

DEPARTMENT OF SCIENCE

COURSE OUTLINE – Winter 2024

BI1080 (A2): Introduction to Biological Diversity – 3 (3-1-3) 105 Hours for 15 Weeks

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation, and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

INSTRUCTOR: Dr. Jessie Zgurski **PHONE:** 780-539-2863
OFFICE: J221 **E-MAIL:** JZgurski@nwpolytech.ca
Monday 1:00 PM – 4:00 PM, Wednesday 11:00 AM – 2:00 PM, Friday
OFFICE HOURS: 11:00 AM – 2:00 PM, or by appointment.

CALENDAR DESCRIPTION: This course examines the major lineages of life on Earth. It provides an overview of evolutionary principles and classification, the history of life, and the key adaptations of prokaryotes, protists, fungi, plants, and animals. Laboratories survey the diversity of biological form and function and introduce students to data collection and scientific writing.

PREREQUISITE(S)/COREQUISITE: Biology 30 (Prerequisite)

REQUIRED TEXT/RESOURCE MATERIALS:

1) Wasserman, S. A., Minorsky, P. V., Jackson, R. B., Scott, K. G. E., Rawle, F. E., Moyes, C. D., Durnford, D. G., Walde, S. J., Cain, M. L., Urry, L. A., and Reece, J. B. 2021. Campbell Biology, Third Canadian Edition. Pearson Canada. (Recommended Textbook. The Second Edition of Campbell Biology, Canadian Edition, is also acceptable.)

2) Biology 1080 Lab Manual (Required – Available at the Bookstore)

3) Binder for Biology 1080 Lab Manual (and other lab handouts) – It should be able to hold about 200 pages.

DELIVERY MODE(S): Lectures (Tuesday and Thursday, 8:30 – 9:50 AM in J202), Laboratory (Wednesday or Friday, 2:30 – 5:20 PM in J130), Seminars (Monday 11:30 AM – 12:20 PM in J201 or Friday 10:00 AM – 10:50 AM in J201).

LEARNING OUTCOMES: By the end of the course, students should:

- Understand how to use the scientific method to test biological hypotheses.
- Be able to describe the process of natural selection and be able to provide examples of the evidence for evolution via natural selection.
- Be able to use current phylogenetic and taxonomic nomenclature to discuss the evolution of life on Earth.
- Be able to list the characteristics that define the major clades of life, including the eukaryotes, fungi, land plants, vascular plants, seed plants, flowering plants, chordates, and amniotes.

TRANSFERABILITY:

Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at the Alberta Transfer Guide main page

<http://www.transferalberta.alberta.ca>.

** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions.

Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability.

EVALUATIONS:	Laboratory	40% (Labs start January 17/19, 2024)
	Seminar	10% (Seminars start January 15/19, 2024)
	Midterm	20% (In class, February 29, 2024)
	Final Exam	30% (During exam week, exact time and place TBA)

The 40% laboratory mark will be broken down as follows:

<i>Anolis</i> Assignment	1% (Due end of lab, January 24 or 26)*
Museum Questions	3% (Due February 7 or 9)
Isopod Assignment	6% (Due February 14 or 16)
Algae Lab Questions	3% (Due February 28 or March 1)
<i>Brassica</i> Lab Report	11% (Due March 20 or 22)
Lab Final	16% (On April 3 or 5)

* This due date will depend on which lab section you are registered in.

The 10% seminar mark will be based on participation. You will frequently be asked to hand in work completed during the seminar period.

GRADING CRITERIA

Please note that most universities will not accept your course for transfer credit **IF** your grade is less than C-.

All marks will be assigned according to the criteria outlined in this syllabus.

Alpha Grade	4-point Equivalent	Percentage Guidelines	Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	90-100	C+	2.3	67-69
A	4.0	85-89	C	2.0	63-66
A-	3.7	80-84	C-	1.7	60-62
B+	3.3	77-79	D+	1.3	55-59
B	3.0	73-76	D	1.0	50-54
B-	2.7	70-72	F	0.0	00-49

COURSE SCHEDULE/TENTATIVE TIMELINE:

Lecture Schedule – Winter 2024		
LECTURE TOPIC	Readings (Campbell's Biology)	
	Dates (Approximate)	Textbook Chapter
Introduction to BI 1080	January 9	-
1. Unifying Themes in Biology	January 9, 11	Chapter 1
2. Taxonomy, Phylogeny & Systematics	January 16, 18	Chapter 26
3. Descent with Modification	January 23, 25	Chapter 22
4. Evolution of Populations	January 30, February 1	Chapter 23
5. Origin of Species	February 6, 8	Chapter 24
6. History of Life	February 13, 15	Chapter 25
Winter Break	February 20, 22	N/A

Lecture Schedule – Winter 2024		
LECTURE TOPIC	Readings (Campbell's Biology)	
	Dates (Approximate)	Textbook Chapter
7. Protists	February 27, March 5	Chapter 28
8. Plants – Colonization of Land	March 7, 12	Chapter 29
9. Plants – Seed & Flowering plants	March 14, 19	Chapter 30
10. Fungi	March 21, 26	Chapter 31
11. Animals - Overview	March 28	Chapter 32
12. Animals – Invertebrates	April 2, 4	Chapter 33
13. Animals – Chordates/Vertebrates	April 9, 11	Chapter 34
Final Exam	TBA – Exam Week	Covers Topics 7 – 13

