Fall 2020 Course Descriptions as of 04/05/2020 08:10 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**.

Arid Lands Resource Science (ARL)

ARL 418: Southwest Land and Society (3 units)
Description: The course encompasses the greater Southwest, including northern Mexico from pre-Columbian times to the present. Evidence from archaeology, ethnology, linguistics, and biological anthropology is integrated. Emphasis is placed on the interaction of Indian, Hispanic, and Euroamerican peoples and their adaptation to and exploitation of the natural environment through time.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Equivalent to: AIS 418, ANTV 418, ARL 418, LAS 418
Also offered as: AIS 418, ANTH 418, LAS 418
Co-convened with: ARL 518
Course typically offered:
Main Campus: Spring

Home department: School of Anthropology

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

Home department: American Indian Studies Committee

ARL 452: Antibiotics - A Biological Perspective (3 units)
Description: Antibiotics - a biological perspective provides an introduction to the major classes of antibiotics, their modes of action, the threat and reality of antibiotic resistant "superbugs", as well as the biosynthesis, microbiological role, discovery, and industrial production of these compounds. The course will concentrate on the microbiological, genetic, and molecular biological aspects of antibiotics and antibiotic resistance, with less emphasis on chemistry. Thus, it complements but does not replace other courses that may detail the chemical synthesis and medicinal chemistry of these compounds, or concentrate on their medical or veterinary application as drugs. The course is designed to increase the awareness and appreciation of the importance of antibiotics and anti-infective research in an age when: cheap and failsafe antibiotic cures are considered a birthright in developed countries while lacking in the rest of the world; antibiotic use and misuse is prevalent in medicine, veterinary practice, and agriculture; antibiotic agents increasingly lose effectiveness due to emerging resistance; and anti-infective research has been severely curtailed by pharmaceutical companies.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Equivalent to: ARL 452, PLP 452
Also offered as: MIC 452, PLP 452
Co-convened with:
Course typically offered:
Main Campus: Fall

Recommendations and additional information: CHEM 103A, MCB 181R; MIC 205A is recommended.
Home department: Veterinary Science & Microbiology

ARL 480: Medicinal Plants (3 units)
Description: Historical and cultural aspects of plants and medicine, therapeutic uses of plants, psychoactive and food plants, contribution of medicinal plants to modern medicine, future of medicinal plants.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Equivalent to: ARL 480
Also offered as: PLS 480
Co-convened with:
Course typically offered:
Main Campus: Fall (even years only)

Home department: School of Plant Science

ARL 512: Development Economics (3 units)
Description: This course provides a graduate-level overview of development economics from a policy-oriented perspective. The goal of this course is to allow students to analyze policy debates surrounding economic growth and development from a broad and rigorous analytical base. Topics covered include theories of economic growth, poverty, inequality, education, health, gender inequality, development programs, and psychological and social foundations of economic development.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: ARL 512, ARL 512, ECON 512
Also offered as: AREC 512, ECON 512
Course typically offered:
Main Campus: Fall

Recommendations and additional information: ECON 361, MATH 113.
Home department: Agricultural & Resource Economics

ARL 518: Southwest Land and Society (3 units)
Description: The course encompasses the greater Southwest, including northern Mexico from pre-Columbian times to the present. Evidence from archaeology, ethnology, linguistics, and biological anthropology is integrated. Emphasis is placed on the interaction of Indian, Hispanic, and Euroamerican peoples and their adaptation to and exploitation of the natural environment through time. Graduate-level requirements include an in-depth familiarity with a subfield of choice through preparation of a substantial research paper (15-25 pages) and submission of weekly critical memos on required readings.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: AIS 518, ANTV 518, ARL 518, GEOG 518, LAS 518
Also offered as: AIS 518, ANTH 518, LAS 518
Co-convened with: ARL 418
Course typically offered:
Main Campus: Spring

Home department: School of Anthropology

ARL 523: Hydrology (3 units)
Description: Discussion and analysis of major topics of the hydrologic cycle and their interrelationship, such as rainfall, infiltration, evaporation, and runoff. Statistical and probabilistic methods in water supply and flood hydrology. Graduate-level requirements include a project paper.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: ARL 523, ARL 523, HWRS 523, HYDR 523
Also offered as: ATMO 523, CE 523, HWRS 523
Course typically offered:
Main Campus: Spring

