Fall 2020 Course Descriptions as of 04/05/2020 08:14 PM

Information in Browse Course Catalog is subject to change. Information is term specific. Please refer to the appropriate term when searching for course content. Key to Course Descriptions may be found at: **http://rcs.registrar.arizona.edu/course_descriptions_key**.

Wildlife & Fisheries Science (WFSC)

WFSC 193: Internship (1 - 8 units)
Description: Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 199: Independent Study (1 - 3 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 199H: Honors Independent Study (1 - 3 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

Enrollment requirement: Student must be active in the Honors College.
Honors Course: Honors Course
Honors Course: Honors Course

-SA represents a Student Abroad & Student Exchange offering
-CC represents a Correspondence Course offering
May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

WFSC 223: Dealing With Data in the Wild (3 units)
Description: Do you want to live permanently on Antarctica? Now is your chance, apply for Mission Antarctica! The ice is melting, the penguins are marching; it seems like a perfect time to settle, but many challenges await. Data can help you live and thrive in this changing environment and not be eaten by a leopard seal. However, most of us do not know how to organize, analyze, and translate real-life data into decisions. In this class, we undergo a series of scenarios to teach you how to use data to design and evaluate if we are making a difference in our new society. These scenarios include case studies related to disease, food security, conservation, sustainability, and nutrition. Through a combination of lectures, hands-on problem solving, and collaboration, this course teaches introductory data literacy skills such as data management, analytics, and visualization useful for decision making and your careers. No programming experience is required and students are encouraged to have in class laptops for in-class activities and assignments. All readings and supplemental material are open source, or free to students. Most importantly, no penguins will be harmed in this adventure, we promise.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Spring

Field trip: None

WFSC 293: Internship (1 - 8 units)
Description: Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 299: Independent Study (1 - 5 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

-SA represents a Student Abroad & Student Exchange offering
-CC represents a Correspondence Course offering
May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

WFSC 299H: Honors Independent Study (1 - 3 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

Enrollment requirement: Student must be active in the Honors College.
Honors Course: Honors Course
Honors Course: Honors Course

WFSC 385: Zoo and Aquarium Conservation (3 units)
Description: Contemporary conservation often involves ex situ (outside of natural environments) efforts in zoo and aquarium facilities to provide opportunities for species to persist until challenges in the wild are remedied. This course will focus on current topics in zoo and aquarium conservation and management. Subjects covered include captive breeding and releases, the role of education in zoos, enclosure habitat enhancement, animal behavior, handling and monitoring techniques, and other topics that are important in the conservation of captive wild animals.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Fall

WFSC 393: Internship (1 - 8 units)
Description: Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 399: Independent Study (1 - 3 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 399H: Honors Independent Study (1 - 3 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

Enrollment requirement: Student must be active in the Honors College.
Honors Course: Honors Course
Honors Course: Honors Course

WFSC 405: Aquatic Entomology (4 units)
Description: Morphological, physiological and behavioral adaptations of insects to life in water; taxonomy and ecology of aquatic insects.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Laboratory Required
Lecture Required
Equivalent to: ECOL 405, WFSC 405
Also offered as: ECOL 405, ENTO 405
Course typically offered:
Main Campus: Spring

Recommendations and additional information: ECOL 182R and ECOL 182L.
Field trip: Field trip.
Home department: Entomology

WFSC 430: Conservation Genetics (3 units)
Description: Basic methods and theories of genetic/genomic analyses together with the application of these analyses to promote conservation, proper management, and long term survival of free-ranging species, including the exploration of current conservation genetic/genomic literature.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture — Required
Seminar — May Be Offered
Also offered as: ECOL 430, GENE 430
Co-convened with: WFSC 530
Course typically offered:
Main Campus: Fall

Recommendations and additional information: ECOL 320, PLS 312, basic genetics class, or consent of instructor.

