

FISHERIES (FISH)

FISH F100 Skeleton Articulation as an Introduction to Marine Conservation Biology

2 Credits

Offered As Demand Warrants

Course designed for high school students.

Prerequisites: GPA of 2.5 or higher; offered to high school juniors and seniors with at least 1 biology and 1 math class completed.

Lecture + Lab + Other: 1 + 3 + 0

FISH F102 Fact or Fishin': Case Studies in Fisheries and Marine Sciences

1 Credit

Offered Fall

This seminar will promote active learning, critical thinking, and problem solving through a series of case studies involving current issues in fisheries and marine sciences conservation and management. Students enrolled in this course will also receive instruction on fundamental skills required to successfully complete a four-year degree at UAF.

Crosslisted with MSL F102.

Lecture + Lab + Other: 1.5 + 0 + 0

FISH F103 The Harvest of the Sea

2 Credits

Offered Spring

This course will explore the scientific and popular literature related to the exploitation of global marine fisheries resources. Specific topics of the course will be based on three core themes: (1) early exploitation of marine resources, leading to the need for fisheries management; (2) overexploitation of fish and marine mammal stocks driven largely by technological advancements culminating from the Industrial Revolution; and (3) the current status and future sustainability of marine fisheries resources. This course is largely discussion based; as a result, weekly attendance and preparation is a critical component of the course.

Prerequisites: FISH F102; FISH F110; placement in WRTG F111X.

Lecture + Lab + Other: 2 + 0 + 0

FISH F110 Fish and Fisheries in a Changing World

3 Credits

Offered Fall

This course is an exploration of the patterns of fish diversity, and the resilience and sustainability that results. The topics that we will cover are intended to act as foundational principles that fisheries resource professionals will use throughout their careers. Together we will examine the complexity of what constitutes a "fishery" and better understand the factors that have led some fisheries to collapse and others to persist. In addition to lectures, students will read, discuss and write extensively and by doing so, can expect to gain better understanding of the "science of sustainability" with regards to 21st century fisheries in Alaska and beyond.

Lecture + Lab + Other: 3 + 0 + 0

FISH F192 Seminar

1-6 Credits

Lecture + Lab + Other: 0 + 0 + 0

FISH F261 Introduction to Fisheries Utilization (a)

3 Credits

Offered Fall

Application of harvesting, processing, preservation and marketing of Alaska's rich fisheries resources. Core course requirement for all B.A. students completing a minor in fisheries and for B.S. fisheries students. Course is offered via videoconference.

Prerequisites: BIOL F103X or CHEM F100X.

Lecture + Lab + Other: 3 + 0 + 0

FISH F288 Fish and Fisheries of Alaska (a)

3 Credits

Offered Spring

This course will provide mid-level undergraduate students with an introduction to the biology and fisheries of Alaskan fish, shellfish and marine mammals, with important finfishes as the main focus of the course. First, we will examine important recreational, subsistence and commercial shellfish and finfish species. Next we will briefly cover fisheries economics and then turn our attention to lesser known freshwater and marine mammal fisheries in Alaska. The amount of coverage of each topic will vary depending on what is known about each group of organisms. Before enrolling students should have a basic understanding of biological and ecological concepts. This course is required of all fisheries students but should appeal to anyone interested in Alaska's fish and fisheries.

Prerequisites: FISH F110.

Lecture + Lab + Other: 3 + 0 + 0

FISH F290 Fisheries Internship (a)

1 Credit

Offered Fall, Spring and Summer

Under the supervision of a fisheries professional, students gain practical, professional experience through employment. Can be repeated up to four times, each for a different type of employment. The primary learning objectives for students are to gain professional experience in fisheries and refine career goals.

Prerequisites: Permission of the Fisheries Experiential Learning

Coordinator/instructor; a student internship agreement form turned into the Experiential Learning Coordinator.

Recommended: STAT F200X.

Lecture + Lab + Other: 0 + 0 + 1-4

FISH F292 Seminar

1-6 Credits

Lecture + Lab + Other: 0 + 0 + 0

FISH F315 Freshwater Fisheries Techniques

3 Credits

Offered Summer Even-numbered Years

Introduction to laboratory and field sampling methods in aquaculture, limnology, and fisheries biology. Emphasis will be placed on the proper care and use of laboratory equipment and field sampling gears, as well as the development of sampling protocols for collecting representative, non-biased fisheries and aquatic sciences data.

Prerequisites: FISH F110; FISH F288; STAT F200X.

Lecture + Lab + Other: 2 + 3 + 0

FISH F320 Salmon, People and Place (a)

3 Credits

Offered Spring

An examination of the deep ties between salmon and Indigenous peoples' food security, subsistence traditions and ways of life; contemporary Western society connections to salmon, including governance structures, recreational and commercial fishing, and global economies; case studies of pressing challenges facing salmon-dependent communities.

Prerequisites: ANTH F100X, FISH F110, WRTG F111X, or FISH F288.

Lecture + Lab + Other: 3 + 0 + 0

FISH F336 Introduction to Aquaculture (a)

3 Credits

Offered Spring Odd-numbered Years

Contribution of Alaska's aquaculture industries including salmon ocean ranching, shellfish and kelp mariculture, contribute to the world's increasingly important aquaculture production. Survey of worldwide production, introduction to production systems, and familiarization with Alaska systems. Team taught by SFOS specialists and featuring invited lecturers, laboratory demonstrations and field trips.

Prerequisites: BIOL F115X.

Special Notes: This course is taught in Juneau.

Lecture + Lab + Other: 3 + 0 + 0

FISH F340 Seafood Business

3 Credits

Offered Fall

Development and management of a successful seafood business from inception to operation. Practical application of business planning, obtaining financing, accounting, permitting, feasibility analysis, marketing, human resource management, and operational aspects of seafood harvesting and processing using case studies and guest lecturers from seafood industry.

Prerequisites: FISH F261.

Lecture + Lab + Other: 3 + 0 + 0

FISH F411 Human Dimensions of Environmental Systems

3 Credits

Offered Fall

Study of human-environment relationships and applications to resource management. Draws on a range of social scientific approaches to the study of environmental systems, including: environmental anthropology, environmental history, historical ecology, political ecology, ethnoecology, property theory, and environmental justice.

Prerequisites: COJO F131X or COJO F141X; WRTG F211X, WRTG F212X, WRTG F213X or WRTG F214X; F200-level course in cultural anthropology, human geography, sociology, or political science.

Stacked with FISH F611.

Lecture + Lab + Other: 3 + 0 + 0

FISH F412 Human-environment Research Methods

3 Credits

Offered Fall Odd-numbered Years

Basic overview of qualitative and quantitative social science methods for studying human-environment relationships. Introduction to research ethics, research design, data collection, data analysis and data reporting. Methods and data analysis techniques include interviews, text analysis, surveys, scales, cognitive anthropology and ethnoecology, social networks, behavioral observation and visual methods. Provides hands-on training in data collection and data analysis software.

Prerequisites: COJO F131X or COJO F141X; WRTG F211X, WRTG F212X, WRTG F213X or WRTG F214X; upper level standing.

Cross-listed with ANTH F412.

Stacked with FISH F613.

Lecture + Lab + Other: 3 + 0 + 0

FISH F413 Marine and Freshwater Conservation Biology

4 Credits

Offered Fall Odd-numbered Years

Conservation biology is an applied science that draws from multiple disciplines to address biodiversity loss, maintenance and restoration of threatened populations and habitats. This course will examine the theory and practice of conservation biology in aquatic ecosystems across genetic, population, community and landscape scales. Using case studies, students will examine causes and consequences of biodiversity loss, extinction risk and endangered species management and the human dimensions of conservation in the U.S. and worldwide.

Prerequisites: junior or senior standing; a F200-level course in biological sciences or fisheries.

Stacked with FISH F612.

Lecture + Lab + Other: 4 + 0 + 0

FISH F414 Field Methods in Marine Ecology and Fisheries

3 Credits

Offered Summer Odd-numbered Years

A hands-on introduction to the methods used to study ecological patterns and processes in the marine environment. Class will consist of a series of group field exercises conducted in local marine habitats. These exercises will emphasize a variety of sampling methods for documenting patterns of distribution and abundance, experimental designs for testing hypotheses and statistical interpretation of results. These skills are fundamental to most basic and applied research in marine ecology and fisheries. Thus this course provides an essential foundation for a professional career in these areas.

Prerequisites: FISH F101; BIOL F371.

Lecture + Lab + Other: 13.3 + 20 + 0

FISH F421 Fisheries Population Dynamics

4 Credits

Offered Fall Odd-numbered Years

This course introduces basic ecological and fisheries stock assessment models. Through lectures, assignments and weekly computer lab, it provides a conceptual understanding of population dynamics relevant to fisheries and practice manipulating equations.

Prerequisites: STAT F200X.

Lecture + Lab + Other: 4 + 0 + 0

FISH F425 Fish Ecology

3 Credits

Offered Fall Odd-numbered Years

This course is an exploration of how fish interact with and adapt to, their physical and biological environment, taught through the viewpoint that habitat diversity acts as a template for biological diversity within and among species. We will examine the ecology of major freshwater and marine habitats (with an emphasis on the former), as well as the potential threats to these habitats from human activity.

Prerequisites: FISH F110; BIOL F371.**Stacked with** FISH F650.**Lecture + Lab + Other:** 3 + 0 + 0**FISH F426 Behavioral Ecology of Fishes**

3 Credits

Offered Spring Even-numbered Years

This course will provide upper-level undergraduate and graduate students with an advanced understanding of behavioral responses and adaptations of fishes in both freshwater and marine systems to natural and anthropogenic environmental variables. It provides students an option to fulfill upper-level undergraduate and graduate required and elective course work. Before enrolling, students should have a sound understanding of both ecological and biological concepts relating to fishes.

Prerequisites: BIOL F371 or FISH F427.**Recommended:** FISH F425.**Stacked with** FISH F626.**Lecture + Lab + Other:** 3 + 0 + 0**FISH F427 Ichthyology (n)**

4 Credits

Offered Fall and Spring

Major groups of fishes, emphasizing fishes of northwestern North America. Classification structure, evolution, general biology and importance to man.

Prerequisites: BIOL F116X.**Cross-listed with** BIOL F427.**Lecture + Lab + Other:** 3 + 3 + 0**FISH F428 Physiological Ecology of Fishes**

3 Credits

Offered Spring Odd-numbered Years

This course will provide upper-level undergraduate and graduate students with an advanced understanding of physiological responses and adaptations of fishes in both freshwater and marine systems to natural and anthropogenic environmental variables. It provides students an option to fulfill upper-level undergraduate and graduate level requirements and elective coursework. Before enrolling, students should have a sound understanding of both ecological and biological concepts relating to fish.

Prerequisites: BIOL F310, FISH F427 or BIOL F427.**Stacked with** FISH F628.**Lecture + Lab + Other:** 3 + 0 + 0**FISH F433 Pacific Salmon Life Histories**

3 Credits

Offered Spring Even-numbered Years

This course provides an introduction to the life histories of Pacific salmon. We will explore variation in life history traits within and among species, as well as within and among populations, at each stage of the salmon life cycle. Life histories will be understood in evolutionary and ecological contexts. We will also discuss management and conservation of Pacific salmonid species throughout their range, but with focus on Alaska. This course is taught in Juneau.

Prerequisites: BIOL F115X; BIOL F116X.**Stacked with** FISH F633.**Lecture + Lab + Other:** 3 + 0 + 0**FISH F435 Data Visualization in Fisheries (a)**

2 Credits

Offered Spring

Fundamental methods for presenting fisheries data visually, including figures, tables and visual abstracts. Focus will be on effective design and the preparation of publication-ready figures and tables. Student activities will include critiquing figures and tables published in fisheries literature as well as creating their own from existing datasets.

Prerequisites: STAT F200X.**Stacked with** FISH F635.**Lecture + Lab + Other:** 2 + 0 + 0**FISH F443 Fisheries Oceanography**

4 Credits

Offered Fall Odd-numbered Years

Oceanography of marine processes affecting vertebrates and invertebrates. Interactions between fisheries resources and physical and biological oceanography, and climatological and meteorological conditions that support sustainable management. Topics include recruitment, transport, mortality, feeding, distribution, abundance, El Nino/La Nina, regime shifts, and climate change. Global to local scales. Worldwide ecosystems and examples.

Prerequisites: FISH F110 or FISH F288; STAT F200X, MSL F111X, or CHEM F105X; PHYS F123X.**Cross-listed with** MSL F443.**Stacked with** MSL F643, FISH F643.**Lecture + Lab + Other:** 4 + 0 + 0**FISH F446 Freshwater Habitat Dynamics**

3 Credits

Offered Fall Even-numbered Years

Theoretical background of habitat dynamics in freshwaters with a focus on the response of biota and practical application of current sampling methods.

