

**NRM 3303 – Ecology and Conservation of Natural Resource**  
**Dept. of Natural Resource Management, Sul Ross State University**  
**Fall 2020 – Course Syllabus**

**Instructor:** Dr. Carlos E. Gonzalez

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**Office:** 116 RAS

**Office hours:** Monday & Wednesday, 8:00 AM to 10:00 AM.

**Lecture location:** RAS 129

**Time:** Monday, Wednesday, & Friday 10:00 AM to 10:50 AM.

**Description.** The practice of Natural Resource Management has been conducted in some form or another for hundreds of years. In contemporary societies management efforts have focused on returning a disturbed ecosystem to some historical condition defined by the stakeholders. Modern management of ecosystems attempts to recover the composition, structure, and function of these complex systems. Ecological restoration is interdisciplinary and must consider social, political, economic, and scientific issues to be successful. The class integrates principles from ecology used to repair ecosystems that have been degraded, damaged, or destroyed.

In this course we will focus on what ecological science contributes to restoration ecology; more specifically students will develop an understanding of ecological theory as it is applied to restoration of ecosystems and natural resources. The goal is to acquire knowledge needed to restore the structure of biological communities, ecological functions and improve ecosystems services. This course will cover topics for students who see themselves practicing or participating in natural resource management projects during their careers.

Using a combination of lectures, readings, field trips, and project work, we will cover the conceptual and theoretical foundations that underlie restoration efforts, and link these to the real-world applications in past and ongoing restoration projects. We will take advantage of projects ongoing in the Chihuahuan Desert to reinforce principles discussed in class.

**Course Objectives:**

1. Understand the ecological concepts relevant for restoring ecosystems and critically think about the scientific/logistic challenges of applying these concepts into a restoration plan.
2. Learn how to think critically regarding the structure and relationships of ecosystem modules.
3. Learn the ecological processes that control the structure and function of a specific ecosystem by participating in an ongoing restoration project and developing a restoration plan.

**Course Outline. \*Tentative and subject to change\***

- 1. Introduction to course**
  1. *Introduction*
  2. *Stewardship and Stakeholders*
- 2. Ecosystem processes – Establishment of Ecological Theory for Management**
  1. *Ecological theory and restoration ecology*
  2. *Ecological dynamics*

3. *State and Transition Models: Theory, Applications, and Challenges*
4. *Nonequilibrium Ecology and Resilience Theory*
5. *Evolutionary restoration ecology*
6. *Macroecology and the theory of island biogeographic*
7. *Climate variability*
8. *Challenges and conclusions*

**Group Presentations**

**EXAM 1**

**3. Wildlife**

1. *Operating Concepts*
4. *Wildlife Reintroductions*
5. *Threats to Biodiversity*
  - i. *Biodiversity. The goal and driver for restoration?*
6. *Populations*
7. *Invasive species and restoration challenges*
8. *Case studies*
  - i. *Scaled Quail*
  - ii. *Pronghorn*
  - iii. *Desert Bighorn Sheep*
  - iv. *Aoudad*

**Group Presentations**

**EXAM 2**

**3. Habitat Restoration Ecology**

1. *Habitat*
2. *Recovery of ecosystem processes*
3. *Watershed processes*
4. *Heterogeneity as the Basis for Rangeland Management*
5. *Landscape ecology and restoration process*

**Group Presentations**

**EXAM 3**

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

Three comprehensive one-hour exams will be given during the semester. Additionally, 1 assignment and 1 presentation will be given during the semester.

<u>Grading</u>	<u>Points</u>
Exam 1	100
Exam 2	100
Exam 3	100
Class Presentation 1	100
Class Presentation 2	100

Class Presentation 3 100

**Total possible points 600**

A = 90 - 100%

B = 80 - 89%

C = 70 - 79%

D = 60 - 69%

F = <60%

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

*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.

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

1. Exams (100 pts each / 300 points total). Exams will cover all content of lectures and reading assignments. Format will include multiple-choice, true/false, short answer, and essay questions.
2. Design a restoration project (100 pts each / 300 points total). Working in groups of 2-4, students will choose a degraded local habitat in need of restoration, visit the site, and then design a restoration plan.

*2.1 Presentations.* Each group will present a report with the following components:

- a) Assessment of the problem
- b) Statement of restoration goals/targets
- c) Restoration plan describing what should be done
- d) Expectations
- e) A description of the monitoring plan.

Grades will be assigned based on the completeness and detail of the project design, and ability to integrate principles discussed in lecture to the restoration proposal presentation. Groups will present their restoration proposal in a 15-min talk. Grades will be assigned based on the clarity and professionalism of the presentation, and the ability to convincingly justify the restoration proposal.

**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 Schwartze, 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. E-mail: [mschwartze@sulross.edu](mailto:mschwartze@sulross.edu).