Physics

Overview

The Folsom Lake College physics program offers an array of transferable courses that fulfill both major and general education requirements. The physics program consists of a three semester calculus-based physics sequence and a two semester trigonometry-based sequence. These sequences are designed to meet transfer requirements for students in the physical and life sciences, engineering, architecture, and computer information science. A preparatory physics course is also offered.

The PHYS 310 and PHYS 312 classes are meant to give liberal arts students a comprehensive breadth of the field of physics and a hands-on learning experience. Both courses are an excellent way for liberal arts students to gain an appreciation of scientific knowledge and methods.

PHYS 311 is a preparatory class for prospective PHYS 350 and PHYS 411 students who have the required math, but lack physics and problem solving skills needed for success in future physics classes.

Career Options

Calculus-Based Physics
- Architect
- Astronomer
- Chemist
- Computer Scientist
- Engineer
- Geologist
- Meteorologist
- Oceanographer
- Physical Scientist
- Physicist

Trigonometry-Based Physics
- Allied Health
- Life Science Fields
- Pre-Med

Highlights
Modern and well-equipped laboratories
Small class size

Program Maps

Science, Technology, Engineering, and Mathematics Undecided Major (/flc/main/doc/instruction/program-maps/STEM-Undecided-major.pdf)

Physics, A.S.-T Degree (/flc/main/doc/instruction/program-maps/Physics-AST.pdf)


- Dean: Greg McCormac (/about-us/contact-us/faculty-and-staff-directory/greg-mccormac)
- Department Chair: Daniel Hale (/about-us/contact-us/faculty-and-staff-directory/daniel-hale)
- Phone: (916) 608-6615
- Email: mccormg@flc.losrios.edu

Associate Degrees for Transfer

A.S.-T. in Physics

The Associate in Science in Physics for Transfer Degree program provides students with a major that fulfills the general requirements for transfer to the California State University. Students with this degree will receive priority admission with junior status to the California State University system. Students should work closely with their Folsom Lake College counselor to ensure that they are taking the appropriate coursework to prepare for majoring in Physics at the institution they wish to transfer to because major and general education requirements may vary for each CSU and the degree may only transfer to specific institutions.

This program has the following completion requirements:

1. Completion of 60 semester units or 90 quarter units that are eligible for transfer to the California State University, including both of the following:
   A. The Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education – Breadth Requirements.
   B. A minimum of 18 semester units or 27 quarter units in a major or area of emphasis, as determined by the community college district.
2. Obtainment of a minimum grade point average of 2.0.

ADTs also require that students must earn a C or better in all courses required for the major or area of emphasis.

Catalog Date: June 1, 2020

Degree Requirements

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 411</td>
<td>Mechanics of Solids and Fluids</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 421</td>
<td>Electricity and Magnetism</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 431</td>
<td>Heat, Waves, Light and Modern Physics</td>
<td>4</td>
</tr>
<tr>
<td>MATH 400</td>
<td>Calculus I</td>
<td>5</td>
</tr>
<tr>
<td>MATH 401</td>
<td>Calculus II</td>
<td>5</td>
</tr>
<tr>
<td>MATH 402</td>
<td>Calculus III</td>
<td>5</td>
</tr>
<tr>
<td>Total Units</td>
<td></td>
<td>27</td>
</tr>
</tbody>
</table>

The Associate in Science in Physics for Transfer (AS-T) degree may be obtained by completion of 60 transferable, semester units with a minimum 2.0 GPA, including (a) the major or area of emphasis described in the Required Program, and (b) either the Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education-Breadth Requirements.

Student Learning Outcomes

Upon completion of this program, the student will be able to:
- recall fundamental principles and basic definitions from the topics of physics.
- solve conceptual problems from the topics of physics.
- solve calculus, trigonometry and algebra based problems from the topics of physics and clearly communicate steps taken in the solution.
- analyze experimental data from the topics of physics.

Associate Degrees

A.A. in Interdisciplinary Studies: Math and Science

The Interdisciplinary Studies degree is designed for students who wish to obtain a broad knowledge of arts and sciences plus additional coursework in a prescribed "Area of Emphasis". This program is a good choice for students planning on transferring to the California State University or University of California. The student will be able to satisfy general education requirements, plus focus on transferable course work that relates to a specific major and/or individual interest. This degree will have an "Area of Emphasis" in Math and Science. These courses emphasize the natural sciences which examine the physical universe, its life forms and its natural phenomena. Courses in math emphasize the development of mathematical and quantitative reasoning skills beyond the level of intermediate algebra. Students will be able to demonstrate an understanding of the methodologies of science as investigative tools. Students will also examine the influence that the acquisition of scientific knowledge has on the development of the world's civilizations. Possible majors at a four-year institution include, but are not limited to: mathematics, biology, chemistry, and physical science.
It is highly recommended that students consult a counselor to determine the classes within each area that will best prepare them for their intended transfer major.

