NORTHWESTERN POLYTECHNIC

DEPARTMENT OF SCIENCE

COURSE OUTLINE – WINTER 2023

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) 903 6313
OFFICE:	J221	**E-MAIL:**	JZgurski@nwpolytech.ca
OFFICE HOURS:	Monday 1:00 – 4:00 PM, Tuesday, & Thursday 11:30 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 OR RECOMMENDED 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): Lecture (Monday and Wednesday, 10:00 – 11:20 AM in J226), Laboratory (Thursday or Friday, 2:30 – 5:20 PM, J130), and Seminar (Monday 11:30 AM– 12:20 PM in J201 or Friday at11:30 AM – 12:20 PM in J202)

COURSE OBJECTIVES: To provide the student with a thorough understanding of current evolutionary theory and to demonstrate how the evolutionary process has produced a wide variety of organisms, both extinct and extant.

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.

NOTE: Additional detailed learning outcomes will be provided for each topic and laboratory in the course.

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.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 12/13, 2023)
	Seminar	10% (Seminars start January 9/13, 2023)
	Midterm	20% (In class, February 22, 2023)
	Final Exam	30% (During exam week, exact time and place to be announced)

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

Anolis Assignment	2%	(Due January 26 or 27)*
Lab Three Questions	2%	(Due February 2 or 3)
Brassica Lab Assignment	5%	(Due February 20)
Isopod Lab Report	10%	(Due March 16 or 17)
Presentations	5%	(On March 23 or 24)
Lab Final	16%	(On March 30 or 31)

*The precise due date for the laboratory assignments will depend on which laboratory section a student is enrolled in.

The 10% seminar mark will be broken down as follows:

Phylogenetics Assignment	2.5%	(Due January 30 or February 3)
Genetics Assignment	2.5%	(Due February 6 or 10)
Participation	5%	

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

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 2023		
LECTURE TOPIC	**Readings (Campbell's Biology)**	
	Dates (Approximate)	**Textbook Chapter**
Introduction to BI 1080	January 4	-
1. Unifying Themes in Biology	January 4, 9	Chapter 1
2. Taxonomy, Phylogeny & Systematics	January 11, 16, 18	Chapter 26
3. Descent with Modification	January 18, 23	Chapter 22
4. Evolution of Populations	January 25, 30	Chapter 23
5. Origin of Species	February 1, 6	Chapter 24
6. History of Life	February 8, 20	Chapter 25
Fall Break – No Class	**February 13 and 15**	**N/A**
Midterm	**February 22**	**Covers Topics 1 - 6.**
7. Protists	February 27, March 1	Chapter 28
8. Plants – Colonization of Land	March 6, 8	Chapter 29
9. Plants – Seed & Flowering plants	March 13, 15	Chapter 30
10. Fungi	March 20, 22	Chapter 31
11. Animals - Overview	March 27, 29	Chapter 32

Lecture Schedule – Winter 2023		
LECTURE TOPIC	**Readings (Campbell's Biology)**	
	Dates (Approximate)	**Textbook Chapter**
12. Animals – Invertebrates	March 29, April 3, 5	Chapter 33
13. Animals – Chordates/Vertebrates	April 10, 12	Chapter 34
Final Exam	**TBA – Exam Week**	**Covers Topics 7 – 13**

Laboratory Schedule – Winter 2023*		
Date	**Lab**	**Assignment**
January 12 or 13	Lab 1: Biology Tools and Techniques	No
January 19 or 20	Lab 2: An Introduction to Evolution and Speciation	No
January 26 or 27	Lab 3: Diversity of Photosynthetic Pigments	Hand in *Anolis* graphing assignment by this date.
February 2 or 3	Lab 4: Plants Part I: Plant Form and Function	Hand in Lab 3 Questions
February 9 or 10	Lab 5: Plants Part II: Reproduction in Land Plants	No
February 16 & 17	**No Labs – Winter Break**	**No**
February 20	N/A	Hand in *Brassica* Assignment
February 23 or 24	Lab 6: Kingdom Fungi	No
March 2 or 3	Lab 7: Habitat Selection in Terrestrial Isopods	No
March 9 or 10	Lab 8: Biology of Invertebrates (Protostomes)	No
March 16 or 17	Lab 9: Introduction to Deuterostomes	Isopod Report Due
March 23 or 24	Lab 10: Review Lab	Presentation
March 30 or 31	Lab Exam	Lab Exam

Seminar Schedule – Winter 2023		
Date	**Activity**	**Notes**
January 9 or 13	Finding primary and secondary sources	No assignment due, tutorial will be conducted in computer lab.
January 16 or 20	Statistics Tutorial I (t test)	No assignment due, tutorial will be conducted in computer lab.
January 23 or 27	Phylogenetics tutorial	No assignment due
January 30 or February 3	Population Genetics	Phylogenetics Assignment
February 6 or 10	Earthviewer Activity	Population Genetics Assignment Due
February 13 or 17	**No Seminar – Winter Break**	No assignment due
February 20 or 24	No Seminar – Midterm Week	No assignment due
February 27 or March 3	Lab Report Writing Tutorial	No assignment due
March 6 and 10	Botany/Protista review exercises	No assignment due
March 13 and 17	TBA	No assignment due
March 20 and 24	Lab Exam Review	No assignment due
March 27 and 31	No Seminar – Lab Final Week	No assignment due
April 3 and 7	Final Exam Review	No assignment due

STUDENT RESPONSIBILITIES: For our first laboratory (on January 12 or 13, 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. If you cannot make it to the laboratory due to an illness or another compelling reason, please contact the instructor and let her know.

Seminars start during the second week of class, so the first seminars will be held on January 9 or 13, 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 5% participation mark is based primarily on attendance, but everyone gets one "free" absence before marks are lost for non-attendance. Students must also participate in the seminar exercises to earn full participation marks.

Students are responsible for completing and submitting work on time. Late assignments will typically be docked 10% of the mark. However, if you have a compelling reason for requiring an extension, please contact the instructor and the late penalty may be waived.

The midterm will be conducted in class on February 22 and the laboratory final will be delivered during the last laboratory period on March 30 or 31. 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 PLAGIARISM AND CHEATING: Cheating and plagiarism will not be tolerated and there will be penalties. For a more precise definition of plagiarism and its consequences, refer to the Student Conduct section of the College Calendar at https://www.nwpolytech.ca/programs/calendar/ or the College Policy on Student Misconduct: Plagiarism and Cheating at https://www.nwpolytech.ca/about/administration/policies/index.html

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

ACCESSIBILTY 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/students.html/ for more information.