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Fall 9-1-2021

### BIOE 371.00: General Ecology Lab

Holly Reading Jackson

*University of Montana, Missoula*, [holly1.jackson@umontana.edu](mailto:holly1.jackson@umontana.edu)

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**Ecology Laboratory Syllabus**  
**BIOE 371: Fall, 2021**  
**Lab Location: Natural Science 207**  
**Sections: Monday-Friday, 1:00-4:50 PM**

**INSTRUCTOR:**

Holly Jackson  
Office: NS 311  
Email: [holly1.jackson@umconnect.umt.edu](mailto:holly1.jackson@umconnect.umt.edu)  
Phone: 716-803-7226  
Office Hours: Wed. & Fri. from 10:30-11:00 or by appointment

The course website is being hosted on **Moodle**: <http://umonline.umt.edu/>  
To log in to moodle you will need your NETID and password, which you can obtain from IT Central (243-4357). If you have problems with Moodle, contact UOnline: 243-4999.

**TEACHING ASSISTANTS**



TA: Timber Burnette  
Section 4: Monday (70354)  
Email: [timber.burnette@umconnect.umt.edu](mailto:timber.burnette@umconnect.umt.edu)  
Office: \_\_\_\_\_  
Office Hours: \_\_\_\_\_



TA: Madaline Cochrane  
Section 1: Tuesday (70008)  
Email: [madaline.cochrane@umconnect.umt.edu](mailto:madaline.cochrane@umconnect.umt.edu)  
Office: \_\_\_\_\_  
Office Hours: \_\_\_\_\_



TA: Colleen Livingstone  
Section 5: Wednesday (73170)  
Email: [colleen.livingstone@umconnect.umt.edu](mailto:colleen.livingstone@umconnect.umt.edu)  
Office: \_\_\_\_\_  
Office Hours: \_\_\_\_\_

TA: Scott Debnam  
Section 3: Thursday (70010)  
Email: [scott.debnam@umconnect.umt.edu](mailto:scott.debnam@umconnect.umt.edu)  
Office: \_\_\_\_\_  
Office Hours: \_\_\_\_\_



TA: Holly Jackson  
Section 2: Friday (70009)  
Email: [holly1.jackson@umconnect.umt.edu](mailto:holly1.jackson@umconnect.umt.edu)  
Office: NS 311  
Office Hours: Wed. & Fri. from 10:30-11:00

## COURSE OVERVIEW AND LEARNING OUTCOMES

The purpose of this course is to introduce you to the science of ecology. In this class you will become familiar with how scientists conduct ecological research. More specifically, you will learn how to:

1. Observe nature.
2. Access and evaluate the primary literature.
3. Use the scientific method to generate and evaluate hypotheses.
4. Apply statistical methods to evaluate data.
5. Communicate scientific results in **written** and **oral** formats.
6. Have fun! Science is fun to do; hopefully, you'll learn this, too!

Please note that this course (in combination with 2 others) can be used to fulfill the upper-division writing requirement in the Terrestrial and Aquatic options of the Wildlife Program. These courses are designed to:

- Identify and pursue more sophisticated questions for academic inquiry
- Find, evaluate, analyze, and synthesize information effectively from diverse sources
- Manage multiple perspectives as appropriate
- Recognize the purposes and needs of discipline-specific audiences and adopt the academic voice necessary for the chosen discipline
- Use multiple drafts, revision, and editing in conducting inquiry and preparing written work
- Follow the conventions of citation, documentation, and formal presentation appropriate to that discipline
- Develop competence in information technology and digital literacy

Labs for the class include a few short assignments, a few prepared labs and an independent group project. Some of the labs involve visits to nearby natural areas so on days marked **FIELD** *come prepared to spend several hours outside* in potentially extreme weather conditions. **Montana can be cold & wet or hot & dry!**

Please visit the course website often to download handouts and assignments, and view any changes to the syllabus.

**IMPORTANT DISCLAIMER:** Montana weather can wreak havoc with scheduling. While you should never assume a lab will be canceled, the schedule below is subject to change.

**SYLLABUS**

<b>Week</b>	<b>Week of:</b>	<b>Activity</b>	<b>Assignment Due</b>	<b>Meet/ Go to...</b>
1	8/30	The Scientific Method I: Intro to Ecological Research	<i>None.</i>	Ecology lab/ <b>FIELD</b>
2	9/6	<b><i>Labor Day (Mon)</i></b>	<b><i>No labs this week</i></b>	
3	9/13	The Scientific Method II: <i>Understanding Experimental Design</i> GROUP PROJECTS: <b>Formation of groups &amp; development of hypotheses</b>	<b>Intro to Scientific Method</b> <i>*Come prepared to discuss ideas &amp; develop hypotheses for your group project.</i>	<b>Computer</b> M HS 114 T SH 106 W HS 114 Th SH 106 F HS 114
4	9/20	Rattlesnake: Succession and Disturbance	<b>Understanding Experimental Design Due;</b> Finalize groups; review questions & hypotheses	Ecology lab/ <b>FIELD</b>
5	9/27	Mark-Recapture w/Crickets	<b>1. Succession &amp; Disturbance Write-Up DUE.</b> <b>2. Mark-Recapture-Due at Class End</b>	Ecology
6	10/4	Predation Risk I: Data collection	<b>Group Project Proposal (1/group)</b>	Ecology lab/ <b>FIELD</b>
7	10/11	Predation Risk II: Data analysis; Components of a Scientific Paper	<b>Field Note Due</b>	<b>Computer</b> HS 114
8	10/18	GROUP PROJECTS: <i>Class Discussion &amp; Critique of Project Proposals.</i>	<b>Predation Risk Lab Write-Up DUE</b> <i>*Group Proposal Revisions at lab's end.</i>	Ecology Lab
9	10/25	GROUP PROJECTS: <i>Project review &amp; Finalization/ Data Collection</i>	<i>In-class discussions with instructor.</i>	Ecology Lab
10	11/1	GROUP PROJECTS: <b><i>Data Collection</i></b>		Ecology Lab
11	11/8	<b><i>Veteran's Day (Thurs)</i></b>	<b><i>No labs this week</i></b>	
12	11/15	GROUP PROJECTS: <b><i>Data Collection</i></b>	Predation Risk Lab <b>Re-write!</b>	
13	11/22	<b><i>Thanksgiving</i></b>	<b><i>No labs this week</i></b>	
14	11/29	GROUP PROJECTS: <i>Data Analysis;</i> <i>Giving a Scientific Talk</i>		<b>Computer</b> HS 114
15	12/6	GROUP PROJECTS: <i>Presentations</i>	<b>Group Project Write-Up (individual)</b>	

## **COME TO CLASS PREPARED!**

You should thoroughly READ all handouts associated with the lab before coming to class. In some cases you might even want to take notes to refer to in lab which might make things go more efficiently during class. In general, lab assignments will be due the week after a lab is completed. Due dates are listed on the syllabus (see above). Late assignments will be penalized at a rate of 10% per day. Please keep in mind that academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University; for further information see:

<http://www.umt.edu/student-affairs/community-standards/default.php>

**Lab attendance is required!** This includes labs set aside for group projects! Additionally, because some labs involve fieldtrips, please arrive on time or you may be left behind! If you miss a lab you will be penalized 15% on the report for that lab.

**Switching Lab Sections.** If you need to attend a different lab section for any reason during the semester, you need to get *prior permission* for this with your regular TA **and** the TA of the section you wish to attend.

## **GRADING**

Grades are based on a series of written assignments. Starred (\*) assignments must be written using the journal format. Letter grades will be assigned as follows: A ( $\geq 93\%$ ), A- (90-92.99%), B+ (87-89.9%), B (83-86.99%), B- (80-82.99%), C+ (77-79.9%), C (73-76.99%), C- (70-72.99%), D+ (67-69.9%), D (63-66.99%), D- (60-62.99%), and F ( $< 60\%$ ).

