

BIOLOGY, BA

Banner Code: SC-BA-BIOL

Academic Advising

Exploratory Hall, Room 1200
Fairfax Campus

Website: biology.gmu.edu/academics/degree-programs/

The Biology, BA provides a sound liberal arts education with substantial experience in quantitative and analytical thought, along with preparation for related professions. The department provides the strong background necessary for not only for graduate study in the life sciences, but also enables students to develop careers in a wide variety of disciplines, including secondary school teaching, environmental management, microbiology, molecular biology, biotechnology, genetics, wildlife management, fisheries biology, and marine science. Furthermore, our curriculum prepares students for careers in the health sciences including medicine, dentistry, veterinary science, and related allied health disciplines.

Admissions & Policies

Admissions

University-wide admissions policies can be found in the Undergraduate Admissions Policies section of this catalog.

To apply for this program, please complete the George Mason University Admissions Application (<https://www2.gmu.edu/admissions-aid/apply-now>).

Policies

Students must fulfill all Requirements for Bachelor's Degrees, including the Mason Core. Students in this bachelor's program must also complete the additional College Requirements for the BA Degree (see Requirements).

The writing intensive requirement is fulfilled by BIOL 308 Foundations of Ecology and Evolution.

Important information and departmental policies are listed with the Department of Biology.

For policies governing all undergraduate programs, see AP.5 Undergraduate Policies.

Important Program Requirements

Students must complete degree requirements with:

- A minimum GPA of 2.00 in the 32 credits of BIOL courses listed in degree program
- A minimum GPA of 2.00 in the supporting courses listed in degree program

Additionally:

- Students may apply no more than 4 credits of BIOL 103 Introductory Biology I (Mason Core) or BIOL 104 Introductory Biology II (Mason Core) toward elective credit (or equivalent transfer credit at the 100 to

200-level) if taken before the successful completion of BIOL 213 Cell Structure and Function (Mason Core).

- Biology majors must earn a minimum grade of 'C' in all of the biology core courses. A grade of 'C' or better must be earned in BIOL 213 Cell Structure and Function (Mason Core) in order to advance to other core requirements.
- Students may repeat BIOL 213 Cell Structure and Function (Mason Core) once, but a second time only with permission of the Department of Biology.
- Students may **not** count BIOL 124 Human Anatomy and Physiology and/or BIOL 125 Human Anatomy and Physiology toward any biology major requirement.
- Students who take BIOL 310 Biodiversity and BIOL 330 Biodiversity Lab and Recitation may **not** count BIOL 303 Animal Biology and/or BIOL 304 Plant Biology toward any biology major requirement.
- BIOL 308 Foundations of Ecology and Evolution meets the writing intensive requirement for this major.
- BIOL 493 Honors Research in Biology, BIOL 495 Directed Studies in Biology, and BIOL 497 Special Problems in Biology do not satisfy the requirements of the BA degree which state that students must complete at least one upper division course that includes a laboratory. The courses do, however, count as non-laboratory electives.

Teacher Licensure

Students majoring in biology who wish to pursue a career teaching secondary school may consider applying for the Secondary Education – Biology (6-12) Undergraduate Certificate offered by the College of Education and Human Development as an option in seeking an initial Virginia teaching license. The certificate includes current endorsement and licensure coursework embedded within your major. Students apply to add this as a secondary program during their sophomore year and complete required content and education coursework leading to initial licensure in the state of Virginia within 120 credits.

Other routes to licensure include the Biology, BA or BS/Curriculum and Instruction, Accelerated MEd (Secondary Education Biology Concentration) or select traditional Master's programs. Please contact the undergraduate advisor in the College of Education and Human Development for more information.

Requirements

Degree Requirements

Total credits: minimum 120

Students should refer to the Admissions & Policies tab for specific policies related to this program.

Biology Core Courses

BIOL 213	Cell Structure and Function (Mason Core)	4
BIOL 214	Biostatistics for Biology Majors	4
BIOL 308	Foundations of Ecology and Evolution ¹	5
BIOL 310 & BIOL 330	Biodiversity and Biodiversity Lab and Recitation	5

BIOL 311	General Genetics	4
Total Credits		22

¹ Fulfills the writing intensive requirement.

