APPLIED MATHEMATICS AND STATISTICS

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

The concentration in applied mathematics and statistics prepares students for careers and studies in high-demand fields that require excellent skills in computation and statistics. The curriculum focuses on applications with a view to strengthening the skills of students in addressing real-world problems in fields that continually see significant growth in career prospects in areas such as business, industry, and government.

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
MATH 121	Calculus I	4
MATH 122	Calculus II	4
MATH 201	Introduction to Discrete Mathematics	3-4
or CPSC 284	Applied Discrete Mathematics	
MATH 224A	Multivariable Calculus	4
STAT 180	Introduction to Statistics	3
STAT 280	Statistical Methods	3
MATH 300	Linear Algebra	4
STAT 381	Probability and Statistical Inference	3
MATH 312	Differential Equations	3
MATH 351A	Numerical Analysis I	3
STAT 320	Applied Regression Analysis	3
Select an additional 6 credits from courses at the 400 level from the list below, one of which must be MATH 411, MATH 421, MATH 453, or MATH 481.		6
Select 3 additional credits from MATH 352A, MATH 411, MATH 421, MATH 453, MATH 481, MATH 491, STAT 361, STAT 382, STAT 420, STAT 461, STAT 491, ECON 462, PSYC 360 [1]		3
Total Credits		**46-47**

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.

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 Elective		3
General Education Courses or Electives		9
	Credits	**16**

Junior		
Fall		
MATH 312	Differential Equations	3
STAT 381	Probability and Statistical Inference	3
General Education Courses or Electives		9
	Credits	**15**
Spring		
STAT 320	Applied Regression Analysis	3
400-Level Math Elective		3
General Electives		9
	Credits	**15**
Senior		
Fall		
MATH 351A	Numerical Analysis I	3
400-Level Math Elective		3
General Electives		9
	Credits	**15**
Spring		
MATH 305	Mathematics as a Profession	1
400-Level Math Elective		
General Electives		13
	Credits	**14**
	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