Birla Institute of Technology & Science, Pilani
Hyderabad Campus

FIRST SEMESTER 2021 - 2022

Course Handout Part II

Date: 30-9-2021

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : PHY F112
Course Title : General Physics
Instructor-in-charge : P.K.Thiruvikraman

Scope and Objective of the course

The objective of this course is to give a general overview of the fundamentals of basic Physics. The course will broadly cover the following topics: Oscillations, Waves and Optics.

Textbook

- **Fundamentals of Physics** by *Halliday, Resnick & Walker*, John Wiley & Sons, 6th Edition

Reference Books

- **Principles of Physics** (3rd edition), *R.A. Serway and J.W. Jewett*, Thomson Brooks/Cole
- **Sears & Zemansky's University Physics** (11th edition), *H.D. Young and R.A. Freedman*, Pearson Education (LPE).

Course Plan

Lecture Number	Learning objective	Topics to be covered	Chapter in the Text Book
1 - 5	Oscillations	Simple harmonic motion, Damped simple harmonic motion, Forced oscillations and resonance	16
6 - 10	Waves	Speed, Energy and Power of a wave,	17 and 18.7

		Principle of super position, Beats	
11 - 17	Optics – Interference	Wave nature of light, Interference, Young's interference experiment, Coherence, Double slit interference, Michelson's interferometer	36
18 - 23	Diffraction	Diffraction and wave theory of light, Single slit, Double slit diffraction, Grating, Dispersion, Resolving power, X - ray diffraction	37
24 - 28	Polarization	Electromagnetic spectrum, Polarization, Reflection and refraction, Total internal reflection, Polarization by reflection	34.6 - 34.9
29 - 34	Photons and matter waves	Quantum of light, Photo electric effect, Matter waves, Schrödinger wave equation, Heisenberg's uncertainty principle, Particle in a one-dimensional well	39, 40
35 - 42	Atoms, molecules and solids	Electron spin, Angular and magnetic dipole moments, Stern - Gerlach experiment, Magnetic resonance, Pauli exclusion principle, X – rays and the numbering of elements, Lasers, Insulators, Metals, Semiconductors, Electrical properties of solids	41.1 - 41.7, 41.10 42.1 - 42.6

Evaluation Scheme

EC No.	Evaluation component	Duration	Weightage	Date & time	Nature of component
1	Quizzes*	50 min	25 %	To be announced	Open book
2	Mid-semester exam	90 min	35 %	07/12 - 9.00 - 10.30AM	Open book
3	Comprehensive Examination	2 hours	40 %	24/01 FN	Open book

- **Two quizzes will be conducted and the best performance will be considered. There will be no makeup for the quizzes.**

Make-up policy: Make up will be granted ONLY for serious medical emergencies.

Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor-in-charge
PHY F112