### **Written assignments:**

Intro to Exp. Design Assignment	50 points
Understanding Experimental Design	100 points
Succession write-up	100 points
Mark-Recapture w/Crickets	50 points
Predation Risk Lab – DRAFT*	50 points*
Predation Risk Lab – REWRITE*	100 points*
Field Note	100 points
Group Project: Project Proposal (FINAL)	50 points
Group Project: Individual Write-Up*	200 points*
Group Project: Presentation	100 points
<b>Total</b>	<b>900 points</b>

## **GROUP PROJECTS**

A bit more than 1/3 of your grade (350 points) will be based on an independent research project that you do with a team of several other students (3-4 total). Think of the group project as an ecology lab that you invent. The purpose of this independent project is to give you a chance to be involved in all stages of a small scientific investigation, from the identification of an interesting ecological pattern or question, formulation of hypotheses that might account for the observed patterns, appropriate experimental design, collection, analysis and interpretation of the data. We will provide you with plenty of feedback throughout the semester as you develop your projects.

### ***Working together***

Working well in groups is an essential and important skill that will be important to you after you graduate. If your group works well together, this can be an incredibly rewarding experience. If your group is dysfunctional, this is incredibly frustrating. The major source of friction usually occurs when a member of a group does not pull their weight. Don't be that person!! As a group you will need to negotiate how to make sure that everyone is participating fully in the project. If you have problems with this that you are having difficulty resolving, please communicate with your TA.

We will work with you to help you develop methods to ensure that your groups work together effectively. If you do not pull your weight in a group project you will lose points. **Your group must come up and sign a contract stating expectations for participation, who will do what, and what will happen should you fail to meet your obligations.**

## ***Possible Research Questions***

You will initially be tempted to carve out too big a project. A good project will consist of ONE carefully defined and delimited question, a set of alternative hypotheses that might explain this pattern, predictions that follow from the hypotheses and appropriate data for the evaluation of your hypotheses. One way of coming up with a project is to think of questions that you might have had while we were doing other labs. You should pick something fairly near Missoula. Also, stick with a project for which your group has appropriate natural history expertise. For example, do not look at the effects of spotted knapweed on native plant diversity if no one in your group can identify plants. Let your TA know if you need equipment for your project. To help you get started, I have listed below some ideas that would be appropriate:

- 1) Associations between some plants and rock slides on Mount Sentinel. Some plants on Mount Sentinel seem to be found almost exclusively near rock slides. Is this association real? If it is, what may cause the association?
- 2) Species distribution and abundance in clear cuts versus burns. Are clear cuts ecologically similar to burned forests? Pick a group of organisms (e.g. lichens, beetles under rocks, ground cover, etc.) and compare the patterns of diversity in clear cuts versus burned areas. *Note: If you choose this topic, it is especially important that you talk to your TA about experimental design. For example, you will have to pair sampling areas so that they are similar in elevation, exposure, and time since the disturbance, etc.*
- 3) Ant foraging and ecology. One local species of ant (*Formica rufa*) builds a very prominent mound nest. How far from the nest do these ants forage? What do they forage on? What quantity of food does a nest harvest a day? What might be the ecological impact of these ants on the surrounding vegetation? How does weather influence the activity patterns of the ants? What is the function of the mound? **THERE ARE MANY PROJECTS IN HERE! DON'T ATTEMPT ALL OF THIS.**
- 4) Leaf decomposition. What controls the rate at which different leaf species decompose? Do different species decompose at different rates in streams? Does temperature matter? Is most of the decomposition done by insects or fungi and bacteria? Once again, there are lots of questions here. If you choose this, I may be able to provide you with leaves.

These are just a few ideas to give you some ideas about the sorts of questions that would be reasonable. However, we ENCOURAGE you to come up with your own research ideas. This is a chance to use your imagination and investigate something that excites you.

## ***Miscellaneous***

- NO projects involving handling of vertebrates are allowed. This is because the permits required through the university are too difficult to get for this activity.
- Projects that involve observations or handling of any animals require that you fill out a research application through IACUC (Institutional Animal Care and Use Committee).

