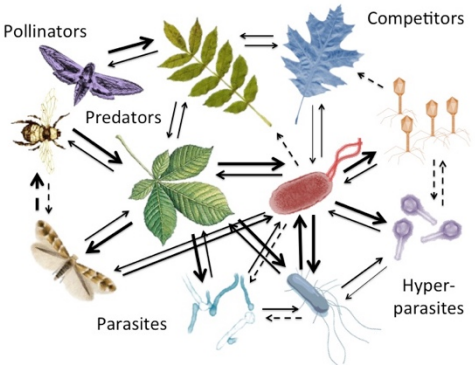
BI 370 General Ecology

CRN: 11350 (Remote)

Fall 2020



Instructor
Tobias Policha tpolicha@uoregon.edu; Office hour: Wednesday 11:45 - 12:45 or by appointment.

Graduate Employees
Sarah Erskine serskine@uoregon.edu; Office hour: Monday 11:45 - 12:45.
Aidan Short ashort2@uoregon.edu; Office hour: Friday 11:00 – 12:00.

All offices hours held at https://uoregon.zoom.us/j/99018551444
THE PASSCODE FOR ALL ZOOM MEETINGS FOR THIS COURSE WILL BE **"370"**

Lecture Sessions: Monday and Wednesday 10:15 - 11:45. https://uoregon.zoom.us/j/99018551444

Lab Session: Thursday 9:30 - 12:00 https://uoregon.zoom.us/j/95220001523 CRN 11351
Lab Session: Thursday 12:30 - 15:00 https://uoregon.zoom.us/j/97504917423 CRN 11352

COURSE OVERVIEW

This is an introductory course focusing on the scientific study of organisms' interactions with abiotic and biotic components of the environment. This course will include general principles of ecology and contemporary applications, as well as methods used in studying ecological interactions. A basic working knowledge of biology and chemistry will be assumed. The prerequisite for this course is Biology 213/283H or the equivalent.

COURSE GOALS

Appreciate the broad biological significance of ecological theory.
Understand the questions that ecologists ask and the methods they use to study them.
Develop your ability to apply quantitative skills to analyze and interpret ecological data.

COURSE OUTCOMES

Students should be able to:

1. Survey key principles of organisms' interactions with abiotic and biotic components of ecosystems.
2. Understand techniques used in studying plant and animal species, communities, and ecological interactions.
3. Apply quantitative reasoning and analysis to biological science problems.
4. Read and critically evaluate primary literature in the field of ecology.
5. Ask questions, test hypotheses, and write reports in the format of a scientific journal.

COURSE FORMAT

Note on remote learning during COVID-19

I know that many of you may not have considered taking an ecology course online prior to this pandemic. I certainly did not ever imagine teaching ecology online prior to this pandemic! The good news is that at this point most of us have some experience with 'remote' courses, and this time we know what we are signing up for. I am planning on encouraging active collaboration and discussion in this course, and encourage everyone, as much as possible, to attend the remote meeting sessions on Zoom. We will work on projects in small groups and discuss material as a class. It is my understanding that we will likely be in this pandemic for a while and that even when it is 'over' the nature of work may be changed forever. As someone that has led international, multi-institution, research endeavors, I can appreciate how some of the remote collaboration skills that we are developing together could be very useful in a variety of post-pandemic applications.

We will obviously not be able to do everything that we would in an in-person lab/field course. But you will still get the same training in understanding ecological systems, asking ecological questions, and analyzing ecological data. We will practice writing and peer review, and a variety of other tasks that ecological scientists routinely engage in. This is still a five credit lab/field class, and **you would do well to budget 10-15 hours a week outside of our class meetings** to fully delve into this material.

As we build virtual community, I urge us all to remember that we did not sign up for this. Not for the sickness, not for the quarantine, not for teaching remotely, not for being forced into taking online classes. We will get through this though, by prioritizing each other as human beings, by prioritizing simple solutions that work for the most people, and by sharing resources and communicating clearly. We will remain flexible and adjust to the situation as needed. **Everyone needs support and understanding** in this unprecedented moment.

