

Lonavala Education Trust's
Dr. B.N. Purandare Arts, Smt. S.G. Gupta Commerce and Smt. Shardaben Amrutlal Mithaiwala Science College, Lonavala-410403.
Department of Chemistry

Chemistry Course Outcomes_(A.Y. 2021-2022)

| S.N | Class | Course Name | Course Code | Course Credit/L | Course Outcomes |
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| 1 | F.Y.B.Sc | Physical Chemistry | CH-101 | 2 Credit/36L | <ol style="list-style-type: none">1. After completing the course work, the learner will be acquired with knowledge of chemical energetics, Chemical equilibrium and ionic equilibria.2. Students will be able to apply thermodynamic principles to physical and chemical process3. Calculations of enthalpy , Bond energy, Bond dissociation energy , resonance energy4. Relation between Free energy and equilibrium and factors affecting equilibrium constant.5. Exergonic and endergonic reaction6. Concept to ionization process occurred in acids, bases and pH scale7. Related concepts such as Common ion effect hydrolysis constant, ionic product, solubility8. product9. Degree of hydrolysis and pH for different salts , buffer solutions |
| 2 | F.Y.B.Sc | Organic Chemistry | CH-102 | 2 Credit/36L | <p>Students will learn Fundamentals of organic chemistry, stereochemistry (Conformations, configurations and nomenclatures) and functional group approach for aliphatic hydrocarbons. In that,</p> <ol style="list-style-type: none">1. The students are expected to understand the fundamentals, principles, and recent developments in the2. subject area.3. It is expected to inspire and boost interest of the students towards chemistry as the main subject. |

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| | | | | | <ol style="list-style-type: none"> 4. To familiarize with current and recent developments in Chemistry. 5. To create a foundation for research and development in Chemistry. |
| 3 | F.Y.B.Sc | Chemistry Practical-I | CH-103 | 1.5Credit/47L | <ol style="list-style-type: none"> 1. The practical course is in relevance to the theory courses to improve the Understanding of the concepts. 2. It would help in the development of practical skills of the students. 3. Use of microscale techniques wherever required 4. Importance of chemical safety and Lab safety while performing experiments in laboratory 5. Determination of thermochemical parameters and related concepts 6. Techniques of pH measurements 7. Preparation of buffer solutions 8. Elemental analysis of organic compounds (non instrumental) 9. Chromatographic Techniques for separation of constituents of mixtures |
| 4 | F.Y.B.Sc | Inorganic Chemistry | CH-201 | 2 Credit/36L | <ol style="list-style-type: none"> 1. Students will learn quantum mechanical approach to atomic structure, Periodicity of elements, various theories for chemical bonding. 2. Various theories and principles applied to reveal atomic structure 3. Origin of quantum mechanics and its need to understand structure of hydrogen atom 4. Explain rules for filling electrons in various orbitals- Aufbau's principle, Pauli exclusion principle, Hund's rule of maximum multiplicity 5. Discuss electronic configuration of an atom and anomalous electronic configurations. 6. Attainment of stable electronic configurations. 7. Define various types of chemical bonds- Ionic, covalent, coordinate and metallic bond |
| 5 | F.Y.B.Sc | Analytical Chemistry | CH-202 | 2 Credit/36L | Students will know about the basics of analytical chemistry, some techniques of analysis and be able to do calculations essential for analysis. |

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| | | | | | <ol style="list-style-type: none"> 1. Perspectives of analytical Chemistry, analytical problems 2. Calculations of mole, molar concentrations and various units of concentrations which will be helpful for preparation of solution 3. Relation between molecular formula and empirical formula, Stoichiometric calculation 4. Basics of type determination, characteristic tests and classifications, reactions of different functional groups. 5. Separation of binary mixtures and analysis, Elemental analysis -Detection of nitrogen, sulfur, halogen and phosphorus by Lassaigne's test, Purification techniques for organic compounds. 6. Basics of chromatography and types of chromatography pH meter and electrodes for pH measurement |
| 6 | F.Y.B.Sc | Chemistry Practical–II | CH-203 | 1.5 Credit/47L | <ol style="list-style-type: none"> 1. The practical course is in relevance to the theory courses to improve the Understanding of the concepts. 2. It would help in the development of practical skills of the students. 3. Use of microscale techniques wherever required 4. Inorganic Estimations using volumetric analysis 5. Synthesis of Inorganic compounds 6. Analysis of commercial products 7. Purification of organic compounds 8. Preparations and mechanism of reactions involved |
| 7 | S.Y.B.Sc | Physical and Analytical Chemistry | CH-301 | 2 Credit/36L | After studying this course, the student will be able to know and understand the basics in chemical kinetics, surface chemistry, errors in quantitative analysis and volumetric analysis. |
| 8 | S.Y.B.Sc | Inorganic and Organic Chemistry | CH-302 | 2 Credit/36L | After studying this course, the student will be able to know and understand the concepts in molecular orbital theory in covalent bonding, coordination compounds, aromatic hydrocarbons, alkyl and aryl halides, alcohols, phenols and ethers. |
| 9 | S.Y.B.Sc | Chemistry Practical- III | CH-303 | 2 Credit/73L | <p>After studying this course, the student will be able to know and be aware about following practical skills.</p> <ol style="list-style-type: none"> 1. Verify theoretical principles experimentally |

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| | | | | | <ol style="list-style-type: none"> 2. Interpret the experimental data on the basis of theoretical principles. 3. Correlate the theory to the experiments. Understand / verify theoretical principles by experiment or explain practical output with the help of theory. 4. Understand systematic methods of identification of substances by chemical methods. 5. Write a balanced equation for all the chemical reactions performed in the laboratory. 6. Perform organic and inorganic synthesis and be able to follow the progress of the chemical reaction. 7. Set up the apparatus properly for the designed experiments. 8. Perform the quantitative chemical analysis of substances and be able to explain principles behind it. 9. Systematic working skills in the laboratory will be imparted to students. |
| 10 | S.Y.B.Sc | Physical and Analytical Chemistry | CH-401 | 2 Credit/36L | After studying this course, the student will be able to know and understand the basics of phase equilibrium, ideal and real solutions, conductometry, calorimetry and column chromatography. |
| 11 | S.Y.B.Sc | Inorganic and Organic Chemistry | CH-402 | 2 Credit/36L | <p>After studying this course, the student will be able to know and understand:</p> <ol style="list-style-type: none"> 1. Isomerism in coordination complexes 2. Valence Bond Theory of Coordination Compounds 3. Crystal field Theory 4. Aldehydes and ketones 5. Carboxylic acids and their derivatives 6. Amines and Diazonium Salts 7. Stereochemistry of Cyclohexane |
| 12 | S.Y.B.Sc | Chemistry Practical - IV | CH-403 | 2 Credit/73L | <p>After studying this course, the student will be able to know and understand:</p> <ol style="list-style-type: none"> 1. Verify theoretical principles experimentally 2. Interpret the experimental data on the basis of theoretical |

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| | | | | | <p>principles.</p> <ol style="list-style-type: none"> 3. Correlate the theory to the experiments. Understand / verify theoretical principles by experiment or explain practical output with the help of theory. 4. Understand systematic methods of identification of substances by chemical methods. 5. Write a balanced equation for all the chemical reactions performed in the laboratory. 6. Perform organic and inorganic synthesis and be able to follow the progress of the chemical reaction. 7. Set up the apparatus properly for the designed experiments. 8. Perform the quantitative chemical analysis of substances and be able to explain principles behind it. |
| 13 | T.Y.B.Sc | Physical Chemistry-I | CH-501 | 2 Credit/36L | <p>After completion of the course student should be able to know and understand:</p> <ol style="list-style-type: none"> 1. Know the historical development of quantum mechanics in chemistry. 2. Understand the Molecular structure, Microwave, Infrared and Raman spectroscopy. 3. Know the Photochemistry, Thermal & Photochemical Processes, Photochemical Reactions. 4. Various photochemical phenomena like fluorescence and phosphorescence, Chemiluminescence. |
| 14 | T.Y.B.Sc | Analytical Chemistry-I | CH-502 | 2 Credit/36L | <p>After studying this course, the student will be able to know and understand:</p> <ol style="list-style-type: none"> 1. Define basic terms in gravimetry, spectrophotometry, qualitative analysis and parameters in instrumental analysis. 2. Identify important parameters in analytical processes or estimations. 3. Perform quantitative calculations depending upon equations the student has studied in the theory. 4. Differentiate/distinguish / Compare among the different analytical terms, process and analytical methods. |

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| 15 | T.Y.B.Sc | Physical Chemistry Practical-I | CH-503 | 2 Credit/73L | After completion of the course student should be able to understand the practical skills about Refractometry, Spectrophotometry and Colorimetry, Conductometry, Viscosity, Photofluorometer. |
| 16 | T.Y.B.Sc | Inorganic Chemistry-I | CH-504 | 2 Credit/36L | After studying this course, the student will be able to know and understand basics of <ol style="list-style-type: none"> 1. Molecular Orbital Theory of Coordination Compounds 2. Inorganic Reaction Mechanism 3. Chemistry of transition elements 4. Chemistry of f-block elements 5. Metals, Semiconductors and Superconductors |
| 17 | T.Y.B.Sc | Industrial Chemistry | CH-505 | 2 Credit/36L | After studying this course, the student will be able to know and understand the basic concepts in <ol style="list-style-type: none"> 1. Modern Approach to Chemical Industry 2. Manufacture of Basic Chemicals 3. Sugar and Fermentation Industry 4. Soap and Detergents Industry 5. Dyes and Pigments |
| 18 | T.Y.B.Sc | Inorganic Chemistry Practical-I | CH-506 | 2 Credit/73L | After studying this course, the student will be able to know and understand the skills of identification of inorganic qualitative analysis, gravimetric estimations, preparation skills and knowledge of inorganic complexes. |
| 19 | T.Y.B.Sc | Organic Chemistry-I | CH-507 | 2 Credit/36L | After studying this course, the student will be able to know and understand basics of <ol style="list-style-type: none"> 1. Polynuclear and Heteronuclear Aromatic Compounds 2. Active Methylene Compounds 3. Rearrangement Reactions 4. Elimination reactions |
| 20 | T.Y.B.Sc | Chemistry of Biomolecules | CH-508 | 2 Credit/36L | After studying this course, the student will be able to know and understand basics of <ol style="list-style-type: none"> 1. Introduction to molecular logic of life |

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| | | | | | <ol style="list-style-type: none"> 2. Carbohydrates 3. Lipids 4. Amino acids and Proteins 5. Enzymes 6. Hormones |
| 21 | T.Y.B.Sc | Organic Chemistry Practical-I | CH-509 | 2 Credit/73L | <p>After studying this course, the student will be able to know and understand:</p> <ol style="list-style-type: none"> 1. Separation of Binary Mixtures and Qualitative Analysis 2. Basic principles of green and sustainable chemistry. 3. Understand the techniques involving drying and recrystallization by various method 4. Expertise the various techniques of preparation and analysis of organic substances. 5. Understand the purification technique used in organic chemistry. 6. Understand the principle of Thin Layer Chromatographic techniques. |
| 22 | T.Y.B.Sc | Polymer Chemistry | CH-510 | 2 Credit/36L | <p>The students are expected to learn the following aspects of Polymer Chemistry:</p> <ol style="list-style-type: none"> 1) History of polymers. 2) Difference between simple compounds and polymers. 3) Names of polymers. 4) Various ways of nomenclature. 5) Difference between natural, synthetic, organic and inorganic polymers. 6) Terms-Monomer, Polymer, Polymerization, Degree of polymerization, Functionality, Number average, Weight average molecular weight. 7) Mechanisms of polymerization. 8) Polymerization techniques. 9) Uses & properties of polymers. 10) Role of polymer industry in the economy. 11) Advantages of polymers. |
| 23 | T.Y.B.Sc | Environmental Chemistry | CH-511A | 2 Credit/36L | <p>After studying this course, the student will be able to know and understand basics of</p> <ol style="list-style-type: none"> 1. Concepts and Scope of Environmental Chemistry |

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| | | | | | <ol style="list-style-type: none"> 2. Hydrosphere and Water Pollution 3. Analytical Techniques in water Analysis 4. Water pollution and treatment methods |
| 24 | T.Y.B.Sc | Physical Chemistry-II | CH-601 | 2 Credit/36L | After studying this course, the student will be able to know and understand the basics of Electrochemical Cells , Crystal structure and Nuclear Chemistry. |
| 25 | T.Y.B.Sc | Physical Chemistry-III | CH-602 | 2 Credit/36L | After studying this course, the student will be able to know and understand the concepts and meaning in Colligative properties of dilute solutions, Kinetics of Reactions in the Solid State , Electronic structure and macroscopic properties and Polymers. |
| 26 | T.Y.B.Sc | Physical Chemistry Practical-II | CH-603 | 2 Credit/36L | After studying this course, the student will be able to know and understand the practical skills of experiments using potentiometer and PH meter. To know about Radioactivity experiments, colligative properties and turbidimetry. |
| 27 | T.Y.B.Sc | Inorganic Chemistry-II | CH-604 | 2 Credit/36L | <p>After studying this course, the student will be able to know and understand basics of</p> <ol style="list-style-type: none"> 1. Organometallic Chemistry 2. Homogeneous and Heterogeneous catalysis 3. Bioinorganic Chemistry 4. Inorganic Polymers 5. Inorganic solids/ionic liquids of technological importance |
| 28 | T.Y.B.Sc | Inorganic Chemistry-III | CH-605 | 2 Credit/36L | <p>After studying this course, the student will be able to know and understand:</p> <ol style="list-style-type: none"> 1 Acid–Base and Donor–Acceptor Chemistry 2 Ionic Solids 3 Chemistry of Zeolites 4 Introduction to Nanochemistry 5 Chemical Toxicology |
| 29 | T.Y.B.Sc | Inorganic Chemistry Practical-II | CH-606 | 2 Credit/36L | After studying this course, the student will be able to know and understand: Volumetric estimations, Flame Photometry, Column |

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| | | | | | Chromatography, Nanomaterial synthesis. |
| 30 | T.Y.B.Sc | Organic Chemistry-II | CH-607 | 2 Credit/36L | <p>After studying this course, the student will be able to know and understand:</p> <ol style="list-style-type: none"> 1. Students will learn the principle of mass spectroscopy, its instrumentation and nature of mass spectrum. 2. Students will understand the principle of UV spectroscopy and the nature of UV spectrum. They will learn types of electronic excitations. 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. 4. Students will understand the principle of IR spectroscopy, types of vibrations and the nature of IR spectrum. 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. 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. 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. 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). 9. Stereochemistry of Disubstituted Cyclohexane and Decalin |
| 31 | T.Y.B.Sc | Organic Chemistry-III | CH-608 | 2 Credit/36L | <p>After studying this course, the student will be able to know and understand:</p> <ol style="list-style-type: none"> 1. Retrosynthetic Analysis and Applications 2. Organic Reaction Mechanism and Synthetic Applications 3. Reagents in Organic Synthesis 4. Natural Products |
| 32 | T.Y.B.Sc | Organic Chemistry Practical-II | CH-609 | 2 Credit/36L | <p>After studying this course, the student will be able to know and understand:</p> |

