raman, Electronic and Mossbauer and its application.
2		CHI-230 Inorganic Chemistry	<ul style="list-style-type: none"> *Understand the mechanism in transition metal complexes, Born Haber cycle to calculate lattice energy. *Learn the use of catalyst, radius ratio rule of coordination number 3,4. *study the structure of atom, Hund's rule, term symbol, calculation of microstate and selection rule. *Understand the metal complexes in biological system.
3		CHO-250 Name reaction ,synthetic Organic Chemistry and spectroscopy	<ul style="list-style-type: none"> *Studied the various name reaction with examples. *Learn the mechanism of rearrangement reaction, use synthetic reagent of oxidation and reduction for solving the problems. *Understand the factors affecting UV-absorption spectra, Interpret IR-spectra on basic values of IR-frequencies. *Discuss the problem of UV, IR and NMR.
4		CHA-290 General Chemistry	<ul style="list-style-type: none"> *Study the instrumentation, sample injection system, columns for HPLC and GC, Solvent treatment system and choice of mobile phase. *Learn instrumentation of mass spectrometry, fragmentation, structure determination. *Solve mean and standard deviation problems. *Understand the accuracy and precision and classification error. *Learn distillation, solvent extraction, crystallization, and other separation techniques.
5	M.Sc.Part I Organic Chemistry. Semester-II (Practical's)	CH-P-1 Physical chemistry practical's	<ul style="list-style-type: none"> *Calculate molar and normal solution of various concentrations. *determine specific rotations and percentage of optically active substances by polarimetrically. * Study the energy of activation and second order reaction. *study the stability of complex ion and standard free energy change and equilibrium constant by potentiometry. Find out the acidity, Basicity and PKa Value on pH meter.
6		CH-I-1 Inorganic chemistry practical's	<ul style="list-style-type: none"> *Study the gravimetric and volumetric analysis of ores and alloy. *Prepare a various inorganic complexes and determine its % purity. *Preparation of nonmaterial. *To understand the chromatographic techniques.
7		CH-O-1 Organic chemistry practical's	<ul style="list-style-type: none"> *perform the ternary mixtures. *Preparation of organic compounds, their purifications and run TLC. * Determination of physical constant: Melting point, Boiling point. * Different separation techniques.



M.SC.PART II (ORGANIC CHEMISTRY):

Sr No.		Course	Course Outcomes (COs)
1	M.Sc.Part II Organic Chemistry. Semester-III (Theory)	CHO-350 Organic reaction mechanis m	<ul style="list-style-type: none"> *Study of carbanion-formation, stability and related name reaction, enamies and its applications. *Understand the NGP. *Learn the carbines and nitrenes. * Study of free radicals: generation of radicals, Nucleophilic electrophilic radicals, inter and intra molecular C-C bond formation via mercuric hydride. *study of oxidative coupling and SNAr reaction.
2		CHO-351 Spectroscopic methods in structure determination.	<ul style="list-style-type: none"> *Study ¹H NMR Spectroscopy: Chemical Shift, deshielding, correlation for protons bonded to carbon and other nuclei. *Study of ¹³C NMR spectroscopy: FT- NMR, type of ¹³C NMR spectra, proton decoupled , off resonance, APT, INEPT, DEPT, Chemical shift, nuclear and hetero nuclear coupling constant *2D NMR techniques: COSY, homo and hetero nuclear 2D resorts spectroscopy, NOESY and the applications *Study of mass spectrometry: Instrumentation, various methods of ionization, SIMS, FAB, MALDI. Different detectors rules of fragmentations of different functional groups.
3		CHO-352 Organic stereochemistry	<ul style="list-style-type: none"> *Study of stereochemistry of six member ring. *Learn the stereochemistry of rings other than six members. *Understand fused bridge and Caged rings. *Learn resolution of racemic modification, stereochemistry of organic compound using NMR. *Determine geometrical iso merism and stereochemistry of olefins.
4		CHO-353 Photochemistry, Pericyclic reaction and heterocyclic chemistry.	<ul style="list-style-type: none"> *Study of photochemistry: Carbonyl compounds, alkenes, dienes, polyenes and aromatic compounds. *Study photo rearrangement Barton reaction, application of photochemical reaction. * Learn Pericyclic reaction: Electro cyclic, Cycloaddition, Ene Reaction, analysis by correlation diagram, FMO approach and ATS concept. *Study of heterocyclic chemistry: Five and six member heterocyclic with one or two hetero atoms. *Understand condensed five and six member's heterocyclic. *Study the synthesis, reactivity, aromatic character and importance of heterocyclic compounds.
5	M.Sc.Part II Organic Chemistry. Semester-III (Practical's)	CH-O-347 Single stage preparations	<ul style="list-style-type: none"> *Spectral analysis best on instrumental techniques. *Preparation of organic compounds, their purifications and run TLC. * Determination of physical constant: Melting point, Boiling point. * Different separation techniques.
6		CH-O-447 Two stage preparation	<ul style="list-style-type: none"> * Spectral analysis best on instrumental techniques *Preparation of organic compounds, their purifications and run TLC. * Determination of physical constant: Melting point, Boiling point. * Different separation techniques.
7		CH-O-448 Single stage preparations by Green synthesis.	<ul style="list-style-type: none"> * Spectral analysis best on instrumental techniques. *Preparation of organic compounds, their purifications and run TLC. * Determination of physical constant: Melting point, Boiling point. * Different separation techniques.



Sr .No.	Course	Course Outcomes (COs)
1	CHO-450 Chemistry of natural product	*Study structure and stereochemistry of hardwickic acid, camptothecin and podophyllotoxin. *Study the synthesis of taxol, estome and mefepristone, fredericamycin A. *Learn biogenesis tepenoides, alkaloides and shikimite pathway.
2	CHO-451 Advance synthetic organic chemistry.	*Study of transition metal complexes in organic synthesis. * Learn C=C formation reaction, multi compound reaction, ring formation reaction. *Study of sharpless azides Cycloaddition, use of boron and silicon in organic synthesis.
3	CHO-452 Carbohydrate and chiral approach, chiral drugs and medicinal chemistry.	*Study of carbohydrates: Introduction of sugar, structure of triose tetrosa, panctose ,hexoes, stereochemistry of glucose. *Understand the chiral approach, concept of chiral templates, and utilization of the basic concept for reterosynthetic strategy. *Study of chiral drug. *Learn medicinal chemistry, the action and discovery. *Study the structure activity and drug targets. *Study of antimicrobial drugs, antibacterial, antifungal, antiviral, antimalarial etc.
4	CHO-453 Designing organic synthesis and asymmetric synthesis.	*Study the design of organic synthesis, protection deprotection of hydroxyl, amino carboxyl, ketones and aldehyde. *Learn reterosynthesis. *Understand the principle and application of asymmetric synthesis. *Study of cram's rule, felkin-Anh rule, Cram's chelate model asymmetric synthesis using chiral reagent.
5	M.Sc.Part II Organic Chemistry. Semester-IV (Theory)	CH-O-347 Single stage preparations
6		CH-O-447 Two stage preparation
7		CH-O-448 Single stage preparations by Green synthesis.



DEPARTMENT OF BOTANY

F.Y.B.Sc. COURSE OUTCOME (CO) (SEM I & II)

COURSE TITLE: PLANT LIFE AND UTILIZATION I

- CO1. Students will be made aware of plant life and its classification
- CO2. Students will know lower cryptogams, higher cryptogams and phanerogams
- CO3. The student will understand the role of lower and higher cryptogams with detailed understanding of their life cycles, and applications.

COURSE TITLE: PLANT MORPHOLOGY AND ANATOMY

- CO1. The learners will be made aware of definition, descriptive and interpretative morphology so as to distinguish the plant forms.
- CO2. Students will acquire knowledge on different morphological features like, fruit, flower, inflorescences their types and distinguishing features.
- CO3. The learner will also have a deep understanding of anatomical features, types of tissues and its organization in the plant body with special emphasis on its role and functions.
- CO4. These learning points will help the student in further applied aspects of the subjects during their higher studies.
- CO5. The course will also develop their thinking ability to identify and let know the knowhow and importance of the plants to wider societal reach.

COURSE TITLE: PLANT LIFE AND UTILIZATION II

- CO1. Students will be made aware of plant diversity in Pteridophytes, Gymnosperms and Angiosperms with reference to vascular plants
- CO2. The student will understand the role of these groups with detailed understanding of their life cycles, and applications.
- CO3. The learners will be acquainted with understanding of application and uses of such plants in utilization.

COURSE TITLE: PRINCIPLES OF PLANT SCIENCE

- CO1. The learner will understand the physiological processes in the plants.
- CO2. The students will get acquainted with different cellular functions and processes of cell division
- CO3. The learners will get knowledge of the subatomic molecules and their role and functions in the cell.
- CO4. The course will create an applied interest of the students in the subject and will provoke to consider research as one of the potential field as career.



S.Y.B.Sc. COURSE OUTCOME (CO) (SEM I & II)

COURSE TITLE: FUNDAMENTALS OF PLANT SYSTEMATICS AND PLANT ECOLOGY

CO1. The students will be able to know the objectives, importance and scope of plant systematics.

CO2. The learners will get acquainted with sources of data on systematics, botanical nomenclature.

CO3. The learner will have a deep knowledge on different plant families and its characterization features.

CO4. The students will be made aware of environmental awareness, ecological grouping and community dynamics.

CO5. The course will be made aware of his/her role in environment and will make them a responsible citizen it will also force to think students about sustainable ecology.

COURSE TITLE: FUNDAMENTALS OF PLANT PHYSIOLOGY

CO1. Learners will have an in deep knowledge about importance of plant physiology and its application

CO2. Students will acquire understanding about biophysical phenomenon and various process in plants like plasmolysis, osmosis, diffusion, permeability

CO3. The learner will have an understanding about water absorption, various cells involved in the process and their functioning.

CO4. The course also emphasize on understanding of various processes such as mineral and salt absorption with references to growth.

CO5. The students will understand the role of plant growth regulators its types and also the process of flowering.

CO6. The course will help students to take up research as career and will also those provoke understanding of growth and flowering to make them successful entrepreneurs.

COURSE TITLE: STRUCTURAL BOTANY (ANATOMY, EMBRYOLOGY AND PALYNOLOGY)

CO1. The students will have an in deep knowledge about different types of tissues with understanding of their role in plant system

CO2. The learner of the course will also understand the process of tissues systems in plants and will be able to know the growth types happening in the plant body.

CO3. The student will understand the process of embryo formation, types of embryo and process of fertilization in plants. Which will help them to know about its application in horticulture and agricultural practices.

CO4. The learner will also get an in deep idea about a branch of botany i.e. palynology, with its application in lucrative industries viz. honey making. This will certainly help them select the stream as one of the potential career.

COURSE TITLE: FUNDAMENTALS OF PLANT BIOTECHNOLOGY

CO1. The student will be introduced and made acquainted with the applied field of biotechnology with special reference to the plants.



CO2. The learner of the course will have a detailed knowledge on plant genome, genetic engineering and bioprocesses.

CO3. The student will have an understanding about the different applied industries in the stream and its applications in food, medicine etc.

CO4. The learner will not only be acquainted with production processes but also will be made aware about scale ups in upstream and downstream processes.

CO5. The course will ensure enhanced the level of understanding of students in the subject area and provoke them to consider it as a potential career.

T.Y.B.Sc. COURSE OUTCOME (CO) (SEM I & II)

PAPER I - BO 351: CRYPTOGAMIC BOTANY (ALGAE AND FUNGI)

CO1. The learner will get acquainted with life cycles of lower cryptogams.

CO2. The students will understand details and applications of algae, fungi.

CO3. The learner of the course will have an understanding of the phylogenetic relationship and role in human welfare.

PAPER II- BO 352 ARCHEGONIATE

CO1. The learner will get acquainted with life cycles of archegoniate.

CO2. The students will understand details and applications of bryophytes and pteridophytes.

CO3. The learner of the course will have an understanding of the phylogenetic relationship and role in human welfare.

PAPER III- BO 353 -SPERMATOPHYTA AND PALEOBOTANY

CO1. The learner will understand gymnosperms and angiosperms in details with classification, origin and study of angiosperm families

CO2. The student will be able to identify the plants based on various keys like Latin diagnosis, bracketed keys and also will be able to prepare artificial keys.

CO3. The student will learn to identify and classify the groups of plants according to their characters.

CO4. The students will understand importance of learning paleobotany, this will help in comparing the present day plants with primitive fossil plants.

PAPER IV- BO 354 - PLANT ECOLOGY

CO1. The learner of the course will have an interrelationship between the living world and environment.

CO2. The learners will understand environmental crisis, environmental impact assessment and environmental audit so as to know the responsibility.

CO3. The students of the course will also be acquainted with ecology and economics & remote sensing.

CO4. The students of the course will also be well versed with introduction of biodiversity, its aim, concept and objectives.

CO5. The learners of the course will be taught about characterization of biodiversity, by virtue of which they can understand the concept of endemism and phytogeography.

CO6. The students will be well versed with biodiversity loss, importance, IUCN categories and inventorying and monitoring of biodiversity.

CO7. The students of the course will understand current practices in conservation including in situ, ex situ and social approach to biodiversity conservation.



PAPER V - BO 355 - CELL AND MOLECULAR BIOLOGY

- CO1. Organisation of cell its history and type of cells: prokaryotic and eukaryotic
- CO2. Physical and chemical nature of cell matrix
- CO3. Plant cell cytoplasmic constituents, cell organelles and their structure and function.
- CO4. Learner will be acquainted with nuclear organization and chromosome structures , types and functions.
- CO5. The student learn central Dogma of molecular biology, and various process involved in it.
- CO6. Learner will be acquire knowledge related to genetic material, its nature, forms, various structure models and laws.
- CO7. Learners will be enlightened with DNA replication, experiments invoeled in providing it and its mechanism, DNA damage and repair.
- CO8. Students will also learn about gene organization, transcription, genetic code and translation, gene activation and regulation.

PAPER VI - BO 356- GENETICS

- CO1. Students will learn about concept of heredity and variation along with various branches and application of genetics
- CO2. Learners will have basic information and understanding about Mendelism, terminology involved and various laws involved.
- CO3. The students will make an understanding about interactions involved in genes Multiple allele using Nicotiana and Drosophila as model organism.
- CO4. The learner of this course will have an understanding of quantitative and cytoplasmic inheritance and sex linked inheritance with reference to Drosophila
- CO5. The student will learn about ploidy specifically euploidy and aneuploidy. They will be acquainted with chromosomal aberrations.
- CO6. The students of the course will be introduced to theories of evolution Darwinism and Lamarckian and modern synthetic theory.
- CO7. Students will be well versed with evidences of evolution and population genetics and evolution.

PAPER IX - BO 3510 - MEDICINAL BOTANY

- CO1. The students will be introduced to pharmacognosy its origin history and scope.
- CO2. The learner will be introduced to ayurvedic pharmacy, tridosha concept, ayurvedic principles and formulations.
- CO3. The students will be made understand analytical medicinal botany along with cultivation, collection and processing of herbal drugs.
- CO4. The course will also help the students to study the drugs w.r.t. occurrence distribution and cultivation, microscopic characters and constituents.
- CO5. The learner of the course will have a in depth knowledge on applied medicinal botany, concepts of major metabolic pathway, ethnobotany.

PAPER X - BO 3511- PLANT DIVERSITY & HUMAN HEALTH

- CO1: Student will understand plant diversity and importance of it in human health.
- CO2: They will come to know about exotic species- Identification and morphological characteristics.
- CO3: To make student realize ecological importance of plants and describe the role of plants in relation to Human health.
- CO4: Students will know diversity issues and types of diversity, conservation strategies to implemented in their daily life.
- CO5: The students will be made acquainted with agrobiodiversity and its importance in human health.



● Semester VI

PAPER I - BO 361- PLANT PHYSIOLOGY AND METABOLISM

CO1. The learner of the course will understand details on plant physiology, photosynthesis, and different pathways.

CO2. The students will have knowledge on respiration, structure of mitochondrion, and various cycles involved like glycolysis, TCA, ETS and ATP synthesis.

CO3. The learners will understand translocation of organic solutes, and stress physiology.

CO4: The learner should understand the functional aspect of the plant's metabolism.

PAPER II - BO 362 - BIOCHEMISTRY

CO1. The learner is able to learn the mechanism of conversion of simple to complex components and their functions.

CO2. The learners of the course will be made available knowledge on carbohydrates, amino acids, proteins, lipids.

CO3. The students will understand definition and nature of enzymes and properties of enzymes.

CO4. The students will be acquainted with definition and types of secondary metabolites and will understand production of secondary metabolites via mevalonic and shikimic acid pathways.

PAPER III - BO 363- PLANT PATHOLOGY

CO1. The learners will be made acquainted with fundamentals of plant pathology, and important terminologies and significance.

CO2. The students will be having a wide exposure to various institutes working on such area, concept of disease cycle, disease development and its mechanism.

CO3. The students will be made versed with methods of studying plant diseases, fungal, bacterial, mycoplasma, nematodal, viral plant disease, non parasitic diseases.

CO4. The course will provide insights in principles of plant disease control and molecular diagnostics and transgenic in crop protection.

PAPER IV - BO 364 - EVOLUTION AND POPULATION GENETICS

CO1: After completing the course the student should understand and be able to explain fundamental terminology and concepts in the fields of genetics and evolution.

CO2: The student should have a good understanding of central concepts in population and quantitative genetics.

CO3: Student should also understand the basic scientific methods, including data analysis, used in these fields, and be able to carry out simple analyses using empirical population genetics and quantitative genetics data.

CO4: Students should be able to combine this knowledge to interpret results from studies in population and quantitative genetics.

CO5: The student should be capable of reflect on the outcome of genetic and evolutionary studies on a general level and evaluate their biological significance.

PAPER V- BO 365 - ADVANCED PLANT BIOTECHNOLOGY

CO1. The learner of the study will be introduced to biotechnology its history.

CO2. The students will be introduced to brief history and importance of plant tissue culture and its application

CO3. The learner of the course will be introduced to germplasm and cryopreservation strategies.

CO4. The students will be made available with information on transgenic plants as bioreactors.

CO5. The learners of the course will be taught about non symbiotic nitrogen fixation, biological nitrogen fixation.

CO6. The students will be made versed with biotechnology and society.



CO7. The students will be introduced to bioinformatics and its scope and use in plant science. They will also be taught its application.

CO8. The learners will be introduced to methods, types, concepts and applications of genomics and proteomics.

PAPER VI - BO 366- PLANT BREEDING AND SEED TECHNOLOGY

CO1. The learner of the course will understand the scope and importance of plant breeding.

CO2. The student will be introduced to conventional techniques, methods and practices in breeding.

CO3. The students will be taught alternative breeding techniques, breeding for stress tolerance.

CO4. The students will be introduced to seed technology, stages of seed production and role of seed technology.

CO5. The learner of the course will be made understand seed certification, seed processing and seed sampling, storage and packaging.

CO6. The students will understand purity analysis of seeds, seed testing and seed marketing.

PAPER IX - BO 3610 - NURSERY AND GARDENING MANAGEMENT

CO1. Nursery management, nursery sites, preparation of sites, design and layout, producing plants from seed.

CO2. Learning of plants through vegetative propagation.

CO3. methods of growing plants like polyhouse, greenhouse etc.

CO4. Gardening, pre-requisites of commercial gardening, harvesting and processing of flowers, commercial production of flowers.

PAPER X- BO 3611 - BIOFERTILIZERS

CO1. Learners will understand the importance of organic farming.

CO2. To study the use of biofertilizers in environment sustainability.

CO3. Learners will be acquainted with the types, functions and applications of biofertilizers.

CO4. To understand the large scale production of biofertilizers.

CO5. To understand the method of marketing, popularizing the biofertilizer technology.



POST GRADUATE: M.Sc. COURSE OUTCOME (COS) (SEM I & II)

COURSE NAME: PLANT SYSTEMATICS I

- CO1. Systematics and taxonomy its principles, concepts and classification of algae
- CO2. Algological studies, habits pigments, reserve food, modes of perennation in algae.
- CO3. Study of various groups of algae, cyanophyta, chlorophyta, charophyta, euglenophyta, xanthophyta, bacillariophyta and chrysophyta, phaeophyta, rhodophyta
- CO4. Application of algae
- CO5. Thallus structure nutrition, and classification of fungi
- CO6. Study of distinguishing characters of myxomycotina, mastigomycotina, zygomycotina, ascomycotina, basidiomycotina, deuteromycotina.
- CO7. Application of fungi
- CO8. Introduction, characters and affinity with thallophytes and pteridophytes. Classification
- CO9. Distribution and distinguishing characters of selected orders of bryophytes
- CO10. Application of bryophytes.

COURSE NAME: CELL BIOLOGY

- CO1. Dynamic organization of the cell
- CO2. Internal organization of the cell, cell wall, cell membrane, biogenesis, ultrastructure of cell organelles
- CO3. Giant chromosomes
- CO4. Cellular signalling, transport and trafficking
- CO5. Types of receptors, G Protein, phospholipid signalling,
- CO6. Diversity in protein kinases and phosphates
- CO7. Specific signalling mechanisms
- CO8. Nuclear organelle signalling during plastid development
- CO9. Receptor serine/threonine kinases, ethylene mediated two component systems
- CO10. Molecular mechanisms of membrane transport
- CO11. Cellular process, cell cycle and its regulation
- CO12. Genome instability and cell transformation
- CO13. Mutations, types of mutations, transpositions, tumour suppressor genes, activation and suppression of tumour suppressor genes.

COURSE NAME: CYTOGENETICS AND PLANT BREEDING AND EVOLUTION

- CO1. Principles of Mendelian inheritance and interaction of genes
- CO2. Cytoplasmic inheritance, maternal effect, plastid inheritance, mitochondrial inheritance
- CO3. Quantitative inheritance, multiple factor hypothesis, quantitative traits, QTL mapping
- CO4. Linkage, recombination and crossing over, sex linkages
- CO5. Mutation, types, germinal vs somatic mutations, intentional mutagenesis
- CO6. Microbial genetics and cytogenetics, mapping of bacterial genome by interrupted mating
- CO7. Karyotype and chromosome banding, B chromosome and accessory chromosomes
- CO8. Numerical alterations of chromosomes, aneuploids, polyploids, human genetic disorders
- CO9. Structural alterations of chromosomes, deletion, duplication, inversion, Robertsonian translocations



- CO10. Introduction to model systems in genetics
- CO11. Plant breeding, plant genetic resources, methods of plant breeding
- CO12. Experimental designs of plant breeding and registration of variety
- CO13. Selection and hybridization methods, breeding for stress tolerance
- CO14. Applications of molecular markers in plant breeding
- CO15. Evolution its theories, origin of cells and cellular evolution, molecular evolution, palaeontology and evolutionary history

COURSE NAME: BIOFERTILIZER AND ALGAL TECHNOLOGY

- CO1. Biofertilizer its introduction, significance of biofertilizers in agriculture
- CO2. Types and scope of biofertilizers, production technology, methods of applications and use of genetically engineered microorganisms.
- CO3. Algal technology, its introduction, potential food and feed,
- CO4. Algal biofertilizers biodiesel
- CO5. Biohydrogen production from algae
- CO6. Algal products, SCP spirulina mass cultivation and applications.

