BS MATHEMATICS

Program Learning Objectives

1. Understand the nature of mathematical proof and be able to write clear and concise proofs.
2. Develop the ability to read, understand, and use basic definitions in linear and abstract algebra and real analysis, and be able to prove simple consequences of these definitions.
3. Be able to use standard mathematical techniques to solve elementary problems.
4. Be able to communicate effectively in oral and written form.
5. Be able to write simple computer programs to perform mathematical computations.
6. Gain experience exploring open-ended problems, learn to make conjectures, and gather evidence to support or refute these conjectures.
7. Develop the ability to read and to learn mathematics independently.
8. Learn about applications of mathematics in other fields and gain experience in mathematical modeling.

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:

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

Note: No Major, Support or Concentration courses may be selected as credit/no credit.

MAJOR COURSES

MATH 141	Calculus I (B4) [1]	4
MATH 142	Calculus II (GE Electives) [1]	4
MATH 143	Calculus III	4
MATH 202	Orientation to Mathematics Major	1
MATH 206	Linear Algebra I	4
MATH 241	Calculus IV	4
MATH 242	Differential Equations I	4
MATH 248	Methods of Proof in Mathematics	4
MATH 306	Linear Algebra II	4
MATH 334	Combinatorial Math (Upper-Division B) [1]	4
MATH 412	Introduction to Analysis I	4
Select from the following: [2]		4
MATH 459	Senior Project Seminar	
MATH 460	Senior Project Applied Seminar	
MATH 461 & MATH 462	Senior Project I and Senior Project II	
MATH 481	Abstract Algebra I	4
CSC/CPE 101	Fundamentals of Computer Science	4
PHYS 141	General Physics I	4
Select from the following: [1]		4
PHYS 142	General Physics II (B1 & B3)	
PHYS 143	General Physics III (B1 & B3)	
General Curriculum in BS Mathematics or Concentration [3]		44/56/48/48
GENERAL EDUCATION (GE)		
(See GE program requirements below.)		56
FREE ELECTIVES		
Free Electives [3,4]		19/7/15/15
Total units		**180**

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

[2]   MATH 460 is recommended for students in the Applied Mathematics concentration.

[3] General Curriculum/Applied Mathematics concentration/Mathematics Teaching concentration/Pure Mathematics concentration.

[4] 60 units must come from upper-division courses at the 300-400 level for the General Curriculum in BS Mathematics.

General Curriculum in BS Mathematics or Concentrations (select one)

- General Curriculum (https://catalog.calpoly.edu/collegesandprograms/collegeofsciencemathematics/mathematics/bsmathematics/generalcurriculum/)
- Applied Mathematics (https://catalog.calpoly.edu/collegesandprograms/collegeofsciencemathematics/mathematics/bsmathematics/appliedmathematicsconcentration/)
- Mathematics Teaching (https://catalog.calpoly.edu/collegesandprograms/collegeofsciencemathematics/mathematics/bsmathematics/mathematicsteachingconcentration/)
- Pure Mathematics (https://catalog.calpoly.edu/collegesandprograms/collegeofsciencemathematics/mathematics/bsmathematics/puremathematicsconcentration/)

General Education (GE) Requirements

- 72 units required, 16 of which are specified in Major and/or Support.
- If any of the remaining 56 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/generalrequirementsbachelorsdegree/#generaleducationtext).
- A grade of C- or better is required in one course in each of the following GE Areas: A1 (Oral Communication), A2 (Written Communication), A3 (Critical Thinking), and B4 (Mathematics/Quantitative Reasoning).

Area A	English Language Communication and Critical Thinking	
A1	Oral Communication	4
A2	Written Communication	4
A3	Critical Thinking	4
Area B	**Scientific Inquiry and Quantitative Reasoning**	
B1	Physical Science (4 units in Major) [1]	0

B2	Life Science	4
B3	One lab taken with either a B1 or B2 course	
B4	Mathematics/Quantitative Reasoning (4 units in Major) [1]	0
Upper-Division B (4 units in Major) [1]		0
Area C	**Arts and Humanities**	
Lower-division courses in Area C must come from three different subject prefixes.		
C1	Arts: Arts, Cinema, Dance, Music, Theater	4
C2	Humanities: Literature, Philosophy, Languages other than English	4
Lower-Division C Elective - Select a course from either C1 or C2		4
Upper-Division C		4
Area D	**Social Sciences - Select courses in Area D from at least two different prefixes**	
D1	American Institutions (Title 5, Section 40404 Requirement)	4
D2	Lower-Division D	4
Upper-Division D		4
Area E	**Lifelong Learning and Self-Development**	
Lower-Division E		4
Area F	**Ethnic Studies**	
F	Ethnic Studies	4
GE Electives in Areas B, C, and D		
Select courses from two different areas; may be lower-division or upper-division courses.		
GE Electives (4 units in Major plus 4 units in GE) [1]		4
Total units		**56**

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