Fisheries and Wildlife Sciences Curriculum 2016-2017 11/28/2016

Courses are subject to change, check online catalog for updated class schedule. FW Core Courses may double count with Bacc. Core.

BACCALAUREATE CORE

This section is only required for students earning their first degree with the exception of the speech and WIC requirement.

Writing I, Speech & Math 111 must be completed within the first 45 OSU credit hours & Writing II within the first 90 OSU credit hours. Transfer students must complete Writing II & Speech within first 45 OSU credit hours.

Literature & Arts (LA)	Social Processes & Institutions (SPI)	Contemporary Global Issues (CGI)
Western Culture (WC)	Difference, Power, & Discrimination (DPD)	Science, Technology, and Society (STS)
Cultural Diversity (CD)	Fitness HHS 231 & 241 -or- PAC	**Synthesis courses cannot be from the same Department (CGI & STS)**

No more than two courses from one Department can be taken to fulfill perspective courses (CD, LA, SPI & WC)

	CREDITS
WR I: WR 121 English Composition*	3
Speech: COMM 111 Public Speaking or Comm 114*	3
Writing Intensive Course (can double count) ^	3

Select one WR II:

	CREDITS
WR 222 English Composition* **-or-**	
WR 327 Technical Writing* **-or-**	
WR 362 Science Writing* **-or-**	3
HC 199 Honors Writing*	
CREDITS	**24-25**

FISHERIES AND WILDLIFE SCIENCES CORE

Select One:

MTH 241 Calculus for Mgmt.* **-or-**	4
MTH 245 Math for Mgmt., Life & SS* **-or-**	4
MTH 251 Differential Calculus*	4

Complete Series:

CH 121 General Chemistry I*	5
CH 122 General Chemistry II*	5
CH 123 General Chemistry III*	5

For on campus students CH 231-233 Corvallis campus labs 261-263 may be substituted for CH 121-123.

Complete Series:

BI 211 Principles of Biology I*	4
BI 212 Principles of Biology II*	4
BI 213 Principles of Biology III*	4

Ecampus students may substitute the BI 204, 205, 206 series for BI 211, 212, 213.

BI 370 Ecology (prereqs: BI 211-213)	3
ST 351 Intro to Statistical Methods I	4
ST 352 Intro to Statistical Methods II	4
CREDITS	**42**

FISHERIES AND WILDLIFE SCIENCES SPECIFIC CORE

FW 107 Orientation to Fisheries and Wildlife	1
FW 209 Career Skills in Fisheries and Wildlife Sciences	1
FW 251 Principles of F&W Conservation	3
FW 255 Field Sampling of Fish and Wildlife	3
FW 289 Communication Skills for F &W Professionals	4
FW 307 Specialization Development	1

FW 320 Intro. Population Dynamics (Prereq: BI 370)	4
FW 321 App. Comm. & Ecosystem Eco. (Prereq: FW 320)	3
FW 410 Internship: Exploratory	1
FW 410 Internship : Intensive	3
FW 488 Problem Solving in F & W	3
CREDITS	**26 - 28**

VERTEBRATE BIOLOGY CORE (choose one)	
FW 311 Ornithology	3
FW 315 Ichthyology	3
FW 317 Mammalogy	3
FW 331 Ecology of Marine and Estuarine Birds	4
BI/FW 302 Bio. & Conservation of Marine Mammals	4
Z 473 Herpetology	3

SYSTEMATICS CORE (choose one)	
FW 312 Systematics of Birds	2
FW 316 Systematics of Fish	3
FW 318 Systematics of Mammals	2
Z 474 Systematic Herpetology	2

_____ Select one additional course from Vertebrate or Systematics column (2 or 3 or 4 credits) **CREDITS** **7 - 11**

ADVANCED FISHERIES AND WILDLIFE SCIENCES CORE - Choose one course from each category, plus one additional.

_____ Choose one additional course from the following Advanced Fisheries and Wildlife Sciences Core sections

Genetics and Evolution	Species Conservation Management	Botany
ANS 378 Animal Genetics (4)	FW 419 The Natural Hist. of Whales & Whaling (3)	BOT 313 Plant Structure (4)
BI 311 Genetics (4)	FW/BI 421 Aquatic Biological Invasions (4)	BOT 321 Plant Systematics (4)
BI 345 Introduction to Evolution* (STS) (3)	FW 427 Principles of Wildlife Diseases (4)	BOT 323 Flowering Plants of the World^ (3)
CSS/HORT/PBG 430 Plant Genetics (3)	FW 451 Avian Conservation & Management (3)	BOT 331 Plant Physiology (4)
FW 370 Conservation Genetics (4)	FW 454 Fishery Biology^ (4)	BOT 341 Plant Ecology (4)
Z 422 Comparative Anatomy (5)	FW 458 Mammal Conservation & Management (4)	BOT 416 Aquatic Botany (4)
	FW 464 Marine Conservation Biology (3)	BOT 440 Field Methods in Plant Ecology (4)
Credit hours per course are listed after course names in parentheses	FW 465 Marine Fisheries (4)	BOT 442 Plant Population Ecology (3)
	FW 473 Fish Ecology (4)	BOT 488 Environmental Physiology of Plants (3)
	FW 481 Wildlife Ecology (3)	RNG 353 Wildland Plant Identification (4)
	FW/MB 491 Fish Diseases in Cons. Bio. & Aqua. (3)	
CREDITS 3 - 5	**CREDITS 3 - 4**	**CREDITS 3 - 4**

Students may sub FW 434 or FW 479 for the Botany Category with advisor approval

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ADVANCED FISHERIES AND WILDLIFE SCIENCES CORE (cont..)

Habitats and Ecosystems	Behavior and Physiology
BI 351 Marine Ecology (3)	ANS 311 Principles of Animal Nutrition (3)
FES 341 Forest Ecology (3)	ANS 314 Animal Physiology (4)
FES 342 Forest Types of the Northwest (3)	FW 469 Methods in Phys. & Beh. Of Marine Megafauna (3)
FW 426 Coastal Ecology and Resource Mgmt. (5) (can sub. for 488)	FW 471 Environmental Physiology of Fishes (4)
FW 434 Estuarine Ecology (4)	FW 474 Early Life History of Fishes (4)
FW 435 Wildlife in Agricultural Ecosystems^ (3)	FW 475 Wildlife Behavior (4)
FW/FES 445 Ecological Restoration (4)	FW 476 Fish Physiology (4)
FES 440 Wildland Fire Ecology (3)	Z 350 Animal Behavior (3)
FW/FES 452 Biodiversity Conservation of Managed Forests (3)	Z 423 Environmental Physiology (3)
FW 456 Limnology (5)	Z 431 Vertebrate Physiology (4)
FW 462 Ecosystem Services (3)	Z 432 Vertebrate Physiology (4)
FW 467 Antarctic Science and Conservation (4)	Credit hours per course are listed after course names in parentheses
FW 479 Wetlands & Riparian Ecology (prereq: BI 370) (3)	
RNG 341 Rangeland Ecology and Management (3)	
CREDITS 3 - 5	**CREDITS 3 - 4**

PHYSICS and EARTH SCIENCES Choose 3 courses from the lists below, NO MORE than 2 courses from a category

PHYSICS & MATH	EARTH SCIENCES	CHEMISTRY
PH 201 General Physics I* (5)	**ATS 210** Introduction to the Atmospheric Sciences (3)	**BB 350** Elementary Biochemistry (4)
PH 202 General Physics II* (5)	**ATS 320** The Changing Climate* (STS) (3)	**CH 130** Gen. Chem. Of Living Systems (4)
PH 203 General Physics III* (5)	**GEO 201** Physical Geology* (4)	**CH 324** Quantitative Analysis (4)
PH 211 General Physics with Calculus I* (4)	**GEO 202** Earth System Science* (4)	**CH 331** Organic Chemistry (4)
PH 212 General Physics with Calculus II* (4)	**GEO 203** Evolution of Planet Earth* (4)	**CH 332** Organic Chemistry (4)
PH 213 General Physics with Calculus III* (4)	**GEO 221** Environmental Geology* (4)	**CH 334** Organic Chemistry (4)
PH 331 Sound, Hearing, and Music* (STS) (3)	**GEO 305** Living with Active Cascade Volcanoes* (STS) (3)	**CH 335** Organic Chemistry (4)
PH 332 Light, Vision, and Color* (STS) (3)	**GEO 306** Minerals, Energy, Water, and Envrmt.* (STS) (3)	**CH 336** Organic Chemistry (4)
MTH 241 Calculus for Mgmt. & Soc. Sci.* (4)	**GEO 307** Nat'l Park Geo. And Preservation* (STS) (3)	**CH 390** Environmental Chemistry (3)
MTH 251 Differential Calculus* (4)	**GEO 308** Global Change and Earth Sciences* (CGI) (3)	**TOX 360** The World of Poisons* (STS) (3)
MTH 252 Integral Calculus (4)	**GEO 322** Surface Processes (4)	1.)_____ 2.)_____ 3.)_____
MTH 268 Mathematical Ideas in Biology (4)	**GEOG 323** Climatology^ (4)	Credit hours per course are listed after course names in parentheses
MTH 241 & 251 cannot double count with FW Core	**OC 201** Oceanography* (4)	
	OC 332 Coastal Oceanography (3)	
	SOIL 205 Soil Science* (4) or **CSS 205** Soil Science* (4)	**CREDITS 9 - 14**

HUMAN DIMENSIONS Choose 3 courses from the list of Human Dimensions courses (credit hours listed after course name). Bolded courses are highly recommended

AEC 250 Introduction to Environmental Economics and Policy* (SPI)	**FW 340 Multicultural Perspectives in Natural Resources* (DPD) (3)**
AEC 351 Natural Resource Economics & Policy* (CGI) (3)	**FW 350** Endangered Species/Society/Sustainability* (STS) (3)
AEC/ECON 352 Environmental Economics & Policy (CGI) (3)	**FW 360** Origins of F & W Management- Evolution, Genetics & Ecology* (STS) (3)
AEC 432 Environmental Law (4)	**FW 415** Fisheries and Wildlife Law and Policy (3)
AG 301 Ecosystem Science of Pac. NW Indians* (DPD) (3)	**FW/FES 439** Human Dimensions of Fisheries and Wildlife Management^ (3)
ANTH 481 Natural Resources & Community Values* (STS) (3)	**FW/HSTS 470** Ecology and History: Landscapes of the Columbia Basin* (STS) (3)
BI 301 Human Impacts on Ecosystems* (CGI) (3)	**FES 485** Consensus and Natural Resources* (STS) (3)
BI 348 Human Ecology* (STS) (3)	**GEOG 300** Sustainability for the Common Good* (CGI) (STS) (3)
BOT 322 Economic and Ethnobotany: Role of Plants in Human Culture (3)	**HST 481** Environmental History of the U.S.* (STS) (3)
FES 351 Recreation Behavior and Management (4)	**HSTS 415** Theory of Evolution and Foundation of Modern Biology*^(STS) (4)
FES 355 Management for Multiple Resource Values (3)	**OC 333** Oceans, Coasts and People (3)
FES 360 Collaboration and Conflict Management (3)	**PHL 440** Environmental Ethics (3)
FES 365 Issues in Natural Resources Conservation* (3) (CGI)	**PHL 443** World Views and Environmental Values* (CGI) (3)
FES 432 Economics of Recreation Resources (4)	**PS 475** Environmental Politics and Policy (4)
FOR 330 Forest Resource Economics I (4)	**PS 476** Science and Politics* (STS) (4)
FOR/FE 456 International Forestry* (CGI) (3)	**SOC 480** Environmental Sociology* (CGI) (4)
FOR 462 Natural Resource Policy and Law (3)	**SOC 481 Society and Natural Resources* (STS) (4)**
FW 325 Global Crises in Resource Ecology* (CGI) (3)	**SOIL 335/GEOG 340** Introduction to Water Science and Policy* (STS) (3)
1.)_____ 2.)_____ 3.)_____	**CREDITS 9 - 12**
Electives	**CREDITS 0 - 22**
Specialization (see text for details)	**CREDITS 24**

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BIOLOGY SERIES

Please note that the BI 204, 205, 206 series does not serve as a prerequisite to the following courses in the Fisheries and Wildlife curriculum: Z 422, Z 431, and Z 432. Also, this series may not be appropriate for careers in Veterinary, Dental, or Medical Sciences or any degrees offered through the OSU College of Science, please consult with your advisor before enrolling in the series.

AREA OF SPECIALIZATION (24 credit minimum)

To supplement the Advanced Fisheries and Wildlife Core, students develop an additional set of classes, called the "Specialization," that are focused on the student's career interests. The Specialization selection process, along with career development activities, is part of FW 307: Specialization Development. Students generally take this course their junior year after consultation with their advisor. Students work with the course instructor and their advisor to finalize the courses within their Specialization.

Specializations are in addition to Fisheries and Wildlife Core/Advanced Core courses and must contain a minimum of 24 credits. At least 20 credits within a Specialization will be from upper division (300 and 400 level) courses; no more than four lower division credits are allowed. A maximum of two courses may be completed prior to approval of the Specialization, additional upper division credits may be allowed through petition to advisor. With the exception of Writing Intensive Courses (WIC), double counting (when credit is given twice for a course), is not permitted between the Specialization and other University or Departmental course work. For students completing their first BS degree, 12 credit hours applied towards their minor may also be applied towards the specialization (requires approval by Advisor in Minor Department and FW Advisor). A maximum of 12 credit hours, in any combination, of FW 401 Research and FW 410 International Internship can be used towards the specialization. Post Baccalaureate students who are completing their second degree may use a maximum of 12 credits from their first degree towards their specialization (approved by FW Advisor).

FW 410 INTERNSHIPS (4 credits minimum)

There are two types of internships: Exploratory (1-2 credits) and Intensive (3-6) credits. Students are required to complete a minimum of two internships or other approved alternative experiences (one of each type) for their degree. Students are encouraged to start gaining professional experience by volunteering or interning with a natural resource agency as early as possible and no later than their junior year. Both internships should be completed at least two terms prior to graduation and need not be sequential.

The **Exploratory Internship** helps students explore career directions. It involves a professional experience with at least 40 hours of learning time off campus in a natural resource setting. Most students attend a professional conference, such as the Annual Conference of The Wildlife Society or American Fisheries Society, or assist a professional biologist with field work.

The **Intensive Internship** helps students experience work as a professional and gain technical skills that complement the academic/conceptual knowledge learned in classes. It involves a professional experience in an off-campus natural resource organization for a long enough time period and with enough depth and breadth to gain competence in one or more facets of a position or organization. This experience often leads to the student performing professional duties independent of supervision.

Students need to register for the FW 410 internship class for the term in which their internship occurs (even if it is summer term). Before registering, students must have their internship approved by the FW Internship Coordinator. The Internship Coordinator is responsible for guiding students, providing general oversight, and final evaluation of the internship/experience requirement. Before beginning the internship, a formal letter of understanding between the student, department, and mentor in the natural resource profession must be submitted by the student.

At the conclusion of the experience the student will complete the course by meeting the requirements listed on the FW 410 class syllabus, including submission of a resume and brief report describing the activities and what was learned. Mentors may provide a brief evaluation of the student's education.

For more information, contact the Internship Coordinator.
Corvallis Campus students: Danielle Jarkowsky, Danielle.Jarkowsky@oregonstate.edu, Nash 104E.
Ecampus students: Rebecca Goggans, Rebecca.Goggans@oregonstate.edu.

FW 488 CAPSTONE COURSE 3 credits

Students participate in the capstone experience through FW 488 Problem Solving in Fisheries & Wildlife Science. This course is taken after a student has reached at least senior standing and is as close to the end of their degree requirements as possible. Students are required to complete FW 320 & FW 321 and are recommended to have taken one or more 400 level FW classes before they begin the capstone course. The capstone course is designed to introduce students to the synthesis of scientific information on species, habitats and ecosystems and the use of such data in shaping fisheries and wildlife conservation, management, and policy. It includes a group problem solving project and case studies.

FW 488 Problem Solving in Fisheries & Wildlife Science (3 credits)

This course focuses on three activities: 1) a review of several case histories on current, "real world" conservation and management problems presented by faculty or agency biologists who have worked on each problem; 2) discussion about the process used to logically address complex problems in fish and wildlife conservation, and; 3) independent work by students in small groups on a selected topic of their choice. The group project provides an opportunity for students to apply what they have learned in this and previous courses to address a conservation or management issue of interest. Projects include data analysis and/or synthesis, literature review, and/or evaluation of the social and economic systems involved in the controversy or management problem.