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| | | | | | <ol style="list-style-type: none"> 1. Interpretation of IR and NMR spectra 2. Organic Estimations-Glucose, Glycine 3. Organic Extractions- Caffeine from tea leaves,etc 4. Column chromatographic techniques. |
| 33 | T.Y.B.Sc | Chemistry of Soil and Agrochemicals | CH-610 | 2 Credit/36L | <ol style="list-style-type: none"> 1. After studying this course, student is expected to 2. Understood various components of soil and soil properties and their impact on plant growth. 3. Understood the classification of the soil. 4. Explore the problems and potentials of soil and decide the most appropriate treatment for land use. 5. Understand the Reclamation and management of soil physical and chemical constraints. 6. Useful in making decisions on nutrient dose, choice of fertilizers and method of application etc. practiced in crop production. 7. Got experience on advanced analytical and instrumentation methods in the estimation of soil. 8. Understood various Nutrient management concepts and Nutrient use efficiencies of major and micronutrients and enhancement techniques. 9. Proper understanding of the chemistry of pesticides will be inculcated among the students. 10. 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. |
| 34 | T.Y.B.Sc | Analytical Chemistry | CH-611A | 2 Credit/36L | <ol style="list-style-type: none"> 1. After completion of the course student should able to 2. Define basic terms in solvent extraction, basics of chromatography, HPLC, GC, and AAS and AES. 3. Identify important parameters in analytical processes or estimations. 4. Explain different principles involved in the analyses using solvent extraction, basics of 5. instrumental chromatography, HPLC, GC, and atomic spectroscopic techniques. 6. Perform quantitative calculations depending upon equations |

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| | | | | | <p>students have studied in the theory.</p> <ol style="list-style-type: none">7. Discuss / Describe procedure for different types analyses included in the syllabus.8. Select a particular method of analysis if an analyte sample is given to him.9. Differentiate / distinguish / compare among the different analytical terms, process and analytical methods.10. Demonstrate / explain theoretical principles with help of practical.11. Design analytical procedure for given sample.12. Apply whatever theoretical principles he has studied in theory during practice in the laboratory. |
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Department of Physics

(Year 2021-22)

Three Year B.Sc. Physics Undergraduate programme

The department is mainly emphasized on following three principles,

- 1) **Understanding basic Physics:** Starting from F.Y.B.Sc. students department always focused on to make understand basic concepts in Physics in a simple way and with day today examples. The courses such as Physics principles and applications and mechanics help students to gain knowledge about contribution of Scientist in the development of modern physics.
- 2) **Problem solving and Practical Skills:** In the S.Y.B.Sc. course to develop the skills of physics problems solving (related to their day today life examples) the courses such as Mathematical methods in Physics and electronics are included in the syllabus. Including these courses two more courses such as waves, oscillations and sound and optics developed the practical skills among the students. To develop the deep and recent knowledge in T.Y.B.Sc. Physics student's various disciplines in Physics such as Electronics, Classical Mechanics, Quantum mechanics, Material Science, Nuclear Physics, Atomic and Molecular Physics etc are introduced. To get awareness related to basic software programs computational Physics (C-Programming) is also included in the course.
- 3) **Employment related skills:** All and all, F.Y.B.Sc., S.Y.B.Sc. and T.Y.B.Sc. is three year B.Sc. Physics undergraduate programme which introduces the pursuit of **Physics**, its historical discoveries, inventions and recent developments in modern Physics. It also provides the technical background required for shaping their career in Physics.

CHOICE BASED CREDIT SYSTEM: Savitribai Phule Pune University is changing from the conventional course structure to Choice Based Credit System (CBCS) along with introduction to semester system at first year B.Sc from the academic year 2019-20, S.Y.B.Sc. from the academic year 2020-21 and T.Y.B.Sc. Physics from 2021-22. The semester system will help B.Sc. students in developing the skill-oriented teaching-learning process. In future the choice-based credit system can adapt the interdisciplinary environment among B.Sc. Physics students, so that they will have choice to have their career in specialized subject in

physics such as Nanotechnology, Energy of materials and so on. In support to this, Savitribai Phule Pune University has introduced Skill Enhancement Courses in T.Y.B.Sc. credit pattern syllabus to develop knowledge skill or technical skill amongst the students.

Programme Outcomes:

PO1: Learning outcomes

After successful completion of this course students will be able to,

- 1) understand the basic concepts in Physics and relate them to their day today life.
- 2) achieve depth knowledge of scientific and technological aspects of Physics.
- 3) enrich knowledge through problem solving, hand on activities, study visits, projects etc.

PO2: Professional Skill outcomes:

After successful completion of this course students will be able to,

- 1) Inculcate the presentation skills and laboratory practical skills.
- 2) develop skills related to research, education, industry, and market.

Programme Specific Outcomes (PSO's)

PSO1) To create foundation for research and development in the modern subjects such as Electronics, Nanotechnology, Renewable Energy Sources.

PSO2) To develop analytical abilities towards real world problems.

PSO3) To help students' build-up a progressive and successful career in Physics.

Course Outcomes (CO's)

CO1: F.Y.B.Sc.

Mechanics and Properties of Matter:

- Revision of Newton's Laws of motion and demonstrate it with day today examples.
- Basics of work-Energy, Surface Tension, Elasticity, Viscosity, and fluid mechanics by solving related problems.

Physics Principles and its Applications:

- To understand the basics and development in the understanding of atomic structure.
- To understand the basic principle of LASER, its LASER action, and various Applications.
- To understand the types of bonds and their roles in the formation of molecules.
- To understand the historical perspective, general properties, and applications of Electromagnetic waves.

Heat and Thermodynamics:

- To define the fundamentals of Thermodynamics and laws of Thermodynamics.
- To understand the heat transfer mechanism such as Carnot's cycle, Carnot's heat engine, different heat engines such as Otto engine and diesel engine.
- To understand the construction and working of different types of thermometers used in laboratory and industries.

Electricity and Magnetism:

- To understand the fundamentals of Electrostatics and Magnetostatics by learning the different related laws in Physics which describes the electric and magnetic fields in detail.
- To understand the concept and application of dielectrics.
- To understand the different properties of magnetic materials.

CO2: S.Y.B.Sc.

Mathematical Methods in Physics

- To introduce the complex numbers with its different forms (rectangular, polar and exponential form) and study applications of complex numbers.
- To study the different forms of differentiation such as partial, total, exact etc. by solving related problems.
- To revise the scalar and vector product and to study its triple product with problems.

Electronics

- To apply different network theorems related to electrical circuits.
- To understand basics and working of transistors.
- To understand the working principle and working of operational amplifiers.
- To study different number system and detail working of logic gates.

Oscillation, Waves and Sound

- To understand the difference in undamped, damped and forced oscillations with their numerical expressions and examples.
- To study the basics of wave motion, their types and related concepts in detail.
- To study the different characteristics and its related concepts of sound such as Doppler effect and its applications.

Optics

- To describe the fundamental concepts of lenses and their different aberrations.
- To understand the concept of focal length and cardinal points with problems.
- To understand the basic operation of many optical devices.
- To study in detail about interference, diffraction, and polarization.

CO3: T.Y.B.Sc.

Mathematical methods in Physics

- To understand cartesian, spherical polar and cylindrical co-ordinate systems, transformation equations, and general curvilinear co-ordinate system.
- To demonstrate the special theory of relativity with examples.
- To understand the differential equation and special functions in detail.

Solid state physics

- To understand the concepts related to crystalline state such as Lattice, Basis, Translational vectors, Primitive unit cell, Symmetry operations, Different types of lattices 2D and 3D (Bravais lattices), Miller indices, Inter planer distances and its different types (SC,FCC and BCC) with their characteristics.
- To introduce X-ray diffraction and other characterization techniques, free electron and band theory in metals and magnetism concepts in detail.

Classical Mechanics:

- To explain the mechanics of system of particles and their motion in a central force field.
- To study the scattering of a particles in centre of mass frame and laboratory frame.
- To introduce the Langrangian and Hamiltonian formulation for N particle system.
- To solve the problems related to canonical transformation and Poisson's bracket.

Atomic and Molecular Physics

- To make understand the history of development in understanding the basic particles of atomic structure and study its energy levels and spectra.
- To demonstrate the one and two electron systems.
- To study the observed Zeeman effect in atoms and molecules.
- To understand the theory and experimental of X-ray, Raman, and Molecular spectroscopies.

Computational Physics

- To study the concepts in programming like flowchart and algorithm.
- To understand the basic structure of C-programming, its keywords, registers, character set etc.
- To study the graphics in C with examples.
- To study the various possible errors in this language.

Elements of Material Science

- To study the different types of defects in metals.
- To understand the single and molecular phases in metals.
- To study Ceramic materials and phase diagrams.
- To introduce smart materials, their properties, and applications.

Classical Electrodynamics

- To revise the basic laws and detailed theory of electrostatics and magnetostatics.
- To study electrodynamics and its numerical.

Quantum Mechanics

- To understand the origin of quantum mechanics.
- To introduce the new concepts in modern physics such as Schrodinger equations and its applications.
- To solve the problems related to operators in quantum mechanics.

Thermodynamics and Statistical physics

- To revise the kinetic theory of gasses and related concepts such as mean free path, viscosity etc.
- To demonstrate Maxwell's relations and applications.
- To understand the elementary concepts of statistics, distribution of systems of particles, statistical ensembles, and quantum statistics.

Nuclear Physics

- To revise the fundamental properties of the nucleus.
- To introduce the concept of radioactivity and related phenomena.
- To understand about the nuclear forces, nuclear reactions, and nuclear energy in detail.
- To understand the theory of particle accelerators and detectors.

Electronics

- To study the various types of diodes, transistor amplifiers, Field effect transistors, and operational amplifiers.
- To understand about timers, different components of regulated power supply.
- To demonstrate sequential logic circuits.

Lasers

- To introduce the theory and function of LASER and its action.
- To understand about Laser oscillator and its output in detail.
- To study about characteristics, types, and applications of lasers.

Skill Enhancement Courses (SEC)

Energy Studies

- Learn to conduct energy audits and provide consultancy.
- To inculcate skills to implement solar P-V systems at domestic levels, educational institutions, and office premises.
- To become self-employed in the field of biomass energy sources, biogas plants, gasifiers, windmills, hybrid systems etc.

Physics Workshop Skill

- To learn handling and testing various instruments in Physics Laboratory.

Solar PV System: Installation, Repairing and Maintenance

- To learn basics of light conversion in electricity.
- To hands on training will motivate to use Solar PV system.
- To become entrepreneur / self-employed.
- To analysed of MSEB electricity bill and design and sizing of off-grid PV system
- To participants will learn about solar PV module and batteries used in solar PV plant.

Photography

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

- Understand the basic principle, structure and handling techniques in digital photography.
- Students will be able to develop and apply photographic skills using digital photography tools including digital editing, saving, sizing, and posting of the images
- Students get proficient at the technical aspect of photographing with a digital camera.
- Students can identify and apply appropriate business practices specific to the self-employed professional photographer

Department of Mathematics
Programme Specific Outcomes and Course outcomes

Programme Specific Outcomes (PSO):

The completion of the B.Sc. Programme will help students to:

- i) Communicate mathematics strongly by written, computational and graphic means.
- ii) Create mathematical ideas from basic axioms.
- iii) Use mathematics to solve problems by analysing and understanding
- iv) Identify applications of mathematics to the real-world problems

Course Outcomes (CO)

1. Algebra (MT-111)

This course will help students to

- Identify injective, surjective and bijective functions.
- Find inverse of function.
- Apply Euclid's algorithm to find GCD of integers.
- Apply Fermat's theorem to compute remainders
- Apply De-Moivre's theorem to find nth roots of a complex number.

2. Calculus I (MT-112)

This course will help students to

- Determine real numbers satisfying inequations.
- Apply density theorem to find rational number between two irrationals.
- Determine convergence and divergence of sequences.
- Study $\varepsilon - \delta$ definition of limit of a function.
- Study continuity of function on an interval.
- Locate intervals in which the root of the equation occurs.

3. Mathematics Practical (SEM I) (MT-113)

This course will help students to

- Develop computational skills
- Use MAXIMA software to solve mathematical problems
- Use Maxima software to visualize and confirm mathematical concepts graphically.

4. Analytical Geometry (MT-121)

This course will help students to

- Study translation and rotation of axes
- Identify, classify conics and reducing general second degree term to standard form.
- Find equation of plane in normal form
- Find angle between planes, distance between parallel planes.
- Find equation of line in symmetric form.
- Find angle between line and plane, condition of Coplanarity of lines.
- Find equation of spheres in different forms.
- Find plane section of sphere.
- Find equation of tangent plane to the sphere.

5. Calculus II (MT-122)

This course will help students to

- Study mean value theorems
- Find limit using the L'Hospital Rule.
- Find nth derivatives using Leibnitz theorem
- Find Taylor's and Maclaurin's series
- Solve linear ordinary differential equations
- Solve exact differential equations
- Solve non exact differential equations using integrating factors

6. Mathematics Practical (SEM II) (MT-123)

This course will help students to

- Develop computational skills
- Use MAXIMA software to solve mathematical problems
- Use Maxima software to visualize and confirm mathematical concepts graphically.

7. Multivariable Calculus I (MT 231)

This course will help students to

- Sketch level curves and graph of a function
- Discuss limit continuity of functions of several variables.
- Find approximate values using differentials.
- Find extreme values of functions of several variables.
- Study Taylor's theorem for the function of two variables.
- Find double and triple integrations.
- To change the order of double integrals.

8. Numerical Methods (MT 232 A)

This course will help students to

- Find significant figure, errors.
- Round of given numbers to significant figures

- Find numerical solutions of algebraic and transcendental equations.
- Find derivatives from the tabular data.
- Find solutions of ordinary differential equations using Taylor's series, Euler's method, Runge-Kutta method.

9. Mathematics Practical based on MT 231 AND MT 232 A

This course will help students to

- Develop computational skills
- Use MAXIMA software to solve mathematical problems
- Use Maxima software to visualize and confirm mathematical concepts graphically.

10. Linear Algebra (MT 241)

This course will help students to

- Find rank of matrix from its row echelon form
- Solve a system of m linear equations in n unknowns.
- Study Vector spaces, subspaces, basis, dimension, linear dependence, independence of vectors and functions.
- Study linear transformation, kernel and range of linear transformations.
- Study rank-nullity theorem of linear transformation.
- Find matrix of linear transformation
- Study inner product spaces, Cauchy-Schwarz inequality.
- Find an orthogonal basis using the Gram-Schmidt process.