WFSC 430L: Conservation Genetics Lab (1 unit)
Description: This course is offered to meet the needs of students wanting to work in conservation genetics and to provide a genetic prospective to students working in other areas of conservation biology. The two primary goals of the class are to give students first-hand experience in a conservation genetics lab and to publish a research paper as a class. This is a laboratory based course with an emphasis on producing useful conservation related data and subsequently publishing our results. The class will be structured to mirror the steps involved in taking a research project from an idea all the way through to publication. Emphasis will be primarily on the lab work, data analyses, and writing and review process, though grant writing and sample collection will be introduced.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Laboratory — Required
Also offered as: GENE 430L
Co-convened with: WFSC 530L
Course typically offered:
Main Campus: Fall

Enrollment requirement: Concurrent enrollment in WFSC/GENE/ECOL 430 required.

WFSC 431A: Traditional Ecological Knowledge (3 units)
Description: An introduction to the growing literature on traditional ecological knowledge and its relationships to the ecological and social sciences.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Also offered as: AIS 431A, ANTH 431A, ENVS 431A, GEOG 431A, RAM 431A, RNR 431A, WSM 431A
Co-convened with: WFSC 531A
Course typically offered:
Main Campus: Fall

Home department: American Indian Studies Committee

WFSC 441A: Natural Resource Management in Native Communities (3 units)
Description: This course is a survey of basic issues and concepts in natural resource management and the environment in Native communities using integrated case studies that survey all the major varieties of environmental issues in Indian Country in the 21st century. A central theme will be developing tribally-specific solutions to rebuilding the resiliency of degraded ecosystems. We will consider particular case studies such as: tribal sovereignty, land tenure, reserved rights and Native claims; Native knowledge systems and Western science; co-management and restoration; water; fish and wildlife; agriculture and rangeland management; energy, mining and nuclear waste; and global climate change.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Equivalent to: ANTH 441A, ARL 441A, RAM 441A, RNR 441A, SWES 441A, WFSC 441A, WSM 441A
Also offered as: AIS 441A, ANTH 441A, ARL 441A, ENVS 441A, RAM 441A, RNR 441A, WSM 441A
Co-convened with: WFSC 541A
Course typically offered:
Main Campus: Fall, Spring

Home department: American Indian Studies Committee

WFSC 442: Limnology (4 units)
Description: Study of lakes and streams; biological characteristics, as related to physical, chemical, geological, and historical processes operating on fresh waters.
Grading basis: Regular Grades
Career: Undergraduate
Flat Fee: $23
Course Components: Laboratory — May Be Offered
Lecture — Required
Equivalent to: ECOL 441
Also offered as: ECOL 442, ENVS 442
Co-convened with:
Recommendations and additional information: Six units of biology, 3 units of chemistry and 3 units of ecology.
Home department: Environmental Science

WFSC 444: Wildlife Ecology, Conservation, and Management (4 units)
Description: WFSC 444 is a senior level course that introduces students to the ways in which society influences the distribution and abundance of animals and communities viewed as ecologically, economically or intrinsically valuable and presents the mathematical and analytical tools available to wildlife professionals whose purpose is to understand population dynamics and manipulate the human-wildlife interface towards specific goals. WFSC 444 is centered primarily on vertebrate (fish, birds, mammals, reptiles, amphibians) populations but also considers community and ecosystem perspectives. WFSC 444 explores socio-political perspectives, biological and ecological concepts, and mathematical underpinnings to population regulation and human-wildlife interactions.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Laboratory — May Be Offered
Lecture — Required
Co-convened with: WFSC 544
Course typically offered:
Main Campus: Fall

Recommendations and additional information: ECOL 182R, ECOL 182L, Calculus, Statistics.
Writing Emphasis: Writing Emphasis Course

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-CC represents a Correspondence Course offering
May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

WFSC 445: Population Ecology (3 units)
Description: Explore ecological and anthropogenic processes that influence the distribution, dynamics, and demographics of animal populations. Develop models useful for describing, conserving, and managing animal populations, while emphasizing the relationships between ecological processes and their influence on strategies for conservation and management.
Grading basis: Regular Grades
Career: Undergraduate
Flat Fee: $30
Course Components: Laboratory Required
Lecture Required
Co-convened with: WFSC 545
Course typically offered:
Main Campus: Spring

Recommendations and additional information: One course in Calculus and one course in Statistics. A graduate level statistics course is strongly recommended for graduate students.
Enrollment requirement: (RNR 316 or ECOL 302) and RNR 321 and WFSC 444.

