FISHERIES AND WILDLIFE (FW)

FW LDEA, LOWER DIVISION ED ABROAD, 0-16 Credits

This course is repeatable for 99 credits.

FW UDEA, UPPER DIVISION ED ABROAD, 0-16 Credits

This course is repeatable for 99 credits.

FW 107, ORIENTATION TO FISHERIES AND WILDLIFE, 1 Credit

Information relevant to academic pathways and career planning in the fields of fisheries and wildlife.
Available via Ecampus

FW 113, INTRODUCTION TO MARINE LIFE IN THE SEA-MARINE BIRDS AND MAMMALS, 1 Credit

Introduces first- and second-year undergraduates, teachers and non-degree students to the breadth of marine science course offerings and research at Oregon State University's Hatfield Marine Science Center located in Newport, Oregon. Using an experiential based format, students collect field data to better understand marine mammals (whales, dolphins and porpoises), seabirds, and their interactions with their environment.

FW 115, INTRODUCTION TO SHARKS, 2 Credits

Introduces safe, effective methods to study shark species and their complex behaviors. Introduces students to biology and ecology of sharks through field, laboratory, and lecture experiences. Focuses on the ecological roles that sharks play in our marine communities and adaptations that have allowed them to swim in our oceans for nearly 400 million years. Explores how scientists study sharks: demonstrating safe handling techniques, tagging methods, and behavioral classification. Critically reviews the narrative of sharks as a societal menace in popular media against the essential role sharks play in maintaining marine ecosystems.

FW 199, SPECIAL STUDIES, 1-16 Credits

Equivalent to: FW 199H
This course is repeatable for 16 credits.

FW 199H, SPECIAL STUDIES, 1-16 Credits

Attributes: HNRS — Honors Course Designator
Equivalent to: FW 199
This course is repeatable for 16 credits.

FW 209, +CAREER SKILLS IN FISHERIES, WILDLIFE, AND CONSERVATION SCIENCES, 1 Credit

Develops and practices the skills needed to search, apply, and attain internships and jobs in fisheries, wildlife, and conservation sciences. Focuses on building a career-ready resume and cover letter, mock interview practice, attendance and reflection of a career-relevant event, and a personalized plan for their career advancement.
Attributes: CSC1 — Core Ed - Beyond OSU Career Preparation; CSC2 — Core Ed - Beyond OSU Career Engagement
Prerequisite: FW 107 with P or better and (CORE 100 [D-] or CORE 300 [D-] or LA 100 [D-] or LA 300 [D-] or SCI 100 [D-] or SCI 300 [D-] or BA 100 [D-] or BA 300 [D-] or ED 100 [D-] or ED 300 [D-] or ENGR 110 [D-] or ENGR 110H [D-] or ENGR 310 [D-] or Baccalaureate Core Student with a score of 1)
Available via Ecampus

FW 251, PRINCIPLES OF FISH AND WILDLIFE CONSERVATION, 3 Credits

History of conservation and natural resource use; ecological principles, and social and economic limitations of conservation; principles and practices of wildlife and fisheries management; role of research in management.
Recommended: One course in introductory biology
Available via Ecampus

FW 255, FIELD SAMPLING OF FISH AND WILDLIFE, 3 Credits

Introduction to sampling populations and communities of vertebrate animals emphasizing sampling design, collection and management of data, and communication of results.
Recommended: WR 121Z and familiarity with personal computers
Available via Ecampus

FW 289, COMMUNICATION SKILLS FOR FISHERIES AND WILDLIFE PROFESSIONALS, 4 Credits

Introduces students to the theoretical and practical dimensions of interpersonal and public communication in a natural resource management field.
Recommended: FW 251
Available via Ecampus

FW 301, FIELD TECHNIQUES FOR MARINE MAMMAL CONSERVATION, 1 Credit

A laboratory and hands-on experience covering field techniques, computer software for data organization and analyses, and understanding the practical management conservation application.
Prerequisite: BI 302 (may be taken concurrently) with D- or better or FW 302 (may be taken concurrently) with D- or better

FW 302, BIOLOGY AND CONSERVATION OF MARINE MAMMALS, 4 Credits

Examines the biology of cetaceans, pinnipeds, and other marine mammals. Topics including general adaptations to a marine existence; systematics and biogeography; reproduction; diving physiology; communication and echolocation; feeding and migratory behavior; the role of genetics in conservation; current whaling regulations and marine mammal/human interactions.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better) and (BI 222Z [C-] or BI 222HZ [C-]) and (BI 223Z [C-] or BI 223HZ [C-])) or ((BI 221 [C-] or BI 221H [C-]) and (BI 222 [C-] or BI 222H [C-]) and (BI 223 [C-] or BI 223H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])
Available via Ecampus

FW 303, SURVEY OF GEOGRAPHIC INFORMATION SYSTEMS IN NATURAL RESOURCE, 3 Credits

Concepts underlying geographic information systems, global positioning system, and remote sensing; application to management and research, data quality issues, and case studies. Not a lab/skills class.
Available via Ecampus

FW 307, SPECIALIZATION DEVELOPMENT, 1 Credit

Examine career alternatives, develop career goals, learn what knowledge, skills, and abilities are important for diverse careers in fisheries and wildlife conservation, and develop an academic and lifelong plan for achieving career goals. Intended to assist students in developing a specialization in fisheries and wildlife sciences.
Recommended: FW 209
Available via Ecampus

FW 310, EXPLORATORY INTERNSHIP, 1 Credit

Gain professional experience related to students' desired career path, either by attending a multi-day conference or by gaining experiential learning related to their career goals within the fisheries, wildlife, and conservation sciences fields. Reflect on these experiences and learn how to leverage them into your next professional endeavors.
This course is repeatable for 2 credits.
Recommended: Collaboration, leadership, and problem solving skills
Available via Ecampus

FW 311, ORNITHOLOGY, 3 Credits

Surveys the adaptations of birds to a diverse array of habitats. Examines origins, anatomy, reproductive strategies, migration, flight, behavior, physiology, nutrition, and conservation.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better or BI 221 with C- or better or BI 221H with C- or better) and (BI 222Z [D-] or BI 222HZ [D-] or BI 222 [D-] or BI 222H [D-]) and (BI 223Z [D-] or BI 223HZ [D-] or BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-])
Available via Ecampus

FW 312, SYSTEMATICS OF BIRDS, 3 Credits

Describes the external anatomy of birds using scientific terminology. Evaluates the evolutionary relationships of birds using modern naming procedures, and identifies birds by sight and sound.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better or BI 221 with C- or better or BI 221H with C- or better) and (BI 222Z [D-] or BI 222HZ [D-] or BI 222 [D-] or BI 222H [D-]) and (BI 223Z [D-] or BI 223HZ [D-] or BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-])
Available via Ecampus

FW 315, ICHTHYOLOGY, 3 Credits

Surveys the diversity of biological adaptations of fishes. Explores physiological and zoogeographical adaptations, reproduction, evolution, cladogenesis, morphology, behavior, and genetics.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better or BI 221 with C- or better or BI 221H with C- or better) and (BI 222Z [D-] or BI 222HZ [D-] or BI 222 [D-] or BI 222H [D-]) and (BI 223Z [D-] or BI 223HZ [D-] or BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-])
Available via Ecampus

FW 316, SYSTEMATICS OF FISHES, 3 Credits

Analyzes phylogenetic diversity, evolution, and relationships of the world's fishes, with a particular focus on Oregon fishes. Identifies fishes through anatomical analysis and the use of keys. Introduces the comparative method, systematic theory, taxonomy, field collection and specimen curation.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better or BI 221 with C- or better or BI 221H with C- or better) and (BI 222Z [D-] or BI 222HZ [D-] or BI 222 [D-] or BI 222H [D-]) and (BI 223Z [D-] or BI 223HZ [D-] or BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-])
Recommended: FW 315
Available via Ecampus

FW 317, MAMMALOGY, 3 Credits

Surveys the origins, evolution, and diversity of mammals, and their adaptations to diverse environments. Examines taxonomy, reproduction, sensory perception, physiology, life history, and behavior.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better or BI 221 with C- or better or BI 221H with C- or better) and (BI 222Z [D-] or BI 222HZ [D-] or BI 222 [D-] or BI 222H [D-]) and (BI 223Z [D-] or BI 223HZ [D-] or BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-])
Available via Ecampus

FW 318, SYSTEMATICS OF MAMMALS, 3 Credits

Explore the diversity of mammals in temperate North America, with a focus on species in Oregon. Use skull, dentition, and pelt characteristics to classify mammals to order, family, genus and species. Describe habitat, range, diet, physical characteristics, and systematic relationships of mammal species. Learn and apply scientific skills, concepts, and terminology of mammalian systematics.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better or BI 221 with C- or better or BI 221H with C- or better) and (BI 222Z [D-] or BI 222HZ [D-] or BI 222 [D-] or BI 222H [D-]) and (BI 223Z [D-] or BI 223HZ [D-] or BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-])
Available via Ecampus

FW 320, INTRODUCTORY POPULATION DYNAMICS, 4 Credits

Examines the principles and concepts of population dynamics related to fish and wildlife populations. Engages in methods of estimating abundance, mortality, sustainable harvest levels and extinction risk. Introduces hands-on modelling for population analysis in lecture and labs.
Prerequisite: (MTH 227 with D- or better or MTH 241 with D- or better or MTH 241H with D- or better or MTH 245 with D- or better or MTH 251Z with D- or better or MTH 251HZ with D- or better or MTH 251 with D- or better or MTH 251H with D- or better) and (((BI 221Z with C- or better or BI 221HZ with C- or better) and (BI 222Z [D-] or BI 222HZ [D-]) and (BI 223Z [D-] or BI 223HZ [D-])) or ((BI 221 [C-] or BI 221H [C-]) and (BI 222 [D-] or BI 222H [D-]) and (BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-]))
Available via Ecampus

FW 321, APPLIED COMMUNITY AND ECOSYSTEM ECOLOGY, 3 Credits

Develops a strong understanding of the linkages between community and ecosystem ecology and applied management strategies. Expands upon theoretical concepts such as metapopulation theory and invasion biology, and relates them to real world management issues, such as reserve design. Explores how wildlife and fisheries populations fit into the broader ecology of the system for effective management of these species. Examines community and ecosystem theory and the management strategies and techniques borne from them to accurately and appropriately evaluate and conserve natural resources.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better or BI 221 with C- or better or BI 221H with C- or better) and (BI 222Z [D-] or BI 222HZ [D-] or BI 222 [D-] or BI 222H [D-]) and (BI 223Z [D-] or BI 223HZ [D-] or BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-])
Available via Ecampus

FW 323, MANAGEMENT PRINCIPLES OF PACIFIC SALMON IN THE NORTHWEST, 3 Credits

Explores the nature of the salmon problem in the Northwest. Experts from diverse disciplines describe principles of salmon biology, habitat ecology and management, socioeconomics of direct and indirect users, and government policies.
Available via Ecampus

FW 324, +*FOOD FROM THE SEA, 3 Credits

Explores where seafood comes from, and how it gets to the plate. Investigates how productive the world's oceans are, and whether they can continue to feed (and employ) the masses. Discusses how different cultures, ethnicities, and regions of the world rely upon food from the sea for their daily meals and the importance of seafood to the world's total global protein consumption. Explores the cultural, societal, economic, practical, and environmental features of the protein that feeds billions.
Attributes: CSGI – Bacc Core, Synthesis, Contemporary Global Issues; CSSS – Core Ed - Seeking Solutions
Equivalent to: FW 324H
Available via Ecampus

FW 324H, +*FOOD FROM THE SEA, 3 Credits

Explores where seafood comes from, and how it gets to the plate. Investigates how productive the world's oceans are, and whether they can continue to feed (and employ) the masses. Discusses how different cultures, ethnicities, and regions of the world rely upon food from the sea for their daily meals and the importance of seafood to the world's total global protein consumption. Explores the cultural, societal, economic, practical, and environmental features of the protein that feeds billions.
Attributes: CSGI – Bacc Core, Synthesis, Contemporary Global Issues; CSSS – Core Ed - Seeking Solutions; HNRS – Honors Course Designator
Equivalent to: FW 324
Available via Ecampus

FW 325, +*SEEKING SOLUTIONS TO GLOBAL CRISES IN RESOURCE ECOLOGY, 3 Credits

Examines historical and contemporary implications of the burgeoning anthropogenic footprint on rates and patterns of global ecological change. Analyzes the various reasons why these changes (also called Wicked Problems) are difficult to solve. Explores the drivers and potential solutions to these changes in the context of cultural and political institutions.
Attributes: CSGI – Bacc Core, Synthesis, Contemporary Global Issues; CSSS – Core Ed - Seeking Solutions
Available via Ecampus

FW 326, INTEGRATED WATERSHED MANAGEMENT, 3 Credits

A comprehensive approach to watershed management, one that includes biophysical, socioeconomic, planning and education related topics. Intended for students interested in the sustainable management of natural resources.
Recommended: FW 251
Available via Ecampus

FW 328, WILDLIFE CAPTURE AND IMMOBILIZATION, 2 Credits

Manual and chemical restraint methods are covered with an emphasis on darting equipment, animal and human safety, drug pharmacology and species specific recommendations.
This course is repeatable for 4 credits.

FW 331, ECOLOGY OF MARINE AND ESTUARINE BIRDS, 4 Credits

Explores the diversity of marine and estuarine birds: their life histories, foraging ecology, and their physiological and behavioral adaptations for the marine environment. Implements field and laboratory experiences to practice ornithological research methods including field observations, species identification, data visualization and interpretation, Discusses conservation concerns for marine and estuarine birds. Introduces topics in oceanography.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better or BI 221 with C- or better or BI 221H with C- or better) and (BI 222Z [D-] or BI 222HZ [D-] or BI 222 [D-] or BI 222H [D-]) and (BI 223Z [D-] or BI 223HZ [D-] or BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-])
Available via Ecampus

FW 340, +*POWER AND JUSTICE IN U.S. NATURAL RESOURCE MANAGEMENT, 3 Credits

Explores the role of systems of oppression in natural resource management in the U.S. from history to present. Emphasizes the roles of policies and social norms in creating structural inequities to land use, environmental governance, and engaging in the scientific process.
Attributes: CPDP – Bacc Core, Perspectives, Difference/Power/Discrimination; CSDP – Core Ed - Advanced Difference, Power & Oppression
Recommended: Completion of a Difference, Power, and Oppression Foundations course
Available via Ecampus

FW 341, FISH AND WILDLIFE LAW ENFORCEMENT, 2 Credits

Introduction to the philosophy, purposes, and methods of enforcing natural resource laws, emphasizing fish and wildlife laws.

FW 342, FISH AND WILDLIFE POLICY AND GOVERNANCE, 3 Credits

Examines historical and contemporary policy, law, and governance regarding fish and wildlife in the United States. Addresses key regulatory and procedural aspects essential for the conservation and management of fish and wildlife in both state and federal settings. Introduces and analyzes policy as a social process, exploring the various governance and planning processes that shape how fish and wildlife policies are developed, modified, and implemented.
Prerequisite: FW 251 with D- or better
Available via Ecampus

FW 345, GLOBAL CHANGE BIOLOGY, 3 Credits

Examines the impact of climate change on natural systems, and explores actions to mitigate (slow) or adapt to climate change. Integrates knowledge from natural and social sciences and explores other knowledge systems. Analyzes existing data to inform decision making in conservation planning. Explores the role that managers and researchers can play in mitigating and adapting to climate change.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better or BI 221 with C- or better or BI 221H with C- or better) and (BI 222Z [D-] or BI 222HZ [D-] or BI 222 [D-] or BI 222H [D-]) and (BI 223Z [D-] or BI 223HZ [D-] or BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-])
Equivalent to: FW 345H
Available via Ecampus

FW 345H, GLOBAL CHANGE BIOLOGY, 3 Credits

Examines the impact of climate change on natural systems, and explores actions to mitigate (slow) or adapt to climate change. Integrates knowledge from natural and social sciences and explores other knowledge systems. Analyzes existing data to inform decision making in conservation planning. Explores the role that managers and researchers can play in mitigating and adapting to climate change.
Attributes: HNRS – Honors Course Designator
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better or BI 221 with C- or better or BI 221H with C- or better) and (BI 222Z [D-] or BI 222HZ [D-] or BI 222 [D-] or BI 222H [D-]) and (BI 223Z [D-] or BI 223HZ [D-] or BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-])
Equivalent to: FW 345
Available via Ecampus

FW 350, +*ENDANGERED SPECIES & SOCIETY, 3 Credits

Examines the primary causes of biodiversity loss and explores strategies to communicate these issues effectively to diverse stakeholders. Includes group activities that explore interdisciplinary approaches to solving problems at the intersection of endangered species and society. Provides a general background on endangered species biology and the social and economic implications of legislation enacted to protect them.
Attributes: CSSS – Core Ed - Seeking Solutions; CSST – Bacc Core, Synthesis, Science/Technology/Society
Recommended: FW 251
Available via Ecampus

FW 366, ENVIRONMENTAL CONTAMINANTS IN FISH AND WILDLIFE, 3 Credits

Explores the field of ecotoxicology, linking the ecology of fish and wildlife with toxicology of environmental contaminants. Pairs introductory concepts with key case studies, focusing on studying, managing or conserving fish and wildlife populations.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better or BI 221 with C- or better or BI 221H with C- or better) and (BI 222Z [D-] or BI 222HZ [D-] or BI 222 [D-] or BI 222H [D-]) and (BI 223Z [D-] or BI 223HZ [D-] or BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-])
Available via Ecampus

FW 370, CONSERVATION GENETICS, 3 Credits

Evaluates the effects of habitat loss, exploitation, and environmental change on the genetic composition of natural populations, and how these changes affect the viability of populations. Explores units that define populations to inform management decisions and maintain biological diversity among populations. Introduces the tools and techniques geneticists employ from population, quantitative and molecular genomics, as well as systematics and phylogenetics. Provides a foundation for the acquisition and interpretation of wildlife genetic data. Expands problem-solving and critical-thinking skills using genetic methodology.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better or BI 221 with C- or better or BI 221H with C- or better) and (BI 222Z [D-] or BI 222HZ [D-] or BI 222 [D-] or BI 222H [D-]) and (BI 223Z [D-] or BI 223HZ [D-] or BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-])
Recommended: FW 251
Available via Ecampus

FW 371, ENVIRONMENTAL PHYSIOLOGY OF FISHES, 3 Credits

Introduces fish physiology and the interactions between physiological systems in fishes and both natural and human-modified habitats and ecosystems. Describes key aspects of fish physiology, understand how to use physiology to define fish health, and consider how large environmental factors like climate change will influence fish health. Examples and case histories will emphasize marine, estuarine, and anadromous fishes.
Equivalent to: FW 471
Recommended: FW 315 or one year of introductory biology; critical thinking, problem solving, and synthesis skills
Available via Ecampus

FW 391, *RIDGE TO REEF: SUSTAINABLE RESOURCE MANAGEMENT IN PALAU, 4 Credits

How do small islands address issues of natural resource management, food security, and sustainability? What role do communities, governments, and non-profits play in addressing these issues? Can traditional ecological knowledge help solve these challenges? What about climate change on small Islands? The Republic of Palau will be our classroom. Students will work with and learn from fishers, farmers, community leaders, traditional chiefs, terrestrial and marine biologists, and policy makers. Key topics include food security/production, climate change adaptation, protected area management, biocultural conservation, sustainable forest management, watershed management, sustainable development, coral reef and fisheries management, biodiversity measurement methods and ecosystem restoration.
Attributes: CSGI – Bacc Core, Synthesis, Contemporary Global Issues

FW 401, RESEARCH, 1-16 Credits

This course is repeatable for 16 credits.
Available via Ecampus

FW 403, THESIS, 1-16 Credits

This course is repeatable for 32 credits.
Available via Ecampus

FW 405, READING AND CONFERENCE, 1-16 Credits

This course is repeatable for 16 credits.
Available via Ecampus

FW 407, SEMINAR, 1-16 Credits

Equivalent to: FW 407H
This course is repeatable for 16 credits.
Available via Ecampus

FW 407H, SEMINAR, 1-16 Credits

Attributes: HNRS – Honors Course Designator
Equivalent to: FW 407
This course is repeatable for 16 credits.

FW 408, WORKSHOP, 1-16 Credits

This course is repeatable for 16 credits.

FW 410, INTERNSHIP, 1-6 Credits

This course is repeatable for 99 credits.
Available via Ecampus

FW 415, FISHERIES AND WILDLIFE LAW AND POLICY, 3 Credits

Provides students with an understanding of the key legal frameworks within which they will work to conserve fish and wildlife resources. Examines federal law and policy relating to allocation and conservation of fish and wildlife resources.
Recommended: PS 201 or other introductory political science course
Available via Ecampus

FW 418, URBAN ECOLOGY, 3 Credits

Understand how an increasing human population increases pressure on fish and wildlife communities and resources within ecosystems. Examines the interactions between humans and animal species within urban areas and the effects of urbanization on species, communities, and ecosystems. Topics include conserving biodiversity, invasive species, human health and well-being, and urban planning.
Prerequisite: BI 370 with D- or better or BI 370H with D- or better or FW 321 with D- or better
Available via Ecampus

FW 419, THE NATURAL HISTORY OF WHALES AND WHALING, 3 Credits

Addresses the natural history of whales as a unique example of adaptation in an evolutionary lineage, and the history of whaling as a general example of the failings of international resource management.
Prerequisite: BI 370 with D- or better or BI 370H with D- or better or FW 321 with D- or better
Available via Ecampus

FW 421, AQUATIC BIOLOGICAL INVASIONS, 4 Credits

Focuses on the background, theory, evolution, ecology, politics, and conservation of invasions by introduced species in aquatic environments.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better or BI 221 with C- or better or BI 221H with C- or better) and (BI 222Z [D-] or BI 222HZ [D-] or BI 222 [D-] or BI 222H [D-]) and (BI 223Z [D-] or BI 223HZ [D-] or BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-])
Equivalent to: BI 421
Available via Ecampus

FW 422, INTRODUCTION TO OCEAN LAW, 3 Credits

Examination of US law and primary international law focused on fisheries management with coverage of regulation of other ocean resources including energy, marine mammals, endangered species, pollution, and protected areas. Final project is intended to provide students with hands-on exposure to real-world fisheries and ocean management issues.
Available via Ecampus

FW 426, COASTAL ECOLOGY AND RESOURCE MANAGEMENT, 4 Credits

Leverages student's existing knowledge to complex coastal concerns providing exposure to diverse coastal ecosystems and stakeholder perspectives. Emphasizes experimental (participatory) learning by integrating lectures, group discussions, field activities, analyses of real-world datasets, and interaction with professionals in fields related to coastal ecology and resource management. Examines topics ranging from coastal forests to open oceans, linking science and management. Explores various venues of coastal ecology and topical issues affecting management of natural resources on the Oregon coast through immersive field excursions.

FW 427, PRINCIPLES OF WILDLIFE DISEASES, 4 Credits

Examines the general principles of how wildlife diseases emerge, evolve, and spread. Explores the relationships between human society, environmental change, and wildlife disease. Emphasizes how global environmental change (e.g. climate change, land use change, globalization of travel and trade) affect disease dynamics and cross-species transmission. Covers disease examples of North American mammals, birds, reptiles, and amphibians.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better or BI 221 with C- or better or BI 221H with C- or better) and (BI 222Z [D-] or BI 222HZ [D-] or BI 222 [D-] or BI 222H [D-]) and (BI 223Z [D-] or BI 223HZ [D-] or BI 223 [D-] or BI 223H [D-])) or (BI 204 [C-] and BI 205 [D-] and BI 206 [D-])
Available via Ecampus

FW 430, INTRODUCTION TO SCIENTIFIC DIVING, 4 Credits

Prepares students to manage the task loading associated with performing scientific work underwater through a combination of classroom, confined water, and open water training. Introduces the diver to basic techniques and equipment used in underwater data collection. Includes required field trips to dive in both freshwater and marine habitats (two single-day trips and one three-day trip).
Equivalent to: GRAD 430
Recommended: Cold water diving experience; experience with cold water exposure protection (drysuit, thick wetsuit, thick or dry gloves)

FW 432X, AQUATIC SYSTEMS & SALMON CONFLICTS, 3 Credits

Focuses on understanding aquatic ecosystems from an environmental and societal viewpoint and highlight the role of intensive salmon production in Chile and Oregon. Examines the intersection of intensive salmon production with environmental and societal values in Chile and Oregon. Explores innovative, transdisciplinary solutions to ensure the management of sustainable aquatic systems, bringing enterprise into harmony with the environment and society.
Recommended: 9 credits of upper-division biological sciences

FW 433, POPULATION DYNAMICS FOR CONSERVATION, 4 Credits

Synthesizes the principles of population dynamics from the viewpoint of a resource manager. Focuses on populations structured by age, size, or over space, and considers both fisheries and wildlife management. Uses computer programming in the R language in the laboratory work to implement examples from lecture.
Prerequisite: (FW 320 with C or better or BI 483 with C or better) and ((MTH 227 with C or better and MTH 228 [C]) or (MTH 251Z [C] or MTH 251HZ [C] or MTH 251 [C] or MTH 251H [C]) and (MTH 252Z [C] or MTH 252HZ [C] or MTH 252 [C] or MTH 252H [C]))

FW 435, ^WILDLIFE IN AGRICULTURAL ECOSYSTEMS, 3 Credits

Examines the relationships between agricultural production and fish and wildlife populations and communities. Explores the impacts of agricultural practices on fish and wildlife. Field trips required; transportation fee charged. OSU Ecampus students are not required to attend field trips.
Attributes: CSWC — Core Ed - Writing Intensive Curriculum (WIC); CWIC — Bacc Core, Skills, Writing Intensive Curriculum (WIC)
Recommended: BI 370 and FW 251
Available via Ecampus

FW 439, ^HUMAN DIMENSIONS OF FISHERIES AND WILDLIFE MANAGEMENT, 3 Credits

Examines the human dimensions of fisheries and wildlife including economics, policy, communications, and management. Focuses on the application of social scientific theories and approaches to fisheries and wildlife issues. Independent and group work with a substantial writing component.
Attributes: CSWC — Core Ed - Writing Intensive Curriculum (WIC); CWIC — Bacc Core, Skills, Writing Intensive Curriculum (WIC)
Recommended: FW 255, FW 289 and completion of human dimensions coursework
Available via Ecampus

FW 448, HERPETOFAUNA CONSERVATION AND MANAGEMENT, 3 Credits

Reviews life history traits of amphibians and reptiles and the wide variety of factors that threaten herpetofauna populations worldwide. Discusses a variety of sampling techniques and current laws and policies that directly impact herpetofauna management. Focuses on species and conservation strategies in the United States, but international conservation efforts will be discussed as well.
Prerequisite: BI 370 with D- or better or BI 370H with D- or better or FW 321 with D- or better
Available via Ecampus

FW 451, AVIAN CONSERVATION AND MANAGEMENT, 3 Credits

Identification, classification, life history strategies, ecology and management of upland and migratory birds.
Prerequisite: BI 370 with D- or better or BI 370H with D- or better or FW 321 with D- or better
Available via Ecampus

FW 452, BIODIVERSITY CONSERVATION IN MANAGED FORESTS, 3 Credits

Designed for students in forestry, wildlife, fisheries and related fields. Introduces the concepts of, and approaches to, managing forest stands, landscapes and regions to achieve desired habitat conditions for indicator species and conservation of biological diversity. CROSSLISTED as FES 452/FW 452.
Equivalent to: FES 452
Recommended: FES 240 or FES 341 or BI 370

FW 454, FISHERY BIOLOGY, 4 Credits

Focuses on principles and methods used in studying the biology of fishes; ecological requirements of freshwater and anadromous fishes; principles and practices in sport fishery management.
Prerequisite: FW 315 with D- or better and FW 320 [D-]
Available via Ecampus

FW 456, FRESHWATER ECOLOGY AND CONSERVATION, 4 Credits

Examines the structure and function of aquatic ecosystems, emphasizing the physical, chemical, biological, and human-influenced processes of lakes and streams. Discusses environmental factors that influence aquatic communities. Highlights differences between lakes and stream ecosystems. Explores interactions between biological communities and physical and chemical processes. Discusses ecosystem contexts for research, management and conservation of lakes and streams and presents applications of recent ecological principles for research and management of aquatic ecosystems.
Prerequisite: BI 370 with D- or better or BI 370H with D- or better or FW 321 with D- or better
Recommended: 9 credits of upper-division biological sciences
Available via Ecampus

FW 457X, BIOLOGY, ECOLOGY, AND CONSERVATION OF MARINE MAMMALS, 9 Credits

Provides a comprehensive overview of the ecology, biology, and evolution of marine mammals, which are globally distributed, shape marine ecosystems, and are inextricably linked to humans. Examines adaptations of marine mammals to the marine environment, biogeography, bioacoustics, ecological roles, social, feeding and migratory behavior, and conservation issues. Emphasizes integrative learning through lectures, group discussions and debates, field activities, lab work, analyses of real-world data, and interaction with a wide variety of professions and fields related to marine mammal science.
Recommended: 200-level biology series; familiarity with field work in marine environment and with R computer programming

FW 458, MAMMAL CONSERVATION AND MANAGEMENT, 4 Credits

A thorough understanding of the management, conservation, and ecology of mammals in North America; includes population dynamics, harvest management, techniques to determine abundance, diets, reproduction, and the cultural and political variables that contribute to formulation of management programs.
Prerequisite: BI 370 with D- or better or BI 370H with D- or better or FW 321 with D- or better
Available via Ecampus

FW 461X, INTRODUCTION TO MARINE BIOACOUSTICS, 3 Credits

Focuses on passive and active acoustic sources, sound production mechanisms, animal communication, tools used, and the impacts of human-made noise on animals. Provides experience in collecting and analyzing acoustic data based on the sounds made and used by different species to make hydrophones. Analyzes how bioacoustics can be used in conservation studies.

FW 462, ECOSYSTEM SERVICES, 3 Credits

Introduces students to the ecological, economic, and social/ethical issues involved in the study of ecosystem services, with a major focus on biological components involved in ecosystem services. Topics covered include: 1) an introduction to the roles that living organisms play in the provision of ecosystem services, 2) the relationship of ecosystem functions and services, 3) the societal factors that influence this relationship, 4) general categories of ecosystem services, 5) identification of potential ecosystem services in terrestrial and aquatic systems, 6) an overview of the methods of valuation, and 7) translating ecosystems functions to services. Case studies will be used to illustrate key concepts and relationships within different ecological and social contexts.
Recommended: BI 370
Available via Ecampus

FW 464, MARINE CONSERVATION BIOLOGY, 3 Credits

Lectures, group library research, and class debates on current issues regarding the conservation of biodiversity in the sea. Topics include overfishing, invasive species, eutrophication, marine pollution, and global warming, as well as means of addressing these threats.
Prerequisite: BI 370 with D- or better or BI 370H with D- or better or FW 321 with D- or better
Available via Ecampus

FW 466, BEHAVIORAL ECOLOGY OF MARINE ANIMALS, 3 Credits

Examines how the social lives of animals contributes to solving fundamental life challenges—eat, not be eaten, reproduce—from an evolutionary and ecological perspective. Examines how group-living shape animal societies in terms of structure, organization, mating and care systems. Explores fundamental concepts of behavioral ecology, sociobiology, social evolution, with emphasis on marine megafauna (cetaceans, pinnipeds, seabirds, elasmobranchs). Combines lectures, groups discussions, field activities, and data analyses on animal societies.
Prerequisite: BI 370 with D- or better or BI 370H with D- or better or FW 321 with D- or better

FW 467, ANTARCTIC SCIENCE AND CONSERVATION, 4 Credits

Explores the history, geology, climate, and ecosystems of Antarctica, with an emphasis on current research and conservation issues. Focuses on critical thinking skills developed through independent research on a topic of interest, an internal peer review project, and discussions of relevant case studies in Antarctic research.
Prerequisite: BI 370 with D- or better or BI 370H with D- or better or FW 321 with D- or better
Available via Ecampus

FW 469, METHODS IN PHYSIOLOGY AND BEHAVIOR OF MARINE MEGAFAUNA, 4 Credits

An in-depth study of marine megafauna (mammals, birds, turtles) with an emphasis on methods and analyses of behavior and physiology for conservation. Lab and field exercises include investigations into the behavior—physiology nexus of diving, migration, thermoregulation, energy expenditure, and mating systems. Research techniques to be explored will include, for example, tracking and remote biotelemetry monitoring technologies, respirometry, genetics, and direct field study observation. Theoretical approaches, field techniques and statistical analyses will help prepare students for a career in fisheries or wildlife science.
Prerequisite: ((BI 221Z with C- or better or BI 221HZ with C- or better) and (BI 222Z [C-] or BI 222HZ [C-]) and (BI 223Z [C-] or BI 223HZ [C-])) or ((BI 221 [C-] or BI 221H [C-]) and (BI 222 [C-] or BI 222H [C-]) and (BI 223 [C-] or BI 223H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])
Recommended: FW 302, FW 320, FW 331 and FW 475

FW 473, FISH ECOLOGY, 4 Credits

Explores how fish physiology and behavior interact with spatial and temporal heterogeneity in aquatic ecosystems. Considers emergent properties at population, community, and ecosystem levels and their implications for management and conservation.
Prerequisite: BI 370 with D- or better or BI 370H with D- or better or FW 321 with D- or better
Available via Ecampus

FW 474, EARLY LIFE HISTORY OF FISHES, 4 Credits

Overview of diversity of development patterns in fishes; emphasis on morphology, life history, and evolution. CROSSLISTED as FW 474/OC 474.
Equivalent to: OC 474
Recommended: FW 315

FW 475, WILDLIFE BEHAVIOR, 4 Credits

Emphasizes adaptive significance of egocentric and social behavior of wildlife species. Discusses implications of behavior in sound management practice.
Prerequisite: BI 370 with D- or better or BI 370H with D- or better or FW 321 with D- or better
Available via Ecampus

FW 476, FISH PHYSIOLOGY, 4 Credits

Physiological specializations and adaptations of major groups of fishes.
Prerequisite: FW 315 with D- or better

FW 479, WETLANDS AND RIPARIAN ECOLOGY, 3 Credits

Ecology of riparian freshwater and estuarine wetlands of the Pacific Northwest. Effects of land use on ecosystem structure, function, biodiversity, and restoration will be explored.
Prerequisite: BI 370 with D- or better or BI 370H with D- or better or FW 321 with D- or better
Available via Ecampus

FW 481, WILDLIFE ECOLOGY, 3 Credits

Interrelationships of wildlife, environmental change. Predicting and measuring responses of wildlife to altered habitat conditions
Prerequisite: BI 370 with D- or better or BI 370H with D- or better or FW 321 with D- or better
Available via Ecampus

FW 485, *CONSENSUS AND NATURAL RESOURCES, 3 Credits

Using a working group approach, select a natural resource topic, study the team process and interaction as a method of learning, explore the issue using systems practice, and strive for consensus on solutions to the issue. CROSSLISTED as FES 485/FW 485.
Attributes: CSST – Bacc Core, Synthesis, Science/Technology/Society
Equivalent to: FES 485, FES 485H

FW 488, PROBLEM SOLVING IN FISHERIES AND WILDLIFE SCIENCE, 3 Credits

Explores the synthesis of scientific information on species, habitats and ecosystems and the use of such data in shaping fisheries and wildlife conservation strategies, management and policy, with emphasis on topics with multiple stakeholder viewpoints. Incorporates a group problem-solving project and case studies, with group work, peer review, and discussions.
Prerequisite: FW 320 with D- or better and FW 321 (may be taken concurrently) [D-]
Recommended: 400-level FW coursework (e.g., FW 426 or FW 454 or FW 481)
Available via Ecampus

FW 491, FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE, 3 Credits

Introduction to diseases of fish including pathogens important to aquaculture and ornamental industries as well as to wild fish populations and conservation programs. CROSSLISTED as FW 491/MB 491 and FW 591/MB 591.
Equivalent to: MB 491
Recommended: 9 credits of upper-division fisheries or biology

FW 497, ^AQUACULTURE, 3 Credits

Principles and practices for the aquaculture of fish, shellfish, and algae.
Attributes: CSWC – Core Ed - Writing Intensive Curriculum (WIC); CWIC – Bacc Core, Skills, Writing Intensive Curriculum (WIC)
Recommended: 9 credits of upper-division biology.

FW 498, AQUACULTURE LABORATORY, 3 Credits

Biology and culture requirements of fish, shellfish, and algae. Emphasis on laboratory culture techniques and practical experience in handling organisms.
Recommended: 9 credits of upper-division biology

FW 499, SPECIAL TOPICS IN FISHERIES AND WILDLIFE, 0-16 Credits

This course is repeatable for 16 credits.
Available via Ecampus

FW 501, RESEARCH, 1-16 Credits

This course is repeatable for 16 credits.
Available via Ecampus

FW 502, TEACHING METHODS IN FISHERIES AND WILDLIFE, 1 Credit

This is a discussion course designed to help new GTAs and instructors who are learning the trials and tribulations of university-level teaching in our department. This is a great course for students who are interested in hearing more about teaching approaches, grading and assessment, student communication, problem students, and development of teaching.

FW 503, THESIS, 1-16 Credits

This course is repeatable for 999 credits.
Available via Ecampus

FW 505, READING AND CONFERENCE, 1-16 Credits

This course is repeatable for 16 credits.
Available via Ecampus

FW 506, PROJECTS, 1-6 Credits

This course is repeatable for 12 credits.
Available via Ecampus

FW 507, SEMINAR, 1-16 Credits

This course is repeatable for 16 credits.
Available via Ecampus

FW 508, WORKSHOP, 1-16 Credits

This course is repeatable for 16 credits.

FW 509, PRACTICUM, 1-16 Credits

This course is repeatable for 99 credits.
Available via Ecampus

FW 510, PROFESSIONAL INTERNSHIP, 1-10 Credits

This course is repeatable for 10 credits.
Available via Ecampus

FW 514, PROFESSIONAL DEVELOPMENT: MEETING COMMUNICATIONS, 1-3 Credits

Fisheries and wildlife professionals use meetings of scientists, managers and stakeholders to communicate key findings and develop consensus recommendations for policy. This experiential learning course exposes students to a scientific or management meeting in their chosen field (fisheries, wildlife, ecology, or conservation biology) and gets them to think about how meetings function as well as their content.
This course is repeatable for 3 credits.
Available via Ecampus

FW 515, US WILDLIFE LAW, 3 Credits

Explores US treaty and statutory law in the context of contemporary conservation of island fish and wildlife species. Includes the context of the framework's historical evolution from the Public Trust Doctrine and other common law concepts, Tribal, State, Territorial, and Federal management and collaborations therein, examining judicial decisions to illustrate key examples of the system's application, process, and outcomes.

Recommended: PS 201 or other introductory political science course

Available via Ecampus

FW 518, URBAN ECOLOGY, 3 Credits

Understand how an increasing human population increases pressure on fish and wildlife communities and resources within ecosystems. Examines the interactions between humans and animal species within urban areas and the effects of urbanization on species, communities, and ecosystems. Topics include conserving biodiversity, invasive species, human health and well-being, and urban planning.

Recommended: BI 370 or FW 321

Available via Ecampus

FW 519, THE NATURAL HISTORY OF WHALES AND WHALING, 3 Credits

Addresses the natural history of whales as a unique example of adaptation in an evolutionary lineage, and the history of whaling as a general example of the failings of international resource management.

Recommended: BI 370 or FW 321

Available via Ecampus

FW 521, AQUATIC BIOLOGICAL INVASIONS, 4 Credits

Focuses on the background, theory, evolution, ecology, politics, and conservation of invasions by introduced species in aquatic environments.

Recommended: One year of university-level biology

Available via Ecampus

FW 522, INTRODUCTION TO OCEAN LAW, 3 Credits

Examination of US law and primary international law focused on fisheries management with coverage of regulation of other ocean resources including energy, marine mammals, endangered species, pollution, and protected areas. Final project is intended to provide students with hands-on exposure to real-world fisheries and ocean management issues.

Available via Ecampus

FW 523, MONITORING WILDLIFE POPULATIONS AND THEIR HABITATS, 3 Credits

An overview of monitoring plan design and the conceptual background needed to understand and critique monitoring plans, and have the basic skills to develop and implement a monitoring program as part of an interdisciplinary team.

Recommended: Introductory course in statistics and introductory course in ecology.

Available via Ecampus

FW 524, INTRODUCTION TO FISHERIES ASSESSMENT, 3 Credits

Fisheries management strategies rely on models that predict a population's responses to exploitation. Introduces approaches commonly used to assess and evaluate the dynamics and status of a population. Provides an overview of the terminology, data requirements, underlying rationale, assumptions, limitations and uncertainty associated with stock assessments.

Recommended: College algebra, introductory statistics and, if unfamiliar with data collection and analysis methods in fisheries, FW 454/FW 554

Available via Ecampus

FW 526, COASTAL ECOLOGY AND RESOURCE MANAGEMENT, 4 Credits

Leverages student's existing knowledge to complex coastal concerns providing exposure to diverse coastal ecosystems and stakeholder perspectives. Emphasizes experimental (participatory) learning by integrating lectures, group discussions, field activities, analyses of real-world datasets, and interaction with professionals in fields related to coastal ecology and resource management. Examines topics ranging from coastal forests to open oceans, linking science and management. Explores various venues of coastal ecology and topical issues affecting management of natural resources on the Oregon coast through immersive field excursions.

FW 527, PRINCIPLES OF WILDLIFE DISEASES, 4 Credits

Examines the general principles of how wildlife diseases emerge, evolve, and spread. Explores the relationships between human society, environmental change, and wildlife disease. Emphasizes how global environmental change (e.g. climate change, land use change, globalization of travel and trade) affect disease dynamics and cross-species transmission. Covers disease examples of North American mammals, birds, reptiles, and amphibians.

Available via Ecampus

FW 530, INTRODUCTION TO SCIENTIFIC DIVING, 4 Credits

Prepares students to manage the task loading associated with performing scientific work underwater through a combination of classroom, confined water, and open water training. Introduces the diver to basic techniques and equipment used in underwater data collection. Includes required field trips to dive in both freshwater and marine habitats (two single-day trips and one three-day trip).

Equivalent to: GRAD 530

Recommended: Cold water diving experience; experience with cold water exposure protection (drysuit, thick wetsuit, thick or dry gloves)

FW 532, MACHINE LEARNING IN SPECIES DISTRIBUTION MODELING, 3 Credits

Explores machine learning (ML) topics for building and evaluating species distribution models (SDMs). Examines ML approaches such as tree-based methods, maximum entropy methods, and cross-validation through reading and discussion of current literature as well as hands-on exercises in the R programming language. Culminates in student projects to apply the material.

Recommended: Experience with programming in R

FW 533, POPULATION DYNAMICS FOR CONSERVATION, 4 Credits

Synthesizes the principles of population dynamics from the viewpoint of a resource manager. Focuses on populations structured by age, size, or over space, and considers both fisheries and wildlife management. Uses computer programming in the R language in the laboratory work to implement examples from lecture.
Recommended: IB 592 and ((MTH 227 and MTH 228) or (MTH 251 and MTH 252))

FW 535, WILDLIFE IN AGRICULTURAL ECOSYSTEMS, 3 Credits

Examines the relationships between agricultural production and fish and wildlife populations and communities. Explores the impacts of agricultural practices on fish and wildlife. Field trips required; transportation fee charged. OSU Ecampus students are not required to attend field trips.
Recommended: BI 370 and FW 251
Available via Ecampus

FW 536, STATISTICAL MODELING FOR ECOLOGY AND CONSERVATION, 3 Credits

Explores statistical modeling and practical analysis of data typical of ecology, conservation, and natural resources. Facilitates deep interpretation and application by covering probability, continuous and discrete probability distributions and their use for ecology, generalized linear models and their interpretation, mixed effects models for ecological data, model selection, and applications of maximum likelihood and Bayesian statistics for common hierarchical modeling problems in ecology. Includes hands-on exercises in the R programming language and the BUGS language implemented in Nimble and JAGS.
Recommended: Familiarity with the R programming language and prior introductory statistics courses

FW 537, STRUCTURED DECISION MAKING IN NATURAL RESOURCE MANAGEMENT, 2 Credits

Structured decision making (SDM) is used for making natural resource management and policy decisions. It is an ideal framework for interdisciplinary teams to cooperate and identify the most effective management strategies. Graduate students from diverse backgrounds (natural resources, political science, others) are provided with an understanding of the SDM process.
Recommended: One year of college-level mathematics and one quarter of fish and wildlife management
Available via Ecampus

FW 539, COMMUNITY SCIENCE, 3 Credits

Examines the growing movement of involving the public in scientific research and how community-driven projects function. Evaluates best practices of successful projects, sources and solutions for error and bias, opportunities to include diverse audiences and participants, and creation of new community science projects.
Available via Ecampus

FW 544, QUANTITATIVE DECISION ANALYSIS FOR FISH AND WILDLIFE MANAGEMENT, 4 Credits

Decision analysis allows decision makers to examine the expected effects of different strategies before implementation; incorporate multiple objectives and values of stakeholders; determine the relative influence of various sources of uncertainty; and estimate the value of collecting additional data. Quantitatively oriented graduate students in natural resources are provided with an in-depth overview of decision analysis and adaptive management, emphasizing animal population management.
Recommended: ST 511 and ST 512 or equivalent, basic background in animal population dynamics and management.

FW 548, HERPETOFAUNA CONSERVATION AND MANAGEMENT, 3 Credits

Reviews life history traits of amphibians and reptiles and the wide variety of factors that threaten herpetofauna populations worldwide. Discusses a variety of sampling techniques and current laws and policies that directly impact herpetofauna management. Focuses on species and conservation strategies in the United States, but international conservation efforts will be discussed as well.
Recommended: BI 370 or FW 321
Available via Ecampus

FW 550, TROPHIC CASCADES, 2-3 Credits

Theory and empirical analysis of terrestrial carnivore effects on plants and ecosystems as mediated through herbivores. Emphasis on large carnivores, frequency/strength of trophic cascades, implications for ecosystem function, management, and restoration. Lectures, current literature, discussions, field exercise, term paper, and student presentations. CROSSLISTED as FES 550/FW 550.
Equivalent to: FES 550, FOR 547, FW 547
This course is repeatable for 3 credits.

FW 551, AVIAN CONSERVATION AND MANAGEMENT, 3 Credits

Identification, classification, life history strategies, ecology and management of upland and migratory birds.
Recommended: FW 311
Available via Ecampus

FW 552, FOREST WILDLIFE HABITAT MANAGEMENT, 4 Credits

Management of terrestrial vertebrates in forest ecosystems. Effects on silvicultural practices and landscape pattern on habitats and populations. CROSSLISTED as FES 552/FW 552.
Equivalent to: FES 552
Recommended: FOR 341 or equivalent course in ecology.
Available via Ecampus

FW 554, FISHERY BIOLOGY, 4 Credits

Focuses on principles and methods used in studying the biology of fishes; ecological requirements of freshwater and anadromous fishes; principles and practices in sport fishery management.
Recommended: FW 315 and FW 320
Available via Ecampus

FW 556, FRESHWATER ECOLOGY AND CONSERVATION, 4 Credits

Examines the structure and function of aquatic ecosystems, emphasizing the physical, chemical, biological, and human-influenced processes of lakes and streams. Discusses environmental factors that influence aquatic communities. Highlights differences between lakes and stream ecosystems. Explores interactions between biological communities and physical and chemical processes. Discusses ecosystem contexts for research, management and conservation of lakes and streams and presents applications of recent ecological principles for research and management of aquatic ecosystems.
Recommended: BI 370 or FW 321 and 9 credits of upper-division biological sciences
Available via Ecampus

FW 557X, BIOLOGY, ECOLOGY, AND CONSERVATION OF MARINE MAMMALS, 9 Credits

Provides a comprehensive overview of the ecology, biology, and evolution of marine mammals, which are globally distributed, shape marine ecosystems, and are inextricably linked to humans. Examines adaptations of marine mammals to the marine environment, biogeography, bioacoustics, ecological roles, social, feeding and migratory behavior, and conservation issues. Emphasizes integrative learning through lectures, group discussions and debates, field activities, lab work, analyses of real-world data, and interaction with a wide variety of professions and fields related to marine mammal science.
Recommended: 200-level biology series; familiarity with field work in marine environment and with R computer programming

FW 558, MAMMAL CONSERVATION AND MANAGEMENT, 4 Credits

A thorough understanding of the management, conservation, and ecology of mammals in North America; includes population dynamics, harvest management, techniques to determine abundance, diets, reproduction, and the cultural and political variables that contribute to formulation of management programs.
Recommended: BI 370 or FW 321
Available via Ecampus

FW 560, PSYCHOLOGY OF ENVIRONMENTAL DECISIONS, 3 Credits

Natural resource management and conservation programs have one thing in common: to be effective, they must consider how and why humans make decisions. This course approaches this topic from a psychological lens and will cover the psychological processes associated with making individual and group decisions, common biases and heuristics in our decision-making, and how these apply to diverse natural resource management and conservation issues. Students will learn how to take these aspects of human decision making into consideration when participating in or facilitating collaborative environmental programs.
Available via Ecampus

FW 561X, INTRODUCTION TO MARINE BIOACOUSTICS, 3 Credits

Focuses on passive and active acoustic sources, sound production mechanisms, animal communication, tools used, and the impacts of human-made noise on animals. Provides experience in collecting and analyzing acoustic data based on the sounds made and used by different species to make hydrophones. Analyzes how bioacoustics can be used in conservation studies.

FW 562, ECOSYSTEM SERVICES, 3 Credits

Introduces students to the ecological, economic, and social/ethical issues involved in the study of ecosystem services, with a major focus on biological components involved in ecosystem services. Topics covered include: 1) an introduction to the roles that living organisms play in the provision of ecosystem services, 2) the relationship of ecosystem functions and services, 3) the societal factors that influence this relationship, 4) general categories of ecosystem services, 5) identification of potential ecosystem services in terrestrial and aquatic systems, 6) an overview of the methods of valuation, and 7) translating ecosystems functions to services. Case studies will be used to illustrate key concepts and relationships within different ecological and social contexts.
Recommended: BI 370
Available via Ecampus

FW 563, CONSERVATION BIOLOGY OF WILDLIFE, 3 Credits

Overview of the field of conservation biology with emphasis on the relationship to conservation and management of wildlife.
Available via Ecampus

FW 564, MARINE CONSERVATION BIOLOGY, 3 Credits

Lectures, group library research, and class debates on current issues regarding the conservation of biodiversity in the sea. Topics include overfishing, invasive species, eutrophication, marine pollution, and global warming, as well as means of addressing these threats.
Recommended: BI 370 or FW 321
Available via Ecampus

FW 566, BEHAVIORAL ECOLOGY OF MARINE ANIMALS, 3 Credits

Examines how the social lives of animals contributes to solving fundamental life challenges—eat, not be eaten, reproduce—from an evolutionary and ecological perspective. Examines how group-living shape animal societies in terms of structure, organization, mating and care systems. Explores fundamental concepts of behavioral ecology, sociobiology, social evolution, with emphasis on marine megafauna (cetaceans, pinnipeds, seabirds, elasmobranchs). Combines lectures, groups discussions, field activities, and data analyses on animal societies.
Recommended: BI 370 or FW 321

FW 567, ANTARCTIC SCIENCE AND CONSERVATION, 4 Credits

Explores the history, geology, climate, and ecosystems of Antarctica, with an emphasis on current research and conservation issues. Focuses on critical thinking skills developed through independent research on a topic of interest, an internal peer review project, and discussions of relevant case studies in Antarctic research.
Recommended: BI 370 or FW 321
Available via Ecampus

FW 568, HUMAN DIMENSIONS OF MARINE MAMMAL CONSERVATION, 4 Credits

Approaches for more ethical, equitable, and effective conservation of marine mammals. Issues in marine mammal conservation and key concepts related to the human (social, political, economic, and cultural) dimensions of conservation, and lessons learned from real-world examples. Topics will include: social-ecological systems; transdisciplinarity; Design Thinking; human rights-based approach to management; social science and participatory research methods; responsible community engagement; conservation evaluation.
Recommended: FW 302 or equivalent marine mammal biology course

FW 569, METHODS IN PHYSIOLOGY AND BEHAVIOR OF MARINE MEGAFAUNA, 4 Credits

An in-depth study of marine megafauna (mammals, birds, turtles) with an emphasis on methods and analyses of behavior and physiology for conservation. Lab and field exercises include investigations into the behavior–physiology nexus of diving, migration, thermoregulation, energy expenditure, and mating systems. Research techniques to be explored will include, for example, tracking and remote biotelemetry monitoring technologies, respirometry, genetics, and direct field study observation. Theoretical approaches, field techniques and statistical analyses will help prepare students for a career in fisheries or wildlife science.
Recommended: FW 302, FW 320, FW 331, and FW 475

FW 570, COMMUNITY STRUCTURE AND ANALYSIS, 4 Credits

Quantitative methods for the analysis of biotic communities, including community concepts, estimation of community composition parameters, theoretical aspects of multivariate methods of analyzing species-importance data, and overview of multivariate tools; hands-on computer analysis of data sets. CROSSLISTED as BOT 570/FW 570.
Equivalent to: BOT 570
Recommended: BI 370 and (ST 412 or ST 512) and calculus

FW 573, FISH ECOLOGY, 4 Credits

Explores how fish physiology and behavior interact with spatial and temporal heterogeneity in aquatic ecosystems. Considers emergent properties at population, community, and ecosystem levels and their implications for management and conservation.
Recommended: BI 370 or FW 321
Available via Ecampus

FW 574, EARLY LIFE HISTORY OF FISHES, 4 Credits

Overview of diversity of development patterns in fishes; emphasis on morphology, life history, and evolution. CROSSLISTED as FW 574/OC 574.
Equivalent to: OC 574
Recommended: FW 315

FW 575, WILDLIFE BEHAVIOR, 4 Credits

Emphasizes adaptive significance of egocentric and social behavior of wildlife species. Discusses implications of behavior in sound management practice.
Recommended: BI 370 or FW 321
Available via Ecampus

FW 576, FISH PHYSIOLOGY, 4 Credits

Physiological specializations and adaptations of major groups of fishes.
Recommended: FW 315

FW 579, WETLANDS AND RIPARIAN ECOLOGY, 3 Credits

Ecology of riparian freshwater and estuarine wetlands of the Pacific Northwest. Effects of land use on ecosystem structure, function, biodiversity, and restoration will be explored.
Recommended: BI 370 or BI 371
Available via Ecampus

FW 581, WILDLIFE ECOLOGY, 3 Credits

Interrelationships of wildlife, environment and humans. Evaluation of properties and habitats of wildlife populations.
Recommended: BI 370 or FW 321
Available via Ecampus

FW 583, SPECIES RECOVERY PLANNING AND RESTORATION, 3 Credits

The importance of communication in science is stressed and a broad knowledge of endangered species-related information is provided. Students develop the ability to critically evaluate published information in scientific literature and to present and summarize it as part of the collaborative species recovery planning process with a varied audience of stakeholders.
Recommended: FW 563 and FW 573
Available via Ecampus

FW 591, FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE, 3 Credits

Introduction to diseases of fish including pathogens important to aquaculture and ornamental industries as well as to wild fish populations and conservation programs. CROSSLISTED as FW 491/MB 491 and FW 591/MB 591.
Equivalent to: MB 591
Recommended: 9 credits of upper-division fisheries or biology

FW 597, AQUACULTURE, 3 Credits

Principles and practices for the aquaculture of fish, shellfish, and algae.
Recommended: 9 credits of upper-division biology.

FW 598, AQUACULTURE LABORATORY, 3 Credits

Biology and culture requirements of fish, shellfish, and algae. Emphasis on laboratory culture techniques and practical experience in handling organisms.
Recommended: 9 credits of upper-division biology.

FW 599, SPECIAL TOPICS IN FISHERIES AND WILDLIFE, 0-16 Credits

This course is repeatable for 99 credits.
Available via Ecampus

FW 601, RESEARCH, 1-16 Credits

This course is repeatable for 16 credits.

FW 603, THESIS, 1-16 Credits

This course is repeatable for 999 credits.
Available via Ecampus

FW 605, READING AND CONFERENCE, 1-16 Credits

This course is repeatable for 16 credits.

FW 606, PROJECTS, 1-16 Credits

This course is repeatable for 16 credits.

FW 607, SEMINAR, 1-16 Credits

This course is repeatable for 16 credits.

FW 620, ECOLOGICAL POLICY, 3 Credits

Policy issues associated with ecosystem management, risk assessment, biological diversity, ecosystem health, sustainability, invasive species, bioregionalism, globalization and transnational factors, and rights, ethics, and morals.
Recommended: Background in natural resources, environmental sciences, ecological sciences, ecological economics, political science, or similar discipline.
Available via Ecampus

FW 661, ANALYSIS OF ANIMAL POPULATIONS, 5 Credits

Quantitative methods for estimating parameters (abundance, survival, population stability) of animal populations. Emphasis is on vertebrate animals and statistical methods of hypothesis testing, parameter estimation, and inference testing.
Recommended: ST 511 and ST 512 or equivalent

FW 699, SPECIAL TOPICS IN FISHERIES AND WILDLIFE, 1-4 Credits

This course is repeatable for 8 credits.