



Oregon State
University

Natural Resources Major: Course List



OREGON STATE UNIVERSITY

College of Forestry

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Managing Natural Resources for the Future

Preserving the integrity of the Earth's ecosystems is a key challenge of the 21st century. Increasing human population continues to place greater demands on our limited resources. Students in the Natural Resources program at Oregon State University gain an understanding of complex biophysical, social, and cultural systems shaping natural resource management.

The Natural Resources program is an interdisciplinary degree. The degree emphasizes a broad-based approach to the study of natural resources, providing students the opportunity to combine areas of particular interest and focus on topics not otherwise offered at the undergraduate level.

With this degree program students will:

- Study an interdisciplinary curriculum based in agricultural sciences, forestry, liberal arts, and science.
- Learn about the social and political components of resource management.
- Begin preparation for a career in ecological restoration, fish and wildlife conservation, forest ecosystem science, natural resource planning, human dimensions, natural resource policy, watershed management, analysis of complex environmental problems, or other natural resources professions.

Recent program graduates are working as natural resource specialists and planners with state and federal agencies, working with non-profit conservation groups, managing lands for private entities, attending law school, training/working as teachers in K-12 education, and pursuing graduate degrees in a variety of disciplines.

Curriculum Overview

The Bachelor of Science in Natural Resources curriculum consists of four blocks of study.

Baccalaureate Core - A standard set of courses that are required for all Oregon State University students. (This section is waived for Post-Baccalaureate Students and Associate of Arts Oregon Transfer degree students except for two "Synthesis" courses.)

Natural Resources Core - Foundational courses that will give you a solid background in sciences, math, and policy. Minimum GPA for this block is 2.0.

Natural Resources Breadth - Upper division (300-400) courses that will broaden your knowledge of the field of Natural Resources.

Minimum GPA for this block is 2.0.

Natural Resources Specialty Option - Focused areas of study that will tailor your degree to your career interests and goals. Minimum GPA for this block is 2.25.

Career Opportunities

Graduates of the Natural Resources Program work in a broad spectrum of careers. A few examples include:

**Park Ranger ~ Wildlife Biologist ~ Watershed Management ~ GIS Technician
Forester ~ Educator ~ Sustainability Consultant ~ Land Use Planner ~ Outdoor Recreation Leader
Conservation Law Enforcement Officer ~ Ecologist ~ Natural Resource Specialist
Parks and Recreation Manager ~ Environmental Consultant ~ Wildfire Ecologist**

See the Student Advising Guide for more detailed information: <http://nr.forestry.oregonstate.edu/>

NATURAL RESOURCES CORE (74-94 credits) Minimum Block GPA 2.0

Additional on-campus or local courses may fulfill requirements as well; please consult your advisor.

*=Baccalaureate Core / ^ =WIC (Writing Intensive Course / Courses in **BOLD** are also offered through Ecampus.

ANIMAL ID: *Choose one*

FW 312 Systematics of Birds (2)
FW316 Systematics of Fishes (2)
FW 318 Systematics of Mammals (2)
Z 477 Aquatic Entomology (4)

ATMOSPHERIC SCIENCE: *Choose One*

ATS 201* Climate Science (4)
GEOG 323^ Climatology (4) (*was GEO 323*)
SUS 103* Intro to Climate Change (4)

BIOLOGY I, II AND III:

*BI 101,102,103 (4,4,4) General Biology
BI 204,205,206 (4,4,4) Introduction to Biology (*Biology for natural science majors*) **RESTRICTED TO ECAMPUS STUDENTS ONLY**
*BI 211,212,213 or equivalent (4,4,4) Principles of Biology (*Biology for health science majors*)

CHEMISTRY: *Choose One*

CH 121 General Chemistry (5)
CH 231 *General Chemistry (4) **and** CH261 Lab for CH 231 (1)

COMMUNICATIONS: *One of the following 300-400 level courses*

COMM 321 Introduction to Communication Theory (3)
COMM 322 Small Group Problem Solving (3)
COMM 328 Non Verbal Communication (3)
COMM 385 Comm. and Culture in Cyberspace (3)
COMM 440 Theories of Conflict and Conflict Management (3)
COMM 442 Bargaining and Negotiation Processes (3)
FES 430 Forest as Classroom (4)
FES 485 * Consensus and Natural Resources (3)
NR 312 Critical Thinking for NR Challenges (3)
TRAL 493 Environmental Interpretation (4)

EARTH SCIENCE: *Choose One*

GEO 101 *The Solid Earth (4)
GEO 201 *Physical Geology (4)
GEO 202 *Earth Systems Science (4)
GEO 221 *Environmental Geology (4)
GEOG 102 *The Surface of the Earth (4) (*was GEO102*)

ENVIRONMENTAL ASSESSMENT & PLANNING: *Choose One*

FES/FW 445 Ecological Restoration (4)
FES 485 * Consensus and Natural Resources (3)
FW 435 ^ Wildlife in Agricultural Ecosystems (4)
GEOG 450 Land Use in the American West (3) (*was GEO 423*)
~~PS 449 ^Topics in Comparative Politics (4)~~
PS 477 International Environ. Politics and Policy (4)
RNG 421 Wildland Restoration and Ecology (4)
RNG 490 Rangeland Management Planning (4)
SUS 304* Sustainability Assessment (4)
SUS 350* Sustainable Communities (4)

(Environmental Assessment & Planning Continued)

TRAL 456 Planning for Sustainable Recreation (4)
TRAL 457 Planning for Sustainable Tourism (4)

GENERAL ECOLOGY: *Choose One*

BI 370 General Ecology (3)
BOT 341 Plant Ecology (4)
FES 240 *Forest Biology (4)
FES 341 Forest Ecology (3)
(*Prerequisite for BI370 is a year of "biology for science majors," as approved by the OSU Biology Program*)

GIS (GEOGRAPHIC INFORMATION SYSTEMS): *Choose One*

CROP/HORT 414 Precision Agriculture (4)
FE 257 GIS and Forest Engineering Applications (3)
FW 303 Survey Geog. Info Systems in NR (3)
GEOG 201 Foundations of Geospatial Science and GIS (4)
GEOG 360 Geoscience I: GI systems and Theory (4) (*was GEO365*)