WFSC 447: Wildlife Conservation Behavior (3 units)
Description: Conservation behavior is the application of knowledge of animal behavior to solve wildlife conservation problems. This course reviews basic principles of animal behavior in the context of applied problems in conservation and management of wildlife populations. Topics include behavior in human-impacted landscapes, antipredatory responses, use of space and habitat, demographic consequences of social and mating systems, mitigation of human disturbance, captive breeding and reintroduction programs, reserve design, and challenges of climate change.
Grading basis: Regular Grades
Career: Undergraduate
Flat Fee: $37
Course Components: Lecture Required
Co-convened with: WFSC 547
Course typically offered:
Main Campus: Spring (odd years only)

Recommendations and additional information: ECOL 182R and complete RNR 316 or equivalent.

WFSC 449: Diseases of Wildlife (3 units)
Description: Important diseases of wildlife. Immunity, disease mechanisms, infectious agents, diagnostic procedures, and post-mortem techniques as well as a survey of selected but generally well-recognized diseases of wildlife.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Equivalent to: ANS 449, WFSC 449
Also offered as: ACBS 449
Co-convened with:
Course typically offered:
Main Campus: Fall

Home department: School of Animal & Comparative Biomedical Sciences

WFSC 454: Water Harvesting (3 units)
Description: Course focuses on water harvesting principles and techniques at a variety of scales and settings. Students participate in hands-on implementation of water harvesting projects on the UA campus.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Equivalent to: ECOL 454, WFSC 454
Also offered as: ECOL 454, ENVS 454
Co-convened with: WFSC 554
Course typically offered:
Main Campus: Spring

Home department: Soil, Water, & Environmental Sciences
Honors Course: Honors Contract
Honors Course: Honors Contract
Student Engagement Activity: Discovery
Student Engagement Competency: Sustainability

WFSC 455L: Fishery Management Laboratory (1 unit)
Description: Field and laboratory methods pertaining to fishery investigations and management. Offered in spring of even years.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Laboratory Required
Co-convened with: WFSC 555L
Course typically offered:
Main Campus: Spring (even years only)

WFSC 455R: Fishery Management (3 units)
Description: Methods and concepts pertaining to fishery investigations and management; application of principles for enhancement of fisheries and aquatic habitats. Offered in spring of even years.
Grading basis: Regular Grades
Career: Undergraduate
Flat Fee: $17
Course Components: Lecture Required
Co-convened with: WFSC 555R
Course typically offered:
Main Campus: Spring (even years only)

Recommendations and additional information: WFSC 441.
Writing Emphasis: Writing Emphasis Course

WFSC 456: Aquaculture (3 units)
Description: Overview lectures and assigned readings on the theory and practice of aquaculture. Includes the culture of seaweeds, mollusks, crustaceans, and finfish.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Equivalent to: WFSC 456
Also offered as: ACBS 456
Co-convened with:
Course typically offered:
Main Campus: Spring

Recommendations and additional information: ECOL 181R, ECOL 182R, ECOL 182L, CHEM 103A, CHEM 103B, CHEM 104A, CHEM 104B.
Field trip: Field trips.
Home department: School of Animal & Comparative Biomedical Sciences

WFSC 471: Stream Ecology (3 units)
Description: This course will examine the structure and function of stream ecosystems with emphasis on the interaction of physical and biotic elements of streams in arid regions. We will examine the role of natural and anthropogenic stressors in shaping aquatic assemblages in streams. Quantification of impairment of stream structure and function requires a thorough understanding of fundamental ecological concepts of natural streams; this will be a major focus. Also, students will learn to use current methods to assess stream condition and signs of impairment.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Equivalent to: WFSC 471
Co-convened with: SWES 571
Course typically offered:
Main Campus: Fall

Recommendations and additional information: MCB 181R.

