INTRODUCTORY ECOLOGY
BIOLOGY 2210
ENVIRONMENTAL STUDIES 2210

Course Outline 2025 Fall

BIOL 2210FAO

"If it dies, it's biology; if it blows up, it's chemistry; if it doesn't work, it's physics."

John Wilkes

"*The question is not what you look at, but what you see*."

Henry David Thoreau

"...you don't know what you got till it's gone.
They paved paradise and put up a parking lot."

Joni Mitchell

"If you don't have time to do it right the first time,
When are you going to have time to do it again?"

Anonymous

"Natural selection has, through all its long history, shown a might y open-mindedness toward any idea that works."

Robert Ardrey

Lakehead
UNIVERSITY

Introduction

Ecology is an old science. It concerns the study of individual species of plants and animals, and assemblages of organisms, interacting with their biotic and abiotic environments. In Ecology 2210, the emphasis has been placed on the concept of the ecosystem as the basic unit within the biosphere and the fundamental idea of the non-cyclical flow of energy and the recycling of materials within ecosystems. Implicit in any ecological study is the interrelatedness of living things.

In this course, we shall explore the biotic components of ecosystems (traditionally the plants and animals) with respect to species adaption to local environments, methods of dispersal, population structure, and interaction at the community level of organization. Additionally, we will examine the interactions of floral and faunal communities with the physical environments in which they occur.

The topics in lab will echo many of those presented in lecture and give you an introduction to some of the techniques by which we can gain knowledge in ecology. It is hoped that by introducing you to the fundamentals of ecology -- whether you are interested in ecology as a profession or simply as a subject of concern -- you will be better prepared to soundly evaluate the many choices which the future holds.

The following excerpt from "Looking Ahead: a Strategy for Ontario" (OMNR Wildlife Working Group 1991) neatly summarizes the concept of an ecosystem:

> ***AN ECOSYSTEM:*** *is a network of living things (such as plants and animals, including humans) and non-living components of their environment (such as air, soil and water), interacting with each other and with other ecosystems. Most ecosystems are powered by solar energy and bound together through a network of food chains: green plants use solar energy to manufacture organic substances from carbon dioxide in air, from the water, and from nutrients in the soil; plants, in turn, support populations of herbivores which, in turn, provide food for carnivores. And when an organism dies its body is recycled by decomposer organisms such as bacteria and fungi.*
>
> *The concept of linkages and interactions in ecosystems can be applied at many levels. The largest is the ecosphere, the thin layer at the surface of the earth in which life is possible. At the other extreme are the interactions in a small pond, in a rotting log, or in a garden. Lying between these extremes are the large regional landscapes, which may include many identifiable ecosystems, all working the same way: driven by finite amounts of sunlight and constantly recycling material and transferring energy in food webs. This is the productive machine that supports the diversity of wildlife in Ontario. Ecosystems are dynamic, constantly changing on local scales, while providing each species with its unique life requirements within a series of progressively larger ecosystems.*

Who?

Lectures: Dr. Nanda Kanavillil: nkanavil@lakeheadu.ca Office Room: OA 3009
Labs: Mr. Chase Moser cmoser@lakeheadu.ca Office Room: OA 3003

What?

Required Text: Rick Relyea 2025
Ecology: The Economy of Nature, 10th Edition. $75.99 CAN
McMillian Learning, New York NY.
(ISBN- 978-1-319-52483-8)

Mark Allocation:

Labs: 35%

Lectures:

Fall break: Monday October 13 - Friday October 17 (Orillia no classes)
Monday October 20- Friday October 24 (Barrie no classes)

Midterm Exam: 80 mins 20%
(October 15) Chapters 1-8 (from 10.00 am to 11.20 am**) BARRIE**
(October 22) Chapters 1-8 (from 10.00 am to 11.20 am**) ORILLIA**

Final Exam: 120 min 25%
(for date and time see LU exam timetable) **chapters 9-22**

Class quizzes (four announced quizzes 5% each) 20%

Lecture total 65%

Lecture + Labs 100 %

Where and When?

Lectures: Monday and Wednesday: 10.00 am – 11.30 am (**Zoom**)

Labs Orillia: Thursday: 11.30am to 2.30pm (**OA 3002 - in person**)
Labs Barrie: Friday 8.00 am to 11.00 am (**Barrie – in person**)

Office hrs: Tuesday and Thursday 10.00 am – 11.30 am or by email appointment

2025 Lecture Outline (Subject to change)

< Chapter 1 An introduction to Ecology

PART I CLIMATES, CLIMATE CHANGE AND BIOMES
< Chapter 2 Global Climates
< Chapter 3 Global Climate change
< Chapter 4 Terrestrial and Aquatic Biomes
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PART II ADAPTATIONS TO ENVIRONMENTS
< Chapter 5 Evolutionary Ecology
< Chapter 6 Adaptations to Aquatic Environments
< Chapter 7 Adaptations to Terrestrial Envionments
< Chapter 8 Adaptations to Variable Environments
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PART III LIFE HISTORIES, REPRODUCTIVE STRATEGIES AND SOCIAL BEHAVIOURS
< Chapter 9 Life Histories
< Chapter 10 Reproductive Strategies
< Chapter 11 Social Behaviours
<
PART IV POPULATIONS
< Chapter 12 Population Distributions
< Chapter 13 Population Growth and Regulation
< Chapter 14 Population Dynamics over Time and Space
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PART V SPECIES INTERACTIONS
Chapter 15 Predation and Herbivory
< Chapter 16 Parasitism and Infectious Diseases
< Chapter 17 Competition
< Chapter 18 Mutualism

PART VI Communities and Ecosystems
< Chapter 19 Community Structure: Biodiversity and Food Webs
< Chapter 20 Community Succession
< Chapter 21 Energy Flow in Ecosystems
< Chapter 22 Nutrient Cycling in Ecosystems
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<PART VII GLOBAL ECOLOGY
< Chapter 23 Landscape Ecology and Global Biodiversity
< Chapter 24 Conservation of Global Biodiversity

Quizzes/tests (Subject to change)

Quizzes and tests (midterm and final) will be multiple choices, fill in the blanks and very short answer type questions. Each quiz will be based on two lectures taught in the previous week of the date of the quiz (will be communicated to you by the instructor). Altogether there will be four quizzes. The quizzes are online and will open at the beginning of the class and will be available for a duration of 15 min. The quizzes/tests need to be completed and submitted before the end-time for grading. **Everyone should come on video (for invigilation purpose) while writing the quiz/test otherwise the quiz/test will not be graded**. The dates of the quizzes/tests are:

Quiz 1 - Sept 17 (from 10.00 am to 10.15 am)
Quiz 2 - Oct 01 (from 10.00 am to 10.15 am)
Quiz 3 - Nov 05 (from 10.00 am to 10.15 am)
Quiz 4 - Nov 19 (from 10.00 am to 10.15 am)

Midterm - Oct 15 (from 10.00 am to 11,20am) – FOR BARRIE
Midterm - Oct 22 (from 10.00 am to 11.20 am) – FOR ORILLIA

Final - To be Announced by the University

Academic Dishonesty

Plagiarism in any form including AI assisted text generation is an extremely serious academic offense and carries penalties varying from failure in an assignment to expulsion from the university. Students are encouraged to review the following link of the University Regulations regarding academic dishonesty.

A listing of University Regulations can be found at:
http://calendar.lakeheadu.ca/current/contents/regulations/univregsintro.html

The code of student behaviour and disciplinary procedures can be found at:
http://policies.lakeheadu.ca/policy.php?pid=60

If anyone needed additional information, please obtain a copy of the "Code of Student Behaviour and Disciplinary Procedures" from the Registrar's Office.

Why?

Whether you are a history major, an outdoor recreation specialist, a nature lover or a pre-med student, we hope you will learn to appreciate the natural world around you in this Introductory Ecology course. You may not be thinking of a career in this field but everyone at

one time or other will take a walk “in the bush”, except now you will know a few of the plants you see and which invertebrates are squishing through your toes in the stream and you will know how the studies were done that closed down your favourite fishing spot and how a skinny little mouse can survive -30^{o}C temperatures better than you.

Isn’t it important for all of us to know that plants and animals and their surrounding environment all interact together so nothing stands alone? Each has their own special importance in the big picture just as we do in our everyday lives.