ENGINEERING PHYSICS LABORATORY

I Semester: AE / ECE / ME II Semester: CSE / IT / CE / EEE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
AHSB10	Foundation	-	-	3	1.5	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 45				Total Classes: 45		

OBJECTIVES:

The course should enable the students to:

I. Upgrade practical knowledge in optics.
II. Enlighten the real time application of electromagnetic theory.
III. Enrich the knowledge of electric and magnetic properties.

COURSE OUTCOMES (COs):

CO 1: Understand the basic principles of physics and correlate with experiments.
CO 2: Explore the working principles of semiconducting devices.
CO 3: Summarize various phenomenon of optics like interference and diffraction.
CO 4: Analyze the basic theory of semiconductor diode in electronic devises.
CO 5: Explain the concept of hysteresis curve of a ferromagnetic material.

COURSE LEARNING OUTCOMES (CLOs):

The students should enable to:

1. Evaluate the carrier density of a semiconductor using the principle of Hall Effect.
2. Perform Melde's experiment to understand propagation of longitudinal and transverse waves.
3. Examine the magnetic field produced in a coil to verify the Tangent's law.
4. Analyze the hysteresis property of a ferromagnetic material.
5. Evaluate the energy gap of a semiconductor diode.
6. Determine the numerical aperture of an optical fiber.
7. Understand the phenomena of diffraction to determine wavelength of laser.
8. Estimate the value of Planck's constant using light emitting diode.
9. Examine the behavior of LED by studying its V-I characteristics.
10. Apply the concept of Newton's rings to determine the radius of curvature of convex lens.
11. Determine the slit width using the phenomena of diffraction.
12. Understand the sensitivity of photo diode to light intensity.
13. Evaluate time constant of a RC circuit.
14. Verify L-I characteristics of a solar cell.
15. Correlate the basic principles of physics with laboratory experiments.

LIST OF EXPERIMENTS	
Week-l	**INTRODUCTION TO PHYSICS LABORATORY**
Do's and Don'ts in physics laboratory. Precautions to be taken in laboratory.	
Week-2	**HALL EFFECT (LORENTZ FORCE)**
Determination of charge carrier density.	
Week-3	**MELDE'E EXPERIMENT**
Determination of frequency of a given tuning fork.	
Week-4	**STEWART GEE'S APPARATUS**
Magnetic field along the axis of current carrying coil-Stewart and Gee's method.	
Week-5	**B-H CURVE WITH CRO**
To determine the value of retentivity and coercivity of a given magnetic material.	
Week-6	**ENERGY GAP OF A SEMICONDUCTOR DIODE**
Determination of energy gap of a semiconductor diode.	
Week-7	**PIN AND AVALANCHE DIODE**
Studying V-I characteristics of PIN and Avalanche diode.	
Week-8	**OPTICAL FIBER**
Evaluation of numerical aperture of a given optical fiber.	
Week-9	**WAVE LENGTH OF LASER LIGHT**
Determination of wavelength of a given laser light using diffraction grating.	
Week-10	**PLANK'S CONSTANT**
Determination of Plank's constant using LED.	
Week-11	**LIGHT EMITTING DIODE**
Studying V-I characteristics of LED	
Week-12	**NEWTONS RINGS**
Determination of radius of curvature of a given plano-convex lens.	
Week-13	**SINGLE SLIT DIFFRACTION**
Determination of width of a given single slit.	

Text Books:

1. C. L. Arora, “Practical Physics”, S. Chand & Co., New Delhi, 3rd Edition, 2012.
2. Vijay Kumar, Dr. T. Radhakrishna, “Practical Physics for Engineering Students”, S M Enterprises, 2nd Edition, 2014.

Reference Books:

1. C.F. Coombs,"Basic Electronic Instrument Handbook", McGraw-Hill Book Co., 1972.
2. C.H. Bernard and C.D. Epp, John Wiley and Sons, "Laboratory Experiments in College Physics" Inc., New York, 1995.

Web References :

1. https://www.scribd.com/doc/143091652/ENGINEERING-PHYSICS-LAB.
2. https://www3.nd.edu/~wzech/LabManual_0907c.pdf.
3. https://www.morebooks.de/store/gb/book/engineering-physics-lab-manual/isbn/978-3-330-34402.