COURSE OUTLINE: WINTER 2025

COURSE TITLE: INTRODUCTION TO ECOLOGY, EVOLUTION, & BIODIVERSITY

COURSE CODE: BIOL 1051 (WAO)

CREDITS: 0.5

WEEKLY HOURS: 3.0 (2 lectures per week: **Mon** & **Wed** **08h30 to 09h50**)

3.0 (LAB: **Thurs** **11h30 to 14h20**)

ROOM: OA 2008 (lecture); OA3002 (lab)

SUGGESTED TEXT: *Concepts of Biology* from OpenStax (open source: free)

*all other course material will be provided on D2L

PROFESSOR: DR. GERARDO REYES

OFFICE: OR 1035

TELEPHONE: (705) 330-4008 x2698

E-MAIL: greyes@lakeheadu.ca

OFFICE HOURS: by appointment (set up via e-mail)

---

1. COURSE DESCRIPTION

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.

Type C: Engineering, Mathematical and Natural Sciences
Notes: Students who have previous credit for Biology 1110 cannot take Biology 1051 for credit. An additional fee (see Miscellaneous Fees) is required for this course.

2. COURSE GOALS

BIOL 1051 introduces students to the array of lifeforms inhabiting our planet, how they developed and radiated over geological time, and ultimately, helps to deepen one's appreciation of the functions and benefits that a rich and healthy biodiversity provides. Case-studies of current and emerging issues associated with the exploitation and conservation of biodiversity are examined through group research and discussion.

Knowledge gained

You will be introduced to key theoretical & conceptual foundations associated with ecology, evolution, & the diversity of life;

Particular attention will be given to:

(a) Improving understanding of how the complex array of species inhabiting our planet today developed & evolved
(b) providing evidence for the unity of life, & how higher levels of structural organisation are constructed & continuously updated

Analytical, technical, & applied skills

You will:

a) improve identification skills; i.e., recognise & organise species into groups according to key characteristics
b) improve critical reading skills through evaluation & review of assigned materials
c) improve written communication skills by writing short-answer responses to questions related to assigned course readings
d) improve oral communication skills through class discussion
e) improve group environment & project management skills

3. MODES OF INSTRUCTION

Assigned readings, lectures, and group discussions are employed.

The material presented in all modes of instruction is introductory in nature but will be sufficient to allow continuation to higher level courses required for completion of your respective BA or BSc degree programs. Students are expected to be prepared in advance prior to each lecture by completing assigned readings. Class time will build upon this base, focusing on important and/or more difficult concepts during lectures. Lectures will generally start with an introduction to the material by me, followed by a discussion and question period. Students should also take advantage of the lecture material accessed through the *MyCourseLink* site.

Notice for Recording Lectures & Class Activities

In BIOL 1051, in the context of remote instruction and participation, video and audio recordings of class activities will be made to ensure students' and instructors' easy and comprehensive access to those activities. The recordings are confidential and are intended only for the use of the course students and instructors. They may otherwise not be used or disclosed. During recording, to protect others' privacy, each student should ensure that no one else is present in the location where they are being recorded without that non-student's consent. The recordings are made under the authority of Sections 3 and 14 of The Lakehead University Act, 1965. Questions about the collection of the images and sounds in the recordings may be directed to Dr Azim Mallik, Chair of Biology, 955 Oliver Road, Thunder Bay, ON, Canada, P7B 5E1, (807) 343-8927.

https://www.lakeheadu.ca/sites/default/files/policies_procedures/Student%20Code%20of%20Conduct%20-%20Academic%20Integrity.pdf

4. COURSE OUTLINE

Again, all lectures will be interactive (lecture, discussion, question & answer), thus requiring students to read the assigned material prior to class. The course is designed to encourage active participation; thus, its success (& fun!) will depend on coming to class prepared and engaging one another in friendly discussion. Further, group work will provide you an opportunity to (i) actively participate in the learning process and (ii) apply knowledge gained through previous lectures and reading materials.