COURSE NAME: PLANT SYSTEMATICS II

- CO1. Pteridophytes, distinguishing characters, distribution, application of pteridophytes,
- CO2. Gymnosperms, its classifications, affinities to pteridophytes and angiosperms,
- CO3. Distribution of gymnosperms its economic aspects
- CO4. Comparative account, morphology, seed development
- CO5. Angiosperms characteristics, hierarchical classifications
- CO6. Phylogenetic systems, APGIII, phylogeny of angiosperms, study of plant families.

COURSE NAME: MOLECULAR BIOLOGY

- CO1. Technique and tools in molecular biology, its scope and applications
- CO2. Enzymes in molecular biology,
- CO3. Minor equipment
- CO4. Major equipment, PCR, Gel doc, ELISA, Millipore, Lyophilizer, Refractometer, sequencer
- CO5. Molecular techniques, Sequencing techniques
- CO6. DNA Structure, functions and damage
- CO7. Gene structure and functions, transcription, translation
- CO8. Gene regulation, transposable elements,
- CO9. Genomics and proteomics

COURSE NAME: BIOCHEMISTRY

- CO1. Fundamental aspects, water, buffers, solutions, bioenergetics
- CO2. Biomolecules, carbohydrates, lipids, nucleic acids
- CO3. Protein biochemistry, amino acids, proteins, enzymology, nitrogen metabolism
- CO4. Phytochemistry and metabolomics, phytochemical investigations



COURSE NAME: FLORICULTURE AND NURSERY MANAGEMENT

- CO1. Floriculture, pre-requisites of commercial floriculture, harvesting and processing of flowers, commercial production of flowers.
- CO2. Nursery management, nursery sites, preparation of sites, design and layout, producing plants from seed
- CO3. Producing plants vegetative
- CO4. Growing media.

M.Sc. II COURSE OUTCOME (COS) (SEM III & IV)

COURSE NAME: SPERMATOPHYTIC BOTANY

- CO1. Outline classification of spermatophyta
- CO2. Gymnosperm classification and affinities with pteridophytes and angiosperms
- CO3. Distribution of gymnosperms, pteridospermales, cycadeoidales, Pentoxylales, Cordaitales
- CO4. Living gymnosperms
- CO5. Systematics and classification of angiosperms
- CO6. International code of botanical nomenclature
- CO7. Systems of angiosperm classification
- CO8. Recent systems of classifications
- CO9. Taxonomic aspects of angiosperms, morphological variations, Phyto geography.

COURSE NAME: DEVELOPMENTAL AND ECONOMIC BOTANY

- CO1. Process of plant development, processes of development,
- CO2. Factors affecting development, vegetative development, seed germination
- CO3. Phenomenon of development
- CO4. Embryological aspects of development
- CO5. Transition, gametophyte, fertilization, embryo development, polyembryony
- CO6. Physiology and molecular basis of plant development
- CO7. Case study on organ culture, anther, pollen and protoplast culture
- CO8. Economic botany, cereals, millets, legumes, vegetables fruits, plants, wood and cork, rubber and its products
- CO9. Fatty oils, essential oils, sugar industry byproducts, spices

COURSE NAME: INDUSTRIAL BOTANY I

- CO1. Introduction to algal technology, resource potential
- CO2. Algal products, SCP, fertilizers
- CO3. Bio pesticide technology Herbal, insect predators, fungal, bacterial, viral,
- CO4. Biofuel technology, environmental implications of fossil fuel,
- CO5. Bioethanol technology, sources, production, distillation, standardization
- CO6. Lipid derived biofuels, bio-hydrogen, methanogenesis
- CO7. Fermentation technology, History and introduction
- CO8. Alcohol and beverage industry, organic acid industry
- CO9. Antibiotic industry and food industry
- CO10. Entrepreneur, concept and characteristics



- CO11. Entrepreneurship development programmes, project identification and selection
- CO12. Institutional finance to entrepreneurs, institutional support of entrepreneurs
- CO13. The business, its nature and scope, fundamentals of management.

COURSE NAME: ADVANCED ANGIOSPERMS

- CO1. Modern trends in angiosperm taxonomy, embryology in relation to taxonomy
- CO2. Anatomy in relation to taxonomy, palynotaxonomy
- CO3. Phytogeography, ecology, genetics and taxonomy, numerical taxonomy, cytotaxonomy
- CO4. Chemotaxonomy, ultrastructural systematics, Molecular systematics
- CO5. Taxonomic aspects, morphological variations, systematic positions, interrelationships, phylogeny and economic importance.

COURSE NAME: COMPUTATIONAL BOTANY

- CO1. Introduction to statistics, measures of central tendency, measures of dispersion,
- CO2. Correlation and regression
- CO3. Experimental statistics, Design of experiments and analysis of variance, Testing of hypothesis,
- CO4. Bioinformatics, introduction to databases, molecular tools in protein and nucleotide sequence
- CO5. Sequence similarities, FASTA, BLAST, Multiple sequence alignments
- CO6. Biomathematics, types of measurement and their units, ions and electrical potential
- CO7. pH measurements and preparation of buffers, measuring concentration
- CO8. Enzyme activity, cell counting, radioisotopes.

COURSE NAME: PLANT ORGANISM INTERACTION

- CO1. Plant interactions, allelopathy, parasitic association, competitive mechanisms
- CO2. Herbivore and carnivore plants, plant signalling, defence, genetic engineering
- CO3. Symbiotic associations, lichens, mycorrhizae, entophytic association, nodulating bacteria, algae and coral relationship
- CO4. Pollination and dispersal biology, pollinators, co-evolution, seed dispersal mechanism.

COURSE NAME: INDUSTRIAL BOTANY II

- CO1. Herbal technology, concept and prospects
- CO2. Phytotechnology, medicinal plants mentioned in Arharva vedas
- CO3. Medicinal mushrooms, natural dyes and aromatic plants
- CO4. Gardening and forest botany
- CO5. Floriculture its significance, importance, scope and prospects and role
- CO6. Principles of garden design, styles of gardening, indoor gardening, landscape gardening
- CO7. Industrial plant tissue culture, laboratory design, maintenance
- CO8. Case studies of micro propagation of banana, sugarcane, lily, orchids and gerbera
- CO9. Transpiring, economics and preparation of bankable techno commercial reports of micropropagation of banana sugarcane and lily
- CO10. Post harvest technology of fruits,
- CO11. Post-harvest biology of tropical subtropical fruits.
- CO12. Post-harvest technologies of fruits, preservation and processing of fruits.



COURSE NAME: PLANT PATHOLOGY

- CO1. Plant pathology, introduction, objectives and milestones
- CO2. Nature and concept of plant disease, classification of diseases
- CO3. Causes of plant diseases, bacterial viral and nematodal
- CO4. Effect of plant diseases on human affairs
- CO5. Pathogenesis, effect of pathogen on plant physiological functions
- CO6. Enzymes and toxins in plant disease, pathogenicity of bio trophic and necrotrophic pathogens
- CO7. Disease development, environmental factors and disease development
- CO8. Genetics of plant pathogen interactions
- CO9. Plant defence mechanism, molecular biology
- CO10. Concept of post-harvest disease of fruits, vegetables and seeds
- CO11. Disease management and related aspects, Diagnosis, breeding for improvement, control
- CO12. Bio-control agents, disease control, plant disease assessment, biotechnology and its role in plant pathology.

COURSE NAME: RESEARCH METHODOLOGY AND SUMMER TRAINING REPORT

- CO1. Projects will be allotted in third semester and students will submit project work having introduction, review of literature, well defined material and methods, results and discussion, conclusions and references.
 - CO2. Reviewed based on review of literature on some advanced techniques in Botany and its presentation.
 - CO3. Report submission based on one summer training in research institutes/laboratory/industry for atleast one month with certificate from respective authority.
 - CO4. Techno-commercial case study of any four units
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DEPARTMENT OF ZOOLOGY

F.Y.B.Sc. COURSE OUTCOMES (CO) (Sem. I and II):

COURSE TITLE: ANIMAL DIVERSITY –I & II

- CO1.** The student will be able to understand classify and identify the diversity of animals.
- CO 2.** The student understands the importance of classification of animals and classifies them effectively using the six levels of classification.
- CO 3.** The student knows his role in nature as a protector, preserver and promoter of life which he has achieved by learning, observing and understanding life.

COURSE TITLE: ANIMAL ECOLOGY

- CO1.** The learners will be able to identify and critically evaluate their own beliefs, values and actions in relation to professional and societal standards of ethics and its impact on ecosystem and biosphere due to the dynamics in population.
- CO 2.** To understand anticipate, analyse and evaluate natural resource issues and act on a lifestyle that conserves nature.
- CO3.** The Learner understands and appreciates the diversity of ecosystems and applies beyond the syllabi to understand the local lifestyle and problems of the community.
- CO4.** The learner will be able to link the intricacies of food chains, food webs and link it with human life for its betterment and for non-exploitation of the biotic and abiotic components.
- CO 5.** The working in nature to save environment will help development of leadership skills to promote betterment of environment.

COURSE TITLE: CELL BIOLOGY

- CO1.** Learning outcomes for Cell Biology.
- CO2.** The learner will understand the importance of cell as a structural and functional unit of life.
- CO3.** The learner understands and compares between the prokaryotic and eukaryotic system and extrapolates the life to the aspect of development.



CO4. The dynamism of bio membranes indicates the dynamism of life. Its working mechanism and precision are responsible for our performance in life.

CO5. The cellular mechanisms and its functioning depends on endo-membranes and structures. They are best studied with microscopy.

S.Y.B.Sc. COURSE OUTCOMES (CO) (Sem. III and IV):

ANIMAL DIVERSITY III & IV

CO1. The students will be able to understand, classify and identify the diversity of higher vertebrates.

CO2. The students will be able to understand the complexity of higher vertebrates

CO3. The students will be able to understand different life functions of higher vertebrates.

CO4. The students will be able to understand the linkage among different groups of higher vertebrates.

CO5. The student will become aware regarding his role and responsibility towards nature as a protector, to understand his role as a trustee and conservator of life which he has achieved by learning, observing and understanding life.

APPLIED ZOOLOGY I AND II

CO1. To understand the basic life cycle of the honeybees, beekeeping tools and equipments.

CO2. To learn for managing beehives for honey production and pollination.

CO3. To understand the basic information about fishery, cultural and harvesting methods of fishes.

CO4. To understand fish preservation techniques.

CO5. To understand the biology, varieties of silkworms and the basic techniques of silk production and harvesting of cocoons.

CO6. To learn the different silkworm species and their host plants.

CO7. To study types of agricultural pests and Major insect pests of agricultural importance.

CO8. To study Pest control practices.

CO9. The learner understands the basics about beekeeping tools, equipment, and managing beehives.

CO10. The learner understands the basic information about fishery, cultural and harvesting methods of fishes and fish preservation techniques.

CO11. The learner understands the biology, varieties of silkworms and the basic techniques of silk production.

CO12. The learner understands the types of agricultural pests, Major insect pests of agricultural importance and Pest control practices.



T.Y.B.Sc. COURSE OUTCOMES (CO) (Sem. V and VI):

SEMESTER – V

ZO 351 - PEST MANAGEMENT

- CO1.** Define pest management.
- CO2.** Describe the economic, ecological, and sociological benefits of IPM.
- CO3.** Distinguish positive and negative impacts of pesticide use.
- CO4.** Understand problems resulting from misuse, overuse, and abuse of chemical pesticides.
- CO5.** Define and describe pesticide resistance and how it develops.
- CO6.** Identify ecological and biological characteristics important in development of pest populations.
- CO7.** Identify 10 tactics commonly used in IPM and be able to distinguish them.
- CO8.** Understand society's role in IPM decisions.
- CO9.** Describe different groups of pests and compare them to weeds and plant pathogens.
- CO10.** Analyse and compare management tactics to determine the best approach to reducing pest populations, weeds, and disease presence.
- CO11.** Locate appropriate, scientifically valid sources of information on specific tactics to manage insect pests, weeds, and diseases.
- CO12.** Know and how to develop an IPM program.

ZO 352 – HISTOLOGY

- CO1.** The students will be able to understand, classify and identify the different types of tissue.
- CO2.** The students will understand the complexity of various tissues in an organ.
- CO3.** The students will be able to learn structure & functions of various tissues.
- CO4.** The students will understand the various diseases related to organs.
- CO5.** The student will be able to know the role of glands in mammals.

ZO 353 - BIOLOGICAL CHEMISTRY

- CO1.** Learners shall be able to understand basic concepts and significance of biochemistry
- CO2.** The students will learn about the pH and Buffers.
- CO3.** The students will learn about the chemical structures of carbohydrate, and their biological and clinical significance.
- CO4.** The students will be able to understand, interpret structure and importance of proteins, carbohydrates and lipids
- CO5.** Learners will be able to comprehend variations in enzyme activity and kinetics.



ZO 356 – PARASITOLOGY

- CO1.** The students will be able to learn about basics and scope of parasitology.
- CO2.** The students will be able to learn the types of host and parasite with examples.
- CO3.** The students will be able to learn about the morphology, life cycle, pathogenicity and treatment of common parasites (Protists and Platyhelminthes).
- CO4.** The students will be able to learn about host -parasite relationships and their effects on host body.
- CO5.** The students will be able to learn about the arthropod parasites and their role as vector.

ZO – 3511 POULTRY MANAGEMENT

- CO1.** The students will be able to understand the Poultry farming practices.
- CO2.** The students will be able to understand the poultry breeding techniques.
- CO3.** The students will be able to understand poultry rearing techniques.
- CO4.** The students will be able to understand feeding requirement and food ingredients.
- CO5.** The students will be able to understand the poultry disease and their pathogens.
- CO6.** The students will be able to understand market value of poultry products.

ZO 361 - MEDICAL & FORENSIC ZOOLOGY

- CO1.** The students will be able to understand the basics principles of Medical and Forensic Zoology.
- CO2.** The students will be able to understand scientific methods in crime detection.
- CO3.** The students will be able to understand the advancements in the field of Medical and Forensic Zoology.
- CO4.** The students will be able to understand modern tools, techniques and skills in forensic investigations.
- CO5.** The students will be able to describe the fundamental principles and functions of forensic science and its significance to human society.

ZO 362 - ANIMAL PHYSIOLOGY

- CO1.** The various physiological organ-systems and their importance to the integrative functions of the human body.
- CO2.** Understand Concept of energy requirements
- CO3.** Various aspects of Digestive physiology.
- CO4.** Circulatory system with medical conditions
- CO5.** Understand Respiratory mechanism and gases transport.
- CO6.** Eliminations of waste materials from the body.
- CO7.** Develop understanding in Structure and functions of muscles
- CO8.** Understand formation of gametes and function of endocrine glands.



ZO 363 - MOLECULAR BIOLOGY

CO1. Learner shall get an insight into molecular mechanisms of various biological processes in cells and organisms

CO2. Learner shall get an insight into the Structure of DNA and RNA, DNA and RNA as genetic material

CO3. The course shall prepare learner to get insight into the Central Dogma of Molecular Biology

CO4. Learner shall also understand the concept of gene regulation

CO5. Learner shall get an insight into the DNA Damage and Repair

ZO 364 – ENTOMOLOGY

CO1. Understand basic concepts in Entomology and its scope.

CO2. Learn morphology and anatomy of Insects.

CO3. Understand the concept of social organization in Insects.

CO4. Understand the development process of Insects.

CO5. Identify disease causing insect vectors.

CO6. Will be able to design and implement pest controlling methods against pests.

ZO 366 - EVOLUTIONARY BIOLOGY

CO1. Students will be able to learn most of the essential aspects of Evolutionary Biology in detail which will help them in acquiring better understanding regarding the subject.

CO2. Explain important processes, principles and concepts and critically evaluate theories and empirical research within evolutionary biology

CO3. Apply evolutionary theory and concepts to address empirical and theoretical questions in evolutionary biology.

CO4. Independently investigate evolutionary questions using literature and analyses of empirical data.

CO5. Communicate the principles, theories, problems and research results associated with questions that lie within the evolutionary framework to students



➤ COURSE OUTCOMES (COS)

SEMESTER-I

1) BIOCHEMISTRY & BIOCHEMICAL TECHNIQUES:

- CO1: Define basic terms in biochemistry and biochemical techniques.
- CO2: Explain the applications of the various biochemical techniques.
- CO3: Explain the structure and functions of various Biomolecules.
- CO4: Explain the importance of tools and techniques in biology.
- CO5: Illustrate the importance of pH, buffer and water in living systems.
- CO6: Illustrate the principle, working and applications of basic techniques used in biology.
- CO7: Draw the structures of various carbohydrates and amino acids.
- CO8: Classify enzymes with examples.
- CO9: Explain the importance and applications of techniques in biochemistry.
- CO10: Explain the principle and applications of various chromatographic techniques with examples.
- CO11: Explain the principle, working, materials used and applications of electrophoresis.
- CO12: Describe the concept of light, electromagnetic spectrum and its application in absorption spectroscopy.
- CO13: Illustrate the importance of radioactive compounds and radioactivity in biology.
- CO14: Demonstrate the principle and working of Warburg's apparatus.
- CO15: Demonstrate the principle, working, applications of centrifugation.
- CO16: Justify the applications of radioactivity compounds in biology.

2) CELL BIOLOGY & DEVELOPMENTAL BIOLOGY:

- CO1: Label the various cell parts
- CO2: Sketch and label various types of cells and cell organelles.
- CO3: Explain carbon as backbone of Biomolecules.
- CO4: Explain the ultrastructure and functions of various cell organelles.
- CO5: Explain the concepts of cell signalling.
- CO6: Illustrate the chemistry and organization of cytoskeleton.
- CO7: Illustrate the types, development and causes of tumor.
- CO8: Diagrammatically represent the cell cycle phases and its regulation.
- CO9: Define the terms in developmental biology
- CO10: Explain the significance of model organism for developmental studies.
- CO11: Explain the types of eggs, concept of fertilization and cleavage pattern.
- CO12: Explain the concept of mesoderm induction and pattern formation with examples.
- CO13: Describe neural competence and induction.
- CO14: Explain the concept of growth and differentiation.
- CO15: Illustrate postembryonic development.
- CO16: Compare and contrast spermatogenesis and Oogenesis.



3) GENETICS & ENGLISH IN SCIENTIFIC COMMUNICATION:

- CO1:** Define the basic terminologies in genetics.
- CO2:** Identify genetic disorders based on Karyotypes and traits.
- CO3:** Explain the concept of Mendelian genetics, gene, gene regulation and multiple alleles.
- CO4:** Discuss Linkage and crossing with their types and significance.
- CO5:** Explain the principles of Population genetics.
- CO6:** Illustrate the modified Mendelian laws of inheritance.
- CO7:** Justify the inheritance of qualitative and quantitative traits.
- CO8:** Solve the problems based on gene frequency.
- CO9:** Write the outline of a scientific paper.
- CO10:** Write the title, abstract, discussion and citations of a given scientific article.
- CO11:** Prepare a scientific presentation using PowerPoint.
- CO12:** Explain language as a tool for effective scientific communication.
- CO13:** Use the formal elements of specific types of scientific writing.
- CO14:** Critically analyze data from research; incorporate it into assigned writing clearly, concisely, and logically; and attribute the source with proper citation.
- CO15:** Practice the unique qualities of professional rhetoric and writing style.
- CO16:** Justify the importance of plagiarism check and Proof-read given article.

4) BIOSTATISTICS:

- CO1:** Explain the application of sampling in biological sciences.
- CO2:** Explain standard Probability distributions.
- CO3:** Explain the concept and types of central tendency.
- CO4:** Explain the concept of correlation and regression with their properties.
- CO5:** Classify the given data.
- CO6:** Graphically represent the given data.
- CO7:** Illustrate the measures of dispersion with examples.
- CO8:** Solve statistical problems.

SEMESTER-II

1) MOLECULAR BIOLOGY AND BIOINFORMATICS.

- CO1:** Explain the DNA structure & types, topology, Physical properties; chromatin structure and organization.
- CO2:** Discuss genome organization, DNA and Protein sequencing with their application in evolutionary studies.
- CO3:** Explain the mobile DNA elements.
- CO4:** Explain mechanism of DNA damage and repair.
- CO5:** Illustrate the process of DNA replication, transcription, translation and their regulations.



CO6: Illustrate the database tools with their significance.

CO7: Schematically represent the processes of central dogma.

2) ENDOCRINOLOGY:

CO1: Discuss the roles of Pituitary gland and pineal body.

CO2: Explain hormonal regulation of biomolecules and mineral metabolism.

CO3: Describe the role of osmoregulatory and gastrointestinal hormones.

CO4: Explain the role of hormones in moulting, change in body colour of crustaceans; yolk synthesis in amphibians; insect development.

CO5: Explain the hormonal regulation of metabolism.

CO6: Illustrate the mechanism of hormone action and role of hormone receptors.

CO7: Justify hormones as coordination molecules.

CO8: Justify the significance of biological clocks and rhythms.

3) PARASITOLOGY:

CO1: Define the terminologies of parasitology.

CO2: Explain the concepts of animal association with examples.

CO3: Describe the role of parasites in public health and hygiene.

CO4: Explain the morphology and life cycle of common parasites.

CO5: Explain the pathogenicity and control measures of common parasites.

CO6: Illustrate the process of parasitic infections to human.

CO7: Justify the importance of control strategies against parasitic infections.

CO8: Justify the significance of vectors and disease transmission.

4) COMPARATIVE ANIMAL PHYSIOLOGY:

CO1: Explain the physiology of processes like digestion, respiration, muscle contraction and excretion.

CO2: Describe the mechanism of thermoregulation in both poikilotherms and homeotherms.

CO3: Explain the mechanism of chemical communication in vertebrates.

CO4: Comment on the structure and functions of various sense organs.

CO5: Illustrate the concept of osmotic regulation in various animals with suitable examples.

CO6: Compare the physiology of regulatory mechanisms in various groups of animals.

CO7: Justify the survival strategies of organism in varied climatic conditions.

CO8: Justify the evolution of various life processes in living forms.

5) ENVIRONMENTAL BIOLOGY:

CO1: List the endangered, endemic and extinct animal species of India.