Prerequisites: FISH F110, BIOL F371.**Cross-listed with** BIOL F446.**Stacked with** FISH F646, BIOL F646.**Lecture + Lab + Other:** 3 + 0 + 0

FISH F487 Fisheries Management (O, W, n)

3 Credits

Offered Spring

Theory and practice of fisheries management, including strategies utilized for the management of freshwater and marine fisheries. Application of quantitative methodologies for the assessment and manipulation of aquatic habitats, fish populations and human resource users are considered, as is the setting of appropriate goals and objectives for science-based management.

Prerequisites: COJO F131X or COJO F141X; FISH F288; STAT F200X.**Stacked with** FISH F687.**Lecture + Lab + Other:** 3 + 0 + 0**FISH F490 Experiential Learning: Fisheries and Marine Sciences Internship**

1 Credit

Offered Fall, Spring and Summer

Under the supervision of a faculty member and a fisheries or marine sciences professional, upper-division students gain professional experience through employment. Requirements are decided prior to enrollment based on a 3-way agreement between the employer, student, and faculty member, which contains learning objectives that reflect upper-division credit. Can be repeated up to 4 times, each for a different type of employment.

Prerequisites: Junior or senior standing plus permission of Faculty Sponsor and the Fisheries Experiential Learning Coordinator/instructor (the Coordinator can be a sponsor as well); signing of a student internship agreement form that contains learning objectives for the internship that reflects upper-division internship credit.

Recommended: FISH F315; STAT F200X; STAT F401.**Lecture + Lab + Other:** 0 + 0 + 1-4**FISH F492 Seminar**

1-6 Credits

Lecture + Lab + Other: 0 + 0 + 0**FISH F492P Seminar**

1-6 Credits

Lecture + Lab + Other: 1-6 + 0 + 0**FISH F498 Senior Thesis Proposal**

1-3 Credits

Students will complete the first part of a year-long, self-designed scholarly project that is the capstone of a student's exemplary academic performance. For this component of senior thesis, the student will develop a proposal that will reflect a thorough understanding of the existing literature, study objectives and testable hypotheses, the methodology by which data will be collected through field and/or laboratory research, including data analyses, and a timeline by which the senior thesis will be completed. The student should also complete the collection of field and/or laboratory data and begin data analysis.

Prerequisites: Fisheries major with senior standing; a GPA of 3.2 or higher and permission of a Fisheries Division faculty mentor and the SFOS Internship Coordinator (the coordinator may also be a mentor); STAT F200X and ENGL F414.

Recommended: FISH F315; STAT F401 or STAT F402.**Lecture + Lab + Other:** 0 + 0 + 0**FISH F499 Fisheries Senior Thesis**

2-4 Credits

Students will complete the second part of a year-long, self-designed scholarly project that is the capstone of a student's exemplary academic performance. For this component of senior thesis, the student will complete analysis of field and/or laboratory data collected during FISH F498 and develop a research paper/manuscript that will interpret the study results and cast them within the context of the existing literature relevant to the study topic. Students will be expected to work with their senior thesis mentor to submit the manuscript for peer review to a scientific journal and will be required to present their study results as an oral or poster presentation.

Prerequisites: Fisheries major with senior standing; with a GPA of 3.2 or higher; and permission of a Fisheries Division faculty mentor and the SFOS Internship Coordinator (the coordinator may also be a mentor); FISH F498.

Recommended: FISH F315; STAT F401; STAT F402.**Lecture + Lab + Other:** 0 + 0 + 2-4**FISH F604 Modern Applied Statistics for Fisheries**

4 Credits

Offered Fall Odd-numbered Years

Covers general statistical approaches to quantitative problems in marine science and fisheries with guidance on how to collect and organize data, how to select appropriate statistical methods and how to communicate results. A variety of advanced statistical methods for analyzing environmental data sets will be illustrated in theory and practice.

Prerequisites: STAT F200X; STAT F401; proficiency in computing with R.**Cross-listed with** MSL F604.**Lecture + Lab + Other:** 3 + 3 + 0**FISH F605 Communicating Science to the Public**

2 Credits

Offered Spring Odd-numbered Years

In this course, students will gain practical skills in communicating their research to peers and public audiences. Short lectures, readings and discussion will focus on communication issues in environmental science and management and best practices for good oral and written communication. Throughout the semester, students will engage with professionals in science journalism, education and resource management. Students will gain direct experience in communicating science to public audiences through a group outreach event they will co-organize at the culmination of the course.

Prerequisites: Graduate standing in the sciences.**Lecture + Lab + Other:** 2 + 0 + 0**FISH F611 Human Dimensions of Environmental Systems**

3 Credits

Offered Fall

Study of human-environment relationships and applications to resource management. Draws on a range of social scientific approaches to the study of environmental systems, including: environmental anthropology, environmental history, historical ecology, political ecology, ethnoecology, property theory, and environmental justice.

Prerequisites: Graduate standing.**Stacked with** FISH F411.**Lecture + Lab + Other:** 3 + 0 + 0

FISH F612 Marine and Freshwater Conservation Biology

4 Credits

Offered Fall Odd-numbered Years

Conservation biology is an applied science that draws from multiple disciplines to address biodiversity loss, maintenance and restoration of threatened populations and habitats. This course will examine the theory and practice of conservation biology in aquatic ecosystems across genetic, population, community and landscape scales. Using case studies, students will examine causes and consequences of biodiversity loss, extinction risk and endangered species management and the human dimensions of conservation in the U.S. and worldwide.

Prerequisites: graduate standing.**Stacked with** FISH F413.**Lecture + Lab + Other:** 4 + 0 + 0**FISH F613 Human-environment Research Methods**

3 Credits

Offered Fall Odd-numbered Years

Basic overview of qualitative and quantitative social science methods for studying human-environment relationships. Introduction to research ethics, research design, data collection, data analysis and data reporting. Methods and data analysis techniques include interviews, text analysis, surveys, scales, cognitive anthropology and ethnoecology, social networks, behavioral observation and visual methods. Provides hands-on training in data collection and data analysis software.

Prerequisites: Graduate standing.**Stacked with** FISH F412 and ANTH F412.**Lecture + Lab + Other:** 3 + 0 + 0**FISH F621 Estimation of Fish Abundance**

3 Credits

Offered Fall Even-numbered Years

Estimation of abundance of fish and other aquatic populations, using mark-recapture, line-transect, catch-effort and change-in-ratio techniques. Computer lab work and homework from actual and simulated populations.

Prerequisites: MATH F252X; STAT F401; familiarity with PCs including word processing and spreadsheets.**Recommended:** FISH F421; MATH F302; MATH F314.**Lecture + Lab + Other:** 2 + 2.5 + 0**FISH F622 Quantitative Fish Population Dynamics**

3 Credits

Offered Spring Odd-numbered Years This course is taught in Juneau. Modeling fish population mortality, recruitment individual growth and fecundity. Models and assessment techniques for age- and length-structured populations. Biological reference points and management strategies derived from population and harvesting parameters. Computer lab work and homework with data from actual and simulated populations.

Prerequisites: MATH F252X; STAT F401; Familiarity with PCs including word processing and spreadsheets.**Recommended:** FISH F421; MATH F302; MATH F314.**Lecture + Lab + Other:** 2 + 2.5 + 0**FISH F625 Population Dynamics of Vertebrates**

3 Credits

Offered Spring Odd-numbered Years This course is taught in Juneau.

Sampling vertebrate populations, modeling their population dynamics and the implications for management. Focus will be on study design, model assumptions, estimation of population parameters and inference. State-of-the-art computer applications will be employed in laboratory exercises of actual and simulated data.

Prerequisites: BIOL F371; STAT F401.**Cross-listed with** WLF F625.**Lecture + Lab + Other:** 2 + 3 + 0**FISH F626 Behavioral Ecology of Fishes**

3 Credits

Offered Spring Even-numbered Years

This course will provide upper-level undergraduate and graduate students with an advanced understanding of behavioral responses and adaptations of fishes in both freshwater and marine systems to natural and anthropogenic environmental variables. It provides students an option to fulfill upper-level undergraduate and graduate required and elective course work. Before enrolling, students should have a sound understanding of both ecological and biological concepts relating to fishes.

Prerequisites: BIOL F371 or FISH F427.**Recommended:** FISH F425.**Stacked with** FISH F426.**Lecture + Lab + Other:** 3 + 0 + 0**FISH F627 Statistical Computing with R**

2 Credits

Offered Fall

Using the free, open-source software R to teach computing, programming, and modeling concepts for the statistical computing of fisheries and biological data. Prepares students for other graduate-level, quantitative fisheries courses and covers exploratory statistical and graphical analyses, as well as computer-intensive methods such as bootstrapping and randomization tests.

