

CLIMATE AND ENVIRONMENTAL CHANGE B.S.

Program Requirements

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Minimum Requirements for Climate and Environmental Change B.S.: 120 credits

CONCENTRATIONS: ECOLOGICAL PROCESSES (P. 1), ENVIRONMENTAL EARTH SCIENCE (P. 2), PHYSICAL PROCESSES (P. 2), SUSTAINABILITY (P. 2)

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

Code	Title	Credits
General University Requirements		
Complete the general university requirements. (https://catalog.uaf.edu/bachelors/#gurbachelorsdegreestext)		
General Education Requirements		
Complete the general education requirements. (https://catalog.uaf.edu/bachelors/#generaleducationrequirementstext)		35-40
As part of the general education requirements, complete the following: ^{1,2}		
ECON F235X	Introduction to Natural Resource Economics	
MATH F251X	Calculus I	
	or MATH F230X Essential Calculus with Applications	
NRM F111X	Introduction to Sustainability Science	
PS F101X	Introduction to American Government and Politics	
B.S. Degree Requirements		
Complete the B.S. degree requirements. (https://catalog.uaf.edu/bachelors/#bachelorofsciencetext)		15
As part of the B.S. requirements, complete the following: ³		
NRM F303X	Environmental Ethics and Actions	
STAT F200X	Elementary Statistics ⁴	
	or STAT F300 Statistics	
Climate and Environmental Change Program Requirements		
Complete the following:		
ATM/GEOS F480	Climate Change Processes: Past, Present, Future	4
BIOL F115X	Fundamentals of Biology I ⁴	4
	or BIOL F103X Biology and Society	
	or BIOL F104X Natural History of Alaska	
CHEM F105X	General Chemistry I	4
CLIM F400	Climate and Environmental Change Capstone ePortfolio ⁵	1
GEOS F101X	The Dynamic Earth	4

GEOS F483	Research Design, Writing and Presentation Methods	3
	or STO F401 Communicating Science	
	or ENGL F314 Technical Writing	
	or ENGL F414 Research Writing	
NRM F125	Our Changing Climate: Past, Present, Future	3
NRM F338	Introduction to Geographic Information Systems	3
PHYS F123X	College Physics I	4
	or PHYS F211X General Physics I	
PS F447	U.S. Environmental Politics	3
Concentration		
Complete one of the following:		35-36
Ecological Processes		
Environmental Earth Science		
Physical Processes		
Sustainability		
Electives		
General Electives		0-2
Total Credits		120-124

- ¹ Students in the Environmental Earth Science and Physical Processes concentrations must take MATH F251X to meet this requirement
- ² WRTG F213X is recommended
- ³ Quantitatively-inclined students are encouraged to take STAT F300
- ⁴ Students in the Ecological Processes and Sustainability Concentrations must take BIOL F115X
- ⁵ Fulfills the baccalaureate capstone requirement

Concentrations

ECOLOGICAL PROCESSES

Code	Title	Credits
Ecological Processes Concentration Requirements		
As part of the general education requirements, complete the following:		
MATH F230X	Essential Calculus with Applications	
	or MATH F251X Calculus I	
As part of the B.S. requirements, complete the following:		
BIOL F115X	Fundamentals of Biology I	
BIOL F116X	Fundamentals of Biology II	
Complete the following:		
BIOL F371	Principles of Ecology	4
BIOL F385	Global Change Biology	3
BIOL F476	Ecosystem Ecology	4
CHEM F106X	General Chemistry II	4
GEOS F112X	The History of Earth and Life	4
STAT F401	Regression and Analysis of Variance	4
Complete two courses from the Policy, Society and Humanities course list ⁶		6
Complete one course from the Physical Processes Course List ⁶		3

Complete one course from the Biotic Processes or Technical & Data Skills lists ⁶	3
Total Credits	35

⁶ When choosing electives, students should consider the requirement for 39 credits of upper division coursework prior to graduation.

ENVIRONMENTAL EARTH SCIENCE

Code	Title	Credits
Environmental Earth Science Concentration Requirements		
As part of the general education requirements, complete the following:		
MATH F251X	Calculus I	
As part of the B.S. requirements, complete the following:		
GEOS F112X	The History of Earth and Life	
Complete the following:		
ATM F456	Climate and Climate Change	3
or OCN F481	The Ocean and Global Change	
GEOS F213	Mineralogy	4
GEOS F304	Geomorphology	3
GEOS F315	Paleobiology and Paleontology	4
or GEOS F322	Stratigraphy and Sedimentation	
GEOS F422	Geoscience Applications of Remote Sensing	3
NRM F370	Introduction to Watershed Management	3
NRM F380	Soils and the Environment	3
Complete two courses from the Policy, Society and Humanities course list ⁶		6
Complete one additional course from the Physical Processes course list ⁶		3
Complete one additional course from the Biotic Processes or Technical & Data Skills course lists ⁶		3
Total Credits		35

⁶ When choosing electives, students should consider the requirement for 39 credits of upper-division coursework prior to graduation.

