

## **BIODIVERSITY AND ECOLOGY (BIOL 226/03)**

Course Outline: September 2019

**Note: Any changes that I make since posting the original course outline will be shown in red.**

*In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.*

### **Instructor: Dr. Eric Pedersen, Department of Biology**

Office: SP-401.05, Phone: 848-2424 ext. 8531, Email: eric.pedersen@concordia.ca

Office hours: Tuesday and Thursday 10:30 – 12:00. You can also talk to me after class or via appointment.

Email policy: I will try to answer your emails promptly. However, it may take up to 48 hours to get back to you, so please plan accordingly. Please include the course number (BIOL 226) in the subject line to make sure I see it.

### **Teaching Assistant**

Emily Kroft; Contact information and office: TBA

### **Course Description**

Lectures: Tuesdays & Thursdays, 1445-1600, Loyola Campus, SP-S110

This course introduces the evolution, biodiversity, and ecology of organisms. The origin and diversity of life, from prokaryotes through simple eukaryotes to multi-cellular organisms are introduced. Natural selection, speciation, and phylogeny, stressing evolutionary relationships in conjunction with changing conditions on earth, are presented. The course introduces major concepts in ecology: the physical and chemical environment, population structure, life histories, species interactions, communities, and ecosystems. Lectures only.

Prerequisites: CEGEP Biology 1 or BIOL 201 or permission of the instructor.

#### Course Objectives:

Students will learn the fundamental principles of evolutionary theory, and then use this knowledge to explore the evolution of biodiversity on earth. By the end of the course, students will be familiar with the major groups of organisms, including when they first appeared on earth and how they are related to one another. Students will also learn basic ecological theory and begin to use these principles in understanding the concept of sustainability and proposing solutions to the major environmental problems facing the biosphere.

### Required Materials:

- **Textbook:** Campbell Biology, 2<sup>nd</sup> Canadian Edition. J.B. Reece, et al. 2018. Pearson.  
(Note on earlier editions: First Canadian Edition is ok and the 9<sup>th</sup> edition is probably ok. Course texts are also available on reserve from the library.)
- **iClicker** (can be purchased new or used from the bookstore) **OR: a student can use networked devices such as smart phones, tablets, and laptops and the REEF polling feature.** If opting for the REEF feature, students need to purchase a Reef license (<https://app.reef-education.com/#/login>) and may have to consent to share their personal information with a third party; see:  
<https://www.concordia.ca/content/dam/concordia/docs/IITS/iclicker-documentation/iclicker-may2018/In-course%20Use%20of%20External%20Education%20Software%20and%20Services.pdf>  
**\*Please refer to the final section of the syllabus for information about registering your iClicker or mobile device**

### Course Philosophy:

I expect students to read the assigned chapter, complete the *Definitions, Explanations or Lists*, answer the *Assigned Questions*, and at least think about the *Review Exercises* for that chapter before coming to class. This material will form the backbone of your notes for the course. I suggest you bring the answers to class so that any information covered in class can be added to your notes. Because students will have already read the chapter, I do not feel obliged to cover the entire chapter in the lecture period. Instead, I will use class time to concentrate on difficult topics, tell you stuff that isn't in the book, do problems, answer questions, etc.

### Assigned Questions:

Students will hand in answers to the Assigned Questions electronically via Moodle by 11 am the day they are due. Answers will be graded by the T.A. and returned via Moodle. Students are expected to complete but not hand in the Definitions and Review Exercises. Each student must hand in his/her own work (see below). Late submissions (i.e. after 11 am on the due date) will not be accepted.

### Academic Misconduct:

Copying from other students or from last year's assignments defeats the purpose of the assigned questions and is plagiarism "**the presentation of the work of another person as one's own or without proper acknowledgement**" (see Article 17.10.3 III of the Undergraduate Calendar). It is also academic misconduct to use another student's clicker.

### What are you responsible for?

In decreasing order of importance: (1) what we cover in class, (2) your answers to Definitions, Assigned Questions and Review Exercises, and (3) any assigned reading material not covered in assigned questions or lectures.

### What to do when ill?

Assigned questions: **only your best 8 count**, so I do not accept late submissions. The marking scheme is generous because there will be **no exceptions for illness etc.**

Tests: there will be no make-up tests. Email me **before the test** to let me know that you are ill or have some legitimate reason (e.g. religious holiday or funeral) for not writing, and I will increase the value of your final exam to compensate for the missing test.