Prerequisites: STAT F200X, STAT F401, and proficiency with Excel.**Cross-listed with** MSL F627.**Lecture + Lab + Other:** 1 + 3 + 0**FISH F628 Physiological Ecology of Fishes**

3 Credits

Offered Spring Odd-numbered Years

This course will provide upper-level undergraduate and graduate students with an advanced understanding of physiological responses and adaptations of fishes in both freshwater and marine systems to natural and anthropogenic environmental variables. It should provide students with another option to fulfill upper-level undergraduate and graduate level elective course work. Before enrolling, students should have a sound understanding of both ecological and biological concepts relating to fish.

Prerequisites: BIOL F310, FISH F427 or BIOL F427; graduate standing.**Lecture + Lab + Other:** 3 + 0 + 0**FISH F630 Natural Resource Modeling**

2 Credits

Offered Spring Odd-numbered Years

A hands-on introduction to the techniques and issues involved in modeling natural resources. Students will complete an individual modeling project related to each student's graduate research.

Prerequisites: FISH F421 and STAT F401.**Special Notes:** This course is taught in Juneau.**Lecture + Lab + Other:** 1 + 3 + 0

FISH F631 Data Analysis in Community Ecology

3 Credits

Offered Spring Odd-numbered Years

This course will provide an overview of statistical methods that have been specifically developed to aid our understanding and interpretation of the structure, abundance, and distribution of species and communities in relation to resources and the environment.

Prerequisites: STAT F200X; STAT F401; FISH F627 (Statistical Computing with R) or familiarity with R, general ecology, graduate standing in fisheries.

Cross-listed with MSL F631.

Lecture + Lab + Other: 3 + 0 + 0

FISH F633 Pacific Salmon Life Histories

3 Credits

Offered Spring Even-numbered Years

This course provides an introduction to the life histories of Pacific salmon. We will explore variation in life history traits within and among species, as well as within and among populations, at each stage of the salmon life cycle. Life histories will be understood in evolutionary and ecological contexts. We will also discuss management and conservation of Pacific salmonid species throughout their range, but with focus on Alaska. This course is taught in Juneau.

Prerequisites: BIOL F115X; BIOL F116X.

Stacked with FISH F433.

Lecture + Lab + Other: 3 + 0 + 0

FISH F635 Data Visualization in Fisheries (a)

2 Credits

Offered Spring

Fundamental methods for presenting fisheries data visually, including figures, tables and visual abstracts. Focus will be on effective design and the preparation of publication-ready figures and tables. Student activities will include critiquing figures and tables published in fisheries literature as well as creating their own from existing datasets.

Prerequisites: STAT F401.

Stacked with FISH F435.

Lecture + Lab + Other: 2 + 0 + 0

FISH F640 Management of Renewable Marine Resources

3 Credits

Offered Fall Even-numbered Years

Principles of fisheries management, along with case studies of successes and failures. Topics include management objectives, relationships of fished species to their environment, fishing methods, human dimensions, fishery data acquisition, harvest strategies, ecosystem effects of fishing, aquaculture and alternative management strategies, including ecosystem-based fishery management.

Prerequisites: FISH F427.

Recommended: FISH F487.

Lecture + Lab + Other: 3 + 0 + 0

FISH F641 Ecosystem-based Fisheries Management

2 Credits

Offered Spring Odd-numbered Years

This course examines the theory and practice of ecosystem-based fisheries management (EBFM). Topics include legal frameworks, principles, governance, approaches, scientific basis, management implementation and outcomes of EBFM. Emphasis is placed on Alaska with other illustrative examples from around the world.

Prerequisites: FISH F487; or FISH F640; or graduate standing.

Lecture + Lab + Other: 2 + 0 + 0

FISH F642 Bayesian Decision Theory for Resource Management

4 Credits

Offered Spring Even-numbered Years

Application of decision theory to problems in natural resources management. Students will learn to perform Bayesian calculations and uncomplicated decision analysis themselves.

Prerequisites: FISH F621 or FISH F630.

Cross-listed with STAT F642.

Lecture + Lab + Other: 2 + 2 + 0

FISH F643 Fisheries Oceanography

4 Credits

Offered Fall Odd-numbered Years

Oceanography of marine processes affecting vertebrates and invertebrates. Interactions between fisheries resources and physical and biological oceanography, and climatological and meteorological conditions that support sustainable management. Topics include recruitment, transport, mortality, feeding, distribution, abundance, El Nino/La Nina, regime shifts, and climate change. Global to local scales. Worldwide ecosystems and examples.

