RGSC-RANGE SCIENCE

RGSC 1110. The Range Science Profession
1 Credit (1)
Introduction to scientific disciplines and career opportunities in rangeland science and management.
Learning Outcomes
1. To introduce students to the Range Science program and to a variety of career opportunities in Range Science.
2. To develop an individualized course curriculum that prepares the student to achieve their career goals.
3. To examine opportunities to gain practical work experience through internships and cooperative employment.

RGSC 2110. Introduction to Rangeland Management
3 Credits (3)
This course covers the principles of managing and understanding pasture and rangelands. Plant physiology and ecology, plant communities and rangeland sustainability and how they relate to livestock production and wildlife management will be discussed. Restricted to: Main campus only.
Learning Outcomes
1. Understand rangeland management operations.
2. Identify rangeland plants.
3. Gain a perspective of watershed management.
4. Discuss the management of rangeland resources.
5. Understand the process of rangeland evaluation through a broad understanding of monitoring and production of these rangelands.
6. Gain a perspective of the correlation of rangelands and the economic principles guiding resource management.
7. Understand the process of rangeland condition.
8. Understand the concepts of stocking rates and usage of rangelands.
9. Gain a broad perspective of different classes of land ownership; Tribal, federal, private and state. 1
10. Recognize vegetative communities, ecological sites, plant physiology andapplication to rangeland management considerations.

RGSC 2996. Special Topics
1-4 Credits
Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.
Learning Outcomes
1. Varies

RGSC 302V. Forestry and Society
3 Credits (3)
Global study of the development and use of forest resources for production of wood, fuel, fiber, and food products. Climatic, edaphic, cultural, and economic influences on forests of the world evaluated. Same as HORT 302V.

RGSC 316. Rangeland Plants
3 Credits (2+3P)
Identification, classification, cultural uses, and economic importance of native and introduced rangeland plants.

RGSC 317. Rangeland Communities
3 Credits (3)
Rangeland associations and communities, their plant species composition, and ecological factors affecting management of communities.

RGSC 318. Watershed Management
3 Credits (2+2P)
Management of rangeland and forest watersheds with emphasis on hydrologic cycle and land use effects on runoff and water quality.

RGSC 325. Rangeland Restoration Ecology
3 Credits (3)
Principles and practices of vegetation management and ecological restoration. Course emphasizes problems associated with rangeland degradation, and implementation of rangeland restoration and improvements.
Prerequisite(s): Sophomore standing or consent of instructor.

RGSC 350. Special Topics
1-4 Credits
Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

RGSC 357. Grass Taxonomy and Identification
3 Credits (1+4P)
Taxonomy of grasses; grass anatomy, variation in reproductive structures, and identification of grasses by sight and through the use of dichotomous keys. Students must be Junior standing to enroll in this course.

RGSC 390. Internship
1-3 Credits
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Graded S/U.
Prerequisite: consent of instructor.

RGSC 402. Seminar
1 Credit (1)
A seminar course designed to inform students of the career opportunities, develop their interviewing and other interpersonal skills may also include reading, discussions, written reports, and seminar presentations of current relevant literature.
Prerequisite(s): Senior standing.

RGSC 402 H. Range Science Seminar
1 Credit (1)
Taught with RGSC 402 with additional work.
Prerequisite(s): Meets Honors eligibility and/or Crimson Scholar status and senior standing.

RGSC 440. Rangeland Resource Ecology
3 Credits (3)
Plant adaptations to arid environments. Life histories of arid land plants. Biotic interactions among rangeland organisms. Arid land plant communities: their physiognomy, diversity, productivity, and response to disturbance. Arid land ecosystem dynamics.
Prerequisite(s): Senior standing.

RGSC 440 L. Rangeland Resource Ecology Lab
1 Credit (2P)
Living and nonliving factors of the range environment, the life forms and role of range plants and animals on succession and interactions in range ecosystems. Corerequisite(s): RGSC 440.

RGSC 448. Problems
1-4 Credits (1-4)
Individual investigation in a specific area of range science. Maximum of 4 credits per semester and a grand total of 6 credits. Consent of Instructor required.

RGSC 452. Vegetation Measurements for Rangeland Assessment
4 Credits (2+4P)

Sampling principles, sampling design, and measurement methods used to quantify vegetation attributes and to assess the structure and function of rangeland ecosystems. Laboratory emphasizes practical field techniques, quantitative analysis, and interpretation of results.
Prerequisite(s): RGSC 294 and A ST 311.

RGSC 458. Livestock Behavior, Welfare and Handling
3 Credits (2+3P)
Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Crosslisted with: ANSC 458
Prerequisite(s): RGSC 2110 or ANSC 1120.

RGSC 460. Rangeland and Natural Resource Planning and Management
4 Credits (3+3P)
Planning and problem solving in rangeland and natural resource management. Public land planning and policy. Application of land management principles to resolve rangeland, riparian and habitat issues.
Prerequisite(s): Senior or graduate student standing.

RGSC 485. Land Cover Analysis for Natural Resources
3 Credits (3)
This course is designed to help students understand, manipulate and extract Earth Observation (EO) data and to conduct land cover analysis related to natural resources including water and vegetation. The course provides and highlights means to identify and access EO data in different formats, extract meaningful information, and to help students developing critical thinking skills. The course introduces tools such as python and ArcGIS Pro to handle different data formats (e.g. hdf) efficiently; develop and present creative maps. The course provides basic information about how to conduct land use, land cover change analysis, mapping vegetation, water related variables and plant and animal distribution analysis.

RGSC 509. Approaches to Rangeland Research
3 Credits (3)
Experimental design and statistical analysis of experimental results.
Prerequisite(s): A ST 505 or consent of instructor.

RGSC 513. Advanced Rangeland Ecology
3 Credits (3)
Overview of the current state of knowledge in selected areas of rangeland ecology, with emphasis on currently developing ideas and issues relevant to rangeland management.
Prerequisite(s): RGSC 440 or equivalent.

RGSC 515. Graduate Seminar
1 Credit (1)
Current topics. Graded S/U.

RGSC 516. Arid Land Management
3 Credits (3)
Survey of seminal and current literature dealing with management of arid and semiarid lands including soil-plant-animal interactions, plant community ecology, arid land assessment methods, and arid land hydrology.

RGSC 518. Watershed Methods and Management
3 Credits (3)
Management of rangeland and forest watersheds with emphasis on the hydrologic cycle and land use effects on runoff and water quality. Hydrologic monitoring methods problem sets required for graduate credit.

RGSC 520. Arid Land Plant Herbivore Interactions
3 Credits (3)
Survey of seminal and current literature dealing with plant- and animal-related factors that influence herbivory patterns in arid landscapes. Although ungulate herbivory is a central focus of the course, the role of plant defenses in deterring both vertebrate and invertebrate herbivores is discussed in detail.

RGSC 525. Advanced Rangeland Restoration Ecology
3 Credits (3)
Theory and application of restoration ecology and the principles and practices of ecological restoration. Course emphasizes problems associated with rangeland degradation and highlights current restoration management actions. May be repeated up to 3 credits.

RGSC 550. Special Topics
1-4 Credits
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

RGSC 551. Earth Data Retrieval
3 Credits (3)
This course covers topics related to identifying sources, preprocessing, utilizing earth data that can be used to monitor some hydrological and water related variables, vegetation growth and related biophysical properties. The course focuses on developing students' skills on how to handle and analyze high-level large amounts of research data in different formats (i.e. .hdf). The course highlights the use of remote sensing and land surface models-based (NLDAS) earth observation datasets (e.g. NDVI, LST, Ta, and ET). The course uses some open-source tools including Python, API as well as MATLAB. Crosslisted with: WSAM 551.

RGSC 557. Advanced Grass Taxonomy and Identification
3 Credits (1+4P)
Taxonomy of grasses; grass anatomy, variation in reproductive structures, and identification of grasses by sight and through the use of dichotomous keys. Additional writing and grass identification assignments are required for graduate credit.

RGSC 575. Climate Studies, Water and Society
3 Credits (3)
The course provides a brief description of the Earth's climate system, an in-depth review and methodologies used to investigate climate change and variability, evidence of climate change on natural systems (water availability) vulnerability of human systems (e.g. agriculture) to climate change, and mitigation and adaptation strategies. Crosslisted with: WSAM 575.

RGSC 585. Land Cover Analysis for Natural Resources
3 Credits (3)
This course is designed to help students understand, manipulate and extract Earth Observation (EO) data and to conduct land cover analysis related to natural resources including water and vegetation. The course provides and highlights means to identify and access EO data in different formats, extract meaningful information, and to help students developing critical thinking skills. The course introduces tools such as python and ArcGIS Pro to handle different data formats (e.g. hdf) efficiently; develop and present creative maps. The course provides basic information about how to conduct land use, land cover change analysis, mapping vegetation, water related variables and plant and animal distribution analysis. Crosslisted with: WSAM 585.

RGSC 589. Landscape Hydrology Modeling
3 Credits (3)
The course "Landscape Hydrology Modeling" offers topics related to the physical hydrological processes that occur at different spatial and temporal scales in terms of understanding, quantitative evaluation, modeling, and visualization. It addresses precipitation, runoff, infiltration,

and evaporation, as well as understanding impact of land use change on these processes. The course highlights and provide training on the use of hydrological modeling tools including WMS software, HydroVIS and ArcGIS software to help students understand, model, manipulate, and visualize hydrological data processes. The course offers hands-on learning experience on the use of these tools. Consent of Instructor required. Crosslisted with: WSAM 589.

RGSC 598. Special Research Program
1-4 Credits
Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

RGSC 599. Master's Thesis
15 Credits
Thesis. Consent of Instructor required. Thesis/Dissertation Grading.

RGSC 600. Doctoral Research
1-15 Credits
Research. Consent of Instructor required. Thesis/Dissertation Grading.

RGSC 616. Advanced Arid Land Management
3 Credits (3)
In depth discussion of seminal and current literature dealing with management of arid and semiarid lands including land tenure systems, soil-plant-animal interactions (emphasis on livestock grazing), plant community ecology and assessment methods, and arid land hydrology.

RGSC 620. Advanced Arid Land Plant-Herbivore Interactions
3 Credits (3)
In depth discussion of seminal work dealing with plant- and animal-related factors that influence herbivory patterns in arid landscapes. Although ungulate herbivory is a central focus of the course, the role of plant defenses in deterring both vertebrate and invertebrate herbivores is discussed in detail.

RGSC 698. Special Research Programs
1-4 Credits (1-4)
Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

RGSC 700. Doctoral Dissertation
15 Credits
Dissertation. Consent of Instructor required. Thesis/Dissertation Grading.