APPLIED MATHEMATICS,  
BACHELOR OF SCIENCE

College of Letters & Science

The Major Programs
Mathematics is the study of abstract structures, space, change, and the interrelations of these concepts. It also is the language of the exact sciences.

The Program
After completing basic introductory courses such as calculus and linear algebra, students plan an upper division program in consultation with a faculty advisor. Upper division courses include real analysis, probability, modern algebra, as well as a variety of other courses that allow students to further mathematical knowledge and skills that feature their research or career interests. This individualized program can lead to graduate study in pure or applied mathematics, elementary or secondary level teaching, or to other professional goals. It can also reflect a special interest such as computational and applied mathematics, computer science, or statistics, or may be combined with a major in some other field.

Career Alternatives
A degree in mathematics provides entry to many careers in industry in addition to teaching. For instance, operations research, data analysis, systems analysis, computing, actuarial work, insurance, and financial services are only a few such careers. Mathematics is also a sound basis for graduate work in a variety of fields, such as law, engineering, and economics.

Major Advisors
For a current list of faculty and staff advisors, see Math Department Advising or contact the Student Services office (studentservices@math.ucdavis.edu).

Mathematics Placement Requirement
Students who wish to enroll in MAT 012, MAT 016A, MAT 017A, MAT 021A, MAT 021AH, and MAT 021M must satisfy the mathematics placement requirement by taking an online exam. Students who do not satisfy the requirement will be administratively dropped from these courses. For more information, including preparation tips and how to access the online exam, please see Math Placement Requirement (MPR), well in advance of enrolling.

Department Honors
Students who meet the minimum GPA requirement for honors at graduation from the College of Letters & Science and who complete a senior project as part of MAT 194 or MAT 199 units in consultation with their faculty advisor may also be recommended by the department for graduation with High Honors or Highest Honors. Recommendations will be based on evaluations of students’ academic achievements in their major and the quality of their senior project. For complete details, see Honors & Awards (https://www.math.ucdavis.edu/research/honors/).

Graduate Study
The Department offers programs of study and research leading to M.A. and Ph.D. degrees in Mathematics. Information regarding graduate study may be obtained by consulting Graduate
Preparatory Subject Matter Subtotal | 40-47

**Depth Subject Matter**

**A. Core Courses**
- MAT 119A  Ordinary Differential Equations  4
- MAT 127A  Real Analysis  4
- MAT 127B  Real Analysis  4
- MAT 127C  Real Analysis  4
- MAT 135A  Probability  4
- MAT 150A  Modern Algebra  4
- MAT 185A  Complex Analysis  4

Choose two: 8
- MAT 128A  Numerical Analysis
- MAT 128B  Numerical Analysis in Solution of Equations
- MAT 128C  Numerical Analysis in Differential Equations

**B. Enrichment Courses**
1. Choose two: 8
   - MAT 111-MAT 185B; excluding MAT 180, core courses, & courses being used as a capstone.

2. Choose one approved upper division course outside the Department of Mathematics with extensive use of mathematics. Please consult with a math advisor before selecting a course.
   - ATM 120  Atmospheric Thermodynamics & Cloud Physics
   - ATM 121A  Atmospheric Dynamics
   - ATM 121B  Atmospheric Dynamics
   - ATM 128  Radiation & Satellite Meteorology
   - ARE 106  Econometric Theory & Applications
   - CHE 110A  Physical Chemistry: Introduction to Quantum Mechanics
   - CHE 110B  Physical Chemistry: Properties of Atoms & Molecules
   - CHE 110C  Physical Chemistry: Thermodynamics, Equilibria & Kinetics
   - EEC 130A  Electromagnetics I
   - EEC 130B  Introductory Electromagnetics II
   - ECH 140  Mathematical Methods in Biochemical & Chemical Engineering
   - ECI 114  Probabilistic Systems Analysis for Civil & Environmental Engineers
   - ECI 153  Deterministic Optimization & Design
   - ECN 122  Theory of Games & Strategic Behavior
   - ECN 140  Econometrics
   - ECS 120  Theory of Computation
   - ECS 122A  Algorithm Design & Analysis
   - ECS 127  Cryptography
   - EME 115  Introduction to Numerical Analysis & Methods
   - ESP 150A  Physical & Chemical Oceanography
   - EVE 102  Population & Quantitative Genetics
   - GEL 150A  Physical & Chemical Oceanography
   - LIN 177  Computational Linguistics

**C. Capstone Courses**
Choose one: 3-4
- MAT 115B  Number Theory
- MAT 118B  Partial Differential Equations: Eigenfunction Expansions
- MAT 119B  Ordinary Differential Equations
- MAT 135B  Stochastic Processes
- MAT 146  Algebraic Combinatorics
- MAT 150B  Modern Algebra
- MAT 150C  Modern Algebra
- MAT 180  Special Topics
- MAT 185B  Complex Analysis
- MAT 189  Advanced Problem Solving
- MAT 192  Internship in Applied Mathematics (Must take 3 units.)
- MAT 194  Undergraduate Thesis

Depth Subject Matter Subtotal | 51-52

Total Units | 91-99

1 Note: Basic knowledge of MATLAB is required for both MAT 022A and MAT 067. Students can learn it on their own, enroll in ENG 006, EME 005, or in the 1 unit course MAT 022AL (can be taken concurrently).