B.S., BIOLOGICAL SCIENCES WITH CONCENTRATION

Program Requirements

Students must earn a C- grade or better in each course.

Minimum Requirements for Biological Sciences B.S.: 120 credits

CONCENTRATIONS: BIOMEDICAL SCIENCE (P. 1); CELL AND MOLECULAR BIOLOGY (P. 2); ECOLOGY AND EVOLUTIONARY BIOLOGY (P. 2); PHYSIOLOGY (P. 2)

Code	Title	Credits
General University Requirements		
Complete the general university requirements. (https://catalog.uaf.edu/archives/2020-2021/bachelors/)		
General Education Requirements		
Complete the general education requirements. (https://catalog.uaf.edu/archives/2020-2021/bachelors/general-education-requirements/)		
As part of the general education requirements, complete:		
CHEM F105X and CHEM F106X	General Chemistry I and General Chemistry II	
MATH F230X	Essential Calculus with Applications	
or MATH F251X	Calculus I	
B.S. Degree Requirements		
Complete the B.S. degree requirements. (https://catalog.uaf.edu/archives/2020-2021/bachelors/summary-of-bachelors-degree-reqs/#bachelorofsciencetext)		
As part of the B.S. degree requirements, complete:		
BIOL F115X	Fundamentals of Biology I	
BIOL F116X	Fundamentals of Biology II	
STAT F200X	Elementary Statistics	
or STAT F300	Statistics	
Biological Sciences with Concentration Program Requirements		
BIOL F260	Principles of Genetics	4
BIOL F481	Principles of Evolution	4
CHEM F321	Organic Chemistry I	4
CHEM F325	Organic Chemistry II	3-4
or CHEM F351	General Biochemistry: Metabolism	
PHYS F123X	College Physics I	4
or PHYS F211X	General Physics I	
PHYS F124X	College Physics II	3-4
or PHYS F212X	General Physics II	
or CS F103	Introduction to Computer Programming	
or CS F201	Computer Science I	
Complete one from the following four options:		4-8
BIOL F111X and BIOL F112X	Human Anatomy and Physiology I and Human Anatomy and Physiology II	
BIOL F310	Animal Physiology	
BIOL F342	Microbiology	
BIOL F434	Structure and Function of Vascular Plants	
Concentration		
Complete one from the following concentrations: [1]		21-28
Cell and Molecular Biology		
Physiology		
Ecology and Evolutionary Biology		
Biomedical Science		
Capstone [2]		
BIOL F400	Biological Sciences Capstone Project	0
Satisfactory completion of a capstone research project which can be done either working individually with a faculty member or within one of the following courses: [3,4]		0-4
BIOL F434	Structure and Function of Vascular Plants	
BIOL F440	Behavioral Neuroscience Research Capstone	
BIOL F441	Animal Behavior	
BIOL F466	Advanced Cell and Molecular Laboratory	
BIOL F472	Community Ecology	
BIOL F473	Limnology	
BIOL F491	The Human Microbiome	

1. BIOL F397, BIOL F497, URSA F388 or URSA F488 courses may be substituted by petition for a maximum of two required elective courses in biology (3-4 credits of independent study or research per substituted course). The subject area of the independent study or research will determine which biological subject areas the credits satisfy.
2. Fulfills the baccalaureate capstone requirement.
3. Students working individually with a faculty member may, for example, take BIOL F497 credits or work with a faculty member without taking course credits.
4. Capstone courses may be double counted as electives.

Note: A foreign language is encouraged by the department to meet the general education requirements.

Concentrations

BIOMEDICAL SCIENCE

Code	Title	Credits
As part of the general education requirements the following are recommended:		
ECON F100X	Introduction to Economic Analysis	
or ECON F201X	Principles of Economics I: Microeconomics	
or ECON F202X	Principles of Economics II: Macroeconomics	
PSY F101X	Introduction to Psychology	
SOC F101X	Introduction to Sociology	
Complete the following as part of the program requirements:		
BIOL F111X and BIOL F112X	Human Anatomy and Physiology I and Human Anatomy and Physiology II	
or BIOL F310	Animal Physiology	
CHEM F325	Organic Chemistry II	

PHYS F124X	College Physics II	
or PHYS F212X	General Physics II	
Complete the following:		
BIOL F342	Microbiology	4
BIOL F360	Cell and Molecular Biology	3
CHEM F351	General Biochemistry: Metabolism	3
Biology Breadth Electives		
Complete one additional course from lists C or D		3-4
Biomedical Electives		
Complete at least three additional courses from list E		9-12

CELL AND MOLECULAR BIOLOGY

Code	Title	Credits
As part of the program requirements above, complete:		
CHEM F325	Organic Chemistry II	4
Complete the following:		
BIOL F360	Cell and Molecular Biology	3
CHEM F450	Information Storage and Transfer: Molecules and Pathways	3
CHEM F351	General Biochemistry: Metabolism	3
Cell and Molecular and Physiology Electives		
Complete one additional course from list A		3-4
Complete two additional courses from lists A or B		6-8
Biology Breadth Elective		
Complete one additional course from lists C or D		3-4

