The Biology, BA provides a sound liberal arts education with substantial experience in quantitative and analytical thought, along with preparation for related professions. The program 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 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 the degree requirements with:

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

Additionally:
- Students may apply no more than 4 credits of BIOL 103 Introductory Biology I (Mason Core) or BIOL 107 Intro Biology II Lecture (Mason Core) and BIOL 106 Introductory Biology II Laboratory (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 Curriculum and Instruction Undergraduate Certificate offered by the College of Education and Human Development as an option in seeking an initial Virginia teaching license.

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 213</td>
<td>Cell Structure and Function (Mason Core)</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 214</td>
<td>Biostatistics for Biology Majors</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 308</td>
<td>Foundations of Ecology and Evolution</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 310 &amp; BIOL 330</td>
<td>Biodiversity and Biodiversity Lab and Recitation</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 311</td>
<td>General Genetics</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total Credits</td>
<td>22</td>
</tr>
</tbody>
</table>
Biology Electives

Code | Title | Credits
--- | --- | ---
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

Code | Title | Credits
--- | --- | ---
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

Code | Title | Credits
--- | --- | ---
MATH 111 \& MATH 113 | Linear Mathematical Modeling (Mason Core) (Quantitative Reasoning courses) and Analytic Geometry and Calculus I (Mason Core) | 6
MATH 123 \& MATH 124 | Calculus with Algebra/Trigonometry, Part A and Calculus with Algebra/Trigonometry, Part B (Mason Core) | 8

Total Credits | 3-6

Computer Science

Code | Title | Credits
--- | --- | ---
CDS 130 | Computing for Scientists (Mason Core) \(^1\) | 3
Any course(s) that fulfills the Mason Core: Information Technology requirement | 3

Total Credits | 3

\(^1\) Recommended by the Department of Biology

Natural Science

Code | Title | Credits
--- | --- | ---
Select 6-8 credits from the following Mason Core: Natural Science courses: | 6-8
ASTR 103 | Astronomy (Mason Core) | 3
ASTR 111 | Introductory Astronomy: The Solar System (Mason Core) | 3
ASTR 113 | Introductory Astronomy: Stars, Galaxies, and the Universe (Mason Core) | 3
GEOL 101 | Introductory Geology I (Mason Core) | 3
GEOL 102 | Introductory Geology II (Mason Core) | 3
PHYS 160 | University Physics I (Mason Core) | 3
PHYS 243 | College Physics I (Mason Core) | 3
PHYS 245 | College Physics II (Mason Core) | 3

PHYS 260 | University Physics II (Mason Core) | 3

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:

Code | Title | Credits
--- | --- | ---
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 I (Mason Core) and College Physics Lab (Mason Core) | 4
PHYS 245 \& PHYS 246 | College Physics II (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 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 (ENGH 101) | 3
Oral Communication | 3
Quantitative Reasoning | 3
Information Technology and Computing | 3

Exploration Requirements

Arts | 3
Global Understanding | 3
Literature | 3
Natural Science | 3
Social and Behavioral Sciences | 3
Western Civilization/World History | 3

Integration Requirements

Written Communications (ENGH 302) | 3
Writing-Intensive \(^1\) | 3
Synthesis/Capstone \(^2\) | 3

Total Credits | 40
Most programs include the writing-intensive course designated for the major as part of the major requirements; this course is therefore not counted towards the total required for Mason Core.

Minimum 3 credits required.

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

Select 3 credits from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL</td>
<td>Classical Western Political Theory</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Modern Western Political Theory</td>
<td></td>
</tr>
</tbody>
</table>

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, HIST, LING, PSYC, or SOCI, and the following GGS courses:

Select 3 credits from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GGS 101</td>
<td>Major World Regions (Mason Core)</td>
<td>3</td>
</tr>
<tr>
<td>GGS 103</td>
<td>Human Geography (Mason Core)</td>
<td></td>
</tr>
<tr>
<td>GGS 110</td>
<td>Introduction to Geoinformation Technologies</td>
<td></td>
</tr>
<tr>
<td>GGS 301</td>
<td>Political Geography</td>
<td></td>
</tr>
<tr>
<td>GGS 303</td>
<td>Geography of Resource Conservation (Mason Core)</td>
<td></td>
</tr>
<tr>
<td>GGS 304</td>
<td>Population Geography (Mason Core)</td>
<td></td>
</tr>
<tr>
<td>GGS 305</td>
<td>Economic Geography</td>
<td></td>
</tr>
<tr>
<td>GGS 306</td>
<td>Urban Geography</td>
<td></td>
</tr>
<tr>
<td>GGS 315</td>
<td>Geography of the United States</td>
<td></td>
</tr>
<tr>
<td>GGS 316</td>
<td>Geography of Latin America</td>
<td></td>
</tr>
<tr>
<td>GGS 320</td>
<td>Geography of Europe</td>
<td></td>
</tr>
<tr>
<td>GGS 325</td>
<td>Geography of North Africa and the Middle East</td>
<td></td>
</tr>
<tr>
<td>GGS 330</td>
<td>Geography of the Soviet Succession States</td>
<td></td>
</tr>
<tr>
<td>GGS 357</td>
<td>Urban Planning</td>
<td></td>
</tr>
<tr>
<td>GGS 380</td>
<td>Geography of Virginia</td>
<td></td>
</tr>
</tbody>
</table>

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 experience.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Select an additional Mason Core Natural Science course</td>
<td>1</td>
</tr>
</tbody>
</table>

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 required.