Home department: Civil and Architectural Engineering and Mechanics

ARL 530: The Climate System (3 units)
Description: Systematic examination of processes and circulations comprising Earth's climate. Emphasis on circulations influencing geographic processes using examples of atmospheric environmental issues. Graduate-level requirements include the completion of a term paper.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $50
Course Components: Lecture Required
Equivalent to: ARL 530, GC 530
Also offered as: GC 530, GEOG 530
Course typically offered:
Main Campus: Fall, Spring

Home department: School of Geography and Development

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

Home department: American Indian Studies Committee

ARL 550: Geomorphology (4 units)
Description: Processes, form, and dynamics of the fluvial system from source to mouth. Introduction to aeolian, glacial, and planetary geomorphology. Graduate-level requirements include additional discussion section once a week.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $25
Course Components: Laboratory May Be Offered
Lecture Required
Equivalent to: ARL 550, ARL 550
Also offered as: GEOG 550, GEOS 550
Field trip: Field trip.
Home department: Geosciences

-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.

ARL 552: Antibiotics - A Biological Perspective (3 units)
Description: Antibiotics - a biological perspective provides an introduction to the major classes of antibiotics, their modes of action, the threat and reality of antibiotic resistant "superbugs", as well as the biosynthesis, microbiological role, discovery, and industrial production of these compounds. The course will concentrate on the microbiological, genetic, and molecular biological aspects of antibiotics and antibiotic resistance, with less emphasis on chemistry. Thus, it complements but does not replace other courses that may detail the chemical synthesis and medicinal chemistry of these compounds, or concentrate on their medical or veterinary application as drugs. The course is designed to increase the awareness and appreciation of the importance of antibiotics and anti-infective research in an age when: cheap and failsafe antibiotic cures are considered a birthright in developed countries while lacking in the rest of the world; antibiotic use and misuse is prevalent in medicine, veterinary practice, and agriculture; antibiotic agents increasingly lose effectiveness due to emerging resistance; and anti-infective research has been severely curtailed by pharmaceutical companies. Graduate-level requirements include a published peer-reviewed scientific paper pertinent to antibiotic research for reading and for preparing Critical Summaries and a presentation on a selected antibiotic.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: ARL 552, PLP 552
Also offered as: MIC 552, PLP 552
Co-convened with:
Course typically offered:
Main Campus: Fall

Home department: Veterinary Science & Microbiology

ARL 555: Introduction to Atmospheric and Hydrology Remote Sensing (3 units)
Description: The purpose of this course is to introduce the basic remote sensing techniques and their applications to the atmosphere, hydrology and other fields. This includes understanding the basic concepts of radiation transfer, passive and active remote sensing, satellite and ground-based remote sensing and their retrieval techniques. Finally, inversion techniques in remote sensing will be briefly introduced and the uncertainties/errors of the retrieved cloud and precipitation properties will be estimated.Graduate students will do some homework, but primarily work on processing and analyzing the aircraft, ground-based and satellite remote sensing data collected from instructors research projects. Graduate students will get hands-on experience by doing these projects using IDL, MATLAB, FORTRAN, or other programs. For some projects, I may provide key codes as a reference.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Also offered as: ATMO 555, ENVS 555, GEOS 555, HWRS 555, OPTI 555, REM 555
Course typically offered:
Main Campus: Spring

Home department: Hydrology and Atmospheric Sciences

ARL 564: The Arid and Semi-arid Lands (3 units)
Description: Past, present and future of settlement and resource utilization in the world's arid lands; spatial interrelationships of environmental, demographic, socioeconomic and political systems.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: ARL 564, GEOG 564
Also offered as: GEOG 564
Course typically offered:
Main Campus: Spring (odd years only)

ARL 565: Physical Aspects of Arid Lands (3 units)
Description: The climate, landforms, hydrology, soils and vegetation of deserts, with special emphasis on processes and distribution at micro-to-macro scales.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: ARL 565, GEOG 565
Also offered as: GEOG 565
Course typically offered:
Main Campus: Spring (even years only)

ARL 569: Ethnobotany (3 units)
Description: Explores the role of plants in non-industrialized societies from ancient to modern times. Includes ethnobotanical techniques, cultural classifications, wild resources, traditional farming.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: AEC 569, ARL 569, ARL 569, HWR 569, PLS 569, WSM 569
Also offered as: ANTH 569
Course typically offered:
Main Campus: Fall, Spring

