B.Sc.: Physics

Programme Specific Outcomes

At the time of graduation, the students will be able to-

PSO1: Understand basic concepts of Mechanics, Optics, Thermodynamics and Mathematical methods of Physics

PSO2: Use effectively various basic measuring Instruments in laboratory

PSO3: Acquire Knowledge of mathematical Physics, Electronics, Statistical Physics and its applications

PSO4: Understand basic Laws of practical Physics

PSO5: Draw appropriate conclusions on outcomes of experiments

PSO6: Acquire ability to understand different types of crystal structures, classical and quantum theory of specific Heat, Electrodynamics with applications and Fibre Optics and its uses

PSO7: Understand and apply simple basics of Quantum mechanics

PSO8: Understand and solve Maxwell's equations

PSO9: Gain comprehensive knowledge of various techniques used in laser and its applications

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Course Outcomes

F.Y. B. Sc.

Semester I

Paper I –Mechanics

Properties of Matter Upon completion of the course, the students will be able to:

CO1: Describe acceleration due to gravity, Newton's law of gravitation and basics of potential and fields

CO2: Discuss basic properties of matter, Young's modulus, Bulk modulus and Modulus of rigidity

CO3: Discuss properties of matter especially viscosity and surface tension

CO4: Define the general terms in acoustics intensity, loudness, reverberation etc.

Paper II- Heat & Thermodynamics

Upon completion of the course, the students will be able to:

CO1: Define Thermal Conductivity, coefficient of thermal conductivity, Thermal diffusivity, and resistivity; give comparison of conductivities of various metals

CO2: Describe reason for modification of gas equation; derive Vander Waals equation of state; define critical constants

CO3: Explain Transport phenomenon, mean free path with expression, thermal conductivity and viscosity

CO4: Formulate and solve problems in Thermodynamics and Heat; explain adiabatic Process, isothermal process, reversible process, irreversible process and derive relevant equation, draw indicator diagram

CO5: Derive Thermodynamic parameters, Heat engine and Carnot Heat Engine, Maxwell's equation and their applications

Semester II

Paper-IV Geometrical and Physical Optics

Upon completion of the course, the students will be able to: CO1: Describe and determine concept of cardinal point and different eye pieces

CO2: Explain interference phenomenon of light and its relevant experiments

CO3: Explain concept of diffraction of light and grating

CO4: Describe polarization of light and its related Experiments

Paper V- Electricity & Magnetism

Upon completion of the course, the students will be able to:

CO1: Describe the concept of Scalar, vector triple product of vector algebra and Solve divergence, gradient and curl

CO2: Explain Coulomb's law, Gauss law and dielectrics with mathematical derivation

CO3: Explain the concept of Biot-Savrat's Law, Ampere's Law and Ballistic Galvanometer

CO4: Elaborate growth and decay of LCR circuit

S.Y. B. Sc.

Semester III

Paper VII- Mathematical Physics and Relativity

Upon completion of the course, the students will be able to:

CO1: Explain partial differentiation, successive differentiation and total differentiation

CO2: Describe ordinary differential equation and solutions of first and second order

differentiation equation

CO3: Elaborate theories and methods of statistical Physics and quantum statics

CO4: Explain principle of special theory of relativity and derive relevant equations including Einstein equation

Paper VIII- Modern Physics

Upon completion of the course, the students will be able to:

CO1: Explain Photoelectric Effect and its applications in various processes

CO2: Describe X- Ray radiation and its spectra

CO3: Explain theoretical aspect of Atomic mass, nuclear fission and Energy released in nucleus

CO4: Describe Particle accelerator, Cyclotron and Deuterons

Semester IV

Paper XI- General Electronics

Upon completion of the course, the students will be able to:

CO1: Describe semiconductors, Zener diode, Transistor and give its application

CO2: Explain Amplifier, RC coupling and Transistor biasing and discuss its applications

CO3: Describe theoretical and practical aspects of Oscillator and Multi-vibrator

CO4: Elaborate modulation, FM Modulation and AM wave

Paper XII- Solid State Physics

Upon completion of the course, the students will be able to:

CO1: Explain types of solids, miller indices, inter planner spacing and different types of Crystal structures

CO2: Elaborate concept of inter atomic forces and Kroning Penney Model

CO3: Describe classical theory of lattice heat capacity and Debye model; discuss limitations of Debye model

CO4: Discuss applications of free electron theory of Metals, Hall effect, Hall voltage and Hall coefficient and importance of Hall Effect

CO5: Describe transport properties of electrical conductivity thermal conductivity

T.Y. B. Sc.

Semester V

Paper XV- Classical & Quantum Mechanics

Upon completion of the course, the students will be able to:

CO1- Explain basic concept of Classical Mechanics, mechanics of particle, and mechanics of system of particle by using Newton's laws of motion

CO2- Derive Lagrange's equation and its various applications

CO3- Explain basic concepts of constraints, its types and Virtual work done

CO4- Discuss mathematical basics of quantum mechanics, explain matter wave, Group velocity, particle velocity, operators, wave function and expectation values

CO5- Derive Schrodinger time dependent and independent equation and describe particle in one-dimensional box

Paper XVI- Electrodynamics

Upon completion of the course, the students will be able to:

CO1: Describe and understand diversions, curl, and Gauss Law applications in Electrostatics

CO2: Explain concepts of self-induction, mutual induction and equation of continuity

CO3: Describe origin of Maxwell's equations in magnetic and dielectric media

CO4: Derive electromagnetic wave equation in conduction medium

CO5: Explain transport of energy and poyinting vector, poyinting theorem

CO6: Describe boundary condition for electromagnetic field vectors B, E, D and H

Semester VI

Paper XIX- Atomic, Molecular Physics & LASER

Upon completion of the course, the students will be able to:

CO1: Explain Thomson's atom model, Rutherford's nuclear atom model and Bohr's atom model

CO2: Describe the concepts of Vector atom model, quantum numbers, Coupling Scheme and Pauli's exclusive principle

CO3: Explain Zeeman Effect and Stark effect

CO4: Describe Rotation, Vibration Spectra, Raman Effect and its applications in various fields

CO5: Discuss LASER system and its properties, types of LASER and its medical, biological and industrial applications

Paper XX- Non-conventional Energy Sources and Optical Fiber

Upon completion of the course, the students will be able to:

CO1: Explain the concept of technologies of non-conventional sources of energy

CO2: Describe various renewable energy technology

CO3: Discuss non-conventional energy sources: Biomass, wind energy, tidal energy, ocean energy, geothermal energy and solar energy

CO4: Elaborate the concept of solar energy and its applications in various fields

CO5: Describe structures of optical fibers

CO6: Describe fiber fabrication techniques and testing of optical fiber cables

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