

Engineering Physics

Course Code: PHY-109	Credit Hrs: 2-1
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Text and Reference Books:

1. Fundamentals of Physics, 10th edition by Halliday, Resnick, Walker.
2. Physics for Scientists and Engineers, 9th Ed by Serway and Jewet
3. Physics, 7th edition By Halliday, Resnick, Krane.
4. University Physics, 12th Edition by Hugh D.Young, Roger A. Freedman, Lewis Ford

Course Description:

Applied Physics covers fundamental and advanced concepts in physics with practical applications. The course begins with vector analysis, mechanics, and progresses through electrostatics and magnetism, waves and oscillations and modern physics topics like black body radiation and photoelectric effect. Students will engage in real-world problem-solving across various physical phenomena.

Course Objectives:

The main objectives of this course are

- a. Understand and apply the concepts of mechanics
- b. Understand and apply the concepts of electrostatics and magnetostatics
- c. Validate the theoretical concepts through relevant lab experiments

Course Outline:

1. Topics covered in the Course and Level of Coverage

1. Review of vectors, ordinary differentiation of vectors, gradient of scalar field, divergence and curl of vector field with applications	4 hrs
2. Center of gravity, centroid, moment of inertia	2 hrs
3. Simple harmonic oscillator, energy in simple harmonic oscillator, damped harmonic oscillator, forced harmonic oscillator, resonance	4 hrs
4. Types of waves, superposition principle, wave speed on a stretched string, wave equation, energy and power of a wave	6 hrs
5. Electrostatics, Coulomb's law, electric field due to discrete charges	2 hrs
6. Electric field due to continuous charge distribution	2 hrs
7. Electric flux, Gauss' law	2 hrs
8. Magnetic field due to circular current loop and solenoid, magnetic dipole, Ampere's law, Lorentz force, Hall effect	4 hrs
9. Semiconductor physics, energy levels in a semiconductor, hole concept, intrinsic and extrinsic regions, P-N junction, transistors	4 hrs
10. Modern physics, Plank's explanation of black body radiation, photoelectric effect	2 hrs

Assessments:

Quizzes, Assignments, Mid Exam, Final Exam

Practical Work

Experiments related to concepts learned in theory classes will be conducted.