

Introduction to Ecology, Evolution, and Biodiversity (Biology 1051WA)

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.

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Office hours: Wednesdays at II am on Zoom (Other days/times available by appointment)

- Technician: Ms. Kristi Dysievick
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- **Lecture Notes:** *Introduction to Ecology, Evolution, and Biodiversity Lecture Notes* (download from D2L course webpage)
- Lab Manual: *Exploring Biology in the Laboratory, 3rd edition*. MP Pendarvis and JL Crawley. Morton Publishing. (Custom edition available through the LU bookstore)

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 on February 12 and March 11. These tests will be run online through the D2L course webpage. Additional instructions are posted on the course webpage. The final exam is also online and will occur during the April exam period. The tests and final exam are <u>not</u> cumulative.

Midterm Test 1	Unit I (Evolution I) through Unit IO (Flowering Plants)	15%
Midterm Test 2	Unit 11 (Intro to Animals) through Unit 15 (Deuterostomes)	15%
Final Exam	Unit 16 (Fishes) through Unit 25 (Biodiversity/Conservation)	30%

Marking Scheme: Labs

There are two lab exams that will occur in your regularly scheduled lab during the weeks of February 27 and April 2. The lab exams are <u>not</u> cumulative. It is important that you attend these exams at the designated time because you may not have an opportunity to write them at a later date/time. More information will be provided in class.

There is a lab participation mark for each lab to total 3% during the term. In order to receive marks for participation, you must attend your weekly lab session and demonstrate to your teaching assistant that you have completed the review questions in the lab manual for that lab. More information regarding these participation marks will be provided in the first lab.



There are nine weekly online lab quizzes. The lab quiz for each lab will be available from Thursday at 5:30 pm

(on the week of the lab) until the following Tuesday at 8:30 am (see schedule below on page 7). The lab quizzes will not be available to complete at any other time. More information about lab quizzes and exams will be provided during the labs and on the course webpage.

Lab Exam 1	Based on Labs 1 to 5	15%
Lab Exam 2	Based on Labs 6 to 9	15%
Lab Quizzes	See schedule on D2L and below	7%
Lab Participation		3%

Important Dates:

Labs start on the week of January 16/18.

Study week occurs from Monday, February 19 to Friday, February 23.

Midterm exams occur on Monday, February 12 and Monday, March 11.

The final exam will be held during the exam period from April 12 to 22.

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 <u>not</u> 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 2024 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.

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.

<u>If you miss the final exam</u>, 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!

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.



Schedule of Lecture Topics

Week of	Jan 8	Introduction to the Course Unit 1: Evolution – Darwin and Before	
Week of	Jan 15	Unit 2: Evolution – Populations and Species Unit 3: Classification Unit 4: Prokaryotes	1
Week of	Jan 22	Unit 5: Protists Unit 6: Fungi Unit 7: Rise of Land Plants Unit 8: Seedless Plants	X
Week of	Jan 29	Unit 9: Gymnosperms Unit 10: Flowering Plants Unit 11: Introduction to Animals	1 m
Week of	Feb 5	Unit 12: The First Animals Unit 13: Lophotrochozoans	
Week of	Feb 12	Feb 12: Midterm Test 1 (No Lecture) Unit 14: Ecdysozoans	No. 1
Week of	Feb 19	Study week	
Week of	Feb 26	Unit 15: Deuterostomes Unit 16: Fishes	
Week of	Mar 4	Unit 17: Amphibians Unit 18: Reptiles	
Week of	Mar II	Mar II: Midterm Test 2 (No Lecture) Unit 19: Birds	
Week of	Mar 18	Unit 20: Mammals	
Week of	Mar 25	Unit 21: Introduction to Ecology and the Biosphere Unit 22: Population Ecology	
Week of	April 1	Apr 1: Holiday (No Lecture) Unit 23: Communities	
Week of	April 8	Apr 9 (Tuesday): Make-up Lecture for Apr 1 Unit 24: Ecosystems Unit 25: Biodiversity and Conservation	

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 <u>not</u> 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 I: 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 II: 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 Lab Topics

Week of Jan 9/11	No lab
Week of Jan 16/18	Lab I: Understanding Evolution and Classification (Chapters 16 and 17)
Week of Jan 23/25	Lab 2: Bacteria, Protists, and Fungi (Chapters 19, 20, and 26)
Week of Jan 30/Feb 1	Lab 3: Seedless Plants (Chapter 21 and 22)
Week of Feb 6/8	Lab 4: Gymnosperms and Angiosperms (Chapter 23 and 24)
Week of Feb 13/Feb 15	Lab 5: Plant Anatomy (Chapter 25)





Week of Feb 20/22	Study Week (No lab)
Week of Feb 27/29	Lab Exam 1 (Labs 1–5)
Week of Mar 5/7	Lab 6: Phyla Porifera, Cnidaria and the Lophotrochozoans (Chapters 28 and 29)
Week of Mar 12/14	Lab 7: Ecdysozoans (Chapter 30)
Week of Mar 19/21	Lab 8: Deuterostomes 1 (Chapter 31)
Week of Mar 26/28	Lab 9: Deuterostomes 2 (Amniotes) (Chapter 31)
Week of Apr 2/4	Lab Exam 2 (Labs 6–9)

Schedule of Lab Quizzes

	Topic	Opens Thursday at 5:30 pm on:	Closes Tuesday at 8:30 am on:
Lab Quiz 1	Evolution and Classification	January 18	January 23
Lab Quiz 2	Bacteria, Protists, and Fungi	January 25	January 30
Lab Quiz 3	Seedless Plants	February 1	February 6
Lab Quiz 4	Gymnosperms and Angiosperms	February 8	February 13
Lab Quiz 5	Plant Anatomy	February 15	February 27
Lab Quiz 6	Porifera, Cnidaria, Lophotrochozoans	March 7	March 12
Lab Quiz 7	Ecdysozoans	March 14	March 19
Lab Quiz 8	Deuterostomes I	March 21	March 26
Lab Quiz 9	Deuterostomes 2	March 28	April 2

