

Global Learning Semesters

Course Syllabus

Course: PHYS-270 General Physics III

Department: Engineering

Host Institution: University of Nicosia, Nicosia, Cyprus



Course Summary		
Course Code	Course Title	Recommended Credit Hours
PHYS-270	General Physics III	4
Semester Offered	Contact Hours	Prerequisites
Please contact us	42-45	PHYS-160
Department	Level of Course	Language of Instruction
Engineering	Lower Division	English

Course Description

Introduction to the basic concepts and principles of Physics in the areas of thermodynamics, waves, and modern Physics.

Prerequisites

PHYS-160

Topic Areas

1. Fluids, density, pressure, Pascal's / Archimedes's principles.
2. Temperature, zeroth law of thermodynamics, Celsius & Fahrenheit scales, thermal expansion.
3. Heat, first law of thermodynamics.
4. Kinetic theory of gases. Ideal gases, pressure and temperature. Translational kinetic energy, molar specific heats. Equipartition of energy.
5. Engines, refrigerators, second Law of thermodynamics. Ideal engine, Carnot cycle, real engines, entropy.
6. Waves, wavelength, frequency, superposition, interference, standing waves, resonance.
7. Sound waves, intensity, Doppler effect.
8. Maxwell's equations, induced magnetic fields.
9. Electromagnetic waves, radiation pressure, polarization.
10. Geometrical optics, reflection, refraction, mirrors.
11. Interference, light as a wave, diffraction, Young's experiment, coherence.
12. Diffraction: single-slit, circular, x-ray.
13. Relativity. Events, time dilation, length contraction, Lorentz transformation, transformation of velocities, Doppler effect, momentum and energy.

Laboratory

Practical experience of the theoretical concepts, exposition to the difference between real physical systems and idealized systems discussed in lecture, acquaintance with basic experimental techniques and methods of handling experimental data. Experiments on waves, heat, ideal gases, lenses, mirrors.

Readings and Resources

Required Textbook

- D. Halliday, R. Resnick and J. Walker, Fundamentals of Physics, Sixth Edition, Wiley, 2001 (ISBN: 0-471-32000-5).

Recommended Reading

- Wolfson R., Pasachoff J., Physics with Modern Physics for Scientists and Engineers, Second Edition, Harber Collins, 1995 (ISBN: 0-06-501016-7).