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).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Select a foreign language course numbered 202, 209, 210, or higher if a waiver isn't applicable</td>
<td>0-3</td>
</tr>
</tbody>
</table>

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 Requirement 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).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Select 3 credits from approved Non-Western Culture courses if a waiver isn't applicable:</td>
<td>0-3</td>
</tr>
</tbody>
</table>

1 HIST 125 Introduction to World History (Mason Core) may not be used to fulfill this requirement.
ANTH 314 Zombies
ANTH 316 Peoples and Cultures of the Caribbean (Mason Core)
ANTH 323 Digging and Dealing in the Dead: Ethics in Archaeology
ANTH 330 Peoples and Cultures of Selected Regions: Non-Western
ANTH 332 Cross-Cultural Perspectives on Globalization (Mason Core)
ANTH 381 Medical Anthropology
ANTH 383 Cities of the Global South
ANTH 396 Issues in Anthropology: Social Sciences (Mason Core)
ARAB 360 Topics in Arabic Cultural Production
ARAB 420 Survey of Arabic Literature
ARAB 440 Topics in Arabic Religious Thought and Texts (Mason Core)
ARTH 203 Survey of Asian Art (Mason Core)
ARTH 204 Survey of Latin American Art (Mason Core)
ARTH 206 Survey of African Art (Mason Core)
ARTH 318 Art and Archaeology of Ancient Egypt
ARTH 319 Art and Archaeology of the Ancient Near East (Mason Core)
ARTH 320 Art of the Islamic World (Mason Core)
ARTH 382 Arts of India (Mason Core)
ARTH 383 Arts of Southeast Asia (Mason Core)
ARTH 384 Arts of China (Mason Core)
ARTH 385 Arts of Japan (Mason Core)
ARTH 386 The Silk Road (Mason Core)
ARTH 482 RS: Advanced Studies in Asian Art
CHIN 318 Introduction to Classical Chinese (Mason Core)
CHIN 320 Contemporary Chinese Film
CHIN 325 Major Chinese Writers (Mason Core)
DANC 118 World Dance (Mason Core)
ECON 361 Economic Development of Latin America (Mason Core)
ECON 362 African Economic Development (Mason Core)
FREN 451 Topics in Sub-Saharan Francophone Literature and Culture
FREN 454 Topics in Caribbean Francophone Literature and Culture
GGS 101 Major World Regions (Mason Core)
GGS 316 Geography of Latin America
GGS 325 Geography of North Africa and the Middle East
GGS 330 Geography of the Soviet Succession States
GGS 399 Select Topics in GGS
GOVT 328 Global Political Theory
GOVT 332 Government and Politics of the Middle East and North Africa
GOVT 333 Government and Politics of Asia
GOVT 338 Government and Politics of Russia
GOVT 340 Central Asian Politics
GOVT 341 Chinese Foreign Policy
GOVT 345 Islam and Politics
GOVT 433 Political Economy of East Asia
HIST 251 Survey of East Asian History (Mason Core)
HIST 252 Survey of East Asian History (Mason Core)
HIST 261 Survey of African History (Mason Core)
HIST 262 Survey of African History (Mason Core)
HIST 271 Survey of Latin American History (Mason Core)
HIST 272 Survey of Latin American History (Mason Core)
HIST 281 Survey of Middle Eastern Civilization (Mason Core)
HIST 282 Survey of Middle Eastern Civilization (Mason Core)
HIST 326 Stalinism
HIST 327 The Soviet Union and Russia Since World War II
HIST 328 Rise of Russia (Mason Core)
HIST 329 Modern Russia and the Soviet Union (Mason Core)
HIST 353 History of Traditional China
HIST 354 Modern China
HIST 356 Modern Japan (Mason Core)
HIST 357 Postwar Japan (Mason Core)
HIST 358 Post-1949 China (Mason Core)
HIST 360 History of South Africa (Mason Core)
HIST 364 Revolution and Radical Politics in Latin America (Mason Core)
HIST 365 Conquest and Colonization in Latin America (Mason Core)
HIST 366 Comparative Slavery
HIST 367 History, Fiction, and Film in Latin America
HIST 387 Topics in Global History (Mason Core)
HIST 426 The Russian Revolution
HIST 460 Modern Iran (Mason Core)
HIST 461 Arab-Israeli Conflict
HIST 462 Women in Islamic Society (Mason Core)
HIST 465 The Middle East in the 20th Century
JAPA 310 Japanese Culture in a Global World (Mason Core)
JAPA 340 Topics in Japanese Literature (Mason Core)
KORE 320 Korean Popular Culture in a Global World
MUSI 103 Musics of the World (Mason Core)
RELI 211 Religions of the West (Mason Core)
RELI 212 Religions of Asia (Mason Core)
RELI 240 Death and the Afterlife in World Religions
RELI 272 Islam
RELI 313 Hinduism (Mason Core)
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 toward 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 timeframe 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.

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:

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Credits</th>
<th>Spring Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDCI 573</td>
<td>3</td>
<td>EDCI 673</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 672</td>
<td>3</td>
<td>EDRD 619</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

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.