Dr. Ambedkar College of Arts, Commerce and Science, Chandrapur

Faculty of Science and Technology

Course Outcomes

DEPARTMENT OF PHYSICS

B.SC. SEMESTER - I

Course title: Paper I (Mechanics and Relativity)

Course Code: USPHT01

After successful completion of the course, students will be able to:

1. Understand the laws of motions and its applications.
2. Distinguish centre of mass and centre of gravity.
3. Distinguish elastic collision and inelastic collisions with transfer of energy.
4. Have a thorough knowledge of rotational dynamics, non-inertial systems.
5. Understand relative motion and theory of relativity.

Course Title: Paper II (Gravitation, Oscillation and Properties of Matter)

Course Code: USPHT02

After successful completion of the course, students will be able to:

1. Understand concept of gravitation and planetary motion.
2. Have a knowledge of different types of oscillations.
3. Understand the concept of elasticity and different types of elastic moduli & their Inter-relations.
4. Have the knowledge of Streamline flow and Turbulent Flow and Bernoulli's Theorem and its applications
5. Understand the concept of surface tension and its molecular interpretation.
6. Do oral and written scientific communication and will prove that they can think critically and work independently.

PHYSICS LAB I:

Course Code: USPHP01

1. Students will have good laboratory skills, enabling them to take observations and measurements in a physics laboratory and analyze the results to draw valid conclusions.
2. Students will learn the use various apparatus to take the measurements up to the marks.

B.SC. SEMESTER- II

Course Title: **Paper I (Vector Analysis and Electrostatics)**

Course Code: USPHT03

After successful completion of the course, the students will be able to:

1. Have a sound knowledge of vectors and its application to solve the various problem of motion in physics.
2. Understand the Electric Field and Potential, Electrical circuits and be able to apply this knowledge to analyze a variety of physical phenomena.
3. They can use this knowledge in daily life.

Course Title: Paper II (Magnetostatic and Electromagnetic waves)

Course Code: USPHT04

After successful completion of the course, the student is expected to:

1. Understand effect of electric field, Magnetic field, magnetic properties of materials and will able to distinguish them.
2. Have the knowledge of magnetic induction, transformer and their application in daily life.
3. They can understand the propagation of light wave as a electromagnetic wave.
4. They will be able to understand DC and AC electric current and apply to various circuit.

PHYSICS LAB II:

Course Code: USPHP02

1. Students will acquire good laboratory skills to connect various components in circuit.
2. Students will learn the use various apparatus to take the measurements up to the marks.
3. Student will able to take observations and measurements in a physics laboratory and analyze the results to draw valid conclusions.

B.SC. SEMESTER-III

Course Title: Paper I (Thermal Physics)

Course Code: USPHT05

After successful completion of the course, the student is expected to:

1. Have a thorough knowledge of Thermal physics and be able to study of different the thermal phenomenon.
2. Understand the laws of thermodynamics to solve the various problem.
3. Realize the importance of Thermo dynamical functions and applications of Maxwell's relations.

Course Title: Paper II (Radiation and Statistical Physics)

Course Code: USPHT06

The completion of this course will enable the students to:

1. Understand the Thermal Radiation laws.
2. Study statistical basis of thermodynamics.
3. Understand the concept of different statistics.
4. Familiarize in depth about statistical distribution and have basic Ideas about Maxwell- Boltzman, Bose-Einstein and Fermi- Dirac Statistics and their applications

PHYSICS LAB I:

Course Code: USPHP03

1. Students will acquire good laboratory skills to handle the thermal problem.
2. Student will able to take observations and measurements in a physics laboratory and analyze the results to draw valid conclusions.
3. Students will understand experimentally the concept of statistical physics.

B.SC. SEMESTER-IV

Course Title: Paper I (Wave, Acoustics and Laser)

Course Code: USPHT07

After successful completion of the course, the students will be able to:

1. Understand basic concept of sound waves.
2. Distinguish audible, ultrasonic and infrasonic waves.
3. Use the mathematical treatment to show various form of waves.
4. Differentiate noise and music, understand the characteristics of musical sound and requirement of good auditorium.
5. Understand and explain the principles and design considerations of various (solid state, gas and semiconductor) lasers, modes of their operation and areas of their application.

Course Title: Paper II (Optical Physics)

Course Code: USPHT08

The completion of this course will enable the students to:

1. To have a thorough knowledge about Geometrical optics, wave optics, wave motion, and apply the above knowledge to analyze various aspects of a physical phenomenon.
2. Familiar with phenomenon of interference, diffraction and polarization.

3. Understand the applications of interference and diffraction.
4. Understand the applications of interference in design and working of interferometers.

PHYSICS LAB II:

Course Code: USPHP04

1. Students will observe the phenomenon of the interference and diffraction in the laboratory.
2. Student will able to take observations and measurements in a physics laboratory.
3. They can find out the refractive index of various transparent material.

B.SC. SEMESTER-V

Course Title: Paper I (Statistical Physics and Relativity)

Course Code : 5S-PHY 501

After successful completion of the course, the students will be able to:

1. Understand how statistics of the microscopic world can be used to explain the thermal features of the macroscopic world.
2. Establish connection between statistics and thermodynamics.
3. Understand Maxwell-Boltzman, Bose-Einstein and Fermi Dirac statistics.
4. Understand special relativity theory and to solve Lorent'z transformation equations, Length contraction, time dilation, variation of mass with velocity, Einstein's mass-energy relation etc.

Course Title: Paper II (X-rays and Solid State Physics)

Course Code : 5S-PHY 502

After successful completion of the course, the students will be able to:

1. To understand the different types of X-rays and their characteristics and applications in various fields.
2. Understand the magnetic and dielectric properties of solids.
3. Familiar with crystal structures in solids and their determination using XRD.
4. To calculate thermal and electrical properties in the free-electron model and know Bloch's theorem and energy band and distinction between metals, semiconductors and insulators.

PHYSICS LAB I:

Course Code: 5S-PHY 503

1. Students will have a thorough laboratory skills enabling them to take observations and measurements in a physics laboratory and to analyse its results.

