Physics for Transfer (AS-T)

CAREER PATHS:

Physics Teacher
Physicist
Nanosystems Engineer
Atmospheric, Earth, Marine, or Space Scientist

Additional Career Paths and related data, including state-by-state wage info and growth in the field, can be found at www.onetonline.org.

This program map represents one possible pathway. See a counselor to create a customized education plan. Map is for the 2019-2020 catalog year.

SOLANO COMMUNITY COLLEGE

Physics

Associate in Sciences for Transfer
GE Pattern: IGETC
Program Total Units: 62

For more information please contact: (707) 864-7211

1 FIRST SEMESTER

Total Recommended Units: 16

- **MATH 020** 5 units — Analytic Geometry and Calculus 1 (IGETC 2)
- **ENGL 001** 4 units — English Composition (IGETC 1A)
- **LR 010** 1 units — Introduction to Library Research and Information Competency
- **IGETC 4** 3 units
- [illegible]

2 SECOND SEMESTER

Total Recommended Units: 17

- **MATH 021** 5 units — Analytic Geometry and Calculus II
- **PHYS 006 (L)** 5 units — Physics for Science and Engineering (IGETC 5A)
- **IGETC 1B** 4 units — Suggested: ENGL 002 or 004
- **IGETC 3B/Am Inst Grp 2** 3 units — Suggested: HIST 017 or 018 or 028 or 029 or 037

3 THIRD SEMESTER

Total Recommended Units: 15

- **MATH 02[illegible]** 4 units — Analytic Geometry and Calculus II
- **PHYS 007** 5 units — Physics for Science and Engineering
- **IGETC 1C** 3 units — Suggested: COMM 001
- **IGETC 4** 3 units — Suggested: COMM 012 or COUN 015 or PSYC 007

4 FOURTH SEMESTER

Total Recommended Units: 14

- **PHYS 008** 5 units — Physics for Science and Engineering
- **IGETC 5B** 3 units — Without Lab
- **IGETC 3A or 3B** 3 units
- **IGETC 4/Am Inst Grp 1** 3 units — Suggested: PLSC 001 or 005

Required Courses/Courses in Discipline GE Courses/Categories

GET STARTED NOW!

Get started on your Pathway now with these recommended courses! *Then* –See a counselor to create a **CUSTOMIZED** education plan personalized to your career and transfer goals!

Required courses may change depending on a student's career and transfer goals, including requirements for cross-cultural and foreign language courses, and/or specific requirements for an individual CSU or UC.

Unique transfer requirements for a specific institution can be found at **www.assist.org.**

LET US HELP YOU!

How to Apply: solano.edu/ar/apply.php

- **Questions? Talk to a Counselor Now!**
  Main Campus, Fairfield: (707) 864-7101
  Vacaville Center: (707) 863-7836
  Vallejo Center: (707) 642-8188
  Travis AFB: (707) 863-7878
  Visit online at solano.edu/counseling
- **Contact Our Career Center to Learn Your Career Options!**
  Call 707-864-7124, or email at CareerCenter@solano.edu
  Visit online at solano.edu/career
- **You Can Afford College! Learn more about Financial Aid!**
  Call 707-864-7103, or email at FinancialAid@solano.edu
  Visit online at solano.edu/financial_aid
- **College is Accessible!** Contact our Disability Services Program (DSP) at 707-864-7136.

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.

To earn the Associate in Science in Physics for Transfer degree, students must:
1. Complete 60 semester 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.

Program Outcomes
Students who complete the Associate in Science in Physics for Transfer degree will be able to:
1. Demonstrate analytical and/or conceptual problem solving skills related to the study of Physics.
2. Carry out experiments and critically assess data. Students will learn the role of hypothesis, measurement, and analysis in the development of scientific theory, as evidenced by laboratory reports.
3. Write a professional scientific laboratory report.

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**
Total Degree Units	**60**

** 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

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 the 35-39-unit major, general education requirements, and electives. All courses for this major must be completed with a minimum grade of C 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/or conceptual problem solving skills related to the study of Physics.
2. Carry out experiments and critically assess data. Students will learn the role of hypothesis, measurement, and analysis in the development of scientific theory, as evidenced by laboratory reports.
3. Write a professional scientific laboratory report.

