Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs)

Bachelor of Science (B.Sc.)

POs of B.Sc. Programmes

After completing the B.Sc. programme, undergraduate students must acquire the following characteristics and attributes of a science graduate.

PO-1	**Scientific Knowledge and Experimental Skills:** The graduates must be able to demonstrate fundamental concepts in science and apply them in relatively specialized areas like research & development, teaching and government, and social or public services.
PO-2	**Communication skills:** The graduates must be able to transmit complex scientific and technical information in a clear and concise manner relating to all areas of science subjects they studied.
PO-3	**Critical Thinking & Problem-Solving ability:** The graduates must be able to employ critical thinking and problem-solving skills to find appropriate solutions for the scientific and technical problems in the field-related science subjects.
PO-4	**Team leading and working capability:** The graduates must be capable of working independently and as a team leader or a member.
PO-5	**Project Management:** The graduates must be able to identify and mobilize the appropriate resources to manage and complete the undertaken project by observing responsible & ethical conduct and also with laboratory safety and hygiene.
PO-6	**Digital Proficiency in using Modern Digital Tools:** The graduates must be capable of using modern digital tools like computers, software and ICT for teaching, simulating ideas and statistical or analytical data analysis.
PO-7	**Environmental and Societal Consciousness:** The graduates must be aware of environmental & societal problems. They must be capable of using and demonstrating scientific knowledge to address these problems and find appropriate solutions.
PO-8	**Ethics and Human values:** The graduates must be capable of thinking and behaving rationally on the ethical issues they come across at their workplace. Also, the graduates should adopt human values to keep harmony with individuals and human beings.
PO-9	**National perspective:** The graduates must be able to develop a national perspective for their career in the chosen field to play a vital role in contributing to national development.
PO-10	**Lifelong Learning:** The graduates should adopt lifelong learning to keep pace with emerging trends in academics, research and developing technology.

Botany

❖ Programme Specific Outcomes

PSO1: Provide knowledge of the medicinal plants of Melghat region to the students and promote them to use them as earning source.

PSO2: Motivate the Botany students for exploration of Melghat flora.

PSO3: Preserve the rare medicinal plants of the Melghat region.

PSO4: Create recognized laboratory for the students of Botany and provide guidance to the research students.

PSO5: Create awareness about plant propagation.

PSO6: Develop open natural laboratory for the students of botany.

❖ Course Outcomes

Course: Diversity and Applications of Microbes and Cryptogams

CO1: Study of cryptogamous plants and their diversity in aquatic ecosystem

CO2: To study the role of fungi in food industry

CO3: Diversity of fungi in forest ecosystem

CO4: Investigation on diversity of bryophytes and pteridophytes

CO5: Industrial value of aquatic algae, fungi.

Course: Gymnosperm, Morphology of Angiosperms and Utilization of plants

CO1: To bring investigation on paleobotanical study in India

CO2: Taxonomical and economical study of gymnosperms

CO3: Systematic study of plants and their classifications

CO4: Phytitaxonomical study of angiosperm

Course: Angiosperm systematic, anatomy and embryology

CO1: Exsitu and insitu conservation of flora in forest ecosystem

CO2: Role of anatomy in classification of plants and their phylogeny study

CO3: Role of embryolofy in classification of plants

CO4: Plants systematic and their classifications

Course: Cell biology, Genetics and Biochemistry

CO1: Role of cell biology and its fumction

CO2: Role of gemetics in plant classification

CO3: To study the biochemistry of plants

CO4: Role of enzymes in Industries

Course: Plant physiology and Ecology

CO1: To study the physiological characters of wild and cultivated plants

CO2: To study the role of environmental factors on photosynthesis

CO3: Ecological and environmental study of flora in forest ecosystem

CO4: Investigation the effects of environmental factors in trends in succession

CO5: Food chain and food web in ecosystem

Course: Molecular biology and biotechnology

CO1: Role of DNA and transposable elements in plants

CO2: Concept of gene

CO3: Tools and techniques of recombinant DNA technology

CO4: Cloing vectors

CO5: Gene transfer techniques

CO6: Tissue culture techniques

CO7: Fermentation technology- Bakery and alcohol production

CO8: Health care edible vaccines

CO9: Plant kingdom in detail

CO10: Diversity of Plants with respect to habitat, nutrition and ecological status.

CO11: General knowledge about Viruses

CO12: Understood what is TMV and HIV CO13: Basic knowledge of Bacteria

CO14: Role of microbes in Agriculture, Medicine, and industry.