**Catalog Date:** June 1, 2020

## Degree Requirements

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
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<tbody>
<tr>
<td></td>
<td>A minimum of 18 units from the following:</td>
<td>18</td>
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<tr>
<td></td>
<td>You must select courses from at least three different disciplines and complete courses from both math and science. If a course is cross-listed with another on the list, only one may apply to the degree.</td>
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<tr>
<td>ANTH 300</td>
<td>Biological Anthropology (3)</td>
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<tr>
<td>ANTH 301</td>
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<tr>
<td>ANTH 303</td>
<td>Introduction to Forensic Anthropology (3)</td>
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<tr>
<td>ASTR 300</td>
<td>Introduction to Astronomy (3)</td>
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<td>ASTR 400</td>
<td>Astronomy Laboratory (1)</td>
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<tr>
<td>BIOL 300</td>
<td>The Foundations of Biology (3)</td>
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<tr>
<td>BIOL 301</td>
<td>Biology of Organisms (4)</td>
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<tr>
<td>BIOL 310</td>
<td>General Biology (4)</td>
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<tr>
<td>BIOL 323</td>
<td>Plants and People (4)</td>
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<td>BIOL 350</td>
<td>Environmental Biology (3)</td>
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<td>BIOL 400</td>
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<td>BIOL 410</td>
<td>Principles of Botany (5)</td>
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<td>Introduction to Organic and Biological Chemistry (5)</td>
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<td>Physical Geography: Exploring Earth's Environmental Systems (3)</td>
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<td>GEOG 306</td>
<td>Weather and Climate (3)</td>
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<td>GEOL 300</td>
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<td>Historical Geology (3)</td>
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<td>GEOL 330</td>
<td>Introduction to Oceanography (3)</td>
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<td>GEOL 345</td>
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<td>Introduction to Mathematical Ideas (3)</td>
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<td>MATH 310</td>
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<td>MATH 335</td>
<td>Trigonometry with College Algebra (5)</td>
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<td>MATH 341</td>
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<td>Modern Business Mathematics (4)</td>
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<td>MATH 370</td>
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<td>Introduction to Linear Algebra (3)</td>
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<td>Differential Equations (4)</td>
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<td>Nutrition and Metabolism (3)</td>
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<td>PHYS 310</td>
<td>Conceptual Physics (3)</td>
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<td>PHYS 421</td>
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<td>PHYS 431</td>
<td>Heat, Waves, Light and Modern Physics (4)</td>
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<tr>
<td>PS 302</td>
<td>Introduction to Physical Science (4)</td>
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</table>
Physics (PHYS) Courses

PHYS 310 Conceptual Physics

This course provides a conceptual overview of Newtonian and modern physics for non-science students. The conceptual or non-mathematical approach to physics is tied to the student's personal experience in their everyday life. The student learns to see physics not as a classroom or laboratory activity, but as a part of his or her surroundings. The class is open to all students with no previous physics course.

Upon completion of this course, the student will be able to:

- provide the non-science major with a coherent concept of physical reality by the introduction of the central ideas, principles, and relationships of physics and relating them to everyday experience.
- provide a stimulating intellectual experience which can promote interest and motivation for continued inquiry into science, its methods, and value to modern society.
- bolster scientific understanding using the scientific method, deduction and application to the physical world.

PHYS 311 Basic Physics

This course is a survey course for science, engineering, mathematics, architecture, and computer science majors who have had no previous physics courses and plan to continue with PHYS 350 or 411. The course will develop the math and science background and the problem-solving skills necessary for success in Physics 350 or 411. Material covered will include math review, vectors, and basic mechanics (kinematics, Newton's Laws, and energy).

Upon completion of this course, the student will be able to:

- describe fundamental principles and basic definitions in classical mechanics.
- solve conceptual problems in classical mechanics.
- solve trigonometry and algebra-based problems in classical mechanics and clearly communicate steps taken in the solution.
- solve problems with vector decomposition and recombination.
- lay out the scientific method and its application to physics and physics problems.

PHYS 312 Conceptual Physics Laboratory

This laboratory course provides hands-on observation activities and interpretation of data in a variety of experimental situations. Topics include motion, sound, light, heat, electricity, and magnetism.

Student Learning Outcomes
Upon completion of this course, the student will be able to:

- collect, analyze, and present experimental data.
- tabulate, graph, and interpret various experimental measurements and calculated results.
- apply dimensions and units correctly for various physical quantities.
- use instruments such as a protractor, mass balance, timer, ammeter, and voltmeter.
- write a well organized and complete lab report.