B.SC. SEMESTER-VI

Course Title: Paper I (Nuclear Physics, Nanotechnology and Biophysics)

Course Code : 6S-PHY 601

After successful completion of the course, the students will be able to:

1. Know the interaction of charge particles and neutrons with matter understand the construction and working of various types of counters such as G. M. Counter, Proportional Counter and Scintillation counter.
2. Familiar with nuclear reactions, packing fraction, mass defect and binding energy and nuclear fission.
3. Understand basic properties of nucleus and nuclear models to study the nuclear structure properties.
4. Know the elementary particles, alpha decay and its theory.
5. Understand nano-materials nano clusters and quantum dots and its properties
6. Explain different methods of synthesis of nanomaterials and basic principle of characterization techniques if SEM and TEM.
7. Understand various applications of Nanotechnology.

Course Title: Paper II (Fibre Optics, Communication and Digital Electronics)

Course Code : 6S-PHY 602

The completion of this course will enable the students to:

1. Understand the importance of optical fibre and how the light propagate through it.
2. Know the basic structure of optical fibre and it types, difference between electrical and optical bandwidth.
3. Understand need of modulation, different types of modulation and their theories and frequency spectrum.
4. Familiar with different number systems, addition and subtraction of binary numbers.
5. Know the different logic gates, their truth table and Boolean equation and construction and working of Half Adder, Full Adder, Half Subtractor and Full subtractor.
6. Understand the construction and working of different types of multivibrators , Flipflops , counters and shift registers.

PHYSICS LAB II:

Course Code : 6S-PHY 603

1. Students will have a good laboratory skills, enabling them to take observations and measurements in a physics laboratory and analyze the results to draw valid conclusions.
2. Students will be able to construct the various circuits of logic gates, HA, FA, FF and counters and verify their truth tables.

DEPARTMENT OF CHEMISTRY

B.SC. SEMESTER-I

Course Title: I: Paper I (INORGANIC CHEMISTRY)

Outcomes:

1. Students will properly understand the structure of atom, variations of its periodic properties.
2. They will able to understand theory of formation of covalent bond, concept of hybridization and molecular orbital theory.
3. They can understand comparative study of s-block elements and comparative study of p- block elements with regards to various properties
4. Students will have a thorough knowledge of (A) Hydrogen Bonding (B) Chemistry of Nobel gas (C) Theory of Volumetric Analysis**.**

Core II: Paper II (Organic Chemistry)

Outcomes:

1. The student should understand Fundamentals of Organic Chemistry such as Physical Effects, Electronic Displacements, Structure, shape and reactivity of organic molecules, Types of Reactions, Strength of organic acids and bases
2. They will come to know basic concept of stereochemistry.
3. The students will thoroughly understand preparation, properties and reactions of aliphatic hydrocarbons and aromatic hydrocarbons.

CHEMISTRY LAB:

Outcomes:

1. Students will have good laboratory skills, enabling them to handle apparatus and chemicals with precaution to avoid laboratory accidents.
2. Students will learn experiments on volumetric analysis and qualitative analysis.

B.SC. SEMESTER- II

Course Title: Paper I (ORGANIC CHEMISTRY)

Courses Outcomes:

1. The students will thoroughly understand preparation, properties and reactions of alkyl halides, aryl halides, alcohols, phenols, aliphatic and aromatic ethers, aldehydes and ketones.
2. They will understand nomenclature, structure, bonding and physical properties of carboxylic acid and their derivatives.
3. This knowledge can help them to understand organic chemistry properly.

Core II: Paper II (PHYSICAL CHEMISTRY)

Courses Outcomes:

1. Students will learn mathematical concepts necessary to understand physical chemistry throughout.
2. They will understand basic knowledge of ionic equilibrium phenomena.
3. They will understand thermodynamics, thermochemistry.
4. They can understand thoroughly states of matter such as solid state with regard to crystallography, liquid state with its properties and gaseous state with concerning to ideal and real gas.

CHEMISTRY LAB II:

1. Students will know methods of purification of impure organic compounds.
2. Students will develop the skill of preparation of organic compounds.
3. Students will able to verify theoretical knowledge experimentally.

B.SC. SEMESTER-III

Course title: Paper I (INORGANIC CHEMISTRY)

Courses Outcomes:

1. Students will have a thorough knowledge of classification, structure, preparation, and properties of hydrides of Boron, Iodine interhalogen compounds, oxy acids of sulphur and
2. Students will know Ionic structures, radius ratio effect & coordination number of ionic solids. Also they will understand metallic bonding, concept of acids and bases.
3. Students will understand chemistry of first, second, third transition series, lanthanides and actinides

Core II: Paper II (PHYSICAL CHEMISTRY)

Courses Outcomes:

1. Students will understand the Phase equilibria and theory of liquid-liquid mixtures.
2. They will be able to study and understand properly thermodynamics, Chemical kinetics, colligative properties, and magnetic properties.

CHEMISTRY LAB III:

1. Students will acquire good laboratory skills to semi micro qualitative analysis of inorganic salt mixture containing two acid and two basic radicals.
2. Students will understand experimentally the concept of phase equilibria, colligative properties and chemical kinetics.

B.SC. SEMESTER-IV

Course Title: Paper I (INORGANIC CHEMISTRY)

Courses Outcomes:

1. Students will able to understand basic concept of co-ordination chemistry, theory of soft and hard acid and base, and principle involved in extraction of elements.
2. They can study crystal field theory as Metal Ligand Bonding In Transition Metal Complexes
3. They can understand Electronic Spectra of Transition Metal Complexes, Thermodynamic And Kinetic Aspect of Metal Complexes
4. They can understand Colorimetery and Spectrophotometery.

Core II: Paper II (ORGANIC CHEMISTRY)

Courses Outcomes:

1. Students will have a thorough knowledge about Synthesis, structure and chemical reaction of Nitro Compound, Amino compounds, Diazonium salt, Heterocyclic Compounds, organo metallic compounds, Amino Acids, Peptides and Proteins, Carbohydrates and Synthetic Dyes and Drugs.

CHEMISTRY LAB IV:

1. Students will able to prepare some complex compounds.
2. Student will able to handle Colorimeter/spectrophotometer properly and can perform practicals
3. Students will able for quantitative estimation of elements in solution gravimetrically.

B.SC. SEMESTER-V

Course Title: Paper I (ORGANIC CHEMISTRY) Course Code:

Courses Outcomes:

1. Students will understand Nuclear Magnetic Resonance (NMR) spectroscopy
2. Students will able to understand Heterocyclic Compounds, Carbohydrates, Amino Acids, Peptides & Proteins, Fats, Oils & Detergents, Synthetic Dyes, Drugs

Core: II Paper II (Physical Chemistry)

Courses Outcomes:

1. Students will understand thoroughly of Electrochemistry.
2. Students will understand basic concept of quantum mechanics.
3. Students will able to know colligative properties and magnetic properties.

