MATRIX OF DIFFERENCES - ONLINE DEGREES
ENSC / FW / NR

Revised 12/21/16. Subject to change.

For further career exploration and to learn what you can do with these majors, go to:
http://career.oregonstate.edu/students/career-major-exploration/choosing-or-changing-major/what-can-i-do-my-major

	Environmental Sciences (ENSC) http://ecampus.oregonstate.edu/online-degrees/undergraduate/es/	Fisheries & Wildlife (FW) http://ecampus.oregonstate.edu/online-degrees/undergraduate/fw/	Natural Resources (NR) http://ecampus.oregonstate.edu/online-degrees/undergraduate/nr/
STRUCTURE OF MAJOR	**Interdisciplinary - ENSC has no teaching faculty & coursework is from across the university.**	**Discipline Specific - FW has teaching faculty & majority of coursework in FW department.**	**Interdisciplinary - NR has limited teaching faculty & coursework is from across the university.**
ADVISING	**Annual; mandatory**	**Quarterly; mandatory**	**Quarterly, mandatory**
CURRICULUM			
Biology*	**3 courses: Principles of Biology for Science Majors - BI 211, 212, 213 (in-person) or BI 204, 205, 206 (online thru OSU Ecampus).**	**3 courses: Principles of Biology for Science Majors - BI 211, 212, 213 (in-person) or BI 204, 205, 206 (online thru OSU Ecampus),**	**3 courses: Principles of Biology for Science Majors - BI 211,212,213 (in-person) or BI 204, 205, 206 (online thru OSU Ecampus) *preferred* . Or, BI 101, 102, 103 (non-majors) online with Clackamas CC.**
Ecology*	**BI 370**	**BI 370**	**BI 370, FES 240, or FES 341**
Math*	**2 courses: MTH 251, 252 (Calculus)**	**1 course: MTH 241, 245 or 251 (Calculus)**	**1 course: MTH 112 (Trigonometry); 241, 245, or 251 (Calculus)**
Statistics*	**2 courses: ST 351, 352**	**2 courses: ST 351, 352**	**1 course: 4-credit basic statistics**
Chemistry*	**3 courses: General Chemistry - CH 121, 122, 123 or higher.**	**3 courses: General Chemistry - CH 121, 122, 123 or higher.**	**1 course: General Chemistry - CH 121, CH 221, or CH 231/261.**
Physics*	**2 courses: PH 201, 202 (online with OSU degree partner, Chemeketa CC). PH 203 is recommended for students pursuing graduate degree with science focus.**	**3 courses: physics, additional calculus, earth science, or additional chemistry.**	**Not required.**
Experiential Learning	**1 course: 3-credits of Experiential Learning, at minimum. Choices include online field or GIS courses, or an in-person internship experience (arranged by student and approved by Experiential Learning Coordinator).**	**2 courses: 1-credit Exploratory Internship and 3-credit Intensive Internship (arranged in consultation with, and approved by, Internship Coordinator)**	**Recommended, but not required.**
Specialization	**Choose from 8 (27 credits min): Applied Ecology option; Aquatic Biology option; Conservation, Resources & Sustainability option; Earth Systems option; Environmental Agriculture option; Environmental Policy & Economics option; Environmental Water Resources option; Geographic Information Science certificate.**	**Self-designed in FW 307 and in consultation with a faculty member or advisor. 24 credits minimum of primarily 300-400 level courses. No more than 4 credits of 100-200 may be used in specialization.**	**Choose from 5 (40 credit min): Fisheries & Wildlife Conservation option; Human Dimensions in Natural Resources option; Natural Resource Policy option; Urban Forestry option; Landscape Analysis option; or Student-Designed Individualized Option in consultation with advisor.**
CAREER AREAS*	**Technical science or outreach related toward understanding and solving environmental problems.**	**Conservation, ecology, and management of fish, wildlife, and their habitats. Includes management of game animals and endangered species at the population level.**	**Management, restoration and conservation of natural ecosystems with an understanding of ecological, sociological, and economic factors.**
EMPLOYERS*	**State, federal and local government agencies; conservation and nonprofit organizations; research field stations and laboratories; health/safety departments incl. hazardous materials management; K-12 schools; environmental education centers; environmental or sustainability divisions of private companies; environmental consulting firms.**	**State, federal and local government agencies, conservation and nonprofit organizations, research field stations and laboratories, zoos and aquariums, environmental education centers, and environmental consulting firms.**	**State, federal, and local government agencies; environmental monitoring and sustainability initiatives for private companies; conservation and nonprofit organizations, environmental consulting firms; environmental education; outdoor recreation organizations; and, K-12 schools.**

* *Students may take equivalent transfer courses from other institutions, with advisor's prior approval .*

** *Some positions may require further education and/or experience*

*** *Not inclusive*

Comparison of Three Bachelor of Science (BS) Degrees Online:
Environmental Sciences (ENSC)
Fisheries and Wildlife Sciences (FW)
Natural Resources (NR)

The ENSC, FW, and NR degrees have similarities, but also important differences. We recommend you review this document carefully so you can make an informed choice about your major. The academic advisors in ENSC, FW, and NR urge you to study program differences in detail before choosing a degree path. Know each program's strengths and challenges, and assess YOUR interests and academic strengths. Changing from one program to another mid-stream is likely to be costly in time and money. Pursuing a degree for which you are not academically well-suited is likely to hurt your grades and ultimately your ability to complete that program.

All coursework can be completed online through OSU, or an affiliated community college in the OSU Degree Partnership Program. Students who struggle with *mathematics* and *statistics* may benefit from taking those classes early – and in-person, rather than online – before proceeding too far along any of these degree paths. *Competency in these classes is a key indicator of potential success in these degrees.*

OVERVIEW

Each degree develops knowledge and skills, particularly in the specialization areas, to enable students to target different career or graduate school opportunities. Nonetheless, all three degrees *can* lead to the same job, although the level of preparation (curricular and extracurricular) for that job may vary.

The **Environmental Sciences (ENSC)** degree focuses on examining environmental issues from scientific perspectives, while also providing background in environmental ethics, economics, policy and management. ENSC students use basic and applied science to address environmental issues. ENSC students learn how to conduct research and provide potential solutions to environmental problems, predict environmental change, participate in responsible management of the environment and examine the critical relationship between humans and their environment. ENSC students focus on the science and policy aspects of environmental issues. Ecampus ENSC students choose from 8 specialization areas.

The **Fisheries and Wildlife Sciences (FW)** degree focuses on conservation, ecology, sustainable use, and management of fish and wildlife and their terrestrial, aquatic and marine habitats. FW students use basic and applied science to address issues related to fish and wildlife. FW students learn to make decisions on conserving biodiversity, restoring ecological systems and maintaining sustainable use of fish and wildlife populations using fundamental ecological principles and consideration of social influences on conservation. Students develop a unique, individualized 24-credit specialization.

The **Natural Resources (NR)** degree exposes students to a breadth of natural resources disciplines, with emphasis on both the science and management of resources, and the social, economic and political influences on resource use and environmental policy. NR students focus on management of resources with an understanding of ecological, sociological and economic factors. NR students gain technical and scientific knowledge spanning a number of natural resource and social science fields, and learn to understand their interdependence. Ecampus Natural Resources students choose from five specialization areas ("options") or may design their own specialization.

CORE CURRICULA

ENSC and NR are interdisciplinary programs with curricula that utilize coursework from multiple academic disciplines. The FW curriculum is considered discipline-specific because the majority of the required and optional classes are specific to fisheries and wildlife sciences.

All three degree programs require courses in the basic math and sciences, although they differ in the level and depth of requirements in these areas. In general, the ENSC and FW curricula require more technical and laboratory courses, while the NR curriculum places more emphasis on management applications of scientific knowledge, incorporating a wider range of natural resources related courses. Certain emphases in NR, however, may necessitate completion of more math and science beyond the degree's minimum requirements. For detailed information, refer to Matrix of Differences on page 1.

