

Range Inventory and Analysis

NRM 4304

Fall 2022

Instructor:

Dr. Rob Kinucan

RAS 109

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Lecture: M 10:00-11:50 a.m., RAS 129

Laboratory: W 10:00-11:50 a.m., RAS 128/Field/Mimms Ranch

Office Hours: Tuesday at 10:00-12:00 and Wednesday at 2:00-4:00. I am also available by appointment.

Course description:

The methodology of measuring and analyzing plant communities and populations. Statistical summarization, analysis and sampling are covered. Demonstrations of techniques used to inventory rangeland resources, such as vegetation sampling techniques and analysis, range condition and trend assessment, and forage production and utilization. Upon completion of the course students will be able to develop management plans and techniques to inventory and analyze rangeland plant communities.

Resources:

No text is required. Readings and course materials will be provided through class handouts and Blackboard.

Learning objectives:

1. Students will be able to list and discuss all common vegetation inventory techniques.
2. Students will be able to apply these techniques and evaluate the data collected.
3. Students will be able to apply this information in the field by designing and planning a vegetation inventory project for implementing in the field lab. This will be accomplished by identifying and selecting proper methods for different vegetation types.

Student Learning Outcomes for the B.S. in Natural Resource Management:

1. Students will be able to identify species of wildland plants and wildlife common to the western United States and describe their natural history.
2. Students will be able to demonstrate knowledge of the elements of an ecosystem.
3. Students will be able to communicate about natural resources and conservation both verbally and in writing.

Marketable Skills for B.S. in Natural Resource Management:

1. Students will demonstrate public speaking skills.
2. Students will demonstrate writing skills.
3. Students will be able to apply course knowledge through a research project.

ADA Statement:

Sul Ross State University is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. Students seeking accessibility services must contact Counseling and Accessibility Services, Ferguson Hall, Room 112; Mailing address: P.O. Box C-122, Sul Ross State University, Alpine, Texas; Telephone: 432-837-8203; More resources can be found at:

<https://www.sulross.edu/counseling-and-accessibility-services/>

Academic Integrity:

Students in this class are expected to demonstrate scholarly behavior and academic honesty in the use of intellectual property. A scholar is expected to be punctual, prepared, and focused; meaningful and pertinent

participation is appreciated. Examples of academic dishonesty include but are not limited to turning in work as original that was used in whole or part for another course and/or professor; turning in another person's work as one's own; copying from professional works or internet sites without citation; collaborating on a course assignment, examination, or quiz when collaboration is forbidden.

Equipment:

1. You will construct your own sampling quadrat and will need to be prepared for field work, note taking and data logging. We will be outside often, and you need to prepare accordingly. Equipment will be checked out as necessary for each field exercise.
2. You will be issued an iPad mini at the first of the semester and will use it to record your field data. You will be responsible for the iPad through the semester and will need to return it undamaged at the end of the semester. If you have a personal tablet, you can use that rather than an SRSU tablet. You will need to be able to access Excel.

Class Organization:

1. Participation is an important criterion in determining how much you learn and how well you do in class. Attendance will be taken each class and lab as noted by participation in activities and exercises.
2. For individual assignments I expect you to do your own work. For team projects I expect you to work effectively with classmates and contribute a fair share to projects.
3. If you miss a class, you may obtain notes from a classmate. Handouts, and assignments may be obtained from me.
4. We will spend many lab periods conducting field exercises. Be prepared for outside work and wear appropriate clothing. We will spend two full days (dates noted in the schedule) at the Mimms Ranch at Marfa to sample for the midterm monitoring project.
5. We will stick as closely as we can to the class and lab meeting schedule and outline. Conditions sometime require modifications to these timelines, and I will notify you in advance of any changes.

Grades:

Monitoring project and report	200 points
Carrying capacity project	200 points
Field exercises and attendance	200 points
(Half of each score is based on participation)	

Total 600 points

Grade assignments: 90-100 = A; 80-89 = B; 70-79 = C; 60-69 = D; <60 = F

Exercises and lab assignments are generally due the following lab period unless otherwise noted. Check the syllabus, course calendar and gradebook for due dates.

Class-lab meetings and tentative topical outline:

Week of:	Lecture	Lab
Aug 22/24	<p>Introductions</p> <p>Syllabus and Blackboard review</p> <p>The Scientific Method, and population attributes</p> <p>Quadrat construction assignment</p>	Build a quadrat (20 pts)
Aug 29/31	<p>Introduction to vegetation parameters and field sampling</p> <p>Descriptive statistics, measures of central tendency and dispersion.</p> <p>Considerations for sampling – sample location and size</p>	<p>Considerations for sampling – sample location and size (continued)</p> <p>iPad checkout</p>
Sep 5/7	Labor Day	<p>Area sampling techniques - Quadrat techniques</p> <p>Microsoft Excel for sampling and data summary</p> <p>Demonstration of quadrat sampling procedure</p>
Sep 12/14	Sampling attributes - Density, Dominance, and Frequency evaluation	Quadrat sampling (20 pts)
Sep 19/21	Plotless sampling techniques - line intercept and gap intercept techniques	Line sampling (20 pts)
Sep 26/28	<p>Soil Survey and Ecological Sites</p> <p>Maps and remote sensing</p>	<p>Introduction to Mimms Ranch sampling project</p> <p>GIS data and Practice Sampling setup for Mimms project</p>
Oct 3/5	<p>Mimms project preparation</p> <p>Summary calculations for Monitoring project</p>	Mimms Ranch field sampling (all day Wednesday, October 5)
Oct 10/12	Summary calculations for Monitoring project	Mimms Ranch field sampling (all day Wednesday, October 12)
Oct 17/19	Mimms project wrap-up	Mimms Monitoring Report Due (Review and makeup date). (200 points)
Oct 24/26	Calculating carrying capacity and stocking rates	Biomass sampling and utilization (20 pts)
Oct 31/ Nov 1	Plotless sampling techniques, continued - Point techniques and summary calculations	Distance techniques - PCQ and summary calculations
Nov 7/9	PCQ sampling (20 pts)	Final project field sampling
Nov 14/16	Rangeland health and erosion	Rangeland health and erosion (continued)

Nov 21/23	Carrying capacity data analysis and summary (catch-up day)	No Lab, Thanksgiving Holiday
Nov 28/30	Carrying capacity data analysis and summary	Complete analysis and summary for carrying capacity (last class meeting)
Dec 5	Carrying capacity report due at noon on Dec. 5. (200 points)	