MANAGING NR FOR THE FUTURE

NR201 Managing NR for the Future (3)

MATHEMATICS: *Choose One*

MTH 112 *Elementary Functions (4)
MTH 241 *Calculus for Mgmt, Life and Social Sciences (4)
MTH 245 *Mathematics for Mgmt, Life and Social Sci. (4)
MTH 251 *Differential Calculus (4)
or equivalent locally (strongly encouraged) (4)

MEASUREMENTS: *Choose one from either Bio./Phys. or Social Sci.:*

BIOLOGICAL/PHYSICAL SCIENCE

BI 371 ^Ecological Methods (4)
BOT 440 Field Methods in Plant Ecology (4)
FE 208 Forest Surveying (4)
FOR 321 Forest Mensuration (5)
FW 255 Field Sampling of Fish and Wildlife (3)
GEO 452 Sustainable Site Planning (3) (*was GEO 451*)
NR 325 Scientific Methods for Analyzing NR problems (3)
RNG 441 Rangeland Analysis (4)

OR SOCIAL SCIENCE

FES 422 Research Methods in Social Science (4)

NATURAL RESOURCE DECISION MAKING CAPSTONE CLASS: *To be taken toward end of your degree*

NR 455 Natural Resource Decision Making (4)

NATURAL RESOURCES CORE (CONTINUED)

NATURAL RESOURCE POLICY: Choose One

AEC 454 Rural Development Economics and Policy (3)
FOR 460 ^Forest Policy (4)
FOR 462 Natural Resource Policy and Law (3)
GEOG 340 *Intro to Water Science and Policy (3) (was *GEO/SOIL335*)
PS 475 Environmental Politics and Policy (4)
PS 477 International Environ. Politics and Policy (4)

RESOURCE ECONOMICS: Choose One

(prerequisite for most is *MTH 111*, plus *ECON 201* or *AEC250*)

AEC 351 *Natural Resource Economics & Policy (3)
AEC/ECON 352 *Environmental Economics and Policy (3)
AEC 454 Rural Development Economics and Policy (3)
FOR 330 Forest Resource Economics I (4)
TRAL 432 Economics of Recreation and Tourism (3)

SOCIETY AND NATURAL RESOURCES: Choose One

ANTH 110 *Introduction to Cultural Anthropology (3)
FES 355 Management for Multiple Resource Values (3)
GEOG 204 *Climate Change, Water and Society (3)
TRAL 251 Recreation Resource Management (4)
TRAL 354 Communities, Natural Areas and Tourism (3)

Soil Science: Choose One

CSS 205* Soil Science (4) [*Ecampus only*]
CSS 305 Principles of Soil Science (4) [*EOU LaGrande Campus only*]
SOIL 205 *Soil Science (3) **and** **SOIL 206** Lab (1) **or** **FOR 206** (1)

STATISTICS: Choose One Four-credit course in Statistics

ST 201 Principles of Statistics (4)
ST 351 Intro to Statistical Methods (4)

OR at Oregon community colleges, on campus and online:

MTH 243 Probability and Statistics (4)

VEGETATION ID: Choose One

BOT 321 Plant Systematics (4)
BOT 414 Agrostology (4)
BOT 425 Flora of the Pacific Northwest (3)
FES 241 Dendrology (5)
HORT 226 Landscape Plant Materials (4)
HORT 228 Landscape Plant Materials (4)
RNG 353 Wildland Plant Identification (4)

WATER SCIENCE: Choose One

FE 430 Watershed Processes (4)
FW 326 Integrated Watershed Management (3)
OC 201 Oceanography (4)
OC332 Coastal Oceanography (3) [Hatfield Marine Science Center]
RNG 355 Desert Watershed Mgmt. (3)
(*RNG 355* is prerequisite for *RNG455*)

NOTE: PARTICULAR SPECIALTY OPTIONS MAY SPECIFY ADDITIONAL CORE COURSES TO ASSURE THAT STUDENTS MEET PREREQUISITES FOR OPTION COURSES, OR DEVELOP BACKGROUND IN FIELDS IMPORTANT FOR THE OPTION. STUDENTS SHOULD NOT ASSUME THAT THE CORE COURSES LISTED INCLUDE ALL OF THE NECESSARY BACKGROUND IN SCIENCE OR MATH FOR EVERY OPTION.

NATURAL RESOURCES BREADTH (21-28 credits) Minimum Block GPA 2.0

*=Bacc Core, ^=WIC Courses in **BOLD** are also offered through Ecampus

FISHERIES AND WILDLIFE: Choose One

FES 440 Wildland Fire Ecology (3)
FES/FW 445 Ecological Restoration (4)
FES/FW 452 Biodiversity Conservation in Managed Forests (3)
FOR 346 Topics in Wildland Fire (3)
FW 311 Ornithology (3)
FW 315 Ichthyology (3)
FW 317 Mammalogy (3)
FW 320 Introductory Population Dynamics (4)
FW 321 Applied Community & Ecosystem Ecology (3)
FW 323 Mgmt. Princ. of Pac. Salmon in the NW (3)
FW 350 *Endangered. Spec., Society, and Sustain. (3)
FW 426 Coastal Ecology and Resource Management (5) [Hybrid]
FW 427 Principles of Wildlife Diseases (4)
FW 435 ^Wildlife in Agricultural Ecosystems (3)
FW 451 Avian Conservation and Management (3)
FW 454 ^Fishery Biology (4)
FW 458 Mammal Conservation and Management (4)
FW 465 Marine Fisheries (4)
FW 473 Fish Ecology (4)
FW 481 Wildlife Ecology (4)
NR 325 Scientific Methods for Analyzing NR problems (3) NEW!