Biology Electives

Complete 10 credits of additional biology courses ¹ 10

¹ Of which, at least 6 credits must be upper division, and at least one of these upper division courses must include a laboratory.

Chemistry

CHEM 211 & CHEM 213	General Chemistry I (Mason Core) and General Chemistry Laboratory I (Mason Core) (Natural Science course)	4
CHEM 212 & CHEM 214	General Chemistry II (Mason Core) and General Chemistry Laboratory II (Mason Core) (Natural Science course)	4
Total Credits		8

Math

Select one from the following: 3-6

MATH 111	Linear Mathematical Modeling (Mason Core) (Quantitative Reasoning courses)	or MATH 113 Analytic Geometry and Calculus I (Mason Core)
MATH 123 & MATH 124	Calculus with Algebra/Trigonometry, Part A and Calculus with Algebra/Trigonometry, Part B (Mason Core)	
Total Credits		3-6

Computer Science

Select one from the following: 3

CDS 130	Computing for Scientists (Mason Core) ¹	
Any course(s) that fulfills the Mason Core: Information Technology requirement		
Total Credits		3

¹ Recommended by the Department of Biology

Natural Science

Select 6-8 credits from the following Mason Core: Natural Science courses: 6-8

ASTR 103	Astronomy (Mason Core)	
ASTR 111	Introductory Astronomy: The Solar System (Mason Core)	
ASTR 113	Introductory Astronomy: Stars, Galaxies, and the Universe (Mason Core)	
GEOL 101	Introductory Geology I (Mason Core)	
GEOL 102	Introductory Geology II (Mason Core)	
PHYS 160	University Physics I (Mason Core)	
PHYS 243	College Physics (Mason Core)	
PHYS 245	College Physics (Mason Core)	
PHYS 260	University Physics II (Mason Core)	
Total Credits		6-8

Note for Students Expecting to Enter Graduate or Professional School

Students expecting to enter graduate or professional school are strongly encouraged to complete:

MATH 113 & MATH 114	Analytic Geometry and Calculus I (Mason Core) and Analytic Geometry and Calculus II	8
CHEM 313 & CHEM 315	Organic Chemistry I and Organic Chemistry Lab I	5
CHEM 314 & CHEM 318	Organic Chemistry II and Organic Chemistry Lab II	5
PHYS 243 & PHYS 244	College Physics (Mason Core) and College Physics Lab (Mason Core)	4
PHYS 245 & PHYS 246	College Physics (Mason Core) and College Physics Lab (Mason Core)	4

Mason Core and Elective Requirements

In order to meet a minimum of 120 credits, this degree requires an additional 63-68 credits, which may be applied toward any remaining Mason Core (<http://catalog.gmu.edu/content.php?catoid=29&navoid=6253>) requirements (outlined below), Requirements for Bachelor's Degrees (<http://catalog.gmu.edu/content.php?catoid=29&navoid=6151/#undergradrequirements>), College Requirements for the BA Degree (outlined below), and elective courses. Students are strongly encouraged to consult with their advisors to ensure that they fulfill all requirements.

Mason Core

Note: Some Mason Core requirements may already be fulfilled by the major requirements listed above. Students are strongly encouraged to consult their advisors to ensure they fulfill all remaining Mason Core requirements.

Code	Title	Credits
Foundation Requirements		
	Written Communication	6
	Oral Communication	3
	Quantitative Reasoning	3
	Information Technology	3-7
Core Requirements		
	Arts	3
	Global Understanding	3
	Literature	3
	Natural Science	7
	Social and Behavioral Sciences	3
	Western Civilization/World History	3
Synthesis/Capstone Requirement ¹		
	Synthesis/Capstone	3
Total Credits		40

¹ minimum 3 credits

College Requirements for the BA Degree

In addition to the program requirements and the Mason Core requirements, students pursuing a BA degree must complete the coursework below. Except where expressly prohibited, a course used to fulfill this college-level requirement may also be used simultaneously

to satisfy other requirements such as Mason Core requirements, other college-level requirements, or requirements for the major. In some cases, the requirements listed below may be superseded by requirements of the degree program and the Mason Core.