The tentative schedule is as follows:

Week 1	Jan 6	Welcome back! Introduction to ecology, evolution, & biodiversity
	8	Tracing evolutionary history & how populations evolved / Taxonomy & classification / Introduction to the 6 Kingdoms
		Readings (R): 1, 12
Week 2	Jan 13	Mechanisms of evolution (from natural selection, mutation, gene flow, & genetic drift to speciation & radiation) / Population genetics
	15	Bacteria, Protista, Fungi
		R: 8, 11, 13
Week 3	Jan 20	How to be a plant
	22	Plant diversity
		R: 14
Week 4	Jan 27	Plant diversity
	29	Plant diversity
		R: 14
Week 5	Feb 3	**QUIZ A** (up to material including Jan 29)
	5	Animal diversity
		R: 15, 18

Week 6	Feb 10	Animal diversity
	12	**P1** Animal diversity: Sponges to Annelids
		**you need to be present today to participate in P1
		R: 15
Week 7	Feb 17	READING WEEK
	19	READING WEEK
Week 8	Feb 24	**P1 group presentations**
	26	Animal diversity: Echinoderms to Vertebrates
		R: 15
Week 9	Mar 3	Animal diversity: Chordates
	5	***MIDTERM*** (WEEK 1 DAY 1 to WEEK 8 DAY 2)
		R: 15
Week 10	Mar 10	Animal diversity: Chordates II
	12	**P2** Population & Community Ecology
		**you need to be present today to participate in P2
		R: 19
Week 11	Mar 17	**P2 group presentations**
	19	**QUIZ B** (Chordates to Amphibians)
		R: 19
Week 12	Mar 24	Ecosystems & the Biosphere
	26	Ecosystems & the Biosphere
		R: 20
Week 13	Mar 31	Conservation & Biodiversity
	Apr 2	tbd
		R: 21
Exam period		**Final Exam**

5. EVALUATION OF ACHIEVEMENT

Quizzes, exams, & group participation** will reinforce student understanding of the topics covered in BIOL 1051. The quizzes, mid-term, & final exam will consist of multiple choice, T/F, fill-in-the-blanks, matching terms, &/or short answer questions. The exams are **not** cumulative.

QUIZZES:	**10 %**
MIDTERM:	**15 %**
FINAL:	**25 %**
PARTICIPATION:**	**10 %**
LAB:	**40 %**

For your reference:

Table 1. Due dates for all graded components of our course

	Assignment	Due date	Proportion of grade
1	QUIZ A	Feb 3	5
2	Participation 1 (group .ppt)	Feb 23 (night before class)	5
3	MIDTERM	Mar 5	15
4	Participation 2 (group .ppt)	Mar 16 (night before class)	5
5	QUIZ B	Mar 19	5
6	FINAL EXAM	tba	25
	LABS	See lab schedule	40
	TOTAL		**100**

GRADING SCHEME:

A+ A	90 to 100% 80 to 89%	Outstanding understanding of the course concepts including integration of materials and ideas, ability to apply knowledge to situations
B	70 to 79%	Above average to excellent knowledge, ability to apply knowledge to situations
C	60 to 69%	Satisfactory knowledge including ability to recognise and apply major course concepts, and to progress to next level of course
D	50 to 59%	Some grasp of course concepts; will likely encounter difficulty with higher levels
E	40 to 49%	Failed to meet minimum requirements of the course
F	1 to 39%	Failure
F	0	Failure resulting from academic dishonesty

6. NETIQUETTE

Much like in a regular classroom, it is important that a positive, safe, dynamic, and constructive online learning environment is maintained. Thus, a set of guidelines for maintaining Netiquette are listed below. While you may not always agree with your instructor's or one of your peer's posts on the discussion board, please remember that everyone's opinions, thoughts, and responses must be respected. So while you are strongly encouraged to comment, question, or critique a post, personal attacks on an individual are not permitted. Essentially, we wish to build and maintain an engaging and respectful online learning environment.

Our online classroom Netiquette guidelines are as follows:

- Do not dominate any discussion. Give other students the opportunity to join in the discussion.
- Do not use offensive language. Present ideas appropriately.
- Be cautious in using Internet language. For example, do not capitalize all letters since this suggests shouting.
- Popular emoticons such as 😊 or 🙁 can be helpful to convey your tone but do not overdo or overuse them.
- Avoid using vernacular and/or slang language. This could possibly lead to misinterpretation. Essentially, take some time to formulate your ideas. Be clear, concise, and complete.
- Never make fun of someone's ability to read or write.
- Share tips with other students.
- Keep an open-mind and be willing to express even your minority opinion. Minority opinions must be respected.
- Think and edit before you push the *send* button.
- Do not hesitate to ask for feedback.
- Using humor is acceptable but be careful that it is not misinterpreted. For example, are you being humorous or sarcastic?