FORESTRY: Choose One

FE 370 Harvesting Operations (4)
FE/FOR 456 *International Forestry (3)
FES 341 Forest Ecology (3)
FES 342 Forest Types of the Northwest (3)
FES/HORT 350 Urban Forestry (3)
FES 412 Forest Entomology (3)
FES 440 Wildland Fire Ecology (3)
FES/FW 445 Ecological Restoration (4)
FES/FW 452 Biodiversity Conservation in Managed Forests (3)
FES/NR/RNG 477/577 *Agroforestry (3)
FOR/ 346 Topics in Wildland Fire (3)
FOR/BOT 413 Forest Pathology (3)
FOR 436 Wildland Fire Science and Management (4)
FOR 441 Silviculture Principles (4)
FOR 460* Forest Policy (4)
NR 325 Scientific Methods for Analyzing NR problems (3) NEW!
WSE 470* Forests, Wood, and Civilization (3)

LAND AND WATER: Choose One

FE 430 Watershed Processes (4)
FW 456 Limnology (5)
FW 479 Wetlands and Riparian Ecology (3)
GEO 306 *Minerals, Energy, Water and the Environment (3)
GEO 307 *National Park Geology and Preservation (3)
GEO 308 *Global Change and Earth Sciences (3)
GEOG 340 *Introduction to Water Science and Policy (3) (was GEO/SOIL335)
GEOG 440 Water Resource Management in the US (3) (was GEO 425)
GEOG 441 International Water Resource Management (3) (was GEO 424)
NR 325 Scientific Methods for Analyzing NR problems (3) NEW!
RNG 355 Desert Watershed Management (3)
RNG 455 Riparian Ecology and Management (3)

(Land and Water Continued)

SOIL 395 *World Soil Resources (3)
SOIL 466 Soil Morphology and Classification (4)

POLITICAL DIMENSIONS: Choose One

AEC 432 Environmental Law (4)
BI 301 *Human Impacts on Ecosystems (3)
FES 485 *Consensus and Natural Resources (3)
ENT/HORT 300* Plagues, Pest and Politics (3)
FES 365 *Issues in Nat. Resources Conservation (3)
FES 454 Managing at the Wildland-Urban Interface (3)
FOR 462 Natural Resource Policy and Law (3)
FW 325 *Global Crises in Resource Ecology (3)
FW 350 *Endangered Species, Society and Sustain. (3)
GEOG 300 *Sustainability for the Common Good (3) (was GEO 300)
GEOG 340 *Intro to Water Science and Policy (3) (was GEO/SOIL 335)
GEOG 450 Land Use Planning in the American West (3) (was GEO 423)
HST 481 *Environmental History of the U.S. (4)
NR 351 When Science Escapes the Lab (3)
~~PS 449 ^Topics in Comparative Politics (4)~~
PS 455 Politics of Climate Change (4)
PS 473 US Energy Policy (4)
PS 475 Environmental Politics and Policy (4)
PS 476 *Science and Politics (4)
PS 477 International Environ. Politics and Policy (4)
TRAL 351 Recreation Behavior and Management (4)
TRAL 352 Wilderness Management (3)

RANGE: Choose One

FES 440 Wildland Fire Ecology (3)
FES/FW 445 Ecological Restoration (4)
FES/NR/RNG 477/577 *Agroforestry (3)
FOR 346 Topics in Wildland Fire (3)
FOR 436 Wildland Fire Science and Management (4)
RNG 341 Rangeland Ecology and Management (3)
RNG 351 Range Ecology I-Grasslands (3)
RNG 352 Range Ecology II-Shrublands (3)
RNG 421 Wildland Restoration and Ecology (4)
RNG 441 Rangeland Analysis (4)
RNG 442 Rangeland-Animal Relations (4)
RNG 490 Rangeland Management Planning (4)

RESOURCE VALUES/PHILOSOPHY: Choose One

AG 301 *Ecosystems Science of the Pacific NW Indians (3)
ANTH 477 Ecological Anthropology (3)
ANTH 481 *Natural Resources and Community Values (3)
ANTH 482 *Anthropology of International Development (4)
FW 340 *Multicultural Perspectives in Natural Resources (3)
GEO 309 *Environmental Justice (3)
GEOG 430 Resilience Based NR Management (3) (was GEO 420)
HST 481 *Environmental History of the United States (4)
NR 312 Critical Thinking for Natural Resources Challenges (3)
PHL 440 Environmental Ethics (3)
PHL 443 World Views and Environmental Values (3)

NATURAL RESOURCES BREADTH (CONTINUED)

SOCIAL ISSUES: *One of the following*

ANTH 330 *Evolution of People, Tech. and Society (3)
FES 485 *Consensus and Natural Resources (3)
PS 473 US Energy Policy (4)
SOC 360 *Population Trends and Policy (4)
SOC 381 Social Dimensions of Sustainability (4)
SOC 424 Social Psychology (4)
SOC 454 *Leisure and Culture (4)
SOC 456 *Science and Technology in Social Context (4)
SOC 475 Rural Sociology (4)
SOC 480 *Environmental Sociology (4)
SOC 481 *Society and Natural Resources (4)
TRAL 351 Recreation Behavior and Management (4)
TRAL 352 Wilderness Management (3)
TRAL 353 Nature, Eco and Adventure Tourism (3)

TRAL 354 Communities, Natural Areas and Tourism (3)
TRAL 493 Environmental Interpretation (4)
WGSS 440 *Women and Natural Resources (3)

- Note: Most sociology courses require SOC 204 as a prerequisite.

OSU BACCALAUREATE CORE COURSES

The Baccalaureate Core is an OSU requirement for all majors (Post-Bacc students need only complete the Synthesis and Writing Intensive Courses). Students must complete course work in four areas: Skills, Synthesis, Perspectives and a Writing Intensive Course. A complete list of courses (both Ecampus and On Campus) fulfilling the Bacc Core requirements is found at <http://catalog.oregonstate.edu/bcc.aspx>. The courses noted below are suggestions and most can double count in the NR Breadth, Core or Option. For course equivalencies from Oregon and other institutions, see <http://oregonstate.edu/admissions/transfer/transfercredit.html>. FOR FULL LISTING OF COURSES SEE: <http://catalog.oregonstate.edu/bcc.aspx>.