11. Vector Calculus (MT 242 A)

This course will help students to

- Compute limit, derivatives integrals of a vector valued function.
- Compute work done using line integrals
- Apply Green's theorem in the plane to compute line integrals using double integrals.
- Compute surface integrals
- Compute parametrization of surfaces.

12. Mathematics Practical based on MT 241 AND MT 242 A

This course will help students to

- Develop computational skills
- Use MAXIMA software to solve mathematical problems
- Use Maxima software to visualize and confirm mathematical concepts graphically.

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|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Botany | |
| F Y B. Sc. Sem -I | |
| BO111 and BO 121 Plant life and utilization. SEM. I and II | 1. Understand the basic principles of Botany. |
| | 2. To study morphology of plants. |
| | 3. To get them economic importance of plants. |
| | 5. To get the knowledge of functions of plants. |
| BO 112 Plant morphology and Anatomy | 1. To get knowledge of range of plant diversity in terms of structure, function and environmental relationships |
| | 2. To study local flora. |
| | 3. To get knowledge of adaptations in plants |
| | 4. Think logically and organize tasks into a structured form. |
| F Y B. Sc. Sem –II | |
| BO122 Principles of plant science | 1. The evaluation of plant diversity. |
| | 2. The role of plants in the functioning of the global ecosystem. |
| | 3. Plant classification and the flora of Maharashtra |
| | 4. Students learn to carry out practical work, in the field and in the laboratory, with minimal risk. |
| | 5. Students learn Vegetation analysis techniques. |
| S Y B. Sc. Sem -III | |

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| BO 231: Taxonomy of Angiosperms and Plant Ecology | 1. Learn the types of classifications- artificial, Natural and phylogenetic. |
| | 2. Gain knowledge about Botanical Survey of India (BSI). |
| | 3. Briefly studied on herbarium techniques. |
| | 4. Learn the taxonomic evidences from molecular, numerical and chemicals. |
| | 5. Brief studied the economic products with special reference to the Botanical name, family, morphology of useful part and the uses |
| BO232: Plant Physiology | 1. Know about the requirement of mineral nutrition for plant growth |
| | 2. Understand the process of Photosynthesis, Respiration and Nitrogen metabolism |
| S Y B. Sc. Sem -IV | |
| BO 241: Plant Anatomy and Embryology | 1. Understand the internal structure of plant body. |
| | 2. Study the development of plant embryo. |
| | 3. Understand the development of gametes and embryo formation. |
| | 4. Learn the anatomy in relation to taxonomy. |

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| BO 242 Plant Biotechnology | 1.To learn methodology of plant tissue culture |
| | 2.Learn the specific and non-specific methods of gene transfer |
| | 3. Recombinant DNA technology |
| | 4. Applications of Biotechnology in Plant, and Human welfare |
| T.Y.B. Sc. Course Semester V | |
| BO. 351 Algae and Fungi | 1. Learn about the structure, pigmentation, food reserves and methods of reproduction of Algae. |
| | 1. Learn about the structure, food reserves and methods of reproduction of Fungi. |
| | 3. Know about the Economic importance of algae, Fungi and lichen. |
| BO 352 Archegoniate | 1. Ecological and economic importance of Bryophyte and Study of Life Cycle of Bryophytes. |
| | 2. Ecological and Economical Importance of Pteridophytes and Study of Life Cycle of Pteridophytes |
| BO. 353 Spermatophyta and Palaeobotany | 1. Know about the structure, life history and Economic importance of Gymnosperms. |
| | 2. Learn the fossil plants and past flora. |
| | 3. Studied the methods of fossilization and fossil plants. |
| BO 354 Plant Ecology | 1. Learn the Approaches to the study of Ecology (Autecology, Synecology and Genecology) |
| | 2. Understand the population & Community Ecology - concept of metapopulation |

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| | 3. To learn concept, need, objectives, benefits, types of environmental audit. |
| BO. 355 Cell and Molecular Biology | 1. Learn the structure, chemistry and functions of cellular organelles. |
| | 2. Study the structure and properties of Macromolecules. |
| | 3. Study of cell organelles |
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| BO. 356 Genetics | 1. Learn about Mendelian principles. |
| | 2. Know about gene mapping methods & Extra chromosomal inheritance. |
| | 3. Familiarize about Evolution & Emergence of evolutionary thoughts. |
| | 4. Gain knowledge on Plant breeding techniques |
| BO 3510 Medicinal Botany | 1. Learn importance of Medicinal Plants. |
| | 2. Conservation of endangered and endemic medicinal plants and Propagation of Medicinal Plants. |
| | 3. Methods to study ethnobotany; Applications of Ethnobotany. |
| BO 3511 Plant Diversity and Human Health | 1. To study Values and uses of Biodiversity and Conservation of Biodiversity |
| | 2. Study of Role of plants in relation to Human Welfare; |
| | 3. To know the Organizations associated with biodiversity management-Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR. |
| TY B Sc. Semester VI | |
| BO 361 Plant Physiology | 1. Understand the process of Photosynthesis, Respiration and Nitrogen |

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| | metabolism. |
| | 2. Know about the Plant Growth hormones (Auxins, Gibberellins, Cytokinins, Ethylene) |
| | 3. Know about the requirement of mineral nutrition for plant growth. |
| BO 362 Biochemistry | 1. Understand Biomolecules of a cell, functional groups in biomolecules, conformations and configurations of biomolecules. |
| | 2. Know the Mechanism of enzyme action. |
| | 4. Study of Carbohydrates, Lipids and vitamins. |
| BO 363 Plant Pathology | 1. Studied some plant diseases with special reference to the causative agents, symptoms, etiology and control measures. |
| | 2. To know the Bacterial, Mycoplasma, Nematodal and Viral plant diseases. |
| BO 364 Evolution and Population genetics | 1. Study of concept of organic evolution, Theories of Evolution, Pre-Darwinian period, and Post Darwinian period- Modern synthetic theory of evolution. |
| | 2. To know the Population Genetics and Evolution. |
| | |
| BO 365 Advanced Plant Biotechnology | 1. Study of modern Biotechnology. Impact of Biotechnology on Health care, Agriculture, and Environment |
| | 2. Study of Techniques of Genetic Engineering and Methods of gene transfer in Plants. |
| | 3. To know the biotechnological inventions and Intellectual property rights. |
| BO 366 Plant Breeding and Seed Technology | 1. Learn about Mendelian principles |
| | 2. Know about gene mapping methods & Extra chromosomal inheritance |

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| | 3. Gain knowledge on Plant breeding techniques |
| | 4. Study of seed certification, seed testing, seed storage. |
| BO 3610 Nursery and Gardening Management | 1. Learn the techniques of gardening - Types, Methods & Tools |
| | 2. Learn about Floriculture Cultivation of commercial vegetable plants. |
| | |
| BO 3611 Biofertilizers | 1. Know the scope and importance of Biofertilizers. |
| | 2. Study of types and uses of algal and fungal biofertilizers. |
| | 3. Study of compost, and manure and Benefits of vermicompost, field applications |

Dr. Vilas Patil
Dept. of Botany



Lonavala Education Trust's Dr. B.N. Purandare Arts, Smt. S.G. Gupta Commerce and Smt. Shardaben Amrutlal Mithaiwala Science College, Lonavala-410403.

Department of Zoology

Program Outcomes, Program Specific Outcomes, and Course Outcomes of B.Sc. in Zoology

[From A.Y. 2021-20222 to 2022-23]

Zoology Programme:-

B.Sc. in Zoology is an undergraduate Program in Zoology. Zoology is the branch of science which deals with the study of animal kingdom including the evolution, structure, Physiology, classification embryology, habits, habitat and distribution of all the animals both living and extinct, and how they interact with their ecosystems. The B.Sc. Zoology course is premeditated to introduce students to the study of zoology at the organismal and organ function levels. The theoretical part of the program deals with the general principles of classical as well as modern zoology. It includes an interesting range of highly diverse topics. The program provides the student with an introduction to the recent advances in zoology in the areas of systematic, evolution, reproduction, development, animal diversity, biochemistry, cytology, Pest Management, Histology, Genetics, Developmental Biology, Parasitology, Medical & Forensic Zoology, Animal Physiology, Molecular Biology, Entomology, Techniques in Biology and animal ecology. A zoology student needs to gain understanding of many areas of the subject to keep pace with advancements in Life Sciences. This course is offered for candidates who are interested in the study of animals. The minimum time required to complete the course is three years.

This degree offers Discipline Specific Core Courses [CC] in Animal Systematics, Animal Ecology, Animal Cell biology, Applied Zoology, Pest Management, Histology, Biological Chemistry, Genetics, Developmental Biology, Parasitology, Medical & Forensic Zoology, Animal Physiology, Molecular Biology, Entomology, Techniques in Biology and Evolutionary Biology. In addition to the Core Courses, Ability Enhancement Compulsory Courses [AECC] have been added in the second year i.e. Semester III and Semester IV of the undergraduate course. In the third year i.e. Semester V and Semester VI, Discipline specific Elective Courses [DSEC] and Skill Enhancement Courses [SEC] have been offered. The students, therefore, have an opportunity to take courses in Environment Awareness, Language & communication, English / Marathi, Aquarium Management, Poultry Management and Environmental Impact Assessment. In Semester VI the students also have a course dedicated to Project work.

The syllabus has been framed in such a way that the student gains each year, a broader perspective of the subject as he progresses towards completion of the degree program. Field visits, Educational visits and the Project work have been included for the student to experience the applications of the theory learnt in the classroom. After completion of the program, it is expected that students will understand and appreciate: animal diversity, few applications of Zoology, the structure, functions and life processes at cellular, tissue, organ and system level, significance of evolution, and basic concepts of human health. The students would also gain an insight into laboratory and field work through the practical course, field work and the project.

Objectives:

Imparting quality education in Zoology has been the focus of the department right from its inception. Emphasis is given on education both within and outside the classroom. The Department is dedicated to fulfil the following objectives through the curricular and cocurricular activities: To provide students with knowledge of fundamental principles in zoology that will provide a foundation

for their later advanced course in more specific biological subjects. To make students familiar with animal classification schemes and other applied courses as well as developing an understanding of and ability to apply basic zoological principles. To integrate the laboratory and lecture sections of the course and directed toward teaching students both in the classroom and on the field. To provide quality education offering skill based programs and motivate the students for self-employment in applied branches of Zoology. To inculcate the value based education and entrepreneurial skills among the students. To create awareness on environmental issues through various activities.

The calculation of credits and CGPA will be as per the guidelines of the University. The B. Sc. Zoology program provides an appropriate blend of classical and applied aspects of the subject. This newly designed curriculum will allow students to acquire the skill in handling scientific instruments planning and performing in the laboratory and exercising critical judgement, independent thinking and problem solving skills.

The Syllabus has been revised with the following aims –

- To foster curiosity in the students for Zoology,
- To create awareness amongst students for the basic and applied areas of Zoology,
- To orient students about the importance of abiotic and biotic factors of environment and their conservation,
- To provide an insight to the aspects of animal diversity,
- To inculcate good laboratory practices in students and to train them about proper handling of lab instruments.

Programme Outcomes:

After successfully completing B. Sc. (Zoology) Programme students will be able to:

- PO1.** Communicate scientific information through effective formal and informal methods generally used in sciences.
- PO2.** Create an awareness of the impact of Zoology on the environment, Society, and development outside the scientific community.
- PO3.** Develop competence in basic sciences and in the content of the specific courses that constitute the principal knowledge of their degree.
- PO4.** Demonstrate, solve and an understanding of major concepts in all Disciplines of Zoology
- PO5.** Acquire the skills in handling scientific instruments, planning and performing in laboratory experiments.
- PO6.** Understand and be aware of relevant theories, paradigms, concepts and principles of zoology.
- PO7:** Understand the structure and functions of cell types
- PO8:** To study and understand the classification of whole phyla includes in Non chordates with the help of charts/models/pictures
- PO9:** Relate the various abiotic factors with health of living forms and ecosystems
- PO10:** . Use modern techniques, decent equipments and Zoology software's
- PO11:** Apply the knowledge of Zoology to understand the complex life life Processes and phenomena.

After successful completion student should be able to; of three year degree program in Zoology.

Programme Specific Outcomes:-

- PSO-1.** Gain the knowledge of Zoology through theory and practical's.
- PSO2.** Ability to connect and apply biological knowledge to other disciplines and to integrate knowledge into their personal and professional lives.
- PSO-3.** Use modern Zoological tools, Models, Charts and Equipments.
- PSO-4.** Develop research oriented skills
- PSO5.** Explain the origin of life with context to the origin of eukaryotic cell and endosymbiotic theory of origin. Fossil records, Darwinism and Neo-Darwinism, experimental evidences.

- PSO6.** Illustrate zoological science for its application in branches like medical entomology, apiculture, aquaculture and agriculture etc
- PSO7.** Understand animal interactions with the environment and identify the major groups of organisms with an emphasis on animals and classify them within a phylogenetic framework.
- PSO-8.** Know structure-activity relationship
- PSO-9.** Make aware and handle the sophisticated instruments/equipments.

Course Outcomes:-

B. Sc. (Zoology) First Year B.Sc. Choice Based Credit System Syllabus to be implemented from - Academic Year 2019-2020

Course Code ZY 111 -Animal Diversity-I SEM- I Credits = 2

And

Course Code ZY 121 -Animal Diversity-I SEM II Credits = 2

After successfully completing this course, students will be able

CO1: The student will be able to understand classify and identify the diversity of animals

CO2: The student understands the importance of classification of animals and classifies them effectively using the six levels of classification.

CO3: 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.

CO4: Demonstrate anatomical and physiological attributes of each animal group and why these have led to their success

CO5: List the various animals in a given phylum

Course Title: Animal Ecology - Course Code: ZO 112, Semester I (2 Credits)

Learning outcomes for the course: -

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.

CO2: 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.

CO5: The working in nature to save environment will help development of leadership skills to promote betterment of environment.

Course Title: Cell biology Course Code: ZO122; Semester II (2 credits)

Learning outcomes for Cell Biology:-

CO1: The learner will understand the importance of cell as a structural and functional unit of life.

CO2: The learner understands and compares between the prokaryotic and eukaryotic system and extrapolates the life to the aspect of development.

CO3: The dynamism of biomembranes indicates the dynamism of life. Its working mechanism and precision are responsible for our performance in life.

CO4: The cellular mechanisms and its functioning depend on endow-membranes and structures. They are best studied with microscopy

**Course Title: Zoology Practical Paper Course Code: ZO113:
Semester I (2 credits)**

And

**Course Title: Zoology Practical Paper Course Code: ZO123:
Semester II (2 credits)**

After successfully completing this course, students will be able to:-

CO1: Identify of the Dissolved oxygen from given water sample.

CO2: Identify of the Water Alkalinity from given water sample.

CO3: Identify of animal community structure by quadrat method (Field or Simulation).