**PHYS 350 General Physics**

Units: 4

Hours: 54 hours LEC; 54 hours LAB

Prerequisite: MATH 335 with a grade of "C" or better; or a high school course in trigonometry with a grade of "C" or better.

Transferable: CSU; UC (UC credit limitation: PHYS 350, 360 and 411, 421, 431 combined: maximum credit, one series)

General Education: AA/AS Area IV; CSU Area B1; CSU Area B3; IGETC Area 5A; IGETC Area 5C

C-ID: C-ID PHYS 105; Part of C-ID PHYS 100S

Catalog Date: June 1, 2020

This is the first course of the trigonometry-based general physics sequence designed for life science majors. Topics will include classical mechanics, fluids, mechanical waves and thermodynamics.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- understand and apply fundamental principles and basic definitions in classical mechanics, fluids, mechanical waves and thermodynamics.
- solve conceptual problems in classical mechanics, fluids, mechanical waves and thermodynamics.
- solve trigonometry and algebra based problems in classical mechanics, fluids, mechanical waves and thermodynamics and clearly communicate steps taken in the solution.
- analyze experimental data in classical mechanics, fluids, mechanical waves and thermodynamics.

**PHYS 360 General Physics**

Units: 4

Hours: 54 hours LEC; 54 hours LAB

Prerequisite: PHYS 350 with a grade of "C" or better

Transferable: CSU; UC (UC credit limitation: PHYS 350, 360 and 411, 421, 431 combined: maximum credit, one series)

General Education: CSU Area B1; CSU Area B3; IGETC Area 5A; IGETC Area 5C

C-ID: C-ID PHYS 110; Part of C-ID PHYS 100S

Catalog Date: June 1, 2020

This is the second course of the trigonometry-based general physics sequence designed for life science majors. Topics will include classical electricity and magnetism, AC and DC circuits, electromagnetism, optics, wave theory and modern physics.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- understand and apply fundamental principles and basic definitions in classical electricity and magnetism, AC and DC circuits, electromagnetism, optics, wave theory and modern physics.
- solve conceptual problems in classical electricity and magnetism, AC and DC circuits, electromagnetism, optics, wave theory and modern physics.
- solve trigonometry and algebra-based problems in classical electricity and magnetism, AC and DC circuits, electromagnetism, optics, wave theory and modern physics and clearly communicate steps taken in the solution.
- analyze experimental data in classical electricity and magnetism, AC and DC circuits, electromagnetism, optics, wave theory and modern physics.

**PHYS 411 Mechanics of Solids and Fluids**

Units: 4

Hours: 54 hours LEC; 54 hours LAB

Prerequisite: MATH 400 with a grade of "C" or better; See Corequisite

Corequisite: MATH 401. May be taken previously with a grade of "C" or better.

Transferable: CSU; UC (UC credit limitation: PHYS 350, 360 and 411, 421, 431 combined: maximum credit, one series)

General Education: AA/AS Area IV; CSU Area B1; CSU Area B3; IGETC Area 5A; IGETC Area 5C

C-ID: C-ID PHYS 205; Part of C-ID PHYS 200S

Catalog Date: June 1, 2020

This is the first course of the calculus-based physics sequence designed for students studying engineering, physics, chemistry, architecture, and computer science. This course offers a detailed examination of topics from the mechanics of particles, rigid bodies and fluids.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- understand and apply fundamental principles and basic definitions from the mechanics of particles, rigid bodies and fluids.
- solve conceptual problems in the mechanics of particles, rigid bodies and fluids.
- solve calculus, trigonometry and algebra-based problems in the mechanics of particles, rigid bodies and fluids and clearly communicate steps taken in the solution.
- analyze experimental data in the mechanics of particles, rigid bodies and fluids.

**PHYS 412 Mechanics of Solids and Fluids: Problem Solving**

Units: 1
This will be a one unit discussion and application class devised to accompany PHYS411. This class will meet one hour a week to specifically work on problems and problem solving methods for Mechanics of Solids and Fluids.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- test the validity of a hypothesis using the scientific method.
- identify the basic physical principles that apply in a particular situation (such as Newton’s laws, energy conservation and momentum conservation).
- define common physics terms and physical laws.