### Evaluation:

5%	Class participation, via clicker questions. If you respond to clicker questions in at least 80% of classes (i.e. more than 18 lectures) you will receive full marks (i.e. clicking during 80% classes = 5/5; clicking during 40% of classes = 2.5/5 etc.); the marking scheme is generous because there will be <b>absolutely no exceptions</b> because you were sick, forgot your clicker etc.).
10%	Answers to Assigned Questions ( <b>the best 8 of 11</b> ). Graded by the TA
15%	Test I (in class; if you miss it for a <b>valid</b> reason and have discussed this with the professor your final counts for 15% more)
30%	Test II (in class; if you miss it for a <b>valid</b> reason your final counts for 30% more)
40-62.5%*	Final Exam (about 60% will be based on material covered after test II) If your grade on the final exam is > than your grade on: (1) Test I, then Test I will count for only 7.5% and your exam will count for 47.5%; (2) Test II, then Test II will count for only 15% and your final exam will count for 55%; (3) Test I and II, then both tests will count for 22.5% and your final exam will count for 62.5%. If your grade on the final is < than on both tests, then it counts for 40%.

### Grading scheme:

A+≥90, A=85-90, A-=80-85, B+=77-80, B=73-77, B-=70-73, C+=67-70, C=63-67, C-=60-63, D+=57-60, D=53-57, D-=50-53, F<50

### How to do well in BIOL 226?

Attend **all** classes, participate **actively** when you attend, hand in **all** assignments, keep **up to date** with the readings, and study **interactively** by yourself or with a friend. If you find you are struggling with this course, it is in your best interest to see either the TA or instructor *early* so that we can provide resources and guidance. We are here to help you succeed, but it will become increasingly difficult to change your situation as the course goes on.

## Tentative Schedule of Lectures and Assignments

<u>DATE</u>	<u>ACTIVITY</u>	<u>READINGS</u> (1 <sup>st</sup> Can edn; superscripts=9 <sup>th</sup> edition) <i>Readings and assignments are due before the class</i>
Sept 3	Introduction to the course	
Sept 5	What is evolution and why we know life evolved <b>Answers to Ch. 22</b>	“Evidence for evolution” <a href="http://www.khanacademy.org/science/biology/her/evolution-and-natural-selection/a/lines-of-evidence-for-evolution">www.khanacademy.org/science/biology/her/evolution-and-natural-selection/a/lines-of-evidence-for-evolution</a> <b>Ch. 22 Section 22.3</b>
Sept 10	Basics of evolution: populations, variation, heredity; Hardy-Weinberg equilibrium <b>Answers to Ch. 23 part 1</b>	<b>Ch. 23:</b> Sections 23.1 and 23.2
Sept 12	Mechanisms of evolution: natural selection <b>Answers to Chapter 22&amp;23</b>	<b>Ch. 22:</b> except 22.3 <b>Ch. 23:</b> sections 23.3, 23.4
Sept 16	<b>Deadline for withdrawal with tuition refund</b>	
Sept 17	Mechanisms of evolution: Mutation, Drift, and Gene flow	
Sept 19	Origin of Species <b>Answers to Chapter 24, 25 &amp; 26</b> Macroevolution and Phylogeny	<b>Ch 24:</b> except 24.3 (hybrid zones) <b>Ch 25:</b> Table 25.1; Mass ext'n's: 565-570 (556-560 <sup>521-524</sup> ); Evol'n is not goal oriented: 574-575 (565-567 <sup>529-530</sup> ); <b>Ch 26,</b> the tree of life: 582-586 (574-578 <sup>536-539</sup> ); Fig. 26.10 & text; phylogenetic trees: 590-593 (582-584)
<b>Sept 24</b>	<b>Test I (All lectures and readings from Sept 5 to Sept 19)</b>	
Sept 26	Introduction to Biodiversity	<b>Ch 26,</b> Concept 26.6: 598-600 (589-592 <sup>551-553</sup> )
Oct 1	Prokaryotes <b>Answers to Chapter 27</b>	<b>Ch 25,</b> 1 <sup>st</sup> single-celled organisms: 559-60 (551 <sup>516</sup> ) <b>Ch 27</b>
Oct 3	Prokaryotes cont'd	
Oct 8	Protists <b>Answers to Chapter 28</b>	<b>Ch 25,</b> first euks: 560 (552-53 <sup>516-517</sup> ) <b>Ch 28</b>
Oct 10	Plants <b>Answers to Chapter 29</b>	<b>Ch 25,</b> colonization of land: 562 (554 <sup>518-19</sup> ) <b>Ch 29</b>
Oct 15	Plants cont'd <b>Answers to Chapter 30</b>	<b>Ch 30</b>
Oct 17	Fungi <b>Answers to Chapters 31</b>	<b>Ch 31</b>
Oct 22	Introduction to Animals	<b>Ch 25,</b> Cambrian explosion: 561-62 (553-4 <sup>518-9</sup> ) <b>Ch 32</b>