CO4: Detect of density, frequency and abundance of species by quadrat method.

CO5: Prepare of microscopic fauna of freshwater ecosystem (from pond).

CO6: Detect of water holding capacity of given soil sample.

CO7: Detect of dissolved and free carbon dioxide from water sample.

CO8 Identify of Eutrophication in lake/river.

CO9: Explain Study of phylum Protozoa: Euglena, Paramecium, Amoeba, Plasmodium sp.

CO10: Identify Museum study of Phylum Porifera: *Sycon*, *Euplectella*, *Chalina*, Spongilla. *Hydra*, *Physalia*, *Aurelia*, *Metridium*.

CO11: Identify Platyhelminthes: *Planeria*, *Faciolahepatica*, *Taenia solium*

CO12: Identify Paramecium: Culture, External morphology, Conjugation and Binary fission.

CO13: Identify permanent slides: Spicules and Gemmules in Sponges, T.S. of *Sycon*, T.S. of *Hydra*, *Taeniasolium*: Scolex, Gravid proglottid.

CO14: Study Visit to Zoological survey of India/ Museum/National Park. Visit to a vermicomposting unit/ field for insect pest collection and its identification.

CO15 Economic importance of honey bees, Lac insects silk worms, red cotton bug, Anopheles mosquito CO16 Earthworm: vermicomposting bin preparation and maintenance.

CO17 Identify Microscope: Simple and Compound, Micrometry: Measurement of microscopic objects CO18 Explain of cell: Preparation of temporary mount of human buccal epithelial cells.

CO19 Identify Preparation of blood smears to observe the blood cells & mitotic cell from onion roots

CO20 Observation of Cell organelles (any three) by using microphotographs

Second Year B. Sc. Zoology:-

S.Y.B.Sc. Zoology (w.e.f. June 2020) As per Choice-Based credit System

Animal Diversity III & IV

Objectives –

1. To understand the origin and advancement of higher vertebrates (tetrapoda).
2. To understand general characteristic different groups of higher vertebrates.

3. To classify vertebrates and to become able to understand the possible group of vertebrates observed in nature.
4. To understand different behaviours and adaptations in higher vertebrates
5. To understand affinities among different groups of higher vertebrates.

Learning Outcomes for the course –

1. The students will be able to understand, classify and identify the diversity of higher vertebrates.
2. The students will be able to understand the complexity of higher vertebrates
3. The students will be able to understand different life functions of higher vertebrates.
4. The students will be able to understand the linkage among different groups of higher vertebrates.
5. The student will become aware regarding his role and responsibility towards nature as a protector, to understand his role as a trustee and conservator of life which he has achieved by learning, observing and understanding life.

Applied Zoology I and II Objectives:

1. To understand the basic life cycle of the honeybees, beekeeping tools and equipment.
2. To learn for managing beehives for honey production and pollination.
3. To understand the basic information about fishery, cultural and harvesting methods of fishes.
4. To understand fish preservation techniques.
5. To understand the biology, varieties of silkworms and the basic techniques of silk production and harvesting of cocoons.
6. To learn the different silkworm species and their host plants.
7. To study types of agricultural pests and Major insect pests of agricultural importance.
8. To study Pest control practices.

Learning Outcomes of the course:

1. The learner understands the basics about beekeeping tools, equipment, and managing beehives. 2. The learner understands the basic information about fishery, cultural and harvesting methods of fishes and fish preservation techniques.
3. The learner understands the biology, varieties of silkworms and the basic techniques of silk production.
4. The learner understands the types of agricultural pests, Major insect pests of agricultural importance and Pest control practices.

Choice Based Credit System Syllabus to be implemented from - Academic Year 2021-2022

T. Y. B. Sc. Zoology

Savitribai Phule Pune University

SEMESTER - V Course Title: Pest Management Course Code: ZO 351 Credits - 02

ZO 351 – Pest Management Course

Objectives:

After you complete your study of this unit, you should be able to:

- Explain why identification of the pest is the first step in developing an effective pest control strategy.
- Explain the differences between continuous pests, sporadic pests, and potential pests.
- Explain what is meant by prevention, suppression, and eradication of pests.
- Describe "thresholds" and why they are an important consideration in developing a pest control strategy.
- Describe "monitoring" as it relates to pest control and explain why it is important to pest control strategy.

Course Outcomes:

1. Define pest management.
2. Describe the economic, ecological, and sociological benefits of IPM.
3. Distinguish positive and negative impacts of pesticide use.
4. Understand problems resulting from misuse, overuse, and abuse of chemical pesticides.
5. Define and describe pesticide resistance and how it develops.
6. Identify ecological and biological characteristics important in development of pest populations.
7. Identify 10 tactics commonly used in IPM and be able to distinguish them.
8. Understand society's role in IPM decisions.
9. Describe different groups of pests and compare them to weeds and plant pathogens.
10. Analyse and compare management tactics to determine the best approach to reducing pest populations, weeds, and disease presence.
11. Locate appropriate, scientifically valid sources of information on specific tactics to manage insect pests, weeds, and diseases.
12. Know and how to develop an IPM program

Course Title: Histology Course Code: ZO 352 Credits: 02

Objectives –

1. To understand the histological aspects of mammalian organs.
2. To study the important features of different types of tissues in organ system.
3. To understand the classification of various types of basic tissues.
4. To study structure & functions of various tissues in organ system.
5. To understand histological structure of various glands and its functions.

Learning Outcomes for the course –

1. The students will be able to understand, classify and identify the different types of tissue.
2. The students will understand the complexity of various tissues in an organ.
3. The students will be able to learn structure & functions of various tissues.
4. The students will understand the various diseases related to organs.
5. The student will be able to know the role of glands in mammals.

Course Title: Biological Chemistry Course code: ZO 353 Credits: 02

Objectives –

1. To understand the basic concepts and significance of biochemistry.
2. To understand the basic concepts pH and Buffers
3. To understand the chemical structures of carbohydrate, and their biological and clinical significance.
4. To understand the structure and importance of proteins and lipids
5. To understand the variations in enzyme activity and kinetics.

Learning Outcomes for the course –

1. Learners shall be able to understand basic concepts and significance of biochemistry
2. The students will learn about the pH and Buffers.
3. The students will learn about the chemical structures of carbohydrate, and their biological and clinical significance.
4. The students will be able to understand, interpret structure and importance of proteins, carbohydrates and lipids
5. Learners will be able to comprehend variations in enzyme activity and kinetics.

Course Title: Parasitology Course code: ZO 356 Credits: 02

Objectives:

1. To understand the basic terminologies in parasitology.
2. To understand the concepts of animal association with examples.
3. To understand the morphology and life cycle of common parasites (Protists and Platyhelminthes).
4. To understand the phenomenon of Host-parasite relationship.
5. Explain the importance of arthropod vectors with examples.

Learning outcomes:

1. The students will be able to learn about basics and scope of parasitology.
2. The students will be able to learn the types of host and parasite with examples.
3. The students will be able to learn about the morphology, life cycle, pathogenicity and treatment of common parasites (Protists and Platyhelminthes).

4. The students will be able to learn about host -parasite relationships and their effects on host body.
5. The students will be able to learn about the arthropod parasites and their role as vector.

ZO – 3511 Poultry Management

Objectives:

1. To understand the basics of Poultry Farming and it's important.
2. To understand breeding management of broilers and layers of chickens.
3. To understand housing management and equipment of Poultry farming.
4. To understand food, feeding and digestion mechanism of chickens.
5. To understand the poultry diseases and their control.
6. To understand the economic importance of poultry products.

Expected Outcome:

1. The students will be able to understand the Poultry farming practices.
2. The students will able to understand the poultry breeding techniques.
3. The students will be able to understand poultry rearing techniques.
4. The students will be able to understand feeding requirement and food ingredients.
5. The students will be able to understand the poultry disease and their pathogens.
6. The students will be able to understand market value of poultry products.

SEMESTER - VI

Course Title: Medical & Forensic Zoology Course Code: ZO 361 Credits: 02

Objectives:

1. To understand the scope, need and History of Forensic Science.
2. To understand the role of different institutes & allied institutes of Forensic Science.
3. To understand the various branches of Forensic Sciences from Life Sciences.
4. To understand human physiology, post mortal investigations.
5. To understand knowledge of handling different types of evidences and their examinations.

Expected Outcome

1. The students will be able to understand the basics principles of Medical and Forensic Zoology.
2. The students will able to understand scientific methods in crime detection.
3. The students will be able to understand the advancements in the field of Medical and Forensic Zoology.
4. The students will be able to understand modern tools, techniques and skills in forensic investigations.
5. The students will be able to describe the fundamental principles and functions of forensic science and its significance to human society.

Course Title: Animal Physiology Course Code: ZO 362 Credits: 02

Objectives:

1. To acquaint students with the principles and basic facts of Animal Physiology and with some of the laboratory techniques and equipment used in the attainment of physiological data. The importance will be on mammalian.
2. The course will focus on organ-system physiology,
3. Furthermore, emphasis will be placed on nutritive, circulatory, respiratory, excretory, muscular, nervous, reproductive and endocrine physiology. Where appropriate, basic chemical and physical laws will be reviewed in order to enhance and to promote student understanding.
4. The laboratory module of the course is designed to support the topics discussed in theory lecture, as well as to acquaint students with some of the laboratory techniques and equipment used in the gaining of physiological facts.

Learning Outcomes:

Upon successful completion of this course, the students will be able to describe, identify, and/or explain:

1. The various physiological organ-systems and their importance to the integrative functions of the human body.
2. Understand Concept of energy requirements
3. Various aspects of Digestive physiology.
4. Circulatory system with medical conditions
5. Understand Respiratory mechanism and gases transport.
6. Eliminations of waste materials from the body.
7. Develop understanding in Structure and functions of muscles
8. Understand formation of gametes and function of endocrine glands.

Course Title: Molecular Biology Course Code: ZO 363 Credits: 02

Objectives:

1. The course aims to provide students with an introduction of the underlying molecular mechanisms of various biological processes in cells and organisms.
2. To understand the Structure of DNA and RNA, DNA and RNA as genetic material
3. To understand the Central Dogma of Molecular Biology
4. To understand the concept of gene regulation
5. To understand the DNA Damage and Repair
6. The course aims to develop basic understanding of structure-function relationships of nucleic acids and proteins.

Learning outcomes:

1. Learner shall get an insight into molecular mechanisms of various biological processes in cells and organisms
2. Learner shall get an insight into the Structure of DNA and RNA, DNA and RNA as genetic material
3. The course shall prepare learner to get insight into the Central Dogma of Molecular Biology
4. Learner shall also understand the concept of gene regulation
5. Learner shall get an insight into the DNA Damage and Repair

Course Title: Entomology Course Code: ZO 364 Credits: 02

Objectives:

1. To understand the scope of Entomology and general characters of Insects.
2. To study the morphology and anatomy of Insects.
3. To learn the concept of social organization in Insects.
4. To understand metamorphosis in Insects.
5. To study the economically important insects and Pest management of harmful insects.

Course outcomes:

At the end of this course, Students will –

1. Understand basic concepts in Entomology and its scope.
2. Learn morphology and anatomy of Insects.
3. Understand the concept of social organization in Insects.
4. Understand the development process of Insects.
5. Identify disease causing insect vectors.
6. Will be able to design and implement pest controlling methods against pests.

Course Title: Evolutionary Biology Course Code: ZO 366 Credits: 02

Objectives:

1. To provide comprehensive overview of Concept of Evolution.
2. To explain Origin of Life especially Prokaryotes as well as Eukaryotes in detail.
3. To explore salient features of various theories of evolution comprising of Lamarckism, Darwinism and Neo-Darwinism.
4. To impart detailed understanding of Analogy, Homology, Paleontological Evidences, Embryological Evidences and Molecular Phylogeny.
5. To provide adequate information about Geological Time Scale and Neutral Theory of Molecular Evolution.
6. To develop comprehensive knowledge regarding various Sources of Variations and their role in evolution.

7. To give detailed explanation of key concepts of Population Genetics in terms of HardyWeinberg Law, Genetic Drift and Types of Natural Selection.
8. To provide adequate knowledge about Micro-evolutionary changes, Speciation and Adaptive Radiation.
9. to give detailed outline of Extinctions and its types.
10. To impart descriptive knowledge regarding Origin and Evolution of Man.
11. To provide glimpse of Phylogenetic Trees and highlight their construction along with interpretation.

Learning outcomes

After completing the course, the student should be able to

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

Second Year B. Sc. Zoology:-

Course ZY 211-Animal Systematics and Diversity III & IV.

After successfully completing this course, students will be able to:

- CO1: List the various vertebrate animals in a given class.
- CO2: Identify poisonous and non-poisonous snakes.
- CO3: Study and understand Salient features and classification of Arthropoda , Mollusca and Echinodermata
- CO4: Explain various adaptations in avian group as well as migration and flight in birds.
- CO5: Describe the morphology, habit and habitat. Systematic position and various systems in *Scoliodon*.
- CO6: Understand the General Topics like Mouthparts in Insects, Shell and foot modification in mollusc, Metamorphosis in Insects, Mimicry and Economic importance of Insects.
- CO7: Study and Understand External characters , digestive system , blood vascular system and brain of *Scoliodon*.
- CO8: Categorize the diversity found in the vertebrate groups of animals like reptiles, birds and mammals.
- CO9: Understand the external characters digestive system and water vascular system in sea star.
- CO10: Study and understand Salient features of Class Reptilia, Aves and Mammalia.

Course ZY 212: Applied Zoology I & II

After successfully completing this course, students will be able to:

- CO 1: Define the concepts of the applied subjects like Apiculture and Sericulture.
- CO 2: Identify different species and casts of honeybees and species of silkworm.

CO 3 To aware the students and provides the economic importance of Apiculture.
 CO 4: Understand the Bee keeping equipments and apiary management.
 CO 5: Describe the economic importance of honeybee and silkworm.
 CO 6: Introduction to fisheries and its types, Different types of ponds used in fishery
 CO 7: Classify of *Apis*, *Bombyx* and *Anthereria*.
 CO 8: Select economically important species of *Apis* for unifloral and
 CO9: Understand the Harvesting methods of some marine forms.
 CO10: Learn about Crafts and gears in Indian Fishery, fishery byproduct and Fish preservation technique.
 CO11: Learn about various Agricultural Pests and their control.
 CO12: Introduce the term apiculture sericulture to the students.
 CO13: Students can learn about Cultivation and Harvesting of Mulberry and rearing technique of silkworm .

