

# Physics

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For Physical Education, see Kinesiology

## Physics

### Program Description

The focus of this program is on developing an understanding of and appreciation for the basic laws of our physical universe. This is done largely through the development of conceptual understanding, problem solving skills, and laboratory investigations.

### Associate in Science Degree

The Associate in Science Degree can be obtained by completing a total of 60 units, including the 35 - 39-unit major listed below, the general education requirements, and electives. All courses for this major must be completed with a grade of C or better or a P if the course is taken on a Pass/No Pass basis.

### Program Outcomes

Students who complete the Physics Associate Degree will be able to:

1. Demonstrate analytical and problem solving skills.
2. Carry out experiments and critically assess their data.
3. Learn the roles of hypotheses, measurement and analysis in the development of scientific theory as evidenced by laboratory reports.
4. Write a laboratory report or give an oral presentation.

### REQUIRED COURSES . . . . . Units

PHYS 006 Physics for Science and Engineering. . . . .	5
PHYS 007 Physics for Science and Engineering. . . . .	5
PHYS 008 Physics for Science and Engineering. . . . .	5
MATH 020 Analytic Geometry and Calculus I . . . . .	5
MATH 021 Analytic Geometry and Calculus II. . . . .	5
MATH 023 Differential Equations . . . . .	4

### Biological Science

Course selected from the following list. . . . . 3 - 5

Biological Science:

BIO 002, 003, 005, 006, 012, 014, 015, 016, 018

### Physical Science

Course selected from the following list. . . . . 3-5

Physical Science:

ASTR 010, 020, 030, 040

CHEM 001, 002, 003, 004, 010, 011

GEOG 001, 001L

GEOL 001, 002, 005

PHSC 012

**Total Units . . . . . 35 - 39**

# Physics

## Associate in Science in Physics for Transfer (ADT: A.S.-T)

### Program Description

The focus of this program is on developing an understanding of and appreciation for the basic laws of our physical universe. This is done largely through the development of conceptual understanding, problem solving skills, and laboratory investigations. The Physics 006,007,008 sequence is a three-semester offering in introductory physics requiring math through calculus. This sequence satisfies the lower division physics requirement for majors in physics, chemistry, geology or other physical sciences, and engineering. Physics 006 is a study of mechanics, gravitation, vibration and fluids. In Physics 007, students will cover the topics of electricity, magnetism, wave motion, and sound. In Physics 008, students will cover heat, optics, relativity, and modern physics. Students will learn to analyze and solve problems appropriate for this level. Experiments relating to the topics covered will be performed.

### Associate in Science in Physics for Transfer

The Associate in Science in Physics for Transfer, which aligns with the physics TMC, will prepare students for a baccalaureate degree in physics. It consists of the courses necessary for beginning physics students to be able to succeed in the upper division physics courses that they will encounter in the CSU system, or any institution (such as the UC system) that grants an undergraduate physics degree. This preparation for success will be achieved through students mastering the student learning outcomes for individual courses, as well as the outcomes for the overall program.

### To earn the Associate in Science in Physics for Transfer degree, students must:

- (1) Complete 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) Obtain 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. A “P” (Pass) grade is not an acceptable grade for courses in the major.

### Program Outcomes

Students who complete an Associate in Science in Physics degree for transfer will be able to:

1. Demonstrate analytical and problem-solving skills.
2. Carry out experiments and critically assessing the obtained data.
3. Learn the roles of hypotheses, measurement and analysis in the development of scientific theory, as evidenced by laboratory reports.
4. Write a lab report or give an oral presentation

REQUIRED COURSES	Units
PHYS 006 Physics for Science and Engineering	5
PHYS 007 Physics for Science and Engineering	5
PHYS 008 Physics for Science and Engineering	5
MATH 020 Analytic Geometry and Calculus I	5
MATH 021 Analytic Geometry and Calculus II	5
MATH 022 Analytic Geometry and Calculus III	4

Required Major Total Units	29
CSU General Education or IGETC Pattern Units	37 - 39
CSU Transferable Electives	
(as needed to reach 60 transferable units)*	1
<b>Total Degree Units</b>	<b>60</b>

\* 7 units may be double counted toward both the major area of emphasis and CSU General Education or IGETC Pattern. Consult with a counselor for more information on completing this degree.

