PHYSICS

Physics is the foundation discipline that must be incorporated into the education of anyone preparing for a career in engineering or science. It is equally true for the non-scientist having the responsibility to make meaningful decisions in society—the citizen in politics, the business person, or social scientist who deals with problems of a society strongly linked to technology based on the application of physical principles. A truly educated person preparing for life in the 21st century can hardly afford not to be aware of the statements of contemporary physics.

There is a three-semester, calculus-based sequence for the student in Engineering, Physics, and other physical sciences.

For the Biological Sciences student, both a two-semester trigonometry-level Physics sequence and a two-semester calculus-level Physics sequence are offered.

Introductory Physics For Science Majors satisfies the needs of those requiring an introduction to physics prior to entering the Engineering/ Physics sequence.

For those fulfilling a General Education science requirement, a one-semester general survey Physics course is offered.

To satisfy the needs of the Liberal Studies major, the Physics Department offers a non-mathematical one- semester Physical Science course which covers the physical basis of a number of disciplines— Physics, Chemistry, Astronomy, Geology and Meteorology.

Programs of Study

Associate Degree for Transfer

- Physics, Associate in Science for Transfer (AS-T) (https://catalog.sbcc.edu/academic-departments/physics/physics-ast/)

Associate Degree

- Physics, Associate of Arts or Science (AA/AS) (https://catalog.sbcc.edu/academic-departments/physics/physics-aa/)

Credit Courses

Physical Science (PHSC)

PHSC 103 The Physical Universe (4 Units)
Skills Advisories: Eligibility for ENG 98 and proficiency in MATH 1 or MATH 41.
Hours: 108 (54 lecture, 54 lab)
Conceptual non-mathematical introduction to the physical sciences. Topics of current interest from astronomy, physics, chemistry, geology, weather and the environment. Practical illustrations taken from art, music, sports, the home. Recommended for all non-science majors. Satisfies General Education laboratory science requirement.
SBCC General Education: SBCCGE Area A
Transfer Information: Cal-GETC Area 5A, Cal-GETC Area 5C, CSUGE Area B1, CSUGE Area B3, IGETC Area 5A, IGETC Area 5C, SBCCGE Area 5, CSU Transferable, UC Transferable
UC Transfer Limit: No credit for PHSC 103 if taken after a college level course in astronomy, chemistry, geology, or physics.

PHSC 107 Nanoscience in Society (4 Units)
Skills Advisories: Eligibility for ENG 110 or ENG 110H and proficiency in MATH 95.
Hours: 108 (54 lecture, 54 lab)
Interdisciplinary physical sciences course that uses the fundamental principles of science to examine nanoscience, nanotechnology, and the societal impact of these emerging technologies on our lives and environment. Topics of interest include development and global sustainability, nanotechnology and personal responsibility, developing a green future, the pros and cons of emerging nanotechnologies, and energy.
SBCC General Education: SBCCGE Area A
Transfer Information: Cal-GETC Area 5A, Cal-GETC Area 5C, CSUGE Area B1, CSUGE Area B3, IGETC Area 5A, IGETC Area 5C, SBCCGE Area 5, CSU Transferable, UC Transferable

Physics (PHYS)

PHYS 101 Conceptual Physics (3 Units)
Skills Advisories: Eligibility for ENG 098 and proficiency in MATH 001 or MATH 041.
Hours: 54 (54 lecture)
Concept-oriented non-mathematical course in general physics. Topics include motion, heat, sound, light, electricity and modern physics. Special emphasis on everyday experience, with practical illustrations taken from art, music, sports, the home.
SBCC General Education: SBCCGE Area A Lecture
Transfer Information: Cal-GETC Area 5A, CSUGE Area B1, IGETC Area 5A, SBCCGE Area 5, CSU Transferable, UC Transferable
UC Transfer Limit: PHYS 101, 101L and 102 combined: maximum credit, 4 units; no credit for PHYS 101 or 102 if taken after 105.

PHYS 101L Conceptual Physics Laboratory (1 Unit)
Corequisites: PHYS 101.
Skills Advisories: Eligibility for ENG 98 and proficiency in MATH 1 or MATH 41.
Hours: 54 (54 lab)
Concept-oriented laboratory in general physics. Topics include motion, heat, sound, light, electricity and modern physics. Special emphasis on everyday experience, with practical illustrations taken from art, music, sports, the home.
SBCC General Education: SBCCGE Area A Lab
Transfer Information: Cal-GETC Area 5C, CSUGE Area B3, IGETC Area 5C, CSU Transferable, UC Transferable
UC Transfer Limit: PHYS 101, 101L and 102 combined: maximum credit, 4 units.

