

# LECTURE SYLLABUS FOR BI 210: PRINCIPLES OF ECOLOGY

## Lecture (West Science 2904) Winter 2020

**INSTRUCTOR:** Dr. Diana Lafferty  
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**OFFICE HOURS:** Mon. 8-9, 11-12, 2-4, Tu. 8-10, Wed. 9-10, or by appointment

**DIVERSITY AND INCLUSION:** I want to acknowledge that we are on the ancestral homelands of the Anishinaabe Nation and that the Anishinaabe people are among the First Peoples of the Great Lakes. In addition, I believe the diversity all students bring to my classroom is a resource, strength, and benefit to our shared pursuit of scientific knowledge. My goal is that the learning needs of students from all backgrounds and perspectives will be well served in my classroom and that all students in my class are supportive and respectful of the diversity represented here: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, culture, immigration status and religion. Further, I believe that all people have the right to be addressed and referred to in accordance with their personal identity. As such, please let me know the name you prefer to be called as well as your preferred pronouns and I will do my best to refer to all students accordingly and support your fellow classmates in doing so as well. If my academic schedule conflicts with any of your religious events, let me know so that I can make arrangements for you to not miss out important activities and assignments. Please let me know if/how I can make you feel more welcome, valued and supported in our shared pursuit of ecological knowledge.

Sincerely, Dr. Lafferty

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### COURSE REREQUISITES: BI 111, BI 112

**COURSE OBJECTIVES (LECTURE):** The objectives of this course are to (1) provide an overview of the principles of ecology including ecological perspectives across different biological levels of organization ranging from individuals to populations to communities to whole ecosystems [including the role of humans in ecosystem processes] and (2) provide an understanding of the scientific process and methodologies used to study ecology, broadly.

**COURSE OBJECTIVES (LAB):** The laboratory portion of the class will introduce students to the natural history of local plants and animals, provide opportunities for students to observe ecological concepts and processes in the lab and field, and engage students in ecological inquiry via the scientific method.

**OVERARCHING LEARN GOAL:** Students will be able to identify, investigate and understand the interactions between organisms and their environment

**EXPECTED OUTCOMES:** Students should be able to:

- Recognize hierarchical levels of biological organization and that interactions of ecological systems occur at different scales.
- Explain how organisms are adapted to their physical and biological environments.
- Describe the linkages and feedbacks between evolution and ecological interactions and the evidence for these relationships.
- Describe patterns of population growth both qualitatively and quantitatively.
- Explain how populations and communities are maintained, how they interact with each other and their abiotic environment, as well as the factors influencing populations and communities over variable time scales.
- Identify different classes of community-level interactions among organisms and explain how these interactions might influence species co-existence.
- Explain how anthropogenic alterations of the biosphere can cause significant changes in ecosystems and influence the future of human-kind.
- Communicate a basic understanding of the role specific nutrients (e.g., N) play in the structure of ecosystems and the distribution and abundance of populations.
- Calculate basic biodiversity metrics and interpret differences in biodiversity patterns among locations.
- Demonstrate an understanding of the role of primary scientific/ecological literature and be able to interpret research findings.
- Collect, manipulate, analyze, interpret and present ecological data.
- Describe the nature of ecology, demonstrate an ability to ask ecological questions, state testable hypotheses, and describe experimental design.
- Perform the scientific method and to be able to judge the strength of scientific evidence.

**\*\*Assessment of outcomes will be based on student performance on exams, lab activities/assignments, out-of-class assignments/preparations, and i>Clicker activities\*\***

**TEXTBOOK:** Cain, M. L., W. D. Bowman and S. D. Hacker. 2017. Ecology. **Fourth edition.** Sinauer Associates, Inc, Sunderland, Massachusetts. USA.

**CLICKER:** You must have an i>Clicker to participate in the clicker questions in this class as well as for some of the in-class activities, which will be graded. If you miss class for a university-approved reason, you have 1 week (7 days) to make up missed i>Clicker questions during my office hours or during a mutually agreed upon appointment time.

