MATHEMATICS

Degree: B.S., Mathematics
Department of Mathematics (https://cas.umw.edu/math/)

The interests and expertise of the mathematics faculty cover a broad range of mathematical areas, including algebra, analysis, topology, discrete mathematics, number theory, statistics, and applied mathematics. With this spectrum of faculty knowledge, the student is afforded an opportunity to learn the contemporary view of mathematics. Inside the classroom, student comprehension is the main concern of the faculty. Outside the classroom, the faculty offers opportunities for independent study, undergraduate research, and internship supervision.

Courses in mathematics vary from the theoretical to the applied. Thus, a Bachelor of Science degree in Mathematics can be a foundation for a career in industry, government, teaching, or the pursuit of a higher degree in graduate school. The department faculty encourages double majors, giving students entrance to a wide variety of fields upon graduation. Majors in other disciplines can be enhanced with one of our minors in mathematics, applied mathematics, actuarial science, or applied statistics.

The University of Mary Washington hosts a chapter of Pi Mu Epsilon, a national honorary mathematics society, and a chapter of the Mathematical Association of America. The Oscar Schultz Award in Mathematics represents the department's top academic honor and is given annually to a junior or senior in the department. Four additional scholarships are available. The recipients of the Meredith C. Loughran '94 Scholarship are selected based on their meritorious academic record, citizenship and leadership in public service. The Merrilyn Sawyer Dodson/ class of 1968 Scholarship and the Mary Farley Talley '66 Scholarship each recognize the scholastic achievements of mathematics majors, while the Louise W. Robertson, M.D. '56 Scholarship is awarded to a student majoring in mathematics or a health field.

Qualified mathematics majors having at least a 3.5 GPA in mathematics courses and an overall GPA of at least 3.0 may graduate with Honors in Mathematics by completing a directed study or undergraduate research which culminates in an approved Honors thesis.

Majors are encouraged to fulfill the general education experiential learning requirement by completing URES 197 Undergraduate Research, MATH 491B Directed Study , MATH 492A Directed Study , or MATH 499 Internship . Alternatively, majors may meet this requirement by participating in an approved supervised on-campus or off-campus experiential learning activity developed in consultation with the department (such as the UMW Summer Science Institute or a similar program at another college or university). To complete the experiential learning requirement through a summer research experience, contact the department chair for more details.

Student Learning Outcomes

1. Students will learn the central ideas and techniques of various areas of mathematics.

2. Students will analyze, construct, and present mathematical and logical arguments.

3. Students will develop problem-solving abilities.

4. Students will discover mathematical patterns and formulate conjectures by exploration and experimentation.

5. Students will represent quantitative information by means of appropriate symbols, graphs, equations, or tables.

6. Students will read and interpret graphical and numerical data.

7. Students will use technology appropriately to solve problems, perform lengthy calculations, visualize mathematical concepts, and discover new relationships.

Major Requirements

Code	Title	Credits
STAT 180	Introduction to Statistics	3
MATH 121	Calculus I	4
MATH 122	Calculus II	4
MATH 201 or CPSC 284	Introduction to Discrete Mathematics Applied Discrete Mathematics	3-4
MATH 224A	Multivariable Calculus	4
STAT 280	Statistical Methods	3
MATH 300	Linear Algebra	4
MATH 330	Foundations of Advanced Mathematics	3
STAT 381	Probability and Statistical Inference	3
MATH 431	Abstract Algebra	3
MATH 471	Real Analysis	3
Select an additional 6 credits from MATH or STAT courses at the 300-/400-level with at least three credits from 400-level MATH or STAT courses		6
Select 3 additional credits from MATH or STAT courses numbered 207 or above; computer science (CPSC) courses numbered 220 or above; physics (PHYS) courses numbered 105 or above [1]		3
Total Credits		**46-47**

[1] except CPSC 284 Applied Discrete Mathematics and CPSC 302 Computer Ethics; except PHYS 108 General Physics

Mathematics majors must meet the department's computer programming requirement by taking one of the following courses:

Code	Title	Credits
MATH 351A	Numerical Analysis I	3
MATH 421	Applied Partial Differential Equations	3
CPSC 110	Introduction to Computer Science	3
CPSC 219	Foundations for Data Science	3
CPSC 220	Computer Programming and Problem Solving	4

Courses used to satisfy the programming requirement may also be used elsewhere in the major.

