

## BIOLOGY

<http://cos.gmu.edu/academics/undergraduate/majors/biology>

### Name and description of the field

Biology is the study of living organisms and vital processes. Traditionally Biology was divided into botany, microbiology, and zoology. But greatly expanded biological knowledge has demanded focus on smaller areas. For example, zoologists specialize by concentrating their studies on closely related groups such as insects (entomology), amphibians and reptiles (herpetology), mammals (mammalogy), or on aspects common to many groups such as behavior, anatomy, and physiology (internal functions). Likewise botanists study hereditary relationships among plants (taxonomy), plant physiology or structure (morphology). On a smaller scale microbiologists specialize in bacteria, viruses, or fungi (mycology). Other biologists delve into processes that involve whole organisms (cell biology, genetics, developmental biology, evolution and ecology) or particular environments such as lakes and streams, wetlands, estuaries, oceans, forests or grasslands. Students in the Biology programs at George Mason University are required to develop a background in the core areas of cell biology, animal biology, plant biology, microbiology, genetics and ecology as well as in chemistry, physics and mathematics.

### What special skills or abilities are needed to succeed in this major?

As is true of all sciences, biology requires and promotes development of manual, verbal, analytical and quantitative skills and a substantial level of self-discipline. Anyone entering the field should be curious, creative, and have an intense interest in some aspect of biology.

### Is it possible to minor in Biology?

Students may complete a minor in Biology with 19-20 hours of biology course work consisting primarily of those required for the Biology major. The Biology Department also offers a minor in Bioinformatics in cooperation with the Department of Bioinformatics and Computational Sciences.

### If both B.A. and B.S. degrees are offered, what are the differences in career/graduate school opportunities?

The Bachelor of Arts (B.A.) degree program is designed to provide students with a broad-based general education while pursuing a major in Biology. Such a program permits students to demonstrate an interest and competence in the liberal arts. The Bachelor of Science (B.S.) degree program has fewer general education requirements than the B.A. program but requires a greater number of courses in biology and other sciences. Either the B.A. or the B.S. degree provides a sound basis for graduate studies in numerous fields. Other degree programs available to our students include a B.S. in Biology with a specialization in biotechnology, microbiology, molecular, or environmental and conservation biology and a B.S. in Medical Technology.

In order to define their professional goals and design a program to realize those goals, students should consult with professors, Career Services, professionals in the specialty of interest, and graduate school admissions representatives in order to choose electives that strengthen their programs. Biology graduates continue their education in many professional or academic specializations including:

Dentistry	Biomedical Sciences	Botany
Education	Biomedical Engineering	Cell Biology
Environmental Sciences	Biochemistry	Developmental Biology
Law	Fisheries Biology	Genetics
Medicine	Horticulture	Microbiology
Medical Technology	Marine Biology	Molecular Biology
Pharmacy	Wildlife Management	Zoology/Entomology
Physical Therapy	Biochemistry	Veterinary Medicine
Genomics	Bioinformatics	

### What are recent graduates doing?

In addition to pursuing graduate study for the professional and academic fields listed above, graduates are following varied careers in consulting firms, laboratories, and government agencies.

**Specific organizations include:** Ryan, Sharkey & Crutchfield, LLP, Pyramid Systems, American Type Culture Collection, Dr. A. Garrett Gouldin office, E-Park, Independent Group Home Living, Washington Hospital Center, Northern Virginia Regional Park Authority, Smithsonian Institution Department of Entomology, Walter Reed Hospital, WRAIR via The George Washington University, George Mason University Child Development Center, Dr. John Karickhoff office, Commonwealth Psychological Associates, Maxsa Innovations, Saint Johns community services, Sheraton Suits, Henry M. Jackson Foundation, Virginia Hospital Center, David Powers, Dominion pet center, AFAH, Martins Point Veterinary Hospital