Chemistry

❖ Programme Specific Outcomes

PSO1: Identify and become familiar with the scope, methodology and application of modern chemistry and learn to appreciate its ability to explain various aspects.

PSO2: Understand theoretical and practical concepts of instruments that are commonly used in most chemistry fields.

PSO3: Design and carry out scientific experiments and record the results of such experiments.

PSO4: Understand safety of chemicals, transfer and measurement of chemical, preparation of solutions, and using physical properties to identify compounds and chemical reactions.

PSO5: Explain how chemistry is useful for social, economic and environmental problems and issues facing our society in energy, medicine and health.

❖ Course Outcomes

Course: Paper I

CO1: Describe periodic properties of elements, understand formation of ionic bonding & factors affecting ionic bond formation.

CO2: Understand electronic configuration, ionization energy, oxidation state of S and P block elements.

CO3: Identity electronic displacement taking place in the molecule by some effects, generation of reactive intermediates, their stability and reactions.

CO4: Interpret aromaticity and based on that distinguish aromatic, anti-aromatic and non-aromatic compounds, able to know the structure of benzene and its electrophilic substitution reaction.

CO5: Understand limitation of first law of thermodynamics and needs of second law of thermodynamics and know the concept of entropy.

CO6: Know the postulates of kinetic theory of gases, understand phase rule and application of phase rule on water system and sulphur system.

Course: Paper-II

CO1: Define polarization and its application, directional nature of covalent bond, concepts of hybridization and know the theory of acids and bases.

CO2: Understand requirement of good solvent and classification of solvents.

CO3: Describe synthesis and chemical reactions of alkyl halides, aryl halides and alcohol.

CO4: Understand methods of formation of phenols, ether and epoxide and their reactions catalyzed by acid and alkali.

CO5: Identify polar and non polar molecules and know paramagnetic and diamagnetic substances.

CO6: Describe rate of reaction in terms of change in concentration and how the rate of chemical reaction changes as a function of time.

Course: Paper III

CO1: Understand covalent bonding, metallic bonding and describe structure of molecule with regular & distorted geometry by using VSEPR theory and know about gravimetric and volumetric analysis.

CO2: Describe various reactions, acidity and reactivity involved in aldehydes ketone and

carboxylic acid.

CO3: Identify importance of stereochemistry in organic chemistry & apply the knowledge gained to a variety of chemical problems.

CO4: Define work function, Gibbs free energy and application of phase equillibria in miscible and immiscible liquids.

CO5: Understand determination of surface tension, viscosity and effects of temperature on surface tension and viscosity.

Course: Paper-IV

CO1: Understand chemistry of transition elements with reference to electronic configuration, atomic and ionic size, ionization energy and know about extraction of elements.

CO2: Define inner transition elements and know their properties and general principle of

metallurgy.

CO3: Describe reactions of poly nuclear hydrocarbon, synthesis of higher acids with the help of reactive methylene compounds, constitution of glucose, conversion of glucose to fructose etc.

CO4: Know synthesis of aromatic nitro compounds, amino compounds and diazonium salts and their reactions.

CO5: Understand colligative properties of dilute solution and know to determination of molecular weight of solute.

CO6: Identity symmetry in crystal and elements of symmetry in crystals, also know the laws of symmetry.

Course: Paper-V

CO1: Understand key features of co-ordination compounds including variety of structures and know the concepts of oxidation number, coordination number, ligands, chelates and stability of complex.

CO2: Knowledge of crystal field theory to understand splitting in complexes and factors affecting in crystal field splitting.

CO3: Understand heterocyclic compounds especially about their synthesis, reactivity and application of heterocyclic compound in advanced chemical synthesis.

CO4: Classify dyes on the basis of structure and mode of application, preparation and uses of dyes, drugs and pesticides.

CO5: Understand photochemical and thermal reactions by interaction of radiation with matter.

CO6: Identify the electric and magnetic properties of radiation and know the spectroscopic techniques for understanding the atomic structure and structure of molecule.

Course: Paper-VI

CO1: Understand thermodynamic and kinetic stability of complexes and geometry of complexes. Know about spectrophotometric technique for determination of concentration of metal ion. Define and classify chromatographic techniques.

CO2: Know basics of organometallic chemistry, inorganic polymers and bio-inorganic chemistry.

CO3: Identify structure of compound by use of electronic spectroscopy and infrared spectroscopy and know how to interpret spectra.

CO4: Understand the phenomena of Nuclear Magnetic Resonance spectroscopy and mass spectrometry.

