

# PHYS: PHYSICS (UNDERGRADUATE)

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## PHYS 1000 Conceptual Physics (4 Credits)

This course is designed for students without prior exposure to physics. Students will learn about the major themes of physics: mechanics, electricity, thermodynamics, and waves and sound. Emphasis will be on conceptual understanding of fundamental laws of physics, rather than algebraic manipulation of formulas. Students should be able to manipulate simple algebraic expressions. Prerequisites: College Mathematics (MATH 1000) or Algebra (MATH 1040) or equivalent.

**Attributes:** Natural Science Gen Ed, \*Natural Science Gen Ed, Liberal

## PHYS 1100 Introductory Astronomy (4 Credits)

Astronomy is perhaps the most observational of all the physical sciences. Astronomers rarely have the opportunity to directly manipulate the objects they study as they lie so far away from us. This course will introduce students to the universe and the principles used to understand the stars and planets. Course topics include: the history of astronomy, methods of observational astronomy, celestial geometry, age and origin of the Solar System, descriptions of the planets, and discussions of the possibility of life on other planets. Students will use and collect data to study the concepts and design their own final experiment. This course was previously SMT-271434 Introductory Astronomy. Prerequisites: Algebra (MATH 1040) or equivalent.

**Attributes:** Natural Science Gen Ed, \*Natural Science Gen Ed, Liberal

## PHYS 1200 Physics I with Lab (4 Credits)

Physics I with Lab is the first course of the two-term sequence in algebra-based physics. This course serves as an introduction to the basic principles of physics, primarily in the domain of mechanics, the study of the motion of objects. Themes to be explored will include: linear, two-dimensional, and rotational kinematics (motion); linear, two-dimensional, and rotational dynamics (force); models of energy and momentum; gravity; simple harmonic motion; waves and sound; fluids. Students will be performing hands-on experiments in course content areas. This course uses a mandatory hands-on lab kit to provide students an authentic laboratory experience. The kit (in addition to the textbook) will add an additional cost to the Course Materials. See the Learning Contract/Syllabus for specific details. This is an algebra-based physics course. Students taking this course should be comfortable solving algebraic equations. Students who need to strengthen their background in algebra should take Algebra (MATH 1040) before taking this course. This course contains elements which rely on vision and motor skills to complete. If you have a visual or motor impairment and are considering registering for this course, it is recommended that you reach out to Accessibility Resources and Services ([Disability.Services@sunyempire.edu](mailto:Disability.Services@sunyempire.edu)) in advance of registration to determine if this course is appropriate and what alternatives may be available.

**Attributes:** Natural Science Gen Ed, \*Natural Science Gen Ed, Liberal

## PHYS 1201 Physics II with Lab (4 Credits)

Physics II with Lab is the second course of the two-term sequence in general algebra-based physics. This course serves as an introduction to the basic principles of physics, primarily in the domain of electromagnetism, the study of electrical and magnetic systems and phenomena. Additional topics in thermal physics and quantum physics will be explored. Themes to be explored will include: heat and temperature; phases and phase changes; laws of thermodynamics; electric charges, forces, and fields; electric potential; electric current and direct-current circuits; magnetism; electromagnetic waves; geometric optics; physical optics; quantum mechanics; atomic and nuclear physics. Students will be performing hands-on experiments in course content areas. This course uses a mandatory hands-on lab kit to provide students an authentic laboratory experience. The kit (in addition to the textbook) will add an additional cost to the Course Materials. See the Learning Contract/Syllabus for specific details. This is an algebra-based physics course. Students taking this course should be comfortable solving algebraic equations. Students who need to strengthen their background in algebra should take Algebra (MATH 1040) before taking this course. This course contains elements which rely on vision and motor skills to complete. If you have a visual or motor impairment and are considering registering for this course, it is recommended that you reach out to Accessibility Resources and Services ([Disability.Services@sunyempire.edu](mailto:Disability.Services@sunyempire.edu)) in advance of registration to determine if this course is appropriate and what alternatives may be available. Prerequisites: Physics I with Lab (PHYS 1200) or equivalent.

