

BIOLOGY/ENVIRONMENTAL STUDIES 2210 FDE — INTRODUCTORY ECOLOGY

Lectures: Tuesday and Thursday 5:30 – 7:00 pm (online via Zoom)

2020 Outline

Labs: FD4: W, 8:30 – 11:30 am FD5: W, 2:30 – 5:30 pm
FD6: TH, 8:30 – 11:30 am FD7: TH, 2:30 – 5:30 pm
FD8: F, 8:30 – 11:30 am (all labs will be online via Zoom)

Instructor: Dr. Stephen Hecnar
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Website: <http://shecnar.lakeheadu.ca/>

Office: CB 4039 Phone: 343-8250
Office Hours: There will not be any in person face-to-face office hours in Fall 2020. I will remain on Zoom after lectures end to answer questions and then monitor my Lakehead email account (not D2L email) until 8:00 pm.

Lab Technician: Dan Brazeau M.Sc., Office CB 3020A, Phone: 343-8593, Email: dbrazeau@lakeheadu.ca
Office hours by appointment, and time will be made available for discussion at the end of most labs.

*****Course delivery for Fall 2020:** Because of the pandemic situation all lectures, labs, assignments, quizzes and exams will be delivered remotely online through the D2L website for the course. It is ironic that the course that focuses most closely on how nature works has to be offered in such an unnatural way but it is best for all of our health and accessibility needs at this point in time. One benefit of taking the course is that if you become familiar with fundamental ecological principles that will help you gain a better understanding of how pathogens evolve, spread, and need to be managed.

Lectures will be provided ‘synchronously’ with the time assigned above for the course. The schedule and links to join lectures and labs can be accessed via the calendar link on the D2L website for the course. Lectures will be recorded and available for a limited time on the D2L website for the course. Detailed PowerPoint lecture slides can be accessed and downloaded from the D2L website for the course. During the scheduled time slot the instructor will provide a live lecture using the Zoom link on the D2L website for the course. The instructor will use the share screen function so that students can view the slides as the live audio lecture is given. There will be an opportunity to ask questions during the lecture using the raise hand function (clicking “participants” on control bar then “raise hand” on the pop up window). The midterm and final exam will also be given on a specific date and time through the ‘Quiz’ link on the D2L main page for the course. If you have special needs for the course please contact Student Accessibility Services (SAS) who coordinate arrangements.***

Course Description: Interrelationships of plants and animals with the environment. The distribution and dynamics of plant and animal communities. Aspects of applied ecology and conservation.

Goal of the Course: To develop a basic understanding of fundamental ecological concepts. Having a solid foundation in ecology will help those seeking careers in academia, teaching, environmentally related employment, or those taking virtually any other path in life. Studying ecology is both interesting and challenging in its own right because of the complexity of nature. However, understanding basic ecology is also important for utilitarian reasons. All living organisms (including humans) are completely dependent upon the ecosystems in which they occur. Because the amount of energy or resources that sustains life is limited, actions of organisms can affect other organisms and how ecosystems function. The most important problems affecting biodiversity and human society are ecological in nature. Understanding the basic fundamental principles of ecology is thus essential for making informed decisions to solve these problems.

Required Text: Relyea, R. and R.E. Ricklefs. 2018. Ecology: The Economy of Nature, 8th edition, Freeman MacMillan, ISBN: 978 1319 188955 (ebook), or 978 1319 282684 (paperback). Reading the text provides a more detailed background and understanding of the concepts covered in lectures. A variety of options are available for purchasing the textbook (hardcopy, looseleaf, Ebook, Ebook with Sapling [additional online materials]) from the LU bookstore. An earlier version of the text will suffice.

Required Manual: The manual has been discontinued for this year and replaced with a series of modules that will complement the zoom labs and videos. All modules are free for download on D2L and will be updated sequentially as labs are completed.

Marking Scheme: Midterm 20%, Lab 40%, Final Exam 40%. See Lab 1 Module on D2L for details on lab marks.