CO5: Understand limitation of classical mechanics at molecular length scales and difference between classical and quantum mechanics.

CO6: Identify inter conversions of chemical energy and electrical energy by knowing electrochemistry and application of radio isotopes in industry, agriculture, medicine & biosciences.

Mathematics

❖ Programme Specific Outcomes

PSO1: Students will demonstrate an understanding of the common body of knowledge in maths and demonstrate the ability to apply analytical and theoretical skill to model and solve the mathematical problems

PSO2: Understand the nature of mathematical proofs and be able to write clear and concise proofs.

PSO3: Be able to communicate effectively in oral and written form

PSO4: Be able to write simple computer programs to perform the mathematical competition.

PSO5: Learn about application of mathematics in other field and gain experiences in mathematical modelling

PSO6: Develop the ability to read, understand and use basic definition in linear and abstract algebra and real analysis and be able to prove simple consequence of this definition

PSO7: Student learns to communicate idea effectively and to digest new information and concepts independently.

PSO8: Students are encouraged to develop intellectual and become involved with professional organization

PSO9: Communicate mathematical ideas both orally and in writing

PSO 10: Investigate and solve unfamiliar maths problems

PSO11: Demonstrate the proficiency in writing proofs

❖ Course Outcomes

Course: Algebra & Trigonometry

By the completion of this course the student will be able to

CO1: Understand the concepts of Hyperbolic and inverse hyperbolic function , De Moivre's theorem, and its application

CO2: Understand the concept of summation series, Gregory series, Euler's series, Machin's series, Rutherford's series,

CO3: Learn about Elements of quaternion: complex conjugate of a quaternion, norm, inverse, quaternion as a rotation operator, interpretation, a special quaternion product, operator algorithm, quaternion to matrices.

CO4: Deeply know about polynomial equation, its roots nature, solve some quadratic,

biquadratic polynomial, Cardon method to solve cubic equations

CO5: Introduction and explanation of Matrices, Rank, Eigen values and Eigen vector, Caly-Hamilton Theorem etc.

Course: Differential and Integral Calculus

By the completion of this course the student will be able to know

CO1: Definition of the limit of a function, basic properties of limits, continuous functions and

classification of discontinuities.

CO2: Differentiability, successive differentiation, Leibnitz theorem, indeterminate forms and L'Hospital rule. Rolle's theorem, Lagrange's mean value theorem, Cauchy's mean value theorem, Maclaurin and Taylor series expansions.

CO3: Partial derivatives and differentiation of real valued function of two variables, homogeneous functions, Euler's theorem on homogeneous functions.

CO4: Integration of some standard form, reduction formulae Walli's formula, quadrature, rectification,etc.

Course: Differential Equations: Ordinary and Partial

By the completion of this course the student will be able to know

CO1: Degree and order of a ordinary differential equation, linear differential equations and differential equations reducible to the linear form. Exact differential equations. Differential equations of first order and higher degree, Orthogonal trajectories.

CO2: Second order linear differential equations with constant coefficients, homogeneous Linear ordinary differential equations, reducible to homogeneous differential Equations.

CO3: Reduction of order, transformation of the equation by changing the dependent variable and

independent variable, normal form, method of variation of parameters. Ordinary simultaneous differential equations.

CO4: Formation of partial differential equations, partial differential equations of the first order, total differential equation. Lagrange's method, some special types of equations which can be solved easily by methods other than the general method.

CO5:Compatible differential equations.Charpit's general method of solution, partial differential equations of second and higher orders. Homogeneous and non-homogeneous equations with constant coefficients.

Course: Vector Analysis and Solid Geometry

By the completion of this course the student will be able to know

CO1: Scalar and vector product of three vectors, product of four vectors, vector differentiation and vector integration.

CO2: Space curve t, n,b vectors, fundamental planes, curvature, torsion, Frenet Serret formulae.

CO3: Gradient, divergence and Curl, directional derivative, line integral(existence and evaluation),work done, Greens theorem.

CO4: Sphere: Different forms of sphere, section of a sphere by a plane, sphere through a given circle, intersection of sphere and a line, orthogonal sphere and condition of orthogonality.

CO5: Cone : The equation of a cone with a guiding curve, cone with vertex and origin, right circular cone. Cylinder: equation of right circular cylinder

Course: Advanced Calculus

By the completion of this course the student will be able to know

CO1: Sequence, positivity theorem, sandwich theorem, monotonic and bounded sequence, Cauchy sequence.

