

PHYSICS

Physics is the scientific study of matter and energy and the interaction between the two. Courses in physics satisfy general education requirements for the associate degree, an associate degree for transfer in physics and lower division transfer.

Faculty

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<http://www.citruscollege.edu/academics/programs/phys>

Learning Outcomes

This discipline prepares students to do the following:

- Use proper vocabulary and notation when describing physics concepts. Communicate these concepts to others both verbally and in written form including verbal, pictorial, graphical, and mathematical.
- Critically analyze scientific information found in print, visual, or online media such as scientific and non-scientific books, journals, articles, web pages, television, and film.
- Apply physics concepts in mathematical form using the appropriate computational skills for the course, including numeric calculation using algebra, graphical analysis, and/or the evaluation of calculus expressions.
- Demonstrate an understanding of the fundamental principles of physics.
- Develop problem-solving, decision-making, and critical thinking skills and apply them to develop an understanding of interactions in the physical world.
- Distinguish between scientific and non-scientific questions and methods and understand science as a process.
- Think logically and coherently about technical/scientific issues in order to understand the complex problems involved in science and

engineering and to gain an appreciation for the global social and political impact of scientific endeavors.

- Use computers for word processing, data analysis, tutorials, simulations, and/or web-based research as appropriate for each course.
- For laboratory courses, demonstrate fundamental aptitudes in the proper use of mechanical, electrical, and/or other appropriate devices.

Courses

PHYS 109

Physics and the Arts

3 Units (AA/AS; CSU)

54 lecture hours

Grade Mode: Standard Letter

Strongly recommended: MATH 030 or MATH 032; ENGL 101.

A one semester course for non-science majors covering fundamental physics principles and their application to the fine and performing arts as well as theater technology situations.

PHYS 110

Physics in Everyday Life

4 Units (AA/AS; Citrus B2; Citrus B3; CSU; UC; IGETC 5A; IGETC 5C;

CSUGE B1; CSUGE B3)

54 lecture hours, 54 lab hours

Grade Mode: Standard Letter

Strongly recommended: MATH 030; ENGL 101.

A general physics course for non-majors that explores fundamental principles of the physical world, including kinematics, Newton's laws of motion, conservation laws, electromagnetism, waves, optics and modern physics. Special emphasis is given to the applicability of these principles to understand today's core science and technology issues and how everyday things work.

PHYS 111

College Physics A

4 Units (AA/AS; Citrus B2; Citrus B3; CSU; UC; IGETC 5A; IGETC 5C;

CSUGE B1; CSUGE B3)

54 lecture hours, 54 lab hours

Grade Mode: Standard Letter

Prerequisite(s): MATH 151 or higher.

Strongly recommended: ENGL 101.

A trigonometry-based physics course including mechanics, energy, matter, properties of materials, wave motion, and thermodynamics. This course is designed for architecture and liberal arts students who require or are interested in a physics course beyond algebra-based physics. This course is the first in a two-course sequence for students planning to enter medicine, dentistry, pharmacy, optometry, forestry, and (4 year) nursing. (Life Science majors who need calculus-based physics must also take PHYS 111C.)

PHYS 111C

Physics for Life Sciences I Calculus Supplement

1 Unit (AA/AS; CSU; UC)

18 lecture hours

Grade Mode: Standard Letter

Prerequisite(s): PHYS 111 and MATH 190.

Either can be taken concurrently. Application of calculus to topics covered in PHYS 111. This course is intended for students who require credit for a calculus-based physics for life science course.

PHYS 112**College Physics B**

4 Units (AA/AS; Citrus B2; Citrus B3; CSU; UC; IGETC 5A; IGETC 5C; CSUGE B1; CSUGE B3)

54 lecture hours, 54 lab hours

Grade Mode: Standard Letter

Prerequisite(s): PHYS 111.

Strongly recommended: ENGL 101.