Guidelines adapted from:

Mintu-Wimsatt, A., Kernek, C., & Lozada, H. R. (2010). Netiquette: Make it part of your syllabus. *Journal of Online Learning and Teaching* 6(1). Retrieved from http://jolt.merlot.org/vol6no1/mintu-wimsatt_0310.htm

7. WELLBEING

As a university student, you may sometimes experience mental health concerns or stressful events that interfere with your academic performance and negatively impact your daily activities.

All of us can benefit from support during times of struggle. If you or anyone you know experiences academic stress, difficult life events or feelings of anxiety or depression, Lakehead has resources available to you. Check in with the WellU Key to find the mental health resources you are looking for.

Remember that getting help is a smart and courageous thing to do - for yourself, for those you care about, and for those who care about you. Getting support sooner rather than later is almost always helpful.

8. STUDENT RESPONSIBILITIES

Students are expected to participate in all course activities and complete all assignments on time. Late assignments carry a 25% reduction in value per day, no exceptions. This may seem rather severe, but it's just not fair to those who hand assignments in on time.

General regulations

It is the responsibility of each student registered at Lakehead University to be familiar with, and comply with all the terms, requirements, regulations, policies and conditions in the Lakehead University Academic Calendar. This includes, but is not limited to, Academic Program Requirements, Academic Schedule of Dates, University and Faculty/School Policies and Regulations and the Fees and Refund Policies and Schedules

Student Support

There are many resources available to support our students. These include but are not limited to:

- Health and Wellness
- Student Success Centre
- Student Accessibility Centre
- Library
- Academic Support Zone (Writing and Math Tutoring Centre)

Lakehead University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities and/or medical conditions to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact Student Accessibility Services (SAS) and register as early as possible. For more information, please contact Student Accessibility Services http://studentaccessibility.lakeheadu.ca (SC0003, 343-8047 or sas@lakeheadu.ca)

Student Accessibility Services (SAS) (Thunder Bay) and Student Affairs (Orillia) coordinate services and facilitates reasonable academic accommodations for students with disabilities. Academic accommodations are provided on the basis of documentation of a disability. Additional information is available at the following campus websites:

Thunder Bay:	https://www.lakeheadu.ca/students/student-life/student-services/accessibility/
Orillia:	https://www.lakeheadu.ca/students/student-life/student-services/or

Exam/Assignment Integrity

I understand and agree that:

(a) Unless otherwise allowed by the course instructor, I must complete the assignments in this course without the assistance of anyone else.

(b) Unless otherwise allowed by the course instructor, I must not access any sources or materials (in print, online, or in any other way) to complete any course exam.

I further understand and agree that, if I violate either of these two rules, or if I provide any false or misleading information about my completion of course assignments or exams, I may be prosecuted under the Lakehead University Student Code of Conduct – Academic Integrity, which requires students to act ethically and with integrity in academic matters and to demonstrate behaviours that support the University's academic values.

Academic dishonesty (plagiarism):

The most common offense under the Academic Code of Conduct is plagiarism.

This could be material copied word for word from books, journals, internet sites, professor's course notes, etc. It could be material that is paraphrased but closely resembles the original source. It could be the work of a fellow student, for example, an answer on a quiz, data for a lab report, a paper or assignment completed by another student. It might be a paper purchased through one of the many available sources. Plagiarism does not refer to words alone - it can also refer to copying images, graphs, tables, and ideas. "Presentation" is not limited to written work. It also includes oral presentations, computer assignments and artistic works. Finally, if you translate the work of another person into French or English and do not cite the source, this is also plagiarism.

I.E., DO NOT COPY, PARAPHRASE OR TRANSLATE ANYTHING FROM ANYWHERE WITHOUT CITING WHERE YOU OBTAINED IT!

University guidelines on the matter:

The University takes a most serious view of offences against academic honesty such as plagiarism, cheating and impersonation. Penalties for dealing with such offences will be strictly enforced.

A copy of the "Code of Student Behaviour and Disciplinary Procedures" including sections on plagiarism and other forms of misconduct may be obtained from the Office of the Registrar.

The following rules shall govern the treatment of candidates who have been found guilty of attempting to obtain academic credit dishonestly.
(a) The minimum penalty for a candidate found guilty of plagiarism, or of cheating on any part of a course will be a zero for the work concerned.
(b) A candidate found guilty of cheating on a formal examination or a test, or of serious or repeated plagiarism, or of unofficially obtaining a copy of an examination paper before the examination is scheduled to be written, will receive zero for the course and may be expelled from the University.

