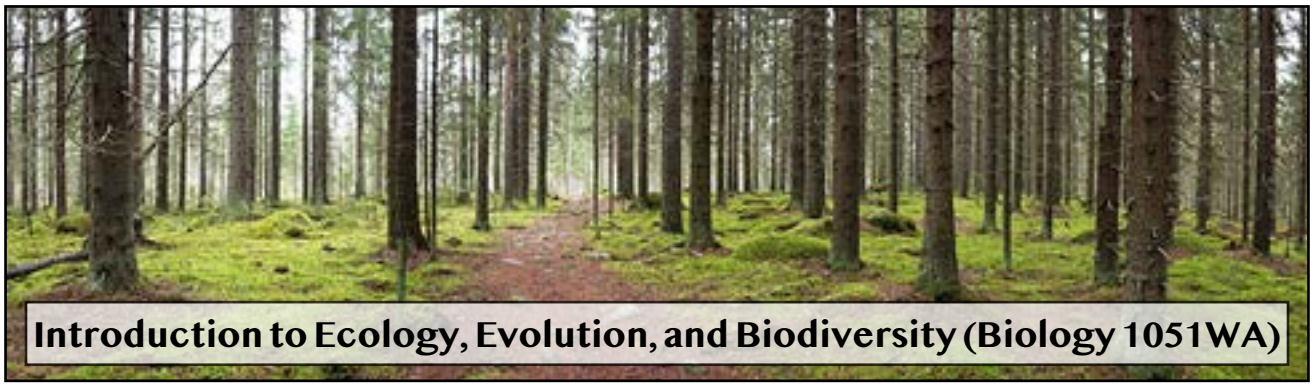


An introduction to fundamental evolutionary and ecological concepts with particular reference to biodiversity and the dynamics of species interactions. Emphasis will be placed on understanding the diversity of life, and the characteristics, behaviour, and classification of prokaryotes, unicellular eukaryotes, fungi, and multicellular plant and animal species. Lecture concepts are reinforced through hands-on exercises in laboratory sessions.

Professor: Dr. Janice M. Hughes
Email: janice.hughes@lakeheadu.ca

Office hours: Wednesday at 10:00 am on Zoom (Other days/times available by appointment)

Technician: Ms. Kristi Valley
Email: kedysiev@lakeheadu.ca

Lab manual: *BIOL 1051 Lab Manual* available on D2L free of charge (required)

Textbook: *Biology 2e* from OpenStax available free of charge on D2L or at https://openstax.org (optional)

Learner Outcomes:

Upon satisfactory completion of this course, students will be able to:

- Understand the fundamental concepts and underlying processes of evolution.
- Understand the basic principles of phylogenetics and classification.
- Categorize the diversity of major lineages of microbes, fungi, and protists, and understand the primary characteristics of each lineage.
- Categorize diversity of major lineages of plants, and understand the primary characteristics of each lineage.
- Categorize diversity of major lineages of animals, and understand the primary characteristics of each lineage.
- Remember the basic properties of populations and ecological interactions among different types of living organisms within ecosystems and biomes.
- Understand the importance of these biotic and abiotic interactions in ecosystem functioning and providing the services upon which all life exists.
- Understand the effects that humans have had on ecological systems and biodiversity, and identify important remediation actions.

