# MATHEMATICS, BACHELOR OF ARTS

#### **College of Letters & Science**

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/advisers/) or contact Student Services (studentservices@math.ucdavis.edu).

#### **Mathematics Placement Requirement**

Students who wish to enroll in MAT 012, MAT 017A,

MAT 019A, 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 Department of Mathematics website, at 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 Mathematics (http://www.math.ucdavis.edu).

### **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, and by sending an email to Student Services (studentservices@math.ucdavis.edu).

The major requirements below are in addition to meeting University Degree Requirements (https://catalog.ucdavis.edu/undergraduateeducation/university-degree-requirements/) & College Degree Requirements (https://catalog.ucdavis.edu/undergraduate-education/ college-degree-requirements/); unless otherwise noted. The minimum number of units required for the Mathematics Bachelor of Arts is 78.

Code	Title	Units	
Preparatory Subject I	Matter		
Calculus			
MAT 021A	Calculus	4	
MAT 021B	Calculus	4	
MAT 021C	Calculus	4	
MAT 021D	Vector Analysis	4	
Linear Algebra & Proof-Writing <sup>1</sup>			
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		0-1	
MAT 022AL	Linear Algebra Computer Laboratory		
Equivalent MATLA	B knowledge.		
Differential Equations			
MAT/BIS 027B	Differential Equations with Applications to Biology	3-4	
or MAT 022B	Differential Equations		
Programming			
ECS 032A	Introduction to Programming	4	
or ENG 006	Engineering Problem Solving		
Additional Non-Mathe	matics Courses		
Chosen from the L&S (https://catalog.ucda science/#nat-sci-mat	Natural Sciences & Mathematics List. wis.edu/undergraduate-education/letters- h)	12	
Preparatory Subject Matter Subtotal		39-45	
Depth Subject Matter			
Plans			
Choose one:		39-40	
Plan 1: General Mathematics (p. 2)			
Plan 2: Secondary Teaching (p. 2)			

<b>Note</b> : Students who wish to satisfy the single subject matter waiver for the teaching credential should see an advisor as early as possible.	
Depth Subject Matter Subtotal	39-40
Total Units	78-85

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**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, or in the one 1 unit course MAT 022AL (can be taken concurrently).

### **Plan 1: General Mathematics**

Code	Title	Units
A. Core Courses		
MAT 127A	Real Analysis	4
MAT 127B	Real Analysis	4
MAT 127C	Real Analysis	4
MAT 135A	Probability	4
MAT 150A	Modern Algebra	4
B. Enrichment Course	es	
Choose four:		16
MAT 111-MAT 185B; approved upper divisi Mathematics with ex	up to four of these 16 units may be ion courses outside of the Department of tensive use of mathematics. <sup>1</sup>	
C. Captstone 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	

MAT 150A	A	Modern Algebra	4
B. Enrichn	nent Course		
Choose or	ne:		4
MAT 111-	MAT 185B.	1	
C. Capsto	ne Course		
Choose or	ne:		3-4
MAT 11	I 5B	Number Theory	
MAT 11	I 8B	Partial Differential Equations: Eigenfunction Expansions	
MAT 11	I 9B	Ordinary Differential Equations	
MAT 13	35B	Stochastic Processes	
MAT 14	46	Algebraic Combinatorics	
MAT 15	50B	Modern Algebra	
MAT 15	50C	Modern Algebra	
MAT 18	30	Special Topics	
MAT 18	35B	Complex Analysis	
MAT 18	39	Advanced Problem Solving	
MAT 19	92	Internship in Applied Mathematics (Must take 3 units.)	
MAT 19	94	Undergraduate Thesis	
EDU/GI	EL 183	Teaching High School Mathematics & Science	
GEL/ED	DU 183	Teaching High School Mathematics & Science	
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Excluding MAT 180, core courses, and courses being used as a capstone.

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

## Plan 2: Secondary Teaching

Code	Title	Units
A. Core Courses		
MAT 111	History of Mathematics	4
MAT 115A	Number Theory	4
MAT 127A	Real Analysis	4
MAT 127B	Real Analysis	4
MAT 127C	Real Analysis	4
MAT 135A	Probability	4
MAT 141	Euclidean Geometry	4