WFSC 474: Aquatic Plants and the Environment (4 units)
Description: The role of riparian areas, estuaries, and constructed wetlands in the environment. Emphasis on plants as wildlife habitat for nutrient cycling and bioremediation.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Equivalent to: ECOL 474, WFSC 474
Also offered as: ECOL 474, ENVS 474
Co-convened with: WFSC 574
Course typically offered:
Main Campus: Fall

Home department: Soil, Water, & Environmental Sciences

WFSC 493: Internship (1 - 8 units)
Description: Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 494R: Research (3 units)
Description: The practical application, on an individual basis, of previously studied theory and the collection of data for future theoretical interpretation.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 2 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

Recommendations and additional information: ENGL 101, ABE 120 and consent of instructor.

WFSC 496B: Wildlife & Fisheries Seminar (1 unit)
Description: Introduction to contemporary challenges in wildlife & fisheries science through presentations by and discussion with professionals and advanced graduate students.
Grading basis: Student Option ABCDE/PF
Career: Undergraduate
Course Components: Seminar Required
Repeatable: Course can be repeated a maximum of 4 times.
Co-convened with: WFSC 596B
Course typically offered:
Main Campus: Fall, Spring

WFSC 498: Senior Capstone (1 - 3 units)
Description: A culminating experience for majors involving a substantive project that demonstrates a synthesis of learning accumulated in the major, including broadly comprehensive knowledge of the discipline and its methodologies. Senior standing required.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 498H: Honors Thesis (3 units)
Description: An honors thesis is required of all the students graduating with honors. Students ordinarily sign up for this course as a two-semester sequence. The first semester the student performs research under the supervision of a faculty member; the second semester the student writes an honors thesis.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated for a maximum of 9 units.
Course typically offered:
Main Campus: Fall, Spring, Summer

Enrollment requirement: Student must be active in the Honors College.
Honors Course: Honors Course
Honors Course: Honors Course

WFSC 499: Independent Study (1 - 5 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 499H: Honors Independent Study (3 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

Enrollment requirement: Student must be active in the Honors College.
Honors Course: Honors Course
Honors Course: Honors Course

WFSC 505: Aquatic Entomology (4 units)
Description: Morphological, physiological and behavioral adaptations of insects to life in water; taxonomy and ecology of aquatic insects. Graduate-level requirements include an original research or review paper on some aspect of aquatic entomology agreed upon by the student and the professor.
Grading basis: Regular Grades
Career: Graduate
Course Components: Laboratory — Required
Lecture — Required
Equivalent to: ECOL 505, ENTO 505, INSC 505, WFSC 505
Also offered as: ECOL 505, EIS 505
Course typically offered:
Main Campus: Spring

Field trip: Field trip.
Home department: Committee on Entomology and Insect Science

WFSC 530: Conservation Genetics (3 units)
Description: Basic methods and theories of genetic/genomic analyses together with the application of these analyses to promote conservation, proper management, and long term survival of free-ranging species, including the exploration of current conservation genetic/genomic literature. Graduate level requirements include a term project and an oral presentation.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture — Required
Seminar — May Be Offered
Equivalent to: ECOL 530, GENE 530
Also offered as: ECOL 530, GENE 530
Co-convened with: WFSC 430
Course typically offered:
Main Campus: Fall

Recommendations and additional information: ECOL 320, PLS 312, basic genetics class, or consent of instructor.

