

MAJOR IN ZOOLOGY



Zoologists study animals—their origin, behavior, diseases, and life processes. Some experiment with live animals in controlled or natural surroundings while others study the structure and function of animal cells, tissues, and organ systems. Some zoologists go on to study veterinary medicine. Zoologists participate in research that has practical outcomes in farming, medicine, pharmacy, wildlife conservation, and pest control. Zoology encompasses many specialties. At CSU, students may focus on general training in animal biology or choose a concentration in the following areas: animal behavior, development, aquatic biology, ecology (how animals adapt to their environments), genetics and evolution, invertebrate organisms, cellular/molecular biology and physiology, systematics, and morphology of vertebrate organisms.

The curriculum is designed to provide a basic understanding of zoology through a variety of laboratory experiences in combination with the study of basic theories and defining concepts. The program encourages flexibility, strength, and depth. The coursework includes a two-semester introductory biology sequence, one course each in invertebrates and vertebrates, and courses in evolution and ecology. Required courses in the physical sciences include a minimum of one year of introductory chemistry and at least one course in organic chemistry, two courses in physics (all with labs) and one in biochemistry. A course each in calculus and statistics is also required. In addition, students select a minimum of 15 credits of Zoology courses.

Learning Objectives

Students completing the Major in Zoology will attain a well-rounded education grounded in the natural sciences, with emphasis on the current state of knowledge in zoology.

Upon successful completion of the degree, students will be able to:

1. Attain a solid foundation in the natural sciences, with emphasis on biological processes and phenomena;
2. Demonstrate a fundamental understanding of biological concepts, processes, and phenomena that are broadly applicable to organisms,

as well as a more detailed understanding of multiple aspects of biological concepts, processes and phenomena applicable to animals;

3. Demonstrate strong analytical, mathematical, and statistical skills, and the ability to apply these appropriately in zoological contexts;
4. Demonstrate the ability to analyze, synthesize, integrate, and evaluate material from zoology and related fields, and effectively communicate such information.

Potential Occupations

This major prepares students to work in various areas of zoology, such as research or private industry, or to begin graduate school or professional studies. Career opportunities include medical biotechnology, research technician, protective agencies such as shelters and refuges, trainers and handlers, animal-related business, aquatic/marine biologists, exotic animal specialists, and wildlife conservation. It is an appropriate major for students planning to attend medical or veterinary school. Graduates often pursue advanced degrees to carry out basic research or advance into leadership positions in industry. Participation in internships, laboratory, or research opportunities is highly recommended and encouraged by the department to enhance practical training and development.

Additional careers for Zoology majors include, but are not limited to: aquarium and museum curator/director; zoo keeper, animal trainer and instructor, science librarian, environmental technician, fish and wildlife technician, veterinary technician/assistant, marine bacteriologist or biologist or ecologist, humane society positions, cytotechnologist, ecologist, fisheries biologist or conservationist, laboratory technician, marketing researcher, medical technologist, park ranger, pharmaceutical sales representative, production supervisor, quality analysis technician in food or pharmaceutical industry, radiation protection technician, research technician, industrial hygienist, wildlife photographer.

Change of Major Process

- **For future or incoming CSU students:** Please contact Admissions (<https://admissions.colostate.edu/>) to declare Zoology.
- **For current on-campus CSU students:** To learn more about Zoology and decide if you are interested in declaring, you must first review the Zoology Major Requirements (<https://www.biology.colostate.edu/undergraduate-students/>). Then sign up for and attend a Major Information Session (<https://www.biology.colostate.edu/advising/>):
 - These are 50-minute group sessions led by advisors with individualized course recommendations and built-in time to answer your questions.
 - If you are exploring the Zoology major, or if you are registering before your session, we recommend you review the Zoology Major Requirements link above and register for any open courses that you are eligible to add.

Requirements Effective Fall 2025

To be qualified for graduation, students must have a minimum grade of C- in all BZ, LIFE, and major electives courses used to meet program requirements.

Freshman

		AUCC	Credits
CHEM 111	General Chemistry I (GT-SC2)	3A	4
CHEM 112	General Chemistry Lab I (GT-SC1)	3A	1
CO 150	College Composition (GT-CO2)	1A	3
LIFE 102	Attributes of Living Systems (GT-SC1)	3A	4
LIFE 103	Biology of Organisms-Animals and Plants (GT-SC1)	3A	4
Select one from the following:			4
MATH 155	Calculus for Biological Scientists I (GT-MA1)	1B	
MATH 160	Calculus for Physical Scientists I (GT-MA1)	1B	
1C (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#aucc)			3
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			6
Total Credits			29

Sophomore

BZ 212	Animal Biology-Invertebrates		4
BZ 214	Animal Biology-Vertebrates		4
BZ 220	Introduction to Evolution		3
CHEM 113	General Chemistry II		3
CHEM 114	General Chemistry Lab II		1
CHEM 245 ²	Fundamentals of Organic Chemistry		4
CHEM 246	Fundamentals of Organic Chemistry Laboratory		1
STAT 301 or 307	Introduction to Applied Statistical Methods		3
	Introduction to Biostatistics		
Historical Perspectives (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)			3
Social and Behavioral Sciences (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences)			3
Electives ¹			2
Total Credits			31