CO2: Series: Series of nonnegative terms, convergence of geometric series and the series Comparison tests, Cauchy's integral test, conditional convergent, Leibnitz rule,

CO3: Limit and continuity of functions of two variables,Taylor's theorem for function of two

variables.

CO4: Maxima and minima of two variables, Lagrange's multipliers method, Jacobians.

CO5; Double integral (definition and evaluation technique)

Course: Elementary Number Theory

By the completion of this course the student will be able to know

CO1: Divisibility, Euclidean algorithm, least common multiple.

CO2: Prime numbers, the fundamental theorem of arithmetic or unique factorization theorem, Fermat

numbers, linear Diophantine equation.

CO3: Congruence, special divisibility test, linear congruences, Chinese remainder theorem.

CO4: Arithmetic functions, Euler's theorem, the functions, Mobius function.

CO5: Primitive roots, primitive roots for prime, polynomial congruences, The congruence

Course: Modern Algebra: groups and rings

By the completion of this course the student will be able to know

CO1: Group: Definition, subgroups, cyclic groups, permutation groups

CO2: Cosets and normal subgroups quotient group.

CO3: Homomorphism and isomorphism Fundamental theorem on homomorphism of a group, natural homomorphism, second isomorphism theorem, third isomorphism theorem.

CO4: Ring, subring, characterization of ring, integral domain, field, subfield and prime field.

CO5: Ideal, quotient ring, ring homomorphism.

Course: Classical Mechanics

By the completion of this course the student will be able to know

CO1: Constraints, generalized coordinates, D'Alembert's principle and Lagrange's equations of motion.

CO2: Central force motion: Areal velocity, equivalent one body problem, central orbit, Virial theorem, Kepler's laws of motion.

CO3: Calculus of variation: functional, externals, Euler's differential equation, Hamilton's principle, procedure, least action principle.

CO4: Rigid body, generalized co-ordinates of a rigid body, Eulerian angles, Euler's theorem, finite rotations, infinitesimal rotations.

Course: Mathematical Analysis

By the completion of this course the student will be able to know

CO1: Riemann Integral monotonic functions, the fundamental theorem of integral calculus, mean value.

CO2: Improper integrals and their convergence, Beta and gamma functions.

CO3: Continuity and differentiability of complex function, analytic function, Cauchy- Riemann equations, harmonic and conjugate functions, Milne-Thomson method.

CO4: Elementary function, mapping by elementary function, Mobius transformation, fixed point, cross ratio, inverse and critical points, conformal mapping.

CO5: Metric spaces, neighbourhood, limit point, interior point, open and closed sets, Cauchy

sequences, completeness.

Course: Mathematical Methods

By the completion of this course the student will be able to know

CO1: Legendre's equation, Bessel's equation Strun-Liouville boundary value problem.

CO2: Fourier series, Fourier series for odd and even functions, half-range Fourier sine series and halfrange Fourier cosine series.

CO3: Laplace transform: Fourier Transform

Course: Linear Algebra

CO1: Vector Space: Linear transformations Dual Spaces Inner Product Spaces Modules its Definition, example and properties

Course: Graph Theory

CO1: To understand Graph. Application of graphs, finite and infinite graphs, incidence and degree, isolated vertex, pendent vertex and null graph, isomorphism, subgraphs, walks, path and circuits, connected graphs and components, Euler graph, operation on graphs, Hamiltonian paths and circuits, travelling sales man problem. Trees, some properties of trees,Fundamental circuits, Cutsets, Some properties of cutesets, Kurutowski's two graphs, different representation of planer graph,

Course: Special Theory of Relativity

CO1: To understand Review of Newtonian Mechanics. Relativistic Kinematics Geometrical representation of space- time Relativistic Mechanics Electromagnetism

Physics

❖ Programme Specific Outcomes

PSO1: To improve scientific attitude and to give emphasis on the development of experimental skills, data analysis, calculations, and also on the limitations of the experimental method and data and, result obtained

PSO2: To underline the strength of equations, formulae, graphs, mathematical tools to tackle the problems

PSO3: To understand the conceptual development of the subject and thereby develop the interest in the subject. A topic on this is introduced in the Emerging Physics Course

PSO4: To create interest in the subject and improve technological aspect through mini projects, projects, models, demonstrations, etc.

PSO5: To create interest in the subject to continue to work in the field of science in general and physics in particular

PSO6: To make students understand the role and contribution of Physics in the present day science and technology

PSO7: To motivate students to make career in Physics.