Philosophy or Religious Studies

Code	Title	Credits
Select 3 credits from the following:		3
PHIL ¹		
RELI		

¹ PHIL 323 Classical Western Political Theory and PHIL 324 Modern Western Political Theory may not be used to fulfill this requirement.

Social and Behavioral Sciences

Choose one approved Mason Core: Social and Behavioral Sciences course in addition to the Mason Core-required course for a total of 6 credits. The two courses used to fulfill the combined college-level and university requirements must be from different disciplines.

This requirement may be fulfilled by completing any course in ANTH, CRIM, ECON, GOVT, HIST¹, LING, PSYC, or SOCI, and the following GGS courses:

Code	Title	Credits
Select any course from the disciplines above or select from the following GGS courses:		3
GGS 101	Major World Regions (Mason Core)	
GGS 103	Human Geography (Mason Core)	
GGS 110	Introduction to Geoinformation Technologies	
GGS 301	Political Geography	
GGS 303	Geography of Resource Conservation (Mason Core)	
GGS 304	Population Geography (Mason Core)	
GGS 305	Economic Geography	
GGS 306	Urban Geography	
GGS 315	Geography of the United States	
GGS 316	Geography of Latin America	
GGS 320	Geography of Europe	
GGS 325	Geography of North Africa and the Middle East	
GGS 330	Geography of the Soviet Succession States	
GGS 357	Structures in Urban Governance and Planning	
GGS 380	Geography of Virginia	
Total Credits		3

¹ HIST 100 History of Western Civilization (Mason Core) and HIST 125 Introduction to World History (Mason Core) may not be used to fulfill this requirement.

Natural Science

Choose one credit in addition to the Mason Core: Natural Science requirement for a total of 8 credits. This combined college-level and university requirement must be fulfilled by completing two of any approved Mason Core: Natural Science courses that include a laboratory experience¹.

Code	Title	Credits
Select an additional Mason Core Natural Science course		1

¹ BIOL 124 Human Anatomy and Physiology and BIOL 125 Human Anatomy and Physiology may not be used to fulfill this requirement.

Foreign Language

Intermediate-level proficiency in one foreign language is required¹. This requirement may be fulfilled by completing a course in a foreign language numbered 202, 209, or 210 (or higher-level courses taught in the language).

Code	Title	Credits
Select a foreign language course numbered 202, 209, 210, or higher if a waiver isn't applicable		0-3

¹ Students may be eligible for a waiver of this requirement if they are already proficient in a second language or if they have received a satisfactory score on an approved proficiency test. Additional information on waivers can be found via the college's Office of Academic and Student Affairs (<https://cos.gmu.edu/uaa>).

Non-Western Culture

Choose one approved Non-Western Culture Requirement¹ course in addition to the course used to fulfill the Mason Core: Global Understanding requirement. A course used to fulfill the Mason Core: Global Understanding requirement may not be simultaneously used to satisfy this college-level requirement. However, a course used to fulfill this requirement may be used simultaneously to fulfill any *other* requirements (Mason Core requirements, college-level requirements, or requirements for the major).

Code	Title	Credits
Select 3 credits from approved Non-Western Culture courses if a waiver isn't applicable:		0-3
ANTH 114	Introduction to Cultural Anthropology (Mason Core)	3
ANTH 300	Civilizations	3
ANTH 301	Native North Americans	3
ANTH 302	Peoples and Cultures of Latin America (Mason Core)	3
ANTH 303	Peoples and Cultures of the Andes	3
ANTH 306	Peoples and Cultures of Island Asia (Mason Core)	3
ANTH 307	Ancient Mesoamerica (Mason Core)	3
ANTH 308	Peoples and Cultures of the Middle East (Mason Core)	3
ANTH 309	Peoples and Cultures of India (Mason Core)	3
ANTH 313	Myth, Magic, and Mind (Mason Core)	3
ANTH 314	Zombies	3
ANTH 316	Peoples and Cultures of the Caribbean (Mason Core)	3
ANTH 323	Digging and Dealing in the Dead: Ethics in Archaeology	3
ANTH 330	Peoples and Cultures of Selected Regions: Non-Western	3
ANTH 332	Cross-Cultural Perspectives on Globalization (Mason Core)	3

