

## HONORS AT UMW

The University Honors Program offers highly motivated and advanced students the opportunity to engage in rigorous honors-designated coursework, interdisciplinary seminars, internships, extended research and creative projects, and community service. Most students entering the honors program will do so upon admission to the university. Admission is based on screenings by the admissions office including consideration of high school GPA, standardized test scores, and rigor of high school curriculum. The program offers small courses that develop students' intellectual potential.

In addition to the honors program, students may pursue honors in their own disciplines. Discipline-specific honors projects are often presented at professional conferences or published in journals, and make our graduates highly attractive to graduate and professional programs.

## INTERNSHIPS

UMW students are encouraged to complete internships before graduation. Internships allow students to gain professional work experience and test out career fields. Students can develop or enhance skills and knowledge, build professional contacts, and manage the multitude of responsibilities that come with a career. The UMW Office of Academic and Career Services (OACS) maintains a database of internships. The office is open from 8 a.m. to 5 p.m. Monday through Friday. Students can call OACS at 540/654-1022 or stop by Room 308, Lee Hall, to make an appointment. Students can also send email to: [casv@umw.edu](mailto:casv@umw.edu).

## STUDENT ORGANIZATIONS AT UMW

WITH MORE THAN 120 STUDENT CLUBS AND ORGANIZATIONS, UMW OFFERS ABUNDANT OPPORTUNITIES TO GET INVOLVED. SOME CLUBS AND ORGANIZATIONS ARE DESIGNED FOR STUDENTS PURSUING DEGREES IN MATH, SCIENCE, OR ADVANCED TECHNOLOGY:

- Biology Club
- Ecology Club
- Mathematical Association of America
- MedLife Club
- Pre-Medical/Pre-Dental Club
- Pre-Vet Club
- Society of Physics Students/Sigma Pi Sigma (physics honors society)
- ACM Computer Science Club



## RESEARCH OPPORTUNITIES AT UMW

The undergraduate research program is one of UMW's strongest assets and is a top priority for our students. Through immersion in the creative process and intensive individual mentorship with faculty, research outside of the classroom uniquely prepares our students for the challenges of graduate study and the professional world. Last academic year, 130 students from 14 different academic departments received \$123,000 in undergraduate research grants from UMW. Students received awards, enabling them to conduct a wide range of projects. Undergraduate research grants may be requested to:

- support research-related supplies, services, and materials costs,
- support research-related travel (such as field studies or trips to primary source collections), or
- support travel to professional meetings and conferences where students present the results of their research.

The Summer Science Institute offers UMW science majors the opportunity to participate in a summer-long research project supervised by a faculty member. The institute runs from mid-May through mid-July, and selected students are provided room, board, and a stipend. In addition, each project is given an expense account. Participating faculty choose student participants each spring. The students work with their faculty member on a research project and participate in intensive science-related workshops and activities. All students present their research at a juried symposium upon the conclusion of the program.

To learn more about the Summer Science Institute, visit:

[research.umw.edu/summerscienceinstitute](https://research.umw.edu/summerscienceinstitute)



# STEM

Science, Technology,  
Engineering, and Mathematics



where great minds get to work

At the University of Mary Washington, we combine **STEM**-related academic programs with the best in **liberal arts education** so our graduates can become the **high-level thinkers** employers need to take on multidisciplinary roles. The expanding fields of science, technology, engineering, and math (STEM) continually need talented and technically adept professionals. To stay competitive in the **global economy** and to fuel the **innovation** needed to solve world problems, however, these individuals must also possess the ability to think critically, work in teams, and **communicate effectively**.

These attributes set **UMW science** and **technology** majors apart and make them **highly sought-after** by many of the top graduate schools in the nation. Recent graduates have been admitted to programs at Princeton, Harvard, Emory, Duke, Yale, Cornell, the University of Virginia, and Pennsylvania State University.

This brochure will introduce you to UMW degrees and programs within the fields of STEM. You will also find descriptions of work environments or careers that each degree may lead to. Regardless of the major you choose, the University of Mary Washington can help you meet your academic and professional goals.

## BIOLOGY

At UMW, biology majors have access to new spectrophotometers, thermocyclers, and centrifuges. Independent research students work with cutting-edge microarray technology, DNA sequencing, and other genome-wide approaches to biological questions. Students also work with faculty to learn electron microscopy, a rare opportunity among universities our size. Upon completion of the program, students possess the knowledge and skills to pursue advanced degrees in specialized areas such as biochemistry, bioinformatics, physiology, immunology, entomology, microbiology, and ecology. They also launch careers in life sciences research, biotechnology, conservation biology, teaching, medicine, dentistry, or allied health professions.