**Attributes:** Natural Science Gen Ed, \*Natural Science Gen Ed, Liberal

## PHYS 1210 Physics I: Lecture (3 Credits)

Physics I is the first course of a two-term sequence in general Physics for science concentrations. This three-credit course covers the lecture and not the laboratory component of the sequence, which is offered as a separate course. Students will explore mechanics, using an algebra-based framework, to study the motion of objects. Topics covered will include linear, two-dimensional, and rotational kinematics (motion); linear, two-dimensional, and rotational dynamics (force); models of energy and momentum; gravity; simple harmonic motion; waves and sound; fluids. Students will be performing hands-on experiments in course content areas. This course uses a mandatory hands-on lab kit to provide students an authentic laboratory experience. The kit (in addition to the textbook) will add an additional cost to the Course Materials. See the Learning Contract/Syllabus for specific details. This is an algebra-based physics course. Students taking this course should be comfortable solving algebraic equations. Students who need to strengthen their background in algebra should take Algebra (MATH 1040) before taking this course.

**Attributes:** Natural Science Gen Ed, \*Natural Science Gen Ed, Liberal

**PHYS 1211 Physics I: Laboratory (1 Credits)**

This is a one-credit laboratory course that supports the Physics I course. Students will learn basic knowledge of the general principles of Physics through laboratory exercises. Students will practice laboratory techniques using laboratory equipment. This course uses a mandatory hands-on lab kit to provide students an authentic laboratory experience. The kit (in addition to the textbook) will add an additional cost to the Course Materials. See the Learning Contract/Syllabus for specific details. This is an algebra-based physics course. Students taking this course should be comfortable solving algebraic equations. Students who need to strengthen their background in algebra should take Algebra (MATH 1040) before taking this course. This course contains elements which rely on vision and motor skills to complete. If you have a visual or motor impairment and are considering registering for this course, it is recommended that you reach out to Accessibility Resources and Services (Disability.Services@sunyempire.edu) in advance of registration to determine if this course is appropriate and what alternatives may be available. Corequisites: Physics I (PHYS 1210) or equivalent.

**Attributes:** Liberal

**PHYS 1212 Physics II: Lecture (3 Credits)**

Physics II is the second course of a two-term sequence in general Physics for science concentrations. This three-credit course covers the lecture and not the laboratory component of the sequence, which is offered as a separate course. Students will explore electromagnetism, thermal physics, and quantum physics using an algebra-based framework. Topics covered will include heat and temperature; phases and phase changes; laws of thermodynamics; electric charges, forces, and fields; electric potential; electric current and direct-current circuits; magnetism; electromagnetic waves; geometric optics; physical optics; quantum physics; atomic and nuclear physics. This is an algebra-based physics course. Students taking this course should be comfortable solving algebraic equations. Students who need to strengthen their background in algebra should take Algebra (MATH 1040) before taking this course. Prerequisites: Physics I (PHYS 1210) or equivalent.

**Attributes:** Natural Science Gen Ed, \*Natural Science Gen Ed, Liberal

**PHYS 1213 Physics II: Laboratory (1 Credits)**

This is a one-credit laboratory course that supports the Physics II course. Students will learn basic knowledge of the general principles of Physics through laboratory exercises. Students will practice laboratory techniques using laboratory equipment. This course uses a mandatory hands-on lab kit to provide students an authentic laboratory experience. The kit (in addition to the textbook) will add an additional cost to the Course Materials. See the Learning Contract/Syllabus for specific details. This is an algebra-based physics course. Students taking this course should be comfortable solving algebraic equations. Students who need to strengthen their background in algebra should take Algebra (MATH 1040) before taking this course. This course contains elements which rely on vision and motor skills to complete. If you have a visual or motor impairment and are considering registering for this course, it is recommended that you reach out to Accessibility Resources and Services (Disability.Services@sunyempire.edu) in advance of registration to determine if this course is appropriate and what alternatives may be available. Prerequisites: Physics I (PHYS 1210) and Physics II (PHYS 1212) or equivalents. Corequisites: Physics II (PHYS 1212) or equivalent.

**Attributes:** Liberal

**PHYS 1998 Individualized Studies in Physics (PHYS) (1-8 Credits)**

Students have the opportunity to develop individualized studies with their mentor in Physics (PHYS). Registration for this class must be approved by the student's mentor.

**PHYS 2998 Individualized Studies in Physics (PHYS) (1-8 Credits)**

Students have the opportunity to develop individualized studies with their mentor in Physics (PHYS). Registration for this class must be approved by the student's mentor.

**PHYS 3998 Individualized Studies in Physics (PHYS) (1-8 Credits)**

Students have the opportunity to develop individualized studies with their mentor in Physics (PHYS). Registration for this class must be approved by the student's mentor.

**PHYS 4998 Individualized Studies in Physics (PHYS) (1-8 Credits)**

Students have the opportunity to develop individualized studies with their mentor in Physics (PHYS). Registration for this class must be approved by the student's mentor.