

Course Information Form (CIF)

Course Code: PHY 121 (IAI P1 900L)

Course Title: General Physics I

Department: Natural Sciences

Effective Date: Summer 2026

PCS Code: 1.1 - Baccalaureate/Transfer

CIP Code: 40.0801

Repeatability: 0

Credit Hours

Catalog Notation: 4-3-5

Credit Hour Distribution:

Lecture: 4

Lab: 3

Clinical: 0

Total: 5

General Course Information

Catalog Description

Concepts and methods of physics for students in arts and sciences. Kinematics, dynamics, momentum, energy, heat, fluids, wave motion, and sound.

General Course Objectives

To give the arts and sciences student an appreciation and working knowledge of the fundamentals of the physics of motion. To foster through constant practice, algebraic and trigonometric skills the ability to select relevant facts and use them while ignoring irrelevant information; and the ability, through laboratory exercises, to make measurements relevant to problem solving.

Minimum Placement Levels

English	Reading	Math
None	Placement out of CCS 098	Credit in MAT 124 with a grade of C or higher, or placement

Prerequisites

None

Methods of Evaluation

12-15 quizzes, 3 two-hour exams, 12-15 homework assignments, 12-15 lab activities, final exam.

Instructional Materials and Additional Supplies

Physics Fundamentals, Coletta, current edition.

Course Content

General Learning Outcomes (GLOs)

- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Introduction	1. Identify what a scalar and vector are and how they differ.	2	0	0
Units	1. Convert within and between the MKS and English systems of measurement.	2	0	0
1D Motion	1. Calculate and graph one-dimensional motion of constant velocity and constant acceleration including distance, velocity, and acceleration. 2. Collect and interpret data to generate position vs. time, velocity vs. time, and acceleration vs. time graphs.	4	3	0
2D Motion	1. Apply and solve simultaneous equations while explaining motion in two dimensions. 2. Measure the time a projectile is in the air for several different horizontal velocities and identify the relationship between vertical velocity and time.	4	3	0
Dynamics	1. Identify which of Newton's three laws to apply to a situation in order to solve a problem. 2. Identify an object and all of the forces which act upon it. 3. Identify the different types of forces and the properties of each. 4. Measure force and understand the conditions for equilibrium.	4	3	0
Centripetal Acceleration	1. Identify that an object moving in a circle with constant speed has an acceleration and that the direction of the acceleration points toward the center of the circle. 2. Measure velocity of rotating object, calculate acceleration and force, and identify direction of acceleration and velocity.	2	3	0
Work and Energy	1. Identify when energy is conserved. 2. Identify when a force does no work. 3. Measure different types of energies and identify if energy is conserved.	4	3	0
Momentum and Impulse	1. Calculate total momentum of a system and determine when it is conserved. 2. Measure and calculate the momentum of a system of objects to determine if momentum is conserved during a collision.	4	3	0
Center of Mass	1. Determine the position of the center of mass of a uniform object. 2. Calculate the velocity of the center of mass of a system of objects.	2	0	0
Rotations	1. Demonstrate knowledge of and ability to use radians. 2. Show how to convert from linear to circular motion.	2	0	0
Torque	1. Identify when a force provides torque. 2. Identify and measure torque and set up situation of equilibrium.	2	3	0
Rotational Energy	1. Identify objects with rotational energy.	2	0	0
Angular Momentum	1. Calculate total angular momentum of a system and identify when it is conserved.	2	0	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Simple Harmonic Motion (SHM)	1. Identify if an object is exhibiting simple, harmonic motion. 2. Generate position, velocity, and acceleration graphs of SHM. 3. Identify positions of maximum velocity and acceleration from graphs of SHM.	4	3	0
Density and Pressure	1. Calculate the density of different objects. 2. Discern the difference between force and pressure.	2	0	0
Archimedes Principle	1. Measure the density of different objects. 2. Identify conditions for floating. 3. Measure buoyancy force directly and by weighing displaced fluid.	2	6	0
Bernoulli's Equation	1. Show how Bernoulli's equation implies that fluids at higher speeds will have lower pressure.	2	0	0
Heat	1. Convert between the three temperature scales. 2. Calculate the linear and volumetric expansion of a solid. 3. Measure linear and volumetric expansion of different solids. 4. Calculate the latent heat of vaporization and latent heat of fusion of materials and understand the conditions of equilibrium. 5. Take measurements of temperature at equilibrium in order to calculate latent heat of fusion for water. 6. Identify the different types of heat transfer.	6	6	0
Thermodynamics	1. Use the ideal gas law to calculate an unknown quantity. 2. Identify the laws of thermodynamics. 3. Explain how a heat engine works. 4. Measure pressure and temperature and calculate heat flow.	4	3	0
Waves and Sound	1. Identify the period, wavelength, and amplitude of a wave. 2. Identify the condition for Doppler effect. 3. Measure period, wavelength, amplitude, and speed of different types of waves. 4. Measure properties of sound and Doppler effect. 5. Identify Doppler effect and measure associated velocities. 6. Identify positions of constructive/destructive interference.	4	6	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
60	45	0