CHEMISTRY LAB V:

1. Students will develop skill of Separation and identification of organic compounds from the given binary mixture.
2. Students will perform practical based on potentiometer and conduct meter and can develop skill ofhandling instruments.

B.SC. SEMESTER-VI

Course Title: Paper I (INORGANIC CHEMISTRY)

Courses Outcomes:

1. Students will able to understand basic concept of Metal Ligand Bonding in Transition Metal Complexes, Electronic Spectra of Transition Metal Complexes, Magnetic Properties of Transition Metal Complexes,Thermodynamic and Kinetic aspect of metal Complexes
2. They can know Separation Techniques such as Chromatography, Ion- Exchange, and Solvent Extraction.
3. They can understand Organometallic Chemistry, Bioinorganic Chemistry, Basic Principal of Soil Chemistry
4. They can understand Colorimetery and Spectrophotometery.

Core II: Paper II (Physical Chemistry)

Courses Outcomes:

1. Students will understand thoroughly Quantum chemistry. Molecular orbital chemistry, Photochemistry, dipole moment
2. Students will understand basic concept of rotational, vibrational spectroscopy, surface chemistry, colloidal chemistry.

CHEMISTRY LAB VI:

1. Students will able to prepare some complex compounds.
2. Students will able to understand practical on colorimeter, Abbe's Refractometer, Polarimeter
3. Student will develop the skill of separation and estimation technique by ion exchange method, chromatography.
4. Students will able to understand theory of adsorption experimentally.

DEPARTMENT OF COMPUTER SCIENCE

B.SC. SEMESTER – I

Course Title: Paper –I: Information and Communication Technology

Course Code: USCST01

Courses Outcomes:

After successful completion of the course, students will be able to:

1. Handle and understand the Computer & IT.
2. Learn and understand the different Number systems and codes.
3. Distinguish between Input, Output and Storage Devices.
4. Understand the Windows Operating System and operate to solve the different tasks.
5. Understand the different Networks types and its topology

Course Title: Paper –II: PROGRAMMING TECHNIQUES & INTRODUCTION TO 'C'

Course Code: USCST02

Courses Outcomes:

After successful completion of the course, students will be able to:

1. Comparative study the different types of computer languages.

2. Study of programming tools such as algorithm, flowcharts.
3. Details study of C-Character Set and Keyboards, Constants and Variables, Data types.
4. Study of Type Casting, Operators and Expressions.
5. Understand conditional statements of C Language.
6. Understand looping statements of C Language. For, while, do-while.

Computer Science Lab I:

Course Code: USCSP01

1. Students will have good laboratory skills, enabling them to write Algorithms, flowcharts and write the programs in computer programming language "C".
2. Students will debugging and execute the programs.
3. Students will learn to handle the Computer.

B.SC. SEMESTER – II

Course Title: Paper –I: OPERATING SYSTEM & LINUX

Course Code: USCST03

Courses Outcomes:

After successful completion of the course, students will be able to:

1. Study the different type of operating systems used in computer and their applications.
2. Study the Operating System Structure.
3. Study the UNIX operating system and different commands used in unix OS.
4. Able to write the programs is shell script.

Course Title: Paper –II: STRUCTURED PROGRAMMING WITH 'C'

Course Code: USCST04

Courses Outcomes:

After successful completion of the course, students will be able to:

1. Understand the array & write programs on arrays.
2. Study the different string library functions.
3. Understand use structure and union using different programs.
4. Differentiate the standard library and user defined functions and their structures.
5. Comparative study of storages classes.
6. Understand the concept of pointer and file.

Computer Science Lab II:

Course Code: USCSP02

Courses Outcomes:

1. Students will have good laboratory skills, enabling them to write Algorithms, Flowcharts and write the programs using arrays, structure and unions in computer Programming language "C".
2. Write Algorithms, flowcharts and write the programs using pointer and file handling.
3. Students will debugging and execute the programs.

B.SC. SEMESTER – III

Course Title: Paper –I: DATABASE MANAGEMENT AND SYSTEM ANALYSIS

Course Code: USCST05

Courses Outcomes:

After successful completion of the course, students will be able to:

1. Study the Database Environment and data models.
2. Understand the different normal forms and their uses.
3. Understand the system and study the system life cycle.
4. Study the System Analysis, Information Gathering Tools and Tools of Structure Analysis.
5. Study the System Design & Implementation.

Course Title: Paper II: OBJECT ORIENTED PROGRAMMING WITH C++

Course Code: USCST06

Courses Outcomes:

After successful completion of the course, students will be able to:

1. Understand the concept of function used in C++.
2. Study and implementation of classes and objects using programs.
3. Understand the concepts of Constructors, Destructors, Operators Overloading and Inheritance.
4. Understand the concepts of Pointers Virtual & Friend functions and file handling

Computer Science Lab III:

Course Code:USCSP03

Courses Outcomes:

1. Students will have good laboratory skills, enabling them to write the programs using C++ Computer Programming Language.
2. Students will debugging and execute the programs.

B.SC. SEMESTER – IV

Course Title: Paper –I: ALGORITHM & DATA STRUCTURES

Course Code: USCST07

Courses Outcomes:

After successful completion of the course, students will be able to:

1. Study different techniques used in data structure such as sorting, searching, merging, stack and their presentation in memory.
2. Study the recursion and queues and their applications.
3. Study the linked lists and their applications.
4. Study the Tree and Graphs

Course Title: Paper –II: VISUAL BASIC & INTRODUCTION TO .NET

Course Code: USCST06

Courses Outcomes:

After successful completion of the course, students will be able to:

1. Understand the concept of Integrated Development Environment (IDE), Programming Constructs and Control flow statement. And implement using programs in VB.
2. Study and implementation of Visual Basic Control, ActiveX Control and Procedure in VB.
3. Study and implementation of Interface, Array and ActiveX Data Object
4. Study the introduction to .NET and implementation of Visual Studio.NET Interface, Array and ActiveX Data Object.

Computer Science Lab IV:

Course Code:USCSP04

1. Students will have good laboratory skills, enabling them to write the programs using Visual basic and .NET.
2. Students will debugging and execute the programs.