**PHYS 421 Electricity and Magnetism**

Units: 4

Hours: 54 hours LEC; 54 hours LAB

Prerequisite: MATH 401 and PHYS 411 with grades of "C" or better

Transferable: CSU; UC (UC credit limitation: PHYS 350, 360 and 411, 421, 431 combined: maximum credit, one series)

General Education: CSU Area B1; CSU Area B3; IGETC Area 5A; IGETC Area 5C

C-ID: C-ID PHYS 210; Part of C-ID PHYS 200S

Catalog Date: June 1, 2020

This is the second course of the calculus-based physics sequence designed for students studying engineering, physics, chemistry, architecture, and computer science. This course offers a detailed examination of topics from electricity and magnetism.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- understand and apply fundamental principles and basic definitions from electricity and magnetism.
- solve conceptual problems in electricity and magnetism.
- solve calculus, trigonometry- and algebra-based problems in electricity and magnetism and clearly communicate steps taken in the solution.
- analyze experimental data in electricity and magnetism.

**PHYS 422 Electricity and Magnetism: Problem Solving**

Units: 1

Hours: 18 hours LEC

Prerequisite: MATH 401 and PHYS 411 with grades of "C" or better

Corequisite: PHYS 421

Transferable: CSU

Catalog Date: June 1, 2020

This is a discussion and applications class devised to accompany PHYS 421. This class will meet one hour a week to specifically work on problems and problem solving methods for PHYS 421: Electricity and Magnetism.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- apply fundamental principles and basic definitions from electricity and magnetism and solve problems in this area.
- solve conceptual problems in electricity and magnetism.
- solve calculus, trigonometry- and algebra-based problems in electricity and magnetism and clearly communicate steps taken in the solution.

**PHYS 431 Heat, Waves, Light and Modern Physics**

Units: 4

Hours: 54 hours LEC; 54 hours LAB

Prerequisite: MATH 401 and PHYS 411 with grades of "C" or better

Transferable: CSU; UC (UC credit limitation: PHYS 350, 360 and 411, 421, 431 combined: maximum credit, one series)

General Education: CSU Area B1; CSU Area B3; IGETC Area 5A; IGETC Area 5C

C-ID: C-ID PHYS 215; Part of C-ID PHYS 200S

Catalog Date: June 1, 2020

This is the third course of the calculus-based physics sequence designed for students studying engineering, physics, chemistry, architecture, and computer science. This course offers a detailed examination of topics from thermodynamics, waves, optics, and modern physics.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- understand and apply fundamental principles and basic definitions from thermodynamics, waves, optics, and modern physics.
solve conceptual problems in thermodynamics, waves, optics, and modern physics.

solve calculus, trigonometry and algebra-based problems in thermodynamics, waves, optics, and modern physics and clearly communicate steps taken in the solution.

analyze experimental data in thermodynamics, waves, optics, and modern physics.

PHYS 432 Heat, Waves, Light and Modern Physics: Problem Solving

Units: 1
Hours: 18 hours LEC
Prerequisite: MATH 401 and PHYS 411 with grades of "C" or better
Corequisite: PHYS 431
Transferable: CSU
Catalog Date: June 1, 2020

This is a discussion and application class devised to accompany PHYS 431. This class will meet one hour a week to specifically work on problems and problem solving methods for Heat, Waves, Light and Modern Physics.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- understand and apply fundamental principles and basic definitions from thermodynamics, waves, optics, and modern physics.
- solve conceptual problems in thermodynamics, waves, optics, and modern physics.
- solve calculus, trigonometry and algebra-based problems in thermodynamics, waves, optics, and modern physics and clearly communicate steps taken in the solution.

PHYS 495 Independent Studies in Physics

Units: 1 - 3
Hours: 54 - 162 hours LAB
Prerequisite: None.
Transferable: CSU
Catalog Date: June 1, 2020

This course offers a student or a small group of students the opportunity to study areas of physics that go beyond what is normally covered in physics department courses. It is meant to be an extension of a particular topic of a specific physics department course, and so to be eligible, students must have completed a physics course at Folsom Lake College. They must also gain approval from a department faculty member for the topic of study.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- demonstrate an understanding of the fundamental principles and basic definitions in the area of study.
- demonstrate the ability to solve conceptual problems in the area of study.
- demonstrate the ability to solve problems of the appropriate mathematical level in the area of study.

PHYS 499 Experimental Offering in Physics

Units: 0.5 - 4
Prerequisite: None.
Transferable: CSU
Catalog Date: June 1, 2020

Faculty

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Email: eitened@flc.losrios.edu
Phone: (916) 608-6574
Web: Dr. Daria Eiteneer-Harmon's Profile Page (/about-us/contact-us/faculty-and-staff-directory/dr-daria-eiteneer-harmon)

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David Ring
Adjunct Professor
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Web: David Ring's Profile Page (/about-us/contact-us/faculty-and-staff-directory/david-ring)

Science, Technology, Engineering, and Mathematics
This program is part of the Science, Technology, Engineering, and Mathematics meta-major.

LEARN MORE ➤ (/ACADEMICS/META-MAJORS)