Oct 24	Introduction to Ecology <b>Answers to Chapter 52</b>	<b>Ch 52</b>
Oct 29	<b>Test II (Lectures from Sept 26 to Oct 22)</b>	
Oct 31	Biomes	
Nov 4	<b>Deadline for academic withdrawal</b>	
Nov 5	Population Ecology <b>Answers to Chapter 53</b>	<b>Ch 53</b>
Nov 7	Population Ecology cont'd	
Nov 12	Community Ecology <b>Answers to Chapter 54</b>	Ch 54
Nov 14	Community Ecology cont'd	
Nov 19	Ecosystem Ecology <b>Answers to Chapter 55</b>	Ch 55
Nov 21	Ecosystem Ecology cont'd	
Nov 26	Applied ecology and evolution	Ch 56
Nov 28	Review	

## Course/Classroom policies and resources

### Accessibility:

As the instructor of this class, I will strive to make the learning experience in this classroom as accessible and inclusive as possible. However, if you have accessibility needs that require academic accommodations, please meet with an advisor from the Access Centre for Students with Disabilities (ACSD) as soon as possible. The ACSD advisor will review your documentation and set an accommodation plan with you. I welcome meeting with you to discuss your accommodations. ACSD Contact information: acsdinfo@concordia.ca; 514-848-2424 ext. 3525; SGW Campus, GM 300. <http://www.concordia.ca/students/accessibility.html>

### Academic Misconduct:

Plagiarism, or "**the presentation of the work of another person as one's own or without proper acknowledgement**" is the most common offense under the Academic Code of Misconduct. **Copying from other students or from last year's assignments defeats the purpose of the assigned questions and is plagiarism.** Additional examples of plagiarism include: material copied word for word from books, journals, websites, etc.; material that is paraphrased but still very closely resembles the original source, or material that is translated into French or English without citing the source. Put simply, you should never copy, paraphrase, or translate material without stating clearly where you obtained it. (Further information: The Academic Integrity Website: <https://www.concordia.ca/students/academic-integrity.html>)

### Technology in the Classroom:

Please use technology in whatever ways facilitate your learning. I trust students to use technology in ways that is helpful to them (e.g., consulting readings, taking notes), and ask that you be mindful of instances that might interfere with the learning of others (i.e., be respectful of your fellow classmates and the instructor, including keeping cell phones on silent during lectures). If students are unable to contribute to classroom discussion and activities or are otherwise distracted by computers, cell phones, or tablets, I may ask that you refrain from using these devices in class. Let's keep an open dialogue about this throughout the semester.

***Statement on Digital Access and Equality:*** Digital devices (like laptops and cell phones) are becoming increasingly important to success in university. In this course, you may need digital devices to access readings, complete and submit written assignments, take in-class polls, and coordinate with other students. I recognize that some students are unable to afford the cost of purchasing digital devices and that other students rely on older, more problem-prone devices that frequently break down or become unusable. I also recognize that those technology problems can be a significant source of stress for students. Given those challenges, ***I encourage students to be aware of the many technology-related resources that Concordia University provides***, including:

- Free on-campus wifi access through the Concordia University or eduroam network:  
<https://www.concordia.ca/it/services/concordia-wireless-network.html>,  
<https://www.concordia.ca/it/services/eduroam-wireless-network.html>
- Free Office software and data storage (*Active Concordia students have access to Office 365 Education - a collection of services that allows you to collaborate and share your schoolwork*): <https://www.concordia.ca/it/services/office-365-education.html>
- Access to free in-person and online support with issues related to Concordia technology (e.g., email, wifi, printing, device setup, etc.): <https://www.concordia.ca/it/support.html>
- Laptops that students can borrow from the Concordia Library:  
<https://library.concordia.ca/help/technology/laptops.php>

If you experience a technology-related problem that interferes with your work in this course that cannot be resolved through the above resources, please contact me. This will enable me to assist you in accessing support. *However, please note that you are expected to save backed up versions of your work (drop box or Google Drive work very well and if you need help in learning how to use these, come to my office hours). Thus, requests for accommodation on late or missed assignments due to a crashing computer (or similar) will not be considered.*

### Students with young children:

Parental and student responsibilities sometime coincide. That's normal. You are welcome to bring your child/ren to class if your usual arrangements have temporarily fallen through. If you are nursing an infant, you are welcome to attend classes with that infant. If you are caring for an infant so young that childcare is not possible, you are welcome to bring that infant to classes. If you are unable to make arrangement for child care and anticipate having to bring your child/ren to every class, please discuss this situation with the instructor. In all cases, I ask that you sit at the end of a row of seating, closer to a door so that your departure or arrival does not interfere with others' learning. For further resources:

- Concordia University Student Parents Centre:

<https://www.concordia.ca/students/parenthood.html>

## **Additional Campus Resources**

The resources listed below (and many others) are in place to help you succeed at Concordia. Everyone faces challenges at some point, and often a new environment or difficult and stressful situations (i.e., university) mean we may need additional help. I encourage you to look into the various resources available at Concordia. If you need assistance and cannot find the appropriate resources, please reach out to me, your academic advisor, or another trusted campus advisor.

### *Resources for health, wellbeing, and student success:*

- Student Resources (overview): <http://stc.concordia.ca/>
- New Student Program: <http://newstudent.concordia.ca/>
- Health Services: <https://www.concordia.ca/students/health.html>
- Counselling and Psychological Services: <http://cdev.concordia.ca/>
- Sexual Assault Resource Center: <https://www.concordia.ca/students/sexual-assault.html>
- Indigenous Student Resources:  
<https://www.concordia.ca/about/indigenous/resources.html>
- International Student Resources: <https://www.concordia.ca/students/international.html>
- Financial Aid and Awards: <http://faao.concordia.ca/main/>

### *Resources related to academic success and integrity*

- Academic Integrity Website: <http://www.concordia.ca/students/academic-integrity.html>
- Student Advocacy Office: <https://www.concordia.ca/offices/advocacy.html>
- Student Success Centre: <http://www.concordia.ca/students/success.html>
- Student Writing Centre: <http://www.concordia.ca/students/success/learning-support/writing-assistance.html>
- Library and Citation Style Guides: <http://library.concordia.ca/help/howto/citations.html>

### *Basic Needs*

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students Office or Concordia Student Union for support, and/or access the following resources (*which include free and reduced meals available daily on both the downtown and Loyola campus*):

- Affordable Food Resources at Concordia and in Montreal:  
<https://www.concordia.ca/students/health/topics/nutrition/affordable-food-resourcesinmontreal.html>
- Concordia Off-Campus Housing and Job Support:  
<https://www.concordia.ca/students/international/sessions-workshops/housing-support.html>
- Concordia Housing and Job Bank (HOJO): <https://www.csu.qc.ca/services/housing-and-job-bank-hojo/>

## Important information about iClickers and Reef Polling

I will be using clickers to increase student involvement in the course, aid in reviewing course material, and improve my understanding of how we are meeting the course objectives. I will ask three types of clicker questions during class:

- (1) review questions based on assigned readings or the material covered in the last class
- (2) discussion questions to provoke students to think about issues; and
- (3) concept questions to test the effectiveness of my teaching and student learning.

All three types of questions will count towards class participation. I rely on feedback from these questions to get a better idea of what concepts you may be struggling with, or that I have not been explaining clearly. As such, I base clicker participation grades on whether you answer the question or not, not on whether you get the question correct.

### *How to register your iClicker?*

<https://www.concordia.ca/content/dam/concordia/docs/IITS/iclicker-documentation/iclicker-updated-docs/iclicker%20Moodle%20Registration%20Guide%20for%20Students.pdf>

1. Log in to Moodle at *moodle.concordia.ca*
2. Locate the “I>CLICKER” block on top left of the homepage
3. Click the **Student Registration** link
4. Enter your i>clicker remote ID (printed on the back of your remote)
5. Click the **Register** button.

### *How to register your mobile device for clicking in class?*

Set up a Reef Polling account:

<https://www.concordia.ca/content/dam/concordia/docs/IITS/iclicker-documentation/REEF%20Polling%20Quick%20Start%20Guide%20for%20Students%20updated%202019-01-30.pdf>

*Students are advised that external software and/or websites will be used in the course and students may be asked to submit or consent to the submission of their work to an online service. Students are responsible for reading and deciding whether or not to agree to any applicable terms of use. Use of this software and service is voluntary. Students who do not consent to the use the software or service should inform themselves of alternative assignments/documentation that may be submitted by consulting the instructor of the course.*

*By using the external software or websites, students agree to provide and share their work and certain personal information (where applicable) with the website/software provider. Students are advised that the University cannot guarantee the protection of intellectual property rights or personal information provided to any website or software company operating anywhere, but especially when that company is located in a jurisdiction outside of Canada, including the US. Intellectual property and personal information held in foreign jurisdictions are subject to the laws of such jurisdictions.*

**Please note that it is considered academic misconduct to use another student’s clicker.**