❖ Course Outcomes

Course: Mechanics, Properties of matter, waves and oscillations

By the completion of this course the student will be able to

CO1: Understand the concepts of gravitation and planetary motions.

CO2: Describe the rotational motion of rigid body and moment of inertia, concept of liner and angular momentum.

CO3: Understand simple harmonic oscillations, damped harmonic oscillations, forced harmonic oscillations and explain the theory of simple pendulum, compound pendulum and Kater's pendulum.

CO4: Describe the concept of combination of S.H.M.'s and Lissajous figures, properties, production and applications of ultrasonic waves

CO5: Knows in details the elastic constants, properties of elastic bodies and different methods to measure elastic constants.

CO6: Introduction and explanation to kinematics of moving fluids, Bernoulli's theorem and surface of tension.

Course: Kinetic theory, thermodynamics and electric current

By the completion of this course the student will be able to

CO1: Describe details regarding kinetic theory of gases, transport phenomenon in gases like transport of mass, momentum and energy.

CO2: Explain the basic laws of thermodynamics, different thermodynamic processes, concept of internal energy, entropy and S-T diagram.

CO3: Describe Joule-Thomson effect, liquefaction of hydrogen and helium gases, thermo-dynamical systems, variables and relations.

CO4: Understand the motion of charge particles in electric and magnetic fields, working of mass spectrograph, linear accelerator and cyclotron.

CO5: Understand basic network theorems and construction and working of Ballistic Galvanometer; concepts of varying currents through different circuits.

CO6: Understand the concepts of alternating current with various combinations of resistor, capacitor and inductor, theory of transformer and energy losses in transformer.

Course: Mathematical background, Solid state electronic devices and special theory of relativity

By the completion of this course the student will be able to

CO1: Focuses on mathematical background and laws of electrostatics.

CO2: Explain basic terms of electrostatics, Maxwell's equations and pointing vector.

CO3: Understand the semiconductor Physics, Hall Effect and semiconducting devices like diode, LED, BJT, J-FET, with emphasis on parameters and applications of OP-AMP.

CO4: Explain special theory of relativity, length contraction, time dilation and energy-mass relation.

CO5: Understand the structure of earth, types and causes of earthquakes, intensity of earthquakes, scattering, absorption and reflection of solar radiation by atmosphere and mechanism of cloud formation.

Course: Optics, Acoustics and renewable sources of energy

By the completion of this course the student will be able to

CO1: Understand geometrical optics and theory of interference of light, formation of Newton's ring, applications of Newton's rings.

CO2: Understand phenomenon of diffraction of light, Fresnel and Fraunhofer diffraction, construction and elementary theory of plan diffraction grating; use the laboratory techniques to determine wavelength of monochromatic source of light and resolving power of grating.

CO3: Understand concept of polarization of light, double refraction, production and detection of polarized light, Phase retardation plates.

CO4: Understand basic concepts, construction, working and applications of different types of LASER.

CO5: Understand the construction, types of fiber optics and role of fiber optics in communication system.

CO6: Understand the various renewable like solar energy, wind energy, ocean energy, geothermal energy, hydrogen energy system and fuel cell, solar energy storage and solar photovoltaic systemsconcept, operating principle and applications.

Course: Quantum mechanics, Atomic and molecular spectroscopy, Nuclear Physics, Hybrid parameters and Oscillators

By the completion of this course the student will be able to

CO1: Understand origin of quantum mechanics. Describe concept of wave packet, Davisson Germer experiment, Heisenberg's Uncertainty principle, Thought experiment and Gamma ray microscope.

CO2: Know the Schrodinger equation and its applications, Schrodinger time dependent and time

independent equations, Eigen functions and Eigen values and qualitative analysis of zero point energy.

CO3: Understand vector atom model, Stern-Gerlach experiment and different types of coupling. Know the properties and types of X-ray, experimental arrangement for Raman Effect.

CO4: Know about detection of charge particles by using G. M. counter, concept of nuclear physics like, Alpha decay, Beta decay, Concept of nuclear fission and fusion and construction of nuclear reactor.

CO5: Understand hybrid parameter, CE amplifier, Bias stability, Thermal runaway, Noise and distortion in amplifier.

CO6: Know properties, advantage and applications of negative feedback. Describe the construction and working of various types of oscillators and multivibrators.

Course: Statistical Mechanics and Solid State Physics

By the completion of this course the student will be able to

CO1: Understand basic concept of statistical mechanics, principle of equal priori probabilities and Boltzman entropy relation, Maxwell-Boltman statistics, Bose-Einstein statistics, Fermi-Dirac statistics and their applications.