Junior

BZ 310	Cell Biology		4
Select one group from the following:			4-6
Group A:			
BC 351	Principles of Biochemistry		
Group B:			
BC 401	Comprehensive Biochemistry I		
BC 403	Comprehensive Biochemistry II		
Select one group from the following:			10
Group A:			
PH 121	General Physics I (GT-SC1)	3A	
PH 122	General Physics II (GT-SC1)	3A	
Group B:			
PH 141	Physics for Scientists and Engineers I (GT-SC1)	3A	
PH 142	Physics for Scientists and Engineers II (GT-SC1)	3A	
Upper-Division Zoology List			6
Electives ¹			4-6
Total Credits			30

Senior

BZ 350	Molecular and General Genetics	4A,4B	4
LIFE 320	Ecology	4C	3
Upper-Division Zoology List			9
Advanced Writing (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)			3
Electives ¹			11
Total Credits			30
Program Total Credits:			120

Upper-Division Zoology Electives (minimum of 8 credits must be BZ courses)

Code	Title	Credits
BZ 300	Animal Behavior	3
BZ 311	Developmental Biology	4
BZ 320	Biogeographic Approaches to Conservation	3
BZ 329	Herpetology	4
BZ 330	Mammalogy	4
BZ 333	Introductory Mycology	4
BZ 335	Ornithology	4
BZ 339	Biology Field Practicum	3
BZ 340	Field Mammalogy	4
BZ 342	Exploring Range Shifts in a Changing World	3
BZ 348/MATH 348	Theory of Population and Evolutionary Ecology	4
BZ 349	Tropical Ecology and Evolution	3
BZ 360	Bioinformatics and Genomics	4
BZ 390	Biology of Sex	3
BZ 401	Comparative Animal Physiology	3
BZ 414	Vertebrate Climate Change Responses	3
BZ 415	Marine Biology	4
BZ 418	Ecology of Infectious Diseases	4
BZ 420	Evolutionary Medicine	3
BZ 424/BSPM 424	Principles of Systematic Science	3
BZ 425	Conservation and Population Genomics	3
BZ 430	Animal Behavior and Conservation	3
BZ 433	Behavioral Genetics	3
BZ 435A	Study Abroad--Honduras: Field Course--Dolphin Behavior and Physiology	2
BZ 435B	Study Abroad--Mexico: Practices in Marine Biology and Ecology	3
BZ 435C	Study Abroad--Kenya: Biology and Behavior of African Mammals	3
BZ 435D	Study Abroad--Madagascar: Biology and Behavior of Primates	3
BZ 449A	Study Abroad--Ecuador: Ecology/Conservation--Ecuadorian Biodiversity	4
BZ 455	Human Heredity and Birth Defects	3
BZ 460	Genome Evolution	4
BZ 462/MIP 462/ BSPM 462	Parasitology and Vector Biology	5
BZ 471	Stream Biology and Ecology	3

BZ 472	Stream Biology and Ecology Laboratory	1
BZ 475	Marine Mammalogy	3
BZ 477	Genome Editing Laboratory	2
BZ 478/VS 478	Biology and Behavior of Cats	3
BZ 479/VS 479	Biology and Behavior of Dogs	3
BZ 482F	Study Abroad--French Polynesia: Environmental and Cultural Studies	3
BZ 492A	Seminar: Behavior	1-3
BZ 492B	Seminar: Ecology	1-3
BZ 492C	Seminar: Genetics	1-3
BZ 492D	Seminar: Ornithology	1-3
BZ 492E	Seminar: Herpetology	1-3
BZ 492F	Seminar: Evolution	1-3
BZ 496	Group Study Biology	1-3
BZ 515	Physiological Ecology of Marine Vertebrates	3
BZ 525	Advanced Conservation & Evolutionary Genomics	4
BZ 535	Behavioral and Cognitive Ecology	3
BZ 548	Theory of Population and Evolutionary Ecology	4
BZ 560	Teaching and Communicating Science	3
BZ 562	Computational Approaches in Molecular Ecology	2
BZ 565/MIP 565	Next Generation Sequencing Platform/ Libraries	1
BZ 568/FW 568	Sustaining River Ecosystems in Changing World	3

A maximum of 7 credits may be selected from the following courses:

AB 303	General Entomology Laboratory
AB 340	Insect Biotechnology
ANEQ 320	Principles of Animal Nutrition
ANEQ 322	Pet Nutrition
ANEQ 323	Zoo Nutrition
ANTH 470	Paleontology Field School
BMS 300	Principles of Human Physiology
BMS 305	Domestic Animal Gross Anatomy
BSPM 302	Applied and General Entomology
FW 300	Biology and Diversity of Fishes
FW 301	Ichthyology Laboratory
FW 400	Conservation of Fish in Aquatic Ecosystems

FW 405	Fish Physiology
GEOL 342	Paleontology
MIP 300	General Microbiology
MIP 302	General Microbiology Laboratory
MIP 315	Pathology of Human and Animal Disease
MIP 342	Immunology
MIP 343	Immunology Laboratory
NR 312	Applied Insect Ecology
PHIL 325	Philosophy of Science
PHIL 326	Philosophy of Biology

A maximum of 3 credits may be selected from the following courses:

BZ 384	Supervised College Teaching
BZ 487	Internship
BZ 495	Independent Study
BZ 498	Laboratory or Field Research

¹ Select enough elective credits to bring the program total to a minimum of 120 credits, of which at least 42 must be upper-division (300- to 400-level).

