

BIOL 425: Experimental Field Ecology – Ecological Morphology of Desert Rodents. Spring Syllabus 2020

Meeting Times: M 3:30-4:50p, TH 1:00-2:30 Room: LSS 254
Field Trip: March 14 – March 22, 2020; Gold Butte, Nevada

Professor:

Dr. Craig McGowan

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Office Hours: By appointment

Required and recommended books will be available online or provided by instructors.

All course materials are on Blackboard Learn (Bb) through the UI website and through free Perusall software. Course materials include: syllabus, schedule, additional readings, additional information necessary for the course, etc.

Course Description: Ecological Morphology of Desert Rodents is a research driven course aimed at using hypothesis driven experiments to identify ecologically significant patterns of movement or behavior within communities of rodents in the Mojave Desert. Emphasis will be placed on developing testable hypotheses rooted in previous studies and designed to be implemented over a one-week research field trip. Students will work in teams to develop skills in assessing scientific literature, developing meaningful scientific questions, designing quantitative experiments, data analysis, and communicating research results to broad audiences.

Learning Outcomes: Several critical Learning Outcomes are sought in this course. These Learning Outcomes include both the University of Idaho Learning Outcomes and a listing of specific Learning Outcomes of the college, unit and/or the course.

1. **Learn and integrate** - Through independent learning and collaborative study, attain, use, and develop knowledge in the arts, humanities, sciences, and social sciences, with disciplinary specialization and the ability to integrate information across disciplines.

Analytical ability. You will learn how to analyze and critically evaluate scientific literature and develop testable hypotheses about functional morphology and desert ecology. This information will enable you to examine the evolutionary history of vertebrate species and assess the functional significance of morphological adaptations for desert species.

2. **Think and create** - Use multiple thinking strategies to examine real-world issues, explore creative avenues of expression, solve problems, and make consequential decisions.

Analytical ability and understanding. You will gain the skills necessary to identify gaps in scientific knowledge and to design experiments to gain information to address these gaps. You will learn how to be critical of others' data and your own, and to understand

the significance of experimental results. Outcomes of your studies will provide additional insight into the evolution and ecology of desert rodent communities and will have implications for understanding the effects of ecological changes such as human encroachment or changing climate.

3. **Communicate** - Acquire, articulate, create and convey intended meaning using verbal and non-verbal methods of communication that demonstrate respect and understanding in a complex society.

Communicative proficiency. Through group and individual work, you will acquire the ability to successfully articulate your understanding of evolution, ecology, and desert communities and to communicate your analysis to your peers and K-12 students.

4. **Clarify purpose and perspective** - Explore one's life purpose and meaning through transformational experiences that foster an understanding of self, relationships, and diverse global perspectives

Throughout the entire semester, you will continually improve your proficiency at **Critical Thinking, Communication, and Analysis**. Your study of desert rodent communities will provide a foundation for understanding the delicate interplay between species and their environment, and enable you to develop an appreciation for the implications of disruptions to this environment, often caused by humans.

5. **Practice citizenship** - Apply principles of ethical leadership, collaborative engagement, socially responsible behavior, respect for diversity in an interdependent world, and a service-oriented commitment to advance and sustain local and global communities.

By working in small groups in class and in field, you will develop the ability to collaborate, to lead, and to follow. You will learn to appreciate multiple points of view from your classmates and teachers and you will gain the skills to respectfully communicate your point of view.

Attendance and Make-up Policy:

Attendance on the field trip is **MANDATORY**.

Attendance to class meetings is not mandatory but is very strongly encouraged.

Only university-sanctioned events or emergency doctor visits will be accepted excuses for missed classes that included a graded material.

University-sanctioned: If you are part of a university-approved (not Greek) group (*i.e.* athletics, ROTC, FAA, etc.) and you will be absent for a scheduled exam, you are responsible for completing the exam **PRIOR** to the scheduled date. No exceptions. See below for additional information.

Emergency doctor visit: If you are ill on the day of an exam, you **must** do the following:

1. Bring a signed doctor's note to class on the first day you return back to school. A make-up exam will be given within three days of your first day back.
2. Send an email to me (cpmcgowan@uidaho.edu) letting me know of your absence.

