

Applied Physics

Code: ZBSC-103

L T P

2 0 1

Theory : 50

Practical : 50

Total : 100

Unit-I

Mechanical Measurement

Basics of Measurements: Introduction, General measurement system, systems of units (FPS, CGS and SI units), Thermometry: Thermoelectric temperature measurement, Resistance thermometry.

Unit-II

Properties of Matter and Thermal Physics

Definition and types of stress and strain, Hooke's law, Fluid properties – density, Specific weight, Specific gravity, Surface tension, Viscosity, Pressure - atmospheric pressure, gauge pressure, absolute pressure, Pascal's law, buoyancy, Introduction to laminar and turbulent flow. Modes of heat transfer- thermal conductivity.

Unit-III

Simple Machines

Definition of simple and compound machine (examples), definition of load, effort, velocity ratio, mechanical advantage and efficiency of a machine and their relationship, law of machines, definition of an ideal machine, reversible and self locking machines. Working principle and application of simple screw jack and worm & worm wheel.

Unit-IV

Lasers and Fibre Optics

Characteristics of Lasers, Spontaneous and stimulated emission of radiation, Ruby laser, Helium-Neon Laser, Applications of lasers. Principle of optical fibre, Acceptance angle and acceptance cone - Numerical aperture - Types of optical fibres and refractive index profiles, Application of optical fibres

Unit-V

Photoconductivity and Nanoscience

Photoconductivity & Photovoltaics: application of photoconductivity, photovoltaic cells, solar cell and its characteristics. Introduction to Nano materials - Basic principles of Nanoscience & Technology, applications of nanotechnology.

List of Experiments:

1. To find the mechanical advantage, velocity ratio and efficiency of a screw jack.
2. To find the mechanical advantage, velocity ratio and efficiency of a worm and worm wheel.
3. To determine force constant of spring using Hooke's law
4. To determine the Moment of Inertia using a Flywheel.
5. To verify the Bernoulli's Theorem.
6. To study the variation of magnetic field with distance and to find the radius of coil by Stewart and Gee's apparatus.
7. To study the characteristics of Cu-Fe thermo couple.
8. To find the value of Planck's constant by using a photo electric cell.
9. To determine the energy gap of a semiconductor diode.
10. Solar Cell: To study the V-I Characteristics of solar cell.
11. Light emitting diode: Plot V-I and P-I characteristics of light emitting diode.
12. Photoelectric effect: To determine work function of a given material.
13. LASER: To study the characteristics of LASER sources.
14. Optical fibre: To determine the bending losses of Optical fibres.

Note: Any 5 experiments are to be performed