# Physics

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**PHYS 002** **5.0 Units**  
**General Physics (Non-Calculus)**

*Prerequisite:* A minimum grade of C in either MATH 051 or MATH 004. *Course Advisory:* Eligibility for English 001. PHYS 002 & 004, a two-semester sequence in introductory physics using math through trigonometry, is recommended for teachers, technicians, pre-dentistry, pre-medical, and biology majors, and others who need a general physics course. It covers the study of motion, energy, momentum, gravitation, solids, fluids, thermodynamics and the gaseous state, vibration, wave motion, and sound. Experiments relating to the topics covered will be performed and students will analyze the experiments. Field trip may be required. C-ID PHYS 105. *Four hours lecture, three hours lab.*

**PHYS 004** **5.0 Units**  
**General Physics (Non-Calculus)**

*Prerequisite:* PHYS 002 with a minimum grade of C. *Course Advisory:* Eligibility for English 001. PHYS 002 & 004, a two-semester sequence in introductory physics using math through trigonometry, is recommended for teachers, technicians, pre-dentistry, pre-medical, and biology majors, and others who need a general physics course. It is a study of electricity, magnetism, light and optics, and modern physics. Students learn to analyze and solve problems appropriate for this level in these topics. Experiments relating to the topics covered will be performed and students will analyze the experiments. Field trip may be required. C-ID PHYS 110. *Four hours lecture, three hours lab.*

**PHYS 006** **5.0 Units**  
**Physics For Science And Engineering**

*Prerequisite:* MATH 021 with a minimum grade of C (may be taken concurrently). *Course Advisory:* Eligibility for English 001 and High School Physics, or PHYS 002 with a minimum grade of C. The Physics 006, 007, 008 sequence is a three-semester offering in introductory physics requiring math through calculus. This sequence satisfies the lower division physics requirement for majors in physics, chemistry, geology or other physical sciences, and engineering. This course is a study of mechanics, gravitation, vibration and fluids. Students will learn to analyze and solve problems appropriate for this level in these topics. Experiments relating to the topics covered will be performed. C-ID PHYS 205. *Four hours lecture, three hours lab.*

**PHYS 007** **5.0 Units**  
**Physics for Science and Engineering**

*Prerequisite:* A minimum grade of C in both PHYS 006 and MATH 021. *Course Advisory:* Eligibility for English 001. The PHYS 006, 007, 008 sequence is a three-semester offering in introductory physics requiring math through calculus. This sequence satisfies the lower division physics requirement for majors in physics, chemistry, geology or other physical sciences, and engineering. This course is a continuation of PHYS 006, covering the topics of electricity, magnetism, wave motion, and sound. Students will learn to analyze and solve problems appropriate for this level in these topics. Experiments relating to the topics covered will be performed. C-ID PHYS 210. *Four hours lecture, three hours lab.*

**PHYS 008** **5.0 Units**  
**Physics For Science And Engineering**

*Prerequisite:* A minimum grade of C in both PHYS 006 and MATH 021. *Course Advisory:* Eligibility for English 001. The Physics 006, 007, 008 sequence is a three-semester offering in introductory physics requiring math through calculus. This sequence satisfies the lower division physics requirement for majors in physics, chemistry, geology or other physical sciences, and engineering. A continuation of PHYS 006 and PHYS 007, covering heat, optics, relativity, and modern physics. Students will learn to analyze and solve problems appropriate for this level in these topics. Experiments relating to the topics covered will be performed and students will analyze the experiments. Field trip may be required. C-ID PHYS 215. *Four hours lecture, three hours lab.*

**PHYS 010** **3.0 Units**  
**Descriptive Physics**

*Course Advisory:* SCC minimum English standard; MATH 330 or MATH 330B. An introductory physics course for both the non-science and the beginning science student. Includes topics such as nuclear physics, relativity, mechanics, properties of matter, quantum physics, heat, light, electricity, and magnetism. Written assignments, tests, and a comprehensive final exam will be used to evaluate student success. Field trip may be required. *Three hours lecture.*