Freshman Biology Orientation Packet

Checklist of graduation requirements for BS in Biology (Catalog year 2024-2025)

All undergraduate students must graduate with a **minimum** of 120 credits (atleast 45 credit must be from 300 or 400 level courses) and fulfill all requirements within their majors.

	Course number and Title or Requirement	Credits	
Core Foundation (6 credits)	ENGH101 Composition	3	
	COMM101 Fundamentals of Communication	3	
Core Exploration (15 credits)	Fine arts	3	
	HIST125 Global history	3	
	Global understanding	3	
	Literature	3	
	Social and Behavioral sciences	3	
Core Integration (6 credits)	ENGH302 Advanced composition	3	
	Synthesis or Capstone Experience Requirement	3	
Biology core (24 credits)	BIOL103 Survey of Cell and Molecular Biology	3	
	BIOL214 Biostatistics	4	
	BIOL213 Cell Structure and Function	4	
	BIOL300 Biodiversity	4	
	BIOL311 General Genetics	4	
	BIOL308 Foundations of Ecology and Evolution (WI)	5	
Supporting coursework for Biology (31-39 credits)	Quantitative reasoning/Math options (choose 1): MATH111 Linear math modeling (4 credits) MATH123 and 124 Calculus with Algebra/Trig Parts A and B (6 credits)* MATH113 Analytic Geometry and Calculus (4 credits)*	4-6	
	CHEM211 and 213 General chemistry I lecture and lab	4	
	CHEM212 and 214 General chemistry II lecture and lab	4	
	CHEM313 and 315 Organic chemistry I lecture and lab	5	
	Additional science requirement options (choose 1): CHEM314 and 318 Organic chemistry II lecture and lab (5 credits) Upper-level chemistry elective (atleast 3 credits- can't be CHEM314) GEOL101/103 Physical geology & GEOL102/104 Historical Geology (8 credits)	3-8	
	PHYS243 and 244 College physics I lecture, recitation, and lab	4	
	PHYS245 and 246 College physics II lecture, recitation, and lab	4	
	CDS130 or any IT Mason core course	3-4	

*Any calculus course would require taking a math placement test.

Biology Electives (20 credits)

- Need 20 credits biology elective coursework (**maximum** of 5 credits may be lower level)
- Upper-level biology electives= BIOL courses that have a course number that is 300 or 400 level
- BIOL courses that are ***NOT*** electives = BIOL301, BIOL300, BIOL311, and BIOL308
- Must take atleast 2 upper-level courses that have an approved lab

Available concentrations (determine what biology electives you should take- not a requirement for Biology majors):

Biotechnology & Molecular biology
Microbiology
Environmental & Conservation Biology
Biopsychology
Bioinformatics

Non-science General electives (10-18 credits)

Take as many more credits will be needed to have a minimum of 120 credits at the time of graduation.

Checklist of graduation requirements for BA in Biology

All undergraduate students must graduate with a **minimum** of 120 credits (atleast 45 credit must be from 300 or 400 level courses) and fulfill all requirements within their majors.

	Course number and Title or Requirement	Credits	
Core Foundation (6 credits)	ENGH101 Composition	3	
	COMM101 Fundamentals of Communication	3	
Core Exploration (15 credits)	Fine arts	3	
	HIST125 Global history	3	
	Global understanding	3	
	Literature	3	
	Social and Behavioral sciences	3	
Core Integration (6 credits)	ENGH302 Advanced composition	3	
	Synthesis or Capstone Experience Requirement	3	
COS- specific requirements (6-18 credits)	Beginner foreign language coursework* (if needed)	6	
	Intermediate foreign language coursework* (if needed)	6	
	2 additional courses from two different categories of Mason core Exploration courses	6	
Biology core (24 credits)	BIOL103 Survey of Cell and Molecular Biology	3	
	BIOL214 Biostatistics	4	
	BIOL213 Cell Structure and Function	4	
	BIOL300 Biodiversity	4	
	BIOL311 General Genetics	4	
	BIOL308 Foundations of Ecology and Evolution (WI)	5	
Supporting coursework for Biology (21-24 credits)	Quantitative reasoning/Math options (choose 1): MATH111 Linear math modeling (4 credits) MATH123 and 124 Calculus with Algebra/Trig Parts A and B (6 credits)* MATH113 Analytic Geometry and Calculus (4 credits)*	4-6	
	CHEM211 and 213 General chemistry I lecture and lab	4	
	CHEM212 and 214 General chemistry II lecture and lab	4	
	Additional science requirement options (choose 2): ASTR103 Astronomy — ASTR111 The Solar system GEOL101 Physical geology — GEOL102 Historical geology PHYS243 College physics I — PHYS244 College physics II	6	
	CDS130 or any IT Mason core course	3-4	

*Any calculus course would require taking a math placement test.