SKILL COURSES (15)

Writing I (3) _____
WR 121

Writing II (3) _____
WR 201, 214, 222, 224, 241, 323, 324, 327, 330

Speech (3) _____
COMM 111, 114, 211 or 218

Lifetime Fitness for Health (3) _____
HHS 231 (2) plus either HHS 241 (1) **OR** a PAC class

Mathematics (3-4) ___MTH 111 College Algebra or higher_____
<http://www.math.oregonstate.edu/mlc-placement-home>
MTH 112, 241, 245, 251 will also fulfill the NR Core Math Requirement.

SYNTHESIS (6) *Two courses must be from different departments*

Contemporary Global Issues (3) _____
AEC 351, AEC/ECON 352, FES 365, FW 325, GEO 300, GEO 308, PHL 443, SOC 454, SOC 480, SUS350, Z349 (Can double count in NR Core /Breadth and /or Option)

Science, Tech & Society (3) _____
ANTH 330, ANTH 481, ATS 320, BI/HORT 330, ENSC 479, GEO 335, SOIL 395, FW 350, FW 360, FW470, GEO 300, GEO 306, GEO 307, HST 481, PS 476, SOC 456, SOC 481, SOC 485, FES/NE/RNG 477, WGSS 440 (Can double count in NR Core/Breadth/Option)

PERSPECTIVES (27) *Only 2 courses may be used from 1 department*

Lab sciences (12):

Physical Science w/lab (4) _____ Can be Fulfilled in NR Core _____

Bio. Science w/lab (4) _____ Can be Fulfilled in NR Core _____

Phys. or Bio. Science w/lab (4) _____ Can be Fulfilled in NR Core _____

One class in each of the following five areas (15):

Suggested courses are shown below because they double-count elsewhere in your NR program, but many other courses are available! See the link above for full course listings.

Western Culture (3) _____
AEC 253 (double-counts in F&W Option or NR Policy Option), PHL 201 (double-counts in NR Policy Option)

Cultural Diversity (3) _____

Literature & Arts (3) _____

Social Proc. & Inst. (3) _____
ECON 201, AEC 250 (prerequisites for AEC 351 and AEC 352 in NR Core)

Difference, Power & Discrimination (3) _____
FW 340, AG 301, or GEO 309 (double-count in NR Breadth: Res. Val/Phil.), SOC 360 (double-counts in NR Breadth: Social Issues)

WRITING INTENSIVE COURSE (WIC) (3)
ENSC 479, FW 435, FOR 460, FES/FW 439, GEO 323, HORT 318, PS449 (Any of these may double count in the NR Core/Breadth/Option)

Specialization Options

(Minimum GPA 2.25 in the Specialization)

ecampus signifies that the entire specialization can also be completed through Ecampus online courses.
(See the Natural Resources Website for additional information about Specialty Options.)

All specializations must have no more than 24 credits from one department; no more than 20 lower division credits, and a *minimum* of 20 upper division credits
*Baccalaureate Core Course / ^ WIC Intensive Course / Courses in **BOLD** are also offered by Ecampus.

Arid Land Ecology

RNG 341 Rangeland Ecology and Management (3)
RNG 352 Range Ecology II-Shrublands (3)
RNG 353 Wildland Plant Identification (4)
RNG 421 Wildland Restoration and Ecology (4)
RNG 442 Rangeland-Animal Relations (4)

Courses in Animals, Plants, Soils, and Ecology (Choose 23 credits)

BOT 313 Plant Structure (4)
BOT 321 Plant Systematics (4)
BOT 414 Agrostology (4)
FES 440 Wildland Fire Ecology (3)
FOR 436 Wildland Fire Science and Management (4)
NR 202 Natural Resource Problems and Solutions (3)
SOIL 466 Soil Morphology and Classification (4)

The courses below should be taken in the NR Core or Breadth:

Measurements (Core) **OR** Range (Breadth)
RNG 441 Rangeland Analysis (4)
Environmental Assessment and Planning (Core) **OR** Range (Breadth)
RNG 490 Rangeland Management Planning (4)

Option Code: 669

Conservation & Technology (OSU-Cascades Campus)

Note: This option is designed for the OSU-Cascades Campus. Students utilize course work from the Cascades campus partner institution Central Oregon Community College. The option may be modified to provide appropriate transfer of courses from other community colleges with forest technology degree programs.

Conservation (3 courses, 9 credits)

FES 365 *Issues in Natural Resources Conservation (3)
FW 251 Wildlife Conservation (3)¹
FW 325 *Global Crises in Resource Ecology (3) (Ecampus only)
FW 350 *Endangered Species, Society and Sustainability (3)

(Conservation and Technology Option continued)

Technology (3 courses, 8-9 credits)

BI 371 ^Ecological Methods (3)
FOR 199 Datasets in NR (3)¹
FOR 220A Aerial Photo (3)¹
FOR 230A Map, Compass, and GPS (3)¹
FOR 230B Forest Surveying (3)¹
SOIL408 Soil Judging and NR 499 Field Instruments (2)

Sustainability (1 courses, 4 credits)

SUS 350 *Sustainable Communities (4)

Ecology and Ecosystems

(18-19 credits from the following department or electives approved by Program Lead)

ENSC 479 Environmental Case Studies^ (3)
FES 342 Forest Types of the Northwest (3)
FES 444 Ecological Aspects of Park Management (3)²
FES/FW 445 Ecological Restoration (4)
FOR 240B Wildlife Ecology (3)¹
FW 311 Ornithology (3)
FW 317 Mammalogy (3)
FW 320 Introductory Population Dynamics (4)
FW 326 Integrated Watershed Management (3)
FW 479 Wetlands and Riparian Ecology (3)
FW 481 Wildlife Ecology (4)
GEO 322 Surface Processes (4)
PS 475 Environmental Politics and Policy (4)
RNG 351 Range Ecology I-Grasslands (3)
SOIL 366 Ecosystems of Wildland Soils (3)
Z349 *Biodiversity: Causes, Consequences and Conservation (3)
Z477 Aquatic Entomology (4)

