

DEPARTMENT OF SCIENCE

COURSE OUTLINE – WINTER 2021

BI1080 (A3): Introduction to Biodiversity – 3 (3-1-3) - 105 Hours for 15 Weeks

INSTRUCTOR:	Dr. Jessie Zgurski	PHONE:	(780) 903 6313
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OFFICE HOURS: Due to the COVID-19 pandemic, I cannot hold in-person office hours. However, please feel free to contact me via E-mail or phone if you have questions or concerns. If you would like to arrange a meeting through Zoom, please contact me to set up an appointment.

WINTER 2021 DELIVERY: Mixed Delivery – Remote and Onsite. This course is delivered remotely with some face-to-face/onsite components at the GPRC Grande Prairie campus.

- For the remote delivery components: students must have a computer with a webcam and reliable internet connection. Technological support is available through helpdesk@gprc.ab.ca.
- For the onsite components: students must supply their own mask [and/or face shield] and follow GPRC Campus Access Guidelines and Expectations.

Note: GPRC reserves the right to change the course delivery.

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**)

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

DELIVERY MODE(S): Lecture, Laboratory, Seminar.

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 also be provided for each topic included 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 <u>http://www.transferalberta.ca</u>.

** 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

40%
10%
20% (February 23, 2021)
30%

The laboratory mark will be broken down as follows:

Anolis Laboratory Graphs	1%
Brassica Lab Assignment	6%
Isopod Lab Report	8%
Participation	5%
Lab Final	20%

The 10% seminar mark will be comprised of quizzes (5%) and two short assignments (2.5% each).

GRADING CRITERIA:

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

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

COURSE SCHEDULE/TENTATIVE TIMELINE:

Lectures: Tuesday and Thursday, Online (Zoom), 11:30 AM – 12:50 PM. Laboratories: Tuesday or Friday. J130, 2:45 – 5:45 PM Seminars: Monday11:30 AM – 12:20 PM, or Friday 8:30 – 9:20 AM, Online (Zoom)

Lecture Schedule					
LECTURE	Readings (pages)				
TOPIC	Dates (Approximate) Textbook Chapter				
Introduction to BI 1080	-	-			
Unifying Themes in Biology	January 5, 7	Chapter 1			
Taxonomy, Phylogeny & Systematics	January 12, 14	Chapter 26			
Descent with Modification	January 19, 21	Chapter 22			
Evolution of Populations	January 26, 28	Chapter 23			
Origin of Species	February 2, 4	Chapter 24			
History of Life	February 9, 11	Chapter 25			
Midterm	February 23	Covers all material to date.			
Protists	February 25, March 2	Chapter 28			
Plants – Colonization of Land	March 4, 9	Chapter 29			
Plants – Seed & Flowering plants	March 9, 11	Chapter 30			
Fungi	March 16, 18	Chapter 31			
Animals - Overview	March 23, 25	Chapter 32			
Animals – Invertebrates	March 25, 30, April 1	Chapter 33			
Animals – Chordates/Vertebrates	April 1, 6, 8	Chapter 34			
Final Exam	TBA – Exam Week	Covers Chapters 28 - 34			

Lab Schedule			
DATE	ACTIVITY		
January 5 or 8	No Labs		
January 12 or 15	Lab 2. Origin of species (Online Lab – log in to Zoom)		
January 19 or 22	Lab 1: Biology Tools and Techniques Anolis Lab Graphs Due		
January 26 or 29	Lab 3: Diversity of Photosynthetic Pigments		
February 2 or 5	Lab 4: Plants Part I, Plant Form and Function		
February 9 or 12	Lab 5: Plants Part II, Reproduction in Land Plants		
February 16 or 19	Winter Break – No Labs!		
February 23 or 26	Lab 7: Habitat Selection in Terrestrial Isopods, <i>Brassica</i> Lab		
	Assignment Due		
March 2 or 5	Lab 8: Biology of Invertebrates (Protostomes)		
March 9 or 12	Lab 9: Introduction to Deuterostomes Isopod Lab Report Due		
March 16 or 19	Lab 6 and 10: Review Lab, Fungi		
March 23 or 26	Lab Final – To be written in lab.		