Other Information: A Desire2Learn (D2L) website is set up for the course. From this site you can *view and/or download the lecture material as PowerPoint or pdf files*. Downloading these files is for your own personal use as a student taking the course. Do not distribute copies to third parties or post on the internet. ***The materials in the PowerPoint lecture files are copyright protected by the instructor and publisher.*** For organizational purposes, we will closely follow the order of topics as outlined in the chapters of your textbook (Relyea and Ricklefs 2018). The grade you ultimately earn depends on the level of your effort. A formula for success involves attending all lectures and labs, completing all assignments on time, reading your text, making good notes, and spending a sufficient amount of studying. Participating in lectures is important so that you will not miss the review of the basic topics and any additional information and examples that the instructor provides. Exam questions often come from topics covered during poorly attended lectures. If you must miss a test or exam because of illness or other serious circumstance, contact the instructor or lab technician as soon as possible (documentation may be required). Although student microphones will be muted during lectures it is best to avoid unnecessary noise and distractions. A student's microphones will be turned on by the instructor after the raised hand function. **Turn cell phones off during lecture and use your electronic devices for viewing course materials or taking notes, but not for shopping, surfing the web, watching movies or other purposes.**

*****All students are required to be familiar with, and abide by, the Student Code of Conduct and university regulations on academic misconduct. The penalty for plagiarism or any form of cheating on any test, quiz, assignment, midterm or final examination, ranges from a grade of zero "0" on the material in question through zero "0" for the course, to expulsion from the university. Occurrence of academic dishonesty remains on your transcript. This can affect your future in terms of employment or further education. Plagiarism or unauthorized copying is theft of intellectual property and subject to penalties to the full extent of the law.**

Midterm: Thursday 22nd October.

Final Exam: TBA December.

Tentative Lecture Topics Outline:

Background Reading

- 1) Introduction

Chapter 1

Part I Life and the Physical Environment

- 2) The Physical Environment
- 3) Adaptation to the Physical Environment
- 4) Variations in the Physical Environment
- 5) Biological Communities: The Biome Concept

Chapter 2 & 3

Chapter 2 & 3

Chapter 4 & 5

Chapter 6

Part II Organisms

- 6) Evolution and Adaptation Chapter 7
- 7) Life Histories and Evolutionary Fitness Chapter 8
- 8) Sex and Evolution Chapter 9
- 9) Family, Society, and Evolution Chapter 10

Part III Populations

- 10) Population Structures Chapter 11
- 11) Population Growth and Regulation Chapter 12
- 12) Temporal and Spatial Dynamics of Populations Chapter 13
- 13) Population Genetics Chapter 7

Part IV Species Interactions

- 14) Consumer-Resource Interactions Chapter 14 & 15
 Predation, Herbivory, Parasitism, Infectious Disease
- 15) Dynamics of Consumer-Resource Interactions Chapter 15
- 16) Competition Chapter 16
- 17) Coevolution and Mutualism Chapter 17

Part V Communities

- 18) Community Structure Chapter 18
- 19) Succession & Community Development Chapter 19
- 20) Biodiversity Chapter 23
- 21) History and Biogeography Chapter 23

Part VI Ecosystems

- 22) Energy in the Ecosystem Chapter 20
- 23) Pathways of Elements in the Ecosystem Chapter 21
- 24) Nutrient Regeneration in Terrestrial and Aquatic Ecosystems Chapter 21

Part VII Ecological Applications

- 25) The Future of Biodiversity (Landscape Ecology, Extinction, Conservation, Economic development and Global Ecology) Chapter 22 & 23

BIOL/ENST 2210 -A Brief Questionnaire (2020): This is a voluntary anonymous survey for informational purposes only. However, try to answer or at least provide your best guess to the questions below.

1. How many species of living organisms inhabit the earth? _____.
2. T F The “Balance of Nature” is a viable concept.
3. T F Human societies are ultimately dependent on natural ecosystems for their existence.
4. T F “Pristine” natural areas exist.
5. Of all the energy available to support life on earth, what percentage is currently appropriated by humans?
10 20 30 40 50 60 70 80 90
6. What percentage of earth’s terrestrial surface has been altered by humans?
10 20 30 40 50 60 70 80 90
7. Along what lines are your interests and career aspirations are more closely aligned?
A) environment, ecology, natural resources B) molecular biology, health sciences, forensics etc.
8. If this course was not required, would you still take it? Yes No
9. In your opinion, what is the most important problem facing human society?

10. What is your ultimate career goal?
A) academics (university) D) health sciences
B) teaching (elementary, secondary) E) natural resources industry
C) government employment F) other _____
11. What is your major? _____
12. Where do you come from?
A) northern Ontario C) elsewhere in Canada
B) southern Ontario D) another country
13. In what setting have you spent most of your life? A) rural B) suburban C) urban
14. How often do you camp? A) never B) occasionally C) often
hunt? A) never B) occasionally C) often
fish? A) never B) occasionally C) often
hike? A) never B) occasionally C) often
canoe/kayak? A) never B) occasionally C) often
birdwatch or other natural observation? A) never B) occasionally C) often

Thanks for participating.