Class Schedule:**Week 1:**

Jan 16

- Introductions
 - Who are we? Who are you – career goals, class goals?
 - Expectations
 - Learning outcomes, presentations
 - How to approach this course to ensure success
- Assign IACUC training.
 - Required to attend field trip and handle animals
- Animals of Gold Butte – what will you see.
- Reading Assignment 1 (Due Jan 22, 11:59pm)
 - Kotler & Brown, 1988
 - “Environmental heterogeneity and the coexistence of desert rodents”

Week 2:

Jan 20 – No Class, MLK Day

Jan 23

- Discussion of Reading 1
- Finding, reading, and evaluating research papers.
 - Google Scholar, EBSCO, Web of Science.
 - What makes a good paper?
 - Understanding that research is always in progress.
- Required personal equipment – what you will need to be happy.
- Reading Assignment 2 (Due Jan 26, 11:59pm)
 - Freymiller et al, 2017
 - “Recent interactions with snakes enhance escape performance of desert kangaroo rats (Rodentia: Heteromyidae) during simulated attacks”

Week 3:

Jan 27

- IACUC training due **(50 pts)**
- Discussion of Reading 2
- Recent research from our team/ previous student projects.
- Reading Assignment 3 (Due Jan 29, 11:59pm)
 - Djwadan & Garland 1988;
 - “Maximal running speeds of bipedal and quadrupedal rodents.”

Jan 30

- Discussion of Reading 3
- Recent research from our team/ previous student projects.
- Reading Assignment 4 (Due Feb 2, 11:59pm)
 - TBD

Week 4:

Feb 3

- Discussion of Reading 4
- Guest lecture – using LIDAR to quantify habitat
- Reading Assignment 5 (Due Feb 5, 11:59pm)
 - Brown & Lieberman 1988;
 - “Resource Utilization and Coexistence of Seed-Eating Desert Rodents in Sand Dune Habitats”

Feb 6

- Discussion of Reading 5
- Experimental design, Notebooks and data management
- Reading Assignment 6 (Due Feb 9, 11:59pm)
 - Student Assigned Paper

Week 5:

Feb 10

- Student led discussion of Reading 6
- Logistics – Life in the field, menu, list of provided equipment
- Reading Assignment 7 (Due Feb 12, 11:59pm)
 - Student Assigned Paper

Feb 13

- Student led discussion of Reading 7
- Project Brainstorming Session
- Reading Assignment 8&9 (Due Feb 19, 11:59pm)
 - Student Assigned Papers

Week 6:

Feb 17 – NO CLASS

Feb 20

- Student led discussion of Reading 8&9
Finalize Research Project – in class discussions and workshops.
- Proposal Outline template discussion
- Reading Assignment 10 (Due Feb 23, 11:59pm)
 - Student Assigned Paper

Week 7:

Feb 24

- **Outline of Research Proposal Due (Feb 23, 11:59pm)**
- Student led discussion of Reading 10
- Forming a research equipment list.
 - What data will you need to collect?
 - What tools will you need to accomplish your goals?

Feb 27

- Contingency plans! What could go wrong and how will we deal with it?

Week 8: Respiratory Fit Test

Mar 2

- Equipment building and organization – do you have what you need?

Mar 5

- **Final Research Proposal Due (Mar 4, 11:59pm)**
 - If you don't turn this in, you will not go on the field trip!
- 5 minute chalk talks – share your plans!

Week 9:

Mar 9

- Group research discussion – detailed plan for all projects
- Field prep
- Logistics
 - How / when will teams get their work done, time management, *etc.*

Mar 12

- Last minute prep/organization

Week 10: Mar 13 - 22 – FIELD TRIP!

- Assign reflection on field trip

Week 11:

Mar 23 No Class – we'll all need a break

Mar 26

- Recap / clean-up.
- Data organization.
- Data analysis methods.
- Assign outline of report.

Week 12:

Mar 30

- In class work day – data analysis.
- Initial contact with school teachers, classrooms.
- Workshop and revise report outlines.

Apr 2

- In class work day – data analysis.
- Workshop and revise report outlines.