B.SC. SEMESTER – V

Course Title: Paper –I: SYSTEM ANALYSIS AND PROJECT MANAGEMENT

Courses Outcomes:

After successful completion of the course, students will be able to:

1. Study the system concepts and system life cycle.
2. Study the different elements of system.
3. Understand the system and study the system life cycle.
4. Study the System Analysis, Information Gathering Tools and Tools of Structure Analysis.

5. Study the System Design & Implementation.
6. Understand the project management.

Course Title: Paper –II: Database Programming With Oracle

Courses Outcomes:

After successful completion of the course, students will be able to:

1. Study the Database Environment and data models.
2. Understand the DBMS and RDBMS.
3. Study the SQL language using Oracle.
4. Study and implement the SQL Function and Database Objects
5. Study the Exception Handling, Cursor and different Attributes of cursors, Subprogram and Packages and Trigger.

Computer Science Lab V:

1. Students will have good laboratory skills, enabling them to write the programs using Oracle and PL/SQL.
2. Students will debugging and execute the programs.

B.SC. SEMESTER – VI

Course Title: Paper –I: E-COMMERCE AND HTML

Courses Outcomes:

After successful completion of the course, students will be able to:

1. Study the E-commerce and its applications.
2. Study the Introduction of HTML.
3. Understand the HTML tags and different attributes used with tag.
4. Understand the working with HTML list, linking, graphics in web page.
5. Design the web pages using tables, different forms and controls.

B.SC. SEMESTER – VI

Course Title: Paper –II: Data Communication With Cloud Computing Basics

Courses Outcomes:

After successful completion of the course, students will be able to:

1. Study the Data communication, data transmission, encoding, multiplexing, and data link controls.
2. Understand the different data communication controls.
3. Study the Communication Architecture Protocols and Architecture.
4. Study the cloud computing overview, Cloud Computing with the Titans, Hardware & Infrastructure.

Computer Science Lab VI:

1. Students will have good laboratory skills, enabling them to write the programs using HTML and design the different web allocations.
2. Students will debugging and execute the programs.

DEPARTMENT OF ELECTRONICS

B.SC. SEMESTER – I

Course Title: Paper-I (Network Analysis and Digital Fundamentals)

Course Code: (USELT01)

Course Outcomes:

On completion of the course, students are able to:

1. Apply concepts of electric network topology, nodes, branches, loops to solve circuit problems Including the use of computer simulation.
2. Understand the basic concepts of various network Theorems.
3. Learn the various parameters and their interrelationship, able to solve numericals with series, cascade, parallel connection using two port parameters.
4. Understand basic digital electronic systems
5. To learn function of basic digital circuits and use of transistors to create logic gates in order to perform Boolean logic.
6. To learn different theorems for simplification of basic Digital electronics circuits.
7. Student understand symbols, Truth tables, Boolean equations, & working principle.

Course Title: Paper-II (Semiconductor Diodes and Analog Electronics)

Course Code: (USELT02)

Outcomes:

On completion of the course, students are able to:

1. Know various semiconductor diodes and their characteristics
2. Know the various types of Rectifies and their advantages and disadvantages.
3. Know the various transistors and their input output characteristics
4. Know about the multistage amplifier using BJT and FET in various configuration to determine frequency response and concept of voltage gain.
5. Know the concept of feedback amplifier and their characteristics.
6. Design the different oscillator circuits for various frequencies

B.SC. SEMESTER – II

Course Title: Paper-I (Unipolar Devices and Linear Integrated Circuits)

Course Code: (USELT03)

Outcomes:

On completion of the course, students are able to:

1. Understand various Unipolar Devices like UJT, MOSSFET
2. Understand the fundamentals and areas of applications for the integrated circuits.
3. Analyze important types of integrated circuits.
4. Understand requirement of Operational Amplifier and Block diagram of Operational Amplifier
5. Understand various parameters of Operational Amplifier
6. Understand various linear and Nonlinear applications of Operational Amplifier

Course Title: Paper-II (Digital Integrated Circuit)

Course Code: (USELT04)

Outcomes:

On completion of the course, students are able to:

1. Understand combinational and logical digital circuits and their differences.
2. Students will be introduced to Flip-flop, shifts register, counters for data Processing circuits.
3. To learn symbol, working principle of basic Digital electronics circuits for data processing application.
4. At the end of this course, students should be able to recognize and analyze the basic digital circuits.

B.SC. SEMESTER – III

Course Title: Paper-I (Power Amplifier, Oscillators and Power Supplies)

Course Code: (USELT05)

Outcomes:

On completion of the course, students are able to:

1. To understand Basic Analog Circuits and their applications using Active Devices
2. To learn basic function of single stage amplifier, multistage amplifier and power Amplifier and their working principle.
3. To understand basic construction of feedback circuits and their application in Oscillators
4. Understand basic amplifier and oscillator circuits and their application in analog circuits.
5. To learn and design various regulated and unregulated Power supplies.

Course Title: Paper-II Microprocessor

Course Code: (USELT06)

Outcomes

On completion of the course, students are able to:

1. To understand the basic architecture of 8- bit microprocessors.
2. Able to write programs on 8085 microprocessor based systems.
3. Identify the addressing modes of an instruction.
4. Develop programming skills in assembly language.

B.SC. SEMESTER – IV

Course Title: Paper-I Communication Electronics

Course code: (USELT07)

On completion of the course, students are able to:

1. Understand different blocks in communication system and how noise affects communication using different parameters.
2. Distinguish between different amplitude modulation schemes with their advantages, disadvantages and applications.
3. Analyze generation and detection of FM signal and comparison between amplitude and angle modulation schemes.
4. Identify different radio receiver circuits and role of AGC.
5. Basic concept of mobile communication System
6. Understand idea of GSM, CDMA, TDMA and FDMA technologies, GPS navigation system.

