

Subject Code: 02PY0151
Subject Name: Physics-II
B.Sc. Year – I (Sem.-II)

Objective: This course aims to make students familiar with fundamental properties of Electric Field, Magnetic field, EM field (light) and its applications in various fields.

Credits Earned: 4 Credits

Course Outcomes: After completion of this course, student will be able to

- Learn the fundamentals of electric field and magnetic field and apply it in electromagnetics
- Interpret the differences between interference and diffraction and utilise its applicability in various science disciplines
- Apply knowledge of physics in other branches of science to solve scientific problems

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	Mid Sem (M)	Internal (I)	Viva (V)	Term Work (TW)	
3	-	2	4	50	30	20	25	25	150

Contents:

Unit	Topics	Contact Hours
1	The Electric Field : Concept of Electric Charge, Electric force and Coloumb's Law, Conservation and Quantization of Charge, The Electric Field, Electric Field due to Point Charge, Electric Field due to Electric Dipole, The Electric Field due to line of charge, Electric Field due to Charged Disk, Flux of an Electric Field, Gauss law, Application of Gauss law	15
2	The Magnetic Field : Magnetic Field, Production of Magnetic Field, Calculating the Magnetic Field due to a Current, Magnetic Force on Current Carrying Wire, Force between Two Parallel Currents, Torque on a Current Loop, Ampere's law, Solenoids and Toroids, A current carrying Coil as Magnetic Dipole	15
3	Optical Interference and Diffraction : Light as wave, Diffraction, Young's interference experiment, Coherence, Intensity in Double slit Interference, interference from Thin Films, Michelson's Interferometer, Diffraction and Wave Theory of Light, Diffraction by a single Slit Locating the minima, Intensity in Single Slit Diffraction, Diffraction by Circular Aperture, Diffraction by Double slit, Diffraction Gratings.	15

Reference Books :

1. Fundamentals of Physics – Halliday , Resnick and Walker, Wiley Publication
2. University Physics by SEARS AND ZEMANSKY'S,
3. The Feynman Lecture on Physics, - Feynman, Pearson Publication

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
20%	20%	30%	15%	10%	5%

Suggested List of Experiments:

1. To measure magnetic dipole moment using deflection magnetometer method.
2. To find out M_1/M_2 by Oscillating magnetometer.
3. Study of Magnetic Field due to Solenoid.
4. To find out grating element of plane diffraction grating.
5. To find the plateau characteristics of a GM Counter and there by obtain its operating voltage.
6. To calculate the current and voltage sensitivity of moving coil galvanometer.
7. To Study of dispersion curve and dispersion power of the material of prism for different colour.
8. To measure the magnetic field along the axis of a circular coil and verify Biot-Savart law.

Instructional Method:

- a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- b. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- c. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- d. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory