



COURSE OUTLINE

**BIOLOGY 101
PRINCIPLES OF BIOLOGY I**

**45 HOURS Lecture, 45 HOURS Lab
3 CREDITS**

PREPARED BY: _____ DATE: _____
Tara Stehelin, Instructor

APPROVED BY: _____ DATE: _____
Margaret Dumkee, Dean

APPROVED BY ACADEMIC COUNCIL: ()

RENEWED BY ACADEMIC COUNCIL: ()



This work is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-sa/4.0/>.

1. General Biology

-the steps taken in rigorous scientific process and what defines a living organism, including knowledge of the unifying themes of living organisms

2. Ecology

-levels of study in ecology and examples of new properties that emerge at each level, factors that determine and influence distribution of life on Earth

3. Evolution

-the observations and main inferences of Charles Darwin such as concepts of evolution, natural selection, mutation, and sources of evidence for evolution, application of Hardy-Weinberg equilibrium, causes of evolutionary change (microevolution), patterns of change in phenotypes resulting from natural selection (macroevolution), speciation, and hybridization

3. The Diversity of Life

-overview of taxonomic groups and the origin of species, unifying characteristics and basic knowledge of the diversity within each of the taxonomic groups; prokaryotes and the two main kingdoms within, eukaryotes including protists and the main groups within, fungi, plants and evolutionary patterns from non-vascular to seedless vascular to seed plants, evolution and adaptations in angiosperms, evolutionary patterns in animals from invertebrates, protostomes, segmented animals, to deuterostomes and chordates, and the challenges of life on land for both plants and animals

4. Chemical Basis of Life

-unique properties of water that allow it to support life, basic understanding of chemical bonds, molecules, compounds and reactions common in living systems

Lab Learning Outcomes

Upon completion of mandatory lab sessions students will be able to demonstrate knowledge of basic ecological practices such as population density estimations, complete a basic statistical test, recognize sources of evidence for evolution, identify types of cells from different taxonomic groups, correct procedures of microscopy using both compound and stereomicroscopes, including the ability to prepare wet mount slides with live organisms. Students will be able to demonstrate practical knowledge necessary to conduct dissections on several invertebrate organisms, including clams, roundworms, segmented worms, crayfish, insects, and sea stars.

COURSE FORMAT (3-3-0)

Three hours of lecture, three hours of labs, and zero hours of tutorial per week. Material will be presented in two lectures and one lab session per week. Attendance in the laboratory is mandatory. ***Students must pass the lab and lecture portions of***

the course independently.

ASSESSMENTS

Attendance policy

Students must attend the laboratory session assigned to them upon registration, once per week. **Attendance is mandatory in labs and greatly encouraged in lectures.** Absence from labs results in a zero grade assigned for assignments and quizzes relevant to the missed lab. If the instructor is notified in advance of potential problems with attendance for medical reasons or travel with a sports team, alternate work may be arranged.

Lab assignments

Assignments are handed out at the beginning of laboratory sessions and graded on the basis of understanding and applying principles involved as well as the correctness of answers to solutions. Most students finish assignments during the lab session, although they are not due until the next week day at noon.

Tests

Quizzes on lecture material are given approximately once every two weeks. There are 5 quizzes in total. The final examination will be held at the end of the term and is worth 20% of the total mark. It will cover material from the entire course and the examination date will be announced as soon as confirmed by administration. Quizzes on laboratory material are given every lab session (except the first) and cover material from the lab exercises the week before and a few questions from that week's lab. **Students are expected to read lab material before coming into the lab.** There is no final exam for the laboratory portion of the course.

EVALUATION

Lecture Quizzes (5)	45%
Final exam	20%
Lab Assignments (11)	17.5%
Lab Quizzes (10)	17.5%
Total	100%

REQUIRED TEXTBOOKS AND MATERIALS

For students in a science program:

Campbell Biology, 2nd Canadian Edition (2017) with Mastering Biology online resources

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.
Pearson

ISBN-13: 9780134589947 ©2018 Cloth Bound with Access Card Published

07/28/2017

Available for purchase in the bookstore or available online as an etext (purchase temporary access)

For students not in a science program: Biology OpenStax free online textbook can be used.

