

PLANT BREEDING, GENETICS, AND GENOMICS OPTION

This option is available within the Crop and Soil Science (<https://catalog.oregonstate.edu/college-departments/agricultural-sciences/crop-soil-science/crop-soil-science-bs-hbs/>) and Horticulture (<https://catalog.oregonstate.edu/college-departments/agricultural-sciences/horticulture/horticulture-bs-hbs/>) majors at the following locations:

- Corvallis
- Ecampus

An interdisciplinary approach to applied plant breeding is the cornerstone of the Plant Breeding, Genetics, and Genomics option. After completing this degree, you will have gained 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.

Graduates of the Plant Breeding, Genetics, and Genomics option often enter public or private sector breeding programs, or go on to attend graduate school.

Active Learning

As a student studying Plant Breeding, Genetics, and Genomics you'll gain practical experience in breeding and genetic analysis. You'll also be able to take advantage of OSU's extensive, cross-campus interdisciplinary plant science network and plant breeding program to explore your research interests.

You can receive either a B.S. in Horticulture or a B.S. in Crop and Soil Science with an option in Plant Breeding, Genetics, and Genomics.

Option Code: 007

Options follow the learning outcomes of the major. For this option, refer to the learning outcomes of the Horticulture (<https://catalog.oregonstate.edu/college-departments/agricultural-sciences/horticulture/horticulture-bs-hbs/#learningoutcomestext>) major.

Code	Title	Credits
Required Core		
BOT 331	PLANT PHYSIOLOGY ¹	4
BOT 451	PLANT PATHOLOGY ¹	4
CROP 463/HORT 463 or CROP 420	SEED BIOLOGY SEED SCIENCE AND TECHNOLOGY	3
CROP 407/HORT 407/ SOIL 407	SEMINAR ²	1
HORT 310 HORT 312	PLANT PROPAGATION ¹ PLANT PROPAGATION LABORATORY (optional)	3
PBG 430	PLANT GENETICS	3
PBG 440	PRINCIPLES OF PLANT TISSUE CULTURE	3
ST 351	INTRODUCTION TO STATISTICAL METHODS ³	4
Capstone		
PBG 450	PLANT BREEDING	4
Data Science		
BB 345 or BDS 310 or CS 201	PYTHON FOR MOLECULAR BIOLOGISTS FOUNDATIONS OF BIOLOGICAL DATA SCIENCES COMPUTER PROGRAMMING FOR NON-CS MAJORS	3-4
Select one course from the following:		3-4
BB 485	APPLIED BIOINFORMATICS	
BDS 311	COMPUTATIONAL APPROACHES FOR BIOLOGICAL DATA	