PHYSICAL PROCESSES

Code	Title	Credits
Physical Processes Concentration Requirements		
As part of the general education requirements, complete the following:		
MATH F251X	Calculus I	
As part of the B.S. requirements, complete the following:		
PHYS F211X	General Physics I	
PHYS F212X	General Physics II	
Complete the following:		
ATM F401	Introduction to Atmospheric Sciences	3
ATM F456	Climate and Climate Change	3
or OCN F481	The Ocean and Global Change	
GEOS F304	Geomorphology	3
GEOS F422	Geoscience Applications of Remote Sensing	3
or NRM F435	GIS Analysis	

GEOS F477	Ice in the Climate System	3
or GEOS F481	Snow in the Environment	
MATH F252X	Calculus II	4
MATH F253X	Calculus III	4
Complete two courses from the Policy, Society, and Humanities course list ⁶		6
Complete two additional courses from the Physical Processes or Technical & Data Skills course lists ⁶		6
Total Credits		35

⁶ When choosing electives, students should consider the requirement for 39 credits of upper-division coursework prior to graduation.

SUSTAINABILITY

Code	Title	Credits
Sustainability Concentration Requirements		
As part of the general education requirements, complete the following:		
MATH F230X	Essential Calculus with Applications	
or MATH F251X	Calculus I	
As part of the B.S. requirements, complete the following:		
BIOL F115X	Fundamentals of Biology I	
BIOL F116X	Fundamentals of Biology II	
Complete the following:		
ANS F461	Native Ways of Knowing ⁷	3
or ANS F347	Voices of Native American Peoples	
ATM F101X	Weather and Climate of Alaska	4
or BIOL F104X	Natural History of Alaska	
or ECON F111X	The Economy of Rural Alaska	
BIOL F371	Principles of Ecology	4
NRM F101	Natural Resources Conservation and Policy	3
or FISH F110	Fish and Fisheries in a Changing World	
or WLF F101	Survey of Wildlife Science	
NRM F210	Principles of Sustainable Agriculture	3
NRM F277	Introduction to Conservation Biology	3
NRM F380	Soils and the Environment	3
or NRM F370	Introduction to Watershed Management	
NRM F430	Resource Management Planning	3
or NRM F407	Environmental Law	
STAT F401	Regression and Analysis of Variance	4
Complete one course from the Biotic or Physical Processes course list ⁶		3
Complete one course from the Technical & Data Skills course list ⁶		3
Total Credits		36

⁶ When choosing electives, students should consider the requirement for 39 credits of upper-division coursework prior to graduation.

⁷ ANS F461 fulfills the Alaska Native-themed requirement (<https://catalog.uaf.edu/bachelors/#alaskanativethemedrequirementtext>).

Course Lists

PHYSICAL PROCESSES

Code	Title	Credits
ATM F401	Introduction to Atmospheric Sciences	3
ATM F456	Climate and Climate Change	3
CHEM F321	Organic Chemistry I	4
CHEM F325	Organic Chemistry II	4
CHEM F331	Physical Chemistry I	4
CHEM F332	Physical Chemistry II	4
GEOS F304	Geomorphology	3
GEOS F380	Geological Hazards	3
GEOS F460	The Dynamic Alaska Coastline	3
GEOS F477	Ice in the Climate System	3
OCN F419	Concepts in Physical Oceanography	3
OCN F481	The Ocean and Global Change	3
PHYS F413	Atmospheric Radiation	3
or ATM F413	Atmospheric Radiation	3

BIOTIC PROCESSES

Code	Title	Credits
BIOL F371	Principles of Ecology	4
BIOL F418	Biogeography	3
BIOL F457	Environmental Microbiology	3
BIOL F476	Ecosystem Ecology	4
GEOS F315	Paleobiology and Paleontology	4
GEOS F453	Palynology and Paleopalynology	4
GEOS F485	Mass Extinctions, Neocatastrophism and the History of Life	3
MBI F482	Human Impacts to the Marine Biosphere	3
NRM F370	Introduction to Watershed Management	3
NRM F380	Soils and the Environment	3
NRM F466	Environmental Soil Chemistry	3