I want you to know that **I stand in firm solidarity with those that are demanding social justice**. I realize that current events are impacting each of you in unique ways, some of which may be difficult for others to understand. I am doing my best to encourage inclusivity and understanding around the unique issues faced by our black students and other students of color, and **I encourage all of us to extend an extra measure of kindness and care to each other** over the coming weeks and months as we collectively seek a more unified community.

Most recent in the litany of insults delivered by 2020 are the climate-driven wildfires ravaging much of the west coast. This has had a direct impact on many members of the UO community. My family and I are safe, but we have several friends that were evacuated and have lost belongings and homes. Please let me know if you have been impacted or continue to be impacted by these events.

In light of everything, I want you to know that I am open to working with you on a range of accommodations to help you feel successful in our upcoming class. Please **contact me early with any anticipated issues**, it will be easier for me to help you if it does not become a last-minute emergency.

Some of the material that we will be covering this term can also be heavy. **Environmental destruction, biodiversity collapse and climate change** are pressing issues that our society must grapple with. So again, a reminder to **be gentle with each other** as we explore some of these issues.

I intend to facilitate a learning experience that will be of value to you in a post-pandemic world. Whether you become an ecologist, or not, I truly believe that the awareness and the skills that we will develop together this term will go a long way toward **promoting a more sustainable and resilient world**, whatever the future holds.

"If there's any good to come of it, I'm trying to think of it as a reminder that despite our illusions of human exceptionalism, natural processes are still in charge, and (of) the importance of our collective responsibilities toward one another."
- Robin Wall Kimmerer on the COVID-19 pandemic

Lectures (Monday and Wednesday 10:15-11:45 https://uoregon.zoom.us/j/99018551444)
These live sessions will be a chance to interact with your classmates and course staff. We will cover course content through lecture, discussion, videos, problem solving, and other activities. You should do the assigned readings before coming to the lectures. During many of the lectures there will be activities that will help you to learn difficult concepts; these will often be done collaboratively with three or four students discussing the problem together for a few minutes before discussing the problem as a whole class. Some of these activities will contribute to your overall course grade. Your active participation in lecture will help you to better understand the material and prepare you for the final exam. If you cannot attend a lecture session for whatever reason, there will be a recording posted to Canvas that you can access, and you will have an opportunity to complete the graded activities on your own.

Lab [Thursday 9:30 - 12:00 (CRN 11351) https://uoregon.zoom.us/j/95220001523 or 12:30 - 15:00 (CRN 11352) https://uoregon.zoom.us/j/97504917423]
We consider the labs to be an integral part of the course. We have tried to design active learning experiences that will broaden your understanding of what the science of ecology is all about. Lab handouts will be available on Canvas and should be read before coming to lab. Lab handouts will usually be turned in at the end of each lab day. You should plan to attend the lab section that you are registered for. You will be randomly assigned to a 'Lab Group' with which you will work on certain projects together. Most labs will include the submission of a formal lab report. **We will have one activity this term that will be offered in-person.** We will collect distribution data on bryophytes and lichens in the Pioneer Cemetery on the UO campus for a research paper that we will work on throughout the term (more info on Canvas). We will only take half of each lab section at time to ensure appropriate distancing. **Half the lab will meet on October 8th and the other half will meet on October 15th**. We will pool all of our data as a class for analysis. The other half of the class will have a different assignment to complete during the week that they are not in the field. ***Some labs will require you to procure your own supplies, material lists will be made available well in advance.***

COURSE MATERIALS

Textbooks a may be purchased through UODuckStore.com; print materials will be shipped free to UO students.