Freshman

Semester 1		Critical	Recommended	AUCC	Credits
CO 150	College Composition (GT-CO2)	X		1A	3
LIFE 102	Attributes of Living Systems (GT-SC1)	X		3A	4
1C (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#aucc)			X	1C	3
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			X	3B	3
MATH 117, MATH 118, MATH 124, MATH 125 may be necessary for some students to fulfill pre-calculus requirements.		X			
Total Credits					13
Semester 2		Critical	Recommended	AUCC	Credits
CHEM 111	General Chemistry I (GT-SC2)	X		3A	4
CHEM 112	General Chemistry Lab I (GT-SC1)	X		3A	1
LIFE 103	Biology of Organisms-Animals and Plants (GT-SC1)	X		3A	4
Select one course from the following:		X			4
MATH 155	Calculus for Biological Scientists I (GT-MA1)			1B	
MATH 160	Calculus for Physical Scientists I (GT-MA1)			1B	
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			X	3B	3
CO 150 must be completed by the end of Semester 2.		X			
Total Credits					16

Sophomore

Semester 3		Critical	Recommended	AUCC	Credits
BZ 212	Animal Biology-Invertebrates	X			4
BZ 220	Introduction to Evolution	X			3
CHEM 113	General Chemistry II	X			3
CHEM 114	General Chemistry Lab II	X			1
Historical Perspectives (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)			X	3D	3
Elective			X		2

² CHEM 341, CHEM 343, and CHEM 344 may be taken as an alternative to CHEM 245 and CHEM 246.

Major Completion Map

Distinctive Requirements for Degree Program:

TO PREPARE FOR FIRST SEMESTER: The curriculum for the Zoology major assumes students enter college prepared to take calculus. Entering students who are not prepared to take calculus will need to fulfill pre-calculus requirements in the first semester. LIFE 102 requires high school chemistry as a prerequisite; CHEM 111 requires Algebra II as a prerequisite (this prerequisite is met by having Algebra II by test credit, transfer credit, or placement out of MATH 117 and MATH 118 on Math Placement Exam). Earned grade of C- or better is required in all BZ, LIFE, and major electives used to meet program requirements. Term 5 may have to be adjusted if the student chooses 2 semesters of Organic Chemistry. It is recommended that you do not take BZ 310 and BZ 350 together.

MATH 155 or MATH 160 must be completed by the end of Semester 3. X

Total Credits				16
Semester 4		Critical	Recommended AUCC	Credits
BZ 214	Animal Biology-Vertebrates	X		4
CHEM 245	Fundamentals of Organic Chemistry	X		4
CHEM 246	Fundamentals of Organic Chemistry Laboratory	X		1
Select one course from the following:		X		3
STAT 301	Introduction to Applied Statistical Methods			
STAT 307	Introduction to Biostatistics			
Social and Behavioral Sciences (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences)			X 3C	3

Total Credits				15
<i>Junior</i>				
Semester 5		Critical	Recommended AUCC	Credits
Select one course from the following:		X		3-4
BC 351	Principles of Biochemistry			
BC 401	Comprehensive Biochemistry I			
Select one course from the following:		X		5
PH 121	General Physics I (GT-SC1)		3A	
PH 141	Physics for Scientists and Engineers I (GT-SC1)		3A	
Upper-Division Zoology Course (See List on Requirements Tab)		X		3
Elective			X	2-3
STAT 301 or STAT 307 must be completed by the end of Semester 5.		X		

Total Credits				14
Semester 6		Critical	Recommended AUCC	Credits
BZ 310	Cell Biology	X		4
Only complete if BC 401 was previously taken in semester 5:		X		0-3
BC 403	Comprehensive Biochemistry II			
Select one course from the following:		X		5
PH 122	General Physics II (GT-SC1)		3A	
PH 142	Physics for Scientists and Engineers II (GT-SC1)		3A	
Upper-Division Zoology Course (See List on Requirements Tab)		X		3
Elective			X	1-4

Total Credits				16
<i>Senior</i>				
Semester 7		Critical	Recommended AUCC	Credits
BZ 350	Molecular and General Genetics	X	4A,4B	4
Upper-Division Zoology Course (See List on Requirements Tab)		X		3
Advanced Writing (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)			X 2	3
Electives			X	5
PH 121 must be completed by the end of Semester 7.		X		

Total Credits				15
Semester 8		Critical	Recommended AUCC	Credits
LIFE 320	Ecology	X	4C	3
Upper-Division Zoology Courses (See List on Requirements Tab)		X		6
Electives			X	6
The benchmark courses for the 8th semester are the remaining courses in the entire program of study.		X		

Total Credits				15
Program Total Credits:				120