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**.

Watershed Management (WSM)

WSM 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

WSM 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

WSM 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.

WSM 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

WSM 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

WSM 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

WSM 330: Introduction to Remote Sensing (3 units)
Description: Introduction to remote sensing principles, techniques, and applications, designed principally for those with no background in the field.
Grading basis: Regular Grades
Career: Undergraduate
Flat Fee: $50
Course Components: Laboratory — May Be Offered
Lecture — Required
Equivalent to: GEN 330, GEOS 330, SW 330, SWES 330, WSM 330
Also offered as: ENVS 330, GEN 330, GEOG 330, GEOS 330, GIST 330
Course typically offered:
Main Campus: Fall
Online Campus: Fall, Spring, Summer

Home department: School of Geography and Development
Student Engagement Activity: Discovery
Student Engagement Competency: Interdisciplinarity

WSM 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

WSM 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

-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.

WSM 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

WSM 402: Air and Water: Physics of Environmental Fluids (3 units)
Description: Understanding the dynamics of air and water is fundamental for addressing important issues concerning environmental science, natural resources, and our watersheds. In this class we will develop a strong comprehension of the basic properties of air and water, critical to addressing almost any environmental issue. Additionally, we will discover differences between fluids at rest and in motion. This will help us become skilled at realizing what can be transported by air and water can transport and how it is transported.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Co-convened with: WSM 502
Recommendations and additional information: MATH 124 or MATH 125; PHYS 103 or consent of instructor.

WSM 426: Watershed Engineering (3 units)
Description: Design of waterways, erosion control structures and small dams. Methods for frequency analysis and synthetic time distribution of rainfall. Methods for estimating infiltration and runoff from small watersheds, flow routing and storm water management. Estimating erosion using the Revised Universal Soil Loss Equation.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Equivalent to: CE 426, WSM 426
Also offered as: BE 426, CE 426
Co-convened with: WSM 526
Course typically offered:
Main Campus: Fall
Distance Campus: Fall

Home department: Biosystems Engineering
Enrollment requirement: Adv. Stdg: Engineering or WSM major or minor. CE 218 or AME 331.

WSM 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, WFSC 431A
Co-convened with: WSM 531A
Course typically offered:
Main Campus: Fall

Home department: American Indian Studies Committee

WSM 439A: Introduction to Dendrochronology (4 units)
Description: Survey of dendrochronological theory and methods. Applications to archaeological, geological, and biological dating problems and paleoenvironmental reconstruction. Emphasis on dating methods, developing tree-ring chronologies, and evaluating tree-ring dates from various contexts.
Grading basis: Regular Grades
Career: Undergraduate
Flat Fee: $85
Course Components: Laboratory Required
Lecture Required
Equivalent to: ANTH 439A, GEOG 439A, WSM 439A
Also offered as: ANTH 439A, GEOG 439A, GEOS 439A
Co-convened with: WSM 539A
Field trip: Field trip.
Home department: Geosciences

WSM 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, WFSC 441A
Co-convened with: WSM 541A
Course typically offered:
Main Campus: Fall, Spring

Home department: American Indian Studies Committee

WSM 444: Applied Environmental Law (3 units)
Description: A guided journey through real world environmental law; U.S. legal system, major environmental laws-criminal and civil; common marketplace problems and solutions; high profile cases; essential professional skills.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Equivalent to: WSM 444
Also offered as: ENVS 444
Co-convened with:
Home department: Soil, Water, & Environmental Sciences

WSM 452: Dryland Ecohydrology and Vegetation Dynamics (4 units)
Description: Overview of ecological and hydrological interrelationships, including ecologically meaningful water budgets, and associated vegetation dynamics for water-limited, dryland ecosystems.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Also offered as: ECOL 452, HWRS 452, RNR 452
Co-convened with: WSM 552
Course typically offered:
Main Campus: Fall

Recommendations and additional information: RNR 316, ECOL 302, or consent of instructor.