Marking Scheme: Lectures

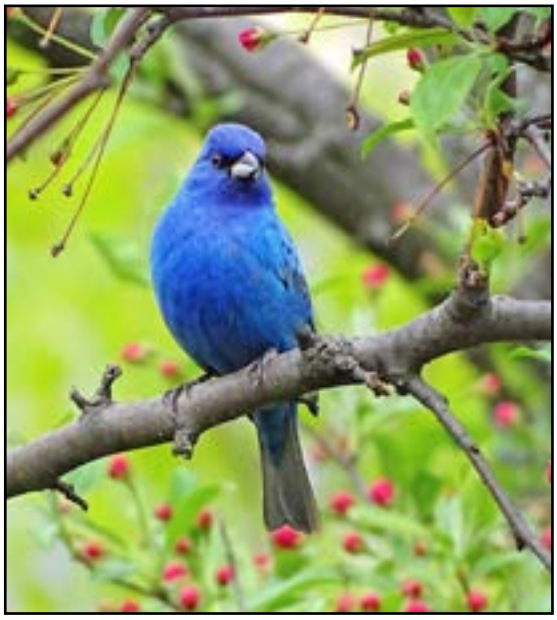
There are two midterm tests that will be run online through the D2L course webpage. Additional instructions are posted on D2L under *Content->Outlines and Important Information*. The final exam is also online and will occur during the April exam period. The tests and final exam are not cumulative.

Midterm 1	Unit 1 (Evolution) to Unit 10 (Flowering Plants)	February 9	15%
Midterm 2	Unit 11 (Intro to Animals) to Unit 15 (Deuterostomes)	March 9	15%
Final Exam	Unit 16 (Fishes) to Unit 25 (Biodiversity/Conservation)	TBA	30%

Marking Scheme: Labs

Exams and Quizzes

1. There are two bell-ringer lab exams that occur during your regularly scheduled lab. The lab exams are not cumulative. It is important that you attend these exams at the designated time because you may not have an opportunity to write them at another date or time.



2. There are eight weekly pre-lab quizzes that occur in-person at the beginning of each lab, except for Lab 1. The lab quizzes are based on the required readings in the lab manual for the lab being held that day. It is important that you attend these lab quizzes because they will not be available to complete at any other time. Your lowest grade among all eight lab quizzes will be dropped before your final grade is calculated in April. More information about the lab quizzes will be provided during the labs.

If you are registered with Student Accessibility Services, please contact Kristi prior to the first lab quiz for specific information on how you can receive your accommodations for the lab quizzes.

Assignments

1. There are nine in-class assignments that occur during your regularly scheduled labs. They must be completed and handed in before the end of each lab. The assignments will not be available to complete at any other time. Your lowest grade among all nine lab assignments will be dropped before your final grade is calculated in April.

Lab Exam 1	Lab 1 (Evolution) to Lab 5 (Plant Anatomy)	February 24/26	12%
Lab Exam 2	Lab 6 (Invertebrates) to Lab 9 (Amniotes)	March 31/April 2	12%
Lab Quizzes	See lab manual chapter readings listed on page 8	Weekly	6%
Assignments	Based on weekly lab topic	Weekly	4%
Mini Report	Topic to be announced	March 6	6%

2. There is a mini report to be completed based on an experimental lab activity that will be performed during the term. Participation in the experimental procedures is mandatory. More information regarding the format and content requirements of the mini report will be provided on D2L and during the labs.

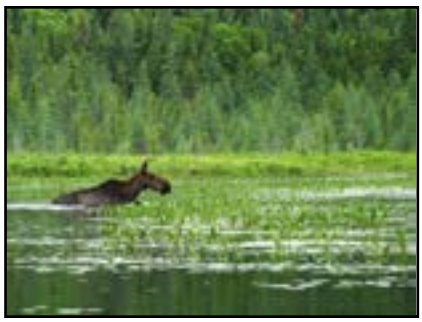
Important Dates

Labs start on the week of January 13/15.
Study week occurs from Monday, February 16 to Friday, February 20.
The final exam will be held during the exam period from April 10 to 19.

Other Important Information:

Course delivery: The lectures for this course will be delivered remotely through Zoom. Attendance in the lectures is highly recommended because it will allow you to ask questions, provide comments, and interact with other students in the chat. You will not be required to turn on your camera during lectures. The labs will be delivered in-person.

Lecture recordings: Lecture recordings will be available after each lecture. The recordings are confidential and are intended for the use of students and instructors only. They may not be shared, viewed, or disclosed to anyone who is not registered in this course during the Winter 2026 term. To protect the privacy of others, please ensure that no one else is present in the room/area where you are located while the lecture is being recorded. If this is a concern, turn your camera off and mute your microphone during the lecture.