POLICY, SOCIETY AND CULTURE

Code	Title	Credits
ACNS F449	Northern and Environmental Literature	3
ACNS F453	Fire, Ice, and the Fate of Humanity: A History of Energy and Climate Change	3
ANS F242X	Indigenous Cultures of Alaska ⁸	3
ANS F347	Voices of Native American Peoples	3
ANS F350	Cross-cultural Communication: Alaska Perspectives ⁸	3
ANS F365	Alaska Native Art History ⁸	3
ANS F461	Native Ways of Knowing ⁸	3
HIST F483	20th-century Circumpolar History	3
HSEM F461	Human Security in Alaska ⁸	3
NRM F204	Public Lands Law and Policy	3
NRM F407	Environmental Law	3
NRM F430	Resource Management Planning	3
PS F403	Public Policy	3

⁸ Fulfills the Alaska Native-themed requirement (<https://catalog.uaf.edu/bachelors/#alaskanativethemedrequirementtext>).

TECHNICAL AND DATA SKILLS

Code	Title	Credits
ATM F473	Micrometeorology with Focus on Subarctic and Arctic Ecosystems	3
CS F201	Computer Science I	3
GEOS F422	Geoscience Applications of Remote Sensing	3
MATH F302	Differential Equations	3
MATH F314	Linear Algebra	3
NRM F240	Natural Resources Measurement and Inventory	3
NRM F435	GIS Analysis	4
STAT F401	Regression and Analysis of Variance	4
STAT F402	Scientific Sampling	3
STAT F461	Applied Multivariate Statistics	3

Road Maps

Climate and Environmental Change B.S. Environmental Earth Science Concentration

Course	Title	Credits
First Year		
Fall		
GEOS F101X	The Dynamic Earth (NS GER 1)	4
LS F101X	Library Information and Research (NS GER 1)	1
MATH F251X	Calculus I (Concentration Requirement, M GER)	4
PS F101X	Introduction to American Government and Politics (Concentration Requirement, M GER)	3
WRTG F111X	Writing Across Contexts (Communication GER 1)	3
		Credits
		15
Spring		
NRM F125	Our Changing Climate: Past, Present, Future	3
COM F131X/F141X	Fundamentals of Oral Communication: Group Context (Communication GER 2)	3
NRM F111X	Introduction to Sustainability Science (S GER 2 (discipline 2))	3
CHEM F105X	General Chemistry I (NS GER 2)	4
Arts GER		3
		Credits
		16
Second Year		
Fall		
BIOL F115X	Fundamentals of Biology I (NS degree requirement)	4

ECON F235X	Introduction to Natural Resource Economics (One more Art, H, or S GER)	3	Open elective	3
PHYS F211X	General Physics I (Major)	4	Credits	13
WRTG F213X	Writing and the Sciences (Communication GER 3)	3	Total Credits	122
Credits		14		
Spring				
GEOS F112X	The History of Earth and Life	4		
GEOS F304	Geomorphology	3		
STAT F200X	Elementary Statistics	3		
Open Elective		3		
H GER 1		3		
Credits		16		
Third Year				
Fall				
GEOS F213	Mineralogy (Concentration)	4		
GEOS F315	Paleobiology and Paleontology (Concentration)	4		
GEOS F422	Geoscience Applications of Remote Sensing (Concentration)	3		
PS F447	U.S. Environmental Politics (Major)	3		
NRM F380	Soils and the Environment (Concentration)	3		
Credits		17		
Spring				
NRM F303X	Environmental Ethics and Actions (S GER 1 (discipline 1))	3		
Policy List (Concentration)		3		
Policy List (Concentration)		3		
Open Elective		3		
Open Elective		3		
Credits		15		
Fourth Year				
Fall				
ATM F480	Climate Change Processes: Past, Present, Future (Major)	4		
GEOS F483	Research Design, Writing and Presentation Methods (Major)	3		
OCN F481	The Ocean and Global Change (Concentration)	3		
NRM F370	Introduction to Watershed Management (Concentration)	3		
NRM F338	Introduction to Geographic Information Systems (Major)	3		
Credits		16		
Spring				
CLIM F400	Climate and Environmental Change Capstone ePortfolio (Major)	1		
Open elective		3		
Physical List (Concentration)		3		
Bio or Tech list (Concentration)		3		