Home department: School of Anthropology

ARL 575: Economics of Water and Environmental Markets and Incentive-based Policies (3 units)
Description: Economic incentives, tradable permits and markets for ecosystem services are pivotal in contemporary water and environmental policy. This class covers theory and application of economic concepts needed to evaluate water and environmental laws and policies; including ecosystem service provision, tradable use permits, benefit cost analysis, externalities, public goods and valuation methodologies. Case studies include federal, state, tribal and international water and environmental policies.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: ARL 575, ECON 575, GEOG 575, HWRS 575, RNR 575
Also offered as: AREC 575, ECON 575, GEOG 575, HWRS 575, RNR 575
Course typically offered:
Main Campus: Fall

Recommendations and additional information: ECON 300 or ECON 361.
Home department: Agricultural & Resource Economics

ARL 580: Medicinal Plants (3 units)
Description: Historical and cultural aspects of plants and medicine, therapeutic uses of plants, psychoactive and food plants, contribution of medicinal plants to modern medicine, future of medicinal plants. Graduate-level requirements include review of at least two leading papers in the field.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: ARL 580
Also offered as: PLS 580
Co-convened with:
Course typically offered:
Main Campus: Fall (even years only)

Home department: School of Plant Science

ARL 590: Remote Sensing for the Study of Planet Earth (3 units)
Description: Remote Sensing for the Study of Planet Earth introduces basic and applied remote sensing science as a means to explore the diversity of our planetary environments (biosphere, atmosphere, lithosphere and hydrosphere) within the radiometric, spectral, spatial, angular and temporal domains of remote sensing systems. This survey course strikes a balance between theory, applications and hands-on labs and assignments. We explore how you can download, process, analyze and interpret multi-sensor data and integrate online remotely sensed data sources/products into your research of interest.
Grading basis: Regular Grades
Career: Graduate
Flat Fee: $50
Course Components: Lecture Required
Equivalent to: ARL 590, ARL 590, ATMO 590, GEN 590, GEOG 590, GEOS 590, HWRS 590, MNE 590, OPTI 590, RNR 590, SW 590, SWES 590
Also offered as: ATMO 590, ENVS 590, GEOG 590, GEOS 590, HWRS 590, MNE 590, OPTI 590, REM 590, RNR 590
Course typically offered:
Main Campus: Fall

Home department: GIDP on Remote Sensing and Spatial Analysis

ARL 593: Internship (1 - 3 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

ARL 595A: Current Research (1 unit)
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: Alternative Grading: S, P, F
Career: Graduate
Course Components: Colloquium Required
Repeatable: Course can be repeated for a maximum of 6 units.
Course typically offered:
Main Campus: Fall, Spring

ARL 599: Independent Study (1 - 6 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

ARL 619: Ecology of Savannas, Shrublands, and Woodlands (3 units)
Description: [Taught Spring semester in even-numbered years] The functional ecology and dynamics of biogeographically diverse savanna, shrubland and woodland ecosystems will be examined. Interactions among co-occurring life forms and growth forms will be emphasized with in the context of climate, soils and disturbance.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: ARL 619, ECOL 619, GEOG 619, SWES 619
Also offered as: ECOL 619, ENVS 619, GEOG 619, RAM 619
Course typically offered:
Main Campus: Spring (even years only)

Home department: Range Management

ARL 631: Anthropology and Development (3 units)
Description: The role of anthropology in interdisciplinary projects involving economic development and planned change on the national and international levels.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: ANTH 531, ARL 531, ARL 631, ARL 631, LAS 631
Also offered as: ANTH 631, LAS 631
Course typically offered:
Main Campus: Spring

Home department: School of Anthropology

ARL 641: Natural and Human Impacts on Arid Lands (3 units)
Description: The influence of nature and humans on arid lands sustainability and the role of locally-adaptable technologies. Various aspects of measuring, monitoring and describing natural and human impacts on arid lands. Focuses on occurrences such as El Nino, population growth, and utilization of limited resources in relation to their economic and environmental significance.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Fall (odd years only)

ARL 642: Use and Management of Arid Lands (3 units)
Description: Major issues surrounding land uses in the world's arid and semi-arid zones. Examination of issues which will determine the future of land management in much of the arid and semi-arid lands of the western United States. The debate over the management of lands in relation to ownership, tenure, and access; intergenerational transfers, and the economic, environmental, and social consequences of proposed changes in current arrangements.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Fall (even years only)

ARL 693: Internship (1 - 3 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

ARL 699: Independent Study (1 - 3 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

ARL 900: Research (1 - 4 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

ARL 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

ARL 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

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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.

ARL 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

-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.