Course Title: Paper-II (Interfacing, PPI devices and Microcontroller)

Course Code: (USELT08)

Outcomes:

On completion of the course, students are able to:

1. Understand interfacing various Input and Output devices with 8085 Microprocessor.
2. Get Knowledge of various PPI Devices used in Microprocessor.
3. Ability to differentiate microprocessor and microcontroller
4. Draw and describe architecture of 8051 microcontroller
5. Write assembly language program for microcontrollers.
6. Design microcontroller based system for various applications

B.SC. SEMESTER – V

Course Title: Paper-I (Electronic Instrumentation)

Course Code: (USELT09)

Outcomes:

On completion of the course, students are able to:

1. Learn various measuring Instruments like voltmeter, ammeter, ohmmeter and various dc bridges.
2. Understand the detailed block diagram of CRO
3. Understand the detailed applications of CRO for the measurement of Phase, frequency and phase.
4. Understand the concept of Transducers.
5. Understand the various types of Transducers.

Course Title: Paper-II (C-Programming-I)

Course Code: (USELT10 DSE-01)

Outcomes

On completion of the course, students are able to:

1. Understand basic of the programming language
2. Able to switch any other programming language
3. Able to write C program for simple real life applications using structures.

B.SC. SEMESTER – VI

Course Title: Paper-I (Photonic Devices and Power Electronics)

Course Code: (USELT11 DSE-02)

Outcomes:

On completion of the course, students are able to:

1. Understand power semiconductor devices used in industries.
2. Understand the construction and working of different power semiconductor devices
3. Analyze various triggering circuits used for different semiconductor devices
4. Design power electronic circuit for real time application like rectifier and convertor etc.
5. Recognize the role power electronics play in the improvement of energy usage efficiency and the applications of power electronics in emerging areas.

Course title: Paper-II

Course Code: (USELT12 DSE-03)

Outcomes:

On completion of the course, students are able to:

1. Understand the fundamentals of C programming.
2. Choose the loops and decision making statements to solve the problem.
3. Implement different Operations on arrays.
4. Use functions to solve the given problem.
5. Understand pointers, structures and unions.
6. Implement file Operations in C programming for a given application

DEPARTMENT OF BOTANY

B.SC. SEMESTER – I

Course Title: Paper – I (Microorganism, Algae, Fungi and Plant Pathology)

Outcomes:

1. On completion of course students are able to understand:
2. Compare the relationships among plants and microbes
3. Know about viruses, mycoplasma, bacteria & cyanobacteria
4. Understand the diversity among Algae.
5. Study of cryptogams and phanerogams and its diversity
6. Know about the systematics, morphology, structure, economic importance of algae & fungi.
7. Compare viral, bacterial & fungal symptoms on plants
8. Know the prevention and control measures of plant diseases and its effect on economy of crops

Course Title: Paper – II (Bryophyta, Pteridophytes, Gymnosperms & Paleobotany

Outcomes:

On completion of the course, students are able to understand

1. Learn about general character, classification and economic importance of the Bryophytes, Pteridophytes and Gymnosperms
2. Know the taxonomic position, occurrence, thallus structure & reproduction of Bryophytes
3. Concept of hererospory and seed habit
4. Knowledge about geological time scale, process of fossilization and type of fossils

5. Understand fossil gymnosperm of Glossopteris & Cycadeoidea
6. Know about external morphology, anatomy and reproduction of the Cycadales & Coniferales

BOTANY LAB - I

1. Students have good laboratory skill of handling of instruments
2. Student got knowledge slide preparation, observation and drawing diagram
3. Students perform practicals as per laboratory exercises in different areas Bacteria, Algae, Fungi, Lichen, Plant pathology, Bryophyta, Pteridophytes, Gymnosperms & Paleobotany

B.SC. SEMESTER – II

Course Title: Paper – I (Morphology and Anatomy of Angiosperms)

Outcomes:

1. Learn about vegetative and reproductive morphology of Angiosperms
2. Understand root apical, shoot apical meristem and tissue system
3. Students know knowledge about primary and secondary structure of angiosperm plants
4. Differences about anomalous secondary structure of stem roots and leaf

Course Title: Paper – II (Taxonomy and diversity of Angiosperms)

Outcomes

1. Understand about primitive angiosperms (Magnolia) & fossil angiosperms
2. knows about classification of angiosperms and herbarium technique
3. Student identify, classify and naming of angiosperm plants. herbarium techniques
4. Enable the students to identify dicot and monocot families
5. Students are able to know about characteristic of various plants and its classification

BOTANY LAB - II

1. Understand good laboratory practices and safety.
2. Acquired knowledge of plants through practical work in fields as well as in laboratory
3. Students described families, identify, classify, and naming of plants.
4. Students acquire fundamental botanical knowledge through practical.
5. Students gain practically knowledge about vegetative, reproductive morphology of Angiosperms and anatomy
6. Students acquired skill about herbarium sheet.

B.SC. SEMESTER – III

COURSE TITLE: PAPER – I - REPRODUCTIVE BIOLOGY OF ANGIOSPERMS, PLANT GROWTH AND DEVELOPMENT

Outcomes:

On completion of course students able to understand

1. Understand about the vegetative and reproductive taxonomic characters of plants
2. Know about types of pollination and structure of embryo sac.
3. Classify endosperm, monocot and dicot embryo and its development
4. Know seed dormancy & its method to break seed dormancy
5. Students understand growth and development of plants
6. Know about plant growth regulators and plant movements.
7. Understand knowledge about physiology of flowering, photoperiodism, phytochromes, senescence and abscission

COURSE TITLE: PAPER – II PLANT BIOCHEMISTRY AND PHYSIOLOGY

Outcomes:

1. To understands the properties & role of Monosaccharides, Oligosaccharides and Polysaccharides.
2. Students know about properties, structure and uses of fatty acids
3. Learn classification of amino acids and proteins structure
4. Student should understand basics of enzymology
5. Students will have a thorough knowledge of nitrogen metabolism and mineral nutrition
6. Understand plant water relations, Ascent of sap, transpiration and phloem transport
7. They will learn about theories of absorption of solute in plants: Active absorption & Passive absorption
8. They will be able to understand Photosynthesis & Respiration

BOTANY LAB - III

1. Students will acquire good laboratory skills to handling the different equipment's regarding practical of reproductive biology of angiosperms, plants growth and development**,** plant biochemistry and plant physiology.
2. Students got knowledge practically about plants description, seed dormancy and germination of pollen tube, embryo and endosperm development.