Students disciplined under the Code of Student Behaviour and Disciplinary Procedures may appeal their case through the Judicial Panel.

Note: "Plagiarism" shall be deemed to include:

1. Plagiarism of ideas as where an idea of an author or speaker is incorporated into the body of an assignment as though it were the writer's idea, i.e. no credit is given the person through referencing or footnoting or endnoting.
2. Plagiarism of words occurs when phrases, sentences, tables or illustrations of an author or speaker are incorporated into the body of a writer's own, i.e. no quotations or indentations (depending on the format followed) are present but referencing or footnoting or endnoting is given.
3. Plagiarism of ideas and words as where words and an idea(s) of an author or speaker are incorporated into the body of a written assignment as though they were the writer's own words and ideas, i.e. no quotations or indentations (depending on format followed) are present and no referencing or footnoting or endnoting is given.

A listing of University Regulations can be found at:

https://www.lakeheadu.ca/programs/graduate/regulations

The code of student behaviour and disciplinary procedures (effective May 1, 2019) can be found at:

https://www.google.com/url?client=internal-element-cse&cx=012906367850555877284:uxo0wfmf8ra&q=https://www.lakeheadu.ca/sites/default/files/uploads/106/Item%25204.1.1%2520c%2520-%2520Code%2520of%2520Student%2520Behaviour%2520and%2520Disciplinary%2520Procedures.pdf&sa=U&ved=2ahUKEwjE9-jzrb-AAxUrE1kFHcbiA0AQFnoECAEQAQ&usg=AOvVaw3GGLgjP1narXf2SciHB4y-

Lakehead UNIVERSITY

AI Policy (GenAI use)

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.

GenAI tools can provide valuable assistance and support in academic work. However, it is essential to use them responsibly and ethically. The following information and guidelines apply to the use of AI-based tools in this course:

a. **Student Responsibility** – It is the responsibility of the student to understand the limitations of AI-based tools. While these tools can provide suggestions and insights, final decisions and critical thinking should come from the student's own understanding and effort. Before submitting, review your work with this in mind. If you don't understand what type of GenAI usage is appropriate, ask the course instructor for clarification.
b. **Formative Usage** – In this class, you may use GenAI for formative, but not summative, work. That means it can be used as a "possibility engine" (brainstorm tool), a "study buddy," a "collaboration coach," a "guide on the side," a "personal tutor," a "co-designer," etc. to help you learn course content, but it cannot be used as the primary vehicle for any work that is submitted for marks or evaluation. (See UNESCO's "ChatGPT and Artificial Intelligence in Higher Education Quick Start Guide," page 9, for explanations and examples of these and other roles GenAI can productively serve in a formative capacity.)
c. **Error & Bias** – AI content is created by computer algorithms that have been trained using large amounts of data. The AI learns from patterns and examples in the data to generate new content that resembles what it has been trained on. If the training data used to train the AI model is biased or limited in scope, the AI may reproduce content that is inaccurate, incomplete, offensive, and/or biased. Students should weigh this as they consider material produced by AI.
d. **Trustworthiness** – Generative AI can be vulnerable to manipulation and misuse. It can be used to generate fake news, misinformation, or deepfake content, which can have harmful consequences. Students should check AI generated content against reputable sources.
e. **Plagiarism** – Since [writing and critical thinking ability] are learning outcomes of this course, all work submitted for evaluation must be the student's original work. Using the work of others (including content curated/generated by AI) without proper citation is considered plagiarism. See "Citing Artificial Intelligence" for assistance with correct documentation.

f. **Citation of Sources** – If you use material generated by an AI program for an assignment in this course, it must be cited like any other source (with due consideration for the quality of the source, which may be judged as poor). Failure to do so will be considered a violation of academic integrity. See Student Code of Conduct – Academic Integrity.

9. LAND ACKNOWLEDGEMENT:

Lakehead University respectfully acknowledges its campuses are located on the traditional lands of Indigenous peoples.

Lakehead Thunder Bay is located on the traditional lands of the Fort William First Nation, Signatory to the Robinson Superior Treaty of 1850. Lakehead Orillia is located on the traditional territory of the Anishinaabeg. The Anishinaabeg include the Ojibwe, Odawa, and Pottawatomi nations, collectively known as the Three Fires Confederacy.

Lakehead University acknowledges the history that many nations hold in the areas around our campuses, and is committed to a relationship with First Nations, Métis, and Inuit peoples based on the principles of mutual trust, respect, reciprocity, and collaboration in the spirit of reconciliation.