The following weeks will be modified based on MHS schedule.

Week 13: Apr 6

- Preliminary data reports/presentation to group.
- How to build a good research talk.
- How and why of science outreach.

Week 14: Apr 13

- How to write a good research report.
- Writing workshops, discussions, and in-class collaborations.

Week 15: Apr 20

- Practice presentations.

Week 16: Apr 27

- Outreach presentations.

Week 17: May 4

- Outreach presentations.

Week 18: May 11 – Finals Week

- Final report due

Grading:

Readings, Assignments, Discussions, Workshops	100 points
Research Proposal	100 points
Field Work	100 points
Final written report	150 points
Final educational presentation	50 points
Total	500 points

THERE IS NO EXTRA CREDIT

Policy on Absences for University-related Activities.

The absence policy is enforced by the Vice Provost for Student Affairs and Office of the Dean of Students, and no other written or verbal agreements preempt this policy.

1. Students are **not** to be excused from class sessions for any living group-related activities (including, but not limited to, residence hall meetings, fraternity or sorority house meetings, or other living group functions). This includes any function deemed “mandatory” by the living group officers that may carry with it fines or other penalties for non-attendance.
2. Only students with a written request signed by a university official will be granted an excused absence for university-sponsored activities, including, but not limited to, travel to sporting events in which the student is an official participant (not spectator) and participation in scheduled, university-sponsored class field trips.
3. Students who seek excused absences from class sessions because of other university-related activities must notify me in advance of their absence to request an excused absence. All work must be completed prior to the absence for full credit.

This policy is designed to help you, the students, achieve academic success and to remain a full and productive member of your classroom community. If you have questions, please contact the Office of the Dean of Students, 885-6757, TLC 232.

University Disability Support Services

Reasonable accommodations are available for students who have documented temporary or permanent disabilities. All accommodations must be approved through Disability Support Services located in the Idaho Commons Building, Room 306. Please meet with the staff of the DSS office at the beginning of each semester to set up accommodations for the semester so that you may notify your instructor(s) early in the semester regarding accommodation(s) needed for the course.

- **885-6307**
- dss@uidaho.edu
- <http://www.uidaho.edu/studentaffairs/asap/dss>

Study Skills and Resources

Remember, you should spend, on average, at least 3 hours of study time (textbook reading, reviewing class notes, etc.) for each hour you spend in class. There is additional time devoted to researching and writing papers, and to developing projects. Plan accordingly. If you need help with note-taking, strategies for studying, writing, time-management, or tutoring assistance, please do not hesitate to ask me.

Honesty:

- Adhere to the highest academic standards of honesty and integrity.
 - No cheating, no plagiarism. Plagiarism is the passing off someone else's work as your own, without citing the source. This includes direct copying, rephrasing, and summarizing, as well as taking someone else's idea and putting it in different words.
 - See the Academic Honesty Student Policy:
<http://www.uidaho.edu/DOS/judicialaffairs/studentcodeofconduct/articleii>
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Respect your fellow students

- Respecting the rights of others to express their views, regardless of what you may think of them.
 - Respecting the rights of others by voicing your own observations in a clear, concise and precise manner, and by not dominating the conversation.
 - And adhering to common courtesies and civilities, such as coming to class on-time, turning off cell phones, listening and not talking while others "have the podium," *etcetera*.
 - Sexual harassment will not be tolerated. Classroom and field sites are places where students are safe to develop as scholars.
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University Classroom Learning Civility Clause:

In any environment in which people gather to learn, it is essential that all members feel as free and safe as possible in their participation. To this end, it is expected that everyone in this course will be treated with mutual respect and civility, with an understanding that all of us (students, instructors, professors, guests, and teaching assistants) will be respectful and civil to one another in discussion, in action, in teaching, and in learning.

Should you feel our classroom interactions do not reflect an environment of civility and respect, you are encouraged to meet with your instructor during office hours to discuss your concern. Additional resources for expression of concern or requesting support include the Dean of Students office and staff (5-6757), the UI Counseling & Testing Center's confidential services (5-6716), or the UI Office of Human Rights, Access, & Inclusion (5-4285)