CO2: Identify various types of natural resources, human impact on these resources, and common resource management practices.



CO3: Explain the structure and impact of biogeochemical cycles, ecosystems and energy transformation across trophic levels.

CO4: Describe concepts in population ecology and their significance.

CO5: Discuss environmental hazards and risks and the socio-economic implications.

CO6: Illustrate the impact of climate and anthropogenic factors on biodiversity with reference to India.

CO7: Illustrate the wildlife management practices and their significance.

6) METABOLIC PATHWAYS.

CO1: Define basic terminologies of metabolic pathways.

CO2: Explain the laws of thermodynamics, concept of free energy and ATP as currency molecule.

CO3: Describe the Concepts and regulation of metabolism.

CO4: Discuss the oxidation of fatty acids and its significance.

CO5: Illustrate the electron transport chain and oxidative phosphorylation.

CO6: Illustrate the reactions, energetics and regulation of glycolysis, glycogen biosynthesis, TCA cycle, Purine and Pyrimidine metabolism

CO7: Write the general reactions of various metabolic pathways.

CO8: Justify the role of enzymes in metabolism.

7) ICHTHYOLOGY

CO1: Identify the common fishes in India.

CO2: Explain the general characters and evolution of fishes.

CO3: Explain the fish morphology and anatomical modifications.

CO4: Illustrate the physiology of reproductive and endocrine organs in fish.

CO5: Discuss the signs, symptoms and control measures of common diseases in fish.

CO6: Justify the role of respiratory and excretory organs in survival of fishes.

CO7: Classify fishes upto order level.

SEMESTER- III

1) ANIMAL PHYSIOLOGY- I (SPECIAL PAPER)

CO1: Explain the membrane physiology and its dynamics.



CO2: Explain the concept of nutrition and digestion.

CO3: Explain the structure, contraction and types of contraction of muscle.

CO4: Illustrate bioluminescence and animal electricity with examples and its significance

CO5: Correlate the organisms Internal and external environments with homeostasis and biological Clocks.

CO6: Diagrammatically represent the mechanism of respiration, gas exchange and transport of O₂ and CO₂.

2) FUNDAMENTALS OF SYSTEMATICS AND ECONOMIC ZOOLOGY

CO1: Explain principles, methods of biological classification and diversity in kingdom Animalia.

CO2: Explain the importance of taxonomic keys and taxonomic characters.

CO3: Explain the principles of zoological classification and nomenclature

CO4: Discuss the various taxonomic procedures and molecular phylogenetics & phylogeography.

CO5: Illustrate the methodologies used in systematics.

CO6: Illustrate the lac culture, apiculture, prawn culture, vermiculture, Poultry, dairy industry and Piggery.

CO7: Explain the role of insects of economic importance.

CO8: Explain parasitic roundworms of animal and plants.

CO9: Signify the role of parasitic and soil protozoan in human welfare.

CO10: Justify the use of animals in pharmaceutical research.

CO11: Explain coral reef and its significance.

3) RESEARCH METHODOLOGY AND INSECT PHYSIOLOGY AND BIOCHEMISTRY

CO1: demonstrate knowledge of research processes (reading, evaluating, and developing)

CO2: perform literature reviews using print and online databases.

CO3: select and define appropriate research problem and parameters to prepare a project proposal.

CO4: identify, explain, compare, and prepare the key elements of a research proposal/report.

CO5: compare and contrast quantitative and qualitative research paradigms

CO6: Use sampling methods, measurement scales and instruments, and appropriate uses of each.

CO7: Justify the rationale for research ethics.

CO8: Explain the structure, Chemistry of integument and sclerotization.

CO9: Describe the process of digestion and metabolism

CO10: Explain the characteristics of haemolymph and types of haemocytes.



CO11: illustrate the structure, physiology and biochemistry of flight muscle.

CO12: Demonstrate the process of excretion, detoxification and water balance

CO13: Justify the role of insect hormones in physiological processes.

4) IMMUNOLOGY

CO1: List the primary and secondary immune organs.

CO2: Explain the concepts of immunity, self-nonsel immune response, autoimmune disease.

CO3: Explain the theories of antibody synthesis and generation of antibody diversity.

CO4: Explain the principle and application of the common techniques used in Immunology

CO5: Illustrate the events and dynamics of inflammation

CO6: Compare the MHC molecules and diseases associated with HLA.

CO7: Differentiate between active and passive immunization

CO8: Compare the three pathways of complement fixation pathway.

5) GENETIC TOXICOLOGY

CO1: Define genotoxicity test systems.

CO2: Describe basic toxicological principles and describe how different chemicals are taken up by, processed in and eliminated from the body

CO3: Inspect physical and chemical genotoxic agents being exposed in his/her environment

CO4: Illustrate physical and chemical genotoxic agents.

CO5: Explain efficiency mechanisms of physical chemical genotoxic agents

CO6: Relate genotoxicity and DNA repair mechanisms and relate types of mutation and DNA repair

CO7: Judge about proper genotoxicity test for mutation types

SEMESTER-IV:

1) ANIMAL PHYSIOLOGY- II (SPECIAL PAPER)

CO1: Explain the composition of blood, types of blood cells, vascular dynamics and clotting.

CO2: Illustrate the anatomy and physiology of heart and cardiac cycle

CO3: Describe the excretory system, nitrogenous wastes and renal regulation

CO4: Illustrate the osmoregulatory mechanism in Invertebrates and Vertebrates

CO5: Discuss the neuronal physiology and various potentials.



CO6: Justify the location and structure of eye, ear and taste buds to their functions.

CO7: Justify energy utilization in physiological and metabolic activities.

2) MAMMALIAN REPRODUCTIVE PHYSIOLOGY AND AQUACULTURE

CO1: Explain the male and female reproductive systems and sexual dimorphic characteristics

CO2: Explain the sexual cycles with examples

CO3: Illustrate the reproductive dysfunctions.

CO4: Diagrammatically represent the hormonal regulation of reproductive processes like pregnancy, lactation and parturition.

CO5: Prepare the flow chart to demonstrate the hormonal coordination of reproductive Processes

CO6: Justify the artificial control of reproduction.

CO7: Identify the fish diseases and the causative organisms

CO8: Mention the various composite fish culture with significance of each type.

CO9: Describe the methods of freshwater prawn culture and its management.

CO10: Explain the methods of pearl culture and pearl harvesting.

CO11: Illustrate the preparation and management of fish culture ponds.

CO12: Demonstrate the methods of packaging and transport of fish and brood fish.

CO13: Illustrate techniques of fish harvesting, preservation & processing.

CO14: Compare the techniques used in fishery development.

3) HISTOLOGY AND HISTOCHEMISTRY

CO1: Explain the fundamental tissues in details.

CO2: Describe the process of histological preparations.

CO3: Illustrate the tools used in histological preparations.

CO4: Justify the use of various stains and dyes used in histochemical detection of biomolecules.

CO5: Justify the importance of Immunohistochemistry.

4) PEST CONTROL

CO1: Explain the Pest, nature of damage caused by pests and pest control.

CO2: Explain medical, veterinary, Household and stored grain pests.

CO3: Explain the Principles and methods of pest control including Biological control measures.

CO4: Explain the Integrated pest management (IPM)



CO5: Explain the Non- insect pest and their control: Rat, Bandicoots, Crabs, Snails, Slugs, Birds and Squirrels.

CO6: Explain the principle and working of pesticide appliances.

5) POLLUTION BIOLOGY

CO1: Explain the organization of biosphere.

CO2: Explain in details the types of pollution.

CO3: Describe the pollution monitoring strategies.

CO4: Illustrate the bioassay methods.

CO5: Elucidate the methods to study the impact of pollutants.

CO6: Justify the importance of biomedical waste management.

6) APICULTURE

CO1: Explain the basic concepts of apiculture like systematics, colony organization, polymorphism, morphology and foraging.

CO2: Explain the tools and management of apiary.

CO3: Explain the importance of institutions pertinent to apiculture.

CO4: Discuss the setup of beekeeping business.

CO5: Illustrate the bee keeping as occupation.

CO6: Justify the presence of bees to increase the agriculture productivity.



DEPARTMENT OF MATHEMATICS

COURSE OUTCOMES (COs)

CO1. A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations, terminology and recognize basic geometrical figures and graphical displays, state important facts resulting from their studies.

CO2. A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.

CO3. A student should get adequate exposure to global and local concerns that explore them many aspects of Mathematical Sciences.

CO4. A student be able to apply their skills and knowledge, that is, translate information presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.

CO5. A student should be made aware of history of mathematics and hence of its past, present and future role as part of our culture.

DSE-1A: MT 351: METRIC SPACES (2 CREDITS)

CO1. understand the introductory concepts of metric spaces;

CO2. correlate these concepts to their counter parts in modern analysis by studying examples;

CO3. learn to analyze mappings between spaces.

CO4. attain background for advanced courses in real analysis, functional analysis, and topology.

CO5. appreciate the abstractness of the concepts such as open balls, closed balls, compactness, connectedness etc. beyond their geometrical imaginations.

DSE-1B: MT: 352 REAL ANALYSIS-I (2 CREDITS)

CO1. learn the basic facts in logic and set theory

CO1. learn to define sequence in terms of functions from \mathbb{N} to a subset of \mathbb{R} and to understand several properties of the real line.

CO1. recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence.

CO1. use the ratio, root, alternating series and limit comparison tests for convergence and



absolute convergence of an infinite series of real numbers.

DSE-2A: MT-353: GROUP THEORY(2 CREDITS)

CO1. recognize the mathematical objects that are groups, and classify them as abelian, cyclic and permutation groups, etc;

CO2. analyze consequences of Lagrange's theorem

CO3. learn about structure preserving maps between groups and their consequences.

CO4. explain the significance of the notion of cosets, normal subgroups, and factor groups.

DSE-2B: MT-354- ORDINARY DIFFERENTIAL EQUATIONS (2 CREDITS)

CO1. understand the genesis of ordinary differential equations.

CO1. learn various techniques of getting exact solutions of solvable first order differential equations and linear differential equations of higher order.

CO1. grasp the concept of a general solution of a linear differential equation of an arbitrary order and also learn a few methods to obtain the general solution of such equations.

DSE-3A: MT 355(A): OPERATIONS RESEARCH (2 CREDITS)

CO1. Analyze and solve linear programming models of real-life situations.

CO1. The graphical solution of LPP with only two variables, and illustrate the concept of convex set and extreme points. The theory of the simplex method is developed.

CO1. The relationships between the primal and dual problems and their solutions with applications to transportation, assignment and two-person zero-sum game problem.

DSE-3A: MT-355(B): DIFFERENTIAL GEOMETRY (2 CREDITS)

CO1. Gain an understanding to solve problems with the use of differential geometry to diverse situations in mathematical contexts.

CO1. Develop different properties associated with curves and surfaces.

CO1. Demonstrate a depth of understanding in advanced mathematical topics in relation to geometry of curves and surfaces Learn to analyze mappings between spaces.

CO1. Apply the theory of differential geometry to specific research problems in mathematics or other fields.

DSE-3A: MT 355(C): C-PROGRAMMING (2 CREDITS)

CO1. The **course** is designed to provide complete knowledge of **C-language**.

Students will be able to develop logics which will help them to create **programs**, applications in C. Also, by **learning** the basic **programming** constructs they can easily switch over to any other **language** in future.

CO1. After the completion of this course, the students will be able to develop applications.



DSE-3B: MT-356(A): MACHINE LEARNING-I (2 CREDITS)

CO1. Gain knowledge about basic concepts of Machine Learning.

CO2. Identify machine learning techniques suitable for a given problem.

CO3. Solve the problems using various machine learning techniques.

DSE-3B: MT-356(B): NUMBER THEORY (2 CREDITS)

CO1. some of the open problems related to prime numbers.

CO1. about number theoretic functions and modular arithmetic.

CO1. the Law of Quadratic Reciprocity and other methods to classify numbers as primitive roots, quadratic residues, and quadratic non-residues.

DSE-3B: MT-356 (C): LAPLACE TRANSFORM AND FOURIER SERIES (2 CREDITS)

CO1. Students will be able to know the use of Laplace transform in system modeling, digital signal processing, process control.

CO1. Solve an initial value problem for an nth order ordinary differential equation using the Laplace transform.

CO1. Find the Fourier series representation of a function of one variable

SEC-I: MT -3510: PROGRAMMING IN PYTHON-I (2 CREDITS)

CO1. The student will be able to explain basic principles of Python programming language.

CO1. The student will implement object oriented concepts.

SEC-II: MT-3511: LATEX FOR SCIENTIFIC WRITING (2 CREDITS)

CO1. Write a simple LaTeX input document based on the article class.

CO2. Turn the input document into pdf with the pdflatex program.

CO3. Format Words, Lines, and Paragraphs.

CO4. Understand how to present data using tables.

Semester-VI

DSE-4A: MT - 361: COMPLEX ANALYSIS (2 CREDITS)

CO1. Understand the significance of differentiability of complex functions leading to the understanding of Cauchy-Riemann equations.

CO2. Evaluate the contour integrals and understand the role of Cauchy-Goursat theorem and the Cauchy integral formula.

CO3. Expand some simple functions as their Taylor and Laurent series, classify the nature



of singularities, find residues and apply Cauchy Residue theorem to evaluate integrals.
CO4. Represent functions as Taylor, power and Laurent series, classify singularities and poles, find residues and evaluate complex integrals using the residue theorem.

DSE-4B: MT: 362 REAL ANALYSIS-II(2 CREDITS)

CO1. some of the families and properties of Riemann integrable functions, and the applications of the fundamental theorems of integration.

CO2. beta and gamma functions and their properties.

CO3. recognize the difference between pointwise and uniform convergence of a sequence of functions.

CO4. illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability, and integrability.

DSE-5A: MT: 363 RING THEORY (2 CREDITS)

CO1. The fundamental concept of Rings, Fields, subrings, integral domains and the corresponding morphisms.

CO2. Learn in detail about polynomial rings, fundamental properties of finite field extensions, and classification of finite fields.

CO3. Appreciate the significance of unique factorization in rings and integral domains.

DSE-5B: MT 364: PARTIAL DIFFERENTIAL EQUATIONS (2 CREDITS)

CO1. formulate, classify and transform partial differential equations into canonical form.

CO2. solve linear partial differential equations using various methods and apply these methods in solving some physical problems.

CO3. solve Laplace equations using various analytical methods demonstrate uniqueness of solutions of certain kinds of these equations.

DSE-6A: MT365 (A): OPTIMIZATION TECHNIQUES (2 CREDITS)

CO1. understand fundamentals of Network Analysis using CPM and PERT.

CO2. solve a sequencing Problem for various jobs and machines.

DSE-6A: MT 365(B): CALCULUS OF VARIATION AND CLASSICAL MECHANICS (2 CREDITS)

CO1. understand problems, methods and techniques of calculus of variations.

CO2. understand necessary conditions for the equilibrium of particles acted upon by



various forces and learn the principle of virtual work for a system of coplanar forces acting on a rigid body.

CO3. deal with the kinematics and kinetics of the rectilinear and planar motions of a particle including the constrained oscillatory motions of particles.

CO4. determine the center of gravity of some materialistic systems and discuss the equilibrium of a uniform cable hanging freely under its own weight.

DSE-6A: MT 365 (C): FINANCIAL MATHEMATICS (2 CREDITS)

CO1. describe and explain the fundamental features of a financial instruments.

CO2. demonstrate a clear understanding of financial research planning, methodology and implementation.

CO3. demonstrate understanding of basic concepts in linear algebra, relating to linear equations, matrices, and optimization.

CO4. demonstrate understanding of concepts relating to functions and annuities.

DSE-6B: MT-366(A): MACHINE LEARNING-II (2 CREDITS)

CO1. The main goal of this course is to help students learn, understand, and practice machine learning approaches, which include the study of modern computing big data technologies and scaling up machine learning techniques focusing on industry applications.

CO2. The students learning outcomes are designed to specify what the students will be able to perform after completion of the course: Ability to select and implement machine learning techniques and computing environment that are suitable for the applications under consideration.

DSE-6B: MT- 366(B): COMPUTATIONAL GEOMETRY (2 CREDITS)

CO1. construct algorithms for simple geometrical problems.

CO2. characterize invariance properties of Euclidean geometry by groups of transformations.

CO3. describe and construct basic geometric shapes and concepts by computational means.

DSE-6B: MT-366(C): LEBESGUE INTEGRATION (2 CREDITS)

CO1. To understand the concept of measure and properties of Lebesgue measure.

CO2. To study the properties of Lebesgue integral and compare it with Riemann integral.



SEC-III: MT-3610: PROGRAMMING IN PYTHON –II(2 CREDITS)

CO1. Demonstrate the use of Python in Mathematics such as operations research and computational Geometry etc.

CO2. Study graphics and design and implement a program to solve a real world problem.

CO3. The students will implement the concepts of data with python and database connectivity.

SEC-IV: MT-3611: MATHEMATICS INTO LATEX (2 CREDITS)

CO1. typeset mathematical formulas, use nested list, tabular and array environments.

CO2. import figures and pictures that are stored in external files.





DEPARTMENT OF BACHLOR OF COMPUTER SCIENCE (BCS)

F.Y.B.SC. (COMPUTER SCIENCE) COURSE OUTCOMES (COS) SEMESTER I

COURSE: PROBLEM SOLVING USING COMPUTER AND 'C' PROGRAMMING – I:

CO1: Explore algorithmic approaches to problem solving

CO2: Develop modular programs using control structures and arrays in 'C'

COURSE TITLE : DATABASE MANAGEMENT SYSTEMS:

CO1: Solve real world problems using appropriate set, function, and relational model.

CO2: Design E-R Model for given requirements and convert the same into database tables.

CO3: Use SQL.

SEMESTER II

COURSE TITLE : ADVANCED 'C' PROGRAMMING:

CO1: Develop modular programs using control structures, pointers, arrays, strings and structures.

CO2: Design and develop solutions to real world problems using C.

COURSE TITLE : RELATIONAL DATABASE MANAGEMENT SYSTEMS:

CO1: Design E-R Model for given requirements and convert the same into database tables.

CO2: Use database techniques such as SQL & PL/SQL.

CO3: Explain transaction Management in relational database System.

CO4: Use advanced database Programming concepts

S.Y.B.SC. (COMPUTER SCIENCE): SEMESTER I

TITLE : DATA STRUCTURES AND ALGORITHMS – I

CO1: To use well-organized data structures in solving various problems

CO2: To differentiate the usage of various structures in problem solution

CO3: Implementing algorithms to solve problems using appropriate data structures.

Title : Software Engineering

CO1: Compare and chose a process model for a software project development.

CO2: Identify requirements analyze and prepare models.

CO3: Prepare the SRS, Design document, Project plan of a given software system.



S.Y.B.SC. (COMPUTER SCIENCE): SEMESTER II

Title : DATA STRUCTURES AND ALGORITHMS-II

- CO1: Implementation of different data structures efficiently
- CO2: Usage of well-organized data structures to handle large amount of data
- CO3: Usage of appropriate data structures for problem solving

Title : Computer Networks-I

- CO1: . Have a good understanding of the OSI and TCP/IP Reference Models and in particular have a good knowledge of Layers
- CO2: Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies

T.Y.B.SC. (COMPUTER SCIENCE) - SEM – V

COURSE TYPE: DSEC – I COURSE CODE : CS - 351 COURSE TITLE : OPERATING SYSTEMS – I

Course Outcomes: After completion of this course students will be able to understand the concept of

- CO 1. Processes and Thread Scheduling by operating system
- CO 2. Synchronization in process and threads by operating system
- CO 3. Memory management by operating system using with the help of various schemes

COURSE CODE: DSEC - I COURSE CODE : CS - 352 COURSE TITLE :COMPUTER NETWORKS - II

- CO 1. Student will understand the different protocols of Application layer.
- CO 2. Develop understanding of technical aspect of Multimedia Systems
- CO 3. Develop various Multimedia Systems applicable in real time.
- CO 4. Identify information security goals.
- CO 5. Understand, compare and apply cryptographic techniques for data security.

COURSE TYPE:DSEC – II COURSE CODE: CS - 353 COURSE TITLE : WEB TECHNOLOGIES - I

- CO 1. To Learn PHP-Database handling
- CO 2. Understand how to develop dynamic and interactive Web Page



COURSE TYPE:DSEC – II COURSE CODE: CS - 354

Paper Title : Foundations of Data Science

- CO 1.** Perform Exploratory Data Analysis
- CO 2.** Obtain, clean/process, and transform data.
- CO 3.** Detect and diagnose common data issues, such as missing values, special values, outliers, inconsistencies, and localization.
- CO 4.** Demonstrate proficiency with statistical analysis of data.
- CO 5.** Present results using data visualization techniques.
- CO 6.** Prepare data for use with a variety of statistical methods and models and recognize how the quality of the data and the means of data collection may affect conclusions.

**COURSE TYPE:DSEC – III COURSE CODE: CS - 355 COURSE TITLE:
OBJECT ORIENTED PROGRAMMING USING JAVA - I**

- CO 1.** Understand the concept of classes, object, packages and Collections.
- CO 2.** To develop GUI based application.

**COURSE TYPE: DSEC - III COURSE CODE: CS - 356 PAPER TITLE:
THEORETICAL COMPUTER SCIENCE**

- CO 1.** Understand the use of automata during language design.
- CO 2.** Relate various automata and Languages.

**COURSE TYPE: DSEC - I COURSE CODE: CS - 357 COURSE TITLE :
PRACTICAL COURSE BASED ON CS - 351**

- CO 1.** Process synchronization
- CO 2.** Processes and Thread Scheduling by operating system
- CO 3.** Memory management by operating system using with the help of various schemes

**COURSE TYPE: DSEC - III COURSE CODE: CS - 359 COURSE TITLE :
PRACTICAL COURSE BASED ON CS - 355**

- CO 1.** Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
- CO 2.** Read and make elementary modifications to Java programs that solve real-world problems.
- CO 3.** Validate input in a Java program.



**COURSE TYPE: SECC – I COURSE CODE : CS-3510 COURSE TITLE:
PYTHON PROGRAMMING**

- CO 1. Develop logic for problem solving
- CO 2. Determine the methods to create and develop Python programs by utilizing the data
- CO 3. structures like lists, dictionaries, tuples and sets.
- CO 4. To be familiar about the basic constructs of programming such as data, operations, conditions, loops, functions etc.
- CO 5. To write python programs and develop a small application project

**COURSE TYPE: SECC – II COURSE CODE : CS-3511 COURSE TITLE:
BLOCKCHAIN TECHNOLOGY**

- CO 1. Learn the fundamentals of Blockchain Technology.
- CO 2. Learn Blockchain programming
- CO 3. Basic knowledge of Smart Contracts and how they function

**COURSE TYPE: DSEC - IV COURSE CODE: CS - 361 COURSE TITLE :
OPERATING SYSTEMS-II**

- CO 1. Management of deadlocks and File System by operating system
- CO 2. Scheduling storage or disk for processes
- CO 3. Distributed Operating System and its architecture and the extended features in mobile OS.

