

Programme : B.Sc.

Physics

Course Outcomes of the Course “Paper-BSCPHC131:General Physics”

- CO1. Use vector algebra tools in various phenomenon discussed in mechanics
- CO2. Assimilate Concepts of circular motion and its application
- CO3. Conceptualize central force and applying in different cases – specifically in case of Kepler’s laws of motion
- CO4. Able to use rotational dynamics in various applications
- CO5. Understand the concept of Thermodynamic systems to know the working of heat engines.
- CO6. Apply concept of entropy in Thermodynamic systems
- CO7. Develop skill to make distinction between real and perfect gases, van der Waals equation of state
- CO8. Gain insight on basic concepts of Cryogenics

Course Outcomes of the Course “Paper-BSCPHC132:Practical Physics”

- CO1. Acquire the Measurement skills of elastic constants.
- CO2. Understand the measurement techniques of fluid properties such as surface tension and viscosity
- CO3. Gain the error analysis skill

Course Outcomes of the Course “Paper-BPHC132: General Physics II”

- CO1. Acquire knowledge of elastic properties of materials
- CO2. Appreciate the concept of relativity
- CO3. Assimilate basics of Astrophysics
- CO4. Gain the knowledge of evolution of stars and Universe – the basic idea of Cosmology
- CO5. Grasp the Fourier techniques for wave analysis

Course Outcomes of the Course “Paper-BSCPHC182: Practical Physics”

- CO1. Gain idea of different methods of measurement of elastic constants
- CO2. Learn statistical behavior of a system
- CO3. Acquire measurement techniques of energy gap

Course Outcomes of the Course “Paper-BSCPHC231: Optics II

- CO1. Understand concept of interference of light, modification of light intensity
- CO2. Acquire the knowledge on thin film interference will be gained.
- CO3. Gain critical thinking and the knowledge of diffraction effects in various cases.
- CO4. Acquire the basic skills of mathematical tools required for Scalar and vector field analysis.
- CO5. Know the working of LASER devices.

Course Outcomes the Course “Paper-BSCPHC182: Practical Physics

- CO1. Gain In-depth idea of constructing electrical circuits
- CO2. Acquire the skill of electrical measurements and techniques
- CO3. Learn the techniques of measurement of wavelength of light

Course Outcomes of the Course “Paper-BSCPHC231: Optics II”

- CO1. Gain the knowledge regarding DC networks
- CO2. Acquire concepts of Network analysis
- CO3. Understand the basic concepts of Alternating current
- CO4. Understand resonance and filter circuits
- CO5. Get the basic skills of using Electrical measurements

Course Outcomes the Course “Paper-BSCPHC282: Practical Physics”

Upon the successful completion of course the student will be able to:

- CO1. Construct electrical circuits for measurements
- CO2. Acquire the skill of handling very sensitive instrument such as Ballistic galvanometers

Course Outcomes of the Course “Paper-BSCPHC331: Modern Physics”

- CO1. Understand limitation of classical Physics
- CO2. Know the concept of Duality in nature and matter waves.
- CO3. Acquire the mathematical skills and logical thinking to understand the basic concepts of Quantum Mechanics.
- CO4. Know mathematical tools of Quantum Mechanics.

Course Outcomes of the Course “Paper-BSCPHC332: Condensed Matter Physics”

- CO1. Grasp Basic ideas of Statistical Mechanics
- CO2. Acquire the concept of Application of Statistical mechanics in explaining properties of metals.
- CO3. Know the working of diodes, transistor and other electronic instruments.
- CO4. Use diodes and transistors in electronic circuits

Course Outcomes of the Course “Paper-BSCPHC333: Practical Physics”

- CO1. Acquire skill of using diodes and transistors in electronic circuits
- CO2. Gain insight on electrical properties and characteristics of diodes

Course Outcomes of the Course “Paper-BSCPHC381: Nuclear Physics”

- CO1. Gain basic ideas of radioactivity, nuclear properties and nuclear reactions.
- CO2. Gain knowledge on different types of nuclear radiations in nature
- CO3. Acquire basic concepts of high energy physics. .

Course Outcomes of the Course “Paper-BSCPHC382: Electronics”

- CO1. Know the working of Operational Amplifiers.
- CO2. Construct power supplies, regulators and oscillators
- CO3. Know the basics of logic gates, adders, flipflops counters and registers
- CO4. Understand the basics of communication techniques
- CO5. Appreciate the Principles Television and mobile communication.

