Biology (BA/BS)

Thank you sincerely for your interest in studying Biology at the University of Oregon, a member of the Association of American Universities, that includes 65 Universities (63 in the US and 2 in Canada) recognized throughout the world for their leading research and teaching. We have developed an outstanding major that will prepare you for a multitude of options including graduate schools and careers in biomedicine and research, allied health, private industry, and education. Our nationally and internationally recognized graduates have completed top MD, PhD, MD-PhD, MS programs and internships all over the world. Emphasis Areas for the Biology major include Ecology & Evolution, Human Biology, Marine Biology, Molecular Cellular & Developmental Biology and Neuroscience & Behavior.

Biology faculty who conduct research and teach specialize in cellular and molecular biology, developmental biology, ecology and evolution, human biology, marine biology, neuroscience and behavior, and bioinformatics. Our students learn and work alongside scientists making important contributions in their field of expertise. We foster collaboration among students, staff and faculty across Biology, Chemistry and Biochemistry, Human Physiology, Physics and Psychology Departments. The interdisciplinary nature of our department creates many opportunities for students post-graduation. Our graduates have secured jobs in a number of fields including:

- Biotechnology companies
- Clinics and hospitals
- Pharmaceutical companies
- Public health departments
- Colleges and universities
- Industry and laboratories
- Inspection agencies and control boards
- Private research institutions
- State and federal government agencies
- Zoos and aquariums

We are excited that you have considered Biology as a major and look forward to meeting with you soon here on campus in Eugene.

Program Learning Outcomes

Upon successful completion of this program, students will be able to:

Fundamental Concepts:

- Evolution and biological diversity: all living organisms are genetically related; the diversity of life evolved over time by processes of mutation and selection.
- Structure and function: Basic units of structure give rise to the function of all living things.
- Information flow, exchange, and storage: Properties of organisms emerge from the flow, exchange, expression, and storage of genetic information.
- Pathways and transformations of energy and matter: Biological systems grow and change by processes based on chemical transformation pathways and are governed by the laws of thermodynamics.
- Systems: Living systems are interconnected and interacting.

Bachelor of Arts Degree Requirements: Biology

Code	Title	Credits
Core Courses		
Math [1]		**8**
MATH 246	Calculus for the Biological Sciences I	
or MATH 251	Calculus I	
MATH 247	Calculus for the Biological Sciences II	
or MATH 252	Calculus II	
General Chemistry		**18**
CH 221	General Chemistry I	
& CH 222	and General Chemistry II	
& CH 223	and General Chemistry III	
CH 227	General Chemistry Laboratory	
& CH 228	and General Chemistry Laboratory	
& CH 229	and General Chemistry Laboratory	
Organic Chemistry [2]		**8**
CH 331	Organic Chemistry I	
CH 335	Organic Chemistry II	
Physics [3]		**12**
PHYS 201	General Physics	
& PHYS 202	and General Physics	
& PHYS 203	and General Physics	
or PHYS 251	Foundations of Physics I	
& PHYS 252	and Foundations of Physics I	
& PHYS 253	and Foundations of Physics I	
Lower-Division Biology		**15-16**
BI 211	General Biology I: Cells	
& BI 212	and General Biology II: Organisms	
& BI 213	and General Biology III: Ecology and Evolution	
& BI 214	and General Biology IV: Biochemistry and Genetics	
or BI 281H	Honors Biology I: Cells, Biochemistry and Physiology	
& BI 282H	and Honors Biology II: Genetics and Molecular Biology	
& BI 283H	and Honors Biology III: Evolution, Diversity and Ecology	
Upper-Division Biology [4]		**44**
At least one course needs to be completed from each area (I, II, and III):		
Area I: 300-level molecular, cellular, and developmental biology course		
Area II: 300-level systems and organisms course		
Area III: 300-level ecology and evolution course		
Two or more 300- or 400-level courses with significant laboratory or fieldwork		
12 credits of courses numbered BI 410, 420–499		
One course in modelling, analysis, programming, and statistics (MAPS) [5]		
Total Credits		**105-106**

[1] A course in statistics is required if an ecology and evolution or neuroscience and behavior emphasis area is selected.

[2] Graduate programs in medicine and allied health typically require an additional organic chemistry lecture, Organic Chemistry III (CH 336), and laboratories (CH 337, 338) beyond that required by the biology major. Often, course work in biochemistry and genetics as well as other additional courses are typically required or preferred. Please consult the Health Professions Program (https://healthprofessions.uoregon.edu/) for further details.

[3] Graduate programs in medicine and allied health typically require additional laboratories (PHYS 204, 205, 206) or three terms of Foundations of Physics Laboratory (PHYS 290) beyond that required by the biology major. Please consult the Health Professions Program (https://healthprofessions.uoregon.edu/) for further details.