B.SC. SEMESTER – IV

COURSE TITLE: PAPER – I CELL BIOLOGY, GENETICS AND BIOTECHNOLOGY

OUTCOMES:

1. Students know about the eukaryotic cell cycle, mitotic and meiotic cell division and DNA
2. Learn plant tissue cultures and regeneration.
3. Study the phenomenon of dominance, laws of segregation, independent assortment of genes, Interaction of genes
4. Students understand linkages & its types, complete and incomplete, significance.
5. They learn about theories, crossing over and variation in chromosome
6. They know about structural changes in chromosome and mutagens
7. Genetic Engineering- tools and techniques of Recombinant DNA technology

COURSE TITLE: PAPER – II -PLANT ECOLOGY

OUTCOMES:

1. Summarize the environmental factors like climatic, edaphic factors and biotic factors CO.2. Understand ecosystem, biogeochemical cycles environmental pollution
2. Compare autecology and synecology
3. Student knows plant succession, causes and climax concept CO.5. Understand phytogeographic regions of India

BOTANY LAB - IV

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

1. Identify different stages of mitosis and meiosis, slide preparation, observation of slide
2. Students perform practicals as per laboratory exercises in the areas of genetics and ecology
3. Solve Mendel's law of inheritance by using color beads
4. To get acquainted with tools of genetic engineering, laboratory equipments, apparatus and instruments in biotechnology laboratory
5. Students acquired knowledge practically by performing practical regarding tissue culture like explants, callus formation & seedling formation and technique of anther culture.
6. Study natural habitats of plants and identify ecological characters of hydrophytes, xerophytes, epiphyte & parasite.

B.SC. SEMESTER – V

COURSE TITLE: PAPER – I- PLANT PHYSIOLOGY AND BIOCHEMISTRY

OUTCOMES:

On completion of the course, students are able to:

1. Understand plant water relations, ascent of sap, transpiration & phloem transport:
2. Understand Mineral Nutrition, role and deficiency symptoms
3. Describe theories of absorption of solute in plants and nitrogen metabolism
4. Compare structure of carbohydrates and lipid
5. Understand structure of primary and secondary proteins
6. Learn about basics enzyme and its properties

COURSE TITLE: PAPER – II- PLANT ECOLOGY

OUTCOMES:

1. Summarize the environmental factors like climatic, edaphic factors and biotic factors
2. Understand and explain the types of ecosystem, nitrogen, carbon and water cycles
3. Study of community and community dynamics
4. Student knows plant succession, causes and climax concept
5. Describe phytogeography

BOTANY LAB - V

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

1. Perform practicals given on physiology and biochemistry experiment & report their findings
2. Students prepared temporary mount of the ecological material & report their findings
3. Perform the given ecological experiments and draw well labelled diagrams
4. and write about its morphological and anatomical characteristics
5. Understand ecological adaptation of plants and different types of soil

B.SC. SEMESTER – VI

COURSE TITLE: PAPER – I- PLANT PHYSIOLOGY, GROWTH AND DEVELOPMENT

OUTCOMES:

1. Understand photosynthesis and respiration
2. Know about growth and developmental processes in plants
3. Learn about plant growth regulators like auxin, cytokinin, gibberellins, ABA and ethylene and its role
4. Describe plant movements, photoperiodism, physiology of flowering, and vernalization.

5. Students know about general account of senescence and abscission
6. Learn about seed dormancy - causes and role, methods to break seed dormancy

COURSE TITLE: PAPER – II- ETHNOBOTANY AND APPLIED BOTANY

OUTCOMES:

1. Understand ethno-botany- branches, Methodology and Importance of ethnobotany in research and conservation
2. Know about ethnic societies of India, World & their contribution
3. Learn about importance, classification and uses of ethnobotanical plants
4. Understand and Identify medicinal and narcotics plants
5. Understand agroforestry useful plants such as *Eucalyptus*, Teak, Bamboo, *Terminalia tomentosa*
6. Study bio -fertilizers, composting, vermiculture and its Application
7. Visited to floriculture, mushroom culture, apiculture in the field

BOTANY LAB - V

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

1. Students perform major and minor experiments about plant physiology and plant growth & development
2. Students applied growth hormone in potted plant and looks positive and negative effects on plants
3. Plant used to cure the arthritis, Piles, Jaundice, snake bites, Diabetes and Fever
4. Study the methods of cultivation of medicinally important plants like *Aloe vera* (Korphad), *Chlorophytum borivilianum* (Safed Musli),*Withania somnifera* (Ashwagandha), *Asparagus* (Satavari), *Adhatoda vasica* (Adulsa
5. Know about vermiculture, floriculture, mushroom culture, apiculture techniques

DEPARTMENT OF MATHEMATICS

B.SC. SEMESTER – I

Course Title: PaperI (Differential and Integral Calculus)

Course Code: USMT-01

Outcomes:

This course will enable the students to:

1. State theorems on limits and continuity.
2. State and prove Mean value theorem.
3. Know statement of Roll's theorem and its proof.
4. Recognize Beta and Gamma function and its properties.
5. Recognize and solve double integration and its properties

Course Title: Paper II (Differential Calculus and Trigonometry)

Course Code: USMT-02

Outcomes:

This course will enable the students to:

1. Acquire the basic knowledge of Partial differentiation, Differential and Chain rule
2. Familiarized with Homogeneous function,Euler's theorem and Taylor's theorem for function of two variable.
3. Distinguish between tracing of curves and tracing of curves in Cartesian form.
4. Understand how to prove De Moivre's theorem and its application.
5. Understand the Circular and Hyperbolic function.
6. Appreciate the beauty of the C + iS method

B.SC. SEMESTER – II

Course Title: Paper I (Ordinary Differential Equation and Difference Equation)

Course Code: USMT-03

Outcomes:

This course will enable the students to:

1. Understand basic properties of differential equations, Orthogonal trajectories, Linear differential equations.
2. Apart from this the students will able to solve ODE by Transformation of the equation by changing the dependent variable/ the independent variable.
3. Solution by operators of nonhomogeneous linear differential equations.
4. Understand formation of Difference equation,Order of difference equation and homogeneous linear equation with constant coefficient.

Course Title: Paper II (Partial Differential Equation)

Course Code: USMT-04

Outcomes:

This course will enable the students to:

1. Apply a range of techniques to solve first & second order partial differential equations.
2. Learn solution of homogeneous partial differential equation with constant coefficients .
3. Know solution of Non-homogeneous partial differential equation and equation reducible to linear partial differential equation with constant coefficiant.
4. Learn classification of second order partial differential equation.

