PHYSICS (BA)

Offered at: San Luis Obispo Campus

The BA in Physics provides the student with a solid foundation in physics. It is a more flexible major serving students with double majors, nontechnical minors, and students who intend to pursue pre-college teaching. The curriculum has fewer required courses than the BS, which allows students to choose from an extensive list of electives. Tailoring the curriculum to maximize student goals should be done in consultation with an academic advisor. Students considering a career in teaching should consult with their academic advisor early.

Program Learning Objectives

1. Successfully solve (analyze, model, evaluate) physics problems, including open-ended problems, using the appropriate concepts and mathematical techniques of the major theoretical frameworks in physics: classical mechanics, electromagnetism, statistical mechanics, and quantum physics.
2. Work effectively in a diverse group to safely make physical measurements in a modern laboratory, using appropriate techniques and instrumentation.
3. Use appropriate computational resources to perform numerical computations, and to collect and analyze data in the laboratory.
4. Communicate scientific ideas effectively in a variety of contexts using written, oral, and visual presentations in a manner consistent with accepted professional norms.
5. Transition successfully to opportunities beyond Cal Poly including teaching, the public and private sectors, national labs, and graduate school.

Degree Requirements and Curriculum

In addition to the program requirements listed on this page, students must also satisfy requirements outlined in more detail in the Minimum Requirements for Graduation (https://catalog.calpoly.edu/generalrequirementsbachelorsdegree/#generaleducationtext) section of this catalog, including:

- 40 units of upper-division courses
- 2.0 GPA
- Graduation Writing Requirements (GWR)
- U.S. Cultural Pluralism (USCP)

Note: No Major courses with a lab component may be selected as credit/no credit. In addition, no more than 12 units of cooperative or internship courses can count towards your degree requirements. Students intending to double major must consult the Physics department chair, preferably prior to sophomore year.

Code	Title	Units
MAJOR COURSES		
PHYS 1100	Introduction to the Physics Major	1
PHYS 1141	General Physics I (5A & 5C) [1]	4
PHYS 1143	General Physics II [2]	4
PHYS 2211	General Physics III: Modern Physics	4
PHYS 3301	Statistical Mechanics	3
PHYS 3305	Classical Mechanics I (Upper-Division 2/5) [1]	3
PHYS 3316	Instrumentation and Techniques of Experimental Physics [2]	4
PHYS 3320	Methods of Theoretical Physics	4
PHYS 3339	Communicating Physics	1
PHYS 3340	Quantum Physics Laboratory I [2]	1
PHYS 3341	Quantum Physics Laboratory II [2]	1
PHYS 4405	Quantum Mechanics I	3
PHYS 4408	Electromagnetic Fields and Waves I	3
PHYS 4461	Senior Project I	2
or PHYS 4461 & PHYS 4462	Senior Project I and Senior Project II	
SUPPORT COURSES		
CSC 1001 & 1001L	Fundamentals of Computer Science and Fundamentals of Computer Science Laboratory	4
CHEM 1120	Fundamentals of Chemical Structure and Properties	4
MATH 1261	Calculus I (2) [1]	4

MATH 1262	Calculus II	4
MATH 2263	Calculus III	3
MATH 2341	Linear Analysis	4
GENERAL EDUCATION (GE)		
(See GE program requirements below)		33
FREE ELECTIVES		
Free Electives [2, 3, 4]		26
Total Units		**120**

1 Required in Major or Support; also satisfies General Education (GE) requirement.

2 Major courses with lab component may not be taken as CR/NC grading: PHYS 1143, PHYS 3316, PHYS 3323, PHYS 3340, PHYS 3341, PHYS 4428, ASTR 4444, or EE 4422.

3 If a General Education (GE) course is used to satisfy a Major or Support requirement, additional units of Free Electives may be needed to complete the total units required for the degree.

4 Free Electives may need to be at the 3000-4000 level to ensure completion of the required minimum of 40 units of upper-division courses.

General Education (GE) Requirements

- 43 units required, 10 of which are specified in Major and/or Support.
- If any of the remaining 33 Units is used to satisfy a Major or Support requirement, additional units of Free Electives may be needed to complete the total units required for the degree.
- See the complete GE course listing (https://catalog.calpoly.edu/academic-standards-policies/general-requirements-bachelors-degree/#generaleducationtext).
- A grade of C- or better is required in one course in each of the following GE Areas: 1A (English Composition), 1B (Critical Thinking), 1C (Oral Communication), and 2 (Mathematics and Quantitative Reasoning).

Lower-Division General Education

Area 1	**English Communication and Critical Thinking**	
1A	Written Communication	3
1B	Critical Thinking	3
1C	Oral Communication	3
Area 2	**Mathematics and Quantitative Reasoning**	
2	Mathematics and Quantitative Reasoning (3 units in Support) [1]	0
Area 3	**Arts and Humanities**	
3A	Arts	3
3B	Humanities: Literature, Philosophy, Languages other than English	3
Area 4	**Social and Behavioral Sciences (Area 4 courses must come from at least two different course prefixes.)**	
4A	American Institutions (Title 5, Section 40404 Requirement)	3
4B	Social and Behavioral Sciences	3
Area 5	**Physical and Life Sciences**	
5A	Physical Sciences (3 units in Major) [1]	0
5B	Life Sciences	3
5C	Laboratory (may be embedded in a 5A or 5B course) (1 units in Major) [1]	0
Area 6	**Ethnic Studies**	
6	Ethnic Studies	3
Upper-Division General Education		
Upper-Division 2/5	Mathematics and Quantitative Reasoning or Physical and Life Sciences (3 units in Major) [1]	0
Upper-Division 3	Arts and Humanities	3
Upper-Division 4	Social and Behavioral Sciences (Area 4 courses must come from at least two different course prefixes.)	3
Total Units		**33**

[1] Required in Major or Support; also satisfies General Education (GE) requirement.

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