

Bachelor of Science with Major in Biology

This program is designed for students interested in obtaining a broad background in biology, with maximum flexibility in program design. Students should consult with their adviser to develop an appropriate course of study.

For example, students anticipating a career in biotechnology or biomedical science research may emphasize coursework in molecular, cellular and developmental biology. Students anticipating careers with ecological and evolutionary applications may emphasize coursework that explores animal behavior, biodiversity, evolutionary history and interactions of organisms and their environments.

Required 120 credits (36 of which must be numbered 300 or above, and 30 of which must be from UND) including:

I. Essential Studies requirements (See University ES listing, minimum 39 total credits.) The following courses must be taken as part of the Essential Studies requirement:

Code	Title	Credits
ENGL 110	College Composition I	3
ENGL 130	Composition II: Writing for Public Audiences	3
COMM 110	Fundamentals of Public Speaking	3
Total Credits		9

II. 44 major hours including:

A. Core requirements (24 hours), all courses below:

Code	Title	Credits
BIOL 120	Orientation to the Biology Major	1
BIOL 150 & BIOL 151	General Biology I and General Biology II *	6
BIOL 150L & BIOL 151L	General Biology I Laboratory and General Biology II Laboratory	2
BIOL 312	Evolution	3
BIOL 315	Genetics	3
BIOL 332	General Ecology	3
BIOL 341	Cell Biology	3
BIOL 480	Senior Capstone Seminar **	3
Total Credits		24

* Students who take BIOL 111 Concepts of Biology and BIOL 111L Concepts of Biology Laboratory and earn a grade of "B" or higher in both of those courses prior to becoming a Biology major may complete the General Biology sequence by taking BIOL 150 General Biology I and BIOL 150L General Biology I Laboratory.

** Three credits for an accepted BIOL 489 Senior Honors Thesis can be substituted for the BIOL 480 Senior Capstone Seminar with prior approval of the thesis topic by the Chair of Biology.

We strongly advise mastery of materials in all core courses except BIOL 480 Senior Capstone Seminar prior to enrolling in other 300 or 400 level Biology courses.

At least 15 of the total 44 credits required for the BS degree must be taken in the UND Biology department, exclusive of the credits earned in other departments and institutions.

B. Advanced requirements (minimum 20 credit hours):

1. Electives. All 300 or 400 level Biology courses will count toward the 20 elective credit hours needed. Certain science courses in other departments may also qualify as electives (see examples below).

Students may include no more than ten combined credit hours from BIOL 494 Directed Studies; BIOL 492 Research; BIOL 491 Seminar, and BIOL 489 Senior Honors Thesis towards the total 44 credit hours required for this Biology major.

Up to two of the following courses from UND departments outside Biology can be applied toward the 20 elective credits required for a BS in Biology degree (lecture + lab = 1 course). Other courses will be considered on a case by case basis. To have a course considered, the student should provide a syllabus to the Department Chair.

Code	Title	Credits
ANTH 325	Human Origins	
ANTH 335	Primates	
BIMD 220 & 220L	Human Anatomy Physiology I and Human Anatomy Physiology I Lab *	
or BIMD 221 & 221L	Human Anatomy Physiology II and Human Anatomy Physiology II Lab	
BIMD 302 & 302L	General Microbiology Lecture and General Microbiology Laboratory	
BIMD 328	Introduction to Immunology	
BIMD 401	Advanced Biochemistry	

* Either BIMD 220/220L or BIMD 221/221L can count as an elective, but not both courses

- BIMD 301 Biochemistry will not be allowed to fulfill elective requirements
- BIMD 202 Introduction to Medical Microbiology Lecture/BIMD 202L Introduction to Medical Microbiology Laboratory will only be allowed with special permission of the Biology department Chair

2. Laboratory Requirement. At least four upper-division Biology courses with laboratories must be included in the 44 hour major. The following labs or courses satisfy this requirement:

Code	Title	Credits
Courses fulfilling lab requirement *		
BIOL 312L	Evolution Laboratory	
BIOL 332L	Gen Ecology Lab	
BIOL 336	Systematic Botany	
BIOL 341L	Cell Biol Lab	
BIOL 363	Entomology	
BIOL 364L	Parasitology Laboratory	
BIOL 369L	Histology Lab	
BIOL 376L	Animal Biology Laboratory	
BIOL 410	Molecular Biology Techniques	
BIOL 415	Genomics	
BIOL 416	Ecological Genomics	
BIOL 418	Systems Biology	
BIOL 425	Ichthyology	
BIOL 427	Ornithology	
BIOL 428	Mammalogy	
BIOL 431	Wildlife Management	
BIOL 433	Aquatic Ecology	
BIOL 438	Fisheries Management	
BIOL 442L	Physiology of Organs and Systems Laboratory	
BIMD 302L	General Microbiology Laboratory	

* BIOL 494 Directed Studies or BIOL 492 Research may be counted as one upper-division laboratory requirement with appropriate documentation of the laboratory experience and approval by the supervising faculty member and the Biology Department Chairperson prior to taking the research credits.