**COURSE TYPE: DSEC - IV COURSE CODE: CS - 362 COURSE TITLE :
SOFTWARE TESTING**

- CO 1. To understand various software testing methods and strategies.
- CO 2. To understand a variety of software metrics, and identify defects and managing those defects for improvement in quality for given software.
- CO 3. To design test cases and test plans, review reports of testing for qualitative software.
- CO 4. To understand latest testing methods used in the software industries.

**COURSE TYPE: DSEC – V COURSE CODE: CS - 363 COURSE TITLE : WEB
TECHNOLOGIES - II**

- CO 1. Build dynamic website.
- CO 2. Using MVC based framework easy to design and handling the errors in dynamic website.



UGC-B.Voc. SECTION



UGC-B.VOC. MEDICINAL PLANTS GROWER

YEAR I SEMESTER I

MPGT – 11 INTRODUCTION TO MEDICINAL PLANTS

- CO1.** To learn about plant classifications
- CO2.** Students will be able to identify and classify the plants
- CO3.** Students will understand primitive and advanced characters
- CO4.** Students will learn about different families in plant kingdom

MPGT – 12 PROPAGATION OF MEDICINAL PLANTS

- CO1.** To learn about plant propagation
- CO2** Students will know the different methods of propagation
- CO3** Students will get the basic idea of propagation of their locally available medicinal plants
- CO4** Students will learn about the propagation of herbs, climbers, trees etc.

MPGT- 13 NURSERY DEVELOPMENTS, SEED TECHNOLOGY

- CO1** To learn how to develop the nursery
- CO2** Students will able to prepare quality seedlings
- CO3** Students will learn about seed certification, seed processing and seed sampling
- CO4** Students will know the seed purity, seed testing, seed marketing etc.

MPGP – 14 INTRODUCTIONS TO MEDICINAL PLANTS

- CO1.** Learn about cultivation practices – Bed preparation
- CO2.** Learn about irrigation systems (water management)
- CO3.** Practical of propagation with the help of suitable material - Suckers
- CO4.** Learn about practical record.

MPGP – 15 PROPAGATION OF MEDICINAL PLANTS

- CO1.** Hands on propagation of herbs ,trees
- CO2.** Student learn equipment required for propagation of plant
- CO3.** Student practical on grafting and layering

MPGP – 16 NURSERY DEVELOPMENT AND SEED TECHNOLOGY

- CO1.** Student study on nursery tool
- CO2** Students will know general nursery plan
- CO3** Students study of nursery diseases and their management
- CO4** Students will learn about testing about seed sampling .

MPGP – 17 COMMUNICATION SKILLS AND SOFT SKILLS

- CO1.** Students will learn Goal setting and swot analysis



- CO2** Students will learn interview techniques
- CO3** Students prepare their own resume
- CO4** Students will learn talk in Group discussion

YEAR I SEMESTER II

MPGT – 21 HARVESTING AND POST HARVEST TECHNOLOGY

- CO1.** To learn about different harvesting methods
- CO2.** Students will get the idea of proper timing and particular methods of harvesting
- CO3.** Students will learn about the post harvest operations like drying, garbling, packing etc.s
- CO4.** Students will be able to know different postharvesting equipments and storage structure

MPGT – 22 MARKETING OF PLANTS AND PRODUCTS

- CO1.** To learn about marketing channels
- CO2.** Students will get the information about value chain concept
- CO3.** Students will get the idea of SWOT analysis
- CO4.** Students will learn about Industry- Community partnership

MPGT- 23 MEDICINAL PLANTS CONSERVATION, UTILIZATION AND MANAGEMENT

- CO1.** To learn about conservation of medicinal plants
- CO2.** Students will able to know the role of medicinal plants at local level
- CO3.** Students will learn biodiversity protection.
- CO4.** Students will learn about management of medicinal plants

MPGP – 24 HARVESTING AND POST HARVEST TECHNOLOGY

- CO1.** Students learn about tools used in harvesting
- CO2** Students hands on method of harvesting
- CO3** Students learn about storage structure of harvested plants
- CO4** Student visit pharmaceutical industry.

MPGP – 25 MARKETING OF PLANTS AND PRODUCTS

- CO1.** Students will learn practically marketing
- CO2** Students will learn about value chain
- CO3** Students will learn about quality specifications
- CO4** Students will learn main supply area of medicinal plant



MPGP – 26 MEDICINAL PLANT CONSERVATION, UTILIZATION AND MANAGEMENT

- CO1.** Students will learn method of conservation of medicinal plant
- CO2** Students will learn quadrat method
- CO3** Students will learn plant producing drugs
- CO4** Students visit to medicinal plant garden

YEAR II SEMESTER III

MPGT – 31 SYSTEMATIC OF PLANTS

- CO1.** Students will learn angiosperm taxonomy
- CO2** Students will understand classification of angiosperm
- CO3** Students will learn plant nomenclature
- CO4** Students will Study of plant family

MPGT – 32 PLANT BIOCHEMISTRY

- CO1.** Students will understand enzymes
- CO2** Students will learn mechanism of inhibition
- CO3** Students will learn 3D structure of protein
- CO4** Students will understand lipid metabolism

MPGT- 33 HERBAL COSMETICS

- CO1.** Students will understand beautifying preparation
- CO2** Students will learn aromatherapy
- CO3** Students will understand hair grooming
- CO4** Students will learn hair tonics preparation

MPGP – 34 PLANT SYSTEMATIC

- CO1.** Students Hands on dicot and monocot flower
- CO2** Students practical on variation in stamens and carpel's
- CO3** Students will learn floral adaptation for pollination

MPGP – 35 PLANT BIOCHEMISTRY

- CO1.** Students will learn pH measurements
- CO2** Students will understand estimation of amino acid
- CO3** Students will learn identification of sugar
- CO4** Students will understand preparation of buffers

MPGP – 36 HERBAL COSMETICS

- CO1.** Students will learn microscopic character of herbs used in skincare
- CO2** Students will understand various oil used in aromatherapy
- CO3** Students will learn method of extraction



CO4 Students will understand constituents of fruit and vegetable

YEAR II SEMESTER IV

MPGT – 41 HERBAL DRUGS TECHNOLOGY & DEVELOPMENT

- CO1. Students will understand what phytoconstituents
- CO2 Students will learn photochemical study
- CO3 Students will understand herbal formulation
- CO4 Students will learn source of herb

MPGT – 42 ETHNOBOTANY

- CO1. Students will learn interdisciplinary approaches ethanobotany
- CO2 Students will understand uses of essential oil from plant as a perfume
- CO3 Students will learn role of ethanobotany in healthcare
- CO4 Students will understand homeopathy

MPGT- 43 CULTIVATION AND UTILIZATION OF AROMATIC PLANTS

- CO1. Students will understand biological source of aromatic plant
- CO2 Students will learn cultivation of aromatic plant
- CO3 Students will understand uses of aromatic plant
- CO4 Students will learn chemical constituent

MPGP – 44 HERBAL DRUGS TECHNOLOGY & DEVELOPMENT

- CO1. Students will learn preparation ayurvedic formulation
- CO2 Students will understand general method of screening of natural product
- CO3 Students will learn determination of ascorbic acid
- CO4 Students will understand gas chromatography

MPGP – 45 ETHNOBOTANY

- CO1. Students will understand study of plant used of tribal people as medicine
- CO2 Students will learn estimation of perfume
- CO3 Students will understand estimation of essential oil
- CO4 Visit to medicinal plant garden

MPGP – 46 CULTIVATION AND UTILIZATION OF AROMATIC PLANTS

- CO1. Students will learn preparation of ayurvedic formulation- Asav
- CO2 Students will understand survey of ayurvedic by rural people
- CO3 Students will learn study of plant used as source of folk



YEAR III SEM- V

MPGT – 51 MEDICINAL PLANT BIOTECHNOLOGY

- CO1. Students will understand plant genome organization
- CO2 Students will learn cell and tissue culture
- CO3 Students will understand symbiotic nitrogen fixation
- CO4 Students will learn genetic engineering in plant

MPGT – 52 FUNDAMENTAL OF PHARMACOGNOSY

- CO1. Students will learn pharmacognosy
- CO2 Students will understand evaluation of drugs
- CO3 Students will learn distribution of drugs
- CO4 Students will understand gross anatomical studies of plant

MPGT- 53 PLANT METABOLISM AND DEVELOPMENT

- CO1. Students will understand plant water relation
- CO2 Students will learn mineral nutrition
- CO3 Students will understand photosynthesis
- CO4 Students will learn phytochromes

MPGP – 54 BIOTECHNOLOGY

- CO1. Students will learn preparation of media
- CO2 Students will understand sterilization techniques
- CO3 Students will learn isolation of plasmid
- CO4 Students will understand anther culture

MPGP – 55 PHARMACOGNOSY

- CO1. Students will identify crude drug
- CO2 Students will learn alkaloid morphological character
- CO3 Students will understand How calculate ash value
- CO4 Students will learn determination of antifungal activities

MPGP – 56 PLANT METABOLISM AND DEVELOPMENT

- CO1. Students will understand osmotic potential of plant cell sap
- CO2 Students will learn calculate stomatal index
- CO3 Students will understand study of mechanism of stomatal opening and closing
- CO4 Students will learn chemical separation of chloroplast pigment



YEAR III SEM- VI

MPGT – 61 MODERN ANALYTICAL TECHNIQUES

- CO1. Students will learn principle of UV visible spectroscopy
- CO2 Students will understand x-ray diffraction method
- CO3 Students will learn instrumentation of HPLC
- CO4 Students will understand octant rule

MPGT – 62 CELL AND MOLECULAR BIOLOGY

- CO1. Students will understand structure of cell wall
- CO2 Students will learn protein sorting
- CO3 Students will understand types of RNA
- CO4 Students will learn single transduction

MPGT- 63 DRUG STANDARDIZATION AND REGULATIONS

- CO1. Students will understand standardization of medicinal plant as per WHO
- CO2 Students will learn method of herbal formulation
- CO3 Students will understand drugs discovery process
- CO4 Students will learn merits and demerits of herbal formulation

MPGP – 64 MODERN ANALYTICAL TECHNIQUES

- CO1. Students will learn estimation of single drug by UV Spectrophotometer
- CO2 Students will understand estimation of multicomponent
- CO3 Students will learn interpretation of structure of drugs
- CO4 Students will understand experiments based on the application of spectroscopy

MPGP – 65 CELL AND MOLECULAR BIOLOGY

- CO1. Students will understand observation of salivary gland chromosome
- CO2 Students will learn cell fractionation and isolation of chloroplast
- CO3 Students will understand study in vitro transcription
- CO4 Students will learn isolation of DNA

MPGP – 66 DRUG STANDARDIZATION AND REGULATIONS

- CO1. Students will understand qualitative and quantitative microscopic examination
- CO2 Students will learn estimation of phytoconstituents
- CO3 Students will understand isolation of piperine from paper
- CO4 Students will learn isolation of hesperidins



ARTS SECTION



DEPARTMENT OF MARATHI

F.Y.B.A. COURSE OUTCOMES

Course – मराठी साहित्य कथा एकांकिका आणि भाषिक कौशल्य विकास

- CO 1. मराठी भाषा, मराठी साहित्य आणि मराठी संस्कृती यांचे अध्येयन करणे.
- CO 2. साहित्य विषयक आकलन, आस्वाद आणि मूल्यमापन क्षमता विकसित करणे.
- CO 3. साहित्याभ्यासातून जीवनविषयक समज विकसित करणे.
- CO 4. मराठी भाषेची उपयोजनात्मक कौशल्य विकसित करणे.
- CO 5. मराठी भाषा, मराठी साहित्य आणि मराठी संस्कृती याविषयीचे अभ्यासक्रमाद्वारे विद्यार्थ्यांनी अध्ययन केले.
- CO 6. अभ्यासक्रमाद्वारे साहित्य विषयक (कथा व एकांकिका) आकलन आस्वाद आणि मूल्य मापन क्षमता विद्यार्थ्यांमध्ये विकसित केली.
- CO 7. कथा आणि कविता या साहित्य प्रकाराद्वारे विद्यार्थ्यांमध्ये जीवनविषयक समाज विकसित केली.
- CO 8. मराठी भाषेची उपयोजनात्मक कौशल्ये उदा. श्रवण, वाचन, लेखन, सारांश लेखन, संवाद लेखन, कल्पनाविस्तार इ. विकसित केली.

F.Y. B.COM. COURSE OUTCOMES

Course – भाषा, साहित्या आणि कौशल्य विकास

- CO 1. विविध क्षेत्रातील भाषा व्यवहाराचे स्वरूप व गरज समजावून देणे.
- CO 2. व्यवहार क्षेत्रातील मराठीच्या भाषेचे स्थान स्पष्ट करणे व त्यातील मराठी या प्रत्यक्ष वापराचा अभ्यास करणे.
- CO 3. विविध लेखन प्रकारांचा अभ्यास व प्रत्यक्ष लेखनाची कौशल्य वापरण्यास सक्षम करणे.
- CO 4. विविध क्षेत्रातील कर्तृत्वान व्यक्तींच्या कार्याची व विचारांची ओळख करून देणे.
- CO 5. विद्यार्थ्यांमध्ये नैतिक, व्यावसायिक व वैचारिक मुल्यांची जोपासना करणे.
- CO 6. विद्यार्थ्यांनी विविध क्षेत्रातील भाषा व्यवहाराचे स्वरूप व गरज समजावून घेतली.
- CO 7. विविध क्षेत्रातील मराठी भाषेचे स्थान व प्रत्यक्ष वापर याविषयाची माहिती विद्यार्थ्यांनी करून घेतली.
- CO 8. विविध लेखन प्रकारांचा (चरित्र, आत्मचरित्र, वैचारिक) अभ्यास व लेखन कौशल्य विद्यार्थ्यांनी प्राप्त केले.
- CO 9. उत्कर्षवाटा या पाठ्यपुस्तकाद्वारे विविध क्षेत्रातील कर्तृत्वान व्यक्तींच्या कार्याची विचाराची ओळख विद्यार्थ्यांनी करून घेतली आहे.
- CO 10. विद्यार्थ्यांचे नैतिक, व्यावसायिक व वैचारिक मुल्यांची जोपासना समजावून घेतली.



S.Y.B.A. COURSE OUTCOMES

1) Course (G-2) आधुनिक मराठी साहित्य आणि उपयोजित मराठी

- CO1. शुद्धलेखनाची ओळख करून देणे.
- CO2. पारिभाषिक शब्दांची ओळख करून देणे.
- CO3. चरित्र आत्मचरित्र या साहित्य प्रकारांच्या तात्विक घटकांचे ज्ञान करून देणे.
- CO4. आधुनिक मराठी साहित्यातील निवडक चरित्र आत्मचरित्रात्मक वेच्यांचे आकलन आस्वाद आणि मूल्यमापन फरकांची क्षमता विद्यार्थ्यांमध्ये निर्माण करणे.
- CO5. शुद्धलेखनाची ओळख विद्यार्थ्यांनी करून घेतली.
- CO6. पारिभाषिक शब्दांची ओळख विद्यार्थ्यांनी करून घेतली.
- CO7. चरित्र व आत्मचरित्र या साहित्य प्रकारांच्या तात्विक घटकांचे ज्ञान विद्यार्थ्यांनी करून घेतले.
- CO8. जीवनवेध (चरित्र लेख) व माझी जडण घडण (आत्मचरित्र लेखन) याविषयीचे आकलन आस्वाद व मूल्यमापन करण्याची क्षमता विद्यार्थ्यांनी विकसित झाली.

2) Course – (s-1) मराठी साहित्यातील विविध साहित्य प्रकार

- CO 1. मराठी साहित्य प्रकारांच्या तात्विक घटकांचे ज्ञान देणे.
- CO 2. वेगवेगळ्या कालखंडातील अभिजात साहित्य कृतींचा संस्कार घडविणे.
- CO 3. साहित्य कृतीचे आकलन आस्वाद व मूल्यमापन करण्याची दृष्टी निर्माण करणे.
- CO 4. साहित्याचा सूक्ष्म पातळीवर अभ्यास करण्याची क्षमता विकसित करणे.
- CO 5. विद्यार्थ्यांनी मराठी साहित्य प्रकारांच्या तात्विक घटकांचे ज्ञान करून घेतले.
- CO 6. वेगवेगळ्या कालखंडातील अभिजात साहित्यकृतींचा संस्कार विद्यार्थ्यांवर केले गेले.
- CO 7. 'फकिरा' (कादंबरी) व 'नटसम्राट' (नाटक) या साहित्यकृतींचे आकलन आस्वाद व मूल्यमापन केले गेले.
- CO 8. साहित्याचा सूक्ष्म पातळीवर अभ्यास करण्याची क्षमता विद्यार्थ्यांमध्ये विकसित झाली.

3) Course (s-2) अर्वाचीन मराठी वाङ्मय:मयाचा इतिहास (इ.स.१८१८ ते १९६०)

- CO 1. मराठी साहित्याच्या ऐतिहासिक परंपरेचे स्थूल ज्ञान करून देणे.
- CO 2. विशिष्ट कालखंडाच्या पार्श्वभूमीवर साहित्यामागील प्रेरणा प्रवृत्तीचे ज्ञान करून देणे.
- CO 3. साहित्य प्रकारांच्या विकसनशील परंपरेचे स्थूल ज्ञान करून देणे.
- CO 4. पदव्युत्तर अभ्यास करण्याची पूर्वतयारी करणे.
- CO 5. मराठी साहित्याच्या ऐतिहासिक परंपरेचे स्थूल ज्ञान विद्यार्थ्यांनी करून घेतले.
- CO 6. विशिष्ट कालखंडाच्या पार्श्वभूमीवर साहित्यामागील प्रेरणा प्रवृत्तीचे ज्ञान विद्यार्थ्यांनी झाले.
- CO 7. साहित्य प्रकारांच्या विकसनशील परंपरेचे स्थूल ज्ञान विद्यार्थ्यांना झाले.
- CO 8. पदनुसार अभ्यास करण्याची पूर्वतयारी विद्यार्थ्यांनी केली.



T.Y.B.A. COURSE OUTCOMES:

Course (G-3) आधुनिक मराठी साहित्य आणि व्यावसायिक व उपयोजित मराठी

- CO 1. आधुनिक मराठी साहित्यातील विविध साहित्यप्रकांचा परिचय वाढविणे त्यांचे आकलन व आस्वाद घेण्याची क्षमता वाढविणे व अभिरुची विकसित करणे.
- CO 2. नेमलेल्या कलाकृतीचा संदर्भ साहित्य परंपरेचा स्थूल परिचय करून देणे.
- CO 3. भाषेचे यथोचित आकलन करण्याची व वापर करण्याची क्षमता विकसित करणे.
- CO 4. निबंध व प्रवासवर्णन या साहित्य प्रकारांचे तात्विक विवेचन करणे.
- CO 5. विद्यार्थ्यांची वाचन व लेखन क्षमता विकसित करून त्यांना ग्रंथ परीक्षणाची आवड निर्माण व्हावी यासाठी प्रवृत्त करणे.
- CO 6. आधुनिक मराठी साहित्यातील विविध साहित्यप्रकांचा विद्यार्थ्यांनी परिचय करून घेऊन त्यांचे आकलन व आस्वाद क्षमता विकसित करण्याची व अभिरुची विकसित होण्यासाठी अध्ययन केले.
- CO 7. नेमलेल्या कलाकृतींच्या संदर्भात साहित्य परंपरेचा स्थूल परिचय करून घेतला.
- CO 8. विद्यार्थ्यांमध्ये भाषेचे यथोचित आकलन व वापर करण्याची क्षमता विकसित केली गेली.
- CO 9. निबंध व प्रवासवर्णन या साहित्य प्रकारांचे तात्विक विवेचन करण्याची क्षमता विकसित केली गेली.
- CO 10. वाचन लेखन व ग्रंथपरीक्षण याविषयी विद्यार्थ्यांमध्ये आवड निर्माण होण्याची क्षमता विकसित केली गेली.

Course (S-3) साहित्य विचार

- CO 1. साहित्याचे स्वरूप समजावून घेणे.
- CO 2. साहित्य प्रयोजने समजावून घेणे.
- CO 3. साहित्य निर्मितीची प्रक्रिया समजावून घेणे.
- CO 4. साहित्याची भाषा समजावून घेणे.
- CO 5. साहित्याची आस्वाद प्रक्रिया समजावून घेणे.
- CO 6. साहित्यिक अभिरुची समजावून घेणे.
- CO 7. वाङ्मयीन मूल्य समजावून घेणे.
- CO 8. साहित्य आणि समाज यातील परस्परसंबंध समजावून घेणे.
- CO 9. विद्यार्थ्यांनी साहित्याचे स्वरूप समजावून घेतले.
- CO 10. साहित्य प्रयोजने समजावून घेतली.
- CO 11. साहित्य निर्मितीची प्रक्रिया समजावून घेतली.
- CO 12. साहित्य भाषा समजावून घेतली.
- CO 13. साहित्याची आस्वाद प्रक्रिया समजावून घेतली.
- CO 14. साहित्यिक अभिरुची समजावून घेतली.
- CO 15. वाङ्मयीन मूल्य समजावून घेतली.
- CO 16. साहित्य आणि समाज यातील परस्परसंबंध समजावून घेतला.

Course (S-4) भाषाविज्ञान: वर्णनात्मक व ऐतिहासिक

- CO 1. भाषेचे स्वरूप / कार्य व महत्व आणि भाषेची प्रमुख अंगे जाणून घेणे.
- CO 2. भाषाभ्यास पद्धतीचे स्वरूप व महत्व जाणून घेणे.
- CO 3. वागिंद्रीयाची रचना व कार्य आणि स्वननिर्मितीची प्रक्रिया समजावून घेणे.
- CO 4. ऐतिहासिक भाषाभ्यास पद्धतीचे स्वरूप व महत्व लक्षात घेणे.
- CO 5. मराठी भाषेचा उत्पत्ती काळ व मराठी भाषेची ऐतिहासिक वाटचाल जाणून घेणे.



