PHYSICS

Chair: William Schreiber, Department of Chemistry and Physics

Physics faculty members offer a curriculum leading to a minor in physics, which may be combined with any major. The minor in physics can be combined with a major in chemistry and education to prepare for the Teacher of Physical Science Certification. A minor in physics also complements the interests of students majoring in mathematics, software engineering, and a variety of other fields. The physics faculty support various undergraduate programs by offering specific courses required in other majors and courses designed to meet the general education natural sciences requirements. They also provide research opportunities for interested students.

Programs

Minor

- Physics (http://catalog.monmouth.edu/undergraduate-catalog/science/physics/physics-minor)

Courses

PH-101  Physics in Our Lives  Credits: 3
Term Offered: Spring Term
Course Type(s): NS
Presents major concepts and methodologies in physics and their importance in today's society. Introduction to principles of physics and their applications to today's technology using lectures and demonstration.

PH-103  The Physics of Sound and Music  Credits: 3
Term Offered: All Terms
Course Type(s): NS
Presents the topics of sound and music from a physics point of view. Covered topics are harmonic motion, waves (both traveling and standing), the human voice and ear, the production of music and musical scales and the physics of several representative instruments.

PH-105  Physics for the Life Sciences I  Credits: 3
Prerequisite(s): MA-101 or MA-109 or MA-115 or higher Math courses passed with grade of C- or higher.
Co-requisite(s): PH-105L
Term Offered: All Terms
Course Type(s): NS
An introduction to classical physics intended primarily for students majoring in the life sciences. Topics include: mechanics, dynamics, heat, electricity, magnetism, and optics.

PH-105L  Physics for the Life Sciences Laboratory I  Credits: 1
Co-requisite(s): PH-105
Term Offered: All Terms
Course Type(s): None
Laboratory work to complement PH-105. Experiments in the fields of statics, dynamics, energy, momentum, heat, sound, electricity, magnetism, optics, and spectroscopy. Three hours per week.

PH-106  Physics for the Life Sciences II  Credits: 3
Prerequisite(s): PH-105 and PH-105L both passed with a grade of C- or higher
Co-requisite(s): PH-106L
Term Offered: All Terms
Course Type(s): NS
An introduction to classical physics intended primarily for students majoring in the life sciences. Topics include, mechanics, dynamics, heat, electricity, magnetism, and optics.

PH-106L  Physics for the Life Sciences Laboratory II  Credits: 1
Co-requisite(s): PH-106
Term Offered: All Terms
Course Type(s): None
Laboratory work to complement PH-106. Experiments in the fields of sound, electricity, magnetism, optics, and spectroscopy. Three hours per week.

PH-150  Principles of Astronomy  Credits: 3
Term Offered: All Terms
Course Type(s): NS
The historical development of astronomy and the modern concepts of the universe, including demonstrations and viewing sessions with optical telescopes.

PH-199  Independent Study in Physics  Credits: 1
Term Offered: Spring Term
Course Type(s): None
Guided study of a selected topic in physics not substantially treated in a regular course, under the direction of a member of the Physics faculty. Prior permission of the directing professor and department chair is required to take this course.

PH-211  General Physics with Calculus I  Credits: 4
Prerequisite(s): MA-125
Co-requisite(s): PH-211L
Term Offered: Fall Term
Course Type(s): NS
The first of a two-semester sequence of courses that, taken together, provide a thorough introduction to classical physics using calculus. Topics covered include: one- and two-dimensional motion, Newton's laws and their applications, energy, momentum and impulse, rotational motion, gravitation, and thermodynamics.

PH-211L  General Physics with Calculus Laboratory I  Credits: 1
Co-requisite(s): PH-211
Term Offered: Fall Term
Course Type(s): None
Laboratory experiments to complement the topics covered in PH-211. Includes experiments in statics, dynamics, and thermodynamics.

PH-212  General Physics with Calculus II  Credits: 4
Prerequisite(s): MA-126, PH-211, and PH-211L all passed with a grade of C- or higher
Co-requisite(s): PH-212L
Term Offered: Spring Term
Course Type(s): NS
The second of a two-semester sequence of courses that, taken together, provide a thorough introduction to classical physics using calculus. Topics covered include: sound and wave mechanics, electrostatics, circuits, magnetic forces and fields, Faraday's Law, reflection and refraction, and optics.
PH-212L  General Physics with Calculus Laboratory II  Credits: 1
Co-requisite(s): PH-212
Term Offered: Spring Term
Course Type(s): None
Laboratory experiments to complement the topics covered in PH-212. Includes experiments in sound, electricity, magnetism, circuits, and optics.

PH-270  Physical Oceanography  Credits: 3
Prerequisite(s): BY-109, CE-111, CE-111L, CE-112, and CE-112L
Term Offered: Fall Term
Course Type(s): MEBP
Physical Oceanography provides a survey of physical, chemical and geological processes that define and affect the coastal ocean including ocean basins, beach formation and dynamic ocean processes (currents, waves, wind, weather). Environmental considerations include the role of the ocean in the association with global climate change issues, problems associated with coastal development, exploitation of marine resources, and ocean and coastal pollution.

PH-298  Special Topics in Physics (200 Level)  Credits: 1-3
Term Offered: All Terms
Course Type(s): None
An intensive study of a particular subject or problem in physics to be announced prior to registration. May be conducted on either a lecture-discussion or a seminar basis. If a prerequisite is required it will be announced in the course schedule.

PH-299  Independent Study in Physics  Credits: 1-3
Term Offered: All Terms
Course Type(s): None
Guided study of a selected topic in physics not substantially treated in a regular course, under the direction of a member of the Physics faculty. Prior permission of the directing professor and department chair is required to take this course.

PH-301  Modern Physics  Credits: 3
Prerequisite(s): PH-302 passed with a grade of C- or higher
Term Offered: All Terms
Course Type(s): None
Topics from physics of the twentieth century, including special relativity, the origins of quantum theory, quantum mechanics, atomic structure, nuclear physics, and elementary particles.

PH-302  Theoretical Physics  Credits: 3
Prerequisite(s): PH-212 passed with a grade of C- or higher
Term Offered: Fall Term
Course Type(s): None
Presents physics topics aimed at the advanced undergraduate level. The subjects range over classical mechanics, electromagnetism, and statistical mechanics, with explicit links made to topics from PH-301. The course is calculus-based, and seeks to round out the physics education of physics minors.

PH-499  Independent Study in Physics (400 Level)  Credits: 1-3
Term Offered: All Terms
Course Type(s): None
Reading and research on a selected topic under the direction of a Physics faculty member. Three hours per week per credit. Prior permission of the directing professor and department chair is required to take this course.