NRM 5303 - Community Ecology

Course Syllabus
Department of Natural Resource Sciences
Sul Ross State University

Instructor: Dr. Antonio Cantu
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Office: RAS 116
Office Hours: Monday and Wednesday, 9:00 AM to 10:30 AM.

Lecture Location: RAS 128
Meeting Times: Tuesday and Thursday, 02:00 PM – 03:50 PM
Semester start-end date: 01/14/2026 – 05/06/2026

Course Description:
This course explores the structure, dynamics, and functioning of ecological communities: the assemblages of interacting species in space and time. Students will examine foundational theory (species interactions, coexistence, diversity patterns, trophic structure, disturbance) and integrate these concepts with applied issues in conservation, invasive species management, restoration, and climate change adaptation. Students will learn from guest speakers about ongoing efforts and challenges in the management of ecological communities within the Chihuahuan Desert. Through readings, discussions, assignments, and field-based inquiry, students will develop conceptual and analytical tools to understand and manage communities in a rapidly changing world.

Course Learning Objectives:

Understand and critically evaluate key concepts in community ecology

Integrate ecological theory with applied management challenges

Communicate ecological ideas and results effectively in oral and written formats

Develop skills to analyze community data and apply models to real-world systems

Weekly Schedule:

Part I: Foundations of Community Ecology

Week	Topics	Readings/activities
Week 1 (Jan 15) Intro to Community Ecology	Course overview, what is Community Ecology? history, major questions in community ecology	
Week 2 (Jan 20 & 22) Patterns of biodiversity	Components of biodiversity, alpha, beta, gamma, and global patterns	Assignment: What defines a community? (using student's own research/interests)
Week 3 (Jan 27 & 29) Species interactions	Intro to species interactions, types (all); Competition, resource, Lotka-Volterra models	Chesson (2000)
Week 4 (Feb 3 & 5) Species interactions	Predation, herbivory, mutualism;	Case studies
Week 5 (Feb 10 & 12) Ecological niche, coexistence	Concepts of niche, resource partitioning, and coexistence; neutral theory	Hutchinson (1957) Concluding Remarks; Hubbell (2001); **Exam 1**
Week 6 (Feb 17 & 19) Food webs and trophic structure	Energy flow, food chain, concepts of keystone species, trophic cascades	Paine (1969, 1995)
Week 7 (Feb 24 & 26) Disturbance and succession	Assembly rules and filters; Environmental gradients; IDH; Grime's triangle	Connell and Slatyer (1977)
Week 8 (Mar 3 & 5) Space and time	Dispersal, island biogeography (MacArthur and Wilson), source-sink dynamics, scaling, species-area relationships, metacommunities	Weins (1989)
Week 9 Spring Break		

Part II: Applied Community Ecology: Theory to Practice

Week 10 (Mar 17 & 19) Community disruption and ecological stability	Stability, resistance, resilience, regime shifts	Holling (1973), Tilman and Downing (1994)
Week 11 (Mar 24 & 26) Invasive species	Invasions, enemy release, inhibition, and community resistance. Management of invasive species	**Exam 2;** Simberloff et al. (2013)
Week 12 (Mar 31 & Apr 2) Restoration and reassembly	Community assembly theory applied to restoration: functional vs. taxonomic recovery	Guest speaker: TBD (restoration)
Week 13 (Apr 7 & 9) Climate change and shifting communities	Climate change, range shifts, trait filtering, novel ecosystems	Hobbs et al. (2009) **Field trip** TBD
Week 14 (Apr 14 & 16) Local problems and remote causes	Top-down and bottom-up; linkages between subsystems; community interactions and land use change	Leibold et al. (2004)
Week 15 (Apr 21 & 23) Human dimensions and socio-economic communities	Human-natural systems, cultural keystone species, metacommunities in human-dominated landscapes	Guest speaker: TBD (multispecies management or urban ecology)
Week 16 (Apr 28 & 30) Intro to the analysis of ecological communities	Sampling, measurements, matrices; emerging tools (metabarcoding, remote sensing, AI)	Exercise: data matrices in community ecology
Week 17 – Final Exam: Theory to Practice (Date TBD)		

Course material:

PowerPoint slides, readings, and assignments will be uploaded weekly to Blackboard.

Optional textbook:

Mittelbach and McGill – Community Ecology 2nd Ed

Assessment and Grading:

Component	Description	Weight
Participation and Discussion	Active engagement, paper discussions, guest speaker interactions	15%
Annotated Bibliographies	1-paragraph summary of each assigned reading	15%
Assignments	2 assignments/exercises	10%
Exam 1	Focused on patterns and species interactions	20%
Exam 2	Focused on key concepts	20%
Final Exam	Focused on applied community ecology	20%

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. In this course, we value a positive and respectful learning environment. Please adhere to the following class etiquette guidelines to ensure a smooth and productive experience for everyone. Attend all classes regularly and arrive punctually, notifying the instructor in advance if you must miss a class. Actively participate in class discussions, respecting the opinions of your classmates. Use respectful language in all forms of communication, maintaining professionalism in emails. Keep the classroom clean and organized. If you bring an apple for the instructor on the second day of class, you will earn one extra point on your first exam. Uphold principles of academic honesty and integrity. Dress appropriately for the learning environment and provide constructive feedback to peers and the instructor. Your commitment to these guidelines contributes to a positive and enriching learning atmosphere.