¹COCC = Central Oregon Community College

²OSU-Cascades

Option Code: 688

Ecological Restoration

Required Courses (29–30 credits)

BI 311 Genetics (4)

or PBG 430 Plant Genetics (3)

BOT 321 Plant Systematics (4)

CH 122 *General Chemistry (5)

or CH 232 *General Chemistry (4) and CH 262 *Laboratory for Chemistry 232 (1)

FES/FW 445 Ecological Restoration (4)

FOR 436 Wildland Fire Science and Management (4)

or FES 440 Wildland Fire Ecology (3)

FW 479 Wetlands and Riparian Ecology (3)

or RNG 455 Riparian Ecology and Management (3)

GEOG 450 Land Use in the American West (3) (*was GEO 423*)

SOIL 366 Ecosystems of Wildland Soils (3)

or SOIL 388 Soil Systems and Plant Growth (4)

or SOIL 466 Soil Morphology and Classification (4)

Social and Ethical Considerations

Choose one course from below:

FOR 431 Economics and Policy of Forest Wildland Fire (3)

NR 312 Critical Thinking for Natural Resource Challenges (3)

PHL 440 Environmental Ethics (3)

PHL 443 *World Views and Environmental Values (3)

SOC 480 *Environmental Sociology (4)

SOC 481 *Society and Natural Resources (4)

Ecological and Natural Resource Electives

Choose a minimum of 8 credits:

BI 351 Marine Ecology (3)

BOT/FES 413 Forest Pathology (3)

BOT 488 Environmental Physiology of Plants (3)

FES 412 Forest Entomology (3)

FES/FW 452 Biodiversity Conservation in Managed Forests (3)

FOR 441 Silviculture Principles (4)

FW 320 Introductory Population Dynamics (4)

FW 321 Applied Community and Ecosystem Ecology (3)

FW 426 Coastal Ecology and Resource Management (5) ¹Hybrid Course

FW 451 Avian Conservation and Management (3)

FW 454 ^Fishery Biology (4)

FW 456 Limnology (5)

FW 458 Mammal Conservation and Management (4)

FW 473 Fish Ecology (4)

FW 481 Wildlife Ecology (4)

NR 202 Natural Resource Problems and Solutions (3)

RNG 421 Wildland Restoration and Ecology (4) ²

SOIL 468 Soil Landscape Analysis (4)

¹ Hatfield Marine Science Center as well as either Ecampus or Corvallis Campus

² Eastern Oregon University

Option Code: 663

Fish and Wildlife Conservation

Required Courses (22 credits)

FES/FW 445 Ecological Restoration (4)

FOR 111 Introduction to Forestry (3)

or FES 342 Forest Types of the Northwest (3)

FOR 346 Topics in Wildland Fire (3)

or FOR 436 Wildland Fire Science and Management (4)

or FES 440 Wildland Fire Ecology (3)

FW 251 Principles of Fish and Wildlife Conservation (3)

FW 323 Management Principles of Pacific Salmon in the Northwest (3)

or FW/HSTS 470 *Ecology and History: Landscapes of the Columbia Basin (3)

or FW 360 *Origins of Fish and Wildlife Management-Evolution, Genetics, and Ecology (3)

RNG 341 Rangeland Ecology and Management (3)

RNG 455 Riparian Ecology and Management (3)

Fish and Wildlife Biology - Choose three of the following:

FW 311 Ornithology (3)

FW 315 Ichthyology (3)

FW 317 Mammalogy (3)

FW 320 Introductory Population Dynamics (4)

FW 321 Applied Community and Ecosystem Ecology (3)

Habitat Management

Choose two of the following:

FW 326 Integrated Watershed Management (3)

FW 435 ^Wildlife in Agricultural Ecosystems (3)

FW 479 Wetlands and Riparian Ecology (3)

Natural Resources Policy

Choose one of the following:

PS 475 Environmental Politics and Policy (4)

SOC 481 *Society and Natural Resources (4)

Option Code: 672

Forest Ecosystems

Ecological Foundations (23 credits)

BOT/FOR 413 Forest Pathology (3)
FES 341 Forest Ecology (3)
FES 412 Forest Entomology (3)
FES/FW 452 Biodiversity Conservation in Managed Forests (3)
FOR 346 Topics in Wildland Fire (3)
FOR 441 Silviculture Principles (4)
FW 251 Principles of Fish and Wildlife Conservation (3)

Ecology Breadth Courses (Choose at least 8 credits)

BOT 321 Plant Systematics (4)
BOT 442 Plant Population Ecology (3)
FES/FW 445 Ecological Restoration (4)
FES/RNG 477 *Agroforestry (3)
FOR 436 Wildland Fire Science and Management (4)
or FES 440 Wildland Fire Ecology (3)
FW 458 Mammal Conservation and Management (4)
RNG 351 Range Ecology I-Grasslands (3)
RNG 352 Range Ecology II-Shrublands (3)
RNG 455 Riparian Ecology and Management (3)

Technical Electives (Choose at least 10 credits)

BOT 425 Flora of the Pacific Northwest (3)
FE 208 Forest Surveying (4)
FE 209 Forest Photogrammetry and Remote Sensing (4)
FE 370 Harvesting Operations (4)
FOR 321 Forest Mensuration (5)
ST 352 Introduction to Statistical Methods (4)

The courses below should be taken in the NR Core or Breadth:

Vegetation ID (NR Core)
FES 241 Dendrology (5)

General Ecology (NR Core)
FES240 Forest Biology (4)

Water Science (NR Core)
FE430 Watershed Processes (4)

Natural Resource Policy (NR Core) or Forestry (NR Breadth)
FOR460^ Forest Policy (4)

Option Code: 673

Human Dimensions in Natural Resources

Ethical Issues

Select 6 credits from the following:

ANTH 110 *Introduction to Cultural Anthropology (3)
BI/FES/TOX 435 *Genes and Chemicals in Agriculture: Value and Risk (3)
PHL 201 *Introduction to Philosophy (4)
PHL 205 *Ethics (4)
PHL 439 Philosophy of Nature (3)
PHL 440 Environmental Ethics (3)
PHL 443 *World Views and Environmental Values (3)
PHL 470 Philosophy of Science (3)

Management and Communication Issues

Select 13 credits from the following:

AEC 253 *Environmental Law, Policy, and Economics (4)
AEC 351 *Natural Resource Economics and Policy (3)
AEC/ECON 352 *Environmental Economics and Policy (3)
FES 355 Management for Multiple Resource Values (3)
FES 365 *Issues in Natural Resources Conservation (3)
FES 440 Wildland Fire Ecology (3)
FES 485 *Consensus and Natural Resources (3)
FW 251 Principles of Fish and Wildlife Conservation (3)
FW 326 Integrated Watershed Management (3)
TRAL 351 Recreation Behavior and Management (4)
TRAL 352 Wilderness Management (3)

Social Issues (21 credits)

Required background course

SOC 204 *Introduction to Sociology (3)

Select 18 credits from the following:

AEC 432 Environmental Law (4)
ANTH 477 Ecological Anthropology (3)
ANTH 481 *Natural Resources and Community Values (3)
FW 340 *Multicultural Perspectives in Natural Resources (3)
FW 350 *Endangered Species, Society, and Sustainability (3)
GEOG 300 *Sustainability for the Common Good (3) (was GEO 300)
HST 481 *Environmental History of the U.S. (4)
NR 202 Natural Resource Problems and Solutions (3) **NEW!**
NR 312 Critical Thinking for Natural Resource Challenges (3)
PS 475 Environmental Politics and Policy (4)
SOC 360 *Population Trends and Policy (4)
SOC 454 *Leisure and Culture (4)
SOC 456 *Science and Technology in Social Context (4)
SOC 480 *Environmental Sociology (4)
SOC 481 *Society and Natural Resources (4)
SUS 350 *Sustainable Communities (4)
WGSS 440 *Women and Natural Resources (3)
WGSS 450 Ecofeminism (3)

Option Code: 675

Some of our Natural Resources students come to OSU with a great deal of prior coursework that cannot easily be applied to our standard specialty option requirements, but is still very applicable to a natural resources degree. In addition some students may have a desire to focus on a very narrow field of study which is not available through our standard options. We encourage those students to create an Individualized Specialty Option, drawing on both their past work and OSU coursework.

If you are interested in creating your own specialty area, discuss this with your advisor as soon as possible. The advisor will be able to guide you in creating an option that works for you and satisfies the program requirements.

Student-designed specialty options must:

- contain at least 20 credits of upper-division courses
- consist of a minimum of 40 credits, encompassing at least three departments, with not more than 24 credits from one department
- have course work that reflects stated knowledge and skill "goals"
- do not duplicate existing specialization options.

Integrated Conservation Analysis

Integrated Analysis (15 credits)

FES 485 *Consensus and Natural Resources (3)
NR 202 Natural Resource Problems and Solutions (3)
NR 312 Critical Thinking for NR Challenges (3)
NR 325 Scientific Methods for Analyzing NR Problems (3)
NR 351 *When Science Escapes the Lab: Science and Resource Management (3)

Disciplinary Focus (25 credits minimum)

Students will select an area of study for disciplinary depth from Policy, Social Science/Human Dimensions or an Ecological Discipline.

Students will be required to submit an academic plan for completion of the option which will be approved by the Natural Resources Program Director. The academic plan must include a minimum of 20 upper division credits.

Option Code: 735

GIScience Required Courses (16 credits)

GEOG 201 Foundations of Geospatial Sci and GIS (4) (was GEO 301)
GEOG 360 GIScience I: GI Systems and Theory (4) (was GEO465/365)
GEOG 370 Geo-visualization: Cartography (4) (was GEO 360)
GEOG 480 Remote Sensing of the Environment (4) (was GEO 444)

GIScience Electives (Choose 7-8 credits)

CE 413 GIS In Water Resources (3)
CROP/HORT 414 Precision Agriculture (4)
ECE 468 Digital Image Processing (3)
ECE/ENSC/FOR/GEO/GEOG 410 Internships (4)
FE 209 Forest Photogrammetry and Remote Sensing (4)
FE 310 Forest Route Surveying (4)
FE 423 Unmanned Aircraft Systems Remote Sensing (3)
FW 303 Survey of Geographic Information Systems in NR (3)
GEOG 361 GIScience II: Analysis and Applications (4) (was GEO 480)
GEOG 371 Geovisualization: Web Mapping (4)
GEOG 451 Planning Principles & Practices for Resilient Comm. (4)
GEOG 462 GIScience III: Programming for Geospatial Analysis (4)
GEOG 463 GIScience IV: Spatial Modeling (4)
GEOG 464 Geospatial Perspec. on Intelligence, Security, Ethics (3)
GEOG 472 Geo-visualization: Geo-Visual Analytics (3) (was GEO 445)
GEOG 481 Remote Sensing II: Digital Image Processing (4)
RNG 430 Applied GIS in Rangeland Science (4)
SOIL468 Soil Landscape Analysis (4)

(Landscape Analysis Continued)

Natural Resources Electives (16-17 credits minimum)

Choose a minimum of 16-17 credits in a disciplinary area related to GIScience to reach a minimum of 40 credits in the option.

Students will be required to submit an academic plan for completion of the option which will be approved by the Natural Resources Program Director.