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
One course from Biological Science	3-5
One course from Physical Science	3-5
Required Major Total Units	**35-39**

Biological Science (select one course)	**Units**
BIO 002 Principles of Cell and Molecular Biology	5
BIO 003 Evolution, Ecology & Biodiversity	5
BIO 005 Human Physiology	5
BIO 012 Environmental Science	3
BIO 014 Principles of Microbiology	4
BIO 015 Introduction to Biology	4
BIO 016 Introduction to Human Biology	3
BIO 018 Biology of Sex	3

Physical Science (select one course)	**Units**
ASTR 010 General Astronomy	3
ASTR 020 Astronomy Laboratory	1
ASTR 030 The Solar System	3
ASTR 040 Stars, Galaxies, and Cosmology	3
CHEM 001 General Chemistry I	5
CHEM 002 General Chemistry II	5
CHEM 003 Organic Chemistry I	5
CHEM 004 Organic Chemistry II	5
CHEM 010 Intermediate Chemistry	4
CHEM 011 Basic Organic Chemistry and Biochemistry	4
GEOG 001 Physical Geography	3
GEOG 001L Physical Geography Laboratory	1
GEOL 001 Physical Geology	3
GEOL 002 Geology Laboratory	1
GEOL 005 Geology of California	3
PHSC 012 Introduction to the Principles of Physical Science	4

CSU General Education or IGETC Pattern units	**37-39**
Transferable Electives (as needed to reach 60 units)	**0**
Total Degree Units CSU GE or IGETC	**62-69**

Solano General Education	**21**
Electives (as needed to reach 60 units)	**0-4**
Total Degree Units Solano GE	**60**

**9-10 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

PHYS 002 General Physics (Non-Calculus) 5.0 Units
Prerequisite: A minimum grade of C in either MATH 004 or MATH 051
General Education: Option A: Area A; Option B: Area 5A, 5C
Transferable to UC/CSU
Hours: 64-72 lecture, 48-54 lab
First in a two-semester sequence with PHYS 004 in introductory physics using math through trigonometry. Recommended for teachers, technicians, pre-dentistry, pre-medical, and biology majors, and others who need a general physics course. The course 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)*

PHYS 004 General Physics (Non-Calculus) 5.0 Units
Prerequisite: PHYS 002 with a minimum grade of C
General Education: Option A: Area A; Option B: Area 5A, 5C; Option C: Area B1, B3
Transferable to UC/CSU
Hours: 64-72 lecture, 48-54 lab
Second in a two-semester sequence with PHYS 002 in introductory physics using math through trigonometry. Recommended for teachers, technicians, pre-dentistry, pre-medical, and biology majors, and others who need a general physics course. The course 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)*

PHYS 006 Physics for Science and Engineering 5.0 Units
Prerequisite: MATH 021 with a minimum grade of C (may enroll concurrently)
Course Advisory: PHYS 002 with a minimum grade of C or high school physics
General Education: Option A: Area A; Option B: Area 5A, 5C; Option C: Area B1, B3
Transferable to UC/CSU
Hours: 64-72 lecture, 48-54 lab
First in a three-semester sequence with PHYS 007 and PHYS 008 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 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)*

PHYS 007 5.0 Units
Physics for Science and Engineering
Prerequisite: A minimum grade of C in both PHYS 006 and MATH 021
General Education: Option A: Area A; Option B: Area 5A, 5C; Option C: Area B1, B3
Transferable to UC/CSU
Hours: 64-72 lecture, 48-54 lab
Second in a three-semester sequence with PHYS 006 and PHYS 008 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 continued covering of topics including 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)*

PHYS 008 5.0 Units
Physics for Science and Engineering
Prerequisite: A minimum grade of C in both PHYS 006 and MATH 021.
General Education: Option A: Area A; Option B: Area 5A, 5C; Option C: Area B1, B3
Transferable to UC/CSU
Hours: 64-72 lecture, 48-54 lab
Third in a three-semester sequence with PHYS 006 and PHYS 007 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 continued covering of 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)*

PHYS 010 Descriptive Physics 3.0 Units
Course Advisory: MATH 330 or MATH 330B
General Education: Option A: Area A; Option B: Area 5A; Option C: Area B1
Transferable to UC/CSU
Hours: 48-54 lecture
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, sound and waves. Written assignments, tests, and a comprehensive final exam will be used to evaluate student success. Field trip may be required.

C-ID Designation may change periodically visit c-id.net/courses/search for current designation or consult with your counselor