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.

Statement Regarding Generative Artificial Intelligence (AI):
The University does not recommend or endorse any specific AI tools or resources. Students should be aware that many generative AI tools (e.g., ChatGPT, Google Gemini, Microsoft Copilot) store user input and may use this data to train future models. For this reason, students should never upload or share personal, confidential, or identifiable information—such as names, ID numbers, health data, or assignment submissions containing such details—into any generative AI platform. When using AI tools, students should verify whether the tool complies with student privacy standards as indicated by the University.

Students may use AI as part of their research and preparation for assignments, or as a text editor, but text that is submitted must be written by the student. For example, students may use AI to generate ideas, questions, or summaries that they then revise, expand, or cite properly. Students should also be aware of the potential benefits and limitations of using AI as a tool for learning and research. AI systems can provide helpful information or suggestions, but they are not always reliable or accurate. Students should critically evaluate the sources, methods, and outputs of AI systems. Violations of this policy will be treated as academic misconduct. If you have any questions about this policy or if you are unsure whether a particular use of AI is acceptable, please do not hesitate to ask for clarification.

University Programs and Policies
Americans with Disability Act (ADA) Statement:

SRSU Accessibility Services. Sul Ross State University (SRSU) is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. Students seeking accessibility/accommodations services must contact Mrs. Mary Schwartze Grisham, LPC, SRSU's Accessibility Services Director or Ronnie Harris, LPC, Counselor, at 432-837-8203 or email mschwartze@sulross.edu or ronnie.harris@sulross.edu. Our office is located on the first floor of Ferguson Hall, room 112, and our mailing address is P.O. Box C122, Sul Ross State University, Alpine. Texas, 79832. Please note that instructors are not permitted to provide classroom accommodations to a student until the appropriate verification has been received.

SRSU Student Responsibilities Statement:
All full-time and part-time students are responsible for familiarizing themselves with the Student Handbook and the Undergraduate & Graduate Catalog and for abiding by the University rules and regulations. Additionally, students are responsible for checking their Sul Ross email as an official form of communication from the university. Every student is expected to obey all federal, state and local laws and is expected to familiarize themselves with the requirements of such laws.

SRSU Distance Education Statement:
Students enrolled in distance education courses have equal access to the university's academic support services, such as library resources, online databases, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires secure login. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website. Directions for filing a student complaint are located in the student handbook.

Technical Support. SRSU 24/7 Blackboard Technical Support: Toll Free: 888.837.6055. Email: blackboardsupport@sulross.edu

SRSU Library Services:
The Bryan Wildenthal Memorial Library and Archives of the Big Bend in Alpine offer FREE resources and services to the entire SRSU community. Access and borrow books, articles,

and more by visiting the library's website, library.sulross.edu/. Off-campus access requires logging in with your LobolD and password. Librarians are a tremendous resource for your coursework and can be reached in person, by email (srsulibrary@sulross.edu), or by phone (432-837-8123). No matter where you are based, public libraries and many academic and special libraries welcome the general public into their spaces for study. SRSU TexShare Cardholders can access additional services and resources at various libraries across Texas. Learn more about the TexShare program by visiting library.sulross.edu/find-and-borrow/texshare/ or ask a librarian by emailing srsulibrary@sulross.edu.
Mike Fernandez, SRSU Librarian, is based in Eagle Pass (Building D-129) to offer specialized library services to students, faculty, and staff. Utilize free services such as InterLibrary Loan (ILL), ScanIt, and Direct Mail to get materials delivered to you at home or via email.

Counseling:

Sul Ross has partnered with TimelyCare where all SR students will have access to nine free counseling sessions. You can learn more about this 24/7/365 support by visiting Timelycare/SRSU. The SR Counseling and Accessibility Services office will continue to offer in-person counseling in Ferguson Hall room 112 (Alpine campus), and telehealth Zoom sessions for remote students and RGC students.

Lobo Den:

The Lobo Den Tutoring Center offers FREE tutoring support to help you excel in your courses. Whether you need assistance in Writing, Math, Science, or other subjects, we're here to help!
Important Information:

- Drop-in and Scheduled Appointments: Flexible options to fit your needs.
- Hours of Operation: Monday–Friday, 8:00 AM – 5:00 PM.
- Workshops: Attend our regularly hosted academic workshops on STEM topics and professional development, often in collaboration with specialized faculty.
- Location: BWML (aka the library) Room 128.
- Contact Us: For more information or to book an appointment, email tutoring@sulross.edu or call (432) 837-8726.

Looking for additional support?

- Tutor.com offers FREE 24/7 online tutoring in over 200 subjects, including specialized support for ESL and ELL learners with native Spanish-speaking tutors.
- Access Tutor.com via Blackboard: Log in to your Blackboard account to get started anytime, anywhere.

Take advantage of these valuable resources to boost your confidence and performance in your classes. They look forward to helping you succeed!