



Oregon State University

ENVIRONMENTAL SCIENCES GRADUATE PROGRAM (ESGP) AREA OF CONCENTRATION IN ECOLOGY

PURPOSE

The Area of Concentration in Ecology is developed to unify the science of ecology at Oregon State University and related Institutions of higher learning. Program goals will be to stimulate interdisciplinary ecological research, increase communication among disciplines, and promote responsible application of ecological data and principles to the solutions of environmental problems. Ecology is the scientific discipline that is concerned with the relationships between organisms and their past, present, and future environments. These relationships include biochemical and physiological responses of individuals, structure, and dynamics of populations, interactions among species, organization of biological communities, processing of energy and matter in ecosystems, and interactions between biota and physical, chemical, and climatic features of their environment. Ecology includes elements of life, physical, and social sciences.

The ecology track is designed for students who have a strong natural sciences background and want to focus on the ecological sciences. Students are recommended to have a background in statistics, mathematics, biology, and chemistry to enroll in courses that constitute the Area of Concentration in Ecology.

PROGRAM OF STUDY

Course work is divided into 5 categories, including ESGP Core courses. Methods and Numerical Skills courses, Ecology courses. Elective courses, and Thesis or Project. Total credits required are a minimum of 45 Cr for the M.S. and M.A. degrees and 108 Cr for the Ph.D. degree. Typical Programs of Study will include minimum credits as follow:

Subject Area	M.S. & M.A. Degrees	Ph.D. Degree
ENSC Core Courses	6 Cr	6 Cr
Methods and Numerical Skills	6-8 Cr	9-10 Cr
Science Focal Area Courses	15 Cr min.	30 Cr min.
Electives	11 Cr max.	26 Cr max.
Thesis or Project	6 Cr	36 Cr
Total	45 Cr	108 Cr

ESGP CORE COURSES

ENSC 515 Environmental Perspectives and Methods (3) (Fall term)
ENSC 520 Environmental Analysis (3) (Winter term)

ETHICS

CITI Responsible Conduct for Research (free training through OSU) or equivalent (0 Cr).
Instructions are found at this link: <https://gradschool.oregonstate.edu/environmental-sciences/student-handbook-environmental-science-graduate-program>

METHODS AND NUMERICAL SKILLS COURSES

6-8 Cr for the M.S. and M.A. degrees and **9 Cr minimum** for the Ph.D. degree. These courses are to ensure students have sufficient skills in research methods including mathematics, statistics, and computer science. Courses are to be selected by the student, advisor, and advising committee from the list below and from other offerings.

The courses below are a suggested partial listing and are to be selected by consensus of the graduate advisor, advising committee, and student.

Additional online courses may be included in the program of study that are not listed below. Search the Schedule of Classes by keyword or prefix for additional course options: https://classes.oregonstate.edu/?keyword=ensc&srcdb=999999&coursetype=coursetype_o2&camp=DB,DI

BOT 570 Community Structure and Analysis (4)
BB 585 Applied Bioinformatics (3)
BEE 511 Global Environmental Change: Using Data to Inform Decisions (3)
BEE 529 Biosystems Modeling Techniques (3)
CROP 590 Experimental Design in Agriculture (4)
GEOG 560, 561, 562 GISCIENCE I, II, III: Geographic Information Science (4)
GEOG 565 Spatial-Temporal Variation in Ecology and Earth Science (4)
GEOG 580 Remote Sensing I: Principles and Applications (4)
IB 592 Theoretical Ecology (4)
OC 512 Basic MATLAB for Environmental Scientists and Engineers (2)
ST 511, 512, 513 Methods of Data Analysis (4 each)
ST 515 Design and Analysis of Planned Experiments (3) ST 531 Sampling Methods (3)
ST 557 Applied Multivariate Analysis (3)

ECOLOGY COURSES

15 Cr minimum for the M.S. and M.A. degrees and 30 Cr minimum for the Ph.D. degree. Focal area courses are intended to develop depth of student understanding of ecology and ecosystems of interest.

The courses below are a suggested partial listing and are to be selected by consensus of the graduate advisor, advising committee, and student.

Additional online courses may be included in the program of study that are not listed below. Search the Schedule of Classes by keyword or prefix for additional course options: https://classes.oregonstate.edu/?keyword=ensc&srcdb=999999&coursetype=coursetype_o2&camp=DB,DI

A. Biochemical and Physiological Ecology Courses
BOT 588 Environmental Physiology of Plants (3)
FW 554 Fishery Biology (4)
IB 523 Environmental Physiology (3)
IB 531 Vertebrate Physiology I and IB 532 Vertebrate Physiology II (4 each)
B. Population Ecology and Evolution Courses
IB 545 Evolution (3)
BOT 668 Plant Disease Dynamics (4)
FES 548 Invasive Plants: Biology, Ecology, and Management (3)
FW 521 Aquatic Biological Invasions (4)
FW 573 Fish Ecology and Conservation (4)
FW 551 Avian Conservation and Management (3)
FW 564 Marine Conservation Biology (3)
IB 583 Population Biology (3)
MB 548 Microbial Ecology (3)
OC 647 Marine Microbial Processes (4)
C. Community Ecology Courses
BOT 570 Community Structure and Analysis (4)
BOT 545 Advance Plant Ecology (3)
IB 594 Community Ecology (5)
D. Landscape/Ecosystem/Process Ecology Courses
FES 540 Wildland Fire Ecology (3)
FES 545 Ecological Restoration (4)
FOR 536 Wildland Fire Science and Management (4)
FW 526 Coastal Ecology and Resource Management (5)
FW 534 Estuarine Ecology (4)
FW 550 Trophic Cascades (2-3)
FW 556 Freshwater Ecology and Conservation (5)
FW 558 Mammal Conservation and Management (4)
FW 579 Wetlands and Riparian Ecology (3)
FW 580 Stream Ecology (3)
FW 581 Wildlife Ecology (3)
GEOG 595 Field Geography of Oregon II (3)
GEOG 596 Field Research in Geomorphology and Landscape Ecology (3)
IB 581 BIOGEOGRAPHY (3)

OC 523 Ocean Ecological Dynamics (4)
RNG 521 Wildland Restoration and Ecology (4) RNG 555 Riparian Ecology and Management (3)
RNG 557 Habitat Analysis I: Habitat Use and Movement (3)
SOIL 525 Mineral-Organic Matter Interactions (3)
SOIL 545 Environmental Soil Chemistry (3) SOIL 555 Biology of Soil Ecosystems (4)

ELECTIVES COURSES

11 Cr maximum for the M.S. and M.A. degrees and **26 Cr maximum** for the Ph.D. degree. Students will work with their graduate advisor and committee to select electives courses to develop necessary background, and to add breadth and depth to the student's Program of Study.

Search the Schedule of Classes by keyword or prefix for additional course options:
https://classes.oregonstate.edu/?keyword=ensc&srcdb=999999&coursetype=coursetype_o2&camp=DB,DI

THESIS OR PROJECT

6 Cr for the M.S. and M.A. degrees and **36 Cr** for the Ph.D. degree.

