PLANT BREEDING AND GENETICS OPTION

This option is offered within the following major(s):

- Crop and Soil Science - College of Agricultural Sciences (http://catalog.oregonstate.edu/college-departments/agricultural-sciences/crop-soil-science/crop-soil-science-bs-hbs)

The Plant Breeding and Genetics (PBG) option at Oregon State University embodies the Land Grant mission of integrated research, teaching and extension in the context of cultivar development and fundamental genetics. Plant breeding is a collaborative discipline spanning everything from classical field approaches to gene manipulation at the molecular level. Breeders regularly cooperate with pathologists, entomologists, soil scientists, physiologists, food scientists, genomicsists, molecular biologists and experts in other fields.

Students in the Plant Breeding and Genetics option will learn an interdisciplinary approach to applied plant breeding by taking courses across a broad spectrum of disciplines. The option may be tailored to meet students’ career goals including graduate school, as well as directly entering public or private sector breeding programs. After completing their degree, students will have gained fundamental knowledge in plant breeding that may be applied in a range of crops including annual and perennial horticultural crops, agronomic food and feed crops, and forestry products.

This option is under both the Crop and Soil Science major and the Horticulture major. The option uses the new horticulture major core.

**Code** | **Title** | **Hours**
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### Plant Materials
Select one of the following: 2-4
- BOT 313 | PLANT STRUCTURE | 
- BOT 321 | PLANT SYSTEMATICS | 
- BOT 425 | FLORA OF THE PACIFIC NORTHWEST | 
- CROP 200 | CROP ECOLOGY AND MORPHOLOGY | 
- FES 241 | DENDROLOGY | 
- 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, GRAPEVINES, AND NUTS | 
- HORT 255 | HERBACEOUS ORNAMENTAL PLANT MATERIALS | 
- HORT 433/ CROP 433 | SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS | 
### Ecology
Select one of the following: 3-4
- BI 370 | ECOLOGY | 
- BOT 341 | PLANT ECOLOGY | 
- HORT 318 | *APPLIED ECOLOGY OF MANAGED ECOSYSTEMS | 
### Technology
- PBG 441 | PLANT TISSUE CULTURE | 4
- CROP 407 | SEMINAR | 1
### Agricultural Communication
- HORT 411 | HORTICULTURE BOOK CLUB | 1
- BOT 323 | *FLOWERING PLANTS OF THE WORLD | 
- HORT 318 | *APPLIED ECOLOGY OF MANAGED ECOSYSTEMS | 
### Capstone
- PBG 450 | PLANT BREEDING | 4
### Science and Technology
- CROP 463/HORT 463 | SEED BIOLOGY | 3
- PBG 430 | PLANT GENETICS | 3
- ST 351 | INTRODUCTION TO STATISTICAL METHODS | 4
### Production and Technology
Select 3 of the following courses, for 9 credits minimum: 9
- BOT 332 | LABORATORY TECHNIQUES IN PLANT BIOLOGY | 
- CROP 199 | SPECIAL STUDIES: ISSUES IN SUSTAINABLE AGRICULTURE | 
- CROP 280 | INTRODUCTION TO THE COMPLEXITY OF OREGON CROPPING SYSTEMS | 
- CROP 310 | FORAGE PRODUCTION | 
- CROP 330 | *WORLD FOOD CROPS | 
- CROP 460 | SEED PRODUCTION | 
- CROP 590 | EXPERIMENTAL DESIGN IN AGRICULTURE | 
- CSS 320 | PRINCIPLES OF OIL AND FIBER CROP PRODUCTION | 
- CSS 321 | PRINCIPLES OF CEREAL CROP PRODUCTION | 
- CSS 322 | PRINCIPLES OF POTATO PRODUCTION | 
- HORT 260 | ORGANIC FARMING AND GARDENING | 
- HORT 300/ CROP 300 | CROP PRODUCTION IN PACIFIC NORTHWEST AGROECOSYSTEMS | 
- HORT 351 | FLORICULTURE AND GREENHOUSE SYSTEMS | 
- HORT 360 | IRRIGATION AND DRAINAGE | 
- HORT 361 | PLANT NURSERY SYSTEMS | 
- HORT 421 | HERBS, SPICES, AND MEDICINAL PLANTS | 
- HORT 444/ ENT 444 | INSECT AGROECOLOGY | 
- HORT 452 | BERRY AND GRAPE PHYSIOLOGY AND CULTURE | 
- HORT 453 | GRAPEVINE GROWTH AND PHYSIOLOGY | 
- HORT 454 | PRINCIPLES AND PRACTICES OF VINEYARD PRODUCTION | 
- HORT 456 | PHYSIOLOGY AND PRODUCTION OF BERRY CROPS | 
- MB 302 | GENERAL MICROBIOLOGY | 
- MB 303 | GENERAL MICROBIOLOGY LABORATORY | 
- SOIL 316 | NUTRIENT CYCLING IN AGROECOSYSTEMS | 
### Plant Synthesis
- HORT 480/CROP 480 | CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT | 4
- or HORT 481 | HORTICULTURE PRODUCTION CASE STUDIES | 
### Ecology and Sustainability Ecosystems Courses
Meets Synthesis Requirements. Each course must be from a different department
- Contemporary Global Issues
Select one of the following: 3-4