Course Outcomes of the Course “Paper-BSCPHC383: Practical Physics”

- CO1. Gain skills in Construction of power supplies
- CO2. Acquire necessary skills of spectroscopy
- CO3. Acquire logical skills to understand adder circuits

Chemistry

Course Outcomes of Course “Chemistry Paper-I”

- CO1. Predict the chemical behavior of elements on the basis of periodic properties.
- CO2. Understand the chemistry involved in everyday life.
- CO3. Know the methods of analyzing the samples synthesized, the methods of isolation, separation, purification, and estimation of natural and synthetic compounds.
- CO4. Predict the structure of any molecule based on different theories like VBT&VSEPR.
- CO5. Understand the bonding aspects in homo & heteronuclear molecules.
- CO6. Compare the M.P & solubility based on Fajan’s rules.
- CO7. Understand the Concept of metallic bonding and conditions of acid-base & enzyme catalysed reactions
- CO8. Determine of order & free energy of activation and crystal structure, Avogadro number.
- CO9. Identify the different types of hybridization.
- CO10. Able to give examples for reactive intermediates and write mechanisms.

Course Outcomes Course “Chemistry Paper-II”

- CO1. Analyse the critical conditions i.e. temperature& pressure required for the liquefaction of gases.
- CO2. Understand the applications of liquid crystals.
- CO3. Analyse the properties of solvents.
- CO4. Predict the position of hydrogen in the periodic table.
- CO5. Differentiate between alkali and alkaline earth metals according to their properties.
- CO6. Know about the reduction potential and reducing properties of alkali metals and alkaline earth metals.
- CO7. Describe the complexation tendencies of alkali metals.
- CO8. Describe the comparative study of p block elements.
- CO9. Know the proper characteristics ,classification and materials, manufacture and applications of fuels, explosives, glass, ceramics, cane sugar, fertilizers, cement, insulators etc.
- CO10. Know about the reagents and their utility in organic isynthesis

Course Outcomes of “Chemistry Paper-III”

- CO1. Understand the importance of I,II& III laws of thermodynamics and the conditions for spontaneity of a chemical reaction.
- CO2. Identify transitional and inner transitional elements by their general characteristics.
- CO3. Compare the properties of d and f block elements.
- CO4. Separate the lanthanides one from the other.
- CO5. Extract and identify the metal impurities.
- CO6. Predict the properties of nanoparticles.
- CO7. Understand deeply about binary mixtures & to separate them based on Nernst distribution law.
- CO8. Classify any compound as acid or base ,based on different theories & to predict the interaction between them based on pearson’s HSAB principle.
- CO9. Understand the applications of std. Redox potential & to represent diagrammatically these redox potentials.
- CO10. To get specialized in synthetic reactions of phenols, ethers, epoxides, aldehydes and ketones and apply the gained knowledge in Research.

Course Outcomes of Course “Chemistry Paper-IV”

- CO1. Explain the nomenclature of coordination compounds.
- CO2. Predict the properties of coordination compounds.
- CO3. Know the type of hybridization, geometry of the complex.

- CO4. Calculate crystal field stabilization energy.
- CO5. Know the strength of the ligands and draw the shapes of s, p, d orbitals.
- CO6. Understand the effect of external factors like temperature & pressure on chemical & physical equilibrium.
- CO7. Draw Phase diagram for different systems.
- CO8. Understand the Principle of fractional crystallization and determine the molecular structure from their physical properties.
- CO9. Understand the reactive methylene compounds and their use in designing a synthetic methodology.
- CO10. Understand nucleophilic, electrophilic substitution and elimination reactions and know the mechanisms involved in these reactions.

Course Outcomes of Course “Chemistry Paper-V”

- CO1. Determine the applications of metal complexes and stability of complexes.
- CO2. Carry out qualitative and quantitative analysis.
- CO3. Understand the stability of complexes in gravimetric and volumetric analysis.
- CO4. Distinguish diamagnetic, paramagnetic and ferromagnetic substances.
- CO5. Predict antiferromagnetic substances and geometry of the complexes.
- CO6. Understand the applications of conductance measurements, applications of cell potential measurements, polarization of a cell, overvoltage.
- CO7. Understand the conditions for the formation of different types of spectra.
- CO8. Understand the structural information obtained from different types of spectra.
- CO9. Assess the reactivity and uses of compounds based on their stereochemistry.
- CO10. Understand the classification, importance and synthesis of vitamins and hormones.