Lab equipment: You will require safety glasses and a lab coat for labs in which dissections are being performed. In addition, you will need a notebook for in-lab notes and assignments; a notebook with removable pages, such as spiral or 3-hole punch bound, is preferred.

Accessibility: I am fully committed to providing all recommended accommodations for students with disabilities who are registered with Student Accessibility Services. Please feel free to make an appointment with me to discuss these options.

Final exams: I cannot reschedule a final exam so please wait until the exam schedule comes out in February before you plan any activities during the final exam period.

Absence due to Illness: If you miss a midterm test due to illness, you must inform me by email within 24 hours of the scheduled test time; otherwise, you may not be able to write a make-up test. Athletes who will miss a midterm test due to competitions must provide a letter or email from their coach in advance that clearly shows the dates of their competitions. No other excuses (e.g., vacations, sleeping in, or non-university related activities) for missing tests will be accepted.

If you miss the final exam, you must follow the procedures outlined by Enrolment Services before a make-up exam can be rescheduled. More information can be found at *https://www.lakeheadu.ca/studentcentral/exams-grades/exam-central*.

Academic Dishonesty: Lakehead University takes academic dishonesty very seriously; this includes (but is not restricted to) cheating, plagiarism, impersonation, and collaboration on tests. There is a zero-tolerance policy for academic dishonesty in my courses, and penalties will be strictly enforced. Also if you are caught participating in academic dishonesty in this course, a formal report will be sent to the Dean of Sciences and Environmental Studies and Office of Student Affairs, and documentation of the offense may be added to the Student Conduct Database and your permanent academic record.

You can find the university regulations regarding academic dishonesty here:
https://www.lakeheadu.ca/students/student-life/student-conduct/academic-integrity

According to these regulations, any collaboration on online exams and quizzes is considered cheating. You must do the online tests alone with no help from friends, family, or classmates! The minimum penalty for collaboration or cheating is a mark of zero on the test. Not reading these instructions is not an excuse for not knowing them!

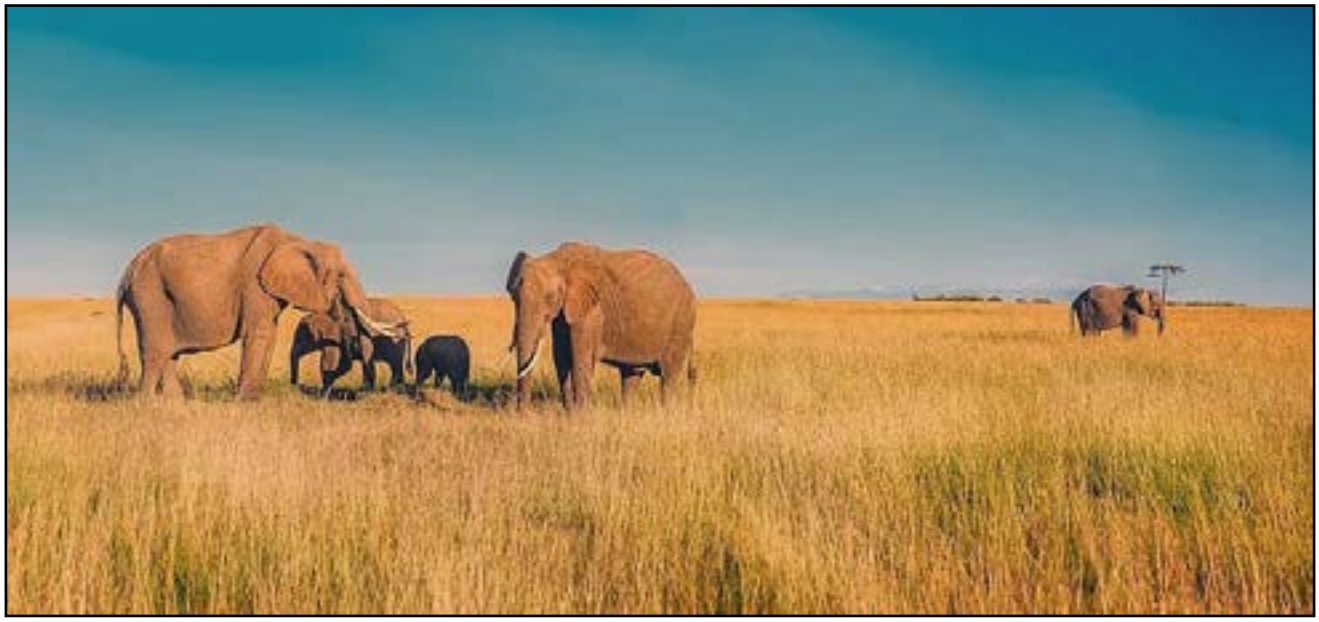
Use of AI Programs: The use of any AI programs (such as ChatGPT) on exams, quizzes, and assignments in this course is considered a breach of academic integrity and, as such, the minimum penalty will be a grade of zero on the work.

Generative artificial intelligence (Generative AI or GenAI) is a category of AI systems capable of generating text, images, or other media in response to prompts. These systems include ChatGPT and its variant Bing (built by OpenAI) and Bard (built by Google) among several others. Other Generative AI models include artificial intelligence art systems such as Stable Diffusion, Midjourney, and DALL-E. Any use of GenAI systems to produce assignments or exam answers for this course is not permitted. All work submitted for evaluation in this course must be the student's original work. The submission of any work containing AI generated content will be considered a violation of academic integrity ("Use of Unauthorized Materials").

Special exam: If you fail the course with a final grade between 40 and 49 (or if you qualify based on other circumstances, see link below), you may be eligible to write the special exam in June. The mark on the special exam will replace the mark that you received on the final exam in April. It is your responsibility to sign up for the special exam through Student Central before the deadline in May. It is advisable that you take the special exam very seriously because if you do poorly on it, your final grade may go down. We do not pick the highest of the two exam grades.

You can find information regarding the special exam here:
https://www.lakeheadu.ca/studentcentral/exams-grades/special-exam-criteria
https://www.lakeheadu.ca/studentcentral/exams-grades/special-exam-deadline-dates

More information: Please see the *Frequently Asked Questions* posted on the D2L course webpage.



Suggested Readings from OpenStax Biology 2e

OpenStax Biology 2e is a free, peer-reviewed, openly licensed textbook created as part of an initiative based at Rice University. It is an excellent resource for students who would like additional information and practice questions for topics covered in this course; please note that it is not a required textbook. A custom edited version of *OpenStax Biology 2e* is available on the course D2L webpage under Study Resources (Lectures). The full version of the textbook is available at *https://openstax.org*.

Unit 1: Evolution – Darwin and Before (Chapter 18)

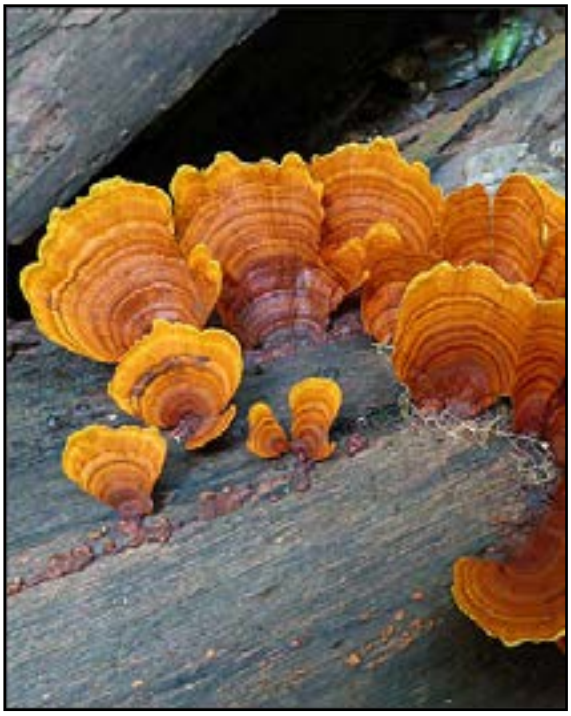
Unit 2: Evolution – Populations and Species (Chapter 19)

