

MAJOR IN SOIL AND CROP SCIENCES, PLANT BIOTECHNOLOGY CONCENTRATION

Crop improvement, whether through breeding or genetic engineering, is one of the most important drivers of agricultural innovation. Students with a major in Soil and Crop Sciences in the Plant Biotechnology

Concentration gain a firm foundation in fundamental principles of genetics and crop breeding and explore new and rapidly evolving technologies that enable us to develop crop varieties that are more nutritious, resilient to climate change, and disease resistant.

Career opportunities are available in both the public and private sectors, including basic research, plant breeding, product development, and sales.

Requirements Effective Fall 2023

Freshman

		AUCC	Credits
AGRI 100	Contemporary Agricultural Systems		1
BZ 120	Principles of Plant Biology (GT-SC1)	3A	4
CHEM 111	General Chemistry I (GT-SC2)	3A	4
CHEM 112	General Chemistry Lab I (GT-SC1)	3A	1
CHEM 113	General Chemistry II		3
CHEM 114	General Chemistry Lab II		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
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	General Crops		4
SOCR 193	Pathways to Success		1
Total Credits			33

Sophomore

AREC 202	Agricultural and Resource Economics (GT-SS1)	3C	3
CHEM 245	Fundamentals of Organic Chemistry		4
CHEM 246	Fundamentals of Organic Chemistry Laboratory		1
MATH 125	Numerical Trigonometry (GT-MA1)	1B	1
SOCR 171/HORT 171	Environmental Issues in Agriculture (GT-SS3)	1C	3
SOCR 210	Microbiome Roles in a Sustainable Earth (GT-SC2)	3A	3
SOCR 221	Cropping Systems Field Experience		1
SOCR 240	Introductory Soil Science		4
Select one course from the following:			3
AGRI 116/IE 116	Plants and Civilizations (GT-SS3)	1C	
AGRI 270/IE 270	World Interdependence-Population and Food (GT-SS3)	1C	
Select one course from the following:			2-3
FSHN 125	Food and Nutrition in Health		
FSHN 150	Survey of Human Nutrition		
Advanced Writing (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)			2
Arts and Humanities (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			3B
Total Credits			31-32

Junior

AGED 210	History of Agriculture in the United States	3D	3
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BC 351	Principles of Biochemistry	4
BZ 310	Cell Biology	4
SOCR 330	Principles of Genetics	3
Select two groups from the following:		6-7
Group A:		
BSPM 302	Applied and General Entomology	
BSPM 303A or 303B	Entomology Laboratory: General Entomology Laboratory: Horticultural	
Group B:		
BSPM 308	Ecology and Management of Weeds	
Group C:		
BSPM 361	Elements of Plant Pathology	
Select one course from the following:		3-4
BSPM 450	Molecular Plant-Microbe Interaction	
BZ 331	Developmental Plant Anatomy	
ESS 405/SOCR 405	Global Agriculture and Environmental Change	
HORT 476	Environmental Plant Stress Physiology	
Select one course from the following:		3
STAT 301	Introduction to Applied Statistical Methods	
STAT 307	Introduction to Biostatistics	
Upper Division Electives		3

Total Credits **29-31**

Senior

BZ 360	Bioinformatics and Genomics	4
BZ 440	Plant Physiology	3
BZ 441	Plant Physiology Laboratory	2
SOCR 335	Applied Plant Genetics	3
SOCR 460/HORT 460	Plant Breeding and Biotechnology	4A,4B,4C
SOCR 486	Practicum	4C
SOCR 492	Preparing for Impact--Your Career Journey	4A,4C
Arts and Humanities (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)	3B	3
Upper Division Electives ¹		5-8

Total Credits **25-28**

Program Total Credits: **120**

Major Completion Map

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
AGRI 100	Contemporary Agricultural Systems				1
CHEM 111	General Chemistry I (GT-SC2)	X		3A	4
CHEM 112	General Chemistry Lab I (GT-SC1)	X		3A	1
LIFE 102	Attributes of Living Systems (GT-SC1)	X		3A	4
MATH 117	College Algebra in Context I (GT-MA1)			1B	1
MATH 118	College Algebra in Context II (GT-MA1)			1B	1
SOCR 100	General Crops	X			4
Total Credits					16

Semester 2		Critical	Recommended	AUCC	Credits
BZ 120	Principles of Plant Biology (GT-SC1)	X		3A	4
CHEM 113	General Chemistry II	X			3
CHEM 114	General Chemistry Lab II	X			1
CO 150	College Composition (GT-CO2)	X		1A	3
LIFE 103	Biology of Organisms-Animals and Plants (GT-SC1)	X		3A	4
MATH 124	Logarithmic and Exponential Functions (GT-MA1)			1B	1
SOCR 193	Pathways to Success	X			1
AUCC 1B (Quantitative Reasoning) must be completed by the end of Semester 2.		X			
Total Credits					17
Sophomore					
Semester 3		Critical	Recommended	AUCC	Credits
CHEM 245	Fundamentals of Organic Chemistry	X			4
CHEM 246	Fundamentals of Organic Chemistry Laboratory	X			1
MATH 125	Numerical Trigonometry (GT-MA1)			1B	1
SOCR 171/ HORT 171	Environmental Issues in Agriculture (GT-SS3)	X		1C	3
SOCR 221	Cropping Systems Field Experience	X			1
SOCR 240	Introductory Soil Science	X			4
Arts and Humanities (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			X	3B	3
LIFE 102 must be completed by the end of Semester 3.		X			
Total Credits					17
Semester 4		Critical	Recommended	AUCC	Credits
AREC 202	Agricultural and Resource Economics (GT-SS1)	X		3C	3
SOCR 210	Microbiome Roles in a Sustainable Earth (GT-SC2)	X		3A	3
Select one course from the following:		X			3
AGRI 116/ IE 116	Plants and Civilizations (GT-SS3)			1C	
AGRI 270/ IE 270	World Interdependence-Population and Food (GT-SS3)			1C	
Select one course from the following:		X			2-3
FSHN 125	Food and Nutrition in Health				
FSHN 150	Survey of Human Nutrition				
Advanced Writing (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)			X	2	3
CHEM 245 must be completed by the end of Semester 4.		X			
Total Credits					14-15
Junior					
Semester 5		Critical	Recommended	AUCC	Credits
BC 351	Principles of Biochemistry	X			4
Select two groups from the following:		X			6-7
Group A:					
BSPM 302	Applied and General Entomology				
BSPM 303A or 303B	Entomology Laboratory: General Entomology Laboratory: Horticultural				
Group B:					
BSPM 308	Ecology and Management of Weeds				
Group C:					
BSPM 361	Elements of Plant Pathology				
Upper-Division Elective			X		3
Total Credits					13-14

Semester 6		Critical	Recommended	AUCC	Credits
AGED 210	History of Agriculture in the United States			3D	3
BZ 310	Cell Biology	X			4
SOCR 330	Principles of Genetics	X			3
Select one course from the following:		X			3-4
BSPM 450	Molecular Plant-Microbe Interaction				
BZ 331	Developmental Plant Anatomy				
ESS 405/ SOCR 405	Global Agriculture and Environmental Change				
HORT 476	Environmental Plant Stress Physiology				
Select one course from the following:		X			3
STAT 301	Introduction to Applied Statistical Methods				
STAT 307	Introduction to Biostatistics				
SOCR 330 must be completed by the end of Semester 6.		X			
Total Credits					16-17
Senior					
Semester 7		Critical	Recommended	AUCC	Credits
SOCR 335	Applied Plant Genetics	X			3
SOCR 492	Preparing for Impact–Your Career Journey	X		4A,4C	1
Arts and Humanities (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			X	3B	3
Upper-Division Electives			X		5
Total Credits					12
Semester 8		Critical	Recommended	AUCC	Credits
BZ 360	Bioinformatics and Genomics	X			4
BZ 440	Plant Physiology	X			3
BZ 441	Plant Physiology Laboratory	X			2
SOCR 460/ HORT 460	Plant Breeding and Biotechnology	X		4A,4B,4C	3
SOCR 486	Practicum	X		4C	1
Upper-Division Electives			X		0-3
The benchmark courses for the 8th semester are the remaining courses in the entire program of study.		X			
Total Credits					13-16
Program Total Credits:					120