

# PHYSICS (PHY)

## PHY-101 General Physics I (3 credits)

This calculus-based course is an introduction to the principles of kinematics and dynamics as they apply to both translational and rotational motion. Topics include Newton's laws, forces, friction, gravity, Kepler's laws, dot products and cross products, potential and kinetic energy, and momentum. Considerable attention is paid to the intellectual history that accompanied the emergence of the Newtonian world view.

Corequisite(s): Take MAT-125; Take PHY-101L

## PHY-101L Gen Physics Lab I (1 credits)

This course is a physics laboratory to accompany PHY-101. The course includes experiments in mechanics and oscillatory motion.

## PHY-102 General Physics II (3 credits)

This course is a continuation of PHY-101. The course covers statics, fluids, oscillations, sound and waves, temperature and heat, electricity and magnetism, and geometric optics.

Prerequisite(s): Take PHY-101

Corequisite(s): Take PHY-102L

## PHY-102L Gen Physics Lab II (1 credits)

This physics laboratory accompanies PHY-102. Experiments in wave motion, thermodynamics, electricity, magnetism and optics are performed

## PHY-103 Physics for Engineers (3 credits)

This course is a calculus-based introductory course in physics enriched in material of relevance to computer science, information technology and engineering students, including kinematics, Newtonian mechanics, momentum, energy, rotational motion, statics, materials, fluids and oscillatory motion.

Corequisite(s): Take MAT-125; Take PHY-103L

## PHY-103L Physics for Engineers Lab 1 (1 credits)

This course is a physics laboratory to accompany PHY-103. The course includes experiments in mechanics and oscillatory motion.

Prerequisite(s): Take MAT-125 PHY-103

Corequisite(s): Take MAT-125 PHY-103

## PHY-104 Physics for Engineers II (3 credits)

This course is a continuation of PHY-103 and is a calculus-based introductory course in physics enriched in material of relevance to computer science information technology, and engineering students, including: wave motion, thermodynamics, heat transfer electricity, circuits and circuit components, magnetism, electromagnetic radiation and optics.

Prerequisite(s): Take PHY-103

Corequisite(s): Take MAT-126; Take PHY-104L

## PHY-104L Physics for Engineers II Lab (1 credits)

This physics laboratory accompanies PHY-104. Experiments in wave motion, thermodynamics, electricity, magnetism and optics are performed

Prerequisite(s): Take MAT-125 PHY-103

Corequisite(s): Take PHY-104

## PHY-111 Introduction to Physics (3 credits)

This course is designed for health services/PT majors and for other students who wish to use it to fulfill part of the core requirement in science Liberal Arts and Sciences requirements. The course lecture must be taken prior to, or concurrently with, the corresponding lab. PHY-111 covers kinematics, dynamics, conservation of energy and momentum, and rotational motion. PHY-112 covers statics, fluids, oscillations, sound and waves, temperature and heat, electricity and magnetism, and ray optics.

## PHY-111L Introduction to Physics Lab (1 credits)

This course is a physics laboratory to accompany PHY-111.

## PHY-112 Introduction to Physics (3 credits)

The course lecture must be taken prior to, or concurrently with, the corresponding lab. PHY-111 covers kinematics, dynamics, conservation of energy and momentum, and rotational motion. PHY-112 covers statics, fluids, oscillations, sound and waves, temperature and heat, electricity and magnetism, and ray optics.

## PHY-112L Introduction to Physics Lab (1 credits)

This course is a physics laboratory to accompany PHY-112.

## PHY-142 Introduction to Astronomy (3 credits)

This course is an introductory astronomy course for students from all majors. Students are introduced to the basics of the telescope, light, the seasons and the tides, the moon, the sun, the solar system, stars, galaxies and the search for extraterrestrial intelligence. Experience involving field use of telescopes and other observational tools is incorporated into the course. Astronomy can be used to fulfill part of the Liberal Arts and Sciences requirements or as a free elective.

## PHY-142L Introduction to Astronomy Lab (1 credits)

This laboratory accompanies the introductory astronomy course. The laboratory work supplements the lectures in PHY-142, focusing on the underlying physics of light, optics, wave motion and planetary motion.

## PHY-145 The Process of Scientific Discovery (3 credits)

This is an introductory science course where students will be introduced to the major elements of science and technology including the basic insights of chemistry, physics, biology and geology in the context of the social and historical development of technology. Special attention will be paid to the impact of the sciences on cultural and human endeavors, and on the role of social change and serendipity in the process of scientific discovery. This course could count as a non-major science core course, an IDS science elective or as a free elective for science majors. There are no prerequisite course requirements. Course may be offered with an emphasis on the field of biology (BIO-145), chemistry (CHE-145) or physics (PHY-145).

## PHY-149 Robotics (3 credits)

Prerequisite(s): Take MAT-101

## PHY-151 Physics for Poets (3 credits)

This introductory physics course for non-science majors aims to survey the West's understanding of the physical universe from its origins in Greek thought to the latest discoveries of the 21st century. Since this covers such a vast area of study, the emphasis will be on breadth rather than depth. However, it is hoped that the student will acquire a comprehensive overview and appreciation for the discipline called physics.

**PHY-201 Discoveries in Physics: A Survey of the Development of Greatest Ideas in Physics (3 credits)**

What is time? Why did ten days disappear in 1582?! What is matter? How many times can you cut an apple in half before there's nothing left to cut? Or can you keep cutting forever? What would the world look like if you were very small? Or very big? Or traveling really fast? How do we know the answers to these questions with certainty?! The course will survey Physics from the Copernican Revolution to Quantum Field Theory and present some of the most fascinating discoveries ever made. You will not only learn about these great discoveries and how they changed our view of the universe, but also learn how physicists work through their ideas and how to think like one.

Course Types: Foundational Gen Ed; Natural Sciences; Scientific Reasoning; Themed

**PHY-220 The Physics of Sports (3 credits)**

This course will help us understand sports by applying fundamental ideas from physics. Real-life examples from a wide range of sports will be used to study the dynamic motion of the human body and various pieces of equipment. Why do balls from different sports move differently? Why do curveballs curve? How does sports equipment make sports safer or increase human performance? All those questions will be investigated during the course.

Course Types: Foundational Gen Ed; Natural Sciences; Problem-Solving; Themed; Thinking Process

**PHY-389 Special Topics in Physics (3 credits)**

This course presents an opportunity to study a selected topic in physics. Topics can originate with faculty or students.

**PHY-499 Capstone Experience (1-2 credits)**

Course Types: Capstone