Laboratory Schedule – Winter 2024		
Date	Lab	Assignment Due?
January 17 or 19	Lab 1: Biology Tools and Techniques	No
January 24 or 26	Lab 2: An Introduction to Evolution and Speciation	Hand in graphs by end of lab period.
January 31 or February 2	Lab 3: Museum Field Trip	No
February 7 or 9	Lab 4: Habitat Selection in Terrestrial Isopods	Hand in Museum Worksheet.
February 14 or 16	Lab 5: Diversity of Photosynthetic Pigments	Isopod Assignment Due
February 21 or 23	No Labs – Winter Break	No
February 28 or March 1	Lab 6: Plants Part I – Plant Form and Function	Algae Assignment Due

Laboratory Schedule – Winter 2024		
Date	Lab	Assignment Due?
March 6 or 8	Lab 7: Plants Part II – Reproduction in Land Plants	No
March 13 or 15	Lab 8: Biology of Invertebrates (Protostomes)	No
March 20 or 22	Lab 9: Introduction to Deuterostomes	<i>Brassica</i> Lab Report Due
March 27 or 29	No Labs – Good Friday	No
April 3 or 5	Lab Exam	Lab Exam this week

Seminar Schedule – Winter 2024	
Date	Activity
January 15 or 19	Finding primary and secondary sources
January 22 or 26	Statistics Tutorial I (Chi-Square Test)
January 29 or February 2	Phylogenetics tutorial
February 5 or 9	Population Genetics Tutorial
February 12 or 16	Earthviewer Exercise
February 19 or 23	No Seminar – Winter Break
February 26 or March 1	No Seminar – Midterm Week
March 4 or 8	Statistics Tutorial II (t-test) and Lab Report Writing
March 11 or 15	Algae and Protista Exercises
March 18 or 22	Fungi Exercises
March 25 or 29	No Seminars – Good Friday
April 1 or 5	No Seminar – Lab Exam Week
April 8 or 12	Final Exam Preparation Exercises

STUDENT RESPONSIBILITIES: For our first laboratory (on January 17 or 19, depending on your lab section), please bring a copy of the lab manual, a binder, and something to write with. Please wear closed-toe shoes. Lab coats and gloves will be provided.

Seminars start during the second week of class, so the first seminars will be held on January 15 or 19, depending on your section. Please bring paper and something to write with. During seminars, you will learn skills that will be necessary to write lab reports, such as how to conduct the required analytical statistical tests. You will also work on problems that will allow you to apply many of the principles learned in class. The mark is based primarily on attendance and participation, but everyone gets one “free” seminar absence. In other words, if you miss one seminar, it will not affect your mark. Students must also participate in the seminar exercises to earn full participation marks. You will frequently be asked to hand in work completed during the seminars.

Students are responsible for completing and submitting work on time. Late assignments will typically be docked 10% of the mark. No assignments will be accepted if they are more than one week late. Assignments not handed in will receive a mark of zero.

The midterm will be conducted in class on February 29 and the laboratory final will be delivered during the last laboratory period on April 3 or 5. A calculator will be permitted during the midterm and the laboratory final; otherwise, electronic devices are prohibited during exams. Students who cannot write the midterm or laboratory exam during the scheduled time due to a serious illness or another compelling reason must arrange to write it later. The final exam will be held during exam week. Failure to write the final exam will result in a grade of zero unless the exam was missed for a compelling reason (such as an illness). In such a case, the exam will be deferred.

You are expected to take notes in this class. Copies of the lecture PowerPoint presentations will be made available on the course website prior to the lectures. I recommend printing out copies of the PowerPoint files or the lecture guides (these will be Word documents) prior to class and writing additional notes on them during lecture. Alternatively, you can load them up on your tablet and take notes that way. The lecture guides are designed to be filled out during lecture. Other learning resources, including practice exam questions and pre-lab PowerPoint presentations, will be added to the page during the semester.

Phones should be put away during this class (including during labs or seminars), and tablets and computers should only be used for taking notes. Using electronic devices to play games, watch videos, shop, or browse social media is distracting to other students and inconsiderate to the instructor.

Students are expected to frequently check the course website and their college E-mail accounts for announcements regarding the class.

STATEMENT ON ACADEMIC MISCONDUCT:

Academic Misconduct will not be tolerated. For a more precise definition of academic misconduct and its consequences, refer to the Student Rights and Responsibilities policy available at <https://www.nwpolytech.ca/about/administration/policies/index.html>.

**Note: all Academic and Administrative policies are available on the same page.

Please note that all work assignments completed for this class must be completed individually.

ACCESSIBILITY SUPPORTS AND DISABILITY SERVICES: If you require disability-related accommodations and support, please contact the Accessibility Supports and Disability Services office. Their Email address is AS@nwpolytech.ca and their website is <https://libguides.nwpolytech.ca/learningcommons/AccessibilityServices>

MENTAL HEALTH SUPPORTS: NWP students have access to mental health counselling services. Please do not hesitate to seek help if you are suffering from issues such as anxiety, depression, trauma, grief, or any coping-related concerns. Go to <http://www.mystudentsupport.com/> or call 1-855-849- 8641 to speak to a counsellor. The NWP website also has mental health supports available. Please visit https://www.nwpolytech.ca/services/mental_health/index.html for more information.