

ABSTRACT SYLLABUS
CARROLL COMMUNITY COLLEGE
Division of Business, Mathematics and Sciences
Department of Sciences
PHYS 111 - Physics 1 for Scientists and Engineers

COURSE DESCRIPTION:

PHYS-111, Physics 1 for Scientists and Engineers, is the first semester of a three-semester calculus-based physics course intended for physics, physical science, engineering and related science majors. The course will enable the student to solve problems for the major concepts in mechanics and particle dynamics including: measurement, vector concepts, kinematics, dynamics, statics, gravitation, energy, momentum, rotation dynamics, and fluids. The student will interpret and apply the experimental laws and fundamental principles of physics to describe the behavior of the physical world. In the laboratory program, the student will develop the ability to collect, appraise, use, and interpret data in order to express mathematically or explain the physical phenomena observed. Credit will not be given for both PHYS-101 and PHYS-111. Prerequisite: completion of MATH-135 with a minimum "C" grade and concurrent enrollment in MATH-136. Three hours lecture, three hours laboratory each week. Four credits. Four billable hours.

MAJOR COURSE OBJECTIVES:

Upon completion of this course, the student should be able to:

1. Apply the vocabulary and mathematical language associated with the topics covered. (PG-3,4) (GE-1,3)
2. Explain the scientific method and demonstrate experimental and collaborative skills by conducting investigations that require the formulation of hypotheses, collection and analysis/interpretation of data, and presentation of results. (PG-1,3,4) (GE-2,3)
3. Resolve motion problems (including projectile motion) using kinematic relationships involving an object's position, velocity, and acceleration. (PG-1,2,4) (GE-3)
4. Demonstrate an understanding of Newton's Laws by analyzing an object in motion or in equilibrium while under the influence of forces, including gravitational forces and friction. (PG-1,2,4) (GE-3)
5. Understand the concepts of work, energy, momentum and conservation of energy and be able to apply these concepts to the resolution of motion and collision problems. (PG-1,2,4) (GE-3)
6. Resolve circular motion problems for both "earth-bound" objects and for celestial objects using Newton's Law of Universal Gravitation. (PG-1,2,4) (GE-3)
7. Resolve rotational motion and dynamics problems. (PG-1,2,4) (GE-3)
8. Resolve fluid problems using Pascal's, Archimedes' and Bernoulli's principles. (PG-1,2,4) (GE-3)
9. Write a formal laboratory report utilizing proper grammar. (PG-1,3) (GE-1,2,3)