Course Title : Physics

I-SEMESTER

- The **objective** of the module is to introduce and develop the methods of **vector analysis**. These methods provide a natural aid to the understanding of geometry and some physical concepts. They are also a fundamental tool in many theories of Applied Mathematics.

- The concept of frame of reference

- The type of frame of reference-(a) Inertial and (b) non-inertial

- The transformation rules for inertial frames called the Galilean transformation

- The invariance of Galilean transformation with respect to laws of motion-called the Galilean Invariance

- Descriptions of motion of particles in terms of displacement, velocity acceleration vectors

- The concept of instantaneous and average displacement, vector and acceleration

- The concept of system of mass particle and the description of the motion of the system of particles and its dynamics

- To study and verify Kepler's Laws of **Planetary Motion**. To become acquainted with the elements which are used to describe the shape, positions and orientations of **orbits** in space.
- Johannes Kepler, a student of Tycho Brahe, failed in his attempts to set up a musical relation among the planets.

SEMESTER-II

- (1) to study the motion of a **simple pendulum**, (2) to study **simple** harmonic motion, (3) to learn the definitions of period, frequency, and amplitude, (4)

to learn the relationships between the period, frequency, amplitude and length of a **simple pendulum**

- Use the **compound pendulum** to find: 1) The acceleration due to gravity g. 2) The moment of inertia of the rod. And h is the distance between the suspension point and the center of mass.
- In this lecture you will learn the following. Derivation of the governing partial differential equation for longitudinal **vibration of bars**. Solution of the governing equations in terms of the natural frequencies and mode shapes.
- Vibrating **String**. To find the frequency of various modes of **vibration** of a **string**. To determine how the frequency depends on the length of the **string** and the tension.

SEMESTER-III

- The **kinetic** molecular **theory of gases** is a model that helps us understand the physical properties of **gases** at the molecular level. ... **Gases** consist of particles (molecules or atoms) that are in constant random motion. **Gas** particles are constantly colliding with each other and the walls of their container.
- Measurable **outcomes** (assessment method): To be able to state the First Law and to define heat, work, thermal efficiency and the difference between various forms of energy. ... To be able to identify and describe energy exchange processes (in terms of various forms of energy, heat and work) in aerospace systems.
- The main **objectives of ENTROPY** include: to design, implement and validate an innovative IT ecosystem for motivating end-users' behavioural changes towards the adoption of energy efficient lifestyles;; to design and implement innovative ICT solutions targeting at aggregation of energy consumption data
- In **thermodynamics**, interactions between large ensembles of **objects** are studied and categorized. ... Properties can be combined to express internal energy and **thermodynamic potentials**, which are useful for determining conditions for equilibrium and spontaneous processes.

- Quantum mechanics gradually arose from theories to explain observations which could not be reconciled with classical physics, such as Max Planck's solution in 1900 to the black-body radiation problem, and from the correspondence between energy and frequency in Albert Einstein's 1905 paper which explained the photoelectric effect. Early quantum theory was profoundly re-conceived in the mid-1920s by Erwin Schrödinger, Werner Heisenberg, Max Born and others. The modern theory is formulated in various specially developed mathematical formalisms. In one of them, a mathematical function, the wave function, provides information about the probability amplitude of position, momentum, and other physical properties of a particle.
- Important applications of quantum theory include quantum chemistry, superconducting magnets, light-emitting diodes, and the laser, the transistor and semiconductors such as the microprocessor, medical and research imaging such as magnetic resonance imaging and electron microscopy.
- The main goal of this course is to acquire fundamental knowledge of classical and quantum **statistical mechanics**; construct a bridge between macroscopic thermodynamics and microscopic **statistical mechanics** by using mathematical methods and fundamental physics for individual.

SEMESTER-IV

- In **optical** engineering, the **objective** is the **optical** element that gathers light from the object being observed and focuses the light rays to produce a real image.
- **Objectives** can be a single lens or mirror, or combinations of several **optical** elements.
- **Fiber Optics** Technician Resume **Objective** Sample. ... You are responsible for the repair, the install and the maintenance of **fiber optic** systems and the cables that provide so many services to everyone around.

SEMESTER-V

- **Electrostatics** give evidence for the existence of two kinds of electric charge (like charges repel, unlike charges attract). Describe and demonstrate a method for determining whether an unknown charge is positive or negative.

- Define **capacitance** and apply a relationship among **capacitance**, applied voltage, and total charge. Compute the **capacitance** of a parallel-plate **capacitor** when the area of the plates and their separation in a medium of known dielectric constant are given.
- **Magnetostatics** and Ohms Law: In this course you will learn the following. Magnetic Field and Magnetic Flux Density. Conduction Current Density J.
- One important **objective of magnetostatics** is to derive formulae for the self inductance and mutual inductance for given current configurations. Use of the vector potential greatly facilitates.
- To understand how induced electric and magnetic fields lead to **electromagnetic waves**. To apply the **wave** model to the **electromagnetic** spectrum. To understand the properties of different types of **electromagnetic waves**.
- To calculate the intensity of light transmitted through a series of polarizing filters.
- **Solid State Physics**. **Objectives** of the course and intended learning outcomes (competences). Basic understanding of symmetry, electronic and thermodynamic properties of solid state systems and their technological applications. Contents (Syllabus outline). Crystal Structure: Translational symmetry.
- Many industrial laser applications require a higher degree of aberration correction than can be achieved from best forms singlet lenses and standard microscope objectives.
- Whether correction over larger apertures, several wavelengths or a wider field is needed, it may be necessary to use a laser focusing objective. Special Optics has a wide variety of standard designs along with custom options to meet many demanding applications.
- To measure the wavelengths of visible light emitted by **atomic** hydrogen and verify the measured wavelengths against those predicted by quantum theory. To identify an unknown element through its **emission spectra**.

SEMESTER-VI

- **ATOMIC SPECTRA Objectives** 1. Determine the **emission spectrum** of Hydrogen and other elements. 2. Calculate the expected wavelengths of H using the Rydberg equation. 3. Determine the composition of unknown

solutions using flame tests. 4. Determine the absorption spectrum of colored solutions and solids.

- One of the main **objectives** of the study of **nuclear physics** is the understanding of the "Structure of Nuclei". This includes all aspects of the motion of the nucleons, their paths in space, their momentum and the correlations between them, the energies binding them to each other.
- Identify methods for making **radioactive** isotopes.
- Recognize the various types of **radioactive** decay.
- Interpret an energy level diagram for **radioactive** decay.
- Identify which modes of **radioactive** decay have application in **radiation** medicine.
- To prepare students to perform the analysis and design of various **digital electronic** circuits.
- Have a thorough understanding of the fundamental concepts and techniques used in **digital electronics**.
- The ability to understand, analyze and design various combinational and sequential circuits