Course Outcomes of Course “Chemistry Paper-VI”

- CO1. Understand Plank’s quantum theory to explain different phenomenon like photoelectric effect, Compton effect etc.
- CO2. Understand the Schrodinger equation & its applications.
- CO3. Understand Raman spectra & applications.
- CO4. Master the electronic spectra of transition metal complexes.
- CO5. Analyse any compound using flame photometry.
- CO6. Understand thermoanalytical techniques(TGA,DTG & DTA)
- CO7. Understand the biological role of metals
- CO8. Understand the concept of OMC
- CO9. Understand the Role of different types of catalyst.
- CO10. Understand the heterocyclic compounds, their reactivity and uses in the design of new compounds.

Course Outcomes of Course “Chemistry Paper-VII”

- CO1. Understand the synthesis and Applications of Inorganic polymers and the composite materials and their application in Industry
- CO2. Understand the Synthetic polymers, photophysical processes like fluorescence’s and phosphorescence’s, Photochemical reactions and Radiochemical reaction and radiation dosimetry.
- CO3. Explain the essential carbohydrates required for the growth of human body.
- CO4. Determine the interconversion of carbohydrates.
- CO5. Write the structures of some of the carbohydrates.
- CO6. Explain the various amino acids based on functional groups, biological activity, and stereochemistry.
- CO7. Know the methods of synthesis of amino acids, polypeptides.
- CO8. Know about the protein level structure.

CO9. Understand the structure and reactivity of carboxylic acids, their derivatives and their applications in day to day life.

CO10. Know about the classification of alkaloids and their structural elucidation.

Course Outcomes of Course “Chemistry Paper-VIII”

CO1. Understand the instrumentation of spectrophotometry and its applications in quantitative analysis.

CO2. Predict electronic absorptions based on structure of organic compounds (Woodward-Fieser rule).

CO3. Explain about the instrumentation and working of NMR spectrometer.

CO4. Interpret the signals produced in NMR spectrum.

CO5. Read the NMR spectrum of different compounds.

CO6. Explain the photoelectron spectra of some simple compounds.

CO7. Know about Composition of petrol, petroleum refining, knocking, octane, cetane number, Bergius process etc.

CO8. Know about terpenes, their classification and structural elucidation.

CO9. Know about drugs, chemotherapeutic agents and their importance in day today life.

CO10. Understand the Structure, synthesis and applications of pesticides, fungicides and herbicides.

Mathematics

Course Outcomes of the Course “Calculus and Analytical Geometry”

- CO1. Solve problems on increasing and decreasing functions, critical points and curve sketching
- CO2. Understand continuous functions, Definite Integrals and Theorems on Definite Integrals
- CO3. Understand derivations of Reduction Formulae for various trigonometric functions and evaluation of integrals using Reduction Formulae
- CO4. Solve problems based on functions of several variables, Partial Derivatives, Mixed Derivatives, Limits and Continuity
- CO5. Solve problems based on different aspects of Conic Sections

Course Outcomes of the Course “Number Theory and Calculus”

- CO1. Know about various algorithms on Number Theory
- CO2. Understand basic properties of Congruences, theorems of Congruences, Binary and Decimal representation of integers
- CO3. Know about theorems on Linear Congruences, Phi-function and its properties
- CO4. Understand various theorems of Calculus and solve problems on Vector Calculus
- CO5. Analyze basic concepts and solve problems on Polar Coordinates, Double Integrals and finding the Limits

Course Outcomes of the Course “Sequences Series and Differential Equations”

- CO1. Know about the fundamental concepts of Sequences and theorems on Sequences
- CO2. Solve problems on Infinite Series, Positive Term Series and Alternative Series
- CO3. Analyze various aspects Differential Equations and learn different theorems on it
- CO4. Solve problems on Differential Equations and applications of Differential Equations
- CO5. Know about definitions and theorems of Differential Equations of different functions and special methods to solve second order equations

Course Outcomes of the Course “Algebra and Complex Analysis”

