PHYSICS LABORATORY

I Semester: AE / ME / CE / ECE / EEE

II Semester: CSE / CSE (AI & ML) / CSE (DS) / CSE (CS) / CSIT / IT

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
AHSC05	Foundation	-	-	3	1.5	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 36				Total Classes: 36		

Pre-Requisites: Basic principles of Physics

I. COURSE OVERVIEW:

This lab course provides hands on experience in a number of experimental techniques and develops competence in the instrumentation typically used in physics. This also develops student's expertise in applying physical concepts to practical problem and in learning about experimental techniques with advanced equipments. This laboratory includes experiments involving electromagnetism and optoelectronics.

II. COURSE OBJECTIVES:

The students will try to learn:

I	To familiarize with the lab facilities, equipment, standard operating procedures.
II	About the different kinds of functional electric and magnetic materials which paves away for them to use in various technical and engineering applications.
III	The analytical techniques and graphical analysis to study the experimental data for optoelectronic devices.
IV	The applications of variation in the intensity of light due to natural phenomena like interference and diffraction.

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

CO 1	**Identify** the type of semiconductor using the principle of Hall Effect and also determine the energy gap of a semiconductor diode.	Apply
CO 2	**Illustrate** principle, working and application of wave propagation and compare results with theoretical harmonics and overtones.	Understand
CO 3	**Investigate** the energy losses associated with a given Ferro magnetic material and also magnetic field induction produced at various points along the axis of current carrying coil.	Apply
CO 4	**Examine** launching of light through optical fiber from the concept of light gathering capacity of numerical aperture.	Understand
CO 5	**Utilize** the phenomena of interference and diffraction for the determination of various parameters like radius of curvature of convex lens, wavelength of laser light and width of single slit.	Apply
CO 6	**Investigate** V-I/L-I characteristics of various optoelectronic devices like Light Emitting Diode, Photodiode to understand their basic principle of functioning as well as to infer the value of Planck's constant.	Apply

IV. SYLLABUS:

Week-1: HALL EFFECT (LORENTZ FORCE)
Determination of charge carrier density.

Week-2: MELDE'E EXPERIMENT
Determination of frequency of a given tuning fork.

Week-3: STEWART GEE'S APPARATUS
Magnetic field along the axis of current carrying coil-Stewart and Gee's method.

Week-4: B-H CURVE WITH CRO
To determine the energy loss per unit volume of a given magnetic material per cycle by tracing the Hysteresis loop (B-

H curve).

Week-5: ENERGY GAP OF A SEMICONDUCTOR DIODE
Determination of energy gap of a semiconductor diode.

Week-6: PHOTO DIODE
Studying V-I characteristics of photo diode.

Week-7: OPTICAL FIBER
Evaluation of numerical aperture of a given optical fiber.

Week-8: WAVE LENGTH OF LASER LIGHT
Determination of wavelength of a given laser light using diffraction grating.

Week-9: PLANCK'S CONSTANT
Determination of Planck's constant using LED.

Week-10: LIGHT EMITTING DIODE
Studying V-I characteristics of LED

Week-11: NEWTONS RINGS
Determination of radius of curvature of a given plano-convex lens.

Week-12: SINGLE SLIT DIFFRACTION
Determination of width of a given single slit.

V. MANUALS:

1. C. L. Arora, "Practical Physics", S. Chand & Co., New Delhi, 3rd Edition, 2012.
2. VijayKumar, Dr.T.Radhakrishna, "Practical Physics for Engineering Students", SM Enterprises, 2nd Edition, 2014.

VI. WEB REFERENCE:

http://www.iare.ac.in