Biology Electives (10 credits)

- Need atleast 10 credits biology elective coursework (**maximum** of 4 credits may be lower level)
- Upper-level biology electives= BIOL courses that have a course number that is 300 or 400 level
- BIOL courses that are ***NOT*** electives = BIOL301, BIOL300, BIOL311, and BIOL308
- Must take atleast 1 upper-level courses that has an approved lab

Possible Concentrations (determine what biology electives you should take- Not required to declare a concentration):
Biological Illustration

Non-science General electives (15-30 credits)
Take as many more credits will be needed to have a minimum of 120 credits at the time of graduation.

Checklist of graduation requirements for BS in Medical Laboratory Sciences

All undergraduate students must graduate with a **minimum** of 120 credits (atleast 45 credit must be from 300 or 400 level courses) and fulfill all requirements within their majors.

	Course number and Title or Requirement	Credits	
Core Foundation (6 credits)	ENGH101 Composition	3	
	COMM101 Fundamentals of Communication	3	
Core Exploration (12 credits)	HIST125 Global history	3	
	Global understanding	3	
	Literature	3	
	Social and Behavioral sciences	3	
Core Integration (6 credits)	ENGH302 Advanced composition	3	
	Synthesis or Capstone Experience Requirement	3	
MLAB core (31 credits)	BIOL213 Cell Structure and Function	4	
	BIOL214 Biostatistics	4	
	BIOL311 General Genetics	4	
	MLAB200 Introduction to Medical Laboratory Science	1	
	MLAB300 Science writing	2	
	BIOL305 and 306 Biology of microorganisms	4	
	BIOL430 Advanced anatomy and physiology	4	
	BIOL431 Advanced anatomy and physiology	4	
	BIOL452 and 453 Immunology lecture and lab	4	
Supporting coursework for Biology (24-28 credits)	Quantitative reasoning/Math options (choose 1): MATH111 Linear math modeling (4 credits) MATH123 and 124 Calculus with Algebra/Trig Parts A and B (6 credits)* MATH113 Analytic Geometry and Calculus (4 credits)*	4-6	
	CHEM211 and 213 General chemistry I lecture and lab	4	
	CHEM212 and 214 General chemistry II lecture and lab	4	
	CHEM313 and 315 Organic chemistry I lecture and lab	5	
	Additional science requirement options (choose 1): CHEM314 and 318 Organic chemistry II lecture and lab (5 credits) BIOL483 Biochemistry (4 credits)	4-5	
	CDS130 or any IT Mason core course	3-4	

*Any calculus course would require taking a math placement test.

Senior year is spent off campus for clinical training (30 credits). This experience is coordinated through Dr. Anne Verhoeven, Director of Medical Laboratory Science program.

Non-science General electives (7-11 credits)
Take as many more credits will be needed to have a minimum of 120 credits at the time of graduation.

Guide to Biology Electives- Non-lab courses

This is a list of non-laboratory courses that are consistently taught by the Biology department. Some may require prerequisites (see the catalog to check prerequisites https://catalog.gmu.edu/search/?scontext=courses&search=BIOL). **This is not an exhaustive list! More electives may be added during your time here at GMU so be sure to look at the schedule of classes every semester during the registration period.**

Course #	Course Title	Credits	Fall?	Spring?	Summer?	Special Notes
BIOL101	Freshman Biology seminar	1	X			For freshman only
BIOL102	Intro Bio I: Survey of Biodiversity and Ecology	4	X	X	X	Must be taken before BIOL213
BIOL105	Intro Biology II lab	1	X	X	X	Opt lab for BIOL103- must take before BIOL213
BIOL177	Ecological applications	3	X	X		Must be taken before BIOL213
BIOL302	Alternative careers in Bio	1		X		No prerequisites required
BIOL305	Biology of microorganisms	3	X	X	X	
BIOL309	Oceanography	3	X			Also listed as EVPP309 and GEOL309
BIOL312	Biostats for Bioinformatics	4		X		
BIOL318	Conservation biology	3	X	X	X	Also listed as EVPP318
BIOL322	Developmental biology	3		X	X	
BIOL326	Animal physiology	3	X			Also listed as EVPP326
BIOL377	Applied ecology	3	X	X	X	Also listed as EVPP377
BIOL382	Introduction to virology	3	X	X		
BIOL385	Biotech & Gen engineering	3	X			
BIOL404	Medical microbiology	3	X	X		
BIOL408	Mushroom, mold, & society	3		X		Also listed as EVPP408
BIOL412	Phage genomics	3		X		
BIOL413	Histotechniques	3		X		Offered **every** other spring
BIOL417	Selected topics in Molec/cell bio	1-4	X	X		Several courses offered under this number
BIOL420	Vaccines	3		X		
BIOL421	Gen of human diseases	3	X			
BIOL423	Bio of obesity/weight loss	3			X	
BIOL425	Human physiology	3			X	
BIOL426	Mechanisms of aging	3	X	X		
BIOL427	Disease ecology & cons	3	X			Also listed as EVPP427
BIOL429	Pharmacology	3	X	X		
BIOL432	Clinical applications in human physiology	4	X			
BIOL435	Selected topics in Bio	4	X	X		Topics will vary- sometimes has a lab
BIOL443	Tropical ecology	3		X		Offered **every** other spring
BIOL449	Marine ecology	3		X		
BIOL450	Marine conservation	3	X			
BIOL452	Immunology	3	X	X	X	
BIOL454	Marine Mammal Bio & Conservation	3		X		
BIOL457	Reproductive strategies	3		X		Offered **every** other spring
BIOL460	Infectious dis & wildlife	3		X		Also listed as EVPP460
BIOL472	Animal behavior	3	X			
BIOL482	Intro to molecular genetics	3	X			
BIOL483	General biochemistry	4	X	X	X	