The courses below should be taken in the NR Core:

Mathematics Requirement (Core): MTH112* Elementary Functions(4)
Measurements Requirement (Core): FE208 Forest Surveying (4)

Option Code: 689

Law Enforcement and Natural Resources

COMM 440 Theories of Conflict and Conflict Management (3)
FES/FW 452 Biodiversity Conservation in Managed Forests (3)
FW 251 Principles of Fish and Wildlife Conservation (3)
FW 316 Systematics of Fishes (2)
FW 318 Systematics of Mammals (2)
FW 341 Fish and Wildlife Law Enforcement (2)
FW 458 Mammal Conservation and Management (4)
SOC 204 *Introduction to Sociology (3)
TRAL 251 Recreation Resource Management (4)

Choose four of the following classes:

SOC 340 Deviant Behavior and Social Control (4)
~~SOC 440 Juvenile Delinquency (4) Restricted to SOC majors~~
SOC 441 Criminology and Penology (4)
SOC 442 Sociology of Drug Use and Abuse (4)
SOC 448 Law and Society (3)

The courses below should be taken in the NR Core and Breadth:
NR Policy (Core) or Political Dimensions (Breadth):
FOR 462 NR Policy and Law (3)

Option Code: 677

Natural Resource Education

Natural Resource Base (17 credits)

FES 251 Recreation Resource Management (4)
TRAL 251 Principles of Fish and Wildlife Conservation (3)
RNG 341 Rangeland Ecology and Management (3)
Plus 7 additional credits from AG, FE, FOR, FS, FW, GEO or another area of natural resources.

Education/Communication Processes (23 credits)

ED 216 *Purpose, Structure, and Function of Education in a Democracy (3)
ED 219 Civil Rights and Multicultural Issues in Education (3)
ED 253 Learning Across the Lifespan (3)
FES 430 Forest as Classroom (3)
OR FES 493 Environmental Interpretation (4)
SOC 450 Sociology of Education (4)
WR 327 *Technical Writing (3)
Plus 3 upper-division credits in speech communication, education (see especially Teacher and Counselor Education), agriculture education, writing, or an allied communication/education field; supervised internships can be used to meet this requirement, if approved in advance.

The courses below should be taken in the NR Core or Breadth:
Vegetation ID (Core)
FES 241 Dendrology (3)

Note: Writing I, Writing II, and Speech are required by the baccalaureate core, and may not be used toward the "3 additional credits" requirement above. WR 327 must be taken in addition to Writing I, Writing II, and Speech.

OPTION CODE: 679

Social Science Foundation

Students must take at least two courses from the following. [PS and SOC are prerequisites for certain upper-division courses]

- PHL 201 *Introduction to Philosophy (4)
- PS 201 *Introduction to United States Government and Politics (4)
- PSY 201 *General Psychology (3)
or PSY 202 *General Psychology (3)
- SOC 204 *Introduction to Sociology (3)

Social Sciences and Natural Resources

Students must take at least three courses from the following, with no more than two from any one department:

- AG 301 *Ecosystem Science of Pacific NW Indians (3)
- COMM 321 Introduction to Communication Theory (3)
- FES 485 *Consensus and Natural Resources (3)
- FOR 111 Introduction to Forestry (3)
- FW 251 Principles of Fish and Wildlife Conservation (3)
- FW 323 Management Principles of Pacific Salmon in the Northwest (3)
- FW 340 *Multicultural Perspectives in Natural Resources (3)
- FW 470 *Ecology and History: Landscapes of the Columbia Basin (3)
- GEOG 300 *Sustainability for the Common Good (3) (was GEO 300)
- NR 312 Critical Thinking for Natural Resources Challenges (3)
- SOC 360 *Population Trends and Policy (4)
- SOC 454 *Leisure and Culture (4)
- SOC 456 *Science and Technology in Social Context (4)
- SOC 480 *Environmental Sociology (4)
- SOC 481 *Society and Natural Resources (4)

Natural Resource Policy and Management

Students must choose 25 credits from the list of courses below:

- AEC 253 *Environmental Law, Policy, and Economics (4)
- BOT 440 Field Methods in Plant Ecology (4)
- ENSC 479 **Environmental Case Studies (3)
- FES 342 Forest Types of the Northwest (3)
- FES 365 *Issues in Natural Resources Conservation (3)
- FES 440 Wildland Fire Ecology (3)
- FES/FW 445 Ecological Restoration (4)
- FOR 346 Topics in Wildland Fire (3)
- FOR 431 Economics and Policy of Forest Wildland (3)
- FOR 436 Wildland Fire Science and Management (4)
- FW 303 Survey of Geographic Information Systems in Natural Resources (3)
- FW 311 Ornithology (3)
- FW 315 Ichthyology (3)
- FW 317 Mammalogy (3)
- FW 320 Introductory Population Dynamics (4)
- FW 321 Applied Community and Ecosystem Ecology (3)
- FW 325 *Global Crises in Resource Ecology (3)
- FW 326 Integrated Watershed Management (3)
- FW 350 *Endangered Species, Society, and Sustainability (3)
- FW 427 Principles of Wildlife Diseases (4)
- FW 435 *Wildlife in Agricultural Ecosystems (3)
- FW 479 Wetlands and Riparian Ecology (3)
- GEO 308 *Global Change and Earth Sciences (3)
- GEOG 201 Foundations of Geospatial Science and GIS (4) (was GEO301)
- GEOG 360 Introduction to Geographic Information Systems (4) (was GEO365)

(NR Policy and Management continued)

- NR 202 Natural Resource Problems and Solutions (3)
- ~~PS 449 ^Topics in Comparative Politics (4)~~
- PS 475 Environmental Politics and Policy (4)
- RNG 455 Riparian Ecology and Management (3) (4cr in SP17)
- RNG 490 Rangeland Management Planning (4)
- TRAL 352 Wilderness Management (3)

Option Code: 680

Recreation and Tourism Management

Recreation and Tourism Management Foundation (19–20 credits)

- FES 422 Research Methods in Social Science (4)
- TRAL 251 Recreation Resource Management (4)
- TRAL 351 Recreation Behavior and Management (4)
- FES 357 Parks and Protected Areas Management (3)
or FES 352 Wilderness Management (3)
- TRAL 353 Nature, Eco and Adventure Tourism (3)
- TRAL 456 Planning for Sustainable Recreation(4)
or TRAL 457 Planning for Sustainable Tourism (4)
- TRAL 493 Environmental Interpretation (4)

Technical/Field Skills (choose 10–11 credits)