S. Y. B. Sc. Practicals:-

Course ZY 223: Practicals in Zoology: (Sem I & Sem II)

After successfully completing this course, students will be able to:

CO1: Study and classification of some non-chordates and chordates phyla
 CO2: Identify animals of higher groups in Invertebrates and Vertebrates.
 CO3: Study of Starfish and various systems in it.
 CO4: Distinguish between poisonous and non-poisonous snakes
 CO5: Label various parts of the animals and their modifications
 CO4: Observe the various tools, crafts and gears used in Apiary, Fishery, Sericulture and Pest control.
 CO5: Identify the pests in agriculture and enemies in Apiary
 CO6: Study and Understand the Identification, Classification and habit, habitat of fresh water fishes.
 CO7: Study and Understand External characters, digestive system, blood vascular system and brain of *Scoliodon*.
 CO8: Study and Understand External characters, digestive system and water vascular system of Starfish
 CO9: Explain the use of tools in Apiary, Sericulture and appliances in Pest control.
 CO10: Describe External features and economic importance of freshwater and Marine water fishes and other aquaculture organisms
 CO11: Describe the morphology, habit and habitat. Systematic position and various systems in starfish and *Scoliodon*
 CO12: To Study Agricultural pests with respect to marks of identification, nature of damage and economic importance.

Third Year B. Sc. Zoology:-

Theory courses: (Sem III: ZY-331 to ZY-336) : Semester

(Sem IV: ZY- 341 to ZY-346) : Semester

Practical Course:(ZY-347-349) : Annual

Department of Zoology- After successful completion student should be able to:

Course ZY 331: Animal Systematics & Diversity V

After successfully completing this course, students will be able to:

CO1: Outline the systematic position of *Pila globosa*. and *Calotes versicolor*
 CO2: Understand the evolution, history of phylum.
 CO3: Label the organs and systems of *Pila globosa*. and *Calotes versicolor*
 CO4: To study the external as well as internal characters of non chordates.
 CO5: Describe the major features in the Phylum Protozoa, Porifera, Coelenterata and Hemichordata and the reason of their success in the ecosystem.
 CO6: Illustrate the morphological peculiarities of Integument, Heart, Kidney and Brain of vertebrates.
 CO7: Understand the economical importance of Molluscs

- CO8: Categorize the Accessory respiratory organs in fish.
- CO9: Understand the economical importance of Molluscan shells.
- CO10: Classify the dentition in mammals.
- CO11: Justify the need of electric organs in fish.
- CO12: Understand the various internal systems like Digestive system, nervous system with the help of charts.

Course ZY 341: Biological techniques

After successfully completing this course, students will be able to:

- CO1: Define the basic terms solution preparation.
- CO2: Understand the various Applications of Biotechnology.
- CO3: Study and Understand the Hybridoma technology as well as Enzyme biotechnology.
- CO3: Describe the techniques used in hematology.
- CO4: Study and understand the DNA Recombinant technology.
- CO5: Explain the principle of separation techniques.
- CO6: Explain the procedure of preparing permanent histological slides.
- CO7: Illustrate the working of microscopes.
- CO8: Analyze the dimensions of the biological samples.
- CO9: Justify the selection of fixatives for histological procedures.
- CO10: Understand the industrial and environmental biotechnology.

Course ZY 332: Mammalian Histology

After successfully completing this course, students will be able to:

- CO1: Understand the terms Histology and Physiology
- CO2: Study the derivatives of skin- horns, nails, hairs.
- CO3: Study and understand the terms- acidosis, alkalosis, asphexia, hypoxia, anoxia and cyanosis.
- CO4: Explain the location, structure and functions of various organs.
- CO5: Illustrate the histology of endocrine glands.
- CO6: Diagrammatically represent the various organs.

Course ZY- 342: Mammalian Physiology & Endocrinology

After successfully completing this course, students will be able to

- CO1: Understand the Importance of physiology and branches of it.
- CO2: List the various types of digestive enzymes.
- CO3: Understand the terms-Osmosis, diffusion, pH and Buffer.
- CO4: Explain the physiological processes in mammals.
- CO5: Explain the anatomy of various systems.
- CO6: Understand the Digestion and Excretion process, by studying the Organs of it.
- CO7: Understand the Circulatory system and Lymphatic system.
- CO8: Illustrate the reproductive cycles with hormonal control.
- CO9: Diagrammatically represent the working of kidney.
- CO10: Understand the process of Metabolism.
- CO11: Understand the term Detoxification.

Course ZY 333 Biological Chemistry

After successfully completing this course, students will be able to:

- CO1: Understand about the agencies responsible for Production of various products using biochemistry
- CO2: Explain the structure, functions and reactions of the various biomolecules.
- CO3: Understand the structure and function of carbohydrate, amino acids, proteins, and lipids.
- CO4: Give examples of each group type of biomolecules.
- CO5: Correlate the changes in the levels of these biomolecules with the diseases in human
- CO6: Understand the term pH, Buffer.

- CO7: Draw the structures of major biomolecules.
CO8: Understand the concept Enzymes and also Vitamins and minerals.
CO9: Understand the Principle role of Vitamins in metabolism and Deficiency diseases

Course ZY 343 Genetics & Molecular biology

After successfully completing this course, students will be able to:

- CO1: Define the basic terms in genetics.
CO2: Discuss the linkage groups and gene frequency.
CO3: Explain the concept of mutation.
CO4: Explain DNA structure.
CO5: Paraphrase the Central dogma of molecular biology.
CO6: Illustrate the mechanism of replication, transcription and translation.
CO7: Justify the post transcriptional and post translational modifications.

Course ZY- 334 Environmental Biology & Toxicology

After successfully completing this course, students will be able to:

- CO1: Know the biotic and abiotic components of ecosystem.
CO2: List the environmental challenges and their remedies.
CO3: Describe the nature of ecosystem, productivity, food webs, energy flow,
CO4: Explain Biosphere, biomes and impact of climate on biomes.
CO5: Understand diversity among various groups of animal kingdom
CO6: Explain wildlife management in India and conservation of wildlife.
CO7: Explain the three necessary and sufficient conditions i.e. struggle for existence; variation; and inheritance.
CO8: Discuss natural resources, causes of their depletion and their conservation.
CO9: Illustrate the toxic effects of chemicals in the environment on human and his livestock.
CO10: Scope , importance and management of biodiversity

Course ZY 344: Organic Evolution:

After successfully completing this course, students will be able to:

- CO 1: Define organic evolution.
CO 2: Understand theories of organic evolution, isolation, speciation
CO 3: Describe the concept of origin of life and theories of origin of life.
CO 4: To understand Origin of life with respect to prokaryotic and eukaryotic cells.
CO 5: Illustrate the presence of organisms at various geological time scale.
CO 6: Apply the knowledge in relevant experimentations.
CO 7: 4. Understand geological time scale, methods and classification of animal distribution and factors affecting animal distribution.
CO 8: Compare animal distribution in different zoogeographical realms.
CO-9. Understand the evidences of organic evolution by anatomical embryological list, paleontological, physiological, genetics and molecular biology evidences.

Course ZY 335 Parasitology

After successfully completing this course, students will be able to:

- CO 1: Define the basic terms in parasitology.
CO2: To study and understand the scope and branches of Medical Zoology.
CO3: To aware the students for various parasites and diseases which spreads in human with the help of study of host-parasite relationship.
CO4: Discuss the life cycle and importance of major parasites.
CO5: Illustrate transmission routes of animal and zoonotic parasites
CO6: To aware about the typhoid, cholera like disease.
CO7: Justify the control measures of arthropod vectors.

CO8: Convince the importance of hygiene with respect to epidemic diseases.

CO9: Understand the various disease causing vectors like Mosquitoes

CO10: To increase awareness for the health in students.

CO11: Understand the importance of medical diagnostic and also understand the term forensic Entomology

Course ZY 345 General Embryology

After successfully completing this course, students will be able to:

CO1: Understand the terms: Gametogenesis, Fertilization and early development.

CO2: Describe the key events in early and systematic embryological development.

CO3: Understand the Morphogenesis and Organogenesis in animals

CO4: Describe the chick development up to 96 hours of incubation and extra embryonic membranes.

CO5: Explain the life cycles of few parasites.

CO6: Explain the theories of preformation, and concepts like growth, differentiation and reproduction.

CO7: Explain the principles and process of fertilization and cleavage.

CO8: Prepare the flow chart of gametogenesis process.

CO9: Understand the Aging, Apoptosis and Senescence.

Course ZY 336 Cell Biology

After successfully completing this course, students will be able to:

CO1: Understand the Scope of cell biology, because cell is the basic unit of life.

CO2: Describe the composition, structure and functions of the plasma membrane.

CO3: Understand the Main distinguishing characters between plant cell and animal cell.

CO4: Explain the structure and functions of the nucleus and its components.

CO5: Describe the three primary components of the cell's cytoskeleton and how they affect cell shape, function, and movement.

CO6: Diagrammatically represent the phases of division of somatic and gametic cells.

CO7: Understand the various applications of cells by using cell biology like study of various types of tumour.

CO8: Differentiate between rough and smooth endoplasmic reticulum both in structure and function.

CO-9. To study and understand the whole cell organelles with their structure and function.

CO10: Understand the cell cycle and know the importance of various cells in body of organisms.

CO11: Understand the Animal cells and various cell organelles by using microphotographs.

Course ZY 346 Medical Entomology

After successfully completing this course, students will be able to:

CO1: Understand the fundamentals of agricultural, forest, medical and veterinary entomology

CO2: Define medical entomology.

CO3: Explain the social organization of insects with examples.

CO4: Illustrate the role of household insects in relation to human health.

CO5: Classify major medically important insects.

CO6: Understand intra specific and inter specific relationships among insects.

CO7: Choose the control measures of medically important insects

CO8: To understand significance of beneficial and harmful insects with reference to their habit and habitat, life cycle, diseases caused by them and their control measures.

Course ZY 347 Practical Paper I

After successfully completing this course, students will be able to:

- CO1: Identify the organs by studying the histological slides.
- CO2: Identify hormonal disorders using pictures.
- CO3: Use techniques like chromatography, spectrophotometry in biological experiments.
- CO4: Explain the anatomical features of brain, heart, kidney and skin of vertebrates.
- CO5: Demonstrate the importance of modifications in animal for their survival.
- CO6: Demonstrate the structure of tissues by making temporary slides.
- CO7: Demonstrate haemin crystals and effect of osmolarities on RBCs.
- CO8: Sketch and label the various systems and organs of *Pila*, *Balanoglossus* and *Calotes*.
- CO9: Prepare blood smear and identify the various cells.
- CO10: Draw exact figures of structures/organism using camera lucida.
- CO11: Measure the cell/organism dimensions.
- CO12: Prepare blood smear and identify the various cells.
- CO13: Process animal tissues and prepare permanent histological slides.
- CO14: Count total leucocytes from blood samples.
- CO15: Estimate the Hb.level in blood samples.
- CO16: Estimate blood glucose level, BT and CT.

Course ZY 348 Practical Paper II

[After successfully completing this course, students will be able to:](#)

- CO1: Identify the fossil types/ adaptations in animals.
- CO2: Explain the stages of human evolution.
- CO3: Demonstrate the effect of physical and chemical factors on enzyme activity.
- CO4: Explain the evidences of evolution
- CO5: Demonstrate physical and chemical properties of water and soil samples.
- CO6: Illustrate the application of Hardy –Weinberg law
- CO7: Detect given carbohydrates using biochemical tests.
- CO8: Measure the pH of given samples.
- CO9: Isolate protein from milk.
- CO10: Prepare acid and base solutions and titrate them.
- CO11: Collect and identify freshwater planktons.
- CO12: Determine LD50 and LC50.
- CO13: Estimate nucleic acids in given samples.
- CO14: Elucidate the difference between ape and man.
- CO15: Prepare temporary mounting of Giant chromosome.
- CO16: Prepare paper model of DNA.
- CO17: Record zoogeographical distribution of animals.

Course ZY 349 Practical Paper III

[After successfully completing this course, students will be able to:](#)

- CO1: Identify the life cycle stages of few parasites.
- CO2: Identify and explain the types of eggs, blastulae and gastrulae
- CO3: Identify the age of chick embryo.
- CO4: Identify the phases of cell division.
- CO5: List the household Pest and social insects.
- CO6: Explain the pathogenicity and morphology of few ectoparasites.
- CO7: Explain the diseases spread by vectors.
- CO8: Explain the interrelationship of insects and human with examples.
- CO9: Explain the effects of household insects on human health.
- CO10: Demonstrate rectal parasites in cockroach.
- CO11: Demonstrate Mitochondria/ mitotic and meiotic stages by stained preparations.
- CO12: Illustrate the social organization in insects.
- CO13: Prepare temporary slide of chick embryo to identify the stage and age.
- CO14: Prepare mounting of mouth parts of few common insects.
- CO15: Justify the effect of colchicine on cell division.

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COURSE OUTCOMES:-

F.Y.B.COM

Course: Financial Accounting:-

(Semester I -112 & Semester II - 122)

After successfully completing this course, student will able to-

CO1: Understand the order of Payment of liabilities and practically solving problems of piecemeal distribution of cash.

CO 2: Understand the GST System in Accounting.

CO 3: Learn single Entry system of Accounting.

CO 4: Learn how to create a company, grouping, generation, Accounting Report with the help of Tally Accounting Software Package.

CO 5: Understand the significance of and application of Accounting Standards in India.

CO 6: Understand the procedure of Royalty Accounting and solving practical problems.

CO 7: Know the Hire Purchase System and Instalment System of Accounting and solve problems.

CO 8: Allocate of expenses on basis of Apportionment in Departmental Accounts.

Course: Business Mathematics and Statistics

(Semester I -114 A & Semester II – 124 A)

After successfully completing this course, student will able to-

CO1: Discuss the pre-requisites of business mathematics and basic methods & types of interest and their basic applications in practice.

CO2: Understand the types of shares and dividends and interpret them with example.

CO3: Learn sampling technique and apply simple statistical methods for analysis.

CO4: Solve the problems of measures of central tendency: Mean, Median and Mode.

CO5: Classify various types and methods of computing interest.

CO6: Know the relevance of measures of dispersion by using Range, Variance and Standard Deviation.

CO7: Classify various types and methods of calculating correlation and regression for the bivariate data.

CO8: Get adapted to the acquired knowledge and skills with practical problems in real life.

Course: Marketing & Salesmanship

(Semester I -116 C & Semester II – 126 C)

After successfully completing this course, student will able to-

CO1: Understand the concept of Market and Marketing.

CO2: It helps students to know about marketing environment and impact of marketing environment on market decision making.

CO3: Gain knowledge regarding Buyer behavior and factors affecting on buyer behavior and buying process.

CO4: Understand Concept of product, product life cycle, pricing decision their methods and factors affecting pricing decision.

CO5: Understand the logistic management, its importance in marketing.

CO6: Study term advertisement, its importance, advantages, types and role of advertisement in sales promotion so they can pursue their carrier in the field of Salesmanship as well as in Advertising world. It also helps to enhance student's creativity.

CO7: Know the importance of rural development for economic growth, its nature, and differentiate rural and urban market and challenges before rural market.

CO8: Learn about the concept of marketing used globally and which modern techniques are followed by various business organizations to capture more market.

