

COLLEGEWIDE COURSE OUTLINE OF RECORD

PHYS 101, PHYSICS I

COURSE TITLE: Physics I

COURSE NUMBER: PHYS 101

PREREQUISITES: MATH 121 Geometry-Trigonometry or MATH 137 Trigonometry with Analytic Geometry

SCHOOL: Liberal Arts and Sciences

PROGRAM: Liberal Arts

CREDIT HOURS: 4

CONTACT HOURS: Lecture: 3 Lab: 2

DATE OF LAST REVISION: Fall, 2014

EFFECTIVE DATE OF THIS REVISION: Fall, 2015

CATALOG DESCRIPTION: Introduces the basic concepts of mechanics, including force and torque, linear and rotational motion, work, energy and power, fluids, and the physics of heat. Includes lab.

MAJOR COURSE LEARNING OBJECTIVES: Upon successful completion of this course the student will be expected to:

1. Use and convert physical quantities and measurements in the SI and USCS systems.
2. Correctly define vector and scalar quantities, and compute vector components and resultants, and quantitatively analyze physical systems using the concepts of translational and rotational equilibrium, and kinetic and static friction.
3. Solve problems using the concepts of moment arm, torque, and center of gravity.
4. Solve problems that require an ability to apply Newton's Three Laws of Motion; describe the interaction of force, mass, weight, and acceleration due to gravity; and compute time, distance, average speed, average acceleration, speed, and acceleration for motion with constant acceleration.
5. Perform computations using the physical relationships among work, momentum, energy, power, equivalence of work and energy, and conservation principles.
6. Compute the rotational motion, centripetal force and acceleration, moment of inertia, and rotational energy for rotating physical systems.
7. Solve problems in elasticity and fluid statics, including static pressure and hydraulics.
8. Measure and/or compute temperature and linear expansion.
9. Compute the quantity of heat transferred using the concepts of specific heat capacity, latent heats of fusion and vaporization, and heat of combustion.
10. Compute the quantity of heat transferred using the concepts and mathematics of thermal conductivity, convection, and radiation.
11. Use the gas laws to compute values for volume, temperature, pressure, and amount of a gas.
12. Use laboratory equipment to demonstrate scientific principles.
13. Recognize uncertainties in data.

14. Tabulate and graph data and compute results.
15. Work in teams.
16. Draw reasonable conclusions from quantitative data and communicate results to others.

COURSE CONTENT: Topical area of study include –

Introduction to measurement and units	Kinematics in one and two dimensions
Motion and force	Circular motion and gravity
Work and energy	Impulse and linear momentum
Rotational motion	Bodies in equilibrium
Elasticity	Fluids
Temperature and expansion	Kinetic theory and gas laws
Heat	

Laboratory experiments will be selected from the topics above.

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The Ivy Tech Library is available to students' on- and off-campus, offering full text journals and books and other resources essential for course assignments. Go to <http://www.ivytech.edu/library/> and choose the link for your campus.

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