Prerequisites: Graduate standing.

Cross-listed with MSL F643.

Stacked with MSL F443, FISH F443.

Lecture + Lab + Other: 4 + 0 + 0

FISH F645 Bioeconomic Modeling and Fisheries Management

3 Credits

Offered Spring Odd-numbered Years

An introduction to analytic and computational models of discrete-time representations of bioeconomic systems, including comparative static and optimal control approaches to optimizing unitary and multiple criteria subject to deterministic and stochastic dynamic processes. Particular attention is given to bioeconomic models of optimal management of exploited populations of fish and shellfish.

Prerequisites: STAT F401; MATH F230X or MATH F251X; graduate standing.

Lecture + Lab + Other: 3 + 0 + 0

FISH F646 Freshwater Habitat Dynamics

3 Credits

Offered Fall Even-numbered Years

Theoretical background of habitat dynamics in freshwaters with a focus on the response of biota and practical application of current sampling methods.

Prerequisites: Graduate standing.

Cross-listed with BIOL F646.

Stacked with FISH F446, BIOL F446.

Lecture + Lab + Other: 3 + 0 + 0

FISH F650 Fish Ecology

3 Credits

Offered Fall Odd-numbered Years

This course is an exploration of how fish interact with and adapt to, their physical and biological environment, taught through the viewpoint that habitat diversity acts as a template for biological diversity within and among species. We will examine the ecology of major freshwater and marine habitats (with an emphasis on the former), as well as the potential threats to these habitats from human activity.

Prerequisites: Graduate standing.

Stacked with FISH F425.

Lecture + Lab + Other: 3 + 0 + 0

FISH F651 Fishery Genetics

4 Credits

Offered Fall

Application of genetics to fisheries. Focus on Alaska fisheries including introduction to the theory of electrophoresis, stock separation, population genetics and quantitative genetics.

Special Notes: This course is taught in Juneau.

Lecture + Lab + Other: 4 + 0 + 0

FISH F653 Zooplankton Ecology

3 Credits

Offered Fall Even-numbered Years

Survey of marine zooplankton including processes and variables which influence their production and dynamics. Emphasis on the northeast Pacific and Arctic Ocean zooplankton communities. Field and lab methods for sampling include fixing, preserving, subsampling, identifying and quantifying zooplankton collections. Laboratory techniques for culture of zooplankton include physiological measurements of bioenergetic parameters. Course is offered outside of Fairbanks by video conference.

Prerequisites: MSL F650.

Cross-listed with MSL F653.

Lecture + Lab + Other: 3 + 0 + 0

FISH F654 Benthic Ecology

3 Credits

Offered Fall Even-numbered Years

Ecology of marine benthos, from subtidal to hadal zone. Methods of collecting, sorting, narcotizing, preserving and analyzing benthic assemblages, including video analytical techniques from submersibles and ROVs. Hydrothermal vent and cold seep assemblages. Physiology/energetics of benthic organisms, including animal-sediment relationships, feeding, reproduction and growth. Depth, spatial and latitudinal distribution patterns.

Prerequisites: Invertebrate zoology course, marine biology course.

Cross-listed with MSL F654.

Special Notes: This course is taught in Juneau and Fairbanks.

Lecture + Lab + Other: 3 + 0 + 0

FISH F665 Aquatic Entomology

2 Credits

Offered Fall Odd-numbered Years

Aquatic invertebrate taxonomy, mostly to the family level, and ecology. Includes field trips to learn collecting techniques and habitats.

Prerequisites: Graduate standing; Students must be able to safely wade in streams and wetlands.

Cross-listed with BIOL F665.

Lecture + Lab + Other: 1 + 3 + 0

FISH F670 Quantitative Analysis for Marine Policy Decisions

3 Credits

Offered Spring Even-numbered Years

An introduction to the practical application of mathematical programming, operations research, simulation, cost-benefit analysis, cost effectiveness analysis, regional impact assessment, economic valuation, risk analysis, adaptive management and other decision theoretic tools in preparation of regulatory documents required for the management of living marine resources and for assessment of environmental damages.

Prerequisites: STAT F401; MATH F230X or MATH F251X; graduate standing.