Course: Business Environment and Entrepreneurship

(Semester I -116 E & Semester II - 126 E)

After successfully completing this course, student will able to-

CO1: Understand Business Environment and Entrepreneurship, study the various types of Business Environment.

CO2: Discuss environment issues like water, air, soil and noise pollution and their remedies.

CO3: Study the various problems of growth and their remedies.

CO4: Explain the qualities required for successful entrepreneurs.

CO5: Distinguish between entrepreneurial personality and non-entrepreneurial personality.

CO6: Explain the role of Entrepreneurship in Economic Development, Industrialization and as a Catalyst.

CO7: Discuss about institutional support and promoting entrepreneurship in Indian at national level, state level and district level.

CO8: Explain the life story of entrepreneurs like Narayan Murti, Cyrus Poona Walla and Milind Kambli, etc.

Course: Banking & Finance

(Semester I -115 B & Semester II - 125 B)

After successfully completing this course, student will able to-

CO1: Explain evolution of Banking in Asia, India, Europe and England.

CO2: Discuss about Primary function and Secondary function of bank.

CO3: Explain types of accounts and account holders.

CO4: Discuss about Traditional Method, electronic fund transfer, RTGS, NEFT, SWIFT.

CO5: Describe concept of Safety, Liquidity, and Profitability.

CO6: Explain types of Negotiable Instruments.

CO7: Define concept of Endorsement and its types.

CO8: Discuss about ATM, Credit card, Debit Card, Net Banking and Core Banking.

S.Y.B.COM:

Course: Corporate Accounting

(Semester III -232 & Semester IV – 242)

After successfully completing this course, student will able to-

CO1: The students will understand the concept of Accounting Standards 5, 6, 10, 14, 21 with Practical Examples. This topic will help students to get knowledge regarding the universal application of Accounting Standards which are used by the different organizations and their importance.

CO2: Preparation of Final Accounts- Forms and contents as per Provisions of Companies Act (As Amendment up to the beginning of the relevant academic year) As per Revised Schedule- VI helps students to know about how companies are preparing their final Accounts to ascertain actual profit earn by them.

CO3: By studying Modes of winding up and liquidation accounting process students can imagine how certain companies are comes to an end and how liquidation process is held.

CO4: By studying Summarize skills for computerized accounting like Inventory Accounting, Payroll Accounting and MIS Reports students will understand how companies prepare their different report systems and after analyzing reports how companies estimates their future business prospective.

CO5: Amalgamation and absorption accounting procedure helps students to understand how weaker section companies comes into end or merge in other big companies and what process are followed while deciding purchase considerations.

CO6: Illustrate external and internal reconstruction accounting procedure leads to give practical idea about companies' reconstruction procedures.

CO7: The study of holding and subsidiary company helps students to study difference between holding and subsidiary companies and which problems are face by the companies while rendering different services in the market.

CO8: In depth knowledge of Calculate value of shares using different methods like Net Assets Method, Yield Basis Method and Fair Value Method.

Course: Business Communication

(Semester III -231 & Semester IV – 241)

After successfully completing this course, student will be able to –

CO1: Understand the Meaning, Definition, Characteristics, Principles, Significance, steps in the process of Communication, Barriers to Communication and their remedies.

CO2: Know various methods and channels of communication.

CO3: Identify and implement the soft-skills and understand the components of soft-skills such as Grooming Manners and Etiquettes, Effective Speaking, Interview Skills, Listening, Group Discussion and Oral Presentation.

CO4: Elaborate the concept and format of business letter, its meaning, and significance, qualities/Essentials of a good business letter, Physical Appearance, and Layout of Business Letter.

CO5: Develop the writing skill of business letters under various circumstances in business that include Enquiry letter, order letter, sales letter, etc.

CO6: Classify the types of Job Application Letters and their Drafting.

CO7: Learn internal office correspondence that include Office Memo, Office Orders, Office Circulars, and Press Releases.

CO8: Understand the contemporary developments in communication technology that is applicable in business like Gmail, Whatsapp, Twitter, Facebook, LinkedIn, YouTube, Mobile Communication as well as Video Conferencing.

Course: Elements of Company Law

(Semester III -235 & Semester IV – 245)

After successfully completing this course, student will able to-

CO1: The Background and Salient Features of the Act of 2013, & Overview of the changes introduced by the Act of 2013 & Types of Companies based on various criteria.

CO2: The four stages of company formation and incorporation.

CO3: Documents required for Incorporation and Raising of Capital.

CO4: The various modes of raising of capital of company including private placement, public issue, rights issue, bonus shares and the procedure for forfeiture, Re- issue of forfeiture, surrender, transfer, transmission and Nomination of shares.

CO5: Basic of MCA Portal, E-filing, DIN-Directors Identification Number and Management of Company such as Legal position of directors, Types of Directors.

CO6: Study various Key Managerial Personnel such as Managing Director, Whole Time Director, Manager, Company Secretary and Corporate Social Responsibility.

CO7: Various Formalities of valid meeting such as agenda, notice, quorum, proxies, voting, resolutions, minutes, filing of resolutions, Virtual Meeting.

CO8: Study the procedure of revival and rehabilitation of sick companies, Compromises, Arrangements and Amalgamation and winding of company.

Course 2143: Business Management

(Semester III -234 & Semester IV – 244)

After successfully completing this course, student will able to-

CO1: Understand the meaning, definition, characteristics, Principles, significance, challenges before management and a brief review of management thoughts of F.W. Taylor & Henry Fayol.

CO2: Know the Meaning, Definition, Nature, Importance, Forms, Types, Steps, and limitations of Planning and Decision Making.

CO3: Describe Meaning, Process of organization and Principles, Departmentalization of Organization and Organization Structure, Staffing and Recruitment.

CO4: Discuss Meaning, components, Principles, Techniques & importance of Direction and communication and Process as well as Barriers of Communication.

CO5: Explain the different theories of motivation such as Maslow's Need Hierarchy Theory, Herzberg's Two Factors Theory, and Douglas McGregor's Theory.

CO6: Study and analyse the leadership styles for eminent leaders such as Mahatma Gandhi, Dr. Babasaheb Ambedkar and Pandit Jawaharlal Nehru.

CO7: Elaborate the concept, need, techniques, difficulties, steps and techniques of coordination and control.

CO8: Know and apply the new trends in business management like Business Ethics, Corporate Social Responsibility, Corporate Governance, Disaster Management, and Management of Change.

Course: Marketing Management Special Paper I

(Semester III -236 H & Semester IV – 246 H)

After successfully completing this course, student will able to-

CO1: Understand the Meaning, Nature and Scope of Marketing Management, Components of Marketing Management, Marketing Management Philosophy, Marketing Characteristics in Indian context, Marketing Management process and Marketing Planning.

CO2: Know the current Marketing Environment in India with reference to Liberalization, Globalization and Privatization, know the elements of marketing environment, analyse the change in marketing practices, and solve global marketing case studies.

CO3: Study the Meaning, Definition and objectives of Marketing Communication Mix, study the New Age Advertising Media and Different forms of appeals for marketing communication.

CO4: Understand the meaning of services marketing, unique features of Services, and classification of services, and the tasks involved in services marketing.

CO5: Learn the Meaning, Definition and utility of e-marketing, its Advantages, limitations and challenges before e – marketing; Online and Offline marketing, Present status of e-marketing in India, Scope for e -marketing in Indian scenario and various online marketing strategies

CO6: Know the significance and relevance of Rural Marketing, features of rural market, problems and challenges before rural marketing, marketing strategies for rural marketing, and present status of rural marketing in India.

CO7:-Discuss the Meaning, Definition and Importance of Green Marketing, Role of Marketing Manager in Green Marketing, Marketing mix of green marketing, and principles for success of green products.

CO8: Elaborate the meaning of Consumer Behaviour, Buying decision process, explain the factors influencing consumer behaviour classify various buying motives & stages involved in buying decision.

Course: Banking & Finance Special Paper I

(Semester III -236 B & Semester IV – 246 B)

After successfully completing this course, student will able to-

CO1: Describe structure of Banking in India.

CO2: Define concept of Central Banking.

CO3: Describe Private sector Banking and types of Private Sector Banks.

CO4: Explain about Public Sector Bank and classification of public Sector Banks.

CO5: Explain the structure of Co-operative Banking in India.

CO6: Discuss the Functions and Roles of Development Banking.

CO7: Illustrate various concepts of Banking.

CO8: Explain role of various Committees on Banking Sector Reforms.

T.Y.B.COM:

Course 301: Business Regulatory Framework (Mercantile Law):

After successfully completing this course, student will able to-

CO1: Explain the meaning of Contract, Offer & Acceptance, Consideration, Consent, Free Consent, and Discharge of Contract.

CO2: Understand the terms Partnership, Limited Liability Partnership, Designated partner, the rights & duties of partners under Partnership Act,1932, know the process and legal requirements for incorporation of LLP, liabilities of LLP & partners, their relations, Financial Disclosure, Conversion, Winding up and Dissolution of LLP.

CO3: Understand the Sale of Goods Act, 1932, define the terms of Sale, Agreement to Sale, rights of an unpaid seller, describe implied conditions and warranties, and explain legal provision regarding transfer by non-owners.

CO4: Know the meaning of E-Contracts, Digital Signature, Describe formation & recognition of E-Contracts, discuss the relevance of Digital Signature and Digital Certificate.

CO5: Explain the terms like Consumer, Complaint, Services, unfair trade practices, restrictive trade practices, discuss consumer protection councils, redressal agencies, describe the procedure to file complaint and resolve the complaint, relief available to customers.

CO6: Elaborate the objectives, organs, programs, and activities of WIPO, define the terms Patent, Copyright, Trademarks, Design, Geographical Indication, Trade secrets and Traditional Knowledge.

CO7: Explain the terms Negotiable Instruments, Promissory Note, bill of exchange, Cheque, discuss the meaning of Holder, Holder in due course, and privileges of Holder in due course, kinds of endorsement.

CO8: Understand Arbitration, essentials of arbitration agreement, describe the rights and duties of arbitrator and explain the meaning of Conciliation.

Course 302: Advanced Accounting

After successfully completing this course, student will able to-

CO1: To know about Impart the knowledge of Indian accounting standards and IFRS like AS- 3, AS-7, AS-12, AS-15 AS-17 to AS-25.

CO2: Banking Company, Legal Provisions, Non - Performing Assets (NPA), Reserve Fund, Acceptance, Endorsements & Other Obligations and Preparation of Final Accounts in vertical form as per Banking Regulation Act 1949. By studying this topic students will come to understand about functioning and working of Banking . It also leads to know about guidelines apply by various banks and financial institutions for its working.

CO3: While studying this topic student will able to Calculate amount of insurance claims using various methods like Claim for Loss of Stock, claim for Loss of Profit and Claim for Loss of Fixed Assets.

CO4: Co-operative society and prepare financial reports as per Maharashtra State Co-operative Societies Act helps students to know about how co-operative works and prepare their financial statements.

CO5: Topic of indirect tax like VAT & VAT Report, Service Tax, Central Value Added Tax and Income Tax - Tax Deducted at Source (TDS) and calculate tax liability using computer improve students' knowledge regarding various kinds of duties and taxes.

CO6: The methods of maintaining accounts of different types of branches and Goods supplied at Cost & Invoice Price helps students to know about pricing methods used by business organization.

CO7: Ascertain profit or loss by using various methods in single entry system like Preparation of Cash Book, Total Debtor Account, Total Creditor Account, and Final Accounts it helps students to study various accounts heads and procedures used while entering transactions in different books.

CO8: Analysis and evaluate the financial performance using various ratios like Gross Profit Ratio, Net Profit Ratio, Operating Ratio, Stock Turnover Ratio, Debtor Turnover Ratio, Current Ratio, Liquid Ratio, Debt to Equity Ratio.

Course 304: Auditing & Taxation

After successfully completing this course, student will able to-

CO1: The students will understand various concepts of audit like Types of errors and frauds, Various Classes of Audit, Audit Programme, Audit Note Book, Working Papers, Internal Control-Internal Check-Internal Audit it helps them to know process followed by Auditors while conducting Audit.

CO2: By studying verification and valuation of assets and liabilities and Auditing and Assurance Standards like AAS- 1,2,3,4,5,28,29 students will aware of policies and guidelines use by Auditor for verification and valuation of different aspect of business organizations.

CO3: The Topic related Recognize Company Auditor like his Qualification, Disqualifications, Appointment, Removal, Rights, Duties and liabilities helps Students to know about procedures follow by business organization related to Appointment of Auditor.

CO4: Tax audit with computerized system and Scope of Auditor's Role under Income Tax Act helps students to know how Audit is conducted in computerized systems .It lead to give students idea about policies follow by Auditor while conducting Audit in computerized system.

CO5: Various concepts under Income Tax act 1961like Income, Person, Assesse, Assessment year, Pervious year, Agricultural Income, Exempted Income, Residential Status of an Assesse, PAN, TAN lead student to get information about how various taxes are impose by the government on individuals and firms.

CO6: Taxable Income under Head of Income like Income from Salary, Income from House Property, Profits and Gains of Business and Professions, Capital Gains and Income from other sources helps to know how incomes of individuals are treated under different heads.

CO7: Calculate total taxable Income and tax liability of an individual under chapter VIA i.e. deductions u/s-80C to 80 U. This lead to understand different Sections of deductions and exemptions on Tax payments.

CO8: The Procedure of individual income tax filing and Income Tax Return Filing and Structure, Functions and powers of various Income Tax Authorities. In this Topic the students will get whole idea about filling of income tax returns.

Course 305-H: Marketing Management II

After successfully completing this course, student will able to-

CO1: Understand the Meaning and importance of Marketing Planning, Types & Elements of Marketing Plan, Process of Preparing a Marketing Plan, Meaning of Sales Forecast, Sales Budgets and Sales Quota, Sales Forecasting Methods Forecasting Techniques.

CO2: Know the Meaning and Objectives of Social Marketing, Social Responsibility of Marketing Manager, Impact of Marketing on Society and other Business, Social Criticism of Marketing, and Recent Trends in Social Marketing.

CO3: Study the meaning of Marketing Organisation, Changing role of Marketing Organisation, Factors affecting on Marketing Organisation, Essentials of an effective Marketing Organisation and Types of Marketing Organisation.

CO4: Understand the concept of Strategy, Characteristics of Strategy, Meaning of Marketing Strategy, Competitive Marketing Strategies, and Competitive Strategies in Global Environment, meaning, process and advantages of Benchmarking.

CO5: Discuss the Meaning of Agriculture Marketing, Types of Agro-Products, Features of Agro-Products, Types of Markets, Defects of Agri- marketing and remedies, Marketing Intelligence System and Agriculture Marketing, Distinction between manufactured goods marketing and Agriculture goods marketing.

CO6: Explain the Meaning, nature, need and importance of International Marketing, International Marketing vs. Domestic Marketing, Problems and Challenges in International Marketing, Mode of entry in International Market and Scope of International Marketing.