[4] Students must complete a minimum of 44 upper-division biology credits. For a complete list of approved courses and other details about upper-division requirements, see the online requirements for the biology major (https://biology.uoregon.edu/undergraduate-program/requirements/).

[5] Visit the Biology Advising Center for a list of approved courses.

Emphasis Areas for the Biology Major

Fulfilling the requirements for an undergraduate degree in biology provides a solid, general foundation in the discipline. Some biology majors choose to concentrate their upper-division course work in one of five emphasis areas:

- ecology and evolution
- human biology
- marine biology
- molecular, cellular, and developmental biology
- neuroscience and behavior

The requirements listed for each emphasis may be fulfilled as the student completes the upper-division course work for the biology major. Though not required, emphasis areas are designed to guide students, based on their specific interests, through upper-division course work. Upon graduation, students who complete the requirements for an emphasis area receive a written recognition from the department.

Visit biology.uoregon.edu/undergraduate-program/requirements (http://biology.uoregon.edu/undergraduate-program/requirements/) for the current requirements for each emphasis area, or contact the Biology Advising Center at 541-346-4525 for more information.

Honors Program in Biology

The honors program requires substantial laboratory or field research supervised by a faculty member. Biology majors who satisfy the following requirements are eligible to graduate with honors:

1. Registration for the honors program through the Biology Advising Center, which includes obtaining an acceptance signature from the faculty research advisor, *before* beginning research
2. Completion of all requirements for the major in biology
3. Attainment of a minimum 3.30 GPA in all upper-division biology courses (including 300- and 400-level approved courses outside the department; see a biology advisor for a list). The GPA will be calculated for **all** courses in this category, regardless of the total number of credits.
4. Completion of a minimum of three terms of intensive research (summer session counts as a term); at least four terms and summer research experience are strongly encouraged
5. Completion of a minimum of 4 credits in Research: [Topic] (BI 401) under the supervision of a single faculty advisor. Up to 4 credits may be applied towards the 44 upper-division elective Biology credits. (*See #7 for Honors College students.*)
6. Completion of a thesis, with the following requirements:
   a. Oversight by a thesis committee comprising two faculty members—a primary advisor and one faculty member on the Biology Undergraduate Affairs Committee
   b. A final version of the thesis must be provided to the committee one week prior to the thesis defense
   c. Both committee members must sign the thesis within one week of the thesis defense, and a final signed copy must be submitted to the Biology Advising Center
7. Thesis defense
   a. Thesis committee must attend the thesis defense.
   b. Defense must happen at least one week prior to the end of the term in which the student is graduating.
   c. The thesis defense will be an open seminar. Other faculty, students, and staff will be encouraged to attend.

The chair of the Biology Undergraduate Affairs Committee will notify students during their senior year with the name of the committee member who will serve as their second thesis committee member. Students should contact both committee members via email sometime during the term before the defense to start working on a range of possible defense dates. For more information, contact the committee chair.

Four-Year Degree Plan

The degree plan shown is only a sample of how students may complete their degrees in four years. There are alternative ways. Students should consult their advisor to determine the best path for them.

Bachelor of Arts in Biology

Course	Title	Credits	Milestones
First Year			
Fall			
CH 111	Introduction to Chemical Principles	4	
MATH 111Z	Precalculus I: Functions	4	
WR 121Z	Composition I	4	
Arts and letters or social science course		4	
	Credits	**16**	
Winter			
CH 221	General Chemistry I	4	
CH 227	General Chemistry Laboratory	2	
MATH 112Z	Precalculus II: Trigonometry	4	
WR 123 or WR 122Z	College Composition III (WR 123 Recommended) or Composition II	4	
PE or seminar elective		1	
	Credits	**15**	
Spring			
CH 222	General Chemistry II	4	
CH 228	General Chemistry Laboratory	2	
MATH 246 or MATH 251	Calculus for the Biological Sciences I (Math 246 recommended) or Calculus I	4	

General education course in Social Science or Arts & Letter		4
PE or seminar elective		1
	Credits	**15**
	Total Credits	**46**

Course	Title	Credits	Milestones
Second Year			
Fall			
BI 211	General Biology I: Cells	5	
CH 223	General Chemistry III	4	
CH 229	General Chemistry Laboratory	2	
General education course in arts and letters or social science		4	
PE or seminar elective		1	
	Credits	**16**	
Winter			
BI 212	General Biology II: Organisms	5	
MATH 247 or MATH 252	Calculus for the Biological Sciences II (Math 247 recommended) or Calculus II	4	
Elective or general education course that also satisfies a multicultural requirement		8	
	Credits	**17**	
Spring			
BI 213 or BI 214	General Biology III: Ecology and Evolution or General Biology IV: Biochemistry and Genetics	5	
General education course in arts and letters or social science		8	
Elective or multicultural requirement or Minor course		4	
	Credits	**17**	
	Total Credits	**50**	