-SA represents a Student Abroad & Student Exchange offering
-CC represents a Correspondence Course offering
May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

WFSC 530L: Conservation Genetics Lab (1 unit)
Description: This course is offered to meet the needs of students wanting to work in conservation genetics and to provide a genetic prospective to students working in other areas of conservation biology. The two primary goals of the class are to give students first-hand experience in a conservation genetics lab and to publish a research paper as a class. This is a laboratory based course with an emphasis on producing useful conservation related data and subsequently publishing our results. The class will be structured to mirror the steps involved in taking a research project from an idea all the way through to publication. Emphasis will be primarily on the lab work, data analyses, and writing and review process, though grant writing and sample collection will be introduced. Graduate students will have additional paper-editing and laboratory duties.
Grading basis: Regular Grades
Career: Graduate
Course Components: Laboratory Required
Also offered as: ECOL 530L, GENE 530L
Co-convened with: WFSC 430L
Course typically offered:
Main Campus: Fall

Enrollment requirement: Concurrent enrollment in WFSC/GENE/ECOL 530 required.

WFSC 531A: Traditional Ecological Knowledge (3 units)
Description: An introduction to the growing literature on traditional ecological knowledge and its relationships to the ecological and social sciences. Graduate-level requirements include preparing for and leading a class discussion on a specific topic.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Also offered as: AIS 531A, ANTH 531A, ENVS 531A, GEOG 531A, RAM 531A, RNR 531A, WSM 531A
Co-convened with: WFSC 431A
Course typically offered:
Main Campus: Fall

Home department: American Indian Studies Committee

WFSC 541A: Natural Resource Management in Native Communities (3 units)
Description: This course is a survey of basic issues and concepts in natural resource management and the environment in Native communities using integrated case studies that survey all the major varieties of environmental issues in Indian Country in the 21st century. A central theme will be developing tribally-specific solutions to rebuilding the resiliency of degraded ecosystems. We will consider particular case studies such as: tribal sovereignty, land tenure, reserved rights and Native claims; Native knowledge systems and Western science; co-management and restoration; water; fish and wildlife; agriculture and rangeland management; energy, mining and nuclear waste; and global climate change. Graduate-level requirements include Increased length of writing assignments.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: ARL 541A, RAM 541A, RNR 541A, SWES 541A, WFSC 541A, WSM 541A
Also offered as: AIS 541A, ARL 541A, ENVS 541A, RAM 541A, RNR 541A, WSM 541A
Co-convened with: WFSC 441A
Course typically offered:
Main Campus: Fall, Spring

Home department: American Indian Studies Committee

WFSC 542: Limnology (4 units)
Description: Study of lakes and streams; biological characteristics, as related to physical, chemical, geological, and historical processes operating on fresh waters. Graduate-level requirements include a report that synthesizes literature on a research issue of current concern, an in-class presentation and several discussion meetings.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $23
Course Components: Laboratory May Be Offered
Lecture Required
Equivalent to: ECOL 541
Also offered as: ECOL 542, ENVS 542
Co-convened with:
Field trip: Weekend field trip
Home department: Environmental Science

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-CC represents a Correspondence Course offering
May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

WFSC 544: Wildlife Ecology, Conservation, and Management (4 units)
Description: Wildlife Ecology, Conservation, and Management introduces advanced students to the ways in which human society influences the distribution and abundance of animals and communities viewed as ecologically, economically or intrinsically valuable and presents the analytical and technical tools available to wildlife professionals whose purpose is to understand population dynamics and manipulate the human-wildlife interface towards specific goals. The course is centered primarily on vertebrate (fish, birds, mammals, reptiles, amphibians) populations but also considers community and ecosystem perspectives. Students will explore sociopolitical perspectives, biological and ecological concepts, and mathematical underpinnings to population regulation and human-wildlife interactions.
Grading basis: Regular Grades
Career: Graduate

Course Components:	Laboratory	May Be Offered
	Lecture	Required

Co-convened with:
Course typically offered:
Main Campus: Fall

WFSC 545: Population Ecology (3 units)
Description: Explore ecological and anthropogenic processes that influence the distribution, dynamics, and demographics of animal populations. Develop models useful for describing, conserving, and managing animal populations, while emphasizing the relationships between ecological processes and their influence on strategies for conservation and management. Graduate-level requirements include answering additional questions on homework assignments and meeting independently with the instructor.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $30

Course Components:	Laboratory	Required
	Lecture	Required

Co-convened with: WFSC 445
Course typically offered:
Main Campus: Spring

Recommendations and additional information: A graduate level statistics course is strongly recommended for graduate students.