AEC 351 *NATURAL RESOURCE ECONOMICS AND POLICY
AEC 352/ ECON 352 *ENVIRONMENTAL ECONOMICS AND POLICY
BI 301 *HUMAN IMPACTS ON ECOSYSTEMS
CROP 330 *WORLD FOOD CROPS
FES 365 *ISSUES IN NATURAL RESOURCES CONSERVATION
FW 325 *GLOBAL CRISIS IN RESOURCE ECOLOGY
GEOG 300 *SUSTAINABILITY FOR THE COMMON GOOD
GEOG 330 **GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION
HORT 331/ ENT 331 *POLLINATORS IN PERIL
SUS 350 *SUSTAINABLE COMMUNITIES
WSE 470 *FORESTS, WOOD, AND CIVILIZATION
Z 349 *BIODIVERSITY: CAUSES, CONSEQUENCES, AND CONSERVATION

Science, Technology and Society
Select one of the following: 3-4

AGRI 411 *INTRODUCTION TO FOOD SYSTEMS: LOCAL TO GLOBAL
ANS 315 *CONTENTIOUS SOCIAL ISSUES IN ANIMAL AGRICULTURE
BI 348 *HUMAN ECOLOGY
BOT 324 *FUNGI IN SOCIETY
CH 374 *TECHNOLOGY, ENERGY, AND RISK
ENGR 350 *SUSTAINABLE ENGINEERING
ENGR 363 *ENERGY MATTERS
ENSC 479 **ENVIRONMENTAL CASE STUDIES
FES 435/TOX 435 *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK
FES 477/NR 477 *AGROFORESTRY
FES 485 *CONSENSUS AND NATURAL RESOURCES
FST 421 *FOOD LAW
FW 470 *ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN
GEOG 300 *SUSTAINABILITY FOR THE COMMON GOOD
GEOG 340 *INTRODUCTION TO WATER SCIENCE AND POLICY
HEST 310 *INTRO TO COMMUNITY ENGAGEMENT AND COMMUNITY-BASED DESIGN
HORT 330/ ENT 300 *PLAGUES, PESTS, AND POLITICS
HST 481 *ENVIRONMENTAL HISTORY OF THE UNITED STATES
HSTS 421 *TECHNOLOGY AND CHANGE
NUTR 312 *ISSUES IN NUTRITION AND HEALTH
PH 313 *ENERGY ALTERNATIVES
PHL 325 *SCIENTIFIC REASONING
PS 476 *SCIENCE AND POLITICS
SOIL 395 *WORLD SOIL RESOURCES
SUS 304 *SUSTAINABILITY ASSESSMENT

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 785

Course | Title | Hours
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First Year
Fall
CH 121 | GENERAL CHEMISTRY | 5
HORT 112 | INTRODUCTION TO HORTICULTURAL SYSTEMS, PRACTICES AND CAREERS | 2
WR 121 | *ENGLISH COMPOSITION | 3
Math course | | 4

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 course | | 3-4

Hours | 15-16

Spring

CH 123 | *GENERAL CHEMISTRY | 5
HHS 231 | *LIFETIME FITNESS FOR HEALTH | 2

HHS 241 | *LIFETIME FITNESS | 1
Bacc Core: Writing II course | | 3
Plant Materials course | | 2-4
Electives | | 0-2

Hours | 13-17

Second Year
Fall

BI 211 | *PRINCIPLES OF BIOLOGY | 4

Horticultural Production elective | | 3-4
Bacc Core: Perspectives course | | 3-4
Electives | | 3-5

Hours | 13-17

Winter

BI 212 | *PRINCIPLE OF BIOLOGY | 4
HORT 316 | PLANT NUTRITION | 4

Total credits required for graduation | 180
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<td>*APPLIED ECOLOGY OF MANAGED ECOSYSTEM/</td>
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