NORTHWESTERN POLYTECHNIC

DEPARTMENT OF SCIENCE

COURSE OUTLINE – FALL 2022

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 12:00 – 2:00 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 (Tuesday and Thursday, 10:00 – 11:20 AM in J203), Laboratory (Monday or Friday, 2:30 – 5:20 PM, J130), and Seminar (Friday 8:30 – 9:20 AM in J203 or 10:00 – 10:50 AM in J201)

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 September 9, 2022)
	Seminar	10% (Seminars start September 9, 2022)
	Midterm	20% (In class, October 20, 2022)
	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	1%	(Due September 23 or 26)*
Lab Three Questions	1%	(Due October 3)
Brassica Lab Assignment	4%	(Due October 17 or 21)
Plant Quiz	3%	(October 24 or 28)
Fungus Quiz	3%	(October 31 or November 4)
Isopod Lab Report	10%	(November 14 or 18)
Invertebrate Quiz	3%	(November 21 or 25)
Lab Final	15%	(November 28 or December 2)

*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%	(October 3)
Genetics Assignment	2.5%	(October 17)
Participation	5%	(Based primarily on attendance)

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 – Fall 2022		
LECTURE TOPIC	**Readings (Campbell's Biology)**	
	Dates (Approximate)	**Textbook Chapter**
Introduction to BI 1080	September 1	-
1. Unifying Themes in Biology	September 1, 6	Chapter 1
2. Taxonomy, Phylogeny & Systematics	September 8, 13, 15	Chapter 26
3. Descent with Modification	September 15, 20	Chapter 22
4. Evolution of Populations	September 22, 27	Chapter 23
5. Origin of Species	September 29, October 4	Chapter 24
6. History of Life	October 6, 18	Chapter 25
Fall Break – No Class	**October 11, 13**	**N/A**
Midterm	**October 20, In Class**	**Covers Topics 1 - 6.**
7. Protists	October 25, 27	Chapter 28
8. Plants – Colonization of Land	November 1, 3	Chapter 29
9. Plants – Seed & Flowering plants	November 8, 10	Chapter 30
10. Fungi	November 15, 17	Chapter 31
11. Animals - Overview	November 22, 24	Chapter 32

Lecture Schedule – Fall 2022		
LECTURE TOPIC	**Readings (Campbell's Biology)**	
	Dates (Approximate)	**Textbook Chapter**
12. Animals – Invertebrates	November 29, December 1	Chapter 33
13. Animals – Chordates/Vertebrates	December 6, 8	Chapter 34
Final Exam	**TBA – Exam Week**	**Covers Topics 7 – 13**

Laboratory Schedule – Fall 2022*		
Date	**Lab**	**Assignment and/or Quiz?**
September 9 or 12	Lab 1: Biology Tools and Techniques	No
September 16 or 19	Lab 2: An Introduction to Evolution and Speciation	No
September 26 or 30	Lab 3: Diversity of Photosynthetic Pigments	Hand in *Anolis* assignment by this date.
October 3 or 7	Lab 4: Plants Part I: Plant Form and Function	Hand in Lab 3 Questions
October 10 or 14	**No Labs: Fall Break**	**No**
October 17 or 21	Lab 5: Plants Part II: Reproduction in Land Plants	*Brassica* lab assignment due
October 24 or 28	Lab 6: Kingdom Fungi	Plant Quiz
October 31 or November 4	Lab 7: Habitat Selection in Terrestrial Isopods	Fungi Quiz
November 7 or 11	**No Labs: Remembrance Day**	**No**
November 14 or 18	Lab 8: Biology of Invertebrates (Protostomes)	Isopod Assignment Due
November 21 or 25	Lab 9: Introduction to Deuterostomes	Invertebrate Quiz
November 28 or December 2	Lab Exam	Lab Exam

* Note: There are no labs Monday, September 5 (Labour Day) or Friday, September 30 (Truth and Reconciliation Day)

Seminar Schedule – Fall 2022		
Date	**Activity**	**Notes**
September 9	Finding primary and secondary sources	No assignment due
September 16	Statistics Tutorial I (t test)	No assignment due
September 23	Phylogenetics tutorial	No assignment due
September 30	**No Seminar (Truth and Reconciliation Day)**	**No assignment due**
October 3	No Seminar (Monday)	Phylogenetics Assignment Due
October 7	Population Genetics	No Assignment Due
October 14	**No Seminar – Fall Break**	**N/A**
October 17	No Seminar (Monday)	Population Genetics Assignment Due
October 21	**No Seminar – Post-Midterm Seminar Break**	**N/A**
October 28	Statistics Tutorial II (Chi Square Test)	No assignment due
November 4	Lab Report Writing Tutorial	No assignment due
November 11	**No Seminar – Remembrance Day**	**No assignment due**
November 18	Botany/Protista review exercises	No assignment due
November 25	Lab Exam Review exercises	No assignment due
December 2	No Seminar – Lab Exam	N/A
December 9	Final Exam Review	No assignment due

STUDENT RESPONSIBILITIES: For our first laboratory (on September 9 or 12, 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. Do not attend the laboratory or class if you are ill.

Seminars start during the second week of class, so the first seminars will be held on September 9. 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 principles learned in class.

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 October 20 and the laboratory final will be delivered during the last laboratory period on November 28 or December 2. 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.

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 Northwestern Polytechnic Calendar at https://www.nwpolytech.ca/programs/calendar/ or the Student Rights and Responsibilities policy which can be found at https://www.nwpolytech.ca/about/administration/policies/index.html

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

ADDITIONAL INFORMATION: 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 or computer 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.

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.