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-CC represents a Correspondence Course offering
May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

WFSC 547: Wildlife Conservation Behavior (3 units)
Description: Conservation behavior is the application of knowledge of animal behavior to solve wildlife conservation problems. This course reviews basic principles of animal behavior in the context of applied problems in conservation and management of wildlife populations. Topics include behavior in human-impacted landscapes, antipredatory responses, use of space and habitat, demographic consequences of social and mating systems, mitigation of human disturbance, captive breeding and reintroduction programs, reserve design, and challenges of climate change.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $37
Course Components: Lecture Required
Co-convened with: WFSC 447
Course typically offered:
Main Campus: Spring (odd years only)

WFSC 549: Diseases of Wildlife (3 units)
Description: Important diseases of wildlife. Immunity, disease mechanisms, infectious agents, diagnostic procedures, and post-mortem techniques as well as a survey of selected but generally well-recognized diseases of wildlife. Graduate-level requirements include a class presentation for which students will review the literature and prepare and present a lecture on a wildlife disease topic to the class.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: ANS 549, WFSC 549
Also offered as: ACBS 549
Co-convened with:
Course typically offered:
Main Campus: Fall

Home department: School of Animal & Comparative Biomedical Sciences

WFSC 554: Water Harvesting (3 units)
Description: Course focuses on water harvesting principles and techniques at a variety of scales and settings. Students participate in hands-on implementation of water harvesting projects on the UA campus.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: ECOL 554, WFSC 554
Also offered as: ECOL 554, ENVS 554
Co-convened with: WFSC 454
Course typically offered:
Main Campus: Spring

Home department: Soil, Water, & Environmental Sciences

WFSC 555L: Fishery Management Laboratory (1 unit)
Description: Field and laboratory methods pertaining to fishery investigations and management. Graduate-level requirements include a detailed report and presentation on a current advance in field or laboratory methods of study. Offered in spring of even years.
Grading basis: Regular Grades
Career: Graduate
Course Components: Laboratory Required
Co-convened with: WFSC 455L
Course typically offered:
Main Campus: Spring (even years only)

WFSC 555R: Fishery Management (3 units)
Description: Methods and concepts pertaining to fishery investigations and management; application of principles for enhancement of fisheries and aquatic habitats. Graduate-level requirements include a report on a current issue in management and a report on a research issue, plus several discussion meetings. Offered in spring of even years.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $17
Course Components: Lecture Required
Equivalent to: VSC 555R
Co-convened with: WFSC 455R
Course typically offered:
Main Campus: Spring (even years only)

WFSC 556: Aquaculture (3 units)
Description: Overview lectures and assigned readings on the theory and practice of aquaculture. Includes the culture of seaweeds, mollusks, crustaceans, and fin fish. Graduate-level requirements include a topic report.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: WFSC 556
Also offered as: ACBS 556
Co-convened with:
Course typically offered:
Main Campus: Spring

Home department: School of Animal & Comparative Biomedical Sciences

WFSC 571: Stream Ecology (3 units)
Description: This course will examine the structure and function of stream ecosystems with emphasis on the interaction of physical and biotic elements of streams in arid regions. We will examine the role of natural and anthropogenic stressors in shaping aquatic assemblages in streams. Quantification of impairment of stream structure and function requires a thorough understanding of fundamental ecological concepts of natural streams; this will be a major focus. Also, students will learn to use current methods to assess stream condition and signs of impairment. Graduate-level requirements include additional essay questions on exams and graduate student must meet with the instructors to discuss selected research articles. Presentations will be longer than undergraduates.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: WFSC 571
Co-convened with: SWES 471
Course typically offered:
Main Campus: Fall