Special electives:

- Students who participate in one or more Smithsonian semesters will have atleast 7 credits of CONS coursework applied as biology elective coursework (one would be a lab elective)
- Students who participate in the Biology Research Semester will earn 12-15 credits of biology elective coursework
- Independent study/research credits (BIOL495 and BIOL497) are determined on a case-by-case basis

Guide to Approved Upper-level laboratory courses

BS in Biology majors must take atleast 2 upper-level lab courses. BA in Biology majors must take atleast 1 upper-level lab. The upper-level lab requirement can be met by taking either approved laboratory courses, laboratory sequences, or one of each in the case of BS in Biology majors.

Approved Upper-level laboratory courses

Course #	Course Title	Credits	Fall?	Spring?	Summer?	Notes
BIOL331	Invertebrate zoology	4		X	X	
BIOL334	Vertebrate paleontology	4	X			Also listed as GEOL334
BIOL336	Invertebrate paleontology	4		X		Also listed as GEOL312
BIOL344	Plant diversity & Evolution	4		X		
BIOL345	Plant ecology	4	X			
BIOL350	Freshwater ecosystems	4	X			Also listed as EVPP350
BIOL401	Phage discovery	3	X			
BIOL405	Microbial Genetics	4		X		
BIOL407	Microbial Diversity	4	X			
BIOL430	Advanced anatomy & physiology I	4	X			
BIOL431	Advanced anatomy & physiology II	4		X		
BIOL437	Ornithology	4		X		
BIOL438	Mammalogy	4	X*			Offered every other fall
BIOL439	Herpetology	4		X*		Offered every other spring
BIOL440	Field biology	4			X	Also listed as CONS440
BIOL465	Histology	4		X		
BIOL485	Cell signaling laboratory	3			X	

Approved upper-level laboratory sequence (must take both the lecture and lab to count as lab elective)

Course #s	Course title	Credits	Fall?	Spring?	Summer?	Notes
BIOL305	Biology of microorganisms	3	X	X	X	
BIOL306		1				
BIOL322	Developmental Biology	3		X	X	Offered **some** summers
BIOL323		1				
BIOL377	Applied Ecology	3	X	X	X	Lab is offered inconsistently
BIOL378		1				
BIOL443	Tropical ecology	3		X		
BIOL444		1				
BIOL452	Immunology	3	X	X	X	
BIOL453		1				
BIOL472	Animal behavior	3	X			
BIOL473		1				
BIOL385	Biotech/Genetic engineering + Molecular biology/Biotech lab	3	X			
BIOL486		2		X		

Current Academic Advisors and how to schedule an appointment

The academic advisors in the Biology department are both academic advisors and instructors in the department. Ideally, you should meet with an academic advisor atleast once a semester. The minimum should be once an academic year to make sure you are on the right track for graduation. Biology majors are not assigned advisors. Feel free to meet with any advisor that fits your schedule.

Name and Title	Email address	Services provided	How to schedule an appointment
Valerie Olmo, PhD Associate professor & Director of Undergrad Studies	volmo@gmu.edu	General biology academic advising Approval of course equivalencies Return from suspension approvals	Log onto Navigate Mason and click on “Get Assistance” (top right hand corner)
Anne Verhoeven, PhD Professor & Director of Med Lab Program	averhoev@gmu.edu	Medical laboratory major advising General biology academic advising	Email
Charles Madden, PhD Professor & Vice Department Chair	cmadden@gmu.edu	General biology academic advising	Email
Malda Kocache, PhD Professor & Honors in Biology Coordinator	mkocache@gmu.edu	Academic advising for honors in biology students General biology academic advising	Log onto Navigate Mason and click on “Get Assistance” (top right hand corner)
Nisan Hubbard, PhD Assistant Professor		General biology academic advising	Log onto Navigate Mason and click on “Get Assistance” (top right hand corner)

*More advisors may be added! Be sure to check Navigate Mason to see who is available.

Useful websites and resources

University prehealth advising:
prehealth.gmu.edu

Office of Admissions transfer credit policies (score equivalencies):
https://www.gmu.edu/admissions-aid/apply-now/how-apply/transfer/transfer-credit-policy

Mason core catalog:
Catalog.gmu.edu/mason-core/

Mason360 (to see calendar events and student clubs):
https://mason360.gmu.edu/home_login

Career Services:
Careers.gmu.edu

Biology department:
Biology.gmu.edu

Math placement test:
https://science.gmu.edu/academics/departments-units/mathematical-sciences/mathematical-sciences-testing-center

PatriotWeb tutorials (tutorials on how to register, add yourself to waitlist, read degree audit, etc):
https://registrar.gmu.edu/students/patriot-web-tutorials/