ANTH 381	Medical Anthropology	3	HIST 252	Survey of East Asian History (Mason Core)	3
ANTH 383	Cities of the Global South	3	HIST 261	Survey of African History (Mason Core)	3
ANTH 396	Issues in Anthropology: Social Sciences (Mason Core)	3	HIST 262	Survey of African History (Mason Core)	3
ARAB 360	Topics in Arabic Cultural Production	3	HIST 271	Survey of Latin American History (Mason Core)	3
ARAB 420	Survey of Arabic Literature	3	HIST 272	Survey of Latin American History (Mason Core)	3
ARAB 440	Topics in Arabic Religious Thought and Texts (Mason Core)	3	HIST 281	Survey of Middle Eastern Civilization (Mason Core)	3
ARTH 203	Survey of Asian Art (Mason Core)	3	HIST 282	Survey of Middle Eastern Civilization (Mason Core)	3
ARTH 204	Survey of Latin American Art (Mason Core)	3	HIST 326	Stalinism	3
ARTH 206	Survey of African Art (Mason Core)	3	HIST 327	The Soviet Union and Russia Since World War II	3
ARTH 318	Art and Archaeology of Ancient Egypt	3	HIST 328	Rise of Russia (Mason Core)	3
ARTH 319	Art and Archaeology of the Ancient Near East (Mason Core)	3	HIST 329	Modern Russia and the Soviet Union (Mason Core)	3
ARTH 320	Art of the Islamic World (Mason Core)	3	HIST 353	History of Traditional China	3
ARTH 382	Arts of India (Mason Core)	3	HIST 354	Modern China	3
ARTH 383	Arts of Southeast Asia (Mason Core)	3	HIST 356	Modern Japan (Mason Core)	3
ARTH 384	Arts of China (Mason Core)	3	HIST 357	Postwar Japan (Mason Core)	3
ARTH 385	Arts of Japan (Mason Core)	3	HIST 358	Post-1949 China (Mason Core)	3
ARTH 386	The Silk Road (Mason Core)	3	HIST 360	History of South Africa (Mason Core)	3
ARTH 482	RS: Advanced Studies in Asian Art	3	HIST 364	Revolution and Radical Politics in Latin America (Mason Core)	3
CHIN 318	Introduction to Classical Chinese (Mason Core)	3	HIST 365	Conquest and Colonization in Latin America (Mason Core)	3
CHIN 320	Contemporary Chinese Film	3	HIST 366	Comparative Slavery	3
CHIN 325	Major Chinese Writers (Mason Core)	3	HIST 367	History, Fiction, and Film in Latin America	3
DANC 118	World Dance (Mason Core)	3	HIST 387	Topics in Global History (Mason Core)	3-6
ECON 361	Economic Development of Latin America (Mason Core)	3	HIST 426	The Russian Revolution	3
ECON 362	African Economic Development (Mason Core)	3	HIST 460	Modern Iran (Mason Core)	3
FREN 451	Topics in Sub-Saharan Francophone Literature and Culture	3	HIST 461	Arab-Israeli Conflict	3
FREN 454	Topics in Caribbean Francophone Literature and Culture	3	HIST 462	Women in Islamic Society (Mason Core)	3
GGG 101	Major World Regions (Mason Core)	3	HIST 465	The Middle East in the 20th Century	3
GGG 316	Geography of Latin America	3	JAPA 310	Japanese Culture in a Global World (Mason Core)	3
GGG 325	Geography of North Africa and the Middle East	3	JAPA 340	Topics in Japanese Literature (Mason Core)	3
GGG 330	Geography of the Soviet Succession States	3	KORE 320	Korean Popular Culture in a Global World	3
GGG 399	Select Topics in GGS	3	MUSI 103	Musics of the World (Mason Core)	3
GOVT 328	Non-Western Political Theory	3	RELI 211	Religions of the West (Mason Core)	3
GOVT 332	Government and Politics of the Middle East and North Africa	3	RELI 212	Religions of Asia (Mason Core)	3
GOVT 333	Government and Politics of Asia	3	RELI 240	Death and the Afterlife in World Religions	3
GOVT 340	Central Asian Politics	3	RELI 272	Islam	3
GOVT 341	Chinese Foreign Policy	3	RELI 313	Hinduism (Mason Core)	3
GOVT 345	Islam and Politics	3	RELI 314	Chinese Philosophies and Religious Traditions	3
GOVT 432	Political Change and Social Development in Sub-Saharan Africa	3	RELI 315	Buddhism (Mason Core)	3
GOVT 433	Political Economy of East Asia	3	RELI 337	Mysticism: East and West	3
HIST 251	Survey of East Asian History (Mason Core)	3	RELI 365	Muhammad: Life and Legacy	3
			RELI 374	Islamic Thought (Mason Core)	3
			RELI 375	Qur'an and Hadith	3