CO2: Understood amorphous and crystalline solids, Diffraction of X-rays by crystals, Bragg's law, experimental determination of lattice parameters of NaCl crystal, Defects in solids.

CO3: Explain free electron theory, density of states, concept of Fermi energy and Band structure.

CO4: Explain diamagnetic, Paramagnetic, ferromagnetic materials; Classical Langevin's theory of dia and paramagnetic domains, Curie's law, Weiss's law and hysteresis.

CO5: Understand superconductors and its type, Meissner effect, Applications of superconductors, Nanomaterials, effect of reduction of dimensions on physical properties, applications of nanomaterials in different fields.

Zoology

❖ Programme Specific Outcomes

PSO1: Provide knowledge about classification of non chordate and chordate animals

PSO2: Provide knowledge about cell and its various cell organelles

PSO3: Motivate the students for study of local fauna and their natural habitat

PSO4: Provide knowledge about branches of biology like advance genetics, evolution, ecology, physiology and biotechnology

❖ Course Outcomes

Course: and diversity of non-chordata & cell and developmental biology

CO1: To study identification and classification of non-chordates

CO2: To study use, care and maintenance of microscope

CO3: To observe the life cycle of various insects

CO4: Provide knowledge about embryological development

Course: Life and diversity of chordates, concept of evolution & Advanced genetics and animal ecology

CO1: To study identification and classification of chordates

CO2: Provide the knowledge of evolution by charts, models and fossil samples

CO3: Provide knowledge about genetic traits and syndromes in humans

CO4: To study the culture of drosophila in laboratory and observe their life cycle and mutant flies

CO5: Provide knowledge about ecosystem ecology

Course: Animal physiology, economic Zoology and Molecular Biology, Biotechnology

CO1: Provide knowledge about various systems in the body and their physiology

CO2: Students learn detection of blood groups, Haemoglobin and measurement of blood pressure in human being

CO3: Provide knowledge about economic zoology like Apiculture, Sericulture, Aquaculture

CO4: Create awareness about locally available fishes and agricultural pests

CO5: Provide knowledge about molecular biology

CO6: Provide knowledge about advance tools and techniques in Zoology like camera lucida, PCR, microtechnique blotting techniques.

Computer Science

❖ Programme Specific Outcomes

PSO1: Communicating computing concepts and solutions to bridge the gap between computing industry experts and business leaders to create and initiate innovation.

PSO2: Effectively utilizing their knowledge of computing principles and mathematical theory to develop sustainable solutions to current and future computing problems.

PSO3: Exhibiting their computing expertise within the computing community through corporate leadership, entrepreneurship and advanced graduate study.

PSO4: Developing and implementing solution based systems and processes that address issues and improve existing systems within a computing based industry.

PSO5: Information on Emerging Trends: Give information about software design and development practices to develop software applications in emerging areas such as Cloud and High performance computing, Data analytics and Cyber security.

PSO6: Successful Career and Entrepreneurship.The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, and for higher studies.

❖ Course Outcomes

Course: Fundamentals of Information Technology and C Programming

By the completion of this course the student will be able to

CO1: Be aware of the history of the discipline of Computer Science and understand the conceptual planning of the subject.

CO2: Understand the nature of the software development process, includeing the need to provide appropriate documentation.

CO3: Understand the working of computers, networking and programming languages like C.

CO4: Analysis of different functions, syntaxes, flow and types of programming languages and be able to program fluently in one or two programming languages.

CO5: Understand standard techniques for solving a problem on a computer, including programming techniques and techniques for the representation of information.

CO6: Understand the importance and the nature of operating systems and compilers.

Course: Web Technology and Advanced Programming in C

By the completion of this course the student will be able to

CO1: Understand the basics of websites.

CO2: Understand different elements used in creation of WebPages.

CO3: Application of different styles on WebPages using CSS.

CO4: Understand data transfers using XML.

CO5: Understand C programming in depth by knowing concepts of arrays, pointers, etc.

CO6: Understand working of functions, structures and file handling in C Programming.

Course: Object Oriented Programming with Data Structure and C++

CO 1: Introduction to data structure & types of data structure.detailed concept of Stacks, Linear arrays & its operations.

CO 2: Student will understand concept of Queues, Linked List and its different operations CO 3: Tees, Sorting and Searching techniques and its operations are studied.

CO 4: Understands Object Oriented Programming concepts which includes Classes and objects specifies, defining data member and member functions, Managing console I/O.

