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
Students majoring in mathematics may follow a program leading to either the Bachelor of Arts or the Bachelor of Science degree. 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 (https://www.math.ucdavis.edu/undergrad/advising/), or contact Student Services (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 the Math Placement Requirement (MPR) (http://www.math.ucdavis.edu/undergrad/math_placement/), well in advance of enrolling.

Department Honors
Students who meet the minimum GPA requirement for honors at graduation for 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/).

Teaching Credential Subject Representative
Dr. Ali Dad-del

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 our website or contacting Student Services (studentservices@math.ucdavis.edu).

Code   Title                         Units
Calculation Subject Matter
Calculus
MAT 021A  Calculus                  4
MAT 021B  Calculus                  4
MAT 021C  Calculus                  4
MAT 021D  Vector Analysis           4
Linear Algebra & Proof-Writing
Choose one option: 4-8
(a) MAT 022A  Linear Algebra
     MAT 108  Introduction to Abstract Mathematics
(b) MAT/BIS 027A  Linear Algebra with Applications to Biology
     MAT 108  Introduction to Abstract Mathematics
(c) MAT 067  Modern Linear Algebra
MATLAB
Choose one: 0-1
     MAT 022AL  Linear Algebra Computer Laboratory
     Equivalent MATLAB knowledge.
Differential Equations
MAT/BIS 027B  Differential Equations with Applications to Biology 3-4
or MAT 022B  Differential Equations
Plans
Choose one: 4-5
Plan I: General Mathematics
PHY 009A  Classical Physics
Plan II: Mathematics for Secondary Teaching
Choose one:
PHY 007A  General Physics
PHY 009A  Classical Physics
STA 013  Elementary Statistics
     or STA 013Y  Elementary Statistics
STA 032  Gateway to Statistical Data Science
STA 100  Applied Statistics for Biological Sciences
Programming
ECS 032A  Introduction to Programming 4
     or ENG 006  Engineering Problem Solving
Subtotal  31-38
Depth Subject Matter
Plans
Choose one: 51-52
Plan 1: General Mathematics (p. 2)
Plan 2: Mathematics for Secondary Teaching (p. 2)

Subtotal 51-52
Total Units 82-90

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 one 1 unit course MAT 022AL (can be taken concurrently).

Plan 1: General Mathematics

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 127A</td>
<td>Real Analysis</td>
<td>4</td>
</tr>
<tr>
<td>MAT 127B</td>
<td>Real Analysis</td>
<td>4</td>
</tr>
<tr>
<td>MAT 127C</td>
<td>Real Analysis</td>
<td>4</td>
</tr>
<tr>
<td>MAT 135A</td>
<td>Probability</td>
<td>4</td>
</tr>
<tr>
<td>MAT 150A</td>
<td>Modern Algebra</td>
<td>4</td>
</tr>
<tr>
<td>MAT 150B</td>
<td>Modern Algebra</td>
<td>4</td>
</tr>
<tr>
<td>MAT 150C</td>
<td>Modern Algebra</td>
<td>4</td>
</tr>
<tr>
<td>MAT 185A</td>
<td>Complex Analysis</td>
<td>4</td>
</tr>
</tbody>
</table>

B. Enrichment Courses

Choose four: 16

MAT 111-MAT 185B 1; Up to four of these 16 units may be approved upper division courses outside of the Department of Mathematics with extensive use of mathematics.

C. Capstone Course

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
EDU/GEL 183  Teaching High School Mathematics & Science

1 Excluding MAT 180, core courses, and courses being used as a capstone.

Plan 2: Mathematics for Secondary Teaching

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<th>Code</th>
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<tbody>
<tr>
<td>MAT 111</td>
<td>History of Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>MAT 115A</td>
<td>Number Theory</td>
<td>4</td>
</tr>
<tr>
<td>MAT 127A</td>
<td>Real Analysis</td>
<td>4</td>
</tr>
<tr>
<td>MAT 127B</td>
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</tr>
<tr>
<td>MAT 127C</td>
<td>Real Analysis</td>
<td>4</td>
</tr>
<tr>
<td>MAT 135A</td>
<td>Probability</td>
<td>4</td>
</tr>
<tr>
<td>MAT 141</td>
<td>Euclidean Geometry</td>
<td>4</td>
</tr>
<tr>
<td>MAT 150A</td>
<td>Modern Algebra</td>
<td>4</td>
</tr>
</tbody>
</table>

B. Enrichment Course

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C. Capstone Course

Choose one: 3-4

MAT 115B  Number Theory
MAT 118B  Partial Differential Equations: Eigenfunction Expansions
MAT 119B  Ordinary Differential Equations
MAT 135B  Stochastic Processes
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MAT 150C  Modern Algebra
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