MAJOR IN SOIL AND CROP SCIENCES, SOIL SCIENCE AND ENVIRONMENTAL SOLUTIONS CONCENTRATION

Soils feed the world, provide clean water, and represent one of the most important scalable solutions to climate change. Soils are also the most biodiverse habitats on earth, containing a vast array of microbes and a multi-level food web. Soil scientists are on the front-lines of fighting climate change, developing resilient food production systems, and reversing environmental degradation through restoration and regeneration of soils.

The Soil and Crops Sciences major with a concentration in Soil Science and Environmental Solutions applies fundamental principles and techniques in soil science to solving complex, real-world environmental sustainability challenges. Students learn how the interactions of plants, the microbiome, and the soil food web with the soil's physical and chemical environment support life on earth, improve water quality, and impact our climate. Our students receive hands-on interdisciplinary training from world leaders in soil-related research, so they are equipped to be change-makers, applying cutting-edge science to real-world challenges.

Exciting careers await our graduates in rapidly emerging fields including sustainability, AgriTech, consulting in institutions ranging from academia, startups, industry, government, and non-profits.

Learning Objectives

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

1. Demonstrate technical competency in the fundamental principles of soils and agroecosystems and synthesize information from field and laboratory observations in meeting identified needs.
2. Identify, formulate, and solve complex soil and agroecosystem sustainability problems by applying quantitative approaches and principles of soil and plant functionality across varying environments.
3. Collaborate with diverse teams to set goals and expectations, foster individual strengths and leadership, and encourage creativity and inclusivity in solving problems.

Requirements Effective Fall 2022

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 or BZ 120	Attributes of Living Systems (GT-SC1) Principles of Plant Biology (GT-SC1)	3A	4
MATH 117	College Algebra in Context I (GT-MA1)	1B	1
MATH 118	College Algebra in Context II (GT-MA1)	1B	1
MATH 124	Logarithmic and Exponential Functions (GT-MA1)	1B	1
SOCR 100	Introduction to Crop Science		4
SOCR 171/HORT 171	Environmental Issues in Agriculture (GT-SS3)	1C	3
SOCR 193	Pathways to Success		1
Historical Perspectives (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)		3D	3
General Electives			4
	Total Credits		**30**

Sophomore

CHEM 113	General Chemistry II		3
GEOL 120	Geology and Society (GT-SC2)	3A	3
GEOL 121	Experiential Geoscience Laboratory (GT-SC1)	3A	1
LAND 220/LIFE 220	Fundamentals of Ecology (GT-SC2)	3A	3
Select one course from the following:			3-4
NR 319	Introduction to Geospatial Science		
SOCR 377/AB 377	Geographic Information Systems in Agriculture		
SOCR 210	Microbiome Roles in a Sustainable Earth (GT-SC2)	3A	3
SOCR 240	Introductory Soil Science		4
SOCR 221	Cropping Systems Field Experience		1

Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)		3B	6
Social and Behavioral Sciences (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences)		3C	3
	Total Credits		**30**

Junior

SOCR 350	Soil Fertility Management		3
SOCR 351	Soil Fertility Laboratory		1
SOCR 375	Soil Biogeochemistry		3
SOCR 405/ESS 405	Global Agriculture and Environmental Change		3
SOCR 440	Pedology		4
SOCR 455	Microbiomes of Soil Systems		3
Select one course from the following:			3
STAT 201	General Statistics (GT-MA1)	1B	
STAT 301	Introduction to Applied Statistical Methods		
STAT 307	Introduction to Biostatistics		
Advanced Writing (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)		2	3
Upper-Division Electives			7
	Total Credits		**30**

Senior

RS 478	Ecological Restoration		3
SOCR 400	Soils and Global Change-Impacts and Solutions	4A,4B,4C	3
SOCR 441	Soil Ecology		3
SOCR 467	Soil and Environmental Chemistry		3
SOCR 470	Soil Physics		3
SOCR 471	Soil Physics Laboratory		1
SOCR 486	Practicum	4C	1
SOCR 492	Preparing for Impact--Your Career Journey	4A,4C	1
Upper-Division Electives			12
	Total Credits		**30**
	Program Total Credits:		**120**

[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).