Course	Title	Credits	Milestones
Third Year			
Fall			
BI 214 or BI 213	General Biology IV: Biochemistry and Genetics or General Biology III: Ecology and Evolution	5	
CH 331	Organic Chemistry I	4	
Upper-division biology course, or MAPS		4	
General education course in arts and letters or social studies		4	
	Credits	**17**	
Winter			
CH 335	Organic Chemistry II	4	
Upper-division biology courses, MAPS requirement		8	
General education course in arts and letters or social studies		4	
	Credits	**16**	
Spring			
Upper-division biology courses		8	
General education course in arts and letters or social studies		4	
Elective or course for minor		4	
	Credits	**16**	
	Total Credits	**49**	

Course	Title	Credits	Milestones
Fourth Year			
Fall			
PHYS 201	General Physics	4	
Upper-division biology course, MAPS course if still need it		4	
Upper-division biology course or elective		4	
Elective courses - consider BI 401, BI 402, or BI 406		4	
	Credits	**16**	
Winter			
PHYS 202	General Physics	4	
Upper-division biology course or elective		4	
Elective course or MAPS if still need it. - Consider BI 401, BI 402, or BI 406, depending on career plans		4	
	Credits	**12**	
Spring			
PHYS 203	General Physics	4	
Upper-division biology course		4	
Upper-division biology course or elective- Consider BI 401, BI 402, or BI 406		4	
	Credits	**12**	
	Total Credits	**40**	

Bachelor of Science in Biology

Course	Title	Credits	Milestones
First Year			
Fall			
CH 221	General Chemistry I	4	
CH 227	General Chemistry Laboratory	2	
MATH 112Z	Precalculus II: Trigonometry	4	
WR 121Z	Composition I	4	
PE or seminar elective		1	
	Credits	**15**	
Winter			
CH 222	General Chemistry II	4	
CH 228	General Chemistry Laboratory	2	
MATH 246 or MATH 251	Calculus for the Biological Sciences I (MATH 246 recommended) or Calculus I	4	
WR 123 or WR 122Z	College Composition III (WR 123 recommended) or Composition II	4	
PE or seminar elective		1	
	Credits	**15**	
Spring			
CH 223	General Chemistry III	4	
CH 229	General Chemistry Laboratory	2	

MATH 247 or MATH 252	Calculus for the Biological Sciences II (Math 247 recommended) or Calculus II	4
General-education course that also satisfies multicultural requirement		4
PE or seminar elective		1
	Credits	**15**
	Total Credits	**45**

Course	Title	Credits	Milestones
Second Year			
Fall			
BI 211 or BI 281H	General Biology I: Cells or Honors Biology I: Cells, Biochemistry and Physiology	5	
CH 331	Organic Chemistry I	4	
General-education course that also satisfies multicultural requirement		4	
General education or minor requirement		4	
	Credits	**17**	
Winter			
BI 212 or BI 282H	General Biology II: Organisms or Honors Biology II: Genetics and Molecular Biology	5	
CH 335	Organic Chemistry II	4	
Elective or general education course that also satisfy a multicultural requirement		4	
General education course in arts and letters or social science		4	
	Credits	**17**	
Spring			
BI 213 or BI 214 or BI 283H	General Biology III: Ecology and Evolution or General Biology IV: Biochemistry and Genetics or Honors Biology III: Evolution, Diversity and Ecology	5	
General-education courses		8	
General education or minor requirement		4	
	Credits	**17**	
	Total Credits	**51**	

Course	Title	Credits	Milestones
Third Year			
Fall			
BI 214 or BI 213	General Biology IV: Biochemistry and Genetics or General Biology III: Ecology and Evolution	5	
PHYS 201	General Physics	4	
Upper-division biology course, MAPS		4	
Elective course - Consider BI 401, BI 402, or BI 406		4	
	Credits	**17**	
Winter			
PHYS 202	General Physics	4	
Upper-division biology courses, MAPS		8	
Elective course - Consider BI 401, BI 402, or BI 406		4	
	Credits	**16**	
Spring			
PHYS 203	General Physics	4	
Upper-division biology courses		8	
Upper-division elective course		4	
All students are required to take 62 upper-division (300- or 400-level) credits			
	Credits	**16**	
	Total Credits	**49**	

Course	Title	Credits	Milestones
Fourth Year			
Fall			
Upper-division biology courses, MAPS if still need it		8	
Upper-division elective course - Pre-med students will need biochemistry (CH 360 or CH 461)		4	
Minor requirement or upper-division biology course		4	
	Credits	**16**	
Winter			
Upper-division biology courses, MAPS if still need it.		8	
Elective course - Consider BI 401, BI 402, or BI 406		4	
	Credits	**12**	
Spring			
Upper-division biology courses		8	
Upper-division elective course - Consider BI 401, BI 402, or BI 406		4	
	Credits	**12**	
	Total Credits	**40**	