

NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY

PHY 231 – GENERAL UNIVERSITY PHYSICS I (5 CR.)

Course Description

Teaches principles of classical physics. Includes mechanics, wave phenomena, heat, electricity, magnetism, and optics, with extended coverage of selected topics. Includes recitation as part of the lecture.

Part I of II. Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.

General Course Purpose

The purpose of the course is to provide engineers, mathematicians and scientists with the basic concepts of physics that are required for their full development into competent professionals and informed and informing citizens.

The course is normally taken by aspirants to four-year institutions and generally satisfies the basic requirements of such institutions.

Course Prerequisites/Corequisites

Prerequisites: MTH 263 (old MTH 173) Calculus with Analytic Geometry I or equivalent.

Course Objectives

Upon completing the course, the student will be able to:

- Identify which physics principles and concepts are applicable to a given problem
- Apply and critically analyze their observations and measurements
- Use established scientific methods to organize and interpret experimental data
- Communicate effectively on physics related issues.

Major Topics to be Included

- Motion in 1 Dimension: displacement, velocity, and acceleration, motion with constant and variable acceleration
- Motion in 2 and Higher Dimensions: circular motion, projectile motion
- Forces: Newton's three laws, friction, centripetal force, variable forces
- Energy: work and energy, conservation of energy, power
- Linear Momentum: collisions, impulse, center of mass, motion with variable mass
- Rotational kinematics and dynamics of extended objects
- Statics and Equilibrium: equilibrium of extended objects, elasticity, Hooke's Law, strain and stress, moduli
- Gravitation
- Fluids: hydrostatic pressure, Pascal's principle, buoyancy and Archimedes' force, Bernoulli's principle
- Oscillations: simple harmonic motion, damped and driven oscillations, resonance
- Thermodynamics: temperature, thermal properties of matter, heat and heat transfer, specific and latent heat, ideal gas law, kinetic theory, thermodynamics laws