- CO1. Know about basic concepts of Group Theory, types and examples of Groups
- CO2. Know about various definitions properties and problems of Group Theory
- CO3. Understand various types of subgroups and theorems of Group Theory
- CO4. Know about the fundamental concepts and theorems of Complex Analysis and solve problems based on Complex Analysis
- CO5. Know about different functions in Complex Analysis and solve related problems

Course Outcomes of the Course “Algebra and Laplace Transforms”

- CO1. Know about the fundamental concepts and examples of Rings
- CO2. Understand basic concepts and examples of Fields and solve related problems
- CO3. Know about different types of Vector Spaces and solve problems related to each of them
- CO4. Solve problems on different aspects of Vector Spaces
- CO5. Learn Laplace Transforms on different types of functions and solve problems on Inverse Transforms

Course Outcomes of the Course “Graph Theory”

- CO1. Know definitions and examples of various types of Graphs
- CO2. Understand definitions and examples of various concepts of Graph Theory
- CO3. Solve different problems on graphs and construct different matrices related to Graphs
- CO4. Know about different characteristics and applications of Trees
- CO5. Understand the concept of Colourability and theorems on Colouring the Graphs

Course Outcomes of the Course “Discrete Mathematics”

- CO1. Understand different types of graphs and representation of graphs
- CO2. Understand the concept of colouring a graph and solve problems on paths and circuits in Graphs
- CO3. Know about different types of Trees
- CO4. Understand the algorithms for finding the shortest path
- CO5. Understand the concepts of discrete numerical functions, recurrence relations and recursive algorithms

Course Outcomes of the Course “Numerical Analysis”

- CO1. Understand the estimation of errors in numerical computation and series approximations
- CO2. Apply numerical methods for finding solution to Algebraic and Transcendental Equations
- CO3. Apply various interpolation methods and divided difference methods to solve problems
- CO4. Solve problems based on Numerical differentiation and integration using different formulae
- CO5. Apply various iterative methods to solve linear system of equations

Course Outcomes of the Course “Linear Algebra”

- CO1. Know about various properties of Linear Transformations
- CO2. Understand and construct different types of matrices associated with Linear Transformations
- CO3. Perform different operations using Matrices and solve related problems
- CO4. Know about different types of linear equations and the methods to solve them
- CO5. Understand different theorems and characteristics of Linear Equations

Course Outcomes of the Course “Linear Programming”

- CO1. Know about the importance of Linear Programming and different type of problems in Linear Programming
- CO2. Understand different methods to solve Linear Programming Problems
- CO3. Understand different types of Matrix Games and Theorems of Linear Programming
- CO4. Solve different types of Transportation Problems
- CO5. Understand different techniques and algorithms to solve Assignment Problems

Computer Science

Course Outcomes of the Course “Fundamentals of Information Technology”

- CO1. Understand different components, Classification, Types and applications of Computers
- CO2. Understand conversions and arithmetic operations using Binary, Decimal, Octal and Hexadecimal number systems and Binary Codes
- CO3. Analyse the functioning of various logic gates and simplify Boolean functions using postulates, theorems and K-maps
- CO4. Analyse the working of combinational circuits such as Adders, Subtractors, Code converters, Magnitude comparators, Decoders, Encoders, Multiplexers and Demultiplexers
- CO5. Analyse the design of different types of Flip Flops
- CO6. Design circuits for various counters and registers

Course Outcomes of the Course “Problem Solving Using C Language”

- CO1. Understand the two problem solving techniques, namely Algorithms and Flowcharts
- CO2. Write algorithms and create flowcharts to solve simple problems
- CO3. Understand specific tokens of C Programming Language
- CO4. Explain the use of input, output, decision making and looping statements for various problems
- CO5. Demonstrate the use of Arrays, Strings, Structures, Unions and Pointers
- CO6. Analyse the purpose of user defined functions, recursion, files and pre-processors

Course Outcomes of the Course “Cloud Computing”

- CO1. Understand the basic concepts of Cloud Computing
- CO2. Explain Characteristics, advantages and disadvantages of Cloud Computing
- CO3. Explain different Cloud Applications
- CO4. Identify the architecture and infrastructure of Cloud computing
- CO5. Explain the various reference models used in Cloud Computing
- CO6. Understand different types of Clouds and their characteristics