BDS 474	INTRODUCTION TO GENOME BIOLOGY	
BDS 475	COMPARATIVE GENOMICS	
BDS 477	POPULATION GENOMICS	
BDS 478	FUNCTIONAL GENOMICS	
Plant Materials		
Select two courses from the following:		5-8
BOT 313	PLANT STRUCTURE	
BOT 321	PLANT SYSTEMATICS	
BOT 425	FLORA OF THE PACIFIC NORTHWEST	
CROP 200	CROP ECOLOGY AND MORPHOLOGY ³	
CROP 433/HORT 433	SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS	
HORT 226	LANDSCAPE PLANT MATERIALS I: DECIDUOUS HARDWOODS AND CONIFERS	
HORT 228	LANDSCAPE PLANT MATERIALS II: SPRING FLOWERING TREES AND SHRUBS	
HORT 251	TEMPERATE TREE FRUIT, BERRIES, GRAPES, AND NUTS	
HORT 255	HERBACEOUS ORNAMENTAL PLANT MATERIALS	
Crop Production		
Select one course from the following:		3-4
CROP 300/HORT 300	CROP PRODUCTION IN PACIFIC NORTHWEST AGROECOSYSTEMS	
CROP 310	FORAGE PRODUCTION	
CROP 350	+*CHALLENGES IN WORLD FOOD PRODUCTION AND FOOD SECURITY	
CROP 460	SEED PRODUCTION	
HORT 260	ORGANIC FARMING AND GARDENING	
HORT 351	FLORICULTURE AND GREENHOUSE SYSTEMS	
HORT 361	PLANT NURSERY SYSTEMS	
HORT 421	HERBS, SPICES, AND MEDICINAL PLANTS	
HORT 454	PRINCIPLES AND PRACTICES OF VINEYARD PRODUCTION	
HORT 456	PHYSIOLOGY AND PRODUCTION OF BERRY CROPS	
Electives		
Select three courses from the following: ⁴		9
BB 314	CELL AND MOLECULAR BIOLOGY	
BB 345	PYTHON FOR MOLECULAR BIOLOGISTS	
BB 485	APPLIED BIOINFORMATICS	
BDS 310	FOUNDATIONS OF BIOLOGICAL DATA SCIENCES	
BDS 474	INTRODUCTION TO GENOME BIOLOGY	
BDS 475	COMPARATIVE GENOMICS	
BDS 477	POPULATION GENOMICS	
BDS 478	FUNCTIONAL GENOMICS	
BOT 323	*FLOWERING PLANTS OF THE WORLD	
BOT 332	LABORATORY TECHNIQUES IN PLANT BIOLOGY	
BOT 341	PLANT ECOLOGY	
CROP 200	CROP ECOLOGY AND MORPHOLOGY	
CROP 280	INTRODUCTION TO THE COMPLEXITY OF OREGON CROPPING SYSTEMS	
CROP 300/ HORT300	CROP PRODUCTION IN PACIFIC NORTHWEST AGROECOSYSTEMS	
CROP 310	FORAGE PRODUCTION	
CROP 350	+*CHALLENGES IN WORLD FOOD PRODUCTION AND FOOD SECURITY	
CROP 414	PRECISION AGRICULTURE	
CROP 420	SEED SCIENCE AND TECHNOLOGY	
CROP 440	WEED MANAGEMENT	
CROP 460	SEED PRODUCTION	
CROP 463/HORT 463	SEED BIOLOGY	
CROP 480/HORT 480	CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT	
CS 201	COMPUTER PROGRAMMING FOR NON-CS MAJORS	
ENT 311	INTRODUCTION TO INSECT PEST MANAGEMENT	

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FES 435	*GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK	
HORT 251	TEMPERATE TREE FRUIT, BERRIES, GRAPES, AND NUTS	
HORT 260	ORGANIC FARMING AND GARDENING	
HORT 308	WEED MANAGEMENT IN ORGANIC CROPPING SYSTEMS	
HORT 344	INSECT AND DISEASE MANAGEMENT IN ORGANIC CROPPING SYSTEMS	
HORT 349	DIAGNOSING PLANT PROBLEMS	
HORT 351	FLORICULTURE AND GREENHOUSE SYSTEMS	
HORT 361	PLANT NURSERY SYSTEMS	
HORT 456	PHYSIOLOGY AND PRODUCTION OF BERRY CROPS	
MB 302	GENERAL MICROBIOLOGY	
MB 448	MICROBE-ENVIRONMENT INTERACTIONS	
PBG 442	PLANT TISSUE CULTURE LABORATORY	
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	PRINCIPLES OF RANGELAND ECOLOGY AND MANAGEMENT	
Writing Intensive Course		
Select one course from the following:		3
BOT 323	*FLOWERING PLANTS OF THE WORLD	
CROP 325/SOIL 325/SUS 325	*AG AND ENVIRONMENTAL PREDICAMENTS: A CASE STUDY APPROACH	
HORT 318	*APPLIED ECOLOGY OF MANAGED ECOSYSTEMS	
SOIL 395	*WORLD SOIL RESOURCES	
Total Credits		58-65

* Baccalaureate Core course. Applies to general education requirements for undergraduate students in a catalog year up to 2024-2025

^ Writing Intensive Curriculum (WIC) course

¹ HORT 310, BOT 331 and BOT 451 can be double-counted in the option and Horticulture major

² CROP 200 and CROP 407/HORT 407/SOIL 407 can be double-counted in the option and Crop & Soil Science major

³ ST 351 is required for all students in the Horticulture major in addition to another Math course at MTH 112Z or higher. Students in the Crop & Soil Science major may use ST 351 as their one math courses above MTH 111Z

⁴ Electives cannot double-count for courses taken as part of the option or major requirements

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