

Physics

In the College of Sciences

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Faculty

Emeritus: Burnett, Cottrell, Day, Feher, Lilly, Nichols, Oseroff, Piserchio, Rehffuss, Shackelford, Shore, Smith, Teasdale, Templin, Wallace, Wolter
Chair: Oseroff
Professors: Davis, Goldberg, Johnson, Morris, Papin, Roeder, S., Sweedler, Torikachvili
Associate Professors: Anderson, Baljon, Johnson, Weber
Assistant Professor: Bromley
Lecturers: DiMauro, Ferguson, Nelson, Roeder, P.
Adjunct: Bendall, Jani, Mueller

Offered by the Department

Master of Arts degree in physics.
Master of Science degree in physics.
Master of Science degree in radiological health physics.
Major in physics with the B.A. degree in liberal arts and sciences.
Major in physics with the B.S. degree in applied arts and sciences.
Major in chemical physics with the B.S. degree in applied arts and sciences.
Teaching major in physical science for the single subject teaching credential in science/physical science.
Minor in physics.

The Major

The study of physics is considered the foundation of modern science. It has fascinated the finest minds of every age – from Newton to Maxwell, Einstein, Bohr, Schroedinger, Oppenheimer and Schwinger. The study of this diverse field encompasses such areas as optics, electricity, magnetism, the properties of the solid state, atomic structure, nuclear structure, motion, relativity, space and time. Physics also plays a significant role in chemistry, biology, astronomy, and geology, and in the applied sciences of engineering and technology.

Students who become physics majors will be selecting a rewarding and vital career. The great burst of activity during the last 20 years has instilled a new excitement in physics. For example, the invention of the laser in the late 1950s revolutionized the field of optics. These advances stimulated whole new areas in physics applications. Superconductivity has led to the search for a high-temperature superconductor so that electrical power might be transmitted without loss; quantum mechanical tunneling has led to the tunnel diode; and solid state physics brought about the transistor and its successors.

The career opportunities for physics graduates are as diverse as the field itself. They include research and development; management or administration in industrial laboratories or government agencies; technical sales; electronic design; laser instrument research; and secondary teaching.

Major Academic Plans (MAPs)

Visit <http://www.sdsu.edu/mymap> for the recommended courses needed to fulfill your major requirements. The MAPs Web site was created to help students navigate the course requirements for their majors and to identify which General Education course will also fulfill a major preparation course requirement.

Physics Major

With the B.A. Degree in Liberal Arts and Sciences
(Major Code: 19021)

All candidates for a degree in liberal arts and sciences must complete the graduation requirements listed in the section of this catalog on "Graduation Requirements." Individual master plans for each student are filed with both the physics undergraduate adviser and the Office of Advising and Evaluations. No more than 48 units in physics courses can apply to the degree.

A minor is not required with this major.

Preparation for the Major. Physics 195, 195L, 196, 196L, 197, 197L; Chemistry 200; Mathematics 150, 151, 252. (29 units)

Language Requirement. Competency (successfully completing the third college semester or fifth college quarter) is required in one foreign language to fulfill the graduation requirement. Refer to the section of this catalog on "Graduation Requirements."

Graduation Writing Assessment Requirement. Passing the Writing Proficiency Assessment with a score of 10 or above or completing one of the approved upper division writing courses (W) with a grade of C (2.0) or better. See "Graduation Requirements" section for a complete listing of requirements.

Major. A minimum of 33 upper division units to include Physics 311, 317, 350, 354, 357, 360, 400A-400B, 410; Mathematics 342A, 342B.

Physics Major

With the B.S. Degree in Applied Arts and Sciences
(Major Code: 19021)

All candidates for a degree in applied arts and sciences must complete the graduation requirements listed in the section of this catalog on "Graduation Requirements." Individual master plans for each student are filed with both the physics undergraduate adviser and the Office of Advising and Evaluations.

A minor is not required with this major.

Basic Requirements for all Students

Preparation for the Major. Physics 195, 195L, 196, 196L, 197, 197L; Chemistry 200; Mathematics 150, 151, 252. (29 units)

Graduation Writing Assessment Requirement. Passing the Writing Proficiency Assessment with a score of 10 or above or completing one of the approved upper division writing courses (W) with a grade of C (2.0) or better. See "Graduation Requirements" section for a complete listing of requirements.

