

BIOL 5303

Advanced Topics in Ecology & Evolution

Co-Instructors: Dr. Charles M. Watson & Dr. J. Rodolfo Valdez Barillas

Watson:

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Research Laboratory: STEM 358
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*Additional times or virtual meetings available upon request.

Valdez:

Office Number: Science and Technology 311L
Research Laboratory: STEM 361
Office Telephone Number: 210/784-2220
Office Hours*: MW: 11-1pm
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Time and Place of Class Meetings:

BIOL 5303 lectures will take place on Mondays from 5:30-8:15pm in SciTech room 223.

Description of Course Content:

This graduate-level course offers an advanced and integrative exploration of organismal biology by synthesizing key concepts from ecosystem ecology, physiological ecology, animal behavior, and evolutionary biology. Designed for students with a strong foundation in biological sciences, this course delves into the complex interactions between organisms and their environments, emphasizing the mechanistic and evolutionary underpinnings of ecological and behavioral patterns.

Student Learning Outcomes:

1. Synthesize major concepts in integrative organismal biology, including ecosystem ecology, physiology, behavior and evolution.
2. Critically evaluate primary research and apply advanced theoretical frameworks to biological problems.
3. Evaluate the role of evolutionary processes in shaping ecological dynamics and organismal traits.
4. Communicate complex biological concepts effectively through written, oral, and visual presentations.

Recommended Textbooks and Other Course Materials:

- Materials and assignments will be posted on BlackBoard.

Blackboard Ultra:

This class uses the learning management system Blackboard Ultra to administer content and evaluate understanding. I will post links to videos, notes, reading materials, digital supplements, and administer essay exams from this learning platform.

Grading Policy:

Daily Participation accounts for 20% of the grade, reflecting your active engagement and contributions to class discussions. Weekly Presentations and Exercises make up 40%, providing regular opportunities to apply course concepts through practical assignments. The remaining 40% is derived from four major essay exams, which evaluate your ability to critically analyze and synthesize the core themes of the course.

Use of Generative AI: There are situations and contexts within this course where you may be asked to use artificial intelligence (AI) tools to explore how they can be used. Outside of those circumstances, you should not use AI tools to generate content (text, video, audio, images) that will end up in any student work (assignments, activities, discussion responses, etc.) that is part of your evaluation in this course. Any student work submitted using AI tools should clearly indicate with attribution what work is the student's work and what part is generated by the AI. In such cases, no more than 25% of the student work should be generated by AI. If any part of this is confusing or uncertain, students should reach out to their instructor for clarification before submitting work for grading. Use of AI-generated content without the instructor's permission and/or proper attribution in this course qualifies as academic dishonesty and violates Texas A&M-San Antonio's standards of academic integrity.

Please refer to the “Important Policies and Resources” document posted alongside the syllabus in Blackboard.

Class Schedule

Date	Primary Instructor	Topic	Product
26 January	Watson and Valdez	Introduction	
02 February	Watson	Evolutionary Ecology Overview	Topic Presentations
09 February	Valdez	Adaptations to Env. Change	Case Studies/Problem-Based Learning
16 February	Watson	Niche Theory and Resource Partitioning	Topic Presentations, Class Exercise
23 February	Valdez	Co-evolution & Biotic interactions (or Coexistence)	Topic Presentations
02 March	Watson	Competitive Exclusion Principle	Topic Presentations
09 March	Spring Break	No Class	Project Proposal
16 March	Valdez	Evolution of size-structure food webs	Case Studies/Problem-Based Learning
23 March	Watson	Life History Trade-offs and r/K Selection	Topic Presentations, Class Exercise
06 April	Valdez	Evolution of biogeochemistry	Topic Presentations
13 April	Watson	Optimal Foraging Theory (OFT)	Topic Presentations
20 April	Valdez	Adaptations to Anthropogenic change	Topic Debate and Consensus
27 April	Watson	Metapopulation Dynamics and Island Biogeography	Topic Presentations, Class Exercise
04 May	Watson and Valdez	Recap and Discussion	

Exam Schedule:

Essay Exams will be posted to Blackboard every three weeks and will be due one week after posting.

University Calendar

The complete academic calendar is available online [here](#).