DEPARTMENT OF HINDI

एफ. वाय. बी. ए. तथा बी. कॉम.(वैकल्पिक हिन्दी)

- CO 1. छात्रों को हिन्दी साहित्य से परिचित किया ।
- CO 2. हिन्दी कहानी साहित्य से अवगत किया ।
- CO 3. हिन्दी भाषा द्वारा संवाद कौशल विकसित किया ।
- CO 4. मौलिक लेखन की ओर रुझान बढ़ा दिया ।
- CO 5. विज्ञापन लेखन कौशल विकसित किया।
- CO 6. अनुवाद संबंधी जानकारी दी ।
- CO 7. हिन्दी कम्प्यूटिंग का परिचय दिया ।
- CO 8. हिन्दी काव्य साहित्य का परिचय दिया।
- CO 9. विज्ञापन लेखन कौशल विकसित किया।

एस. वाय. बी. ए.

पेपर G2

- CO 1. छात्रों को प्रतिनिधी कहानी कारो तथा कविओ का परिचय काराया ।
- CO 2. छात्रों को कहानी तथा कविता की विशेषताओ से परिचय काराया ।
- CO 3. छात्रों को व्यावहारिक तथा कार्यालय पत्र लेखन से अवगत काराया ।
- CO 4. छात्रों को व्यावहारिक क्षेत्र से परिचित काराया ।
- CO 5. छात्रों को शब्द यूग्म ज्ञान का काराया

पेपर S1

- CO 1. छात्रों को भाषा की परिभाषा, विशेषताए तथा भाषा के विविध रूपों की जानकारी दी ।
- CO 2. छात्रों को बोलीयो तथा भाषा विकास के प्रमुख वाद से परिचित किया।
- CO 3. छात्रों में भाषा के वैज्ञानिक अध्ययन की दृष्टी विकसित किया।
- CO 4. भाषा विज्ञान के अंगो तथा भाषा विज्ञान के शाखाओ का परिचय काराया ।
- CO 5. भाषा विज्ञान अन्य विज्ञान से परिचय काराया ।



टी. वाय. बी. ए.

पेपर G3

- CO 1. छात्रों को आत्मकथा विधा तथा काव्य नाटक के स्वरूप का परिचय दिया। छात्रों को पारिभाषिक शब्द तथा संक्षिप्त यो के माध्यम से
- CO 2. सरकारी कार्यालयों में प्रयुक्त की जानेवाली कार्यालयीन हिन्दी का परिचय दिया।
- CO 3. छात्रों को सरकारी पत्र लेखन से अवगत कराया।
- CO 4. छात्रों को पत्रकारिता के विभिन्न पाहलूओं से परिचित कराया।
- CO 5. छात्रों में अंग्रेजी से हिन्दी में अनुवाद की कला को विकसित किया।

पेपर S3 (हिन्दी साहित्य का इतिहास)

- CO 1. हिन्दी साहित्य के इतिहास की लेखन परंपरा से अवगत किया।
- CO 2. हिन्दी साहित्य के इतिहास कालखंडों का परिचय दिया।
- CO 3. हिन्दी साहित्य की प्रति निधी रचनाओं तथा रचना कारों का परिचय दिया।
- CO 4. हिन्दी साहित्य के विकसक्रम तथा साहित्य परिवर्तनों का परिचय दिया।
- CO 5. हिन्दी साहित्य के इतिहास के माध्यम से साहित्य और युग जीवन का संबंध अवगत कराया।

पेपर S4 (काव्यशास्त्र)

- CO 1. छात्रों को काव्य साहित्य की परिभाषा, स्वरूप, काव्य प्रयोजन, काव्य हेतुओं से परिचित किया।
- CO 2. छात्रों को काव्य के तत्व, भेद तथा शब्द शक्ति का ज्ञान कराया।
- CO 3. छात्रों को छंद और अलंकारों का परिचय दिया।
- CO 4. छात्रों को नाटक तथा अन्य गद्य भेदों का परिचय दिया।
- CO 5. छात्रों को रस के विभिन्न अंगों का परिचय दिया।

एम .ए भाग १

पेपर -१ मध्ययुगीन काव्य

- १. मध्ययुगीन काव्य प्रवृत्तियों का परिचय दिया।
- २. मध्ययुगीन कवियों का परिचय दिया।
- ३. मध्ययुगीन काव्य भाषा का परिचय दिया।
- ४. सर्जनात्मक कौशल्य विकसित करना।



पेपर -2 कथा साहित्य

1. उपन्यास विधा से अवगत किया ।
2. कहानी विधा से अवगत किया।
3. जीवन मूल्य से परिचित किया।
4. आलोचनात्मक दृष्टी विकसित की ।

पेपर -3 भारतीय काव्यशास्त्र

1. भारतीय काव्यशास्त्र विकास क्रम का परिचय दिया ।
2. भारतीय काव्यशास्त्र प्रमुख संप्रदायो से परिचित किया।
3. आलोचनात्मक दृष्टी विकसित की ।
4. मूल्य बोध की दृष्टी विकसित की।

पेपर 4 -नाटककार मोहन राकेश

1. नाटक के स्वरूप एवं संरचना का परिचय दिया ।
2. रंगमंच विधान का परिचय दिया ।
3. मोहन राकेश के नाटकों का परिचय दिया ।
4. नाट्य अभिनय कौशल विकसित किये ।

पेपर -5 कथेतर गद्य साहित्य

1. व्यंग्य निबंध रेखाचित्र और संस्मरण विधा से अवगत किया।
2. पाठ्य विधाओ का भाषिक अध्ययन काराया ।
3. मौलिक लेखन कौशल विकसित किया ।

पेपर -6 शोध प्राविधि

1. छात्रो को शोध प्राविधि से अवगत किया।
2. शोध दृष्टी विकसित की ।
3. नये शोध प्रवाह का परिचय दिया।
4. शोध प्रबंध लेखन कौशल विकसित करना ।

पाश्चात्य काव्यशास्त्र

1. पाश्चात्य काव्यशास्त्र के विकास क्रम का परिचय काराया।
2. पाश्चात्य चिंतको के चिंतन से अवगत काराया।
3. छात्रो को आलोचना दृष्टी दिया ।



८. हिन्दी उपन्यास साहित्य

१. हिन्दी उपन्यास साहित्य के विकासक्रम से परिचय दिया.
२. उपन्यास के आस्वादन की अध्ययन की क्षमता विकसित किया।
३. पाठ्य रचना के माध्यम से मूल्य संप्रेषित किये ।
४. मूल्यांकन की दृष्टी विकसित की ।

एम .ए भाग २

पेपर -१५ हिन्दी साहित्य का इतिहास

- १ . छात्रों को गद्य निर्माण की परिस्थितियों से परिचित किया ।
२. गद्य के विकास क्रम का परिचय दिया ।
३. प्रमुख गद्यांशों का परिचय दिया ।
४. आधुनिक कविता का परिचय दिया ।

१६ लोकसाहित्य

१. छात्रों को लोकसाहित्य से परिचित किया ।
२. लोकसाहित्य के विविध विधा की जानकारी दी ।
३. लोकसाहित्य का महत्व विशद किया ।
४. महाराष्ट्र के लोकसाहित्य से अवगत किया।



DEPARTMENT OF ENGLISH

F. Y. B.A. COURSE OUTCOMES (CO) (SEM.I and II)

F.Y.B.A. : COMPULSORY ENGLISH- I AND II

- CO1. To expose students to the best examples of prose and poetry in English so that they realize the beauty and communicative power of English
- CO2. To instill human values and develop the character of students as responsible citizens of the world
- CO3. To develop the ability to appreciate ideas and think critically
- CO4. To enhance employability of the students by developing their linguistic competence and communicative skills
- CO5. To revise and reinforce structures already learnt in the previous stages of learning.

F. Y. B. A- OPTIONAL ENGLISH (GENERAL PAPER-1)

- CO1. To expose students to the basics of literature and language and develop an integrated view about language and literature in them
- CO2. To acquaint them with minor forms of literature in English and help them to appreciate the creative use of language in literature
- CO3. To introduce them to the basics of phonology of English so that they can pronounce better and speak English correctly.
- CO4. To prepare students to go for detailed study and understanding of literature and language
- CO5. To enhance the job potential of students by improving their language skills .

S. Y. B. A. COMPULSORY ENGLISH

- CO1. To develop competence among the students for self-learning
- CO2. To familiarize students with excellent pieces of prose and poetry in English so that they realize the beauty and communicative power of English
- CO3. To develop students' interest in reading literary pieces
- CO4. To expose them to native cultural experiences and situations in order to develop humane values and social awareness
- CO5. To develop overall linguistic competence and communicative skills of the students



S. Y. B. A. GENERAL ENGLISH (G-2)

Title of the Paper: Study of English Language and Literature

- CO1. To expose students to the basics of short story, one of the literary forms.
- CO2. To familiarize them with different types of short stories in English.
- CO3. To make them understand the literary merit, beauty and creative use of language
- CO4. To introduce some advanced units of language so that they become aware of the technical aspects and their practical usage.
- CO5. To prepare students to go for detailed study and understanding of literature and language
- CO6. To develop integrated view about language and literature in them.

Title of the Paper: Appreciating Drama

- CO1. To acquaint and familiarize the students with the terminology in Drama Criticism (i.e. the terms used in Critical Analysis and Appreciation of Drama)
- CO2. To encourage students to make a detailed study of a few sample masterpieces of English Drama from different parts of the world
- CO4. To develop interest among the students to appreciate and analyze drama independently
- CO5. To enhance students awareness in the aesthetics of Drama and to empower them to evaluate drama independently

Title of the Paper: Appreciating Poetry

- CO1. To acquaint and familiarize the students with the terminology in poetry criticism (i.e. the terms used in critical analysis and appreciation of poems)
- CO2. To encourage students to make a detailed study of a few sample masterpieces of English poetry
- CO3. To enhance students awareness in the aesthetics of poetry and to empower them to read, appreciate and critically evaluate the poetry independently.

TITLE OF THE PAPER: ENHANCING EMPLOYABILITY SKILLS

(CREDIT-3)

Prescribed Text- *Aspirations: English for Careers* (Board of Editors- Orient BlackSwan)

After studying the paper successfully, the learners will be able:

- CO 1. To get the awareness of career opportunities available to them.
- CO 2. To identify the career opportunities suitable to them.
- CO 3. To understand the use of English in different careers.
- CO 4. To develop competence in using English for the career of their choice.
- CO 5. To enhance skills required for their placement.



CO 6. To use English effectively in the career of their choice.

CO 7. To exercise verbal as well as nonverbal communication effectively for their career.

DISCIPLINE SPECIFIC ELECTIVE (DSE-1C& DSE-1D) (OLD S-3)

Title of the Paper: Appreciating Novel (Credit-3+1=4)

CO 1. To introduce students to the basics of novel as a literary form

CO 2. To expose students to the historical development and nature of novel

CO 3. To make students aware of different types and aspects of novel

CO 4. To develop literary sensibility and sense of cultural diversity in students

CO 5. To expose students to some of the best examples of novel

DISCIPLINE SPECIFIC ELECTIVE (DSE-2C & DSE-2D) (OLD S-4)

Title of the Paper: Introduction to Literary Criticism (Credit-3+1=4)

CO 1. To introduce students to the basics of literary criticism

CO 2. To make them aware of the nature and historical development of criticism

CO 3. To make them familiar with the significant critical approaches and terms

CO 4. To encourage students to interpret literary works in the light of the critical approaches

CO 5. To develop aptitude for critical analysis

SKILL ENHANCEMENT COURSE (SEC 2-C & SEC 2-D)

Title of the Paper: *Mastering Life Skills and Life Values*

CO 1. To equip the students with the social skills

CO 2. To train the students interpersonal skills

CO 3. To build self-confidence and communicate effectively

CO 4. To Encourage the students to think critically

CO 5. To learn stress management and positive thinking

CO 6. To enhance leadership qualities



COURSE OUTCOMES (COs)

M.A. Part- I SEM- I & II

PAPER : ENGLISH LITERATURE FROM 1550-1798

CO1. To enable learners to appreciate and enjoy a wide range of literary or creative texts and other related cultural forms.

CO2. To broaden students' awareness of the general culture of different places where English is used and enhance their appreciation and understanding of culturally diverse societies.

CO3. To sharpen students critical, creative and analytical skills and enhance their proficiency in English language.

CO4. To acquire vital employability skills and employment opportunities in the fields like teaching, media, journalism, free lance writing, film, drama etc.

PAPER : ENGLISH LITERATURE FROM 1798-2000

CO1.To introduce students to major movements and figures of English Literature through study of selected literary texts

CO2.To create literary sensibility for appreciation in students and expose them to artistic and innovative use of language by writers and to various world views.

CO3. To instill values and develop human concern in students through exposure to literary texts.

CO4.To enhance literary and linguistic competence of students.

PAPER : CONTEMPORARY STUDIES IN ENGLISH LANGUAGE

CO1.To introduce students to the basic tools essential for systematic study of language

CO2. To acquaint students with the basic concepts and issues in linguistics

CO3. To introduce them to various sub-disciplines of linguistics

CO4. To initiate them into theoretical perspectives and enable them to apply the acquired linguistic skills in real life situations.

PAPER : LITERARY CRITICISM AND THEORY

CO1. To introduce students to the nature, function and relevance of literary criticism and theory

CO2. To introduce them to various important critical approaches and their tenets

CO3. To encourage them to deal with highly intellectual and radical content and thereby develop their logical thinking and analytical ability



CO4. To develop sensibility and competence in them for practical application of critical approach to literary texts

M.A. PART-II- (SEMESTER- III&IV)

PAPER- INDIAN WRITING IN ENGLISH

CO1. To introduce students to major movements and figures of Indian Literature in English through the study of selected literary texts

CO2. To create literary sensibility and emotional response to the literary texts and implant sense of appreciation of literary text

CO3. To expose students to the artistic and innovative use of language employed by the writers

CO4. To instill values and develop human concern in students through exposure to literary texts

CO5. To enhance literary and linguistic competence of students.

PAPER : ENGLISH LANGUAGE AND LITERATURE TEACHING

CO1. To acquaint the students with different theoretical and practical aspects of language and literature teaching.

CO2. To acquaint them with different approaches, methods and techniques of teaching English language and literature.

CO3. To sensitize the students to the major issues in ELLT in the Indian context.

PAPER : POETRY IN ENGLISH

CO1. To introduce students to major movements related to poetry in English, works and poet through study of selected texts

CO2. To create literary sensibility for appreciation in students and expose them to artistic and innovative use of language by writers and to various worldviews

CO3 .To instill values and develop human concern in students through exposure to literary texts

CO4. To enhance literary and linguistic competence of students.

PAPER : DRAMA IN ENGLISH

CO1. To introduce students to major movements related to drama, works and dramatists through study of selected texts



CO2 .To create literary sensibility for appreciation in students and expose them to artistic and innovative use of language by writers and to various worldviews

CO3. To instil values and develop human concern in students through exposure to literary texts

CO4. To enhance literary and linguistic competence of students.

PAPER- : RESEARCH METHODOLOGY

CO1. To introduce the students to the concept of research

CO2.To enable them to understand the stages of research

CO3. To familiarize the learners to the procedures involved in research

CO4. To sensitize them to the requirements of cohesion and coherence in continuous composition.

CO5. To highlight the significance of systematic planning and execution of research activity.

CO6. To give the students practice in the use of various tools and techniques of research.

CO7. To prepare them for undertaking research.



DEPARTMENT OF ECONOMICS

COURSE TITLE: INTRODUCTION TO -Indian Economic Environment–I & II

CO1. Ability to develop an understanding of the economic environment and the factors affecting economic environment.

CO2. Ability to develop awareness on the various new developments in the different sectors of economy – agriculture, industry, services, banking, etc.

CO3 Ability to compare and contrast Indian Economy with other world economies.

CO4 At the end of the course, the student should be able to discuss and debate on the various issues and challenges facing the Indian Economic Environment.

S.Y.B.A. COURSE OUTCOMES (CO)

COURSE TITLE: INTRODUCTION TO - Financial System

CO1. To provide the knowledge of various financial and non-financial institutions.

CO2. To provide the students the intricacies of Indian financial system for better financial decision making

Micro Economics

COURSE TITLE: INTRODUCTION TO MICRO ECONOMICS

CO1 To develop an understanding of basic theories of micro economics and their application.

CO2 To demonstrate that the theories discussed in class will usually be applied to real-life situations.

CO3 To help the students to prepare for varied competitive examinations

CO4 : To introduce students to the role of money in an economy.

CO5: To introduce students to the conceptual and theoretical frameworks of inflation, deflation and stagflation, Business Cycle .

CO6 : To familiarize students with the conceptual and theoretical framework of business cycles

CO7 : To introduce students to the role of monetary and fiscal policies in fulfilling the macroeconomic objectives of stability, full employment and growth.

COURSE TITLE: INTRODUCTION TO: BUSINESS ECONOMICS (MICRO) - I

CO1: To analyze and interpret charts and graphs

CO2 : To understand basic theories, concepts of micro economics and their application



T.Y.B.A. Economics

GENERAL PAPER-III: INDIAN ECONOMIC DEVELOPMENT-I

At the end of the course the learner will have ability -

- CO 1. To relate and recognize the concept and indicators of Economic Development.
- CO 2. To describe and analyze the concept and indicators of Human Development.
- CO 3. To explain the characteristics of Developing and Developed Countries.
- CO 4. To describe the constraints to the process of Economic Development.

GENERAL PAPER- III: INDIAN ECONOMIC DEVELOPMENT-II

At the end of the course the learner will have ability-

- CO 1. To describe and explain the process of Economic Planning.
- CO 2. To describe and examine the changing structure of planning process in India.
- CO 3. To describe and explain the relation between Economic Development and Environment.

SPECIAL PAPER - III: INTERNATIONAL ECONOMICS-I

At the end of the course the learner will have Ability

- CO 1. To relate and recall the concepts of International Economics and International Trade.
- CO 2. To describe and apply the theories of international trade.
- CO 3. To explain and comprehend the issues relating to Terms of trade and Balance of Payment.

SPECIAL PAPER - III: INTERNATIONAL ECONOMICS-II

At the end of the course, the learner will have-

- CO 1. Ability to relate and explain the concept of Exchange Rate and Foreign Exchange Market.
- CO 2. Ability to describe the trends in Growth, Composition and Direction of India's Foreign Trade.
- CO 3. Ability to comprehend the issues relating to Foreign Capital and Regional and International Co-Operation.



SPECIAL PAPER – IV: PUBLIC FINANCE –I

Course Learning Outcomes

At the end of the course the learner will have ability-

- CO 1. To relate and recognize the Nature and Scope of Public Finance.
- CO 2. To describe and analyze the concept of Public Revenue and its components.
- CO 3. To explain types of Public Expenditure and reasons for rising Public Expenditure.
- To explain the types of Public Debt and its effects.

SPECIAL PAPER – IV: PUBLIC FINANCE –II

- CO 1. To make students able to analyze Budget process of India.
- CO 2. To make the students aware about Role and working of Finance Commission.
- CO 3. To make students competent to become success in competitive examination.
- CO 4. To explain and assess the components and instruments of Fiscal Policy.
- CO 5. To relate to the concepts of Budget and its components.
- CO 6. To describe and analyze the concept of Deficit Financing and its effects.
- CO 7. To describe and explain the Centre and State Financial Relationship.

SEC 3A: BUSINESS MANAGEMENT-I

At the end of the Course, the Learner will have the following skills:

- CO 1. Management of Business.
- CO 2. Business planning and decision making
- CO 3. Leadership Skills- Ability to work in teams at the same time, ability to show leadership Qualities

SEC-3A: BUSINESS MANAGEMENT-II (PROJECT REPORT)

At the end of the Course, the Learner will have the following skills:

- CO 1. Analytical Skills – Ability to analyze data collected and interpret in the most logical manner
- CO 2. Project Report Writing Skills- Ability to comprehend and illustrate/demonstrate findings
- CO 3. Presentation Skills – PPT/Poster- Ability to illustrate findings in the most appealing manner



M.A.I and II ECONOMICS:

MACRO ECONOMICS ANALYSIS

CO1. To provide a thorough understanding of the principles of macroeconomics and the application of macroeconomic concepts in real-life situations.

CO 2. To discuss the modern developments in macroeconomics.

CO3 Ability to analyze and demonstrate knowledge of the basic theories/laws in macroeconomics.

CO4 At the end of the course, the student should be able to evaluate macroeconomic concepts, models and its use in real life situations.

GROWTH AND DEVELOPMENT

CO 1. To enable learning and understanding of the basic concepts and process to measure the growth and economic development etc.

CO 2 To analyze and evaluate the obstacles in the process of economic growth and development

CO3 Ability to apply the concepts of economic growth and compare international comparison of economic development, etc.

CO4 Ability to analyze and demonstrate knowledge of the economic growth and development theories of economic growth and development.

RESEARCH METHODOLOGY

CO1. To enable an understanding of Research and its methods under various areas of economics.

CO 2 To demonstrate the practical and the applied aspects of research in relation to Economics.

CO3 Ability to develop, demonstrate and examine topics under Economics to pursue research.

CO4 Ability to evaluate and examine subject areas in economics and explore possibilities of research.



INDUSTRIAL ECONOMICS

CO1. To provide an understanding of Industry, Industrial sector and growth and its relation to various economic issues and challenges.

CO2. To demonstrate the practical and the applied aspects of Industrial economics and the study of Industry and its relation to Economics.

CO3. Ability to develop, demonstrate and examine various topics under Industrial Economics.

CO4. Ability to evaluate and examine subject areas in economics bringing out the relation to industry and industrial development.



DEPARTMENT OF HISTORY

F.Y.B.A. History [Semester system]

1] Semester-I Early India: From Prehistory to the Age of the Mauryas [G-1]

- CO 1.** The history of Early India is a crucial part of Indian history.
- CO 2.** It is a base for understanding the entire Indian history.
- CO 3.** The course is aimed at helping the student to understand the history of early India from the prehistoric times to the age of the Mauryas.
- CO 4.** It attempts to highlight the factors and forces behind the rise, growth and spread of civilization and culture of India along with the dynastic history.
- CO 5.** It also attempts to help the students to understand the contribution of Early Indians to polity, art, literature, philosophy, religion and science and technology.
- CO 6.** It also aims to foster the spirit of enquiry among the students by studying the major developments in early Indian history.