**ATTENDANCE:** Attendance at lectures is **expected** and students must get to class on time. Exam questions will be drawn from lecture material, the textbook, classroom preparation assignments, and i>Clicker questions as well as assigned readings from the primary literature. Students are responsible for all information covered during the lecture period, including announcements regarding the course (e.g. schedule changes, test content, etc.). If you miss a lecture, please consult with a classmate to get their notes. Attendance is **required** for scheduled labs. One absence from a lab or field trip will be permitted without penalty but you are still responsible for the material covered (ask a classmate). For each additional absence, **5 points will be subtracted** from your lab grade at the end of the semester. Attendance at examinations is required and you must be on time for exams. It is the student's responsibility to know when an examination is scheduled (see syllabus schedule). Exams will be given as scheduled unless a change is announced at least one week in advance. If an exam is postponed because of the university closing for weather, it will be given in the next scheduled period.

Students who miss an exam (lab or lecture) for a valid reason should notify the instructor as soon as possible, preferably before the exam, so that arrangements can be made for a make-up test. Do not hesitate to use the telephone or email to do this. If an absence from a test is unexcused, a grade of '0' will be recorded. Examples of valid excuses for absence are: severe illness, surgery, death in the family, or travel related to university functions. Excuses will be verified. Make-up exams will consist of fill-in-the-blank, short essay, multiple-choice questions, or a combination of these formats at the instructor's discretion. Similarly, without a valid excuse (as listed above) late assignments will not be accepted and a grade of '0' will be recorded.

**GRADING:** The final course grade will be based upon the following graded materials:

	<u>Points possible</u>
Lecture examination 1	50
Lecture examination 2	50
Lecture examination 3	50
Chapter review assignments (5 pts. each)	50
<u>In-class activities/i&gt;Clicker questions (variable pts.)</u>	<u>50</u>
<b>Lecture Points</b>	<b>250</b>
<u>Lab Points</u>	<u>200</u>
<b>Total Points</b>	<b>450</b>

The following scale will be used:

A	> 93%
A-	90% to 92%
B+	87% to 89%
B	83% to 86%
B-	80% to 82%
C+	77% to 79%
C	73% to 76%
C-	70% to 72%
D+	67% to 69%
D	63% to 66%
D-	60% to 62%
F	59% or <

I reserve the right to adjust the distribution of grades *if* the distribution of scores warrants a change. Any adjustment will always be in favor of the student. There are no extra credit assignments/points possible in this class – please don't ask. Please do not ask me to raise your grade because you are a few points below the next grade level. I will not do that.

You can determine your approximate grade in the course at any time using:  $(\text{points earned to date} \div \text{points possible to date}) \times 100$ , and comparing the result with the percentages for the grades shown to the left.

Please review all graded work within 1-week. Any errors in grading will only be adjusted if the issues is brought to my attention within 7 days (1 week) of the graded work being made available for student review. After the 7-day period, no adjustments to grades will be made.

Tentative Lecture Schedule – Winter 2020

	Lecture Schedule	Chapter Review Due	Lab Schedule
Week 1 1/13-1/17	Ch 1 Web of Life		Lab Orientation & Library Exercise
	Ch 1 Web of Life		
	Ch 16 Nature of Communities	1	
Week 2 1/20-1/24	<b>Martin Luther King Jr. Day</b>		<b>No Lab This Week</b>
	Ch. 16 Nature of Communities		
	Ch. 17 Change in Communities	16	
Week 3 1/27-1/31	Ch. 17 Change in Communities		Jigsaw
	Ch. 19 Species Diversity in Communities		
	Ch. 19 Species Diversity in Communities	17,19	
Week 4 2/3-2/7	Ch. 4 Coping with Variation: Temp./Water		Intro to Zooniverse & animal ID
	Ch. 4 Coping with Variation: Temp./Water		
	Ch. 5 Coping with Variation: Energy	4,5	
Week 5 2/10-2/14	Ch. 5 Coping with Variation: Energy		*Camera trapping technique & interpretive ecology
	<b>LECTURE EXAM 1</b>		
	<b>Flexible day</b>		
Week 6 2/17-2/21	Ch. 6 Evolution & Ecology		Imagery classification & statistical analysis
	Ch. 6 Evolution & Ecology		
	Ch. 7 Life History	6,7	
Week 7 2/24-2/28	Ch. 7 Life History		<b>LAB EXAM I</b>
	Ch. 9 Population Distribution & Abundance		
	Ch. 9 Population Distribution & Abundance	9	
Week 8 3/2-3/6	<i>Mid-semester Break</i>		
Week 9 3/9-3/11	Ch. 10 Population Growth & Regulation		*Tree ID
	Ch. 10 Population Growth & Regulation		
	Ch. 10 Population Growth & Regulation	10	
Week 10 3/16-3/20	Ch. 11 Population Dynamics		*Forest sampling
	Ch. 11 Population Dynamics		
	Ch. 11 Population Dynamics	11	
Week 11 3/23-3/27	<b>Flexible day</b>		Quantitative analysis
	<b>EXAM 2</b>		
	Ch. 12 Predation		
Week 12 3/30-4/3	Ch. 12 Predation		*Map & compass
	Ch. 13 Parasitism		
	Ch. 13 Parasitism	12,13	
Week 13 4/6-4/10	Ch. 14 Competition		*Stream ecology & assessment (or Winter ecology)
	Ch. 14 Competition		
	<b>Flexible day</b>	14	
Week 14 4/13-4/17	Ch. 20 Production		*Bog ecology (or Road salt)
	Ch. 20 Production		
	Ch. 22 Nutrient Supply & Cycling	20,22	
Week 15 4/20-4/24	Ch. 22 Nutrient Supply & Cycling		<b>LAB EXAM 2</b>
	Ch. 25 Global Ecology		
	Ch. 25 Global Ecology	25	
Week 16 4/27-5/1	<b>LECTURE EXAM 3 (FINAL EXAM) 10:00 AM Thursday, April 30<sup>th</sup>, 2020</b>		

\*Field Lab

**REQUIRED SAFETY TRAINING:** You must complete the Biology Department's Online Safety Training to participate in the laboratory section of this course. The training can be accessed via EduCat. The required modules for BI 210 are the General Module and the Field Module. Both modules must be completed in order to attend lab after the first week of the semester.

**APPROPRIATE TECHNOLOGY USE:** During class, computers are to be used for activities related to this course (e.g. taking notes) only. It will be in your best interest to use your NMU issued laptop for lab activities rather than a personal computer. Do not use computers/cell phones for entertainment, email, unrelated homework, looking at memes, etc. Please turn cell phones on silent while you are in class. That being said, you are permitted to use your phone to take photos of specimens during class and in the field. However, if you are noticeably using your phone for other purposes and not engaging in the ongoing activity, this privilege will be lost and you will be asked to turn your phone off in class. Feel free to notify me if other students are bothering you during class.

**ACADEMIC INTEGRITY:** Do not cheat! Although you may be encouraged to work together in-class or out-of-class occasionally, and you may give or receive consulting help to/from each other at specified times designated by myself, you must complete your own work or not tell others your answers to questions on assignments, quizzes, exams, etc., which you are supposed to complete independently. All the work you submit must be your own. The minimum penalty for cheating or plagiarizing on any assignment or exam will be a zero grade for that exercise. If you are caught cheating on a second assignment you will be given a grade of 'F' for this course. Do not cheat!

**INDIVIDUAL CONSULTATION:** If you have difficulty understanding the material or have questions or concerns about any portion of this course, please feel free to see the instructor. If my office hours are not convenient, arrangements will be made to see you at another time.

**NMU'S NON-DISCRIMINATION STATEMENT:** Northern Michigan University does not unlawfully discriminate on the basis of race, color, religion, sex, national origin, age, height, weight, marital status, familial status, handicap/disability, sexual orientation, or veteran status in employment or the provision of services, and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities an equal opportunity to participate in all programs and activities. Anyone having civil rights inquiries may contact the Equal Opportunity Office, 158 Services Building 502, phone number (906) 227-2420.

**DISABILITY SERVICES:** If you have a need for disability-related accommodations or services, please inform the Coordinator of Disability Services in the Dean of Students Office at 2001 C. B. Hedgecock Building, phone number (906) 227-1700. Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation, in accordance with federal, state, and university guidelines.