Course Outcomes of the Course “Data Structures”

- CO1. Comprehend algorithmic notations and their applications.
- CO2. Write algorithms for problems using different data structures
- CO3. Describe the use of various data structures and different data structure operations
- CO4. Demonstrate the use of suitable data structure for a particular problem
- CO5. Explain various searching and sorting techniques
- CO6. Use data structures to implement various algorithms

Course Outcomes of the Course “Operating System & Linux”

- CO1. Understand the different types of Operating Systems
- CO2. Analyse CPU scheduling, Process scheduling, Scheduling algorithms, Critical sections and Semaphores
- CO3. Illustrate the methods of handling deadlocks, deadlock prevention, detection and avoidance
- CO4. Understand page replacement algorithms, file concepts and access methods
- CO5. Explain the basics, features and distributions of Linux operating system
- CO6. Demonstrate the use of various commands used in Linux

Course Outcomes of the Course “Microprocessor Architecture and 8086 Programming”

- CO1. Understand the architecture of 8086 microprocessor
- CO2. Illustrate the use of various addressing modes used in 8086

- CO3. Understand different Assembler directives and instructions used in 8086
- CO4. Understand basic concepts of assembly level language programming
- CO5. Explain interrupts and interrupt service routines in 8086
- CO6. Illustrate mixed language programming

Course Outcomes of the Course “Database Concepts and Oracle”

- CO1. Describe the features of databases, the advantages, the various data models used in DBMS and the database schema
- CO2. Demonstrate the use of E-R diagrams and relational model operations
- CO3. Explain the importance of First Normal Form, Second Normal Form, Third Normal Form and Boyce-Codd Normal Forms with illustrations
- CO4. Understand different techniques used to store information on the secondary storage media
- CO5. Demonstrate the use of different SQL commands to perform various database operations
- CO6. Write simple programs using PL/SQL to illustrate the use of Cursors, Triggers, Exception handling, Functions and Packages

Course Outcomes of the Course “Java Programming”

- CO1. Explain the structure of Java program and feature of Java Programming Language
- CO2. Demonstrate the use of various tokens of Java and different statements used in Java
- CO3. Illustrate use of various concepts such as Inheritance, Packaging, Interfaces, Threads and exception handling in Java
- CO4. Understand the use of different Swing components and choose appropriate Swing control for specific program
- CO5. Demonstrate the concepts of JDBC and use them to develop applications
- CO6. Develop applications in Java Using Embedded SQL to perform different database operations

Course Outcomes of the Course “Visual Basic .NET Programming”

- CO1. Demonstrate the importance of GUI and event-driven programming
- CO2. Understand various statements used in Visual Basic .NET programming and their use
- CO3. Understand the different controls available in Visual Basic.NET
- CO4. Explain the importance of exception handling, procedures and functions of Visual Basic .NET
- CO5. Choose best control for a specific problem and develop programs to solve the problem
- CO6. Develop small applications using Visual Basic.NET as front end and Oracle/MS-Access as back end tools.

Botany

Course Outcomes of Course “Microbes and Algae”

- CO6. Understand Botany and its main branches and scope.
- CO7. Know about contributions of Indian Botanists.
- CO8. Discover and classify viruses, viroids, phytoplasma, Bacteria & diseases
- CO9. Understand classification & characteristics of different classes of algae.
- CO10. Analyse reproduction and life cycle of Myxophyceae, Chlorophyceae, Xanthophyceae, Bacillariophyceae and Phaeophyceae & Phaeophyceae.
- CO11. Know about economic importance of Algae

Course Outcomes of Course “Fungi, Bryophytes, Histology and Anatomy”

- CO1. Understand salient features and Thallus organization of Mycota.
- CO2. Know about Plant-Fungal Interactions and Economic importance of Fungi.
- CO3. Impart knowledge of economic importance of Fungi.
- CO4. Understand classification & characteristics of different classes of Bryophytes.
- CO5. Explain evolution of sporophytes in bryophytes.
- CO6. Analyse reproduction and life cycle reproduction of *Riccia*, *Porella*, *Anthoceros* and *Funaria*.
- CO7. Know Plant Histology and Anatomy.