- CS 195 Introduction to Web Authoring (4)
- FE 208 Forest Surveying (4)
- FW 255 Field Sampling of Fish and Wildlife (3)
- FW 341 Fish and Wildlife Law Enforcement (2)
- GEOG 201 Foundations of Geospatial Science and GIS (4) (Was GEO301)
- GEOG 370 GEOvis I: Principles of Cartography (4) (was GEO 360)
- GEOG 472 GEOvis III: Geovisual Analytics (3) (was GEO 445)

Applications in Recreation and Social Science (choose 10–11 credits)

- AEC 253 *Environmental Law, Policy, and Economics (4)
- ANTH 477 Ecological Anthropology (4)
- COMM 324 Communication in Organizations (3)
- COMM 326 Intercultural Communication (3)
- PS 475 Environmental Politics and Policy (4)
- SOC 454 *Leisure and Culture (4)
- SOC 481 *Society and Natural Resources (4)

Option Code: 681

Sustainable Agroforestry

Required Courses

BOT 488 Environmental Physiology of Plants (3)
CH 122 *General Chemistry (5)
or CH 232 *General Chemistry (4) and CH 262 *Laboratory for Chemistry 232 (1)
CROP/HORT 300 Crop Production in Pacific Northwest Agro ecosystems (4)
CROP 440 Weed Management (4)
or FES/FW 445 Ecological Restoration (4)
CSS 306 Problem Solving: Soil Science Applications (1) [*CSS taught at EOU La Grande campus only*]
CSS 315 ^Nutrient Management and Cycling (4)
or HORT 316 Plant Nutrition (4)
FES 433 Planning Agroforestry Projects (2)
FES/NR/RNG 477 *Agroforestry (3)
FOR 441 Silviculture Principles (4)
or HORT 301 The Biology of Horticulture (3)
HORT 311 Plant Propagation (4)
RNG 442 Rangeland-Animal Relations (4)

Choose one of the following courses:

ANS 215 Beef/Dairy Industries (3)
ANS 216 Sheep/Swine Industries (3)
CROP 310 Forage Production (4)
HORT 451 Tree Fruit Physiology and Culture (4)
HORT 452 Berry and Grape Physiology and Culture (4)
NR 202 Natural Resource Problems and Solutions (3)

The courses below should be taken in the NR Core or Breadth:

Range: RNG 441 Rangeland Analysis (4)

Option Code: 684

Urban Forest Landscapes

Urban Forest Foundations (22-23 credits)

FES/HORT 350 Urban Forestry (3)
FES/FW 445 Ecological Restoration (4)
FES/HORT 447 Arboriculture (4)
FES/HORT 455 Urban Forest Planning, Policy and Management (4)
HORT 226 Landscape Plant Materials I: Deciduous Hardwoods and Conifers (4)
HORT 318 ^Applied Ecology of Managed Ecosystems (3)
or HORT 315 Sustainable Landscapes: Maintenance, Conservation, Restore (4)

Social/Political/Community Integration (19-20 credits)

ANTH 481 *Natural Resources and Community Values (3)
FES 485 *Consensus and Natural Resources (3)
FOR 462 Natural Resource Policy and Law (3)
or PS 475 Environmental Politics and Policy (4)
FW462 Ecosystems Services (3)
GEOG 450 Land Use in the American West (3) (was GEO 423)
or FW 435 ^Wildlife in Agricultural Ecosystems (3)
SOC 481 *Society and Natural Resources (4)

Option Code: 685

Watershed Management

CH 122 *General Chemistry (5)
or CH 232 *General Chemistry (4) and CH 262 *Lab for Chemistry 232 (1)
FE 430 Watershed Processes (4)
FES/FW 445 Ecological Restoration (4)
FW 315 Ichthyology (3)
and FW 316 Systematics of Fishes (2)
or just GEO 487 Hydrogeology (4)
FW 456 Limnology (5)
MTH 252 Integral Calculus (4)
PH 201, PH 202. *General Physics (5,5)
RNG 455 Riparian Ecology and Management (3)
or FW 479 Wetlands and Riparian Ecology (3)
SOIL 366 Ecosystems of Wildland Soils (3)
SOIL 466 Soil Morphology and Classification (4)

The courses below are required prerequisites for some courses in this option and should be taken in the NR Core:

BI204/205/206 *Introductory Biology (4 credits each) OR BI 211/212/213 Principles of Biology (4 credits each) (**Biology requirements in NR Core**)
BI 370 General Ecology (4) (*Gen Ecology*)
FE 208 Forest Surveying (4) (*Measurements*)
GEO 202 Earth Systems Science (4) (*Earth Science*)
MTH 251 *Differential Calculus (4) (*Mathematics*)
RNG 355 Desert Watershed Management (3) (*Water Science*)

Option Code: 686

Wildland Fire Ecology

Foundations in Wildland Fire and Recovery (21 Credits)

FES 440 Wildland Fire Ecology (3) (was FOR 446)
FES/FW 445 Ecological Restoration (4)
or RNG 421 Wildland Restoration and Ecology (4)
FES 454 Managing at the Wildland-Urban Interface (3)
FOR 346 Topics in Wildland Fire (3)
FOR 436 Wildland Fire Science and Management (4)
FOR 441 Silviculture Principles (4)

Ecological and Natural Resource Electives (Choose 19 credits)

BOT/FOR 413 Forest Pathology (3)
BOT 442 Plant Population Ecology (3)
CSS/CROP 440 Weed Management (4)
FES 412 Forest Entomology (3)
FES 342 Forest Types of the Northwest (3)
FES/FW 452 Biodiversity Conservation in Managed Forests (3)
FOR 431 Economics and Policy of Forest Wildland Fire (3) **NEW!**
FW 458 Mammal Conservation and Management (4)
SOIL 366 Ecosystems of Wildland Soils (3)
or SOIL 388 Soil Systems and Plant Growth (4)
or SOIL 466 Soil Morphology and Classifications (4)
SOIL 468 Soil Landscape Analysis (4)

Option Code: 687