A.D.B. First Grade College, Harapanahalli

Course Outcomes (CO's)

DEPARTMENT OF PHYSICS

B.Sc. I SEMESTER

MECHANICS & PROPERTIES OF MATTER

After completion of this course student should able to

- Explain the basics frames of reference and special theory of relativity.
- Apply conservation laws to understand physical systems.
- Apply dynamics of rigid bodies to understand physical systems.
- Explain elastic behaviour of materials.
- Explain properties of fluids based on surface tension and viscosity.
- Setup experiments for the determination of moment of inertia of bodies.
- Setup experiments for the determination of elastic properties of solids.
- Setup experiments to verify laws in mechanics and elasticity.
- Setup experiments for the determination of surface tension, viscosity and other properties of liquids.

B.Sc. II SEMESTER

ELECTRICITY & MAGNETISM

At the end of the course, students will be able to:

- Apply electric field concepts to physical systems.
- Interpret DC & AC electrical circuits.
- Apply magnetism concepts to physical systems.
- Apply vector analysis in electromagnet theory.
- Explain magnetic properties of materials.
- Design experiments in electricity and magnetism.
- Execute experiments in electricity and magnetism.
- Experientially verify electrical theorems and measure electrical properties of materials.

B.Sc. III SEMESTER

ELECRICITY, VECTOR ANALYSIS & ELECTROMAGNETIC THEORY

At the end of the course, students will be able to:

- Understand the basic electrical components.
- Apply network theorems to two terminal linear networks.
- Understand response of LR, CR and LCR circuits to alternating current/voltage.
- Understand working of bridges and filters.
- Working principle of CRO.
- Apply vector calculus in various physics calculations.
- Understand the concepts of Coulomb's law Gauss's law, Biot-Savert's law, Ampere's law and their applications.
- Understand Electromagnetic waves and their productions

B.Sc. IV SEMESTER

PHYSICAL OPTICS, FIBRE OPTICS & COMPUTATIONAL PHYSICS

At the end of the course, students will be able to:

- Understand various theories of physical and geometrical optic.
- Understand the construction and working of optical instruments optical fibres.
- Understand concepts of special theory of relativity.
- Understand experimental aspects of interference, diffraction and polarisation.

B.Sc. V Semester (Paper-5)

ATOMIC PHYSICS & LASER

At the end of the course, students will be able to:

- Understand the calculation of fundamental quantity of an electron-charge and specific charge.
- Understand the effect of finite nuclear mass.
- Understand the concept of space quantisation and spinning of the electron and hence the fine structure of atomic spectrum.
- Understand interaction between spin motion and orbital motion of the electrons.
- Understand new concepts of modern physics such as Zeeman Effect, Stark Effect and Paschen back effect.
- Understand the concept of X-rays and their origin and characteristics.
- Understand the concept of LASER, construction and working of different types of Lasers and their applications in different fields.

B.Sc. V Semester (Paer-6)

MOLECULAR PHYSICS, NUCLEAR PHYSICS & STATISTICAL PHYSICS

At the end of the course, students will be able to:

- Understand the different types of spectrum exhibited by molecules.
- Understand the distribution functions such as Fermi-Dirac, Maxwell-Boltzmann and Bose-Einstein distributions.
- Understand the concepts of theories of radioactivity, nuclear forces, nuclear models, nuclear detectors, nuclear accelerators and nuclear reactions.
- Understand Cosmic ray discovery and theory of origin of cosmic rays.

B.Sc. VI Semester (Paper-7)

ELECTRONICS, SOLIDSTATE PHYSICS & NANOMATERIALS

At the end of the course, students will be able to:

- Understand the naming, working, modes of connection & biasing of transistor.
- Understand the analysis of transistor circuit using h-parameters.
- Understand op-amp characteristics and applications.
- Understand types of feedback & oscillator circuit- construction and working.
- Understand the concept of digital electronics-different types of logic gates & their working, Boolean laws, De-Morgan’s theorem and their implications.

- Understand crystal structure, types of crystals, Bragg's law, and Bragg's spectrometer.
- Understand the concept of Specific heat of solids & free electron theory of Metals.
- Understand the concept of Band theory of solids, Superconductivity, Magnetic materials, Nanomaterials.

B.Sc. VI Semester (Paper-8)

RELATIVITY, ASTROPHYSICS, QUANTUM MECHANICS & SPACE PHYSICS

- At the end of the course, students will be able to understand:
- The Special Theory of Relativity, Limitations of classical (Galilean) Relativity, The Michelson-Morley Experiment.
- Postulates of the Special Theory of Relativity, Lorentz Transformation, Relativity of Simultaneity, Length Contraction &Time dilation.
- Relativistic transformation of velocity, relativistic variation of mass, Einstein's mass energy equivalence with illustrations,
- Concept of Matter Waves- de Broglie hypothesis, Characteristics of matter waves, Group and phase velocity of matter Waves
- Heisenberg's Uncertainty Principle and applications of the Uncertainty Principle
- Concept of wave function, Properties of wave function & its Physical significance
- Schrodinger's Wave Equation in time independent and time dependent forms. Application of Schrodinger's equation.
- Basic concepts of Astrophysics, Stellar Spectra, Stellar Structure Stellar Evolution,
- Solar atmosphere electromagnetic radiations from the sun, Solar wind & solar cycles.