California State University, Stanislaus

2020-2021 Academic Catalog

[Archived Catalog]

Mathematics B.A./B.S.

View information for the Department of Mathematics, including Learning Objectives.

The mathematics program offers the quality education you would expect from a large university with the feel of a small one. Professors work closely with students to ensure they get the best education possible. Graduates are very successful in their careers and in earning graduate fellowships from many of the best-known mathematics departments in the country.

The Department of Mathematics offers three degree programs:

- **Bachelor of Arts in Mathematics** - oriented to pure mathematics; preparation for graduate study in mathematics.
- **Bachelor of Science in Mathematics** - oriented to applied mathematics and applications; preparation for careers in industry, a government, or graduate study in applied mathematics.
- **Bachelor of Arts with** Subject Matter Preparation Program - oriented to teaching mathematics, approved by the California Commission on Teacher Credentialing, and satisfies the subject matter prerequisites for entry into a single subject credential program to teach mathematics.

The Department also offers Mathematics Concentration in the Liberal Studies B.A. and Mathematics Minor.

Program Learning Outcomes

Students will be able to:

1. Use problem-solving techniques to solve both standard and nonstandard mathematical problems.
2. Use mathematical models to represent and solve real-world problems.
3. Use appropriate technology for solving mathematical problems.
4. Apply mathematical reasoning in solving complex problems.
5. Develop enthusiasm and an appreciation for studying and applying mathematics.
6. Comprehend and write mathematical proofs.
7. Effectively communicate mathematical concepts in written and oral form.
8. Demonstrate understanding of the theory, techniques, and applications of calculus and differential equations, linear algebra, geometry, statistics, and abstract algebra.

Requirements

1. Complete the Baccalaureate Degree Requirements.

A student must comply with all University regulations and satisfy the following requirements:

1. Units and Residency (minimum of 120 units: 40 units of upper division coursework and 30 semester units at Stanislaus State. At least 24 of these 30 units must be earned in upper-division courses, at least 12 must be in the major, and at least 9 must be applicable to General Education-Breadth requirements)
2. Grade Point Average (minimum grade point average of 2.0 (C) or better)

3. General Education (minimum of 49 units)
4. Upper Division Writing Proficiency (minimum of 3 units)
   - Writing Proficiency (WP) Course (may double count in the major)
5. United States Constitution and California State and Local Government (minimum of 3 units)
6. Multicultural Requirement (minimum of 3 units) (may double count with General Education requirements or in the major)

Subsequently all students must submit an application for graduation and receive approval from the major advisor, department chair, and Director of Academic Advising. For more information see the Baccalaureate Degree Requirements.

2. Complete the following prerequisites to the major:

Mathematics B.A. Prerequisites

(21 units)

- MATH 1410 - Calculus I *4 unit(s)*
- MATH 1420 - Calculus II *4 unit(s)*
- MATH 1620 - Probability and Statistics *4 unit(s)*
- MATH 2410 - Multivariate Calculus *4 unit(s)*
- MATH 2460 - Introduction to Differential Equation *2 unit(s)*
- MATH 2530 - Linear Algebra *3 unit(s)*

Mathematics B.S. Prerequisites

(24 units)

In addition to the requirements for the Mathematics B.A., the Mathematics B.S. also requires completion of the following:

- CS 1500 - Computer Programming I *3 unit(s)*

Mathematics B.A. + Mathematics SMPP Prerequisites

(26 units)

In addition to the requirements for the Mathematics B.A., the Mathematics Subject Matter Preparation Program, or SMPP, also requires completion of the following:

- CS 1500 - Computer Programming I *3 unit(s)*
- MATH 1412 - Calculus I Laboratory *1 unit(s)*
- MATH 1422 - Calculus II Laboratory *1 unit(s)*

3. Complete the major of not less than 30 units for the desired program.

All courses which apply to the major must be completed with a grade of C- or better.

Mathematics B.A.

(Without the Subject Matter Preparation Program)

(30 units)

1. Complete the following courses:

(21 units)

- MATH 3400 - Set Theory and Logic *3 unit(s)*
- MATH 3600 - Theory of Numbers *3 unit(s)*
- MATH 4130 - Real Analysis I *3 unit(s)*
- MATH 4140 - Real Analysis II *3 unit(s)*
- MATH 4530 - Abstract Algebra *3 unit(s)*
- MATH 4540 - Abstract Algebra II *3 unit(s)*
- MATH 4600 - Complex Variables *3 unit(s)*

2. Complete two of the following courses:

(6 units)

- MATH 3230 - Differential Equations *3 unit(s)*
- MATH 4330 - Numerical Analysis *3 unit(s)*
- MATH 4430 - Operations Research *3 unit(s)*
- MATH 4630 - Probability Theory *3 unit(s)*

3. Complete selected upper-division courses,

as approved by the major adviser so the total upper-division units in mathematics is 30 units (3 elective units).

Mathematics B.S.

(30 units)

1. Complete the following courses:

(24 units)

- MATH 3230 - Differential Equations *3 unit(s)*
- MATH 3400 - Set Theory and Logic *3 unit(s)*
- MATH 4130 - Real Analysis I *3 unit(s)*
- MATH 4330 - Numerical Analysis *3 unit(s)*
- MATH 4430 - Operations Research *3 unit(s)*
- MATH 4530 - Abstract Algebra *3 unit(s)*
- MATH 4600 - Complex Variables *3 unit(s)*
- MATH 4630 - Probability Theory *3 unit(s)*

2. Complete selected upper-division courses,

as approved by the major adviser so the total upper-division units in mathematics is 30 units (6 elective units).

Mathematics B.A. + Mathematics SMPP

(with the Mathematics B.A. + Subject Matter Preparation Program in Mathematics)

(31 units)

1. Complete the following courses:

(28 units)

- MATH 3060 - Modern Geometry *3 unit(s)*
- MATH 3110 - History of Mathematics *3 unit(s)*
- MATH 3400 - Set Theory and Logic *3 unit(s)*
- MATH 3600 - Theory of Numbers *3 unit(s)*
- MATH 4020 - Math for Secondary Teachers *3 unit(s)*
- MATH 4022 - Mathematics for Secondary Teachers Lab *1 unit(s)*
- MATH 4130 - Real Analysis I *3 unit(s)*
- MATH 4530 - Abstract Algebra *3 unit(s)*
- MATH 4630 - Probability Theory *3 unit(s)*
- MATH 4960 - Senior Seminar in Mathematics (WP) *3 unit(s)*

2. Complete one elective selected from the following:

(3 units)

- MATH 3230 - Differential Equations *3 unit(s)*
- MATH 4330 - Numerical Analysis *3 unit(s)*
- MATH 4430 - Operations Research *3 unit(s)*
- MATH 4600 - Complex Variables *3 unit(s)*

Strongly Recommended Coursework

The following are strongly recommended courses for all mathematics majors.

1. Satisfy the Writing Proficiency (WP) Requirement with the MATH course:

- MATH 4960 - Senior Seminar in Mathematics (WP) *3 unit(s)*

2. Depending on the Student's Interest and Professional Objectives:

Complete one of the following sequences of courses outside the discipline of mathematics:

- CS 1500 - Computer Programming I *3 unit(s)* and
- CS 2500 - Computer Programming II *3 unit(s)*

  or
- ECON 2500 - Principles of Macro Economics *3 unit(s)* and
- ECON 2510 - Principles of Micro Economics *3 unit(s)*

  or
- PHYS 2250 - General Physics I *4 unit(s)* and
- PHYS 2260 - General Physics II *4 unit(s)*