FIRST SEMESTER 2018-2019

COURSE HANDOUT (PART-II)

Date: 02.08.2018

In addition to part I (General handout for all courses appended to the timetable) this portion gives further details regarding the course.

Course No. : **PHY F214**

Course Title : **ELEC MAGNET & OPT LAB**

Instructor In-charge : **SubhashisGangopadhyay**

Instructors Name : **SubhashisGangopadhyay, Amol Holkundkar, Kaushar Vaidya, and Srijata Dey**

1. AIMS AND LEARNING OBJECTIVE:

This lab consists of experiments on electromagnetism and optics. The aim of this lab is to expose students to various topics in the above subject areas by carefully chosen experiments and hence to integrate the theoretical knowledge they acquire in the corresponding theory courses. Students also gain other skills in the process such as how to use various scientific equipments, how to analyze data, how to estimate errors, for example.

2. TEXT BOOK:

Lab manual for Physics: Will be provided in the lab.

Reference: Relevant reference materials are specified in the lab manuals.

3. EVALUATION SCHEME:

EVALUATION COMPONENT	DURATION	DATE & TIME	MARKS (%)
DAY TO DAY PERFORMANCE	4 Hrs/Week		50
LAB TEST	2Hrs		20
COMPRE EXAM	2 Hrs	<TEST_C>	30
TOTAL			**100**

4. Laboratoryexperiments plan

Experiment Name	Learning Outcome
1. Brewster Angle &Malu's Law	• Polarization of light by passing through a polarizer • Polarization by reflection and Brewster angle measurement • Verification ofMalu's law of polarization
2. Gaussian Nature of Laser Beam	• Determine the cross sectional shape of a laser beam • Determine the laser beam spot size
3. Numerical Aperture of Optical Fiber	• Determine the numerical aperture of an optical fibers(OF) • Effect of OFbending on intensity of light passes through it
4. Ultrasonic Diffraction	• Diffraction of light through acoustic grating on liquid surface • Determine the velocity of ultrasonic wave within a liquid
5. Magneto-optic Effect	• Rotation of polarized monochromatic lightwithin a dielectricdue to external magnetic field (Faraday effect) • Determine the Verdet's constant of flint glass
6. Fresnel's Biprism	• Formation of virtual coherent sources of light • Determine the wavelength of sodium light
7.Michelson Interferometer	• Fundamental concepts of diffraction and interference • Wavelength determination using interference mechanism
8. Measurement of Dielectric Constant	• Measure the capacitance of a dielectric cell • Determine the dielectric constant of glass and PZT materials
9. M - B Curve	• Magnetization of a ferromagnetic material • Retentively and coercivity measurement using Hysteresis loop
10. Measurement of magneto-resistance	• Effect of magnetic field on materials resistivity • Magneto-resistance of a semiconductor crystal
11. Biot-Savart Law	• Magnetic field generation by using electrical current • Verify the Biot-Savart law of electromagnetism
12. Current Balance	• Force on current carrying conductor under magnetic field • Verification of Lorentz force of electromagnetic induction

Optics Experiments (No. 1 – 7) : Room 3237
EMT Experiments (No. 8 – 12) : Room 3235

The expectations from students such as regarding maintenance of lab record book, participation in lab, etc., will be clearly spelt out in the first lab.

5. MAKE-UP:

Students are expected to attend all the labs regularly. Make-up will be given in the following conditions only

1. Hospitalized cases
2. Marriage of his or her own brother and sister or any other ceremony in their family (Cards or parent declaration is required).

Without proper proof, make-up will NOT be granted. This will be implemented strictly.

6. NOTICE: Notices concerning this course will be displayed on **FD-III** notice board

Only. Notices shall be uploaded on the course page on Nalanda as well.

Instructor-In-Charge

PHY F214