2] Semester-I I Early India: Post Mauryan Age to the Rashtrakutas [G-1]

- CO 1.** The history of India after the Mauryas is very important to understand the developments in early India after the Mauryas, which finally led to the transition to medieval India.
- CO 2.** The course is aimed at introducing the students to the developments in different parts of India through a brief study of regional kingdoms up to the tenth century C.E.
- CO 3.** It attempts to highlight the consequences of the foreign invasions, particularly on the polity, economy, society and art and architecture.
- CO 4.** The attempt is also to instill the spirit of enquiry among the student

3] Semester-I History of Civilization: Indian Civilization and Heritage [Special]

- CO 1.** The present course will make an effort to increase a sense of awareness and affection towards the nation and its historic heritage among the students.
- CO 2.** This course communicates knowledge about the Indian culture, Civilization and its heritage with its sources like Archeological, Numismatic and Epigraphic and Literary from pre- historic period to early period of Indian history and civilization.
- CO 3.** It also discuss the importance and methods of conservation of Historical Heritage



4] Semester-I I History of Civilization: Indian Civilization & Heritage [Special]

- CO 1.** The present course aims at introducing the students to various aspects of Ancient India like development of Script, Language and literature.
- CO 2.** The course also introduces the students to the various schools of art in Indian Civilization, so as to help the student to understand architecture in India from the ancient to the modern period.

S.Y.B.A History SEM-III [Semester system]

1] Semester -III-Medieval India - Sultanate Period [S-1]

- CO 1.** Provides examples of sources used to study various periods in history.
- CO 2.** Relates key historical developments during medieval period occurring in one place with another.
- CO 3.** Analyses socio - political and economic changes during medieval period
- CO 4.** Estimate the foreign invasion and the achievement of rulers Pedagogy: Lectures/Visual presentation/ Role play/ Critical analysis/Assignments.

2] Semester -III-Glimpses of the Modern World - Part I [S-2]

- CO 1.** This paper is designed to introduce the students to the history of the Modern World with its socio- religious, political and economic developments.
- CO 2.** It will enable students to study interesting historical developments in the countries other than India, which had a significant impact on almost all over the Modern World.
- CO 3.** It will enable students to understand the significant impact of the modern concepts such as Renaissance, Nationalism, Communism, Imperialism, etc.
- CO 4.** It will get students acquainted with the major revolutions, and political developments which led to the World War I and its consequences.

3] Semester -III- History of the Marathas: (1630-1707) [G-2]

- CO 1.** To introduce the students to the regional history of medieval Maharashtra and India.
- CO 2.** To study political, social and conceptual history of the Marathas in an analytical way with the help of primary sources.
- CO 3.** To evaluate contribution of Chhatrapati Shivaji Maharaj to the establishment of Swarajya, contribution of successors and later development of the Maratha kingdom.
- CO 4.** To study administrative Institutions of the Maratha.
- CO 5.** Student will develop the ability to analyse sources for Maratha History.
- CO 6.** Student will learn significance of regional history and political foundation of the region.



CO 7. It will enhance their perception of 17th century Maharashtra and India in context of Maratha history.

CO 8. Appreciate the skills of leadership and the administrative system of the Marathas.

Skill Enhancement Course Semester III

1] Art and Architecture of Early India (From 3000 B.C. to 12th Century A.D.)

CO 1. Students will get an overall understanding of the emergence and development of the art and architecture in Early India.

CO 2. They will understand the emergence of the Pottery, Terracotta figures, Ornaments, Town Planning, preparation of seals and coins.

CO 3. They will have an understanding of the art and architecture in early India

S.Y.B.A History SEM-IV [Semester system]

1] Semester -IV-Medieval India: Mughal Period

[S-1]

CO 1. Produce well researched written work that engages with both primary sources and the secondary literature.

CO 2. To learn the Mughal ruler and incidents regarding Deccan policies.

CO 3. To understand the analytical studies of Medieval South India.

CO 4. Maps- important centers in Mughal Empire under Akbar and Aurangzeb

2] Semester -IV-Glimpses of the Modern World - Part II

[S-2]

CO 1. This paper is designed to introduce the students to the political history of the Modern World.

CO 2. It will enable students to study remarkable historical developments in the various countries including India, which had a significant impact on almost all over the Modern World.

CO 3. It will enable students to understand the significant impact of the modern concepts such as Dictatorship, Cold War, Nationalism, Communism, Imperialism, Polarization, etc.

CO 4. It will get students acquainted with the major nationalist movements, the World War II and its consequences, the Cold War and its Consequences.

CO 5. It will enable students to develop the overall understanding of the Modern World.

CO 6. The students will get acquainted with the major nationalist movements, the World War II and its consequences, the Cold War and its Consequences.

CO 7. It will enhance their overall perception of the history of the Modern World.



3] Semester -IV- History of the Marathas: (1707-1818) –

[G-2]

- CO 1.** To understand changed nature of Maratha Polity during the Peshwa Period.
- CO 2.** To examine the dynamics of Maratha Confederacy and reciprocity.
- CO 3.** To examine role of Marathas and regionality in National politics of 18th Century India.
- CO 4.** To study administrative system, society and economy of the Peshawa period
- CO 5.** Students will be able to analyze the Marathas policy of expansionism and its consequences.
- CO 6.** They will understand the role played by the Marathas in the 18th century India.
- CO 7.** They will be acquainted with the art of diplomacy in the Deccan region.
- CO 8.** It will help to enrich the knowledge of the administrative skills and profundity of diplomacy.

T.Y.B.A.

SEMESTER V: COURSE TITLE: - INDIAN NATIONAL MOVEMENT (1885-1947)

- CO 1.** The course is designed to make the students aware about the making of Modern India and the struggle for independence.
- CO 2.** To make the students aware of the multi-dimensionality of Modern India.
- CO 3.** To highlight the ideas, institutions, forces and movements that contributed to be shaping of Indian Modernity.
- CO 4.** To acquaint the students with various interpretative perspectives.
- CO 5.** It will enable students to develop an overall understanding of Modern India.
- CO 6.** It will increase the spirit of healthy Nationalism, Democratic Values and Secularism among the Students.

SEMESTER V COURSE TITLE: - WORLD CIVILIZATION AND HERITAGE (PART I)

- CO 1.** To Introduce students to the various concept and theories of World Civilization.
- CO 2.** To study the types of Stone Culture and its various aspects.
- CO 3.** To acquaint the students with rise and growth of Ancient Civilization in West Asia.
- CO 4.** To understand about Ancient Civilization of China and its various parts.

SEMESTER –V COURSE TITLE: INTRODUCTION TO HISTORIOGRAPHY

- CO 1.** Students will be introduced to the information and importance of Historiography.
- CO 2.** Students will be introduced to the different Methods and Tools of data collection.



CO 3. Students can study the interdisciplinary approach of History.

CO 4. Students will learn about the usefulness of History in the 21st century, its changing perspectives, the new ideas that have been invented, and the importance of History in a competitive World.

SEMESTER –V COURSE TITLE: MAHARASHTRA IN THE 19TH CENTURY

CO 1. To Introduce the students to the history of 19th century in Maharashtra

CO 2. To study Political, Social, Economic and conceptual History of the 19th Century Maharashtra in an analytical way with the help of primary sources.

CO 3. To evaluate contribution of 19th century in Maharashtra to the establishment of Maharashtra state contribution of successors and later development of the 19th century Maharashtra

CO 4. To study Socio-religious System of the 19th Century in Maharashtra.

CO 5. Student will develop the ability to analyse sources for 19th century Maharashtra History.

CO 6. Student will learn significance of Regional History and Socio- religious reformism foundation of the region.

CO 7. It will enhance their perception of 19th Century Maharashtra.

CO 8. Appreciate the skills of leadership and the Socio-religious System of the Maharashtra.

SEMESTER -V COURSE TITLE- CONSTITUTIONAL DEVELOPMENT IN INDIA (1773-1853)

CO 1. To Introduce the students to evolution of Constitution of India.

CO 2. To study Factors and Situations that shaped the Constitutions.

CO 3. Students will understand evolution of Constitution of India.

CO 4. Student will learn factors and conditions that contributed to constitution of India

SEMESTER V: -SEC: 9 COURSE TITLE: SOUTH INDIAN ART AND ARCHITECTURE

(From 4th Century A.D. to 12th Century A.D.)

CO 1. Students will get an overall understanding of the development of the Art and Architecture in South India.

CO 2. They will understand the changing patterns of the Art and Architecture in South India.

CO 3. They will understand the impact of Persian Art on Islamic Art and Architecture in South India



SKILL ENHANCEMENT COURSES (SEC 2 C) – (2 CREDITS)

Semester V -SEC -:10 Research Paper Writing

- CO 1.** Students will be introduced to the information and importance of Historiography.
- CO 2.** Students can study the interdisciplinary approach History.

SKILL ENHANCEMENT COURSES (SEC 2 C) – (2 CREDITS)

Semester V -SEC: 11 Course Title: - Museology

- CO 1.** The Students will understand the Concepts of Museum and learn the basic Principles of Museology
- CO 2.** The Students will gain Comprehensive Knowledge of the Process of Curating and Conserving Museum of objects

Core Course 4 (3 Credit)

SEMESTER VI: COURSE TITLE: - INDIA AFTER INDEPENDENCE- (1947-1991)

- CO 3.** It will enable students to develop an overall understanding of the Contemporary India.
- CO 4.** To increase the spirit of healthy Nationalism, Democratic Values and Secularism among the students.
- CO 5.** Students will understand various aspects of India's domestic and foreign policies that shaped Post-Independence India.

Core Course 4 History of Civilization (3 Credit)

SEMESTER VI COURSE TITLE: -WORLD CIVILIZATION AND HERITAGE (PART II)

- CO 1.** To Orient students about Western Classical Civilization of Greece and Roman.
- CO 2.** To introduce students to the Arab Civilization and its various aspects.
- CO 3.** To study various Concept and theory's in Medieval Europe.
- CO 4.** To understand the Renaissance- Reformation Movement and impact of various Past Civilizations.

DISCIPLINE SPECIFIC ELECTIVE COURSES (DSE-3C) -(3 CREDIT)

Semester –VI, Course Title: Applied History

- CO 1.** Students will be introduced to the information and importance of applied history.



- CO 2.** Student will learn about the Historical significance of Archaeology and Archives and opportunities in the field of Archaeology and Archives.
- CO 3.** Through this course, students will be informed about the opportunities in the field of Media, Museums.
- CO 4.** the about learn will Students usefulness of history in the 21st Century, its changing Perspectives, the new ideas that have been invented, and the importance of History in a Competitive World.

DISCIPLINE SPECIFIC ELECTIVE COURSES (DSE-4D)- (3) CREDIT

Semester -VI, Course Title: History of Maharashtra in the 20th Century

- CO 1.** Student will develop the ability to analyses sources for 20th Century Maharashtra History.
- CO 2.** Student will learn significance of regional history and Socio- Religious Reformism foundation of the region.
- CO 3.** It will enhance their Perception of 20th Century Maharashtra.
- CO 4.** Appreciate the skills of leadership and the Socio-Religious System of the Maharashtra.

DISCIPLINE SPECIFIC ELECTIVE COURSES (DSE-4D)- (3) CREDIT

Semester -VI, Course Title- Constitutional Development in India (1858-1950)

- CO 1.** Student will understand evolution of Constitution of India.
- CO 2.** Student will learn factors and conditions that contributed to Constitution of India
- CO 3.** Students will understand democratic processes and thereby strengthen Democracy.

SKILL ENHANCEMENT COURSES (SEC 2 D) – (2 CREDITS)

- CO 1.** To understand the introduction of Heritage Management to the Students
- CO 2.** To get an Opportunity to seek self-employment to the students

SKILL ENHANCEMENT COURSES (SEC 2 D) – (2 CREDITS)

Semester VI: 13 Course Title: - Archaeology

- CO 1.** Students will learn to understand the definition, aims and scope of Archaeology so as to understand its applications in interpreting the human past.
- CO 2.** They will be able to understand the nature of the archaeological record and the unique role of science in archaeology.
- CO 3.** They will have an overall understanding of the Archaeology.



SKILL ENHANCEMENT COURSES (SEC 2 D) – (2 CREDITS)

Semester VI -SEC:14 Course Title: Numismatics

CO 1. Students will be able to identify and decipher the Coins.

CO 2. They will also be able to understand the Socio-Political background that accure through the coinage of that time; thus getting holistic picture of that economic system prevalent in Ancient India.

M.A.- I : HISTORY (SEM- I):

1] HISTORY: THEORY AND METHOD

COURSE OUTCOMES (CO):

CO 1. The paper is designed to provide adequate conceptual base, bring better understanding of history and its forces.

CO 3. Help interrogate existing paradigms and challenge the outdated, help in developing critique.

CO 4. Help research in terms of formulating hypotheses and develop broad frames of interaction with other social sciences and attain certain level of Interdisciplinary approach.

2] EVOLUTION OF IDEAS AND INSTITUTIONS IN EARLY INDIA

COURSE OUTCOMES (CO):

1. The course intends to provide an understanding of the social, economic and institutional bases of early India.
2. It is based on the premise that an understanding of early Indian history is crucial to understand Indian history as a whole.

3] MARATHA POLITY

COURSE OUTCOMES (CO):

1. The purpose of the course is to study the administrative system of the Marathas in an analytical way, to acquaint the student with the nature of Maratha Polity,
2. to understand basic components of the Maratha administrative structure, to enable the student to understand the basic concepts of the Maratha polity.



4] HISTORY OF DECCAN – PRE HISTORY TO CHALUKYAS

COURSE OUTCOMES (CO):

1. The paper is designed to make the student aware of the background of the history of the region.
2. A broad survey of the pre-history which connects with the early history is aimed at emphasising the continuities and changes in terms of geographical and cultural conditions created by the rulers.

M.A .-I (SEM-II)

1] APPROACHES TO HISTORY

COURSE OUTCOMES (CO):

1. The paper is designed to make the student aware about the various approaches to the discipline of History.
2. With its roots in Indian history, the paper provides a historical review of the salient approaches that have developed over the last few centuries.
3. It is hoped that the student will become aware of the idea that the same set of historical source materials can be interpreted in different ways depending upon the approach one takes in studying them.

2] IDEAS AND INSTITUTIONS IN MEDIEVAL INDIA

COURSE OUTCOMES (CO):

1. The course examines the nature of medieval Indian society, economy, state formations, and the main religious currents of the time.
2. It is seen as a continuation of the course on ancient India. It is also seen to be crucial to an understanding of the nature of society, and the problems of the challenge to that society, through colonialism, at a later stage.

3] SOCIO-ECONOMIC HISTORY OF THE MARATHAS

COURSE OUTCOMES (CO):

1. The purpose of the course is to study socio-economic history of the Marathas in an analytical way.
2. To acquaint the student with the components of social structure and their functions, to understand the relationship between religion, caste, customs, traditions, class in 17th and 18th century Maratha Society, to enable the student to understand aspects of



economic life, to trace the determinants of changes in social and economic life.

4] MARATHAS IN 17TH AND 18TH CENTURY: POWER POLITICS

COURSE OUTCOMES (CO):

1. The course intends to study the role played by the Marathas in the context of India, the changing nature of Maratha State.
2. To understand and analyse the Maratha expansionism and its significance in various spheres.

M.A .-II, (SEMESTER III)

1] COURSE TITLE: CULTURAL HISTORY OF MAHARASHTRA

COURSE OUTCOMES (CO):

1. This paper is designed to help the student situate and interpret the cultural manifestations across historical memory which have contributed to the creation of the geopolitical region of Maharashtra.

2] COURSE TITLE: INTELLECTUAL HISTORY OF MODERN WORLD

COURSE OUTCOMES (CO):

1. The paper is seen as a prerequisite for understanding the concepts that are used in history, to acquaint the student with the intellectual activity that played an important role in shaping events; the transition from medieval to modern times.

3] COURSE TITLE: ECONOMIC HISTORY OF MODERN INDIA

COURSE OUTCOMES (CO):

1. To acquaint the student with structural and conceptual changes in Indian economy after coming of the British, to make them aware of the exploitative nature of the British rule.
2. To help them understand the process of internalization by Indians of new economic ideas, principles and practices. Content 1. European economic interests in India and

4] TITLE: DISSERTATION

COURSE OUTCOMES (CO):

1. The students will select a theme for their dissertation in consultation with the teacher.



2. They will work throughout the semester on the chosen topic. The Departmental Committee will assign a teacher to the student.

M.A .-II, (SEMESTER IV):

1] MODERN MAHARASHTRA: A HISTORY OF IDEAS (1818-1960)

COURSE OUTCOMES (CO):

1. The paper aims to let the students explore the ideas which have given Maharashtra its unique character.
2. It also hopes to offer a specialized knowledge of the Intellectual History of Maharashtra based on a critical reading of the original textual sources.

2] DEBATES IN INDIAN HISTORIOGRAPHY

COURSE OUTCOMES (CO):

1. The course is designed to introduce the student to some of the issues that have been debated by historians and to introduce some perspectives with reference to Indian History.

3] WORLD AFTER WORLD WAR II (1945-2000)

COURSE OUTCOMES (CO):

1. To acquaint the student with the post-World War II scenario and to enable them to understand contemporary world from the historical perspective.

4] HISTORY OF MODERN INDIA (1857-1971)

COURSE OUTCOMES (CO):

1. The purpose of this course is to enable the student to study the history of 'Modern India' from an analytical perspective; to make the student aware of the multi-dimensionality of Modern India.
2. To highlight the ideas, institutions, forces and movements that contributed to the shaping of Indian modernity; to acquaint the student with various interpretative perspectives.
3. To help them in articulating their own ideas and views leading to research orientation.



DEPARTMENT OF POLITICAL SCIENCE

• F.Y.B.A. COURSE OUTCOMES (CO) (Sem. I and II):

COURSE TITLE: INTRODUCTION TO INDIAN CONSTITUTION –I & II

CO1. To acquaint students with the important features of the Constitution of India and with The basic framework of Indian government.

CO 2. To familiarize students with the working of the Constitution of India.

• S.Y.B.A. COURSE OUTCOMES (CO)

COURSE TITLE:- POLITICAL THEORY& CONCEPTS

CO1.This is an introductory paper to the concepts, ideas and theories in political theory. It seeks to explain the evolution and usage of these concepts, ideas and theories with reference to individual thinkers both historically and analytically.

CO2.The different ideological standpoints with regard to various concepts and theories are to be critically explained with the purpose of highlighting the differences in their perspectives and in order to understand their continuity and change.

CO3.Furthermore there is a need to emphasize the continuing relevance of these concepts today and explain how an idea and theory of yesteryears gains prominence in contemporary political theory.

COURSE TITLE:- WESTERN POLITICAL THOUGHT

CO1. This paper studies the classical tradition in political theory from Plato to Marx with the view to understand how the great Masters explained and analyzed political events and problems of their time and prescribed solutions.

CO2.The texts are to be interpreted both in the historical and philosophical perspectives to understand the universality of the enterprise of political theorizing. The limitations of the classical tradition, namely its neglect of women's concerns and issues and the non-European world are critically examined.

CO3.The legacy of the thinkers is explained with the view to establish the continuity and Change within the Western political tradition.

COURSE TITLE:- POLITICAL SOCIOLOGY

CO1.To introduces students to the basic social processes of society, social institutions and patterns of social behaviour.



CO2. To train students to understand and to interpret objectively the role of social processes, social institutions and social interactions in their lives.

• **T.Y.B.A. COURSE OUTCOMES (CO)**

LOCAL SELF GOVERNMENT IN MAHARASHTRA

- CO 1.** To introduce the evolution of Local Self Government in Maharashtra
- CO 2.** To make students aware about 73rd and 74th Constitutional Amendments
- CO 3.** To introduce the students the structure of Local Self Government
- CO 4.** To make students aware about composition, power and functions of local bodies

SAMYUKTA MAHARASHTRA MOVEMENT

- CO 1.** This Course is an introduction to the political process in Maharashtra with special reference to regionalism sub-regionalism and Samyukta Maharashtra Movement.
- CO 2.** The aim of the course is that students are expected to understand both the historical evolution of Maharashtra's politics and different analyses of politics of the state.
- CO 3.** It tries to acquaint students with the main issues and concerns in the public life of a regional society as it shaped in the concept of colonialism, nationalism and modernity.

LOCAL SELF GOVERNMENT IN INDIA

- CO 4.** To acquaint the students with the Objectives, Structure and Functions of Local Government.
- CO 5.** To acquaint the students with the working of the urban and rural system of Local Government.
- CO 6.** To identify the role of Local Government in development.

FINANCIAL ADMINISTRATION

- CO 1.** To acquaint the students with the Objectives, Structure and Functions of Financial Administration
- CO 2.** To acquaint the students with the working of the system of Financial Administration.
- CO 3.** To identify the role of Financial Administration in Development.



DEPARTMENT OF GEOGRAPHY

COURSE OUTCOMES (CO) GEOGRAPHY (UG)

GEOMORPHOLOGY (GEO- SEM-I)

- CO1. Develop an idea about geomorphology and different types of fundamental concepts.
- CO2. Explain different types of geomorphic processes like weathering and mass wasting and cycle of erosion.
- CO3. Understand the processes of erosion, deposition and resulting landforms.
- CO4. Acquire knowledge about slope forms and processes.

PRACTICALS (GEO- SEM-I)

- CO1. Gain knowledge about topographical maps and apply this knowledge in ground surface.
- CO2. Identification of different types of rock and minerals.

HUMAN GEOGRAPHY (GEO- SEM-II)

- CO1. Gain knowledge about major themes of human geography.
- CO2. Develop an idea about space and society.
- CO3. Build an idea about population growth and distribution of population.
- CO4. . Know about population –resource relationship.

PRACTICALS (GEO-, SEM-II)

- CO1. Know about diagrammatic data presentation like line, bar and circle.
- CO2. Develop an idea about different types of thematic mapping techniques

SETTLEMENT GEOGRAPHY (GEO-, SEM-II)

- CO1. Build an idea about urban and rural settlements, and its relationship with environment and also different theories related to settlement geography.
- CO2. Know about classification and morphology of settlements.
- CO3. Understand the trends and patterns of world urbanization.
- CO4. Know about different theories of urban growth.

PRACTICALS (GEO- SEM-II)

- CO1. Brings direct interaction of different types of surveying instruments like Dumpy level and Theodolite with environment.
- CO2. Develop an idea about different types of thematic mapping technique

PHYSICAL GEOGRAPHY- PART I

- CO1. Understand different theories of the earth.



- CO2. Develop history of geomorphic ideas of different schools.
- CO3. Gain knowledge about earth's interior.
- CO4. Develop an idea about concept of earth's movements and related topography
- CO5. Acquire knowledge about different process of denudation.

PHYSICAL GEOGRAPHY - PART II

- CO1. Understand the processes of erosion, deposition and resulting landforms.
- CO2. Explain the development of drainage system in uniclinal and folded structure.
- CO3. Understand concept of normal cycle of erosion and its interruption.
- CO4. Develop an idea about types of coastal landforms.
- CO5. Acquire knowledge about hydrology.