PHYS 102 Introductory Physics For Science Majors (4 Units)
Skills Advisories: Eligibility for ENG 110 or ENG 110H and proficiency in MATH 104 or MATH 107 or MATH 111.
Hours: 108 (54 lecture, 54 lab)
Introductory course, with quantitative applications and problem-solving introduced where appropriate, for students majoring in the physical sciences. Topics include the meaning of physical law, vectors, Newton's Laws of Motion (classical physics), work and energy, waves, electricity, magnetism, light, atomic and nuclear physics.
SBCC General Education: SBCCGE Area A
Transfer Information: Cal-GETC Area 5A, Cal-GETC Area 5C, CSUGE Area B1, CSUGE Area B3, IGETC Area 5A, IGETC Area 5C, SBCCGE Area 5, CSU Transferable, UC Transferable
UC Transfer Limit: PHYS 101, 101L and 102 combined: maximum credit, 4 units; no credit for PHYS 101 or 102 if taken after 105.

PHYS 105 General Physics (4 Units)
Prerequisites: Math 137 or equivalent based on SBCC's Assessment Center placement via multiple measures.
Hours: 108 (54 lecture, 54 lab)
Newton's Laws of Motion, statics and dynamics of particles and rigid bodies, work and energy, rotational motion, fluid statics and dynamics, temperature and heat, thermodynamics, wave motion and sound.
SBCC General Education: SBCCGE Area A
Transfer Information: Cal-GETC Area 5A, Cal-GETC Area 5C, CSUGE Area B1, CSUGE Area B3, IGETC Area 5A, IGETC Area 5C, SBCCGE Area 5, CSU Transferable, UC Transferable
UC Transfer Limit: PHYS 105 and 106 or PHYS 110 and 111 or 121, 122 and 123 combined: maximum credit, one series.
C-ID: C-ID PHYS 105 or C-ID PHYS 100S (with SBCC's PHYS 106).

PHYS 105D Physics Discussion I (1 Unit)
Corequisites: PHYS 105 or PHYS 110.
Hours: 54 (54 lab)
Concurrent Discussion session designed to accompany PHYS 105 or PHYS 110. This course will allow for extra practice and group discussion of the course topics, and also cover more in-depth problem solving techniques and applying the concepts to real world scenarios. Topics include Newton's Laws of Motion, statics and dynamics of particles and rigid bodies, work and energy, rotational motion, fluid statics and dynamics, temperature and heat, thermodynamics, wave motion and sound.
Transfer Information: CSU Transferable, UC Transferable

PHYS 106 General Physics (4 Units)
Prerequisites: MATH 137 or equivalent based on SBCC's Assessment Center placement via multiple measures.
Hours: 108 (54 lecture, 54 lab)
, PHYS 105. Electricity, magnetism, circuits, optics, relativity, atomic and nuclear physics.
SBCC General Education: SBCCGE Area A
Transfer Information: Cal-GETC Area 5A, Cal-GETC Area 5C, CSUGE Area B1, CSUGE Area B3, IGETC Area 5A, IGETC Area 5C, SBCCGE Area 5, CSU Transferable, UC Transferable
UC Transfer Limit: PHYS 105 and 106 or PHYS 110 and 111 or 121, 122 and 123 combined: maximum credit, one series.
C-ID: C-ID PHYS 110 or C-ID PHYS 100S (with SBCC's PHYS 105).

PHYS 106D Physics Discussion II (1 Unit)
Corequisites: PHYS 106 or PHYS 111.
Hours: 54 (54 lab)
Concurrent Discussion session designed to accompany PHYS 106 or PHYS 111. This course will allow for extra practice and group discussion of the course topics, and also cover more in-depth problem solving techniques and applying the concepts to real world scenarios. Topics include electricity, magnetism, circuits, optics, relativity, atomic and nuclear physics.
Transfer Information: CSU Transferable, UC Transferable

PHYS 110 Introductory Physics (4 Units)
Prerequisites: MATH 130 or MATH 150.
Skills Advisories: Eligibility for ENG 110 or ENG 110H.
Hours: 108 (54 lecture, 54 lab)
Newton's Laws of Motion, statics and dynamics of particles and rigid bodies, work and energy, rotational motion, fluid statics and dynamics, temperature and heat, thermodynamics, wave motion and sound. (Appropriate for Life Science majors requiring calculus-level physics).
SBCC General Education: SBCCGE Area A
Transfer Information: Cal-GETC Area 5A, Cal-GETC Area 5C, CSUGE Area B1, CSUGE Area B3, IGETC Area 5A, IGETC Area 5C, SBCCGE Area 5, CSU Transferable, UC Transferable
UC Transfer Limit: PHYS 105 and 106 or PHYS 110 and 111 or 121, 122 and 123 combined: maximum credit, one series.
C-ID: PHYS 105.

PHYS 111 Introductory Physics (4 Units)
Prerequisites: PHYS 110 and MATH 130 or MATH 150.
Hours: 108 (54 lecture, 54 lab)
Electricity, magnetism, circuits, optics, relativity, atomic and nuclear physics. Appropriate for Life Science majors requiring calculus-level physics.
SBCC General Education: SBCCGE Area A
Transfer Information: Cal-GETC Area 5A, Cal-GETC Area 5C, CSUGE Area B1, CSUGE Area B3, IGETC Area 5A, IGETC Area 5C, SBCCGE Area 5, CSU Transferable, UC Transferable
UC Transfer Limit: PHYS 105 and 106 or PHYS 110 and 111 or 121, 122 and 123 combined: maximum credit, one series.
C-ID: PHYS 110.