The second of two trigonometry-based physics courses covering optics, electromagnetism and modern physics with an emphasis on how these concepts apply to biological systems. This course is designed for students planning to enter medicine, dentistry, pharmacy, optometry, forestry, and (4 year) nursing. (For transfer as a calculus-based physics course, students must take PHYS 112C.)

PHYS 112C**Physics for Life Sciences II Calculus Supplement**

1 Unit (AA/AS; CSU; UC)

18 lecture hours

Grade Mode: Standard Letter

Prerequisite(s): PHYS 112 and MATH 191.

Either can be taken concurrently. Application of calculus to topics covered in PHYS 112. The course is intended for students who require credit for a calculus-based physics for life science course.

PHYS 201**Physics A: Mechanics**

5 Units (AA/AS; Citrus B2; Citrus B3; CSU; UC; IGETC 5A; IGETC 5C; CSUGE B1; CSUGE B3)

72 lecture hours, 54 lab hours

Grade Mode: Standard Letter

Prerequisite(s): MATH 190.

Fundamental principles of mechanics, vectors, motion, work, energy, momentum, and rotational motion. Required for all majors in engineering, physics, chemistry, and some geology and mathematics majors.

PHYS 202**Physics B: Thermodynamics and Electromagnetism**

5 Units (AA/AS; Citrus B2; Citrus B3; CSU; UC; IGETC 5A; IGETC 5C; CSUGE B1; CSUGE B3)

72 lecture hours, 54 lab hours

Grade Mode: Standard Letter

Prerequisite(s): PHYS 201 and MATH 191.

Strongly recommended: MATH 210 as a pre- or co-requisite.

Core topics include electrostatics, magnetism, DC and AC circuits, laws of thermodynamics, and the kinetic theory of gases. This course is part of a three-semester sequence and is required of all majors in engineering, physics, chemistry, and some geology and mathematics majors.

PHYS 203**Physics C: Waves, Optics & Modern Physics**

5 Units (AA/AS; Citrus B2; Citrus B3; CSU; UC; IGETC 5A; IGETC 5C; CSUGE B1; CSUGE B3)

72 lecture hours, 54 lab hours

Grade Mode: Standard Letter

Prerequisite(s): PHYS 201 and MATH 191; MATH 191 may be taken concurrently.

Core topics are waves, optics and modern physics. This course is intended for students majoring in physical sciences and engineering and is part of a three-semester course sequence.

PHYS 220A**Introduction to Independent Research in Physics**

1 Unit (AA/AS; CSU)

54 lab hours

Grade Mode: Standard Letter

Prerequisite(s): Instructor approval is required prior to enrollment.

Strongly recommended: PHYS 201; ENGL 101 or ENGL 101H.

An introductory course in research for students interested in physics-related research or projects. This course includes an introduction to research methods, directed reading, or other advanced study beyond the introductory physics level.

PHYS 225**Team-Based Research in Physics I**

1 Unit (AA/AS; CSU)

54 lab hours

Grade Mode: Standard Letter

Prerequisite(s): PHYS 110 or PHYS 201 or concurrent enrollment for either.

Strongly recommended: ENGL 101.

An introductory course in research for students participating in team based, physics-related research or projects. Topics include conducting a literature review, learning to be part of an effective research/design team and selecting feasible research ideas for implementation and outreach.

PHYS 226**Team-Based Research Physics II**

1 Unit (AA/AS; CSU)

54 lab hours

Grade Mode: Standard Letter

Prerequisite(s): PHYS 201 or PHYS 220A or PHYS 225; MATH 151 or MATH 190 or higher.

Strongly recommended: ENGL 101 or ENGL 101H or higher.

A second course in research for students participating in team based, physics-related research or projects. Topics include preparing and presenting a professional-style research proposal and the development of an experimental design to carry out the research.

Programs

Associate Degree

- ADT in Physics (<http://catalog.citruscollege.edu/disciplines/physics/physics-adt>)