T.Y.B.A. (Sem. V and VI)

GEOGRAPHY OF DISASTER MANAGEMENT-I CC1E(NO. OF CREDITS: 03)

- CO 1.** To introduce students the concept of disaster & its relation with Geography.
- CO 2.** To acquaint the students with the utility & application of hazards in different areas & its management.
- CO 3.** To make the students aware of the need of protection & disaster management

GEOGRAPHY OF TOURISM- I CC1E(NO. OF CREDITS: 03)

- CO 1.** To understand the history of Tourism
- CO 2.** To introduce the students to the basic concepts in Tourism Geography.
- CO 3.** To understand the types of Tourism
- CO 4.** To gain knowledge different aspects of Tourism Geography.

GEOGRAPHY OF INDIA -I DSE 1 C(NO. OF CREDITS: 03)

- CO 1.** To acquaint the students with geography of our Nation.
- CO 2.** To make the student aware of the magnitude of problems and Prospects at National level.
- CO 3.** To help the students to understand the inter relationship between the subject and the society.
- CO 4.** To help the students to understand the recent trends in regional studied.



GEOGRAPHY OF RURAL DEVELOPMENT -I DSE 1 C(NO. OF CREDITS: 03)

- CO 1.** To understand the concept, nature and scope of rural development in India.
- CO 2.** To overview various approaches to rural development.
- CO 3.** To discuss some important issues related to rural development.
- CO 4.** To study various schemes and policies for rural health in India.

PRACTICAL GEOGRAPHY- I

(Techniques of Spatial Analysis) DSE- 2 C

(No. of Credits: 04)

- CO 1.** To introduce the basic concepts and techniques of Geographical Analysis.
- CO 2.** To introduce the students with SOI Toposheets and acquire the Knowledge of Toposheet interpretation.
- CO 3.** To introduce the students with Weather Maps and acquire the Knowledge of its interpretation.
- CO 4.** To introduce the students with Aerial Photographs and Satellite Images and acquire knowledge to interpret it .
- CO 5.** To acquaint students with the spatial and structural characteristics of Practical Geography.

SEC 2 C VALUE/SKILL BASED COURSE RESEARCH METHODOLOGY – I CREDIT - 2

- CO 6.** To develop the understanding of the basic concept of research
- CO 7.** To develop the understanding of the basic framework of sampling and data collection
- CO 8.** To develop the understanding of various sampling methods and techniques

GEOGRAPHY OF TOURISM- II CC1F(NO. OF CREDITS: 03)

- CO 1.** To understand the history of Tourism
- CO 2.** To introduce the students to the basic concepts in Tourism Geography.
- CO 3.** To understand the types of Tourism
- CO 4.** To gain knowledge different aspects of Tourism Geography.

Semester VI

GEOGRAPHY OF INDIA -II DSE1 D(NO. OF CREDITS: 03)

- CO 1.** To acquaint the students with geography of our Nation.
- CO 2.** To make the student aware of the magnitude of problems and Prospects at National level.
- CO 3.** To help the students to understand the inter relationship between the subject and the society.



CO 4. To help the students to understand the recent trends in regional studied

GEOGRAPHY OF RURAL DEVELOPMENT II DSE 1 D (NO. OF CREDITS: 03)

CO 1. To study the problems and policies related to education in rural areas.

CO 2. To create awareness among the students about various area development programmes and Target Group Programmes implemented in India.

CO 3. To create a positive approach for rural development among the students through the examples of successful case studies.



COMMERCE SECTION



FACULTY OF COMMERCE

SEMESTER – I

FINANCIAL ACCOUNTING- I

- CO 1. To impart knowledge of basic accounting concepts
- C O 2. To create awareness about application of these concepts in business world
- C O 3. To impart skills regarding Computerised Accounting
- C O 4. To impart knowledge regarding finalization of accounts of various establishments.

BUSINESS MATHEMATICS & STATISTICS- I

- C O 1. To introduce the basic concepts in Finance and Business Mathematics and Statistics
- C O 2. To familiar the students with applications of Statistics and Mathematics in Business
- C O 3. To acquaint students with some basic concepts in Statistics.
- C O 4. To learn some elementary statistical methods for analysis of data.
- C O 5. The main outcome of this course is that the students are able to analyze the data by using some elementary statistical methods

ORGANIZATIONAL SKILLS DEVELOPMENT- I

- C O 1. To introduce the students to the emerging changes in the modern office environment
- C O 2. To develop the conceptual , analytical , technical and managerial skills of students efficient office organization and records management
- C O 3. To develop the organizational skills of students
- C O 4. To develop Technical skills among the students for designing and developing effective means to manage records , consistency and efficiency of work flow in the administrative section of an organisation
- C O 5. To develop employability skills among the students

MARKETING AND SALESMANSHIP- I

- CO 1. To introduce the basic concepts in Marketing.
- CO 2. To give the insight of the basic knowledge of Market Segmentation and Marketing Mix
- CO 3. To impart knowledge on Product and Price Mix.
- CO 4. To establish link between commerce, business and marketing.
- CO 5. To understand the segmentation of markets and Marketing Mix.
- CO 6. To enable students to apply this knowledge in practicality by enhancing their skills in the field of Marketing.



CONSUMER PROTECTION AND BUSINESS ETHICS – I

- CO 1. To develop general awareness of consumerism among the students.
- CO 2. To understand the consumers rights, responsibility and role of United Nations.
- CO 3. To have a comprehensive understanding about the existing law on consumer protection in India.
- CO 4. To create awareness among the students about dispute redresses machinery and basic procedures for handling consumer dispute.
- CO 5. To understand the issues relating to e-commerce, e-Banking emerging issues and internet regulations.

BUSINESS ENVIRONMENT & ENTREPRENEURSHIP – I

- CO 1) To understand the concept of Business Environment and its aspects
- CO 2) To make students aware about the Business Environment issues and problems of Growth
- CO 3) To examine personality competencies most common to majority of successful entrepreneurs and to show how these competencies can be developed or acquired
- CO 4) To understand the difference between Entrepreneurial and non-Entrepreneurial behaviour
- CO 5) To provide knowledge of the significance of Entrepreneurship in economy
- CO 6) To familiarize the students with the contribution of selected institutes working to promote Entrepreneurship
- CO 7) To generate entrepreneurial inspiration through the study of successful Entrepreneurs

SEMESTER- II

FINANCIAL ACCOUNTING- II

- CO 1. To impart knowledge of various software used in accounting
- CO 2. To impart knowledge about final accounts of charitable trusts
- CO 3. To impart knowledge about valuation of intangible assets
- CO 4. To impart knowledge about accounting for leases.

BUSINESS MATHEMATICS AND STATISTICS – II

- CO 1. To introduce the basic concepts in Finance and Business Mathematics and Statistics
- CO 2. To familiar the students with applications of Statistics and Mathematics in Business
- CO 3. To acquaint students with some basic concepts in Statistics.
- CO 4. To learn some elementary statistical methods for analysis of data.
- CO 5. The main outcome of this course is that the students are able to analyze the data by using some elementary statistical methods



ORGANIZATIONAL SKILL DEVELOPMENT- II

- CO 1. To imbibe among the students the qualities of a good manager and develop the necessary skill sets
- CO 2. To develop the technical skills of the students to keep up with the technological advancements and digitalization
- CO 3. To develop the communication skills of students and introducing them to the latest tools in communication
- CO 4. To develop writing, presentation, interpersonal skills of the students for effective formal corporate reporting.
- CO 5. To educate the students on the recent trends in communication technology and tools of office automation.

MARKETING AND SALESMANSHIP- FUNDAMENTAL OF MARKETING- II

- CO 1. To help the students to prepare themselves for opportunities in marketing field.
- CO 2. To study elaborately the process of salesmanship.
- CO 3. To know about Rural Marketing which is an important sector in modern competitive Indian Scenario.
- CO 4. To educate the students about the sources and relevance of Recent trends in Marketing.

BUSINESS ETHICS – II

- CO 1. To enhance students' general awareness of ethical dilemmas at work.
- CO 2. To understand differing perceptions of interests in business-related situations
- CO 3. To introduce the concept of Corporate Social Responsibility, corporate Governance and explore its relevance to ethical business activity
- CO 4. To examine whether ethics set any boundaries on Accounting, marketing, IT, Social Media and workplace.
- CO 5. To prepare students to play a constructive role in improving the sustainable development with which they may become involved

S.Y.B.COM

BUSINESS COMMUNICATION

- CO 1. To understand the concept, process and importance of communication.
- CO 2. To acquire and develop good communication skills requisite for business correspondence.
- CO 3. To develop awareness regarding new trends in business communication.
- CO 4. To provide knowledge of various media of communication.
- CO 5. To develop business communication skills through the application and exercises.



CORPORATE ACCOUNTING

CO 1. To acquaint the student with knowledge about various Concepts , Objectives and applicability of some important accounting standards associated with to corporate accounting.

CO 2. To develop understanding among the students on the difference between commencement and incorporation of a company and the accounting treatment for transactions during the two phases.

CO 3. To update the students with knowledge for preparation of final accounts of a company as per Schedule III of the Companies Act 2013

CO 4. To empower to students with skills to interpret the financial statements in simple and summarized manner for effective decision making process.

CO 5. To acquaint the student with knowledge about various Concepts , Objectives and applicability of some important accounting standards associated with to corporate accounting.

CO 6. To develop understanding among the students on the difference between commencement and incorporation of a company and the accounting treatment for transactions during the two phases.

CO 7. To update the students with knowledge for preparation of final accounts of a company as per Schedule III of the Companies Act 2013

CO 8. To empower to students with skills to interpret the financial statements in simple and summarized manner for effective decision making process

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BUSINESS MANAGEMENT

CO 1. To provide basic knowledge and understanding about various concepts of Business Management. CO 2. To help the students to develop cognizance of the importance of management principles.

CO 3. To provide an understanding about various functions of management.

CO 4. To provide them tools and techniques to be used in the performance of the managerial job.

ELEMENTS OF COMPANY LAW

CO 1. To develop general awareness of Elements of Company Law among the students.

CO 2. To understand the Companies Act 2013 and its provisions.

CO 3. To have a comprehensive understanding about the existing law on formation of new company in India.

CO 4. To create awareness among the students about legal environment relating to the company law.

CO 5. To acquaint the students on e-commerce, E governance and e-filing mechanism relating to Companies.

CO 6. To enhance capacity of learners to seek the career opportunity in corporate sector.



MARKETING MANAGEMENT

- CO 1. To create awareness and impart knowledge about the basics of Marketing Management which is the basic foundation of Marketing subject.
- CO 2. To orient the students in Marketing Strategy and Consumer Behaviour.
- CO 3. To help students understand how to craft Marketing Plan which help the organisation outline their marketing goals and objectives.
- CO 4. To enable students to apply this knowledge in practicality by enhancing their skills in the field of Marketing.

T.Y.B.COM.

Subject Name: BUSINESS REGULATORY FRAMEWORK

- CO 4. To provide conceptual knowledge about the framework of business Law in India.
- CO 5. To orient the students about the legal aspect of business.
- CO 6. To create awareness among the students about legal environment relating to the Contract Law, Partnership Act, Sale of Goods Act in India.
- CO 7. To understand the emerging issues relating to e-commerce, e-transaction issues and E Contracts
- CO 8. To seek the career opportunity in corporate sector relating to business law in India.
- CO 9. To acquaint students with the basic concepts, terms & provisions of Mercantile and Business Laws.

Paper: ADVANCED ACCOUNTING – I

- CO 1. To acquaint the student with knowledge about various concepts, objectives, and applicability of some important accounting standards.
- CO 2. To develop the knowledge among the students about reorganization of business regarding restructuring the capital.
- CO 3. To update the students with knowledge for preparation of final accounts of a Banking Companies with the provisions of Banking Regulation Act
- CO 4. 1949.
- CO 5. To empower to students with skills to prepare the investment account in simple and summarized manner.
- CO 6. To instill the knowledge about accounting procedures, methods and techniques.
- CO 7. To impart students' knowledge of various Advanced Accounting Concepts.

Subject: INDIAN & GLOBAL ECONOMIC DEVELOPMENT



- CO 1.** Students will be able to understand present Economic Scenario of Indian Economy as well as World Economy.
- CO 2.** Students will be able to understand the various aspects of development in Agricultural, Industrial and service sector in India.
- CO 3.** Student will be able to critically evaluate the role of India in international economy.
- CO 4.** Students will be able to evaluate the working of international financial organization and institutions.

Subject: **INTERNATIONAL ECONOMICS-I**

- CO 1.** To acquaint the students with the basic theories of international trade and international economics.
- CO 2.** To help the students evaluate the working and functions of international organizations and institutions.
- CO 3.** To develop a foundation in the subject that will help the students in their future academic and professional ventures.
- CO 4.** Students will be able to understand present Economic Scenario of Indian Economy as well as World Economy.
- CO 5.** Students will understand the working of foreign trade market and foreign exchange market.
- CO 6.** Students will be able to comprehend trade policies and concepts related to trade policies.

Subject: **AUDITING**

- CO 1.** To acquaint themselves about the Definition, Nature, Objectives and Advantages of Auditing, Types of Audit, Errors and Fraud, Audit Program, Notebook, Working Paper, Internal Control, Check.
- CO 2.** To get knowledge about concept of Checking, Vouching, Verification and Valuation, Types of Audit Report and Auditing Assurance Standard.
- CO 3.** To understand the provision related Qualification, Disqualification, Appointment, Removal, Rights, Duties and Liability of Company Auditor and
- CO 4.** Provisions regarding Tax Audit as per Income Tax Act 1961 (Section 44 AA to 44AE).
- CO 5.** To know the various new concepts in computerized system and Forensic Audit.



Subject : - BUSINESS ADMINISTRATION – II (HUMAN RESOURCE MANAGEMENT)

- CO 1.** To acquaint the student with knowledge about various Concepts , Objectives of the Human Resource Function , to identify the difference between Human Resource Management and Human Resource Development
- CO 2.** To update the students on the emerging trends in the area of Human Resource Management
- CO 3.** To develop understanding among the students the process of Recruitment and Selection, understanding the various means and methods associated with the Recruitment and Selection function
- CO 4.** To educate the students on the importance of Training and Development and its impact on Career Planning and Development.
- CO 5.** To acquaint the students on the concept of Performance Appraisal ,d the process for effective Performance appraisal and imbibe the values of Ethical Performance appraisal among the students.

SPECIAL ELECTIVE COURSE (Special Course – II)

Banking and Finance-Special Paper II (Semester-V)

(Financial Markets and Institutions in India – I Course code: **355-B**)

- CO 1.** To acquaint the students with Indian Financial System and its various segments.
- CO 2.** To make the students aware about Indian Money Market.
- CO 3.** To analyse and understand the functions of Indian Capital Market.
- CO 4.** To enable the students the functioning of Foreign Exchange Market.

SUBJECT NAME: - BUSINESS LAWS AND PRACTICE PAPER II (BLP-II)

- CO 1.** To develop an understanding of the significant provision of selective Business & labour Laws.
- CO 2.** To acquaint the students to address a basic business legal application-oriented issues.
- CO 3.** To impart the students with the fundamental understanding of important business laws.
- CO 4.** To study & acquaint students an application based knowledge of various Business & Labour Laws.
- CO 5.** To familiar the students with legal Business Environment of India.
- CO 6.** To develop & strengthen students through the legal practical knowledge and their importance to the Indian Business organizations.



Subject: -- : **CO-OPERATION & RURAL DEVELOPMENT ((SPECIAL PAPER-II)**

- CO 1.** To create awareness among students about co-operative marketing
- CO 2.** To develop the capability of students for knowing different types Marketing.
- CO 3.** To create awareness about the role of National Agricultural Co-operative Marketing Federation (NAFED)

Subject Name - : **COST AND WORKS ACCOUNTING. SPECIAL PAPER II**

Subject Title - :Overhead and Accounting for Overheads

- CO 1.** To provide knowledge about the concepts and principles of overheads.
- CO 2.** To Introduce the cost accounting standards and the cost accounting standard board.
- CO 3.** To understand the stages involved in the accounting of overheads.
- CO 4.** To build an ability towards strategic overhead accounting under Activity Based Costing.

Subject Name: - **BUSINESS STATISTICS II**

- CO 1.** To understand and Master the concepts of Probability.
- CO 2.** To understand the concepts of discrete probability distributions.
- CO 3.** To make students to understand the art of applying statistical techniques to solve some real life problems.
- CO 4.** To gain knowledge of Statistical Computations.

Subject - : **BUSINESS ENTREPRENEURSHIP (SPECIAL PAPER II)**

- CO 1.** To Develop understanding of MSME and its formation
- CO 2.** To Develop Knowledge and understanding in creating and managing new venture.
- CO 3.** To Equip students with necessary tools and techniques to set up their own business venture
- CO 4.** To help students to bring out their own business plan.
- CO 5.** To make students aware about business crises and sickness.

Subject: **AGRICULTURAL AND INDUSTRIAL ECONOMICS II**

- CO 1.** To understand the concept of Agricultural Marketing and related Issues.
- CO 2.** To impart adequate knowledge role of Agricultural Processing in India.
- CO 3.** To understand the Role, Importance and Growth of Major Industries in India.



CO 4. To get acquainted with the role and problems of Public sector Enterprises in India.

Subject: **DEFENCE BUDGETING FINANCE AND MANAGEMENT SPECIAL PAPER – II**

- CO 1.** Understanding the importance of Defence Budget
- CO 2.** To know the latest development of Indian Defence Industry.
- CO 3.** To know the concept financial management regarding defence.
- CO 4.** Understanding Defence Expenditure.

Subject- **INSURANCE, TRANSPORT & TOURISM-I**

- CO 1.** To acquaint the students with basic insurance terminology.
- CO 2.** To aware about risk management and develop proper understanding in insurance.
- CO 3.** To study the various pricing elements and its importance.
- CO 4.** To review the various legislations and its application to insurance business in India

Subject- **COMPUTER NETWORKING AND E-COMMERCE-I.**

- CO 1.** To know about computer network.
- CO 2.** To understand different topologies used in networking
- CO 3.** To learn different types of network.
- CO 4.** To understanding the use of connecting device used in network.

Subject : - **BUSINESS ADMINISTRATION – III (FINANCE)**

- CO 1.** To acquaint the student with knowledge about Corporate Finance and the structure if the Indian Financial Market
- CO 2.** To develop the Financial Planning Skills among the Students by introducing them to the process of efficient Financial Planning
- CO 3.** To educate the students on the importance of Capitalisation and the importance to maintaining an optimum capital structure
- CO 4.** To create awareness among the students in the various sources of Finance available for raising corporate capital



SPECIAL ELECTIVE COURSE (Special Course – III)

Banking and Finance-Special Paper III (Sem.V)

(Banking Law and Practices in India – I Course code: **356-B**)

- CO 1.** To familiarize the Banking Laws and Practice in correlation to the Banking System in India.
- CO 2.** To understand the legal aspects of Banking transactions and its implication as a Banker and as a customer.
- CO 3.** To familiarize the students with the Banking Laws and Practices in India.
- CO 4.** To make students capable of understanding and applying the legal and practical aspects of banking to help them technically sound in banking parlance.

SUBJECT NAME: - **BUSINESS LAWS AND PRACTICE PAPER II (BLP-II)**

- CO 1.** To impart the students with the fundamental understanding of rules & regulations under various business laws.
- CO 2.** To study & acquaint students an application & overview based knowledge of Laws.
- CO 3.** To make the students aware about legal Business Environment of India.

Subject: -- : **CO-OPERATION & RURAL DEVELOPMENT ((SPECIAL PAPER-III)**

- CO 1.** To acquaint students with the Co-operative Management.
- CO 2.** To study the Co-operative Organization and Management

Cost and Works Accounting Special Paper III

Name - : **TECHNIQUES OF COST ACCOUNTING**

- CO 1.** To prepare learners to understand the basic techniques in Cost Accounting
- CO 2.** To understand the learner, application of Cost Accounting techniques in cost control and decision making.
- CO 3.** To enable the learners to prepare various types of Budgets.
- CO 4.** To learn the basic concept of Uniform Costing and Inter-firm comparison
- CO 5.** To enhance the knowledge of students about MIS and Supply Chain Management.

BUSINESS STATISTICS – III



- CO 1.** To understand and Master the concepts of Game Theory.
- CO 2.** To understand and Master the concepts of Statistical Decision Theory.
- CO 3.** To understand and Master the concepts of Replacement and Sequencing Problems
- CO 4.** To understand and Master the concepts of Statistical Quality Control.

Subject : - **BUSINESS ENTREPRENEURSHIP (SPECIAL PAPER-III)**

- CO 1.** To acquaint students with knowledge and skills required for organizing and carrying out entrepreneurial activities.
- CO 2.** To develop the ability of analyzing and understanding business situations.
- CO 3.** To study the interdependent, fast-changing and diverse world of entrepreneurship and innovation.
- CO 4.** To familiarize students with various concepts and processes involved in entrepreneurship and business formation and development.
- CO 5.** To provide students with the knowledge, skills and motivation to encourage entrepreneurial approach in a variety of settings.
- CO 6.** To study the application of group dynamics to counseling, personal growth and other psychologically-oriented groups.

SPECIAL ELECTIVE COURSE (SPECIAL COURSE PAPER – III)

Marketing Management _Course Code: **356(H)**

- CO 1.** To introduce the concept of advertising and advertising media.
- CO 2.** To provide the students the knowledge about appeals and approaches in advertisement.
- CO 3.** To acquaint the students to the economic ,social and regulatory aspects of advertising.
- CO 4.** To make the student understand the role of Brand Management in marketing.
- CO 5.** To enable the students to apply this knowledge in precisely enhancing their skills in the field of advertising.

Subject: **AGRICULTURAL AND INDUSTRIAL ECONOMICS II**

- CO 1.** To understand the concept of Agricultural Marketing and related Issues.
- CO 2.** To impart adequate knowledge role of Agricultural Processing in India.
- CO 3.** To understand the Role, Importance and Growth of Major Industries in India.
- CO 4.** To get acquainted with the role and problems of Public sector Enterprises in India.

Subject: **DEFENCE BUDGETING FINANCE AND MANAGEMENT SPECIAL PAPER – III**



- CO 1. To understand the impacts of war & how the economic structure affects
- CO 2. To know the elements of war ability
- CO 3. To understand the challenges in 21st century against Defence.
- 4. To Understand the system of financial management in Defence

Subject: **INSURANCE, TRANSPORT & TOURISM-I**

- CO 1. To know the insurance customer and their behaviors.
- CO 2. To understand the principles of underwriting and its process.
- CO 3. To study the insurance market and its regulators.
- CO 4. To review the insurance business, challenges and its prospects.