Textbook
Bowman, W., S. Hacker, M. Cain. 2017. Ecology 4th Edition. Sinauer Associates, Sunderland, MA. The readings include background material useful for preparing for lecture and for studying for quizzes. A

good strategy would be to skim over the entire chapter first, concentrating on the major concepts, then to re-read more carefully for details. Currently, the course is set up to follow the 4th edition. There is a new 5th edition that you are welcome to use as well. However, **if you would like to save some money, students have been successful in the past using the 3rd or even the 2nd editions**. I will not typically ask you to recall specific details from the text, but we will use it as a general reference throughout the course. I will assign the chapters as they appear in the 4th edition but will also give guidance as to the topics in the 3rd and 5th editions.

We will be reading other things this term as well, scientific papers, book chapters, and news articles. These additional materials will be available on Canvas under the Module for the week that they are assigned.

REQUIRED TECHNOLOGY

It is expected that you will have access to a computing device that will allow you regular access and use of the following technologies.

Access to Canvas. We will be using Canvas daily for content delivery, communication and assessment. If you have questions or concerns about accessing and using Canvas, visit the Canvas support page. Canvas and Technology Support also is available by phone or live chat: 6 a.m.–12 a.m. 541-346-4357 livehelp.uoregon.edu

Access to Zoom. We will have three live Zoom sessions each week. It will be very useful for you to learn how to navigate this technology. Please plan to either have your video turned on when you join Zoom, or post a photo as an avatar.

Join our Slack workspace to facilitate real-time and asynchronous communication and collaboration. Slack was designed for business communications, not FERPA compliance, communication about sensitive student information, including grades and personal information, should take place on another platform.

An iNaturalist account and a camera (phone ok). You will be responsible for contributing 20 observations to our course project.

Google Sheets and Google Docs will be used for collaboration.

Excel and R will be used for data analysis in lab and for the research paper. (Google sheets, or other spreadsheet program may be used if necessary.) Details will be included in the lab handouts on Canvas.

Ability to run a SimUText simulation for Lab #6. Requires access to a Mac or Windows based computer. If you do not have access to a machine that will work, contact us early to arrange for virtual access. *There is no fee for the module that we will be using.*

A camera (phone ok) or a scanner to submit lab drawings and field book sketches.

If you have issues accessing the Internet: companies are offering free access during this challenging time. To learn more about options visit Information Services' web page on going remote.

ASSESSMENTS

(In approximate chronological order)

To allow you some flexibility and predictability, all assignments will be due at midnight on Sunday of the week they are listed. Exceptions to this are the Daily Reading Quizzes (due on the days listed), the Final Exam (due at the time determined by the Registrar, and the Research Proposal (due at the Final).

'MENTAL HEALTH OPT-OUT' POLICY

*Due to the unprecedented nature of our times (pandemic, social unrest, economic challenges, wildfire impacts) I am offering everyone **the option to not do ONE assignment, of your choosing**. Couldn't do a*

reading quiz? No problem. Don't want to take the final exam? No worries. Thinking about the realities of climate change too overwhelming? Don't do the lab. If you need a break, take a break. ***Students MUST communicate to me that you are opting out of an assignment BY THE DUE DATE, in order to not receive a zero for that assignment.*** *I don't need to know why, just that you are opting out. Keep in mind that any assignments that you opt out of will not count toward your final grade. You will effectively get graded on fewer things and therefore the assignments that you do complete will have more weight than what is listed in the syllabus. This is a different concept than 'dropping your lowest score'.*

Pre-Course Survey

This short survey is designed for me to get to know a little bit about you, your background, and any special opportunities or potential challenges that your unique situation may present during this course.

Discussion Posts

You will be required to post to a course-wide discussion board at ten specific points in the term. You will also be required to respond to someone else's post (for all discussions). This will hopefully lead to the kind of intellectual interactions that would normally take place in a physical classroom.