## ENVIRONMENTAL SCIENCES

The environmental science (ES) program at UMW is a rigorous science-based interdisciplinary program that comprises two majors: environmental science – natural science (ES-NS) and environmental science – social science (ES-SS). A distinctive feature of both majors is the emphasis on a strong background in the natural sciences: chemistry, biology, and geology. Many environmental sciences majors pursue graduate programs. Others capitalize on the interdisciplinary nature of the curriculum to prepare for science-related careers in teaching or in the management of environmental programs. Examples of environmental sciences careers include atmospheric science, geosciences, ecology, and hydrology.



## CHEMISTRY

The chemistry major at UMW places a strong emphasis on undergraduate research. Students are encouraged to participate in individual study, honors research, the Summer Science Research Institute, or National Science Foundation Research Experience for Undergraduates (NSF-REU) programs. Upon completion of this rigorous major, approved by the American Chemical Society, chemistry students pursue a variety of professional activities including graduate school. Many enter the workforce with companies such as Eli Lilly, Estee Lauder, Dow, and Wyeth/Pfizer, or work for government agencies such as NASA, the Naval Research Laboratory, the Drug Enforcement Agency, Dahlgren Naval Surface Warfare Center, and the National Institutes of Health.

## COMPUTER SCIENCE

Computer science majors at UMW can concentrate their studies in one of three tracks: traditional computer science (CS), computer information systems (CIS), or geographic information systems (GIS). Each is designed to provide students a rigorous, practical course of study that prepares them for graduate studies or immediate employment across the computer technology industry. Students completing this degree program pursue careers as software developers, hardware engineers, programmers, systems analysts, database and information security analysts, Web developers, and network architects. The department also offers two minors, computer science and data science. The minor in data science teaches principles and builds skills in the science of how and why we use data. This minor is offered in conjunction with the College of Business.

## GEOGRAPHY

In classrooms, laboratories, and internships, geography majors at UMW use multidisciplinary approaches to understanding the human and environmental processes and patterns that make up our world. At the same time they learn valuable communication skills and geospatial technologies that prepare them for a wide range of careers. The program's nature and society emphasis, one of three in the major, focuses on the physical and social processes that shape the natural environment and affect human life. This area includes courses in landforms, climate change, and human-environment relationships. In addition, the department's certificate in geographic information science (GIS) includes courses in spatial analysis, remote sensing, and programming.

## GEOLOGY

Students at UMW are drawn to the geology major because geology encompasses many different topics, including the Earth's origin and evolution, the processes that shape its surface, and dynamic events such as earthquakes, floods, and volcanic eruptions. Geologists apply principles from chemistry, physics, biology and mathematics in their quest to understand our planet. UMW's geology major provides a solid foundation for students wishing to pursue careers in industry, environmental consulting, government, teaching, and many other fields. Our major also prepares students for graduate study at top-tier research universities.

## INTERDISCIPLINARY SCIENCE STUDIES

The interdisciplinary science studies major at UMW prepares students to become science educators. Although designed primarily for those who desire to teach at the elementary level, it also provides preparation for those who are interested in becoming science educators for museums, nature centers, aquariums, zoos, and similar organizations. Methods, approaches, and practices involved in teaching science to elementary-age children are provided through coursework in UMW's School of Education. Students enrolled in the interdisciplinary science studies major must also enroll in the undergraduate education coursework required for students enrolled in the five-year master of science in elementary education program.



## MATHEMATICS

Mathematics majors at UMW work in a broad range of topics – from pure areas like analysis and algebra to applied areas like mathematical modeling and information theory. Small classes engage students and provide ample interaction with our expert faculty. Advanced students may work on original mathematics, present their work at professional meetings, and even have their work published. Career opportunities for a mathematician trained in numerical techniques, modeling, applied analysis, or statistics are very promising. This is due to the extensive application of mathematical modeling via computer simulation in physics, chemistry, space technology, economics, business management, finance, statistical analysis, operations research, medical research, and environmental science.

## PHYSICS

Physics majors at UMW are intellectually curious students who seek to understand fundamental laws of the physical universe. Many students pursue graduate studies immediately upon completion of the program. Others pursue more immediate careers in fields such as acoustics, chemical physics, fluid dynamics, geophysics, low-temperature physics, medical physics, materials science, optics, particle physics, physics education, plasma physics, solid state physics, spectroscopy, and vacuum physics.