RELI 379	Islamic Law, Society, and Ethics	3
RELI 387	Islam, Democracy, and Human Rights	3
RELI 490	Comparative Study of Religions (Mason Core)	3
RUSS 353	Russian Civilization (Mason Core)	3
RUSS 354	Contemporary Post-Soviet Life (Mason Core)	3

¹ Students who can document attendance at a native school in a non-western country for at least four years may request a waiver from this requirement through the CHSS Undergraduate Academic Affairs Office (<http://chssundergrad.gmu.edu>).

Honors

Honors in the Major

Admissions

Minimum requirements for invitation:

- GPA in biology courses must be 3.33 or better
- GPA in supporting requirements (math and other science) must be 3.00 or better
- Grade of 'B' or better in BIOL 213 Cell Structure and Function (Mason Core)

Students should apply for admission to the Honors Program during their first or second year at the university. Contact the Department of Biology for information on applying.

Retention Requirements

Students in honors biology must maintain a biology GPA of 3.33 or better and a supporting GPA of 3.00 or better from the time they have accumulated 30 hours and thereafter. Students who fall below this standard will be given a one semester probationary period in which to bring their GPA back up to the minimum standard.

Requirements to Graduate with Biology Honors

Students are required to take 6 to 8 credits in honors courses in BIOL including three semesters of BIOL 494 Honors Seminar in Biology or two semesters of BIOL 494 Honors Seminar in Biology and one semester of BIOL 493 Honors Research in Biology. BIOL 498 Research Seminar may count towards one of the semester requirements of BIOL 494 Honors Seminar in Biology. The GPA requirements are as follows:

- Minimum 3.33 GPA in honors biology courses
- Minimum 3.33 GPA in biology requirements
- Minimum 3.00 GPA in supporting requirements
- Minimum 3.00 GPA overall

Accelerated Master's

Biology, BA or BS/Curriculum and Instruction, Accelerated MEd (Secondary Education Biology concentration)

Overview

Highly-qualified undergraduates may be admitted to the bachelor's/accelerated master's program and obtain a BA or BS in Biology (degree without concentration) and an MEd in Curriculum and Instruction (concentration in secondary education biology) in an accelerated time-frame after satisfactory completion of 149 credits. See AP.6.7 Bachelor's/Accelerated Master's Degree for policies related to this program.

This accelerated option is offered jointly by the Biology Undergraduate Program and the Graduate School of Education.

Students in an accelerated degree program must fulfill all university requirements for the master's degree. For policies governing all graduate degrees, see AP.6 Graduate Policies.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in Graduate Admissions Policies. For information specific to this accelerated master's program, see Application Requirements and Deadlines (<https://cehd.gmu.edu/bachelors-accelerated-masters-program>).

Accelerated Option Requirements

Students must complete the following courses in their senior year:

Senior			
Fall Semester	Credits	Spring Semester	Credits
EDCI 573	3	EDCI 673	3
EDUC 672	3	EDRD 619	3
	6		6
Total Credits 12			

While undergraduate students, accelerated master's students are able to apply two of the courses listed above to both the bachelor's and master's degrees. These courses are considered advanced standing for the MEd. A minimum grade of B must be earned to be eligible to count as advanced standing. The other two courses are taken as reserve graduate credit and do not apply to the undergraduate degree. Early in their final undergraduate semester, students must submit the Bachelor's/Accelerated Master's Transition Form to the CEHD Admissions Office and specify which of the four courses are to be designated as advanced standing and reserve graduate credit.