WFSC 574: Aquatic Plants and the Environment (4 units)
Description: The role of riparian areas, estuaries, and constructed wetlands in the environment. Emphasis on plants as wildlife habitat for nutrient cycling and bioremediation. Graduate-level requirements include an additional research project and class presentation.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Also offered as: ECOL 574, ENVS 574
Co-convened with: WFSC 474
Course typically offered:
Main Campus: Fall

Home department: Environmental Science

WFSC 575: Freshwater and Marine Algae (4 units)
Description: Systematics, ecology, and evolution of planktonic and benthic species; field techniques and lab culture. Graduate-level requirements include a special topic report on an aspect of freshwater algae.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $25
Course Components: Lecture Required
Equivalent to: SWES 575, WFSC 575
Also offered as: ECOL 575, ENVS 575
Course typically offered:
Main Campus: Spring

Home department: Ecology & Evolutionary Biology

WFSC 582: Ichthyology (4 units)
Description: Ecology, evolution and systematics of fishes, with field and lab emphasis on Gulf of California and Arizona fishes. Graduate-level requirements include an in-depth research project on a single aspect of the course topic.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $64
Course Components: Laboratory Required
Lecture May Be Offered
Equivalent to: WFSC 582
Also offered as: ECOL 582
Course typically offered:
Main Campus: Fall (odd years only)

Home department: Ecology & Evolutionary Biology

-SA represents a Student Abroad & Student Exchange offering
-CC represents a Correspondence Course offering
May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

WFSC 583: Herpetology (4 units)
Description: Systematics, ecology, and evolution of the amphibians and reptiles. Graduate-level requirements include an in-depth paper.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $142

Course Components:	Laboratory	May Be Offered
	Lecture	Required

Equivalent to: WFSC 583
Also offered as: ECOL 583
Course typically offered:
Main Campus: Spring (even years only)

Home department: Ecology & Evolutionary Biology

WFSC 584: Ornithology (4 units)
Description: Natural history of birds and its bearing upon the problems of animal behavior, distribution, and evolution. Graduate-level requirements include an independent research project.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $50

Course Components:	Laboratory	Required
	Lecture	Required

Equivalent to: WFSC 584
Also offered as: ECOL 584
Course typically offered:
Main Campus: Spring

Home department: Ecology & Evolutionary Biology

WFSC 585: Mammalogy (4 units)
Description: Systematics, ecology, and evolution of mammals. Graduate-level requirements include an exercise in mammalian taxonomy and a higher level of performance.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $240
Other Fee: This course is pending a course fee review from ABOR and the fee is subject to change if approved.
Course Components: Laboratory Required
Lecture Required
Equivalent to: WFSC 585
Also offered as: ECOL 585
Course typically offered:
Main Campus: Fall

Home department: Ecology & Evolutionary Biology

WFSC 588: Arizona Mammals (4 units)
Description: This course will include ecology and evolution of mammals, taxonomic identification, biomes and communities of the Sonoran Desert region, and field methods in mammalian research. The lecture/laboratory portions of this course are designed to provide students with experience conducting research on mammals in the wild, and will rely heavily on fieldwork. Field work includes small mammal trapping, mist-netting for bats, camera trapping, and other methods. ECOL 488 is for students interested in nature, mammals, camping, and wildlife fieldwork.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $190
Course Components: Lecture Required
Equivalent to: ECOL 588R, WFSC 588, WFSC 588R
Also offered as: ECOL 588
Co-convened with:
Course typically offered:
Main Campus: Summer

Field trip: Two required field trips to be scheduled, each from 2pm to midnight. Flashlights required.
Home department: Ecology & Evolutionary Biology

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May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