Daily Reading Quizzes (DRQs)

Daily **R**eading **Q**uizzes are intended to keep you up-to-date and on track with the course materials. All readings are included on the Course Schedule, although this may be subject to change. These quizzes will be untimed. You are welcome to discuss your ideas with other students, but you should do your own work and not simply get answers from someone else. Because these readings are intended to prepare you for the day's activities, these quizzes are due in the morning on the days listed. *Your lowest three scores will be dropped.*

Lecture Activities

During many of the lectures there will be activities that will help you to learn difficult concepts; these will often be done collaboratively with three or four students working together. Some of these activities will contribute to your overall course grade. If you cannot attend a lecture session for whatever reason you will have an opportunity to complete the graded activities on your own.

Lab Reports

Many of the lab activities that we will engage in this term will be inherently self-directed. As a way to ensure your active participation and to practice the skill of science writing, you will be responsible for completing formal lab reports for several of our activities. Details will vary week-to-week, but will be included in the lab handouts.

iNaturalist

As a way to get you out and observing nature on your own, you will be responsible for making and posting observations (safety permitting) to the iNaturalist citizen science platform. Further details will be available in the Assignments section of Canvas.

Zooniverse Service-Learning

Zooniverse is the world's largest platform for people-powered research. This research is made possible by volunteers like you. By contributing to a research project (of your choosing) on Zooniverse you will make a tangible contribution to real-life research even in this time of physical distancing. Start browsing potential projects here: https://www.zooniverse.org/projects. More details will be available on Canvas.

Field Journals
Most weeks you will required to spend at least one hour outside (safety permitting) making observations of ecology. You will make notes and sketches, ask questions and develop hypotheses. You will submit electronic copies of your work. Further details will be available in the Assignments section of Canvas.

Research Paper
You will develop a hypothesis, collect data and write an original research paper this term. We will collect data as a class during weeks two and three and work on the initial analysis together in Lab during week four. You will be responsible for writing up your methods and results as well as an introduction and discussion based on your review of the relevant literature. This project will be introduced in class and more details including a rubric will be posted to Canvas.

Research Proposal
You will choose a study system, develop a hypothesis, and write an original research proposal this term. This project will be introduced in class and more details including a rubric will be posted to Canvas.

Peer Reviews
Both the research paper and the research proposal will include a peer-review element. This will give you insight into how the scientific process works, give you experience critically evaluating science, and elevate the overall quality of the course projects. more details will be posted to Canvas.

Final Exam
There will only be one exam in this course and it will cover material from the readings, lectures and labs. It is relatively low-stakes in terms of weight within the course, but will encourage you to consider the course experience in its entirety. The final must be taken on the day and time it is listed in the schedule.

ASSESSMENT (ranked by total value)	Each worth	Number	Total Points
Lab Reports	30pts	6	180
DRQs	5 pts	25/28	125
Research Paper	100 pts	1	100
Research Proposal	100 pts	1	100
Lecture Activities	10 pts	10	100
Field Journals	10 pts	8	80
iNaturalist Observations	4 pts	20	80
Final Exam	75 pts	1	75
Discussion Posts	5 pts	10	50
Peer Review	25 pts	2	50
'Zooniverse' service learning	50 pts	1	50
Pre/Post-Surveys	5 pts	2	10
		TOTAL	**1000**

