

## APPLIED PHYSICS LAB

I B. Tech. - I Semester  
Course Code: A3HS08

L T P C  
- - 3 2

### COURSE OVERVIEW:

Applied Physics laboratory course includes the experimental methods for the determination of the mechanical property (Rigidity modulus of a given material), frequency of an AC Signal, basic electronic circuits (LED, RC, LCR circuits), and to study characteristics of LASERS & Optical fiber (LASER wavelength, divergence, Numerical aperture of fiber, Losses in fibers) and Polarisation of light. And also about study of Hall effect, Planck's constant. This interdisciplinary knowledge is designed for the continuous innovation occurring with technology.

### COURSE OBJECTIVES:

The experiments are selected from various area of Physics like Physical Optics, Lasers, Fiber Optics, Mechanics, Electricity & Magnetism and Basic Electronics.

1. To describe the rigidity modulus of given wire by using Torsional pendulum
2. To impart knowledge of LED and SOLAR CELLS.
3. To familiarize the propagation of laser light and how it is used for communication in Optical Communication network.
4. To teach how to calculate energy gap of given semiconductor
5. To describe Melting point of solids
6. To describe the phenomenon of interference of light, Hall effect, Polarization.

### COURSE OUTCOMES:

Up on successful completion of this course, student will be able to:

1. Identify elastic materials and modulus by its properties
2. Select LED or SOLAR CELL for variety of applications
3. Analyze energy gap of semiconductor, Resonance of LCR and Time Constant of RC circuits
4. Analyze the wavelength of laser source using diffraction grating.
5. Evaluate the magnetic field along the axis of a current carrying coil by using Stewart&Gee's apparatus and Speed of light in glass
6. Compare the interference phenomenon by using Newton's ring apparatus.
7. Analyze how Haidinger fringes are used to measure thickness of given thin film

### List of Experiments:

#### (Any 12 experiments compulsory)

1. Error Analysis and Graph Drawing
2. Study of V-I characteristics of an LED
3. Determination of numerical aperture – optical Fibers.
4. Study of V-I characteristics of Solar Cell
5. Determination of Energy gap of a given Semiconductor material
6. Determination of rigidity modulus of the material of a given wire-Torsional Pendulum
7. Determination of wavelength of given laser source by using diffraction grating
8. Study of variation of magnetic field along a circular current carrying conductor – Stewart & Gee apparatus.
9. Determine the radius of curvature of given convex lens by forming Newton's rings
10. Study the Charging and discharging of a capacitor
11. Study the Resonance frequency of LCR circuit
12. Determine the frequency of AC using Melde's Experiment
13. To calibrate a thermistor using a thermometer and using the calibrated thermistor as temperature sensor find the melting point of a given chemical compound
14. To measure the value of Planck's constant 'h'
15. To study Hall effect in extrinsic semiconducting samples and determine the type of Semiconductor and density of majority charge carriers
16. To determine the speed of propagation of light waves in glass
17. To study the polarization of light, to verify Malus law and to find the Brewster angle for glass.
18. Study of Haidinger fringes

**LABORATORY MANUAL:**

1. Laboratory Manual of Engineering Physics by Dr.Y.Aparna & Dr.K.Venkateswara Rao (V.G.S Publishers)
2. Solar photovoltaics – Technology Fundamentals system: A manual for Technics, Trainers & Engineers 2013