PHYS 121 Mechanics Of Solids And Fluids (5 Units)
Prerequisites: PHYS 102 or trigonometry based High School Physics and Math 150.
Hours: 126 (72 lecture, 54 lab)
For Engineering and Physical Science students. Statics and dynamics of particles and rigid bodies, Newton's Laws of Motion, conservation principles, rotational motion, simple harmonic motion, wave motion and sound, and introduction to hydrostatics and hydrodynamics.
SBCC General Education: SBCCGE Area A
Transfer Information: Cal-GETC Area 5A, Cal-GETC Area 5C, CSUGE Area B1, CSUGE Area B3, IGETC Area 5A, IGETC Area 5C, SBCCGE Area 5, CSU Transferable, UC Transferable
UC Transfer Limit: PHYS 105 and 106 or PHYS 110 and 111 or 121, 122 and 123 combined: maximum credit, one series.
C-ID: PHYS 200S, PHYS 205.

PHYS 121W Workshop for Physics 121 (1 Unit)
Corequisites: PHYS 121 (concurrent).
Hours: 54 (54 lab)
"Excellence in Mathematics, Science and Engineering" (EMSE) supplementary problem-solving workshop designed for PHYS 121.

PHYS 122 Electricity and Magnetism (5 Units)
Prerequisites: PHYS 121 and MATH 160.
Skills Advisories: Eligibility for ENG 110 or ENG 110H.
Hours: 126 (72 lecture, 54 lab)
For Engineering and Physical Science students. Electrostatics, Coulomb's Law, Gauss' Law, capacitors and dielectrics, DC circuits, Ohm's Law, magnetism, and electromagnetism, Ampere's Law, Faraday's Law, alternating current theory, electrical oscillators, electromagnetic radiation and electromagnetic waves.
Transfer Information: Cal-GETC Area 5A, Cal-GETC Area 5C, CSUGE Area B1, CSUGE Area B3, IGETC Area 5A, IGETC Area 5C, SBCCGE Area 5, CSU Transferable, UC Transferable
UC Transfer Limit: PHYS 105 and 106 or PHYS 110 and 111 or 121, 122 and 123 combined: maximum credit, one series.
C-ID: PHSY 200S, PHYS 210.

PHYS 122W Workshop for Physics 122 (1 Unit)
Corequisites: PHYS 122 (concurrent).
Hours: 54 (54 lab)
"Excellence in Mathematics, Science and Engineering" (EMSE) supplementary problem-solving workshop designed for PHYS 122.

PHYS 123 Heat, Light and Modern Physics (5 Units)
Prerequisites: PHYS 121 and MATH 160.
Hours: 126 (72 lecture, 54 lab)
For Engineering and Physical Science students. Mechanical waves, thermodynamic processes and systems, kinetic theory, light and modern physics.
Transfer Information: Cal-GETC Area 5A, Cal-GETC Area 5C, CSUGE Area B1, CSUGE Area B3, IGETC Area 5A, IGETC Area 5C, SBCCGE Area 5, CSU Transferable, UC Transferable
UC Transfer Limit: PHYS 105 and 106 or 110 and 111 or 121, 122 and 123 combined: maximum credit, one series.
C-ID: PHYS 200S, PHYS 215.

PHYS 123W Workshop for Physics 123 (1 Unit)
Corequisites: PHYS 123 (concurrent).
Hours: 54 (54 lab)
"Excellence in Mathematics, Science and Engineering"(EMSE) supplementary problem-solving workshop designed for PHYS 123.

PHYS 298 Independent Reading in Physics (1-4 Units)
Limitations on Enrollment: To be eligible for independent reading, a student must have completed 12 units at SBCC with a G.P.A. of 2.5 and a minimum of 4 units with a G.P.A. of 2.5 in the Physics Department.
Hours: 192 (192 lab)
Other: To be eligible for independent reading, a student must have completed 12 units at SBCC with a G.P.A. of 2.5 and a minimum of 4 units with a G.P.A. of 2.5 in the Physics Department. Independent literature search and/or reading of material on a topic in physics. Student works under guidance and direction of sponsoring faculty member on project consistent with interests and abilities. A final report, including an annotated bibliography, is required.
Transfer Information: CSU Transferable

PHYS 299 Independent Research in Physics (1-4 Units)
Limitations on Enrollment: Completion of a minimum of 12 units at SBCC, with a 2.5 G.P.A., and a minimum of 4 units, with a 2.5 G.P.A. within the department.
Hours: 192 (192 lab)
Independent, systematic research investigation of a problem in physics. A final report on research conducted is required. May be taken four times for credit. Course restricted to 3 repetitions
Transfer Information: CSU Transferable