ECOLOGY AND EVOLUTIONARY BIOLOGY

Code	Title	Credits
As part of the program requirements above, complete:		
BIOL F371	Principles of Ecology	4
Ecology and Evolutionary Biology Electives		
Complete two additional courses from list C		6-8
Organismal Elective		
Complete one additional course from list D		3-4
Biology Breadth Elective		
Complete one additional course from lists A, B, or E		3-4
Biology Elective		
Complete one additional course from lists A, B, C, D, or E		3-4
STAT F401	Regression and Analysis of Variance	3-4
or STAT F402	Scientific Sampling	

PHYSIOLOGY

Code	Title	Credits
As part of the program requirements above, complete:		
BIOL F360	Cell and Molecular Biology	3
Physiology or Cell and Molecular Biology Electives		
Complete two additional courses from list B		6-8
Complete two additional courses from lists A or B		6-8
Biology Breadth Elective		
Complete one additional course from lists C or D		3-4
Biology Elective		
Complete one additional course from lists A, B, C, D, or E		3-4

Biology Elective Course Lists

Courses that satisfy upper-division elective credit may require prerequisites.

LIST A - CELL AND MOLECULAR BIOLOGY

Code	Title	Credits
BIOL F342	Microbiology	4
BIOL F360	Cell and Molecular Biology	3
BIOL F417	Neurobiology	3
BIOL F435	Introduction to Biology of Cancer	3
BIOL F460	Principles of Virology	3
BIOL F462	Infectious Diseases	3
BIOL F465	Immunology	3
BIOL F466	Advanced Cell and Molecular Laboratory	3
BIOL F491	The Human Microbiome	4
CHEM F325	Organic Chemistry II	4
CHEM F351	General Biochemistry: Metabolism	3
CHEM F450	Information Storage and Transfer: Molecules and Pathways	3
CHEM F470	Cellular and Molecular Neuroscience	3
CHEM F474	Neurochemistry	3

LIST B - PHYSIOLOGY

Code	Title	Credits
BIOL F310	Animal Physiology	4
BIOL F312	Medical Physiology	3
BIOL F335	Principles of Epidemiology	3
BIOL F342	Microbiology	4
BIOL F412	Exercise Physiology	3
BIOL F417	Neurobiology	3
BIOL F434	Structure and Function of Vascular Plants	4
BIOL F440	Behavioral Neuroscience Research Capstone	3
BIOL F441	Animal Behavior	3
BIOL F455	Environmental Toxicology	3
BIOL F457	Environmental Microbiology	3
BIOL F462	Infectious Diseases	3
BIOL F465	Immunology	3

LIST C - ECOLOGY AND EVOLUTIONARY BIOLOGY

Code	Title	Credits
BIOL F371	Principles of Ecology	4
BIOL F415	Systematic and Comparative Biology	4
BIOL F418	Biogeography	3
BIOL F433	Conservation Genetics	3
BIOL F441	Animal Behavior	3
BIOL F446	Freshwater Habitat Dynamics	3
BIOL F457	Environmental Microbiology	3
BIOL F469	Landscape Ecology and Wildlife Habitat	3
BIOL F471	Population Ecology	3
BIOL F472	Community Ecology	3

BIOL F473	Limnology	3
BIOL F476	Ecosystem Ecology	3
BIOL F483	Stream Ecology	3
BIOL F485	Global Change Biology	3
BIOL F486	Vertebrate Paleontology	3
BIOL F487	Conceptual Issues in Evolutionary Biology	3
BIOL F488	Arctic Vegetation Ecology: Geobotany	3
BIOL F489	Vegetation Description and Analysis	3
WLF F301	Design of Wildlife Studies	3
WLF F421	Ecology and Management of Large Mammals	3

LIST D - ORGANISMAL BIOLOGY

Code	Title	Credits
BIOL F239	Introduction to Plant Biology	4
BIOL F331	Systematic Botany	3
BIOL F406	Entomology	4
BIOL F418	Biogeography	3
BIOL F425	Mammalogy	3
BIOL F426	Ornithology	3
BIOL F427	Ichthyology	4
BIOL F486	Vertebrate Paleontology	3
BIOL F489	Vegetation Description and Analysis	3

LIST E - BIOMEDICAL SCIENCE

Code	Title	Credits
BIOL F312	Medical Physiology	3
BIOL F335	Principles of Epidemiology	3
BIOL F402	Biomedical and Research Ethics	3
BIOL F401		
BIOL F412	Exercise Physiology	3
BIOL F417	Neurobiology	3
BIOL F435	Introduction to Biology of Cancer	3
BIOL F440	Behavioral Neuroscience Research Capstone	3
BIOL F455	Environmental Toxicology	3
BIOL F460	Principles of Virology	3
BIOL F462	Infectious Diseases	3
BIOL F465	Immunology	3
BIOL F466	Advanced Cell and Molecular Laboratory	3
BIOL F491	The Human Microbiome	4
CHEM F450	Information Storage and Transfer: Molecules and Pathways	3
CHEM F470	Cellular and Molecular Neuroscience	3
CHEM F474	Neurochemistry	3