Unit 3: Classification (Chapter 20)

Unit 4: Prokaryotes (Chapter 22)

Unit 5: Protists (Chapter 23)

Unit 6: Fungi (Chapter 24)



Unit 7: Rise of Land Plants (Chapter 25)

Unit 8: Seedless Plants (Chapter 25)

Unit 9: Gymnosperms (Chapters 26, 30)

Unit 10: Flowering Plants (Chapters 26, 30, 32)

Unit 11: Introduction to Animals (Chapters 27, 33, 43)

Unit 12: The First Animals (Chapter 27)

Unit 13: Lophotrochozoans (Chapters 28, 34)

Unit 14: Ecdysozoans (Chapters 28, 34)

Unit 15: Deuterostomes (Chapters 29, 34)

Unit 16: Fishes (Chapter 29)

Unit 17: Amphibians (Chapter 29)

Unit 18: Reptiles (Chapter 29)

Unit 19: Birds (Chapters 29, 34)

Unit 20: Mammals (Chapters 29, 34)

Unit 21: Introduction to Ecology and the Biosphere (Chapter 44)

Unit 22: Population Ecology (Chapter 45)

Unit 23: Communities (Chapter 45)

Unit 24: Ecosystems (Chapter 46)

Unit 25: Biodiversity and Conservation (Chapter 47)

Schedule of Lecture Topics

Week of	Jan 5	Introduction to the Course Unit 1: Evolution – Darwin and Before
Week of	Jan 12	Unit 2: Evolution – Populations and Species Unit 3: Classification Unit 4: Prokaryotes
Week of	Jan 19	Unit 5: Protists Unit 6: Fungi Unit 7: Rise of Land Plants Unit 8: Seedless Plants
Week of	Jan 26	Unit 9: Gymnosperms Unit 10: Flowering Plants Unit 11: Introduction to Animals
Week of	Feb 2	Unit 12: The First Animals Unit 13: Lophotrochozoans
Week of	Feb 9	**Feb 9: Midterm Test 1 (No Lecture)** Unit 14: Ecdysozoans
Week of	Feb 16	**Study week**
Week of	Feb 23	Unit 15: Deuterostomes Unit 16: Fishes
Week of	Mar 2	Unit 17: Amphibians Unit 18: Reptiles
Week of	Mar 9	**Mar 9: Midterm Test 2 (No Lecture)** Unit 19: Birds
Week of	Mar 16	Unit 20: Mammals
Week of	Mar 23	Unit 21: Introduction to Ecology and the Biosphere Unit 22: Population Ecology
Week of	March 30	Unit 23: Communities Unit 24: Ecosystems Unit 25: Biodiversity and Conservation

Schedule of Lab Topics

Week of Jan 6/8	**No lab**
Week of Jan 13/15	Lab 1: Understanding Evolution and Classification
Week of Jan 20/22	Lab 2: Bacteria, Protists, and Fungi
Week of Jan 27/29	Lab 3: Seedless Plants
Week of Feb 3/5	Lab 4: Gymnosperms and Angiosperms
Week of Feb 10/Feb 12	Lab 5: Plant Anatomy
Week of Feb 17/19	**Study Week (No lab)**
Week of Feb 24/26	**Lab Exam 1 (Labs 1–5)**
Week of Mar 3/5	Lab 6: Phyla Porifera, Cnidaria and the Lophotrochozoans
Week of Mar 10/12	Lab 7: Ecdysozoans
Week of Mar 17/19	Lab 8: Deuterostomes 1
Week of Mar 24/26	Lab 9: Deuterostomes 2 (Amniotes)
Week of Mar 31/Apr 2	**Lab Exam 2 (Labs 6–9)**