At most six (6) credits of directed study (MATH 491B Directed Study /MATH 492A Directed Study or STAT 491 Directed Study/STAT 492 Directed Study) will count for the major.

No internship (MATH 499 Internship or STAT 499 Internship) credits will count for the major.

General Education Requirements

The general education requirements for Bachelor of Arts/Bachelor of Science degrees (https://catalog.umw.edu/undergraduate/general-education/requirements-bachelor-arts-bachelor-science-degrees/) apply to all students who are seeking to earn an undergraduate B.A., B.S. or B.S.Ed. degree.

Students seeking a Bachelor of Liberal Studies degree have a separate set of BLS general education requirements (https://catalog.umw.edu/undergraduate/general-education/requirements-bachelor-liberal-studies-degrees/).

Electives

Elective courses are those that are not needed to fulfill a general education requirement or major program requirement but are chosen by the student to complete the 120 credits required for graduation with a B.A./B.S./B.S.Ed. degree or the BLS degree. These courses may be taken graded or pass/fail (or S/U in the case of physical education and 100-level dance). No student in a regular B.A./B.S./B.S.Ed. program may count more than 60 credits in a single discipline toward the 120 credits required for graduation.

Total Credits Required for the Degree: 120 credits

Plan of Study

This suggested plan of study should serve as a guide to assist students when planning their course selections. It is not a substitute for a student's Degree Evaluation or the Program Requirements listed for this major in the catalog. Academic planning is the student's responsibility, and course selections should be finalized only after speaking with an advisor. Students should familiarize themselves with the catalog in effect at the time they matriculated at the University of Mary Washington. Students should also familiarize themselves with general education requirements (https://catalog.umw.edu/undergraduate/general-education/) which can be fulfilled through general electives as well as major/minor course requirements. Course requirements and sequencing may vary with AP, IB, CLEP, Cambridge or previous coursework, transfer courses, or other conditions. To be considered full-time, an undergraduate student must be enrolled in 12 or more credits for the semester.

Course	Title	Credits
Freshman		
Fall		
FSEM 100	First-Year Seminar	3
MATH 121	Calculus I	4
General Education Courses		6
	Credits	**13**
Spring		
MATH 122	Calculus II	4
MATH 201 or CPSC 284	Introduction to Discrete Mathematics or Applied Discrete Mathematics	3
STAT 180	Introduction to Statistics	3
General Education Courses		6
	Credits	**16**
Sophomore		
Fall		
MATH 300	Linear Algebra	4
STAT 280	Statistical Methods	3
General Education Courses or Electives		9
	Credits	**16**
Spring		
MATH 224A	Multivariable Calculus	4
300 or 400-Level Math Elective		3
General Education Courses or Electives		7
	Credits	**14**
Junior		
Fall		
STAT 381	Probability and Statistical Inference	3
300 or 400-Level Math Elective		3
General Education Courses or Electives		9
	Credits	**15**
Spring		
MATH 330	Foundations of Advanced Mathematics	3
400-Level Math Elective		3
General Electives		9
	Credits	**15**
Senior		
Fall		
MATH 431	Abstract Algebra	3
MATH 471	Real Analysis	3
General Electives		9
	Credits	**15**
Spring		
MATH 305	Mathematics as a Profession	1
General Electives		15
	Credits	**16**
	Total Credits	**120**

Mathematics Faculty

Julius N. Esunge, Chair
Randall D. Helmstutler, Career Advisor for Pure Mathematics
Jangwoon Lee, Career Advisor for Applied Mathematics
Debra L. Hydorn, Career Advisor for Statistics

Professors

Julius N. Esunge
Debra L. Hydorn
Janusz Konieczny
Jangwoon Lee
J. Larry Lehman
Keith E. Mellinger
Suzanne Sumner

Associate Professors

Melody B. Denhere
Randall D. Helmstutler

Senior Lecturers

Jennifer M. Magee
Kelly W. Perkins