



School of Science
BIOL 101
Evolution and Biodiversity
Term: Fall 2021
Number of Credits: 3

Course Outline

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TIME/DATES: T/R 10:30 am – 12:00 (lectures) F 9:00 – 12:00 or 1:00 – 4:00 (labs)

OFFICE HOURS: *anytime*, email me, but scheduled office hours are Wednesdays 2:30 – 4:00.

COURSE DESCRIPTION

This course is a core introductory science course, transferrable to most Canadian universities as one semester of a first-year level Biology course, emphasizing principles with wide applications to all living organisms, including the scientific process, principles of ecology, evolution via natural selection, and the origin and diversity of life. A comparative approach to the unity and diversity of organisms is stressed. Weekly mandatory lab sessions reinforce subject matter presented in lectures.

COURSE REQUIREMENTS

Prerequisite(s): *One of the following* is required (and more than one is recommended): Biology 11, Biology 12, or Chemistry 11 (or equivalent).

Corequisite(s): Math 12 (or equivalent) is recommended either as a pre-requisite or co-requisite. Students are expected to utilize basic mathematical skills.

EQUIVALENCY OR TRANSFERABILITY

This course transfers as one semester of first-year biology for Majors at most Canadian institutions, however, please be aware that receiving institutions determine course transferability. Find further information at:

<https://www.yukonu.ca/admissions/transfer-credit>

LEARNING OUTCOMES

Upon successful completion of the course, students will be able to:

1. use the scientific process and apply it to examples in biology,
2. give examples of the different levels of study in ecology and emergent properties at each level,

3. demonstrate knowledge of principles of evolution via natural selection and other agents of evolution, and the origin of species,
4. demonstrate knowledge of the diversity of life across taxonomic groups,
5. use basic principles of chemistry and how it applies to biological systems,
6. conduct modern lab and field procedures safely and ethically, including microscope use, data collection, interpretation, and communication of results.

COURSE FORMAT

This course will be delivered with the following breakdown per week: three hours of lecture (in two 1.5-hour blocks), one three-hour lab, and zero hours of tutorial. Although it will vary from individual to individual, students should expect to spend 6 hours on course material outside of the classroom time (per week) on studying or completing assignments.

Delivery format

This course will be delivered in a face-to-face (in person) format. However, lectures may be attended remotely and recorded to be watched later (upon request). Students will be expected to access the YU online learning platform for additional material (Moodle). Labs can only be conducted in person.

EVALUATION

Lecture quizzes (5 in total)	45 %
Lab Assignments	21 % (60% of Lab Mark)
Lab Quizzes	14 % (40% of Lab Mark)
Final Exam	20 %
Total	100%

Please note that there is no midterm for this course. The midterm mark is based on lecture quizzes.

Lecture quizzes are given during normally scheduled class time and take 30 minutes to complete.

Lab quizzes are given at the start of each lab period (except the first lab) and take 15 minutes to complete. They are based on material covered in the previous lab and some questions on what will be done during that day's lab period. *Students are expected to read lab material before coming into the lab.* There is no final exam for the laboratory portion of the course.

Lab assignments are handed out at the beginning of lab sessions and are to be completed once lab exercises are completed. Some students finish assignments during the lab session, although they are not due until the next weekday at noon. Late assignments may be deducted -5% of marks per day.

Attendance in the laboratory is mandatory. ***Students must pass the lab and lecture portions of the course independently.***

COURSE WITHDRAWAL INFORMATION

The Last date to withdraw without academic penalty is Nov. 5th, 2021. Refer to the YukonU website for other important dates.

TEXTBOOKS & LEARNING MATERIALS

Students are required to purchase a textbook, either a hard copy from the YU bookstore, or an online eText access through the publisher (Pearson).

Campbell Biology, 3rd Canadian Edition (2020).

Authors: Reece, J. B., L. A. Urry, M. L. Cain, S. A. Wasserman, P. V. Minorsky, R. B. Jackson, F. E. Rawle, D. G. Durnford, C. D. Moyes, K. Scott, and S. J. Walde. Publisher: Pearson

Purchase eText access through Pearson or in the YU bookstore.

Lab materials (e.g., lab manuals) are provided in the form of three-hole punched pages in the first lab.

Laboratory coats are mandatory, and students can purchase these online ahead of time, or during their first lab period for \$20. Due to COVID-19 precautions, masks must be worn at all times and should be brought along. Ensure it is a mask that is comfortable for you to wear correctly for the full 3-hour lab session.

ACADEMIC INTEGRITY

Students are expected to contribute toward a positive and supportive environment and are required to conduct themselves in a responsible manner. Academic misconduct includes all forms of academic dishonesty such as cheating, plagiarism, fabrication, fraud, deceit, using the work of others without their permission, aiding other students in committing academic offences, misrepresenting academic assignments prepared by others as one's own, or any other forms of academic dishonesty including falsification of any information on any Yukon University document.

Please refer to Academic Regulations & Procedures for further details about academic standing and student rights and responsibilities. <https://www.yukonu.ca/policies/academic-regulations>

ACADEMIC ACCOMMODATION

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon University Academic Regulations (available on the Yukon University website). It is the student's responsibility to seek these accommodations by contacting the Learning Assistance Centre (LAC): LearningAssistanceCentre@yukonu.ca.

TOPIC OUTLINE

General topic	Chapter	Topics	# Lectures, quiz dates
1. Introduction	CH 1	Introduction to Biology and The Scientific Method	2
2. Ecology	CH 52	Biosphere Ecology	1
	CH 53	Population Ecology	2 Quiz 1 Sep 23*
	CH 54	Community Ecology	1
	CH 51 <i>in part</i>	Behavioral Ecology	1
3. Evolution	CH 22, 23	Variation, Natural Selection	2
	CH 24	Speciation	1 Quiz 2 Oct 7
4. The Diversity of Life	CH 25 <i>in part</i>	History of Life on Earth	1
	CH 27	Bacteria and Archaea	1
	CH 28	Eukarya: Protists	2 Quiz 3 Oct 21
	CH 31	Fungi	1
	CH 29, 30	Plants	2 Quiz 4 Nov 4
	CH 32, 33	Animals: Invertebrates	2
	CH 34	Animals: Vertebrates	3 Quiz 5 Nov 18
5. Introduction to the Basic Chemistry of Life	CH 3	The chemistry of water	1
	CH 4, 5	Organic Chemistry Introduction Macromolecules	– to 1
	Review		Final Exam
	Date set by administration		

Please note that quiz dates are "set" but exact quiz topics may change depending on how fast we move through material!

Lab Schedule and List of Topics – Labs typically start in the SECOND WEEK of CLASSES

Lab 1	Ecology 1- The Boreal Forest: Introduction to ecosystems, trophic structures, plant identification, dichotomous key (<i>Outside lab-bring appropriate clothes to be outside</i>)
Lab 2	Ecology 2- Population Ecology and Community Interactions, population density, quadrat sampling (<i>outside exercise</i>), mark-and-recapture, growth curves, diversity of community interactions
Lab 3	Evidence of Evolution, Evolution and Natural Selection, genetic drift, gene flow, and natural selection exercises
Lab 4	Introduction to the Microscope The Evolution of Biological Diversity – Archaea, Eubacteria, and Protists
Lab 5	Fungal Diversity, Plant Diversity Part 1 - Seedless Plants
Lab 6	Plant Diversity Part 2 - Seed Plants
Lab 7	Plant form and function – Seed plants continued
Lab 8	Animal Diversity Part 1 - Porifera, Cnidaria, Platyhelminthes, Nematoda, and Rotifers
Lab 9	Animal Diversity Part 2 - Molluscs and Annelids
Lab 10	Animal Diversity Part 3 - Arthropods, Echinoderms and Chordates
Lab 11	Introduction to the Chemistry of Life – The Unique Properties of Water