SCHEDULE

WEEK	DATE		TOPIC	READING	QUIZZES (DUE AT 9:30am on the day listed)	ASSIGNMENT (DUE AT 11:59pm on Sundays, unless otherwise noted)
1	9/30	1	The Web of Life	Ch. 1; 'What does Ecology have to do with me?'	1	Pre-course Survey; Discussion Post 1; Lab Group Name
1	**10/1**		**LAB 1: Set up Winogradsky Columns [REPORT]**	**Lab Handout**	**2**	**iNat user name due; Lab Report 1**
2	10/5	2	Organisms and their Environment	Ch. 2-3	3	Discussion Post 2
2	10/7	3	Coping with Environmental Variation	Ch. 4 – 5; Kimmerer 2003 pp. 35-43.	4	Zooniverse project selection (DUE today)
2	**10/8**		**LAB 2: Data Collection: Cemetery [or 'Zooniverse' service learning (½ the group meets on campus)]**	**Lab Handouts; USGS FS-154-02; Smullen 2016**	**5**	**Field Book 1**
3	10/12	4	Traditional Ecological Knowledge (in honor of Indigenous Peoples Day)	Kimmerer 2013 pp. 4-10	6	Discussion Post 3
3	10/14	5	Population Distribution and Abundance	Ch. 9	7	
3	**10/15**		**LAB 3: Data Collection: Cemetery [or 'Zooniverse' service learning (½ the group meets on campus)]**	**Kimmerer 2003 pp. 44-61.**	**8**	**Field Book 2**
4	10/19	6	Data collection debrief	Turbek etal 2016	9	Discussion Post 4
4	10/21	7	Population Growth, Regulation, and Dynamics	Ch. 10-11	10	
4	**10/22**		**LAB 4: Data Analysis: Cemetery [REPORT]**	**Lab Handout; McDonald 2014 (pp. 3-28, 101-119, 127-131, 191-206)**	**11**	**Lab Report 2; Field Book 3**
5	10/26	8	Mutualism	Ch. 15	12	Discussion Post 5
5	10/28	9	Behavior	Ch. 8	13	
	10/29		**LAB 5: Squirrel Behavior [REPORT]**	**Lab Handout**	**14**	**Paper draft; Field Book 4**
6	11/2	10	Competition	Ch. 14	15	Discussion Post 6
6	11/4	11	Predation & Parasitism	Ch. 12-13; Morens & Fauci 2020; Others TBA	16	

6	**11/5**		**LAB 6: How Diseases Spread - Exploring Epidemiology [REPORT w/in software]**	**Lab Handout**	**17**	**Peer review; Lab Report 3; Field Book 5**
7	11/9	12	Communities: Structure and Dynamics	Ch. 16-17	18	Discussion Post 7
7	11/11	13	Community Dynamics con'd	TBA	19	
7	**11/12**		**LAB 7: Phenology [REPORT]**	**Lab Handout**	**20**	**Lab Report 4; Field Book 6; Paper**
8	11/16	14	Evolutionary Ecology	Ch. 6-7; Raguso 2020	21	Discussion Post 8
8	11/18	15	Biodiversity	Ch. 18-19	22	
8	**11/19**		**LAB 8: Open Data: How climate will impact plant-insect distributions [REPORT]**	**Lab Handout**	**23**	**Proposal draft; Lab Report 5; Field Book 7**
9	11/23	16	Energy Flow and Capture	Ch. 20 & 21	24	Discussion Post 9
9	11/25	17	Nutrients	Ch. 22	25	
9	**11/26**		**NO LAB (Thanksgiving)**			Peer Review
10	11/30	18	Conservation	Ch. 23-24	26	Discussion Post 10
10	12/2	19	Global Ecology	Ch. 25	27	
10	**12/3**		**LAB 9: Winogradsky Columns Revisited [Presentations]**	**Lab Handout**	**28**	**Lab Report 6; Field Book 8;**
Finals Week	**12/8**		**Final Exam: December 8, 10:15 AM**	**Enjoy the break!**		**Research Proposal**

ON (OR OFF) CAMPUS RESOURCES

Accessible Education Center (AEC)

The University of Oregon is working to create inclusive learning environments. If there are aspects of the instruction or design of this course that result in barriers to your participation, please notify us as soon as possible. You are also encouraged to contact the Accessible Education Center. If you are not a student with a documented disability, but you would like for us to know about class issues that will impact your ability to learn, contact us so that we can strategize how you can get the most out of this course.

In order to promote social distancing to limit the spread of COVID-19, the Accessible Education Center is currently operating remotely. They are available Monday-Friday 8am-5pm by calling (541) 346-1155 or emailing uoaec@uoregon.edu. Appointments can be made by calling, emailing, or completing our online scheduling form.