III. Cognate requirements in other departments (29-32 credit hours):

Code	Title	Credits
Mathematics *		
MATH 146 or MATH 165	Applied Calculus I ** Calculus I	3-4
Chemistry 8		
General Chemistry		
CHEM 121 & 121L & CHEM 122 & CHEM 122L	General Chemistry I and General Chemistry I Laboratory and General Chemistry II and General Chemistry II Laboratory	
OR		
CHEM 221 & 221L & CHEM 254 & CHEM 254L	Fundamentals of Chemistry - Concepts and Fundamentals of Chemistry Laboratory and Inorganic Chemistry I and Inorganic Chemistry I Laboratory ***	
Organic Chemistry 7-8		
CHEM 340 & 340L & BIMD 301	Survey of Organic Chemistry and Survey of Organic Chemistry Laboratory and Biochemistry	
OR		
CHEM 341 & 341L & CHEM 342 & CHEM 342L	Organic Chemistry I and Organic Chemistry I Laboratory and Organic Chemistry II and Organic Chemistry II Laboratory	
OR		
CHEM 341 & 341L & BIMD 301	Organic Chemistry I and Organic Chemistry I Laboratory and Biochemistry	
Physical Sciences 8		
PHYS 161 & PHYS 162	Introductory College Physics I and Introductory College Physics II #	
OR		
PHYS 211 & PHYS 212	College Physics I and College Physics II	
OR		
PHYS 251 & PHYS 252	University Physics I and University Physics II	
Statistical Methods and Data Interpretation		
Select one of the following: 3-4		
BIOL 470	Biostatistics ##	
SOC 326	Sociological Statistics	
MATH 321	Applied Statistical Methods	

* Students with a particular aptitude for mathematics should consider taking both MATH 165 Calculus I and MATH 166 Calculus II and should consult with their advisor regarding this potential option.

** Pre-requisites for either course are the responsibility of the student.

***The chemistry sequence CHEM 221, CHEM 221L, CHEM 254, and CHEM 254L is intended for students with a strong background and interest in chemistry and presumes some exposure to calculus

***The sequence of CHEM 341 Organic Chemistry I and CHEM 342 Organic Chemistry II AND BIMD 301 Biochemistry is highly recommended for pre-medicine students because some medical schools require or prefer this combination.

Students planning to go to graduate or medical schools are strongly encouraged to take PHYS 211 College Physics I and PHYS 212 College Physics II or PHYS 251 University Physics I and PHYS 252 University Physics II for their Physical Sciences requirement.

##Students may take BIOL 470 and have those credits count toward biology electives AND satisfy the statistics requirement.

Teacher Certification

Students seeking secondary teacher certification in Biology must complete the Department of Teaching and Learning requirements in Secondary Education (see Secondary Education (<https://catalog.und.edu/>)).

undergraduateacademicinformation/departmentalcoursesprograms/teachingandlearning/) listing).

These students must complete the B.S. with Major in Biology, the B.S. in Molecular and Integrative Biology, the B.S. with Major in Biology (Professional Health Sciences Emphasis), or the B.S. in Fisheries and Wildlife Biology and include the following five courses:

Code	Title	Credits
BIOL 312	Evolution	3
BIOL 332	General Ecology	3
BIOL 336	Systematic Botany	4
BIOL 341	Cell Biology	3
BIMD 302 & 302L	General Microbiology Lecture and General Microbiology Laboratory	4

These students must also complete at least four credit hours of earth science from the following:

Code	Title	Credits
GEOL 101 & 101L	Introduction to Geology and Introduction to Geology Laboratory	4
GEOG 121 & 121L	Global Physical Environment and Global Physical Environment Laboratory	4
GEOG 134 & 134L	Introduction to Global Climate and Introduction to Global Climate Laboratory	4

Other choices of courses in Biology should be made with the aid of a Biology adviser. Among the other requirements for the major, students seeking teacher certification must complete the following option.

Code	Title	Credits
CHEM 340 & 340L	Survey of Organic Chemistry and Survey of Organic Chemistry Laboratory	5
BIMD 301	Biochemistry	3

Students interested in certification in both Biology and Physics should take

Code	Title	Credits
PHYS 211	College Physics I (lab included)	4
PHYS 212	College Physics II (lab included)	4
PHYS 213	College Physics III (lab included)	4

Formal admission to Teacher Education is required and is normally sought while enrolled in T&L 250 Introduction to Education(see Department of Teaching and Learning (<https://catalog.und.edu/undergraduateacademicinformation/departmentalcoursesprograms/teachingandlearning/>) listing). Biology majors seeking secondary certification must have an adviser both in the Biology Department and in the Department of Teaching and Learning.