B.SC. SEMESTER – III

Course Title: Paper I (Real Analysis)

Course Code: USMT-05

Outcomes:

This course will enable the students to:

1. Understand many properties of the real line $\mathbb{R}$ and learn to define sequence in terms of functions from $\mathbb{R}$ to a subset of $\mathbb{R}$.
2. Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence.
3. Apply the ratio, root, alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers.
4. Learn some of the properties of Riemann integrable functions, and the applications of the fundamental theorems of integration

Course Title: Paper II (Set Theory And Laplace Transform)

Course Code: USMT-06

Outcomes:

This course will enable the students to:

1. Learn basic facts about the cardinality of a set.
2. Know Dirac delta function, Laplace transforms and its properties.
3. Solve ordinary differential equations using Laplace transforms.
4. Know Convolution theorem and solution of differential equation and partial differential equations.

B.SC. SEMESTER – IV

Course Title: Paper I (Algebra)

Course Code: USMT-07

Outcomes:

The course will enable the students to:

1. Recognize the mathematical objects called groups.
2. Link the fundamental concepts of groups and symmetries of geometrical objects.
3. Explain the significance of the notions of cosets, normal subgroups, and factor groups
4. Analyze consequences of Lagrange's theorem.
5. Learn about structure preserving maps between groups and their consequences
6. Recognize and use the Sylow theorems to characterize certain finite groups.

Course Title: Paper II (Elementary Number Theory)

Course Code: USMT-08

Outcomes:

This course will enable the students to:

1. Learn about some important results in the theory of numbers including the prime number theorem, Chinese remainder theorem, Wilson's theorem and their consequences.
2. Learn about Congruence. properties of congruence, Chinese remainder theorem and Goldbach conjuncture.
3. Familiarize with modular arithmetic and find primitive roots of prime and composite numbers.

B.SC. SEMESTER – V

Course Title: Paper I (Linear Algebra)

Course Code: MAT-301

Outcomes:

This course will enable the students to

1. Understand the concepts of analytic function, Cauchy Riemann equation, harmonic function and Cross ratio.
2. Relate matrices and linear transformations, compute eigen values and eigen vectors of linear transformations.
3. Learn properties of inner product spaces and determine orthogonality in inner product spaces.

Course Title: Paper II (Special relativity-1)

Course Code: MAT-302

Outcomes:

This course will enable the students to:

1. Understand the basic elements of Newtonian mechanics including Michelson–Morley experiment and geometrical interpretations of Lorentz transformation equations.
2. Learn about length contraction, time dilation and Lorentz contraction factor.
3. Study 4-dimensional Minkowskian space-time and its consequences.
4. Understand equations of motion as a part of relativistic mechanics.

B.SC. SEMESTER – VI

Course Title: Paper I (Analysis)

Course Code: MAT-304

Outcomes:

This course will enable the students to:

1. Understand basic properties of real number system such as least upper bound property and Order property.
2. Realize importance of bounded, convergent, Cauchy and monotonic sequences of real numbers, find their limit superior and limit inferior.
3. Apply various tests to determine convergence and absolute convergence of a series of real numbers.
4. Learn about Riemann integrability of bounded functions and algebra of R-integrable functions.
5. Determine various applications of the fundamental theorem and Mean value theorem of integral calculus.
6. Relate concepts of fourier transform.

Course Title: Paper II (Special relativity -II)

Course Code: MAT-305

Outcomes:

This course will enable the students to:

1. Understand basic properties of Tensor analysis
2. Realize importance of Christoffels symbols, Transformation Christoffels symbols , covariant derivatives.
3. Apply various tests to determine Relativistic Mechanics
4. Learn about Electromagnetism

DEPARTMENT OF ZOOLOGY

B.SC. SEMESTER – I

Course Title: Paper I (Animal diversity of non-chordate)

Course Code: USZOT01

Outcomes:

After successful completion of the course, students will be able to:

1. Understand the general characters and classification up to classes of phylum Protozoa to Annelida.
2. Distinguish Locomotory organs, locoamotion, Nutrition and Reproduction in Protozoa.
3. Understand the structure and Life history of Obelia, Taenia solium, Ascaris lumbricoides .
4. Have a detailed knowledge of systems i.e. Digestive, Nervous and Reproductive system of Hirudinaria.
5. Understand the concept of Canal system in Sycon.

Course Title: Paper II (CELL BIOLOGY)

Course Code: USZOT02

Outcomes:

After successful completion of the course, students will be able to:

1. Understand the concept of Cell theory, Protoplasmic theory, and Organismal theory and distinguish the Prokaryotic and Eukaryotic cell.
2. Have a detailed knowledge of cell organelles (Nucleus, Mitochondria, Endoplasmic reticulum, Golgi complex, Lysosomes, and Ribosomes.
3. Understand the occurrence, position and morphology, Ultrastructure, Composition and function of Nuclear membrane, nuclear pore complex.
4. Have the knowledge of Structure and type of Chromosomes.
5. Understand the concept of Cell cycle and their different phases i.e. Mitosis and meiosis.

ZOOLOGY LAB - I

Course Code: USZOP01

Outcomes:

1. Students will have good laboratory skills, enabling them to take observations and
2. measurements in a zoology laboratory and analyze the results to draw valid conclusions.
3. Students will adopt the skill of draw the neat and clean well labeled diagram.

B.SC. SEMESTER – II

Course Title: **Paper I (ANIMALDIVERSITY OF NON-CHORDATE)**

Course Code: USZOT03

Outcomes:

After successful completion of the course, the students will be able to:

1. Have a detailed knowledge of general characters and classification upto the classes of the phylum Arthropoda to Hemichordata.
2. Distinguish the external morphology, digestive system, nervous system, Reproductives system of Periplaneta and Pila.
3. Have the detailed knowledge of Regeneration and Autotomy in Echinoderm
4. Understand the concept of pearl formation.

Course Title: Paper II (Genetics and Evolution)

Course Code: USPHT04

Outcomes:

After successful completion of the course, the student is expected to:

1. Understand the concept of Genetics in detailed.
2. Have the knowledge of Syndrome and their symptoms, concept of the gene mutation.
3. They get information about the major events in History of life and their related theory, and the evidence of Evolution.
4. They will be able to understand processes of the evolutionary changes.

ZOOLOGY LAB – II

Course Code: USPHP02

Outcomes:

1. Students will acquire good laboratory skills to perform the experiment of Genetics.
2. Students will learn the use various apparatus to take the measurements up to the marks.
3. Student will able to take observations of the different picture of Adaptive radiation and different type of Evolution.