**Positions include:** Administrative Assistant, Biologist, Bus attendant, Dental Assistant, Direct Care Counselor, Emergency Department Technician, Gardener, Independent Contractor, Lab assistant, Laboratory Technician, Lead Teacher, Medical insurance clerk, Office Manager, Office Clerk, Residential Counselor, Sr. Research Assistant, Unit Secretary, Vet Tech Manager

### Sample Descriptions of Jobs Advertised for Candidates with a Bachelor's Degree

### Consulting

## EXPLORING MAJORS

Energy and environmental consulting firm is seeking entry-level candidates to work on environmental and renewable energy consulting projects. Individual will assist in analyzing environmental policy, renewable energy, and industrial ecology projects. Position requires strong oral and written communications skills including research, spreadsheet development and database management. Ability to use the internet is desirable.

### Nonprofit Environmental Organization

Degree with environmental experience, administrative experience and good organizational and communication skills. Commitment to wildlife conservation. Good writing and editing. High level of computer literacy with advanced knowledge of word processing. Duties: implement program plans; assist in development of annual budget; respond to letters from members; research conservation issues; coordinate rallies.

### Research Laboratory Technician

Molecular Hematopoiesis Laboratory at medical center is seeking a laboratory technician for cutting-edge studies of the molecular regulation of blood cell formation with a focus on megakaryocyte and platelet production. BA/BS in biology, biochemistry or chemistry is required; advanced degrees desirable. Experience in molecular biologic techniques, DNA manipulation, RNA analysis, tissue culture, and animal work highly desirable.

### Laboratory Position

Regional water company seeks laboratory technician to collect and analyze bacteriological samples; maintain state certification for the lab; collect and analyze other samples as needed for Safe Drinking Water Act compliance. Must maintain high quality standards with little supervision. Post also requires customer service skills: patience and good interpersonal skills to resolve customer problems. Prefer bachelor's degree with biology and chemistry course work focusing on bacteria.

### Botanist

The U.S. Department of the Interior in Luray, Virginia, seeks an individual to maintain existing vegetation monitoring protocols and develop new protocols for threatened and endangered species and other species of concern. Handle plant protection and data management collection; conduct data analysis; prepare and maintain botanical specimens and records; test and implement flora monitoring protocols and apply strict quality control measures to assure data credibility. Requires bachelor's degree in botany and 1 year related experience.

### Resources for further information:

A key element in effective decision making is having sufficient information about the major or career being explored. Sources of information include people in the field, professional associations relating to the field, faculty and your career services counselor. Below are additional resources to aid in exploration:

**Printed Resources:** (Career Services Library, 348 SUB1) - <http://careers.gmu.edu/careerlibrary/wheretostart/biol.pdf>

**Online Resources:** <http://careers.gmu.edu/onlineresources/biol.htm>

**Science Related Job/Internship Postings:** <http://cos.gmu.edu/students/careerservices> & <http://www.aaas.org/careercenter/>

**Networking Resource:** <http://www.mentornet.net/>

**Pre-Health Resources:** <http://prehealth.gmu.edu/> & <http://explorehealthcareers.org/en/index.aspx#> & <http://www.pubinfo.vcu.edu/ahec/>

### Professional Associations:

- **Mason Student Clubs/Orgs/Societies Science and Technology Umbrella** - [http://sa.gmu.edu/student\\_orgs/orgs.php#stu](http://sa.gmu.edu/student_orgs/orgs.php#stu)

### What kinds of experiences are recommended to explore careers related to this major?

The Department of Molecular and Microbiology and University Career Services receive notices of part-time positions that offer practical experience. Check the following resources:

- Bulletin boards on the third floor of David King Hall
- See University Career Services online and printed resources cited above.

### Whom should students contact for further information?

Biology and Allied Health Advising Center 3001 David King Hall 703-993-1051 or 1050	Dr. Emil Chuck Health Professions Advisor Science and Technology I Room 209 <a href="mailto:echuck@gmu.edu">echuck@gmu.edu</a>	Academic Advising Center 304 SUB I 703-993-2470	Gemma Scallon University Career Services 348 SUB I 703-993-2370
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