Seminar Schedule			
Date	Reading / Activity	Comments	Synchronous or Asynchronous?*
January 4 / 8	No seminar for the first week of class.	N/A	N/A
January 11 / 15	No reading for this week. This week will be a demonstration on using library resources and finding primary and secondary resources.	No quiz.	Synchronous
January 18 / 22	No reading for this week. This week will be a statistics tutorial on the t- test. The information will be important for completing a lab assignment.	No quiz.	Synchronous
January 25 / 29	New Species Right Before Our Eyes: How Bird Feeders Can Influence Speciation. The activity will be on phylogenetics, and there will be an associated assignment.	Quiz on assigned reading.	Synchronous
February 1 / 5	Speciation and the Threespine Stickleback: The New Fishes of Paxton Lake. The activity will be on population genetics, and there will be an associated assignment.	Quiz on assigned reading. Phylogenetics assignment Due.	Synchronous
February 8 / 12	Genomes Large and Small: The Evolution of Gene Size in Eukaryotes. We will do some review exercises to prepare for the midterm.	Quiz on assigned reading, Population genetics assignment due.	Synchronous

Seminar Schedule			
Date	Reading / Activity	Comments	Synchronous or Asynchronous?*
February 15 / 19	Winter Break – No Seminars	No Seminar	N/A
February 22 / 26	Midterm week – No Seminars	No Seminar	N/A
March 1 / 5	Development of Endosymbiotic Theory. Reading will be on course website. The activity will be a tutorial on the Chi-square test (you will need to be able to do one for the isopod assignment).	Quiz on assigned reading.	Synchronous
March 8 / 12	Barcoding Biodiversity: The Use of DNA Sequences to Identify Species. The activity will be on writing lab reports.	Quiz on assigned reading.	Synchronous
March 15 / 19	The Burgess Shale and the Cambrian Explosion: Evolution in the Rear-View Mirror. Reading and video.	Quiz on assigned reading and video.	Asynchronous
March 22 / 26	The Evolution of the Vertebrate Jaw: How Would You Eat Without One? Reading and video.	Quiz on assigned reading and video.	Asynchronous
March 29 / April 2	No Seminar (Good Friday)	N/A	N/A

*"Synchronous" means that we will meet online via Zoom at the scheduled seminar time. Asynchronous means that there will be no scheduled Zoom meeting for seminar that week. There will be review exercises placed online for the asynchronous seminars that you can work on anytime during the week. You can also complete the online quizzes anytime during the week for asynchronous seminars.

STUDENT RESPONSIBILITIES: For our first in-person laboratory (held during the week of January 19), please bring a copy of the lab manual and a mask. Masks will be required for in-person science labs during the Winter 2021 semester. The first scheduled laboratory (during the week of January 11) will be an "online" laboratory. 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 if you are ill. The Zoom lecture and seminar sessions can be accessed through the course Brightspace website through the "Zoom" option at the top of the page.

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 final exam, midterm, and seminar quizzes will be delivered online. These will have time limits and must be completed individually. The laboratory final will be delivered during the last laboratory period

and will be conducted in person. Students who cannot write the laboratory exam during the scheduled time due to Covid-19 exposure or another compelling reason can write it at a later date. Failure to write the midterm or final exam will result in a grade of zero unless the exam was missed for a compelling reason (such as 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 College Calendar at <u>http://www.gprc.ab.ca/programs/calendar/</u> or the College Policy on Student Misconduct: Plagiarism and Cheating at <u>https://www.gprc.ab.ca/about/administration/policies</u>

**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 Brightspace 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. Other learning resources, including practice exam questions, 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 <u>asds@gprc.ab.ca</u> and their website is https://libguides.gprc.ab.ca/learningcommons/AccessibilityServices .

MENTAL HEALTH SUPPORTS: GPRC 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 <u>http://www.mystudentsupport.com/</u> or call 1-855-849-8641 to speak to a counsellor. The GPRC website also has mental health supports available. Please visit <u>https://www.gprc.ab.ca/services/mental_health/</u> for more information.