WFSC 593: Internship (1 - 8 units)
Description: Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 595C: Wildlife Habitat Analysis (2 units)
Description: The conceptual foundations for understanding how animals select habitat, and information about animal behavior, cues used in habitat selection, and theoretical models of habitat selection. Students evaluate related subjects, such as habitat quality, habitat sources, populations sinks, and thresholds.
Grading basis: Regular Grades
Career: Graduate
Course Components: Colloquium Required
Course typically offered:
Main Campus: Spring

WFSC 595E: Advanced Topics of Population Ecology (1 unit)
Description: Study of ecological literature on process that impact the size and composition of animal populations. Topics include the evolutionary basis for understanding predation, competition, disease, cooperative interactions, habitat selection, population regulation, and resource partitioning.
Grading basis: Regular Grades
Career: Graduate
Course Components: Colloquium Required
Course typically offered:
Main Campus: Fall

WFSC 595G: Biogeography and Conservation of Sky Islands (2 units)
Description: Study of the physical and ecological characters of montane islands of the US-Mexico boderlands and strategies for conservation of biological diversity.
Grading basis: Regular Grades
Career: Graduate
Course Components: Colloquium Required
Course typically offered:
Main Campus: Spring

WFSC 595S: Management and Conservation of Small Mammals (2 units)
Description: The course will focus on a variety of small-bodied mammals of conservation and management interest to include bats, insectivores, rodents, and small carnivores. The population and behavioral ecology of small mammals will be reviewed in a management context. Strategies for the management of forests, grasslands, and deserts to manipulate abundance and diversity of small mammals will be examined. Threats to conservation and approaches to the abatement of these threats will be addressed. Student led discussions of relevant recent literature will help foster critical thinking skills.
Grading basis: Regular Grades
Career: Graduate
Course Components: Colloquium Required
Course typically offered:
Main Campus: Spring

Recommendations and additional information: Graduate standing in an RNR related discipline or consent of instructor.

WFSC 596B: Wildlife & Fisheries Seminar (1 unit)
Description: Introduction to contemporary challenges in wildlife & fisheries science through presentations by and discussion with professionals and advanced graduate students. Graduate-level requirements include a course blog that provides a visit synopsis.
Grading basis: Student Option ABCDE/PF
Career: Graduate
Course Components: Seminar Required
Repeatable: Course can be repeated a maximum of 4 times.
Co-convened with: WFSC 496B
Course typically offered:
Main Campus: Fall, Spring

WFSC 599: Independent Study (1 - 5 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work. Graduate students doing independent work which cannot be classified as actual research will register for credit under course number 599, 699, or 799.
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 601: Population Regulation in Animals (2 units)
Description: [Taught odd-numbered years] Exploration of theoretical and empirical basis of population regulation; critical review of literature on extrinsic and intrinsic forces; implications for management.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required

WFSC 693: Internship (1 - 8 units)
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 696A: Fish and Wildlife Ecology (1 unit)
Description: The development and exchange of scholarly information, in a small group setting, on selected topics in Wildlife and Fisheries science and management. Course registrants exchange results of research through discussions, reports, and/or papers.
Grading basis: Regular Grades
Career: Graduate
Course Components: Seminar Required
Repeatable: Course can be repeated a maximum of 2 times.
Course typically offered:
Main Campus: Fall

WFSC 699: Independent Study (1 - 5 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work. Graduate students doing independent work which cannot be classified as actual research will register for credit under course number 599, 699, or 799.
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 900: Research (1 - 8 units)
Description: Individual research, not related to thesis or dissertation preparation, by graduate students.
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 909: Master's Report (1 - 3 units)
Description: Individual study or special project or formal report thereof submitted in lieu of thesis for certain master's degrees.
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 910: Thesis (1 - 8 units)
Description: Research for the master's thesis (whether library research, laboratory or field observation or research, artistic creation, or thesis writing). Maximum total credit permitted varies with the major department.
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

WFSC 920: Dissertation (1 - 9 units)
Description: Research for the doctoral dissertation (whether library research, laboratory or field observation or research, artistic creation, or dissertation writing).
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer