

NRM 4303 – Range Ecology
Dept. of Natural Resource Management, Sul Ross State University
Spring 2023 – Course Syllabus

Instructor: Dr. Carlos E. Gonzalez

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Office hours: Monday and Wednesday, 8:00 a.m. to 10:00 a.m.

Lecture location: RAS 128

Time: Tuesday & Thursday, 12:30 p.m. – 1:45 p.m.

Course Description

Ecology is the study of how organisms interact with each other and their environment at the population, community, and ecosystem levels. *Rangelands* are described as “land on which the indigenous vegetation is predominantly grasses, grass-like plants, forbs, or shrubs and is managed as a natural ecosystem.” *Rangeland Ecology and Management* is a field of study devoted to understanding and managing these crucial ecosystems.

Rangelands are dynamic landscapes composed of many resources which produce many products. The rangeland landscape and its resources are continually modified by a suite of non-human forces, including grazing, fire, and climate or weather.

Humans also modify rangelands directly through development (e.g., energy, mining, transportation, and communications infrastructure) and recreation. People also affect the other forces of change by introducing invasive species, controlling or igniting fires, managing grazing, and potentially impacting the climate and weather patterns through human caused changes in atmospheric chemistry.

Managers need to predict how management practices or natural disturbance will impact the vegetation on rangelands, so a better understanding of how the system of interest functions is required. The goal of this course is to familiarize the student with ecological theory and its applications.

Course Objectives

- Provide an understanding of the ecological theory, which helps improve the range resources and facilitate their use by domestic animals and wildlife.
- To gain an understanding of the broad biological significance of ecological theory.
- To advance an understanding of the questions that ecologists study, the methods they use, and the problems that remain unanswered.

Course Outline. Tentative and subject to change

1. Introduction to class and syllabus
2. Range ecology and grasslands
3. Range ecology and grasslands
4. Multiple-use of Rangelands
5. Rangeland types
6. Ecoregions of Texas
7. Terrestrial Environment - Describing what makes Rangelands
8. Climate
 - **Exam 1**
9. Soils and water
10. Mycorrhizae
11. Plants and People
12. Plant Communities Assembly
13. Leaf and Photosynthesis
 - **Exam 2**
- Spring Break March 13-17*
14. Range models and Resilience
15. Plant competition and coexistence
16. Woody Plant Encroachment
17. Non-native Plants
18. Animal Adaptations
 - **Exam 3**
 - **Dead Day May 11**
 - **Final Exam**

Grading. The grading scale will be A = 90-100%, B = 80-89.9%, C = 70-79.9%, D = 60-69.9%.

<u>Grading</u>	<u>Points</u>
Exam 1	100
Exam 2	100
Exam 3	100
Class Presentations	100
Research Paper	100
<u>Final Exam</u>	<u>100</u>
Total	600

A = 540+, B = 539 – 480, C = 479 – 420, D = 419 – 360, F = 359 or less

Grades will be assigned based on student performance in the three categories outlined below.

Exams. Three comprehensive one-hour exams will be given during the semester. Additionally, one final comprehensive one-hour exam will be given at the end of the semester.

- Only the top three grades of the four exams will be used for your final grade.
 - You will have 75 minutes to complete each exam.
 - You will only have one opportunity to take each exam. DO NOT MISS AN EXAM WITHOUT A VALID REASON.
 - The material tested on the final exam covers all the information from the entire semester.

Class Presentations. The class will be divided into several teams. Each team will have to give a 20-minute presentation on an assigned topic related to Rangeland Ecology twice throughout the semester. The class presentations are designed to give you training and experience in making semi-formal presentations characteristic of advanced graduate and professional work.

The primary objectives of these exercises are 1) to enable you to use the knowledge that you have appropriately in discussions and speeches-that is, to build your confidence; 2) to give you practice in planning, organizing, and executing presentations to small groups; 3) to give you practice in anticipating and responding appropriately to your audience's questions and comments.

Research paper. The research paper is intended to allow you to explore your class knowledge and examine it from a more empirical perspective. The paper should be 5 pages long (not including a cover page or references). It should consist of *at least 25 empirical research articles from reputable aging journals*. Popular magazines or web materials should not be used. It would be best if you strived to find articles from the past decade. The paper will be written in the Journal of Wildlife Management style for review articles. A rough draft of the paper is due on April 20th at Midnight. The final paper is due no later than the final exam day. Both the draft and final paper will be uploaded through Blackboard. No papers will be accepted through email or printed copies.

Attendance. Attendance in lecture is not required but strongly encouraged, as we will cover material in class that students will not be able to get from any other source.

Course material. Lecture presentations and PDF files with the PowerPoint slides will be uploaded weekly to blackboard.

Class etiquette. Please turn cell phones off at the beginning of each class. Put away all computers during lectures and do not web surf or email during class.

Academic Dishonesty:

Academic dishonesty includes copying, sharing, or obtaining information from an unauthorized source, attempting to take credit for the intellectual work of another person, falsifying information, and giving or receiving information about a test, quiz, or assignment to other students. Any student involved in academic dishonesty will receive no credit (0) for work done and/or may be penalized in accordance with published University Rules.

Counseling and Accessibility Services:

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 Mary Schwartz, M. Ed., L.P.C., in Counseling and Accessibility Services, Ferguson Hall, Room 112. The mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas 79832. Telephone: 432-837-8691. Email: mschwartz@sulross.edu.

Students with Special Needs:

Sul Ross State University (SRSU) is committed to equal access in compliance with Americans with Disabilities Act of 1973. It is a SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request. Please contact me, Ms. Rebecca Greathouse Wren, M.Ed., LPC-S, Director/Counselor, Accessibility Services Coordinator, Ferguson Hall (Suite 112) at 432.837.8203; mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas 79832. Students should then contact the instructor as soon as possible to initiate the recommended accommodations.