CROP AND SOIL SCIENCE UNDERGRADUATE MAJOR (BS, HBS)

This major offers the following option(s):

- Agronomy (http://catalog.oregonstate.edu/college-departments/agricultural-sciences/crop-soil-science/crop-soil-science-bs-hbs/agronomy-option/)
- Plant Breeding and Genetics (http://catalog.oregonstate.edu/college-departments/agricultural-sciences/crop-soil-science/crop-soil-science-bs-hbs/plant-breeding-genetics-option/)
- Soil Science (http://catalog.oregonstate.edu/college-departments/agricultural-sciences/crop-soil-science/crop-soil-science-bs-hbs/soil-science-option/)

Also available at LaGrande and via Ecampus.

Crop and Soil Science encompasses everything from soils to seeds: natural systems, field crop agriculture, rural and urban economies, and natural resource management. Through a diverse set of course offerings, and collaboration between the public and private sectors, Crop and Soil Science students develop the knowledge and skills to improve the future of farming and natural resource systems in Oregon and beyond. The program focuses on topics related to safe, stable food systems, promoting sustainable practices in agriculture, and understanding and protecting our water and soil resources. The major has three options: Soil Science, Agronomy, or Plant Breeding & Genetics.

The Soil Science option provides students with a solid understanding of the physical, chemical, and biological properties of this essential natural resource. Soil science students explore issues including water quality and management, organic crop production, erosion and sedimentation, land use and reclamation, and soil health and sustainability. Soil science professionals solve real-world, sustainable living problems in urban, agricultural, forest, rangeland, and other natural systems. Many soil scientists work for the Natural Resources Conservation Service and other federal, state, or local government agencies as extension educators, researchers, or surveyors. Others hold teaching or research positions in colleges and universities. Soil scientists also have opportunities in the private sector, including positions with fertilizer companies, private research laboratories, environmental service companies, insurance companies, and land appraisal firms.

Students in the Agronomy option gain the knowledge and skills necessary to be active contributors in producing food, feed, fiber, and energy crops for our world. Agronomic professionals have the expertise to utilize the potentials of a given production system and to choose plant materials and plant production practices that optimize production while minimizing environmental impact. Maximum sustainable production is the goal and requires in-depth knowledge of plants, plant genetics, plant pests, soils, soil fertility, production equipment, economics, and politics to be successful. Agronomists work for field crop production companies, as managers of small to large farms and ranches, and as managers of their own farming operations. Agronomists also work for federal, state, or local government agencies as educators, researchers, or field technicians. Others hold teaching, research, or extension positions in universities.

The Plant Breeding and Genetics option provides an interdisciplinary approach to applied plant breeding and practical experience in breeding and genetic analysis working in the greenhouse, field, and laboratory. Students gain fundamental knowledge in plant breeding that may be applied to a range of crops including annual and perennial horticultural crops, agronomic food and feed crops, and forestry products. In addition to many other important qualities, plant breeders work to develop crops with stronger yields, better disease resistance, and increased tolerance to climate change. Plant breeders are employed in the private sector and by universities and other public entities.

Major Code: 120

- Demonstrate discipline#specific knowledge and skills.
- Find, synthesize and interpret scientific information.
- Communicate scientific findings in writing and in oral/visual presentations.
- Apply the scientific method to solve problems.
- Attain professional skills necessary for careers in crop or soil science.

The Bachelor of Science degree in Crop and Soil Science requires the choice of one of three options:

1. Agronomy
2. Plant Breeding and Genetics
3. Soil Science (also available via Ecampus)

The following major core requirements apply to the Agronomy (http://catalog.oregonstate.edu/college-departments/agricultural-sciences/crop-soil-science/crop-soil-science-bs-hbs/agronomy-option/) and Soil Science (http://catalog.oregonstate.edu/college-departments/agricultural-sciences/crop-soil-science/crop-soil-science-bs-hbs/soil-science-option/) options only. Check Plant Breeding & Genetics (http://catalog.oregonstate.edu/college-departments/agricultural-sciences/crop-soil-science/crop-soil-science-bs-hbs/plant-breeding-genetics-option/) for core courses specific to that option.

Code	Title	Credits
Major Core		
Select one of the following biology series:		12
Series A: Principles of Biology		
BI 221 & BI 222 & BI 223	*PRINCIPLES OF BIOLOGY: CELLS and *PRINCIPLES OF BIOLOGY: ORGANISMS and *PRINCIPLES OF BIOLOGY: POPULATIONS	
Series B: Introductory Biology		
BI 204 & BI 205 & BI 206	*INTRODUCTORY BIOLOGY I and *INTRODUCTORY BIOLOGY II and *INTRODUCTORY BIOLOGY III	
Select one of the following chemistry series:		15
Series A		
CH 121 & CH 122 & CH 123	GENERAL CHEMISTRY and *GENERAL CHEMISTRY and *GENERAL CHEMISTRY	
Series B		
CH 231 & CH 261	GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 231	
CH 232 & CH 262	GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 232	
CH 233 & CH 263	GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 233	
Math		
MTH 111	*COLLEGE ALGEBRA	4
Orientation		
CROP 101/ENT 101/ HORT 101/SOIL 101	INTRODUCTION TO CROP, SOIL, AND INSECT SCIENCE	1
Experiential Learning		