B.SC. SEMESTER – III

Course Title: Paper I (ANIMAL DIVERSITY AND COMPARATIVE ANATOMY)

Course Code: USCZOT05

Outcomes:

After successful completion of the course, the student is expected to:

1. Have the detailed knowledge of the general characters and classification up to the order of the phylum Urochordata, Amphibia, Reptilia, Aves and Mammals.
2. Understand the Osmoregulation and Accessory respiratory organ of the fish..
3. realize the importance of the snake venom and the uses in the medical industry
4. Understand the whole concept of the comparative anatomy.

Course Title: Paper II (PHYSIOLOGY AND BIOCHEMISTRY- I)

Course Code: USCZOT06

Outcomes:

The completion of this course will enable the students to:

1. Understand the concept of the Metabolism.
2. Study the general properties and classification of enzymes.
3. Understand the concept of Nutrition and Digestion and the structure and function of the digestive gland.
4. Study the Mechanism of Respiration, Respiratory pigment and their type, distribution and properties.
5. Have the detailed of the Respiratory disorders and effect of smoking.

ZOOLOGY LAB – III

Course Code: USZOP03

Outcomes:

1. Students will acquire good laboratory skills to handle and focus the microscope.
2. Student will able to take Anatomical observation and skeleton of the Rabbit and fowl.
3. Students will adopt the skill of permanent stained micro preparation. SEMESTER-IV

B.SC. SEMESTER – IV

Course Title: Paper I (Developmental Biology)

Course Code: USCZOT07

Outcomes:

After successful completion of the course, the students will be able to:

1. Understand basic concept of Early Development.
2. They will get detailed knowledge about the Frog and Chick Embryology.
3. Get detailed information about the concept Mammalian development.
4. Differentiate Spermatogenesis and Oogenesis; understand the structure of Sperm and Ovum.
5. Understand and explain the Whole concept of In-vitro Fertilization.

Course Title: Paper II (Physiology and Biochemistry-II)

Course Code: USCZOT08

Outcomes:

The completion of this course will enable the students to:

1. Have knowledge about the whole concept of the Excretion and apply the above knowledge in our daily life.
2. Understand the Concept of Endocrinology and Reproduction.
3. Get detailed information of Nerves and muscles physiology.
4. Understand the whole concept of the Circulatory system of Human body.

ZOOLOGY LAB – IV

Course Code: USZOP04

1. Students will observe the slides of Frog and Chick embryology.
2. Student will able to take observations and measurements in a zoology laboratory.
3. They adopt the skill of Permanent stained Micro preparation.

B.SC. SEMESTER – V

Course Title: Paper I (PARASITOLOGY)

Course Code: USCZOT09

Outcomes:

After successful completion of the course, the students will be able to:

1. Understand the concept of the Parasitism, life cycle, pathogenicity and treatment.
2. Establish connection between parasites in our daily life.
3. Understand the concept of the parasites which is responsible for the diseases found in our daily life.
4. Study the Zoonotic diseases and pathogenicity and vectors as disease transmitters.

Course Title: Paper II (AQUATIC BIOLOGY)

Course Code: USCZOT12

Outcomes:

After successful completion of the course, the students will be able to:

1. Understand the different types of the Zones and applications in various fields.
2. Understand the concept and identification of Zooplankton.
3. Have the detailed knowledge of the physic-chemical characters of the different types the lakes.
4. Understand the concept of the Adaptation of deep sea organism..

ZOOLOGY LAB – V

Course Code: USCZOP08

1. Students will have a thorough laboratory skills enabling them to take observations and measurements in a zoology laboratory and to analyse its results.

B.SC. SEMESTER – VI

Course Title: Paper I (Medical Diagnostics)

Course Code: SEC

Outcomes:

After successful completion of the course, the students will be able to:

1. Know the Blood composition and detailed information about the Blood group.
2. Get the detailed information about the Physical characteristics and Constituent of urine.
3. Get the information about the Disease Tuberculosis and Hepatitis and their causes, types, symptoms, diagnosis and prevention.
4. Know the concept of the types of tumours and Medical imaging.

Course Title: Paper II (Public health and Hygiene)

Course Code: 6S-PHY 602

Outcomes:

The completion of this course will enable the students to:

1. Understand the importance of the personal, community health, Environmental Hygiene and government and its policies for public health.
2. Know the concept of the TB, Polio, diphtheria, tetanus, MMR, Diarrhoea, Typhoid and Vaccination and sterilization programmes.
3. Understand need of social programmes i.e. Family planning, child obesity, malnutrition.
4. Familiar with Hygiene education in communities and their importance.

ZOOLOGY LAB – VI

Course Code: SEC

1. Students will have a good laboratory skills, enabling them to take observations in a zoology laboratory.
2. Students will be able to prepare the chart or posters related to health.

DEPARTMENT OF ENGLISH

B.SC. SEMESTER – I

Course title: Compulsory English

Outcomes:

1. To expose to a range of contexts where the language is used to meet a variety of real life communication needs.
2. To equip with the practical, emotional, intellectual and creative aspects of language by integrating knowledge and skills.
3. To enhance practice in objective and subjective writing.
4. To learn the use rather than usage of English.
5. To develop their critical thinking capabilities focused through the course as an important need.

B.SC. SEMESTER – II

Course title: Compulsory English

Outcomes:

1. To improve spoken communication and written communication.
2. Writing of Resume, letters of application, business letters.
3. To learn the basics of grammar.
4. Narration of experience, daily routine.
5. Interview Techniques.
6. Understanding and interpretation of poem, prose, essay , short stories, etc.

DEPARTMENT OF MARATHI

B.SC. SEMESTER – II

Course Title: Compulsory Marathi

Outcomes:

1. Understanding the interrelation between literature and society.
2. Explaining the nature of language and literature.
3. Obtaining the skills of literary criticism.
4. Imbuing the essay writing skills.
5. Illustrating the nature of literary forms like one-act-play, travellogue and short story.

B.SC. SEMESTER – II

Course Title: Compulsory Marathi

Outcomes:

1. Introduction of the medieval Marathi language and literature.
2. Introduction of the contemporary literary works.
3. Acquiring the skill of translation.
4. Explanation of the need and significance of editing.