WSM 460A: Watershed Hydrology (4 units)
Description: Watershed hydrology looks at how water movement, storage and transformation on the Earth¿s surface is influenced by landscape characteristics, including human modifications of those characteristics, and weather. As such, watershed hydrology will focus on surface water. However, this course offers a brief introduction to groundwater as it pertains to watershed hydrology.
Grading basis: Regular Grades
Career: Undergraduate
Flat Fee: $65
Course Components: Laboratory Required
Lecture Required
Also offered as: HWRS 460A
Co-convened with: WSM 560A
Course typically offered:
Main Campus: Fall

Recommendations and additional information: Calculus and PHYS 102 or equivalent.

WSM 462: Watershed Management (4 units)
Description: The objective of the course is to provide upper-division undergraduate and graduate students with a background in watershed management. The course will be taught from a landscape perspective addressing the linkage between hillslope processes to channel characteristics. The role physical watershed characteristics have in regulating hydrological processes will be examined. The effects of land use and the application of best management practices on the soil and water resources will be reviewed. The students will also be presented with a set of tools for performing a watershed assessment and analysis.
Grading basis: Regular Grades
Career: Undergraduate
Flat Fee: $50
Course Components: Laboratory — May Be Offered
Lecture — Required
Co-convened with: WSM 562
Course typically offered:
Main Campus: Spring

Recommendations and additional information: WSM 460 or one course in hydrology.

WSM 468: Wildland Water Quality (3 units)
Description: Introduction to water quality and its influences in natural environments. Interactions with land management and relationships to the larger issues of environmental quality.
Grading basis: Regular Grades
Career: Undergraduate
Flat Fee: $16
Course Components: Lecture — Required
Co-convened with: WSM 568
Course typically offered:
Main Campus: Spring

WSM 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

WSM 494R: Research (3 units)
Description: Mentored field or laboratory research experience in the Watershed Management and Ecohydrology program.
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.

WSM 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

WSM 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

WSM 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

WSM 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

WSM 502: Air and Water: Physics of Environmental Fluids (3 units)
Description: Understanding the dynamics of air and water is fundamental for addressing important issues concerning environmental science, natural resources, and our watersheds. In this class we will develop a strong comprehension of the basic properties of air and water, critical to addressing almost any environmental issue. Additionally, we will discover differences between fluids at rest and in motion. This will help us become skilled at realizing what can be transported by air and water can transport and how it is transported. Graduate-level requirements include following an environmental problem by completing a scientific literature review on an instructor approved topic relating to air or water (10 Page). See syllabus for point break down.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: HYDR 502
Co-convened with: WSM 402

WSM 526: Watershed Engineering (3 units)
Description: Design of waterways, erosion control structures and small dams. Methods for frequency analysis and synthetic time distribution of rainfall. Methods for estimating infiltration and runoff from small watersheds, flow routing and storm water management. Estimating erosion using the Revised Universal Soil Loss Equation. Graduate-level requirements include a special project.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: CE 526, WSM 526
Also offered as: BE 526, CE 526
Co-convened with: WSM 426
Course typically offered:
Main Campus: Fall
Distance Campus: Fall

Home department: Biosystems Engineering

WSM 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, WFSC 531A
Co-convened with: WSM 431A
Course typically offered:
Main Campus: Fall

Home department: American Indian Studies Committee

WSM 539A: Introduction to Dendrochronology (4 units)
Description: Survey of dendrochronological theory and methods. Applications to archaeological, geological, and biological dating problems and paleoenvironmental reconstruction. Emphasis on dating methods, developing tree-ring chronologies, and evaluating tree-ring dates from various contexts. Graduate-level requirements include a research paper reviewing critically some aspect of dendrochronology.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $85
Course Components: Laboratory Required
Lecture Required
Equivalent to: ANTH 539A, GEOG 539A, WSM 539A
Also offered as: ANTH 539A, GEOG 539A, GEOS 539A
Co-convened with: WSM 439A
Field trip: Field trip.
Home department: Geosciences

WSM 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, WFSC 541A
Co-convened with: WSM 441A
Course typically offered:
Main Campus: Fall, Spring

