

MATHEMATICS MAJOR

Department of Mathematics and Computer Science (<https://catalog.washcoll.edu/catalog/departments-programs/mathematics-computer-science/>)
Division of Natural Sciences and Mathematics

In mathematics, the foundational courses listed below are the gateway to the major. Prospective majors should begin coursework in the foundational courses during their first semester at the College (usually with MAT 111 Differential Calculus or MAT 106 Stretch Differential Calculus I/MAT 107 Stretch Differential Calculus II). Many of our upper-level courses require MAT 240 Discrete Mathematics, so students are encouraged to complete this course during their freshman or sophomore year, after successfully completing either MAT 111 Differential Calculus or MAT 106 Stretch Differential Calculus I/MAT 107 Stretch Differential Calculus II. The Department strongly advises students not to take a course unless they earn a grade of C or better in the prerequisite course.

Requirements for The Bachelor of Science in Mathematics

Normally a student with good preparation in mathematics who intends to major in mathematics or one of the natural sciences will start in the calculus sequence with MAT 111 Differential Calculus, but a student who has had some work in calculus or who has received advanced placement credit for calculus may start with a more advanced course and is encouraged to consult with the department chair to make such arrangements. Students who would like a slower introduction to calculus with integrated pre-requisite material may take the 2-semester Stretch Differential Calculus sequence (MAT 106 Stretch Differential Calculus I and MAT 107 Stretch Differential Calculus II) in place of MAT 111 Differential Calculus.

Mathematics and computer science majors are eligible for the teacher education program. To assure proper scheduling, students wishing to become certified to teach mathematics should inform the chairs of both the Mathematics and Computer Science and Education Departments as soon as possible.

The mathematics major is also compatible with extended courses of study such as the Combined Plan in Engineering at Columbia University or Washington University in St. Louis, where students will take several upper-level math classes. As such, these students will have portions of the major waived, as noted below. Specifically, they can take fewer electives and can forgo writing a senior thesis or taking comprehensive exams.

MATHEMATICS MAJOR REQUIREMENTS

Code	Title	Credits	Notes
Core Courses		24	
MAT 109	Statistical Inference & Data Analysis I		
MAT 111 or MAT 106 & MAT 107	Differential Calculus Stretch Differential Calculus I and Stretch Differential Calculus II		
MAT 112	Integral Calculus		
MAT 210	Multivariable Calculus		
MAT/CSI 240	Discrete Mathematics		
MAT 280	Linear Algebra		
Select 1 Course From Below		4	
CSI 111	Computer Science I		
CSI/PHY 252	Scientific Modeling & Data Analysis		
Select 1 Course From Below		4	
MAT 410	Abstract Algebra		
MAT 470	Real Analysis I		
Select 3 Courses From Below (1 must be MAT)¹		12	
ECN 320	Econometrics		
CHE 305	Chemical Thermodynamics/Kinetics w/Lab		
CHE 306	Quantum Chem & Spectro with Lab		
CSI 220	Data Science		
CSI 320	Theory of Computation		
CSI 360	Machine Learning		
CSI 380	Design & Analysis of Algorithms		
MAT 209	Statistical Inference & Data Analysis II		

MAT 230	Foundations of Geometry	_____
MAT 310	Differential Equations	_____
MAT 320	Probability	_____
MAT 330	Complex Analysis	_____
MAT 340	Numerical Analysis	_____
MAT/CSI 350	Graph Theory & Combinatorics	_____
MAT 370	Operations Research	_____
MAT 380	Number Theory	_____
MAT 480	Real Analysis II	_____
MAT 394	Special Topics	_____
or MAT 294	Special Topics	_____
or MAT 494	Special Topics	_____
PHY 321	Classical Mechanics	_____
PHY 322	Quantum Mechanics	_____
PHY 324	Electricity and Magnetism	_____
Major Seminars		4
MAT 391	Junior Math Major Seminar I (1 credit)	_____
MAT 392	Junior Math Major Seminar II (1 credit)	_____
MAT 491	Senior Math Major Seminar I (1 credit)	_____
MAT 492	Senior Math Major Seminar II (1 credit)	_____
Senior Capstone Experience (MAT SCE) ²		2-4
Total Credits		50-52

¹ Students successfully completing an approved extended course of study in an engineering program may complete only two of the following, at least one of which is a MAT course.

² Completion of a dual-degree engineering program satisfies the SCE requirement.

Major

- Computer Science Major (<https://catalog.washcoll.edu/catalog/departments-programs/mathematics-computer-science/computer-science-major/>)
- Data Science Major (<https://catalog.washcoll.edu/catalog/departments-programs/mathematics-computer-science/data-science-major/>)
- Mathematics Major (p. 1)

Minor

- Computer Science Minor (<https://catalog.washcoll.edu/catalog/departments-programs/mathematics-computer-science/computer-science-minor/>)
- Data Science Minor (<https://catalog.washcoll.edu/catalog/departments-programs/mathematics-computer-science/data-science-minor/>)
- Mathematics Minor (<https://catalog.washcoll.edu/catalog/departments-programs/mathematics-computer-science/mathematics-minor/>)

Certificate

- Secondary Education Certification Program (<https://catalog.washcoll.edu/catalog/departments-programs/education/secondary-education-certification-program/>)