CO7: Discuss the Importance of Marketing Regulations in Marketing, study the Relevance and importance of various Acts in the Context of Marketing Management: Consumer Protection Act, 1986, Trade Mark Act, 1999, Competition Act, 2002, Indian Patent (amendment) Act, 2005, Bureau of Indian Standards Act.

CO8: Understand the Meaning of Globalization, Features of Globalization, discuss Marketing in 21st Century, Impact of Globalization on marketing, Benefits and limitations of Globalization.

Course 306 H: Marketing Management III

After successfully completing this course, student will able to-

CO1: Understand the Fundamentals of Advertising, Nature, Scope and Functions of Advertising, Role of Advertising in Modern Business, Objectives, Types, Benefits and Limitations of Advertising, Ethics in Advertising. Know the various Advertising Media, Factors Affecting Selection of Media, Media Mix, Geographical selectivity, Media Scheduling & E-Advertising.

CO2: Know and understand the significance of various Appeals and Approaches in Advertisement, Relation between Advertising Appeal and Buying Motive, types of buying motives.

CO3: Discuss Brand management, meaning of Branding, Brand identity, Brand Extension, Identity Sources – symbols, logos, trademarks.

CO4: Know the meaning of Industrial Marketing, Types of Industrial Goods, Difference between Industrial and Consumer Marketing, Purchasing practices of Industrial customers.

CO5: Understand Marketing Research, its Meaning, nature and scope, Marketing Research process, Types of Research, Types of Data, and Types of Questionnaire.

CO6: Explain Distribution Management, Warehousing and Transport decisions, meaning and nature of Logistics, Logistics Function, need & functions of Warehousing, modes of Transportation and factors affecting transportation costs.

CO7: Understand the Meaning, nature, importance of Target Marketing, Market Targeting, and Selection of Target Segment, discuss various Targeting Strategies.

CO8: Understand the Meaning & objectives of Marketing Control, Benefits of Marketing Control, and essentials of an effective Marketing Control System, Techniques of Marketing Control, Process of Marketing Control, Meaning, characteristics, objectives, and process of Marketing Audit.

Course 305 B: Banking and Finance II (Financial Markets and Institutions in India)

After successfully completing this course, student will able to-

CO1: Discuss about Financial Institutions and Financial Markets.

CO2: Explain Money Market.

CO3: Discuss the meaning and scope of Indian Capital Market.

CO4: Describe about Foreign Exchange Market and it's Rate.

CO5: Explain about Non-Banking Financial Institutions.

CO6: Explain IFCI, SIDBI, Mudra and Bharatiya Mahila Bank.

CO7: Discuss about UTI, LIC, Provident Funds and Pension Funds.

CO8: Explain about SEBI.

Course 306 B: Banking and Finance III (Banking Law and Practices in India)

After successfully completing this course, student will able to-

CO1: Explain about Banking Regulation Act.

CO2: Describe the concept of Negotiable Instruments.

CO3: Explain Paying Banker.

CO4: Discuss about Collecting Bankers.

CO5: Define concept of Banker and Customer.

CO6: Explain Precaution to be taken by Bankers While Advancing Against Securities.

CO7: Discuss about Methods of Creating Charge.

CO8: Explain the steps in Project Appraisal.

MASTER OF COMMERCE (M.COM)

PROGRAMME OUTCOMES:

After successfully completing this course, student will able to-

PO1: Understand the advanced areas in commerce.

PO2: Understand the strategic approaches in business and deal with the same.

PO3: Understand the whole financial system and the role of financial services and its functioning.

PO4: Know the significance of research in business time learn the methodologies of doing scientific and systematic research.

PO5: Get acquainted with the skills required for business administration and business management.

PO6: Develop ability for critical thinking and taking pivotal decisions for business.

PO7: Learn the practical application of the knowledge gain throughout the course.

PO8: Gain insights in the strategic planning and its implementation.

PO9: Analyse and evaluate new research findings, ideas, methodologies and technicalities of the new areas in commerce.

PO10: Work coherently in the group.

PO11: Build a strong foundation of knowledge in commerce.

PROGRAMME SPECIFIC OUTCOMES:

1. Students will be able to understand the Management Accounting in actual practice.
2. Students will be able to know the significance of ethics in business and various approaches to business ethics.
3. Students will gain insights into the key areas like human resource management, organisational behaviour and industrial economics.
4. Students will know the importance and management of business finance.

M.COM PART I:-

M.COM SEMESTER I:

Course 101: Management Accounting

After successfully completing this course, student will be able to –

CO1: The concepts of Management Accounting in organizational business environment.

CO2: Demonstrate various tools of financial statements of organizational financial performance.

CO3: Learn Methods of financial statement analysis of an organization.

CO4: Assess different types of ratios of organizational financial performance.

CO5: Estimate the cash flow of liquidity capacity of firm.

CO6: Assess minimum working capital required for running organization.

CO7: Describe concept and types of responsibility center accounting for management Controlling.

CO8: Calculate sources and applications of funds of organization.

Course 102: Strategic Management

After successfully completing this course, student will be able to –

CO1: Describe different approaches of strategic decision making in corporate environment.

CO2: Describe various strategies of business and factors affecting on it.

CO3: Analyze techniques of organizational strengths, weakness, opportunities and threats.

CO4: Analyze effectiveness and its utilization in corporate strategic planning.

CO5: Illustrate the different alternatives of corporate strategies.

CO6: Develop allocation of resources for defining corporate strategy of business.

CO7: Describe the different functional strategies for organizational effectiveness.

CO8: Evaluating the Strategic Performance with actual performance

Course 113: Production and Operations Management (SP-1)

After successfully completing this course, student will be able to –

CO1: Explain recent trends in production and plant layout.

CO2: Discuss about Supply Chain Management.

CO3: Explain Production Planning, Control, design and Development.

CO4: Describe Total Quality Management and Emerging issues in Production and Operation Management.

Course 114: Financial Management (SP-II)

After successfully completing this course, student will be able to –

- CO1:** Identify financial system in India & recent changes.
- CO2:** Illustrate role of RBI & SEBI in Indian financial system.
- CO3:** Discuss capital budgeting techniques for financial decision making.
- CO4:** Illustrate capital budgeting methods of investment decisions.
- CO5:** Interpret financial statement & its utility of business firm.
- CO6:** Describe limitations of financial statements in financial analysis.
- CO7:** Gain depth of the concept of working capital management.
- CO8:** Understand concept of inventory management & receivable management.

M.COM SEMESTER II:

Course 201: Financial Analysis & Control

After successfully completing this course, student will be able to –

- CO1:** Describe concepts of capital budgeting.
- CO2:** Compute different tools and techniques to identify capital budgeting.
- CO3:** Explain Tabulated measurement of cost of capital.
- CO4:** Interpret expression view of marginal costing.
- CO5:** Evaluate practical problems on marginal costing which correlates to BEP and P/V analysis.
- CO6:** Illustrate short run managerial decision analysis.
- CO7:** Distinguish concept of budget and budgetary control.
- CO8:** Comparative study of different variance analysis

Course 202: Industrial Economics

After successfully completing this course, student will be able to –

- CO1:** Explain concepts of Industrial Economics.
- CO2:** Describe theories of industrial location and Industrial Imbalance.
- CO3:** Illustrate Industrial Productivity and Efficiency.
- CO4:** Describe Sources of Industrial Finance.

Course 213: Business Ethics & Professional Values (SP-III)

After successfully completing this course, student will be able to –

- CO1:** Understand the concept of business ethics, profession and values.
- CO2:** Classify the factors affecting social ethics.
- CO3:** Elaborate Indian Ethical Practices in marketing, advertising and Employment.
- CO4:** Demonstrate unethical practices in Gender discrimination and accounting disclosures.
- CO5:** Discuss the concept of corporate governance in business.
- CO6:** Analyse the concept of Corporate Social Responsibility in business ethics.
- CO7:** Summarize Indian approaches to business ethics.
- CO8:** Know new values in Indian industries after economic reform 1991.

Course 214: Knowledge Management (SP-IV)

After successfully completing this course, student will be able to –

- CO1:** Understand the concept of knowledge management.
- CO2:** Analyse evolution of knowledge management.
- CO3:** Elaborate the drives of organizational learning.
- CO4:** Discuss organizational learning frame work.
- CO5:** Demonstrate knowledge management tools.
- CO6:** Describe cultural change management.
- CO7:** Study organizational culture for organization development.
- CO8:** Understand measuring of organizational, cultural and climatic norms.

M.COM PART II:-

M.COM SEMESTER III:

Course 301: Business Finance

After successfully completing this course, student will able to-

- CO1:** Explain the role and Importance of Corporate finance and Calculating of Value of Money
- CO2:** Discuss theories of Capitalization
- CO3:** Explain the sources of finance for growing Business.
- CO4:** Explain about Short Term Finance and Working Capital.

Course 302: Research Methodology for Business:

After successfully completing this course, student will be able to –

CO1: Gain deeper understanding about the various concepts of Research in business.

CO2: Know the different types of research and the steps in business research process.

CO3: Make the formulation of research problem.

CO4: Understand various sampling methods in business research.

CO5: Distinguish primary and secondary methods of data collection for research.

CO6: Describe various techniques of data analysis and processing in research.

CO7: Know the writing skill for research project report in business.

CO8: Describe various ways of citation & bibliography for writing of report in business.

Course 313: Human Resource Management (SP-V)

After successfully completing this course, student will able to-

CO1: Explain concept of HRM and HR environment in organisation.

CO2: Discuss about Recruitment, Selection, and Kind of Retirement.

CO3: Explain concept of performance appraisal and merit rating in Human Resource Management.

CO4: Understand Recent Trends in HRM after Covid-19.

Course 314: Organizational Behaviour (SP-VI)

After successfully completing this course, student will able to-

CO1: Define concepts of Organisational Behaviour.

CO2: Identify concept of Horizontal Network and Virtual Design of Organisation.

CO3: Classify theories of Motivation and Define concept of Emotional Intelligence in Workplaces.

CO4: Differentiate various types concept of Stress Conflict and Groups.

M.COM SEMESTER IV:

Course 401: Capital Market and Financial Services

After successfully completing this course, student will be able to –

- CO1:** Define capital market instruments.
- CO2:** Understand different instruments of financial market.
- CO3:** Understand stock market in detail.
- CO4:** Know the functions of primary and secondary market.
- CO5:** Study different types of mutual funds and merchant banking.
- CO6:** Analyse the concept of portfolio management and credit rating.
- CO7:** Know the role of SEBI in financial market.
- CO8:** Understand new trends in Securities and Exchange Board of India.

Course 402: Industrial Economic Environment

After successfully completing this course, student will able to-

- CO1:** Explain concept of Industrial Finance.
- CO2:** Discuss about new Industrial Policy 1991
- CO3:** Explain effects of New Industrial Policy on Industry.
- CO4:** Discuss Progress and Problems of Steel, Textile and Sugar Industries.

Course 413: Recent Advances in Business Administration (SP-VII)

After successfully completing this course, student will able to-

- CO1:** Explain concept and principals of Change Management.
- CO2:** Discuss about Customer Centric Approach.
- CO3:** Understand Global Management System and Cross Cultural Management issues.
- CO4:** Explain concept of Tern around Management and step of Innovation Management.

402: Project Work (SP-VIII)

After successfully completing this course, student will be able to –

CO1: Understand and implement concepts of Research in business.

CO2: Prepare a research proposal or synopsis for project report.

CO3: Learn formulation of a research problem.

CO4: Develop research objectives and hypothesis.

CO5: Formulate questionnaire for collecting primary data and define sample size by using different sampling methods.

CO6: Understanding the application of secondary data in research.

CO7: Learn to analyse and interpret the data collected.

CO7: Learn verification of objectives, hypothesis testing and drawing conclusions from research work.

CO8: Learn how to write a research report in a systematic and scientific manner.

CO9: Understand and use modes of citation & bibliography.

Department of Psychology

Course outcomes

F.Y.B.A (Semester I)

Foundations of Psychology

1. Understand the basic psychological processes and their applications in day to day life.
2. Develop the ability to evaluate cognitive processes, learning and memory of an individual.
3. Understand the importance of motivation and emotion of the individual.
4. Understand the personality and intelligence of the individuals by developing their psychological processes and abstract potentials.

F.Y.B.A (Semester II)

Introduction to Social Psychology

1. Understand the basics of social psychology.
2. Understand the nature of self, concept of attitude and prejudice of the individual.
3. Assess the interactional processes, love and aggression in our day today life. .
4. Understand group dynamics and individuals in the social world.

S.Y.B.A (Semester III)

Health psychology

- 1) Understand the role of psychology in health.
- 2) understand various Bio- psycho social factors related to health and disease.
- 3) Understand the mind-body relationship.
- 4) Realize the importance of quality of life and promoting good health.

S.Y.B.A (Semester IV)
Positive Psychology

- 1) Understand how positive psychology works as the science of happiness.
- 2) Understand the difference between pleasure, happiness and satisfaction.
- 3) Realize the importance of positive emotions in well-being.
- 4) Traced the contours of positive life.

T.Y.B.A (Semester V)
INDUSTRIAL AND ORGANIZATIONAL PSYCHOLOGY

After completing the course, student should be able to:

- CO1: Describe the concept of industrial and organizational psychology, selection and training, evaluation and motivation at the workplace.
- CO2: Explain job profile, job analysis, recruitment techniques and employee training.
- CO3: Identify and classify the appraisal rating system.
- CO4: Compare different theories of motivation.
- CO5: Evaluate the training programme and job performance.

T.Y.B.A (Semester VI)
APPLIED PSYCHOLOGY

After completing the course, student should be able to

- CO1: Describe the concept of applied psychology, educational psychology, family structure and developmental patterns.
- CO2: Know the clinical psychology related mechanisms, social issues, and criminal behavior.
- CO3: Classify intellectual ability, abnormality, criminal behavior.
- CO4: Identify the problems and solutions in the field of education
- CO5: Evaluate the interpersonal relations.
- CO6: Apply psychological remedies to assess abnormal behavior, to tackle the social issues and to rectify the problematic behavior.

Department of Economics

Course Outcomes

1. FYBCOM- Business Economics

This course has two semesters, in the first semester there are four topics-they are related to Microeconomics, Macro concepts, cost revenue demand in detail. The 2nd semester also has 4 topics, they are related to Market structure, their equilibrium features, factor pricing-determination of price paid to factors.

Outcome of the course

1. To make the students aware and clear about the concepts of Economics.
2. To know about the practical use of the different tools used in Economics.
3. To impart the students, the knowledge of the subject in such a way that they will be able to analyze and criticize the theories.

2. TYBCOM-Indian and Global Economic development

This Course is more related with the Indian Economy as an emerging economy so there is comparison between India and other developed economies. Besides, it includes topics on international organizations.