Home department: American Indian Studies Committee

WSM 544: Applied Environmental Law (3 units)
Description: A guided journey through real world environmental law; U.S. legal system, major environmental laws-criminal and civil; common marketplace problems and solutions; high profile cases; essential professional skills. Graduate-level requirements include extra term papers and case studies.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: WSM 544
Also offered as: ENVS 544
Co-convened with:
Home department: Soil, Water, & Environmental Sciences

WSM 552: Dryland Ecohydrology and Vegetation Dynamics (4 units)
Description: Overview of ecological and hydrological interrelationships, including ecologically meaningful water budgets, and associated vegetation dynamics for water-limited, dryland ecosystems. Graduate-level requirements include different grading criteria and exam components plus completing a group research project in coordination with the instructor.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Also offered as: ECOL 552, HWRS 552, RNR 552
Co-convened with: WSM 452
Course typically offered:
Main Campus: Fall

Recommendations and additional information: RNR 316, ECOL 302, or consent of instructor.

WSM 560A: Watershed Hydrology (4 units)
Description: Watershed hydrology looks at how water movement, storage and transformation on the Earth¿s surface is influenced by landscape characteristics, including human modifications of those characteristics, and weather. As such, watershed hydrology will focus on surface water. However, this course offers a brief introduction to groundwater as it pertains to watershed hydrology. Graduate-level requirement includes required completion of a graduate ¿environmental inquiry¿ through volunteer work. Graduate students will be required to blog about these experiences.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $65

Course Components:	Laboratory	Required
	Lecture	Required

Also offered as: HWRS 560A
Co-convened with: WSM 460A
Course typically offered:
Main Campus: Fall

Recommendations and additional information: Calculus and PHYS 102 or equivalent.

WSM 562: Watershed Management (4 units)
Description: The objective of the course is to provide upper-division undergraduate and graduate students with a background in watershed management. The course will be taught from a landscape perspective addressing the linkage between hillslope processes to channel characteristics. The role physical watershed characteristics have in regulating hydrological processes will be examined. The effects of land use and the application of best management practices on the soil and water resources will be reviewed. The students will also be presented with a set of tools for performing a watershed assessment and analysis. Graduate students will submit a literature review on a topic in watershed management.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $50

Course Components:	Laboratory	May Be Offered
	Lecture	Required

Co-convened with: WSM 462
Course typically offered:
Main Campus: Spring

-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.

WSM 568: Wildland Water Quality (3 units)
Description: Introduction to water quality and its influences in natural environments. Interactions with land management and relationships to the larger issues of environmental quality. Graduate-level requirements include a class report and presentation on a negotiated topic of interest.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $16
Course Components: Lecture Required
Co-convened with: WSM 468
Course typically offered:
Main Campus: Spring

WSM 577: Advanced Topics in Water Resource Economics and Policy (3 units)
Description: Advanced economic approaches applied to water management and policy. Topics include economic modeling, pricing, incentive-based policies, regulation of pollution, alternative regulatory instruments and managing risk. Interactive seminar style course. Calculus proficiency and regular attendance essential.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: ECON 577, HWRS 577, WSM 577
Also offered as: AREC 577, ECON 577, HWRS 577, PA 577
Recommendations and additional information: Calculus proficiency required.
Home department: Agricultural & Resource Economics

WSM 579: Boundary Layer Meteorology & Surface Processes (3 units)
Description: Designed for students in the atmospheric sciences, hydrology and related fields. It provides a framework for understanding the basic physical processes that govern mass and heat transfer in the atmospheric boundary layer and the vegetated land surface. In addition to the theoretical part of the course, there is a strong focus on modeling and students will be required to program numerical codes to represent these physical processes.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Repeatable: Course can be repeated a maximum of 2 times.
Also offered as: ATMO 579, ENVS 579, HWRS 579, PTYS 579
Course typically offered:
Main Campus: Spring (even years only)

Recommendations and additional information: MATH 223, PHYS 141, PHYS 253.
Home department: Hydrology and Atmospheric Sciences