Course Outcomes of Course “Pteridophytes, Gymnosperms and Angiosperm Embryology”

- CO1. Understand salient features and classification of Pteridophytes
- CO2. Explain *Psilotum*, *Lycopodium*, *Selaginella*, *Equisetum*, *Ophioglossum*, *Osmunda* and *Pteris* / *Pteridium*, *Marsilea*
- CO3. Comprehend Palaeobotany, Geological time scale and types of plant fossils
- CO4. Understand salient features of Gymnosperms, and classification
- CO5. Explain significance of Fossil Gymnosperm: *Lyginopteris*
- CO6. Analyse economic importance of Gymnosperms
- CO7. Understand Angiosperm embryology
- CO8. Follow the process of pollination and Fertilization in Angiosperms
- CO9. Know Endosperm and seeds

Course Outcomes of Course “Taxonomy and Economic Botany”

- CO1. Understand fundamentals of Plant Taxonomy, cyto-taxonomy, chemo-taxonomy
- CO2. Know numerical taxonomy and molecular taxonomy
- CO3. Understand characteristics of DNA barcoding of plants and APG system
- CO4. Explain botanical nomenclature of herbaria, digital herbaria
- CO5. Know Botanical Survey of India and Botanical Gardens
- CO6. Study selected Plant families of Polypetelae, Gamopetelae, Monochlamydae and Monocotyledonae
- CO7. Understand importance of economic botany – Cereals, Pulses, Spices and condiments
- CO8. Know Beverages, Oil, Fiber and Rubber yielding plants
- CO9. Illustrate importance of Medicinal plants outdoor and indoor ornamental plants, Ethnobotany

Course Outcomes of Course “Ecology and Environmental Biology”

- CO1. Understand ecological factors and adaptations
- CO2. Know about Climatic and Edaphic factors
- CO3. Understand importance of ecological adaptations
- CO4. Illustrate structure and function of ecosystem
- CO5. Analyse ecological pyramids

- CO6. Narrate role of Bio-geo chemical cycles
- CO7. Explain ecological succession
- CO8. Understand Phytogeography and environmental issues
- CO9. Know natural resources and their management

Course Outcomes of Course “Plant Physiology”

- CO1. Understand Plant – Water relations Diffusion, Imbibition, Osmosis
- CO2. Know about water absorption by plants
- CO3. Understand mechanism of Ascent of sap
- CO4. Explain transpiration, mechanism and its significance
- CO5. Illustrate source and importance of Mineral Nutrition and mechanism of mineral salt absorption
- CO6. Explain Enzymes classification, nomenclature and mechanism of enzyme action
- CO7. Impart knowledge about Photosynthesis & its mechanism
- CO8. Demonstrate Translocation of organic solutes, Respiration and its significance

Course Outcomes of Course “Cytology, Molecular and Genetics”

- CO1. Know about Cytology Structure & Ultra-structure and functions
- CO2. Study Cell organelles and Ultrastructure of nucleus
- CO3. Understand Ergastic substances in plant cells, Cell Division and Chromosomes
- CO4. Know structure, chemistry and expression of Gene
- CO5. Explain DNA: Chemical composition, types -A, B and Z DNA, Watson & Crick model
- CO6. Analyse importance of RNAs, Genetic code and its properties. Structure of gene
- CO7. Explain Transcription and Translation, Split gene, Lac Operon Model
- CO8. Understand Gene interactions, Linkage & cross over
- CO9. Illustrate Gene mutations, Molecular basis of mutations, Chromosomal Aberrations
- CO10. Explain Chromosomal Aberrations, Variation in chromosome number extra nuclear genome

Course Outcomes of Course “Propagation and Biotechnology”

- CO1. Know about Plant Propagation and Plant Breeding, Understanding Methods of Plant propagation
- CO2. Illustrate methods of Plant breeding & significance in plant breeding
- CO3. Explain Plant Tissue Culture techniques, Scope & applications
- CO4. Analyse the role of growth hormones in plant tissue culture
- CO5. Narrate Plant Biotechnology, Genetic Engineering, Transgenic plants
- CO6. Understand applications and threats from transgenic plants
- CO7. Understand Environmental Biotechnology and Biotechnology in air pollution control
- CO9. Explain Bioremediation and phytoremediation, bio composting.
- CO10. Analyse production and applications of biogas cellulose, chitin, microbes and transgenic plants