Lecture + Lab + Other: 3 + 0 + 0

FISH F672 Law and Fisheries

2 Credits

Offered Fall Even-numbered Years

This course introduces students to the key Federal, State and International laws that govern fisheries in Alaska state waters and in the US Exclusive Economic Zone off Alaska. In addition, the course introduces students to seminal court rulings that have helped shape those laws.

Prerequisites: graduate standing.

Lecture + Lab + Other: 2 + 0 + 0

FISH F674 Economic Development for Fish-dependent Communities

3 Credits

Offered Spring Even-numbered Years

This course provides an introduction to the economic organization of fishery-dependent communities in Alaska, tools for characterizing community-scale economies, principles of economic development, methods of measuring regional economic impacts of changes in access to fisheries, and a review of policies intended to support the continuity and development of Alaskan communities dependent on commercial fisheries.

Prerequisites: STAT F401 or ECON F227.

Lecture + Lab + Other: 3 + 0 + 0

FISH F675 Political Ecology

3 Credits

Offered Fall Even-numbered Years

Introduction to the field of political ecology. Topics include the sociology of scientific knowledge, traditional and local ecological knowledge, politics of resource management, processes of enclosure and privatization, environmental values, conservation, environmental justice, and colonialism and economic development.

Prerequisites: Graduate standing.

Cross-listed with ANTH F675.

Lecture + Lab + Other: 3 + 0 + 0

FISH F676 Aquatic Food Web Ecology

3 Credits

Offered Fall Even-numbered Years

This course will examine theoretical and applied aspects of aquatic food web ecology, from the ecological processes that give rise to patterns in aquatic communities to the incorporation of trophic interactions into ecosystem-based management. Lectures and discussion will focus on ecological theory and case studies. Lab exercises will introduce empirical and modeling approaches for studying food web interactions. Proficiency with Excel and basic statistics is preferred.

Prerequisites: FISH F425.

Cross-listed with MSL F676.

Lecture + Lab + Other: 2 + 3 + 0

FISH F677 Scientific Writing Techniques

3 Credits

Students learn to write scientifically with skill and clarity by practicing using easy-to-follow writing techniques to write and rewrite a draft manuscript. Topics include writing approaches, storytelling, outlines, style, grammar, punctuation, and editorial review. Most beneficial for graduate students writing theses, but provides excellent writing experience for new students.

Prerequisites: Graduate Standing.

Cross-listed with MSL F677.

Lecture + Lab + Other: 3 + 0 + 0

FISH F681 The North Pacific Fishery Management Council: A Case Study

2 Credits

Offered Summer

This two-week intensive course provides immersion into the scientific and policy basis for fisheries management in Alaska. Students receive two days of classroom instruction, review current management issues and witness the decision-making process by attending a North Pacific Fishery Management Council Meeting. Learning is enhanced by discussions with diverse stakeholders and field trips.

Prerequisites: Permission of instructor.

Lecture + Lab + Other: 1 + 0 + 1

FISH F682 Field Course in Salmon Management

4 Credits

Offered Summer Odd-numbered Years

A hands-on study of salmon management, with participation of harvesters, processors, managers and scientists. Students will track the return of salmon to Bristol Bay and estimate the total return as the runs develop. Consists of a combination of lectures, computer laboratories and field experience in data collection.

Prerequisites: Permission of instructor.

Lecture + Lab + Other: 3 + 3 + 0

FISH F687 Fisheries Management (O, W, n)

3 Credits

Offered Spring

Theory and practice of fisheries management, including strategies utilized for the management of freshwater and marine fisheries. Application of quantitative methodologies for the assessment and manipulation of aquatic habitats, fish populations and human resource users are considered, as is the setting of appropriate goals and objectives for science-based management.

Prerequisites: graduate standing.

Stacked with FISH F487.

Lecture + Lab + Other: 3 + 0 + 0

FISH F692 Seminar

0.5-6 Credits

Lecture + Lab + Other: 0 + 0 + 0

FISH F692A Seminar

1-6 Credits

Lecture + Lab + Other: 0 + 0 + 0

FISH F692P Seminar

1-6 Credits

Lecture + Lab + Other: 1-6 + 0 + 0

FISH F698 Non-thesis Research/Project

1-9 Credits

Lecture + Lab + Other: 0 + 0 + 0

FISH F699 Thesis

1-12 Credits

Lecture + Lab + Other: 0 + 0 + 0