WSM 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

WSM 595E: Topics in Dendrochronology (1 - 4 units)
Description: The exchange of scholarly information and/or secondary research, usually in a small group setting. Instruction often includes lectures by several different persons. Research projects may or may not be required of course registrants.
Grading basis: Regular Grades
Career: Graduate
Course Components: Colloquium Required
Repeatable: Course can be repeated for a maximum of 9 units.
Equivalent to: WSM 595E
Also offered as: GEOS 595E
Home department: Geosciences

WSM 597C: Dendochronology (2 - 3 units)
Description: Hands-on, quantitative construction and assessment of dendrochronologies using software of the Dendrochronological Program Library and other computer resources.
Grading basis: Regular Grades
Career: Graduate
Course Components: Workshop Required
Equivalent to: ANTH 597C, WSM 597C
Also offered as: ANTH 597C, GEOS 597C
Co-convened with: WSM 497C
Home department: Geosciences

WSM 597I: Practical Dendroclimatology (3 units)
Description: An intensive introduction to the practical application of dendrochronology to paleoclimatology. Graduate-level requirements include synthesis and presentation of analytical results.
Grading basis: Regular Grades
Career: Graduate
Course Components: Workshop Required
Repeatable: Course can be repeated a maximum of 2 times.
Equivalent to: ANTH 597I, WSM 597I
Also offered as: ANTH 597I, GEOS 597I
Co-convened with: WSM 497I
Field trip: One day and weekend field trip.
Home department: Geosciences

WSM 597J: Dendroarchaeology (3 units)
Description: An intensive introduction to the practical application of dendrochronology to a selected topic drawn from archaeology, ecology, forest science, or geoscience. Graduate-level requirements include synthesis and presentation of analytical results.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $48
Course Components: Workshop Required
Repeatable: Course can be repeated a maximum of 2 times.
Equivalent to: ANTH 597J, WSM 597J
Also offered as: ANTH 597J, GEOS 597J
Field trip: One day trip and an eight day trip.
Home department: Geosciences

WSM 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

WSM 602: Snow Hydrology (2 units)
Description: [Taught even-numbered years] The significance of snow in hydrologic budgets of watersheds and river basins, and potentials for snowpack management.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Also offered as: HWRS 602
Course typically offered:
Main Campus: Spring (even years only)

Home department: Hydrology and Atmospheric Sciences

WSM 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

WSM 696A: Watershed Management (1 - 3 units)
Description: The development and exchange of scholarly information, in a small group setting, on selected topics in Watershed science and management and Ecohydrology. Course registrants exchange results of research through discussions, reports, and/or papers.
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Seminar Required
Repeatable: Course can be repeated for a maximum of 6 units.
Course typically offered:
Main Campus: Fall, Spring

WSM 696M: Using MATLAB® for Environmental Data Processing (3 units)
Description: The processing and analysis of some scientific data sets data sets often require the use of technical tools capable of handling large volumes of information and the possibility of programming routines to analyze and model processes associated with the data. For the past couple of years, University of Arizona has offered a free license to the MATLAB® programming language which has these capabilities. This course is designed to help students make better use this great resource. While not a requirement, students are encouraged to bring their own data sets to the course, so that they can make progress with their own data over the semester. Topics will be largely based on the needs of the students, but are anticipated to include: the MATLAB® environment, types of data sets and their processing, matrix operations, image analysis, statistics, differential equations and graphical presentation, all in MATLAB®.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $50
Course Components: Seminar Required
Equivalent to: SWES 696M
Also offered as: ENVS 696M

WSM 696Q: Practical and Applied Hydrometeorology (1 - 3 units)
Description: This course is driven by the initiative and interest of the course members, on the basis of group decisions. Student-led discussion will be followed by a practical activity related to site development and site documentation. Field activity at the Biosphere 2 Research Facility (transportation provided) is built into the schedule as appropriate. The research goal is to document and investigate controls of vegetation on water, carbon and energy cycling as measured using eddy covariance and other micrometeorological techniques.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $50
Course Components: Seminar Required
Equivalent to: HWRS 696Q, RNR 696Q
Also offered as: HWRS 696Q, RNR 696Q
Field trip: Field activity at the Biosphere 2 Research Facility.

WSM 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

WSM 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

WSM 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

WSM 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

WSM 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