## **ACADEMIC HONESTY, INTEGRITY & CLASS CONDUCT**

Ecology is a collaborative science. We want you to discuss ideas and concepts with your classmates. You should feel free to work with one another to figure out *how* to solve a problem, interpret some data, or make sense of a reading assignment. Study groups are great ways to prepare for exams. When it comes time to put pen to paper, however, the time for collaboration is over. *You must write your own assignments.* You are welcome, of course, to get help with your writing. We encourage you to ask friends to proofread your assignments or to solicit help from The University of Montana Writing Center (<http://www.umt.edu/writingcenter/>). That being said you must not represent other people's work as your own!

**Academic misconduct.** Academic misconduct will be reported and dealt with as described in The University of Montana Student Conduct Code. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University; for further information see: <http://www.umt.edu/student-affairs/community-standards/default.php>

## ADDITIONAL NOTES

**Mobile Phones.** The use of mobile phones to talk, text, surf the web, play games, etc. is both rude and disruptive. Students caught using their phone for any reason may be dismissed from the lab.

**Email Policy.** In the words of Mark Hebblewhite: “Email is perhaps the world’s most banal form of communication, except text-messaging, which seems destined to erode any last remnants of skill in writing.” Your emails must be carefully crafted in a professional style, with proper punctuation, spelling, and syntax. Each email must have a clear subject line that identifies the course and topic being addressed (e.g., Subject: BIOE 370 Question about lab report).

**Required Materials.** No textbooks are required for this class. Laboratory handouts and readings will be provided in class and on Moodle. We will use SimUText for one lab, which you should already have for the lecture portion of the course. In the event of needing to switch to an online platform, we will rely more heavily on SimUText materials.

**Grading Option Statement.** Please note, this class is offered for traditional letter grade only, it is not offered under the credit/no credit option.

**Accessibility Statement.** The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, [ode@umontana.edu](mailto:ode@umontana.edu), or visit [www.umt.edu/disability](http://www.umt.edu/disability) for more information. Retroactive accommodation requests will not be honored, so please, do not delay. As your instructor, I will work with you and the ODE to implement an effective accommodation, and you are welcome to contact me privately if you wish.

**COVID Statement.** Mask use is required within the laboratory. If you feel sick and/or are exhibiting COVID-19 symptoms, please don’t come to lab and contact the Curry Health Center at (406) 243-4330. If you are required to isolate or quarantine, you will receive support in the class to ensure continued academic progress. Please notify your TA that you will be unable to attend class ahead of time and we can record the lecture for you. UM recommends students get the COVID-19 vaccine. Please direct your questions or concerns about vaccines to Curry Health Center. Social distancing (maintaining consistent 6 feet between individuals) is not possible in our lab set up, so attendance and seating will be recorded to support contact tracing efforts. Students will be expected to wipe down their area when arriving and leaving the lab and we will have air purifiers running during lab. Drinking liquids and eating food is discouraged within the classroom. Mask use is required in vehicles when traveling to field sites as part of class/fieldwork.

**Course Withdrawal Deadlines Statement.** Important Dates Restricting Opportunities to Drop a Course Fall 2021:

To 7 <sup>th</sup> instructional day	Students can add or drop classes on cyberbear	Day 7: Sept. 8 @5PM
To 15 <sup>th</sup> instructional day	Students can drop classes on cyberbear with refund	Day 15: Sept 20 @5PM
16 <sup>th</sup> to 45 <sup>th</sup> instructional day	Drop requires form with instructor and advisor signature, a \$10 fee from registrar’s office, student will receive a ‘W’.	Day 45: Sept 21 @5PM Nov 1 @5PM
Beginning 46 <sup>th</sup> instructional day	Students are only allowed to drop a class under very limited and unusual circumstances. Not doing well in the class, deciding you are concerned about how the class grade might affect your GPA, deciding you did not want to take the class after all, and similar reasons are not among those limited and unusual circumstances. If you want to drop the class for these sorts of reasons, make sure you do so by the end of the 45 <sup>th</sup> instructional day of the semester.	Nov 2 @5M – Dec 10 @5PM

See: <https://www.umt.edu/registrar/calendar/autumn-2021.php>