Lab Manual: will be assembled by instructor and handed out during first lab session

Online resources: A Moodle page is available for the course. Cryptic course content, topic outlines and handouts are available there, but it is important to note that this **NOT an online course** - not everything needed is available online.

ACADEMIC AND STUDENT CONDUCT

Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/ Admissions & Registration web page.

PLAGIARISM

Plagiarism is a serious academic offence. Plagiarism occurs when students present the words of someone else as their own. Plagiarism can be the deliberate use of a whole piece of another person's writing, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material. Whenever the words, research or ideas of others are directly quoted or paraphrased, they must be documented according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Resubmitting a paper which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

YUKON FIRST NATIONS CORE COMPETENCY

Yukon College recognizes that a greater understanding and awareness of Yukon First Nations history, culture and journey towards self-determination will help to build positive relationships among all Yukon citizens. As a result, to graduate from ANY Yukon College program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see www.yukoncollege.yk.ca/yfnccr.

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 College Academic Regulations (available on the

Yukon College website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC): lac@yukoncollege.yk.ca

THE LORENE ROBERTSON WRITING CENTRE

All students are encouraged to make the Writing Centre a regular part of the writing process for coursework. The Lorene Robertson Writing Centre is staffed by helpful writing coaches from across the College and offers one-on-one appointments to students in need of writing support. For in-person appointments, the Centre coaching office is located in the Academic Support Centre in room A2302. You can also participate in coaching appointments over the phone or online. See the Academic Support Centre schedule for English and writing support times.

Topic Outline

General topic	Chapter	Topics	# Lectures, quiz date
1. Introduction	CH 1	The Scientific Method	2
2. Ecology	CH 52	Introduction to Ecology and the Biosphere	1
	CH 53	Population Ecology	2 <i>Quiz 1 Sep 19</i>
	CH 54	Community Ecology	1
3. Evolution	CH 22, 23	Variation, Natural Selection	1
	CH 24	Speciation	1
4. The Diversity of Life	CH 25 (part)	History of Life on Earth	1 <i>Quiz 2 Oct 3</i>
	CH 27	Bacteria and Archaea	1
	CH 28	Eukarya: Protists	1
	CH 31	Fungi	1 <i>Quiz 3 Oct 17</i>
	CH 29, 30	Plants	2 <i>Quiz 4 Oct 31</i>
	CH 32, 33	Animals: Invertebrates	2
	CH 34	Animals: Vertebrates	2
5. Basic Chemistry of Life	CH 3	The chemistry of water	1 <i>Quiz 5 Nov 14</i>
	CH 4, 5	Organic Chemistry	1
6. Introduction to Basic Metabolism	CH 8	Energy flow, ATP, membrane function	2
Date set by administration			<i>Final Exam *</i>

*(Cumulative but mostly focused on portion since last quiz)

NOTE THAT This schedule could change and the exact topics covered on each

quiz will differ depending on how fast we move through material. The exact topics on each quiz will be given to you in lecture.

Lab Schedule and List of Topics

- Lab 1 Ecology 1- The Boreal Forest: Introduction to ecosystems, trophic structures, plant identification, dichotomous key (*Outside lab-bring appropriate clothes to be outside*)
- Lab 2 Ecology 2- Population Ecology and Community Interactions, population density, quadrat sampling (*outside exercise*), mark-and-recapture, growth curves, evolution and diversity of community interactions
- Lab 3 Evidence of Evolution, Evolution and Natural Selection, genetic drift, gene flow, and natural selection exercises
- Lab 4 The Microscope Introduction
The Evolution of Biological Diversity - Archaea, Eubacteria, and Protists
- Lab 5 Fungi 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, and Nematoda, Rotifers
- Lab 9 Animal Diversity Part 2 - Molluscs and Annelids
- Lab 10 Animal Diversity Part 3 - Arthropods, Echinoderms and Chordates
- Lab 11 Chemistry of Life - Water