EXPERIENTIAL LEARNING – INTERNSHIPS & RESEARCH

The ENSC curriculum requires a minimum of 3 credits of experiential learning, which students can meet through completion of an internship, a supervised research project (with the assistance of an Experiential Learning Coordinator), or taking a class that involves hands-on learning. The FW curriculum requires two internships with a minimum of 4 credits; an Internship Coordinator assists FW students in locating and developing an internship that meets their academic and professional goals. The NR degree has no experiential learning requirement, though students are strongly encouraged to obtain internships or work experience in a natural resources-related field of their choice.

SPECIALIZATIONS – OPTIONS, MINORS & CERTIFICATES

Students in each major choose a specialization area (option, minor, or certificate), with the exception of post-baccalaureate students in FW. Specializations are designed to help students focus their academic interest into a specialized area of study to meet their career goals.

ENSC online students choose from 8 specialization areas, requiring a minimum of 27 credits – 1) Applied Ecology option; 2) Aquatic Biology option; 3) Conservation, Resources & Sustainability option; 4) Earth Systems option; 5) Environmental Agriculture option; 6) Environmental Policy & Economics option;7) Environmental Water Resources option; or, 8) Geographic Information Science certificate. Specialization titles are transcript visible.

FW students develop a unique, individualized 24-credit specialization with the assistance of a faculty member and/or advisor. Students choose their specialization courses when they take the required FW 307 Specialization Development course. Specialization titles are not transcript visible. Specializations primarily consist of upper division (300-400) level coursework; no more than 4 credits of lower division (100-200) coursework can be used in the specialization.

NR online students choose from 5 standard specialization areas – 1) Fisheries and Wildlife Conservation option; 2) Human Dimensions in Natural Resources option; 3) Natural Resource Policy option; and, 4) Urban Forestry option; and 5) Landscape Analysis option. Or, students may design their own Specialty Option (Individualized Specialty Option).

CAREERS OPPORTUNITIES

Graduates from all three programs go on to work for federal, state and local land management and planning agencies, non-governmental organizations, private firms, and legislative bodies concerned with policy and laws.

Careers for ENSC undergraduates vary depending on the student's chosen specialization, but tend to deal with research and monitoring, regulatory, management, policy, and public education related to a range of environmental and resource management issues. Careers will often involve research or support of research activities – assessing problems and potential solutions from scientific perspectives.

Careers for FW undergraduates tend to deal directly with the conservation of fish, wildlife and their habitats. Graduates may be involved with management, research, education, or policy in the United States, or globally. Topics include habitat restoration, endangered species conservation, game species management, hatchery management, law enforcement, wildlife behavior, genetics, and aquaculture.

Careers for NR undergraduates vary depending on the student's chosen specialty option (concentration within the degree). Some graduates focus on management of specific lands, water, and other resources, in roles as planners, ecologists, restoration specialists, researchers, analysts, and communication specialists. Others focus on public policy and education.

GRADUATE SCHOOL

Some graduates in all programs continue on to graduate school, law school, or careers in teaching. Some FW graduates pursue veterinary school. Graduates of ENSC and FW may be particularly well suited for graduate work in science, as the core curricula includes prerequisites often required for graduate study.

SUMMARY

Although there is overlap among the ENSC, FW, and NR degrees, each is intended to prepare students for different areas of expertise: ENSC graduates excel in research, monitoring positions and management-related careers; FW graduates focus on management, conservation, research, policy, education and enforcement as they relate specifically to fish or wildlife; and, NR graduates focus on management of all natural resources, including but not restricted to fish and wildlife, and also to careers in public education (as in NR interpretation), enforcement and policy.

FOR MORE INFORMATION

Environmental Sciences – http://ecampus.oregonstate.edu/online-degrees/undergraduate/es/

Fisheries and Wildlife Sciences – http://ecampus.oregonstate.edu/online-degrees/undergraduate/fw/

Natural Resources – http://ecampus.oregonstate.edu/online-degrees/undergraduate/nr/

What Can I Do With This Major? http://career.oregonstate.edu/students/career-major-exploration/choosing-or-changing-major/what-can-i-do-my-major