CO 5: Understands Functions in C++, Function overloading and Inline Function, Friend function. Array of Objects Pointer to objects, 'this' pointer. Constructor and Destructor, Usage of Constructor.

CO 6: Student will able to understand concept of Operator Overloading: Inheritance, virtual base classes and abstract base classes.

Course: RDBMS and PL/SQL

By the completion of this course the student will be able to

CO1: Understands fundamentals of DBMS, architecture of DBMS and database models.

CO2: Understands about relations and Normalization.

CO3: Understands about different commands in SQL and able to do program on SQL.

CO4: Student will understand different functions like conversion, numeric.

CO5: Understands what is PL/SQL,variable, curser and trigger.

CO6: Understands about transactions and their commands like GRAND and REVOKE

Course: RDBMS and Visual Basics

By the completion of this course the student will be able to

CO1: Understand basics of database management system.

CO2: Identify different models in database and knowing the differences in it.

CO3: Understand the Structured Query Language to interact with databases.

CO4: Understand basics of Visual Basic to get knowledge of Event Driven Programming.

CO5: Create Menu Driven Programs in Visual Basic.

CO6: Understand Internal Functions in Visual Basic.

Course: PL/ Advanced Visual Basics

By the completion of this course the student will be able to

CO1: Learn about the built-in functions in SQL.

CO2: Understand the basics of PL/SQL and Transactions.

CO3: Understand the securities applied on databases.

CO4: Understand different aspects of Visual Basic like, Dialog box controls, Forms and File Handling.

CO5: Program with different programming languages effectively in languages like Visual Basic and as back end tool like Oracle.

CO6: Proficient in problem solving using different programming languages.

Electronics

❖ Programme Specific Outcomes

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

PO1: Understand the basic concepts of electronics components, network theorem, digital electronics, solid state semi conductor devices, amplifier theory, Analog and Digital circuits, basic circuits, design using circuit maker software and their application.

PO2: Analyze different parameters of various circuits

PO3: Understand the use of electronics in the field of computer science.

PO4: Perform and testing of different electronics components and circuits.

PO5: Analyze the I/P, O/P V-I characteristics of the circuits.

PO6: Understand the application of Electronics in domestic appliances

PO7: Analyze the relationship between analogue and digital circuits.

PO8: Repair small household electrical and electronics appliances

❖ Course Outcomes

Course: Electronics Components, Network Theorem

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

CO1: Identify the different electronics components used in electronic circuits.

CO2: Understand the working of solid state semiconductor devices used in the circuit

CO3: Understand different concepts of electronics and network theorem.

CO4: Understand different concepts of semiconductor materials and devices.

CO5: Determine various parameters and V-I characteristics of diodes and transistors.

Fundamental of Digital Electronics

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

CO1: Understand the concepts of digital electronics

CO2: Understand the basic working of different logic gates and laws of Boolean algebra, De Morgan theorem, NOR & NAND logic for simplification of circuits.

CO3: Understand the concepts of K-maps and designing of logic circuits.

CO5: Understand and design different controlling circuits used in digital electronics.

Semiconductor Device

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

CO1 : Describe working, characteristics and applications of semiconductor devices. Understand and describe special high power semiconductor.

CO2 : Analyze different parameters and relation between the different terms related to amplifier.

CO3: Classification of different amplifier and analyze the concepts of different types of amplifier.

Advance digital electronics

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

CO1: Understand the concepts of different logic family and comparison of different parameters of logic family.

CO2 : Understand the concept of sequential logic circuits and study of different sequential circuit with reference to storage.

CO3: Understand different counting circuits and their applications.

CO4: Understand different digital storage devices, memory, and their classification with expansion.

OP-AMP and power supply

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

CO1: Understand and compare different amplifier

CO2: Analyze the different parameters of OP-AMP

CO3: Understand the application of OP-AMPs for positive and negative feedback concept.

CO4: Understand the concept of unregulated and regulated power supply

CO5: Understand the IC regulator, different regulator and their performances.

Electronics circuit design.

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

CO1: Understand the concepts and ideas of designing circuit using computers.

CO2: Understand circuit maker software

CO3: Analyze different parameters of simple circuit and setting of different parameters using circuit maker

CO4: Understand the concept of virtual instrumentation and advance virtual instrumentation.

Analog & digital Techniques

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

CO1: Describe OPAMP as different types of RC, AC ASCILLATORS

CO2: Understand OP AMP as multi vibrators

CO3: Design and explain A to D and D to A convertors.