Major Completion Map

Freshman

Semester 1		**Critical**	**Recommended**	**AUCC**	**Credits**
CO 150	College Composition (GT-CO2)	X		1A	3
MATH 117	College Algebra in Context I (GT-MA1)	X		1B	1
MATH 118	College Algebra in Context II (GT-MA1)	X		1B	1
MATH 124	Logarithmic and Exponential Functions (GT-MA1)	X		1B	1
SOCR 100	Introduction to Crop Science	X			4
SOCR 171/ HORT 171	Environmental Issues in Agriculture (GT-SS3)	X		1C	3
General Elective			X		2
	Total Credits				**15**

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 102 or BZ 120	Attributes of Living Systems (GT-SC1) Principles of Plant Biology (GT-SC1)	X		3A	4
SOCR 193	Pathways to Success	X			1
Historical Perspectives (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)			X	3D	3
General Elective			X		2
AUCC 1B must be completed by the end of Semester 2.		X			
	Total Credits				**15**

Sophomore

Semester 3		Critical	Recommended	AUCC	Credits
CHEM 113	General Chemistry II	X			3
LAND 220/ LIFE 220	Fundamentals of Ecology (GT-SC2)	X		3A	3
Select one course from the following:					3-4
NR 319	Introduction to Geospatial Science	X			
SOCR 377/ AB 377	Geographic Information Systems in Agriculture				
SOCR 221	Cropping Systems Field Experience	X			1
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			X	3B	3
	Total Credits				**13**

Semester 4		Critical	Recommended	AUCC	Credits
GEOL 120	Geology and Society (GT-SC2)	X		3A	3
GEOL 121	Experiential Geoscience Laboratory (GT-SC1)	X		3A	1
SOCR 210	Microbiome Roles in a Sustainable Earth (GT-SC2)	X		3A	3
SOCR 240	Introductory Soil Science	X			4
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			X	3B,4B	3
Social and Behavioral Sciences (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences)			X	3C	3
	Total Credits				**17**

Junior

Semester 5		Critical	Recommended	AUCC	Credits
SOCR 440	Pedology	X			4
SOCR 455	Microbiomes of Soil Systems	X			3
Select one course from the following:		X			3
STAT 201	General Statistics (GT-MA1)			1B	
STAT 301	Introduction to Applied Statistical Methods				
STAT 307	Introduction to Biostatistics				
Advanced Writing (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)			X	2	3
Upper-Division Electives			X		3
	Total Credits				**16**

Semester 6		Critical	Recommended	AUCC	Credits
SOCR 350	Soil Fertility Management	X			3
SOCR 351	Soil Fertility Laboratory	X			1
SOCR 375	Soil Biogeochemistry	X			3
SOCR 405/ ESS 405	Global Agriculture and Environmental Change	X			3

Upper-Division Electives			X		4
	Total Credits				**14**
Senior					
Semester 7		**Critical**	**Recommended**	**AUCC**	**Credits**
SOCR 400	Soils and Global Change-Impacts and Solutions	X		4A,4B,4C	3
SOCR 470	Soil Physics	X			3
SOCR 471	Soil Physics Laboratory	X			1
SOCR 486	Practicum	X		4C	1
SOCR 492	Preparing for Impact--Your Career Journey	X		4A,4C	1
Upper-Division Electives			X		6
LAND 220 / LIFE 220 must be completed by the end of Semester 7.		X			
	Total Credits				**15**
Semester 8		**Critical**	**Recommended**	**AUCC**	**Credits**
RS 478	Ecological Restoration	X			3
SOCR 441	Soil Ecology	X			3
SOCR 467	Soil and Environmental Chemistry	X			3
Upper-Division 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**