POST- GRADUATE: COURSE OUTCOME (COS)

MANAGEMENT ACCOUNTING

- CO 1 To enhance the abilities of learners to develop the concept of management accounting and its significance in the business.
- CO 2 To enhance the abilities of learners to analyze the financial statements.
- CO 3 To enable the learners to understand, develop and apply the techniques of management accounting in the financial decision making in the business corporates.
- CO 4 To make the students develop competence with their usage in managerial decision making and control

STRATEGIC MANAGEMENT

- CO 1 To introduce the students to the emerging changes in the modern business environment
- CO 2 To develop the analytical, technical and managerial skills of students in the various areas of Business Administration
- CO 3 To empower to students with necessary skill to become effective future managers and leaders
- CO 4 To develop Technical skills among the students for designing and developing effective Functional strategies for growth and sustainability of business

PRODUCTION & OPERATION MANAGEMENT

- CO 1 To understand and develop deep insight of Production & Operation Management.
- CO 2 To understand & identity business problems involving operational function, planning and control, design development and quality management.



CO 3 Demonstrate awareness and importance of application, operation and supply chain management. CO 4 To develop skills necessary to effectively analyze and synthesize the many inter relationship inherent in complex socio-economic productive systems.

CO 5 To increase the knowledge and perspective to gain from emerging trends in production and operation management.

FINANCIAL MANAGEMENT

CO 1 To acquaint the student with knowledge of various Financial Management terminologies (Investment ,Credit Planning , Working Capital Management

CO 2 To understand the concepts relating to Financing & Financial Statement Analysis

CO 3 To utilize the information gathered to reach an optimum conclusion by a process of reasoning

CO 4 To enable the students to use their learning to evaluate , make decisions and provide recommendations.

FINANCIAL ANALYSIS & CONTROL

CO 1 To enable the students to acquire knowledge of financial analysis and control tools

CO 2 To Make appropriate application and uses of financial analysis and control.

INDUSTRIAL ECONOMICS

CO 1 To make the students understand concepts of industrial economics

CO 2. To help the students know theories of industrial economics

CO 3. To impart students' knowledge about sources of industrial finance and Indian industrial growth.

BUSINESS ETHICS & PROFESSIONAL VALUES

CO 1 To raise the students general awareness on the ethical dilemmas at work place

CO 2. To understand the differing perceptions of interest in business related solutions

CO 3. To present the concept of Corporate Social Responsibility and explore its relevance to ethical obligations and ethical ideals present in the relationship between employers and employees

CO 4. To investigate whether ethics set any boundaries on competition , marketing, sales and advertising

CO 5. To enable students to validate or correct , personal ideas about various ethical perspectives

CO 6. To enable students to develop their own considered judgment about issues in Business Ethics



CO 7. To foster more careful, disciplined thinking in trying to resolve issues in business ethics

CO 8. To prepare students to play a constructive role in improving the sustainable development with which they may become involved.

ELEMENTS OF KNOWLEDGE MANAGEMENT

CO 1 To develop Analytical and Research oriented skills among the students.

CO 2 To understand value application and relevance of Knowledge management in today's corporate world.

CO 3 To promote research and innovation ideas based on Knowledge Management.

CO 4 To enhance knowledge level and practice of linking theoretical background with applied Social Science.

BUSINESS FINANCE

CO 1 To acquaint the students with corporate finance required for Indian Industries.

CO 2. To make the students aware about the latest developments in the field of corporate finance.

CO 3. To enable the students to understand the traditional theories of capitalization and dividend distribution practices.

CO 4. To give detail exposure of working capital management practice of finance to students Skills to be developed.

RESEARCH METHODOLOGY FOR BUSINESS

CO 1 To acquaint the students with the areas of Business Research Activities

CO 2 To enhance capabilities of students to conduct the research in the field of business and social sciences

CO 3 To enable students in developing the most appropriate methodology for their research studies

CO 4 To make them familiar with the art of using different research methods and techniques.

HUMAN RESOURCE MANAGEMENT

CO 1 To understand the basic concepts of Human Resource Management and changing role of HRM in business.

CO 2 To impart adequate knowledge and analytical skills in the field of HRM, HRP and development, Recruitment and Selection Process.

CO 3 To understand the concepts of Training and Development, Performance Appraisal and Merit Rating.

CO 4 To expose the students to the concept, significance and uses of the concepts like Retirement/ Retrenchment Strategies and Recent Trends in HRM



CO 5 To know the concept of Competency mapping

CO 6 To understand the E-HR and recent trends in Human Resource management.

ORGANIZATIONAL BEHAVIOUR

CO 1 To make the students understand various concepts of organization behaviour

CO 2. To provide in depth knowledge about process of formation of group behaviour in an organization set up

CO 3 To know the motivational process and emotional intelligence.

CO 4 To understand the concept of stress and conflict and effects of work culture.

CAPITAL MARKET AND FINANCIAL SERVICES

CO 1. To acquaint the students with working of capital market.

CO 2. To make the students aware about the latest developments in the field of capital market in India. CO 3. To enable the students to understand various transactions in stock exchanges and agencies involved in it.

CO 4. To give exposure of financial services offered by various agencies and financial adviser to students.

INDUSTRIAL ECONOMIC ENVIRONMENT

CO 1 To provide knowledge about basic issues in Industrial Economic Environment to students.

CO 2. To make students aware about Industrial pattern and growth in India and Industrial policies of India since independence.

CO 3. To study the progress and current problems of major industries in India

RECENT ADVANCES IN BUSINESS ADMINISTRATION

CO 1. To familiarize the students with the recent advancements in business administration

CO 2. To develop an understanding about tools and their application in the business.

CO 3. To understand the basic concepts of Change Management and their approaches.

CO 4. To impart adequate knowledge and analytical of cross cultural Management.

CO 5. To impart the basic concept and strategies of customer centric Management.

CO 6. To expose the students to the concept, Innovation Management



DEPARTMENT OF BACHLOR OF COMPUTER APPLICATIONS (BBA/CA)

PROGRAM: BBA (COMPUTER APPLICATION) DEPARTMENT OF COMPUTER APPLICATIONS

Class: FYBBA(CA) Semester - I

COURSE: BUSINESS COMMUNICATION SKILLS BBA(CA) 101 CC: 3

CO1 Concept of Communication Apply communication theories. Show an understanding of opportunities in the field of communication.

CO2 Methods and types of Communication Demonstrate critical and innovative thinking. Display competence in oral, written, and visual communication

CO3 Business Correspondence Use current technology related to the communication field. Demonstrate positive group communication exchanges.

COURSE : PRINCIPLES OF MANAGEMENT BBA(CA) (102) CC : 3

CO1 Nature of management To learn basic aspects of management thinking Develop ability of managerial thinking & cultivate business acumen

CO2 Evolution of management thought To understand different approaches of management scientist to management thought & philosophy To help to understand various approaches of management thinking

CO3 Major managerial functions To understand different functions of management & their roles. Develop ability to organise various programs & events.

CO4 Recent trends in management To understand the themes in modern management & changes in the business To learn about new systems of management.

COURSE : C PROGRAMMING BBA(CA) 103 CC : 3

CO1 Introduction Explore algorithmic and flowchart approaches to problem solving.

CO2 Managing I/O Operations To Familiar with Fundamentals(character set ,Input Output etc.)

CO3 Decision Making and looping Developing Conditional and Iterative statement



CO4 Programs through conditional and looping statements Practice on Program to develop logical thinking.

CO5 Arrays and Strings Ability to work with Advance concept.(arrays,Strings).

CO6 Functions Understanding a concept of functional(modular concept).

CO7 Introduction to pointer Ability to work with Pointer in c.

CO8 Structures To learn User define datatype (structure,union)

Course : DBMS (DATABASE MANAGEMENT SYSTEMS BBA(CA) (104) CC:3

CO1 File Structure and Organization To understand the file structure and its organization.

CO2 Database Management System Students get the knowledge of Relational Database concepts which is the basic requirements of every organization.

CO3 Relational Model Give a description of the Database Management structure.

CO4 SQL (Structured Query Language) Students are able to Compare relational model with the Structured Query Language (SQL)

CO5 Relational Database Design Students are able to Normalize the complex data into simple tables.

COURSE: STATISTICS BBA(CA) (105) CC :3

CO1 Concept of statistics. To Explains the history, definition and scope of Statistics and Differentiates population and sample.

CO2 Measures of central tendency and dispersion To Recognizes central tendency and various measures of central tendency To learn how to Explains and evaluates various measures of central tendency.

CO3 Measures of Dispersion : To Recognizes the importance of measuring dispersion and Explains and evaluates the measures of dispersion.

COURSE : PRINCIPLES OF PROGRAMMING AND ALGORITHM BBA(CA) 107 CC :2

CO1 Algorithms To understand importance of algorithm, program development cycle, how programs are been developed sequentially with help of algorithm.

CO2 Flowchart To learn designing of algorithm and flow of programs with the help of flowchart



CO3 Function To understand the use of function, library function and recursion with its syntax

CO4 Array to understand definition, characteristics and types of array.

SEM II COURSE: ORGANISATIONAL BEHAVIOUR& HUMAN RESOURCE MANAGEMENT BBA(CA) (201) CC :3

CO 1 Introduction to OB To understand the basic concept of OB and to will also acquaint about major trends in OB

CO 2 Introduction to HRM To get basic knowledge of HRM practices carried out in today's scenario.

CO 3 Procurement To know the process of recruitment and selection of employees in an organization.

CO 4 Training & Development To know the training and development methods and evaluation of employees skills in organization.

COURSE: FINANCIAL ACCOUNTING BBA(CA) (202) CC :3

CO1 Financial Accounting- definition and Scope, objectives, Accounting concepts, principles and conventions To understand role and importance of accounting in Business and how accounting concept can be implemented in business

CO2 Voucher system; Accounting Process, To understand how to record different financial Journals, Ledger, Cash Book , subsidiary books ,Trial Balance preparation of Final Accounts of Sole Proprietorship(Trading and Profit & Loss Account and Balance Sheet transactions and their financial implications

CO3 Meaning, importance and preparation of Bank Reconciliation Statement To understand the kind of accounting relationship between customer and bank.

CO4 Computerized Accounting- Role of computers and Financial application, Accounting Software packages To understand growing importance of software and to know how to use software and to write books of accounts Ability to use software like tally for writing of accounts.

COURSE NAME: BUSINESS MATHEMATICS BBA (CA) 203 CC: 3

CO 1 Ratio, Proportional and Percentage To learn how to apply the various concepts in business situation.

CO 2 Profit and loss To understand how to examine concept of discounts in different business solutions

CO 3 Interest and Annuity Shares and Mutual Fund To learn how to Work with simple and compound interest, annuities, invoice preparation, trade discounts, taxes,



CO 4 Matrix and Determinant To understand how to Perform the matrix operations of addition, multiplication and transposition and express a system of simultaneous linear equations in matrix form 2.determine whether or not a given matrix is invertible and if it is, find its inverse .

CO 5 Linear programming Problem To learn how to Develop linear programming (LP) models.

CO 6 Transportation Problem To Understand the mathematical tools that are needed to solve optimization problems. Use mathematical software to solve the proposed models.

Course : RDBMS (RELATIONAL DATABASE MANAGEMENT SYSTEMS) BBA (CA) (204)

CO1 Introduction To RDBMS Understanding of various RDBMS products, Use of relational database

CO2 PL-SQL To understand various data types , operators , functions and control statements To understand concept of compact program writing by making use of functions and procedure

CO3 Transaction Management To brief about the Database Management structure. To Understanding use of transaction and effect on database

CO4 Concurrency Control & Recovery System To understand concept of shared and exclusive lock To learn how to prevent deadlock situation.

COURSE: WEB TECHNOLOGY (HTML- JS-CSS) BBA (CA) (205) CC :3

CO1 Introduction Learn client and server, HTTP, FTP, IP protocols, WWW, Response and Request mechanism.

CO2 Web Design Details how to design a website its look and feel, its planning etc.

CO3 HTML All html tags and how to create webpage using html.

CO4 Style Sheets CSS in detail with its implementation for creating website.

CO5 JavaScript Understand how to develop web based applications.

COURSE: ADVANCE C BBA (CA) 207 CC: 2

CO1 Pointer To Design and develop pointer program

CO2 File handling To Understand the concept of File Handling

CO3 Graphics To Design and develop graphics program

Class: SY BBA (CA) Semester III

COURSE: RELATIONAL DATABASE MANAGEMENT SYSTEM BBA (CA) 201

CO1 Introduction to RDBMS To Understand RDBMS produt,relationaldatabase,knowledge of front end and back end



CO2 PL/SQL To Understanding the programming aspects, writing of triggers, procedure, function and package program

CO3 Transaction management To Understanding use of transaction and effect on database and understanding various states

CO4 Concurrency Control To understand concept of shared and exclusive lock, Understand what deadlock is and how it can occur when giving mutually exclusive access to multiple resources

CO5 Recovery System To learn concepts related to hardware failures, Data recovery with different techniques and Data recovery with different techniques.

COURSE : DATA STRUCTURE USING 'C' BBA(CA) 202

CO1 Basic Concept and Introduction to Data Structure To understand need and types of data structure. Ability to analyze algorithms and a algorithm correctness.

CO2 Searching and Sorting Techniques To understand and implement different searching and sorting techniques

CO3 Linked List To efficiently implement the linked list data structures and solution for specific problems.

CO4 Stack and Queue To efficiently implement the stack and queue data structures and solution for specific problems.

CO5 Trees To efficiently implement the tree data structures and solution for specific problems.

CO6 Graph To efficiently implement the graph data structures and solution for specific problems.

COURSE: OPERATING SYSTEMS BBA (CA) 303

CO1 Introduction to OS System Structure To explain the fundamental components of a computer operating system.

CO2 Process Management Process Scheduling Process Synchronization To Define, restate, discuss, and explain the policies for scheduling, To Understand the process management policies and scheduling of processes by CPU.

CO3 Multithreaded Programming To Define thread and to learn how to Analyze and design the applications to run in parallel either using process or thread models of different OS.

CO4 Deadlocks To Define, restate, discuss, and explain the concept of deadlocks in real life. To Understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system

CO5 Memory Management To Define, restate, discuss, and explain the policies for memory management, To Describe and analyze the memory management and its allocation policies.

CO6 File System To Define, restate, discuss, and explain the policies for file systems.



CO7 I/O System To Define, restate, discuss, and explain the policies for file systems.

COURSE: BUSINESS MATHEMATICS BBA (CA) 304

CO 1 Ratio, Proportional and Percentage Ability to apply the various concepts in business situation.

CO 2 Profit and loss Ability to examine concept of discounts in different business solutions

CO 3 Interest and Annuity To Work with simple and compound interest, annuities, invoice preparation, trade discounts, taxes.

CO 4 Matrix and Determinant To Perform the matrix operations of addition, multiplication and transposition and express a system of simultaneous linear equations in matrix form

CO 5 Linear programming Problem To Develop linear programming (LP) models.

CO 6 Transportation Problem To Understand the mathematical tools that are needed to solve optimization problems. Use mathematical software to solve the proposed models.

COURSE : SOFTWARE ENGINEERING BBA (CA) (305)

CO1 Introduction to System Concepts To learn about basic concepts of systems, Characteristics of system and it's types.

CO2 Requirement Analysis To learn about system analysis, Feasibility study and it's type and Fact finding techniques.

CO3 Introduction to Software Engineering To understand definition of software engineering and It's goals. To learn about how to measure quality of software.

CO4 Software Development Methodologies To understand the strength and weakness of models.

CO5 Analysis and Design Tools To understand designing of system using various types of diagrams. To learn about ER diagram, DFD, Decision table and tree, Data dictionary.

CO6 Structured System Design To learn about module concepts, coupling and cohesion To understand how to construct structure chart.

CO7 Software Testing To learn characteristics of testing . To learn about types of testing and its use.

SEMESTER : IV COURSE: OBJECT ORIENTED PROGRAMMING USING C++ BBA (CA) (401)

CO1 Introduction to C++ To understand the features of C++ and object oriented programming language.

CO2 Tokens, Expressions and Control structures To Understanding the basic concepts.

CO3 Functions in C++ To Implement and built modules in C++.

CO4 Classes and Objects To Understand how to build object oriented software using C++.

CO5 Inheritance and Polymorphism. (object oriented concepts) To Understand how to apply the major object-oriented concepts like inheritance, polymorphism.



CO6 Managing console I/O operations , Working with Files and Templates(Advantage of c++) To Understand advanced features of C++ specifically stream I/O and templates.

COURSE : VISUAL BASIC BBA (CA) (402)

CO1 Getting started with VB To learn about basic concepts of visual basic and application area of VB.

CO2 Constant,variable,opertators,controstruktur e,looping and array To learn programming skill. To learn basic syntax of VB.

CO3 Working with controls To understand various control, properties and events. To develop application using controls.

CO4 With withActivex control and Menus To understand the use of active control To learn how to create menus and submenus

CO5 Working with database To learn connectivity between VB and database. To understand report generation using Data Environment.

COURSE : COMPUTER NETWORKING BBA(CA) 403

CO1 Basics of Computer Networks To know about Network Administrator in any organization.

CO2 Network Models To learn how noise, attenuation, and distortion affect signal traveling through a transmission medium; discuss the factors affecting data rate as well as the theoretical limits on data rate over a noiseless and a noisy channel. To Identify the different types of network topologies and protocols

CO3 Transmission Media To Understand the concept of reliable and unreliable transfer protocol of data and how protocol based on socket programming.

CO4 Wired and Wireless LANs To Understand connecting LAN's, backbone networks, and virtual LAN's.

CO5 Network Connectivity Devices To learn with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

CO6 Internet Basics To learn basics of internet.

COURSE :ENTERPRISE RESOURCE PLANNING AND MANAGEMENT BBA (CA) (404)

CO1 ERP :An overview To introduce ERP.

CO2 Enterprise Modelling and Integration for ERP To understand Business Model and Architecture about ERP systems.

CO3 ERP and Related Technologies To Know about Technologies related ERP for Ex-CRM,BPR etc.

CO4 ERP Implementation To know implementation of ERP And the Obstacles in that.



CO5 Technologies In ERP system To learn about EDI and IDoc application .

CO6 The ERP Domain To know about SAP and Other ERP domain Tool.

CO7 ERP present and Future To know Current Working ERP system and future Requirements of ERP system.

COURSE: HUMAN RESOURCE MANAGEMENT BBA (CA) (405)

CO1 Introduction To HRM To develop the understanding of the concept of human resource management and to understand its relevance in organizations.

CO2 Performance Appraisal, Training and development To develop necessary skill set for application of various HR issues. To analyse the strategic issues and strategies required to select and develop manpower resources.

CO3 Wages and Salary Administration To Apply the factors determining pay rates Ability to implement Employee benefits and Welfare measures

CO4 Grievance and discipline To learn how to implement practices related employee separation

CO5 The E-HR To Evaluate the functions, methods and ways of eHRM .

CLASS:TY BBA (CA) SEM :V COURSE: JAVA PROGRAMMING BBA (CA) (501)

CO1 Introduction to Java To understand the basic fundamentals and important terminologies of java.

CO2 Classes and Objects To understand how to create classes and objects and new functionalities like Interface, Packages etc.

CO3 Collection Get detailed knowledge of collection, map, Iterator etc.

CO4 File and Exception Handling Understand exception and file handling in detailed

CO5 Applet, AWT and Swing Programming To understand how to create small internet applications using applet and know how to create GUI in java using AWT and Swing.

COURSE : WEB TECHNOLOGY BBA (CA) (502)

CO1 Web Essentials To understand 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. To introduce about Clients- Servers and Communication & Internet-Basic ,Internet Protocols

CO2 Markup languages To Understand how to develop static web based applications. To know about different HTML tags & CSS style sheet.

CO3 Javascript To Introduce client scripting language which is used for creating web page along with HTML and validating data accepted in HTML pages.

CO4 Introduction of PHP basics To Understand server side scripting language that is embedded in HTML.

CO5 Functions & string in PHP To Explaining different functions & string built in functions in php.

CO6 Arrays in PHP To Explaining different types & built in functions of arrays in php.



COURSE: VB.NET BBA (CA) (503)

CO1 Introduction to .Net Framework To introduce .Net framework.

CO2 Introduction to VB.Net To understand how to use various controls, methods and event of those controls.

CO3 Object Oriented Programming in VB .Net To understand how to create class and object and know to know about object oriented programming language.

CO4 Architecture Of ADO.Net To know Architecture of ADO.Net

CO5 Crystal Report To understand how to reports.

COURSE :OBJECT ORIENTED SOFTWARE ENGINEERING BBA (CA) (504)

CO1 Object Oriented Concepts , Modeling and UML Students should be aware about the OO concepts and Overview of UML.

CO2 Basic and Advanced Structural Modeling Students should be aware about the Structural diagrams of UML.

CO3 Basic behavioral and Architectural Modeling Students Should be able to Know Behavioral diagram of UML.

CO4 Object Oriented Analysis Students should be able to know Iterative type of SDLC .

CO5 Object Oriented Design Student should be able to know various type of Designing Methods.

SEM VI COURSE: ADVANCED WEB TECHNOLOGY BBA (CA) (601)

CO1 Introduction to Object Oriented Programming in PHP To Explain class, object, inheritance & interface concepts in php.

CO2 Web Techniques To introduce about Clients- Servers and Communication & Web server and Web browser

CO3 Databases To learn PHP and MYSQL database connectivity

CO4 XML To Learn styling, formatting and various XML parsers used for websites.

CO5 Web services To Explain concept of Web service.

CO6 Ajax To understand Design of dynamic and interactive web sites 3)Students learn various recent web technologies viz. PHP, XML, AJAX etc used for client side and server side scripting.

COURSE : ADVANCED JAVA BBA (CA) 602

CO1 JDBC To understand database connectivity with MS access and SQL server.

CO2 Networking To understand client server technology.

CO3 JSP To understand creation of dynamic web pages.

CO4 Servlet To understand creation of dynamic web pages through server.

CO5 Multithreading To understand concepts of thread and develop application using multithreading.



CO6 Java Beans To introduce Java beans and Beans development Kit.

CO7 RMI To introduce RMI, Stubs and Skeleton

COURSE : RECENT TRENDS IN IT BBA (CA) 603

CO1 Software Process And Project Metrics, Analysis Concepts And Principles To study Eco friendly software development.

CO2 Distributed Databases Main objective is to understand the principles and foundations of distributed databases.

CO3 Data Warehouse To learn architecture of Data Warehouse

CO4 Network Security To understand data security and its importance

CO5 Computing and Informatics To learn concept of cloud computing.

COURSE: SOFTWARE TESTING BBA (CA) (604)

CO1 Software Testing Fundamentals of testing

CO2 Approaches to Testing – I Types of testing in details

CO3 Testing for Specialized Environments Able to test on GUI's and all real time systems

CO4 Software Testing Strategies & Software metrics Types of testing in details