CO4: Describe the positive and negative feedback and advantages of positive feedback.

Electronic Instrumentation

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

CO1: Classify the transducers and description of their characteristics.

CO2: Summarize the LM 35 transducer and its application

CO3: Understand working and block diagram of biomedical instruments.

CO: 4 Understand the block diagram for electronic system.

Electronics Communication

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

CO1: Understand the basics of electronics communication and types of communication

CO2: Describe different propagation modes of signals

CO3: Understand the concept of digital communication

CO4: Understand fiber optics communication system and concept of modern communication system.

Fundamental of Microprocessor

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

CO1: Understand and describe 8085 microprocessor

CO2: Describe different modes of operation of 8085 microprocessor

CO3: Understand different instruction set of microprocessor

CO4: Understand the need of interfacing and different modes of data transfer

OP-AMP and power supply

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

CO1: Perform communication system practical using PC/ microcontroller

CO2: Perform ASK and FSK using OPAMP

CO3: Perform simple assembly language program using instruction of 8085 microprocessor

CO4: Understand and study the PPI 8255

Programming in C

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

CO1: Understand the basic of C language

CO2: Understand different syntax, keywords and operators used in C

CO3: Understand different control statement related to C programming

CO4: Understand the concepts of advanced data types

CO5: Understand the concept of file structure in C language.

Microcontroller 8051

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

CO1: Understand basics of 8051 microcontroller

CO2: Understand different instruction and addressing modes of microcontroller

CO3: Understand the concept of subroutines and simple programming

CO4: Describe interfacing of different I/D devices with personal computer.

English

❖ Programme Specific Outcomes

PSO1: Make students English Language proficient to improve their employability

PSO2: Train them in the use and application of English language to overcome their day to day difficulties

PSO3: Tribal can preserve and popularize their language and culture through English

PSO4: Imbibing moral and human values through study of language and literature

PSO5: Give them a broader picture of the world through making them learn English language and literatures of the world

PSO6: Introduce them with technological advancement in English language

❖ Course Outcomes

By the completion of this course the student will be able to

CO1: Students will learn analysis of the text from prose passages for understanding the contents

CO2: Prose passages will help improve reading and writing skills

CO3: They will develop imaginative thinking by reading and reciting poetry

CO4: Language activities will promote effective use of language in day to day life and enhance professional skills

CO5: The course content will enable rational thinking along with learning life skills.

CO6: Students will learn professional ethics.

CO7: Students will learn environmental consciousness.

CO8: Developing sensitivity regarding gender equality.

Marathi

❖ Programme Specific Outcomes

PSO1: To make students learn various literary streams, their nature, scope etc.

PSO2: To go through the contemplation by numerous thinkers on human life, values, and human problems expressed in Marathi

PSO3: To enhance empathy, inclusiveness, tolerance and human values

PSO4: To make the students study multi disciplinary aspects of Marathi

PSO5: To learn about Marathi culture with its variety and plurality vis a vis Indian culture

PSO6: To develop commutation skills

PSO7: To motivate students to make career in Marathi

❖ Course Outcomes

By the completion of this course the student will be able to

CO1: Develop Attitude of Literary Forms. (Marathi Poetry & Story)

CO2: Develop Reading, Writing & Communication Skills of Students.

CO3: Develop Attitude of Literary Forms. (Marathi vaicharik sahitya & Novel)

CO4: Get the students introduced with interdisciplenery aspects of Marathi .

CO5: Information about Literary Theory.

CO6: Develop Attitude of Literary Forms. (Lalit Gadya)

CO7: Get the students introduced with various streams of Marathi

CO8: Information about the history of MODERN Marathi Literature.

CO9: Develop Attitude of Marathi Linguistics & Grammar.

Hindi

❖ Programme Specific Outcomes

PSO1: Promote Hindi as our national language and a symbol of nationality

PSO2: Make students understand its simplicity and lucidity

PSO3: Study and understand Literature in Hindi and significance of its translation

PSO4: Popularize Hindi and promote people to adopt Hindi along with their mother tongue

PSO5: Study Hindi along with local tribal languages

PSO6: Promote regional language translation with the help of study of Hindi

❖ Course Outcomes

By the completion of this course the student will be able to

CO1: Students will understand the various aspects of Hindi Language and literature.

CO2: Hindi is a national language and students will understand and comprehend its significance and relevance.

CO3: They will learn Hindi language and its usage in day to day and professional life.

CO4: Students will develop imaginative and language skills during study of Hindi and Hindi literature.