Taking root as a field of inquiry independent from biology, geography, and other related disciplines in the 1960s, Environmental Sciences developed with ecology at its base. This science-based option takes an applied ecology approach and therefore includes field and geographic methods for collecting and measuring data on ecological change at various scales. Students seeking a concentration in policy and management are encouraged to consider the Conservation, Resources, and Sustainability option.

In the Applied Ecology option, students take at least one advanced ecology course, selecting from plant, forest, wetland riparian, and rangeland ecologies. Their choice may lead to taking additional related courses such as in forest ecology. In consultation with their advisor, students will find many possibilities for pursuing their interests in ecology.

Because environmental scientists who focus on ecology usually conduct fieldwork, the curriculum contains a field methods course either in ecology restoration (BI 375), plant ecology (BOT 440) or wildland plant identification (RNG 353). Complementing the field methods requirement, students take at least one geographic methods course. Various types of ecological data can be analyzed and presented for policy making from local to global scales using geographic information systems (GIScience) and remote sensing.

Students with this specialization prepare for employment with the US Forest Service, Bureau of Land Management, National Park Service, state fish & wildlife service, and related federal and state agencies. They are prepared for research or management careers. Non-governmental organizations that focus on ecological restoration and land trusts also hire students in this area (e.g. Institute for Applied Ecology, McKenzie River Trust).

Internships and research projects in applied ecology have ranged from stream monitoring with the US Forest Service in the Umpqua National Forest (Roseburg, OR) to research on the spotted wing drosophila in an OSU entomology lab, and post-dam removal vegetation GIS mapping at OSU to working as a biology trainee with the Environmental Protection Agency in Newport, OR. Beyond Oregon, students have worked on plant pest and disease diagnosis with the Warren Chemical & Equipment Co., Rapid City, South Dakota, control of the invasive coqui frog with AmeriCorps on Maui, and marine conservation in Machalilla National Park, Equilibrio Azul, Ecuador.
The Applied Ecology option is for Environmental Sciences students who seek to orient their studies around ecology. This is applied ecology and therefore includes geographic methods for measuring and data collection in ecological change. Students seeking a concentration in policy and management are encouraged to consider the Conservation, Resources, and Sustainability option.

NOTE:
• This worksheet may not match the catalog or MyDegrees due to updates in progress.
• Classes used to fulfill requirements in the specialization cannot double count with ENSC Core. All courses must be taken for a letter grade, no S/U grades. Students must earn at least a C- in upper division (300 or higher) major/option courses.

**APPLIED ECOLOGY CORE: 10-20 Total Credits**

**On Campus**

- **ECOLOGICAL STUDIES (Select a minimum of one course from below)**
  - BI 351 Marine Ecology (3) [+]
  - BOT 341 Plant Ecology (4) [+]
  - FES 341 Forest Ecology (3)
  - FW 479 Wetlands and Riparian Ecology (3) [+]
  - RNG 341 Rangeland Ecology and Management (3)
  - OC/FW 434 Estuarine Ecology (3)

**On Campus**

- **FIELD METHODS (Select a minimum of one course from below)**
  - BI 371 Ecological Methods (3) [+]
  - BI 373 Field Methods in Marine Ecology (3) [+]
  - BI 375 Field Methods in Ecology Restoration (4) [+]
  - BOT 440 Field Methods in Plant Ecology (4) [+]
  - FW 493 Field Methods for Marine Research (3) [Taught at HMSC]
  - RNG 353 Wildland Plant Identification (4)

**On Campus**

- **GEOGRAPHIC METHODS (Select one to three courses from below)**
  - GEOG 201 Foundations of Geospatial Science and GIS (4)
  - GEOG 360 GIScience I: Geographic Information Systems and Theory (4)
  - GEOG 370 Geovisualization: Cartography (4) [+]
  - GEOG 480 Remote Sensing I: Principles and Applications (4) [+]

**ELECTIVES: Select 9-17 credits from below.**

**On Campus**

- BI 311 Genetics (4) [+]
  - or PBG 430 Plant Genetics (3) [+]
  - BI 345 Introduction to Evolution (3)
  - or BI 445 Evolution (3) [+]
  - BI 481 Biogeography (3) [+]
  - BOT 313 Plant Structure (4) [+]
  - BOT 321 Plant Systematics (4) [+]
  - BOT 331 Plant Physiology (4) [+]
  - FES 342 Forest Types of the Northwest (3)
  - FES/HORT 350 Urban Forestry (3) [+]
  - FES 412 Forest Entomology (3) [+]
  - FES/FW 445 Ecological Restoration (4) [+]
  - FOR 346 Topics in Wildland Fire (3) [+]
  - FOR/BOT 413 Forest Pathology (3) [+]
  - FW 311 Ornithology (3) [+]
  - FW 312 Systematics of Birds (2) [+]
  - FW 315 Ichthyology (3) [+]
  - FW 317 Mammalogy (3) [+]
  - FW 320 Introductory Population Dynamics (4) [+]
  - FW 321 Applied Community and Ecosystem Ecology (3) [+]

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Bachelor of Science in Environmental Sciences
Applied Ecology Option

Major Code 845 | Revised: 05/07/2019 | ceoas.oregonstate.edu | ceoas.undergrad@oregonstate.edu | 541-737-1201
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<tr>
<td></td>
<td>FW 427 Principles of Wildlife Diseases (4) [+]</td>
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<td>FW 451 Avian Conservation and Management (3) [+]</td>
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<td>FW 456 Freshwater Ecology and Conservation (5) [+]</td>
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<td>FW 462 Ecosystem Services (3) [+]</td>
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<td>FW 470 Ecology and History: Landscapes of the Columbia Basin (+) (3) [+]</td>
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<td>FW 473 Fish Ecology (4) [+]</td>
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<td>FW 481 Wildlife Ecology (4) [+]</td>
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<td>GEOG 324 Geography of Life: Species Distributions and Conservation (4)</td>
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<td>MB 314 Aquatic Microbiology (3) [+]</td>
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<td>OC/FW 434 Estuarine Ecology (4)</td>
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<td>RNG 351 Range Ecology I-Grasslands (3) [+]</td>
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<td>RNG 352 Range Ecology II-Shrublands (3) [+]</td>
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<td>RNG 421 Wildland Restoration and Ecology (4) [+]</td>
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<td>RNG 441 Rangeland Analysis (4) [+]</td>
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<td>RNG 455 Riparian Ecohydrology and Management (3) [+]</td>
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<td>SOIL 366 Ecosystems of Wildland Soils (3) [+]</td>
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<td>SOIL 455 Biology of Soil Ecosystems (4) [+]</td>
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<td>Z 350 Animal Behavior (3) [+]</td>
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<td>Z 365 Biology of Insects (4) [+]</td>
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<td>Z 423 Environmental Physiology (3) [+]</td>
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<td>Z 477 Aquatic Entomology (4) [+]</td>
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Total Credits: 27
WIC – Writing Intensive Course
S – Science Technology and Society
+ Course has prerequisites