Outcome of the course

1. To make Students think and analyze the role of Indian Economy in relation to developed Economies.
2. Comparison of Indian Economy in relation to agriculture, Industry and service sectors with developed economies
3. It throws light on the different international institutions and their relation with India. And India's place in these institutions.
4. It makes the student aware regarding BRICS, SAARC, IMF, ADB organizations as they are in present state.

3. SYBA-G2-Financial Systems

This course is very useful to the students as it covers the financial system. The students come to know about the commercial, cooperative and reserve bank.

Outcome of the course

1. The students learn about its functions, its role and problems of these banks.
2. The students learn how the financial market is divided into 2.
3. The study of the capital market is also important as many students opt for joining the share market. It gives them basic knowledge of this market.
4. It helps students know what the non-banking financial intermediaries are. Whether to invest in them is profitable. They even get an idea of foreign exchange market

4. SYBA S1-Micro Economics

This course helps Students know about Economics clearly. The course includes topics on demand, supply, cost, revenue, market structure, factor price etc.

Outcome of the course

1. The different theories of demand and supply helps students analyze the problem of rise or fall in price.
2. Elasticity of demand helps students know why demand for a commodity or factor of production shows increase or decrease in percentage.
3. The students learn as to how price of factor as well as commodity is determined.
4. The students learn about the different types of commodity markets existing.
5. The course gives the students clear understanding of the concepts and difference between micro and macroeconomics.

5.SYBA-SEC-Basic concepts of research methodologies

This is a very good course introduced in the present credit system for students pursuing research in future.

Outcome of the course

1. This course helps students know about different ways of doing research
2. The different statistical methods used in research are known to the students.
3. It helps the students know how to demonstrate a particular topic with the help of graphs of different types.
4. It even helps the students to know how or what are the different sources of collecting data points.
5. The students even get prepared as to how a problem is to be analyzed and recommend solutions for the problems and measures to be taken.

6. TYBA S4-Public Finance

This course helps the students know about the government's expenditure and revenue sources. It also teaches them about different types of taxes, debts and methods of their payment.

Outcome of the course

1. The course helps students learn and analyze as to what is exactly public finance study about
2. It helps students know as to how and from which source the revenue is collected and why it is spent.

3. It helps students explain different types of expenditure the government makes and why there is a continuous rise in public expenditure.
4. The Debt which is ever increasing to know what is external and internal debt, its effect on the economy and problems of repayment of the debt

Course Outcomes 2019 PATERN

Class - FYBA Semester 1 CBCS 2019

Course Code – 11021A

Course Name - मराठी साहित्य : कथा आणि भाषिक कौशल्यविकास [CC-1A]

- कथा या साहित्य प्रकारची ओळख होईल.
- कथा या साहित्यप्रकाराचे स्वरूप, घटक आणि प्रकार यांची ओळख होईल.
- भाषिक कौशल्यविकासाचे महत्त्व समजेल.
- इलेक्ट्रॉनिक माध्यमांचे ज्ञान अवगत होईल.
- समकालीन साहित्याचे विविध पैलू समजतील.

Class - FYBA SEM – II

CBCS-2019

Course Code – 11022 A

Course Name - मराठी साहित्य एकांकिका आणि भाषिक कौशल्यविकास [CC-1A]

- एकांकिका या साहित्यप्रकाराची ओळख होईल.
- एकांकिका या साहित्यप्रकाराचे स्वरूप, घटक आणि प्रकार यांची ओळख होईल.
- भाषिक कौशल्यविकासाचे महत्त्व समजेल.
- भाषांतर करण्याचे ज्ञान अवगत होईल.
- संवाद लेखनाला चालना मिळेल.
- कल्पना शक्ती प्रबळ होईल.
- दूरदर्शन व रंगभूमीवरील एकांकिका पाहण्याची आवड निर्माण होईल.
- संवाद लेखन, कल्पनाविस्तार, घोषवाक्य लेखन व भाषांतर कौशल्याचा अभ्यास होईल.

Class – SYBA

Sem – I

2019 PATTERN

Course Code – 23023

Course Name – भाषिक कौशल्यविकास आणि आधुनिक मराठी साहित्यप्रकार : कादंबरी [CC - 1 C]

- कादंबरी या साहित्यप्रकारचे स्वरूप, घटक, प्रकार समजून घेता येईल.
- कादंबरी या साहित्य प्रकारांच्या विविध घटकांचे ज्ञान होईल.
- साहित्यकृतीचे आकलन, आस्वाद आणि मूल्यमापन करण्याची दृष्टी निर्माण होईल.
- कादंबरीतील विविध घटकांचे ते विश्लेषण करतील.
- साहित्यकृतीला मुक्त प्रतिसाद देण्याची क्षमता विकसित होईल.
- साहित्याचा सूक्ष्म पातळीवर अभ्यास करण्याची क्षमता विकसित होईल.

Class – SYBA Sem- II

2019 PATTERN

Course Code – 24023

Course Name – भाषिक कौशल्यविकास आणि आधुनिक मराठी साहित्यप्रकार : ललितगद्य [CC - 1 D]

- ललितगद्य या साहित्यप्रकारचे स्वरूप लक्षात येईल.
- ललितगद्य या साहित्यप्रकारची वाटचाल समजेल.
- ललितगद्याचे आकलन, आस्वाद आणि विश्लेषण करता येईल.
- आधुनिक तंत्रज्ञानाचा उपयोग कसा करायचा हे समजेल.
- भाषिक कौशल्यविकासाचे महत्त्व समजेल.

Class – SYBA Sem- I 2019 Pattern Course Code – 23021

Course Name – आधुनिक मराठी साहित्य : प्रकाशवाटा [DSE 1 A]

- आत्मचरित्र या साहित्यप्रकारचे स्वरूप, संकल्पना समजून घेता येईल.
- आत्मचरित्र या साहित्यप्रकाराच्या प्रेरणा आणि वाटचाल यांची ओळख होईल.
- आत्मचरित्र या साहित्यप्रकारचे वेगळेपण समजावून घेता येईल.
- आत्मचरित्र या साहित्यप्रकारचे आकलन, आस्वाद आणि विश्लेषण करता येईल.

Class – SYBA Sem- II 2019 Pattern Course Code – 24021

Course Name – मध्ययुगीन मराठी साहित्य : निवडक मध्ययुगीन गद्य, पद्य [DSE 1 B]

- मध्ययुगीन गद्य, पद्य साहित्य प्रकाराची ओळख होईल.
- मध्ययुगीन गद्य, पद्याचे आकलन, आस्वाद आणि विश्लेषण करता येईल.
- मध्ययुगीन गद्य, पद्य साहित्य निर्मितीच्या प्रेरणा समजून घेता येतील.
- मध्ययुगीन कालखंडाची संस्कृतिक, सामाजिक, राजकीय जडणघडण समजून घेता येईल.

Class – SYBA Sem- I

2019 Pattern

Course Code – 23022

Course Name – साहित्यविचार [DSE 2 A]

- भारतीय आणि पाश्चात्य साहित्यविचाराच्या आधारे साहित्याची संकल्पना स्वरूप आणि प्रयोजनविचार समजून घेता येईल.
- साहित्याची निर्मितीप्रक्रिया समजावून घेता येईल.
- साहित्याची भाषा आणि शैली विषयक विचार समजावून घेता येतील.
- भारतीय व पाश्चिमात्य साहित्य विचाराची विद्यार्थ्यांना ओळख होईल.
- साहित्याच्या निर्मिती प्रक्रियेविषयी चर्चा करू शकतील.
- साहित्याची भाषा समजावून घेता येईल.
- भामह, दण्डी, वामन, रुद्रट, भरत, अभिनवगुप्ता या संस्कृत मीमांसकांचा परिचय होईल.
- साहित्य आणि समाज यातील परस्परसंबंध समजतील.
- वाङ्मयीन मूल्ये समजतील.
- पाश्चिमात्य विचारवंत जॉन्सन, अर्नोल्ड, इ. च्या विचारांचे टिकात्मक परीक्षण करू शकतील.
- साहित्य प्रकाराची संकल्पना समजून घेता येईल.

Class – SYBA Sem- II

2019 Pattern

Course Code – 24022

Course Name – साहित्य समीक्षा [DSE 2 B]

- साहित्य समीक्षेची संकल्पना, स्वरूप यांचा परिचय होईल.
- साहित्य आणि समीक्षा यांचे परस्पर संबंध अभ्यासून त्याचे विवेचन करता येईल.
- साहित्यप्रकारानुसार समीक्षेचे स्वरूप समजावून घेता येईल.
- ग्रंथ परिचय, परीक्षण व समीक्षण यातील फरक समजावून घेता येईल.
- साहित्यव्यवहारातील समीक्षेचे स्थान व कार्य समजेल.
- समीक्षकाचे गुण व त्याने पाळावयाची पथ्ये लक्षात येतील.
- भाषिक, साहित्यिक व सांस्कृतिक संकेत समजतील.

Class – SYBA Sem- I 2019 Pattern Course Code – 23025

Course Name – प्रकाशनव्यवहार आणि संपादन (SEC 2 A)

(DSE विषयाशी निगडीत अनिवार्य)

- प्रकाशनव्यवहार आणि संपादन यासाठी आवश्यक कौशल्ये आत्मसात होतील.
- ग्रंथनिर्मिती प्रक्रिया समजून घेता येईल.
- प्रकाशनव्यवहार आणि संपादन यासाठी आवश्यक प्रशिक्षण घेता येईल.
- लेखनविषयक नियम समजून घेता येतील.

Class – SYBA Sem- II 2019 Pattern Course Code – 24025

Course Name – उपयोजित लेखनकौशल्य (SEC 2 B)

(DSE विषयाशी निगडीत अनिवार्य)

- जाहिरात, मुलाखतलेखन आणि संपादन यासाठी आवश्यक कौशल्य आत्मसात करता येतील.
- जाहिरात लेखनाचे स्वरूप समजावून घेता येईल.
- जाहिरात, मुलाखतलेखन आणि संपादन यासाठी आवश्यक प्रशिक्षण घेता येईल.
- मुलाखत लेखनाचे तंत्र समजावून घेता येईल.

Class – S.Y.B.A. Sem- I 2019 Pattern

Course Code – 23011

Course Name – मराठी भाषिक संज्ञापनकौशल्ये (MIL2)

- प्रगत भाषिक कौशल्यांची क्षमता विकसित होईल.
- प्रसारमाध्यमातील संज्ञापनातील स्वरूप लक्षात येईल.
- प्रसारमाध्यमांसाठी आवश्यक असलेली लेखनक्षमता विकसित होईल.
- लोकशाहीतील जीवनव्यवहार लक्षात येईल.
- व्यक्तिमत्व विकास होईल.

Class – S.Y.B.A. Sem- II 2019 Pattern

Course Code – 24011

Course Name – नवमाध्यमे आणि समाजमाध्यमांसाठी मराठी (MIL2)

- विविध समाजमाध्यमांचे स्वरूप व महत्त्व लक्षात येईल.
- भाषा, जीवनव्यवहार आणि समाजमाध्यमे यांचा परस्पर संबंध लक्षात येईल.
- समाजमाध्यमांचा परिणामकारकपणे वापर करता येईल.
- समाजमाध्यमांसाठीची लेखनक्षमता विकसित होईल.

Course Name – भाषा, साहित्य आणि कौशल्यविकास (117A)

- विविध क्षेत्रातील भाषा व्यवहाराचे स्वरूप व गरज समजावून घेता येईल.
- निबंध या लेखन प्रकाराची दृष्टी निर्माण झाल्याने वैचारिक, ललित व वाणिज्य विषयक ललितलेखन करण्याची क्षमता निर्माण होईल.
- उत्कर्षवाटा या पाठ्यपुस्तकाच्या अभ्यासामुळे विद्यार्थ्यांना व्यावसायिक, सामाजिक व राजकीय प्रश्नांची जाणीव होईल.
- उत्कर्षवाटा या पाठ्यपुस्तकाच्या अभ्यासामुळे विद्यार्थ्यांमध्ये नैतिक, व्यावसायिक व वैचारिक मूल्यांची जोपासना होईल.
- विद्यार्थ्यांमध्ये चरित्र व आत्मचरित्र या साहित्यप्रकारांचा परिचय होईल.

Course Name – भाषा आणि कौशल्यविकास (117B)

- विविध क्षेत्रातील भाषा व्यवहाराचे स्वरूप व गरज समजावून घेता येईल.
- वाणिज्य विषयाच्या विद्यार्थ्यांना मराठी भाषेच्या व्यावहारिक क्षेत्राची व विविध क्षेत्रातील भाषा उपयोजनेची माहिती व स्वरूप याचे ज्ञान होईल.
- मराठी भाषेचे उपयोजन करण्याची सवय लागेल उदा.पत्रलेखन ,कार्यालयीन मराठी, अहवाल लेखन,अर्ज लेखन इ.
- प्रसार माध्यमांतील आकाशवाणी, दूरदर्शन व वर्तमानपत्र यांचे स्वरूप त्यांची कार्यपद्धती आणि माध्यमाबद्दल जिज्ञासा निर्माण होईल.
- भविष्यात या प्रसारमाध्यमांमध्ये काम करण्याची आवड निर्माण होईल.
- वाणिज्य व अर्थकारण मराठीतून प्रभावीपणे मांडणे शक्य होईल .
- मराठीतून वाणिज्य विषयक लेखन करण्याची क्षमता निर्माण होईल .
- इलेक्ट्रॉनिक माध्यमांमध्ये मराठी भाषेचा वापराची आवड निर्माण होईल.
- सारांशलेखन व भाषांतर या लेखनकौशल्याचा परिचय होईल.

Class – S.Y.B.Sc. Sem- I

2019 Pattern

Course Code – 23331

Course Name – उपयोजित मराठी (AECC- 2 A)

- दैनंदिन जीवनात आवश्यक व्यवहारीक भाषा, शास्त्रीय लेखनाची भाषा, प्रसार माध्यम आणि समाज माध्यम लेखनाच्या भाषेची ओळख होईल.
- अर्ज लेखन, संगणकीय अर्ज लेखन आणि स्व परिचय इत्यादी लेखन कौशल्य विकसित होतील
- प्रसारमाध्यमांसाठी आवश्यक लेखन कौशल्याचा विकास होईल
- लेख लेखन, भाषण लेखन, माहितीपटासाठी आवश्यक लेखन कौशल्याचा विकास होईल

Class – S.Y.B.Sc. Sem- II

2019 Pattern

Course Code – 24331

Course Name – मराठी साहित्य (AECC- 2 B)

- विज्ञान विषयक साहित्याचा परिचय होईल.
- विज्ञान विषयक दृष्टिकोन निर्माण होईल.
- मराठी भाषा, मराठी साहित्य आणि विज्ञान यांच्या परस्पर संबंधाची जाणीव होईल.
- विज्ञान साहित्य विषयक आकलन क्षमता वृद्धीस लागेल.