Appointments are available by **phone or by computer/smartphone using** Microsoft Teams**. Teams is free to the UO community.** For more information, please visit the UO Teams Download Instructions**. Support will also be available through email and a text-based chat window.**

Center for Multicultural Academic Excellence (CMAE)

Promoting student retention and persistence for historically underrepresented and underserved populations. Programs and services that support retention, academic excellence, and success at the UO

and beyond. Committed to all students, including undocumented and tuition equity students. cmae@uoregon.edu.

All CMAE advising services will be offered remotely. If you are feeling uncertain or unsure regarding fall term, please connect with us, we are still here providing you support. **To schedule an appointment,** log into Navigate with your Duck ID: http://uo.campus.eab.com or call the front desk at 541-346-3479. You can also access the CMAE Advising Helpdesk live Chat Monday-Friday from 10am-12pm & 1pm-4pm.

Counseling Center

The Counseling Center provides students with confidential consultation 24 hours a day, 7 days a week. Their number is 346-3227. Students often believe that their issues are not "severe" enough for them to call, but at the Counseling Center, no problem is too small. https://counseling.uoregon.edu/.

If you're unable or don't wish to come to the Counseling Center in person, help is still available. Our after-hours support/crisis line is open to all students, wherever you are located. Call 541-346-3227 when the Counseling Center is closed to speak to a therapist. Counseling Center staff can help you figure out how to find mental health services in your area. Call 541-346-3227 during business hours to schedule a consultation with a case manager. We are working to provide telemental health (video) sessions to students physically located in Oregon and California soon. Updates will be posted to this website when available, or call for more information.

COURSE POLICIES

Academic Integrity

All students are expected to complete assignments in a manner consistent with academic integrity. Students must produce their own work and properly acknowledge and document all sources. Students can find more complete information about the University of Oregon's Policy on Academic Dishonesty in the student conduct code (located at dos.uoregon.edu/conduct).

Inclusiveness

Open inquiry, freedom of expression, and respect for difference are fundamental to a comprehensive and dynamic education. We are committed to upholding these ideals by encouraging the exploration, engagement, and expression of divergent perspectives and diverse identities.

Communication

In general, our class will communicate through our Canvas site. Announcements and emails are archived there and automatically forwarded to your UO email, and can even reach you by text. Check and adjust your settings under Account > Notifications. I will have a running Discussion forum on our Canvas site called "Question Board" for the entire group to ask and answer any questions related to the course.

I will try to make myself as available as possible for questions related to course material. However, I also ask that you pose questions to fellow students as well, you can do this through Canvas. If it pertains to course administration, **double-check the syllabus and Canvas.** If you email after regular business hours you may not hear back from me until the next day. ***Please include "BI 370" in the subject line of all emails.*** We will also be using Slack in class to help facilitate communication and collaboration during our Zoom sessions. This workspace will also be available for general communication throughout the term. If you contact me with a question, I will try to respond within one business day. I typically provide feedback on assignments within one week.

Prohibited Discrimination and Harassment

UO is committed to providing an environment free of all forms of prohibited discrimination and harassment, including sex or gender based violence. As an instructor, one of my responsibilities is to help create a safe learning environment for my students and for the campus as a whole. Students experiencing any form of prohibited discrimination or harassment may seek further information on safe.uoregon.edu, respect.uoregon.edu, titleix.uoregon.edu, or aaeo.uoregon.edu or contact the Title IX office (541-346-8136), Office of Civil Rights Compliance office (541-346-3123), or Dean of Students offices (541-346-3216), or call the 24-7 hotline 541-346-SAFE for help.

"Any good poet, in our age at least, must begin with the scientific view of the world;
and any scientist worth listening to must be something of a poet."

- Edward Abbey

First page images from: https://www.fotoaparat.cz/storage/pm/11/01/29/753960_2c422.jpg and https://naturesmicrocosm.com/tag/coevolution/ .