Major. A minimum of 45 upper division units to include Physics 311, 317, 350, 354, 357, 360, 400A-400B, 410, 498A, 498B; Mathematics 342A, 342B. In addition, the student must complete the requirements for either one of the following areas:

(a) General Physics

Nine units of elective coursework in physics or related areas. Electives must be approved by the Physics department undergraduate adviser.

(b) Modern Optics

Required: Physics 406, 552, 553.

Recommended: Physics 516, 532, 554.

PHYS

Chemical Physics Major

With the B.S. Degree in Applied Arts and Sciences
(Major Code: 19081)

All candidates for a degree in applied arts and sciences must complete the graduation requirements listed in the section of this catalog on "Graduation Requirements." Individual master plans for each student are filed with the physics and chemistry undergraduate advisers and the Office of Advising and Evaluations.

A minor is not required with this major.

Preparation for the Major. Physics 195, 195L, 196, 196L, 197, 197L; Chemistry 200, 201, 231, 251; Mathematics 150, 151, and 252. (43 units)

Recommended: A course in computer programming.

Graduation Writing Assessment Requirement. Passing the Writing Proficiency Assessment with a score of 10 or above or completing one of the approved upper division writing courses (W) with a grade of C (2.0) or better. See "Graduation Requirements" section for a complete listing of requirements.

Major. A minimum of 39 upper division units to include Physics 311, 350, 400A, 410; Chemistry 410A-410B, 417, 550; Mathematics 342A, 342B; six units selected from Physics 357, 360, 400B; Chemistry 431, 457, 510; Physics 538 or Chemistry 538; and Research Project: Chemistry 497 (3 units) or Chemistry 498 (3 units) or Physics 498A and 498B (3 units).

Physical Science Major

In preparation for the Single Subject Teaching Credential
in Science/Physical Science

With the B.A. Degree in Applied Arts and Sciences
(Major Code: 19011)

The physical science major in preparation for the single subject teaching credential in science/physical science has been submitted to the California Commission on Teacher Credentialing for approval.

Contact the natural science program coordinator for additional information.

All candidates for a degree in applied arts and sciences must complete the graduation requirements listed in the section of the catalog on "Graduation Requirements." Candidates may complete one of their

two American Institutions courses at the upper division level or satisfy the California state and local government portion of American Institutions by passing the California Government examination available through the Student Testing, Assessment and Research Office.

A minor is not required for this major.

Preparation for the Major. Africana Studies 140 or Chicana and Chicano Studies 111A or Communication 103; Astronomy 109, 201; Biology 201A, 201B; Chemistry 200, 201; Mathematics 150, 151, 252; Physics 195, 195L, 196, 196L, 197, 197L; Teacher Education 211 (1 unit). (50 units)

Graduation Writing Assessment Requirement. Passing the Writing Proficiency Assessment with a score of 10 or above or completing one of the approved upper division writing courses (W) with a grade of C (2.0) or better. See "Graduation Requirements" section for a complete listing of requirements.

Major. A minimum of 31 upper division units to include Geological Sciences 412; Mathematics 342A; Natural Science 315; Physics 311, 317, 350, 354, 357, 360, 400A.

Additional Requirements for Subject Matter Preparation Certification

Satisfactory Grades. At most one course with a C- or lower among the courses listed under Preparation for the Major, and at most one course with a C- or lower among the courses listed under the Major. If a course is repeated, the highest grade will count.

Formative Assessment. Completion of a satisfactory, preliminary portfolio two semesters prior to graduation. Contact the subject matter preparation adviser for information.

Summative Assessment. Completion of a satisfactory, final portfolio, and a positive recommendation from a committee consisting of the instructor of Physics 357, the Department of Physics chair, and the subject matter preparation program adviser.

Physics Minor

The following courses are prerequisites to the physics minor and do not count toward the 15 units required for the minor. Physics 195, 195L, 196, 196L, 197, 197L; Mathematics 150, 151, 252.

The minor in physics consists of a minimum of 15 units to include Physics 350, 354, 360, 400A; Mathematics 342A.

Courses in the minor may not be counted toward the major, but may be used to satisfy preparation for the major and general education requirements, if applicable. A minimum of six upper division units must be completed in residence at San Diego State University.