CROP 407/SOIL 407/ HORT 407	SEMINAR	1
Select one course from the following: [1]		3
CROP 401	RESEARCH	
CROP 403	THESIS	
CROP 410	INTERNSHIP	
SOIL 401	RESEARCH	
SOIL 403	THESIS	
SOIL 408	WORKSHOP	
SOIL 410	INTERNSHIP	
Ecology		
Select one course from the following:		3-4
BI 370	ECOLOGY	
BOT 341	PLANT ECOLOGY	
HORT 318	^APPLIED ECOLOGY OF MANAGED ECOSYSTEMS	
RNG 341	RANGELAND ECOLOGY AND MANAGEMENT	
Technology		
SOIL 468	SOIL LANDSCAPE ANALYSIS	3-4
or CROP 414	PRECISION AGRICULTURE	
or CROP 420	SEED SCIENCE AND TECHNOLOGY	
Writing Intensive Course (WIC)		
SOIL 395	*^WORLD SOIL RESOURCES	3
or SUS 325/CROP 325/SOIL 325	^AG AND ENVIRONMENTAL PREDICAMENTS: A CASE STUDY APPROACH	
Total Credits		45-47

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Baccalaureate Core Course (BCC)

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Writing Intensive Course (WIC)

1

A structured internship (CROP 410) can be substituted for General Electives or Business and Economics credits in the Agronomy option. See option requirements for details

Major Code: 120

Plant Breeding and Genetics Option

First Year

Fall		**Credits**
CH 121	GENERAL CHEMISTRY	5
HORT 112	INTRODUCTION TO HORTICULTURAL SYSTEMS, PRACTICES AND CAREERS	2
WR 121	*ENGLISH COMPOSITION	3
Math course		4
	Credits	14
Winter		
CH 122	*GENERAL CHEMISTRY	5
COMM 211	*COMMUNICATING ONLINE	3
SOIL 205	SOIL SCIENCE	3
SOIL 206	*SOIL SCIENCE LABORATORY FOR SOIL 205	1
Bacc Core: Perspectives		3
	Credits	15
Spring		
CH 123	*GENERAL CHEMISTRY	5
HHS 231	*LIFETIME FITNESS FOR HEALTH	2
HHS 241	*LIFETIME FITNESS	1
Bacc Core: Writing II		3
Plant Materials		3
Elective		2
	Credits	16

Second Year

Fall		
BI 221	*PRINCIPLES OF BIOLOGY: CELLS	4
Horticultural Production Elective		4
Bacc Core: Perspectives		4
Elective		3
	Credits	15
Winter		
BI 222	*PRINCIPLES OF BIOLOGY: ORGANISMS	4
HORT 316	PLANT NUTRITION	4
HORT 318	^APPLIED ECOLOGY OF MANAGED ECOSYSTEMS	3
Bacc Core: Perspectives		3
Elective		1
	Credits	15
Spring		
BI 223	*PRINCIPLES OF BIOLOGY: POPULATIONS	4
Horticultural Production Elective		4
Bacc Core: Perspectives		3
Bacc Core: Perspectives		3
Elective		2
	Credits	16

Third Year

Fall		
HORT 301	GROWTH AND DEVELOPMENT OF HORTICULTURAL CROPS	3
ST 351	INTRODUCTION TO STATISTICAL METHODS	4
Bacc Core: Synthesis		4
Elective		4
	Credits	15
Winter		
BOT 331	PLANT PHYSIOLOGY	4
HORT 311	PLANT PROPAGATION	4
HORT 412	CAREER EXPLORATION: INTERNSHIPS AND RESEARCH PROJECTS	1
PBG 430	PLANT GENETICS	3
Elective		3
	Credits	15
Spring		
ENT 311	INTRODUCTION TO INSECT PEST MANAGEMENT	4
PBG 450	PLANT BREEDING	4
Bacc Core: Synthesis		3
Elective		4
	Credits	15

Fourth Year

Fall		
BOT 350	INTRODUCTORY PLANT PATHOLOGY	4
CROP 440	WEED MANAGEMENT	4
HORT 463	SEED BIOLOGY	3
Elective		4
	Credits	15
Winter		
PBG 441	PLANT TISSUE CULTURE	4
HORT 411	HORTICULTURE BOOK CLUB	1
Horticultural Production Elective		3
Elective		3
Elective		3
	Credits	14
Spring		
HORT 407	SEMINAR	1
HORT 480 or HORT 481	CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT or HORTICULTURE PRODUCTION CASE STUDIES	4
PBG 410	INTERNSHIP	6

Elective		4
	Credits	15
	Total Credits	180