DEPARTMENT OF PHYSICS

I Year B.Sc.-Physics: I Semester Course I: MECHANICS, WAVES AND OSCILLATIONS

Course outcomes:

1. Understand Newton's laws of motion and motion of variable mass system and its application to rocket motion and the concepts of impact parameter, scattering cross section.

2. Apply the rotational kinematic relations, the principle and working of gyroscope and it applications and the precessional motion of a freely rotating symmetric top.

3. Comprehend the general characteristics of central forces and the application of Kepler's laws to describe the motion of planets and satellite in circular orbit through the study of law of Gravitation.

4. Understand postulates of Special theory of relativity and its consequences such as length contraction, time dilation, relativistic mass and mass-energy equivalence.

5. Examine phenomena of simple harmonic motion and the distinction between undamped,damped and forced oscillations and the concepts of resonance and quality factor with reference to damped harmonic oscillator.

6. Appreciate the formulation of the problem of coupled oscillations and solve them to obtain normal modes of oscillation and their frequencies in simple mechanical systems.

7. Figure out the formation of harmonics and overtones in a stretched string and acquire the knowledge on Ultrasonic waves, their production and detection and their applications in different fields

I Year B.Sc.-Physics: II Semester Course-II: WAVE OPTICS

Course outcomes:

1. Understand the phenomenon of interference of light and its formation in (i) Lloyd's single mirror due to division of wave front and (ii) Thin films, Newton's rings and Michelson interferometer due to division of amplitude.

2. Distinguish between Fresnel's diffraction and Fraunhoffer diffraction and observe the diffraction patterns in the case of single slit and the diffraction grating.

3. Describe the construction and working of zone plate and make the comparison of zone plate with convex lens.

4. Explain the various methods of production of plane, circularly and polarized light and their detection and the concept of optical activity..

5. Comprehend the basic principle of laser, the working of He-Ne laser and Ruby lasers and their applications in different fields.

6. Explain about the different aberrations in lenses and discuss the methods of minimizing them.

7. Understand the basic principles of fibreoptic communication and explore the field of Holography and Nonlinear optics and their applications.

II Year B.Sc.-Physics: III Semester Course-III: HEAT AND THERMODYNAMICS

Course outcomes:

1. Understand the basic aspects of kinetic theory of gases, Maxwell-Boltzman distribution law, equipartition of energies, mean free path of molecular collisions and the transport phenomenon in ideal gases

2. Gain knowledge on the basic concepts of thermodynamics, the first and the second law of thermodynamics, the basic principles of refrigeration, the concept of entropy ,the thermodynamic potentials and their physical interpretations.

3. Understand the working of Carnot's ideal heat engine, Carnot cycle and its efficiency

4. Develop critical understanding of concept of Thermodynamic potentials, theformulation of Maxwell's equations and its applications.

5. Differentiate between principles and methods to produce low temperature and liquefy air and also understand the practical applications of substances at low temperatures.

6. Examine the nature of black body radiations and the basic theories.

II Year B.Sc.-Physics: IV Semester Course-IV: ELECTRICITY, MAGNETISM AND ELECTRONICS

Course outcomes:

1. Understand the Gauss law and its application to obtain electric field in different cases and formulate the relationship between electric displacement vector, electric polarization, Susceptibility, Permittivity and Dielectric constant.

2. Distinguish between the magnetic effect of electric current and electromagnetic induction and apply the related laws in appropriate circumstances.

3. Understand Biot and Savart's law and Ampere's circuital law to describe and explain the generation of magnetic fields by electrical currents.

4. Develop an understanding on the unification of electric and magnetic fields and Maxwell's equations governing electromagnetic waves.

5. Phenomenon of resonance in LCR AC-circuits, sharpness of resonance, Q- factor, Power factor and the comparative study of series and parallel resonant circuits.

6. Describe the operation of p-n junction diodes, zener diodes, light emitting diodes and transistors

7. Understand the operation of basic logic gates and universal gates and their truth tables

II Year B.Sc.-Physics: IV Semester Course V: MODERN PHYSICS

Course outcomes:

1. Develop an understanding on the concepts of Atomic and Modern Physics, basic elementary quantum mechanics and nuclear physics.

2. Develop critical understanding of concept of Matter waves and Uncertainty principle.

3. Get familiarized with the principles of quantum mechanics and the formulation of Schrodinger wave equation and its applications.

4. Examine the basic properties of nuclei, characteristics of Nuclear forces, salient features of nuclear models and different nuclear radiation detectors.

5. Classify Elementary particles based on their mass, charge, spin, half-life and interaction.

6. Get familiarized with the Nano materials, their unique properties and applications.

7. Increase the awareness and appreciation of superconductors and their practical applications.

III Year B.Sc.-Physics: Semester – V: Course 6B: LOW TEMPERATURE PHYSICS & REFRIGERATION

Learning Outcomes:

1. Identify various methods and techniques used to produce low temperatures in the Laboratory.

2. Acquire a critical knowledge on refrigeration and air conditioning.

3. Demonstrate skills of Refrigerators through hands on experience and learns about refrigeration components and their accessories.

4. Understand the classification, properties of refrigerants and their effects on environment.

5. Comprehend the applications of Low Temperature Physics and refrigeration.

III Year B.Sc.-Physics: Semester – V: Course 7B: Solar Energy and Applications

Learning Outcomes:

1. Understand Sun structure, forms of energy coming from the Sun and its measurement.

2. Acquire a critical knowledge on the working of thermal and photovoltaic collectors.

3. Demonstrate skills related to callus culture through hands on experience

4. Understand testing procedures and fault analysis of thermal collectors and PV modules.

5. Comprehend applications of thermal collectors and PV modules.