

**Biology 211**  
**Biodiversity, Ecology, and Conservation Biology**

**Syllabus\***  
**Fall 2018**

*We cannot make the world safe for democracy unless we also make the world safe for diversity.*

–Aga Khan

**INSTRUCTOR**

Dr. Robert Podolsky, 214 Grice Marine Lab, podolskyr@cofc.edu (email is preferred)

Lecture: Sections 10, 11: 12:15-1:30 T & R in RITA 152

Recitation: Section D10, 1:35-4:35 T in RITA 281; Section D11, 1:35-4:35 R in RITA 281

Downtown office hours: T, R mornings, RITA 226 or 228, flexible but by prior appointment

**NB:** I will use OAKS frequently to announce reading assignments, posting of lecture notes, and other important information. **Be sure to subscribe to receive notifications or check daily.**

**OVERVIEW**

Biologists study the natural world at many levels of a *hierarchy*. This course focuses at levels of the hierarchy *at or above the whole organism*. What helps to explain the abundance and distribution of organisms? How have taxa diverged from one another over time, and what are the evolutionary innovations of major taxa? You will be introduced to three areas of focus: **(1) population biology**, involving the study of population ecology and evolution; **(2) interactions among organisms and their environments** at the community, ecosystem and biosphere levels, and **(3) biodiversity**, or how organisms are related by common descent. The course is organized around the theme of how we use these scientific principles to conserve biodiversity.

**LEARNING OBJECTIVES**

Professional biologists rely on understanding **theoretical concepts** and on using **practical skills** to test the validity of those concepts. As such, biology is not only a body of knowledge but also a way of gaining that knowledge. The course therefore involves two critical components:

- **Lecture** will introduce you to key concepts in ecology, biodiversity and conservation biology as well as examples of the research involved in developing and testing these concepts.
- **Recitation** will help you to develop practical skills used in doing science: finding, reading, and understanding **primary scientific literature**; organizing, visualizing and analyzing **data**; identifying **questions** and developing **experimental approaches** to addressing research problems; and **presenting scientific information** in a written proposal, a scientific poster, and an oral presentation. You will complete three projects, working in small groups but ultimately completing your work independently. For most students, the discussion is the most valuable part of the course for the development of your ability *to think like a biologist*.

As a hard-working participant in this course, you will come to be able to:

- describe the processes by which populations of organisms increase and decrease in size
- list and explain the forces that lead to evolutionary change in populations
- explain how interactions with the physical environment and with other organisms are involved in ecological and evolutionary change of populations
- develop a foundation of knowledge about the diversity and relatedness of living organisms
- apply ecol & evol principles to problems in the conservation of biodiversity
- apply to your future work many of the professional skills used by a practicing biologist

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\* Please read this syllabus carefully and use it for future reference. It contains information that is important to your life organization and academic health.

## WEBSITE

Course info—including assignment details, copies of articles, and lecture illustrations—will be posted at the OAKS website. Notices sent through OAKS apply to both sections unless specified by section number. Some assignments will be submitted through the OAKS Dropbox.

**Important!** To get the most out of lecture you should **print copies of the lecture illustrations**, available from the website, and bring them to each lecture.

## READINGS

~ **Biological Science**, 6<sup>th</sup> edition, by Freeman et al. ~

~ Articles from the primary literature (available on the course website) ~

## HOW TO SUCCEED IN THIS COURSE

See the **Success** link at the OAKS site and take my advice to heart!

I also highly advise that students earn at least a C- in Biology 111 and 112 before enrolling in Biology 211. Please see me if you have concerns about your preparedness for this course.

## COURSE POLICIES

**Lecture.** **I expect you to attend every lecture.** Without a doubt, your absences will be recorded when you do poorly on exams. I may also occasionally have *brief quizzes at the start of lecture* to benefit those who attend. You will not understand my emphasis, which is the emphasis on exams, only by reading the textbook or looking at illustrations. If you must miss a lecture, be sure to get help with the notes from a classmate and ask me questions during office hours. I'm always willing to take time to help you to better understand material.

**Recitation.** **You are required to attend every 3-hour recitation for its duration.** You will lose 1/3 of attendance points for part of any hour you miss, including coming late. Because you will be working in pairs or groups, it is impossible to entirely “make up” what you miss. Your grade will depend in part on peer evaluations, so you should come prepared to carry out the day's work. Recitation will be held the first week of the semester.

**Participation and conduct.** Discussions during lecture and recitation are interactive. **Your participation is expected and will contribute to your grade.** I also expect you to be respectful of me, your classmates, and the learning environment. I will record disruptions to the class from cell phones, late arrivals, or early departures.

**Collaborative learning.** Several activities in this course involve working in pairs or small groups. Part of your grade will be based on your ability to work collaboratively. Nevertheless, you will complete most assignments individually, so that most of your grade will be based on your own work. You alone are responsible for and required to complete all of your submitted work.

**Exam content.** You will be tested on lecture material and reading material. I will provide study guides as necessary. I encourage you to study in groups after you have studied alone—you will learn more if you quiz each other to test the depth of your understanding of terms and concepts.

**Missing an exam.** You should avoid missing an exam except in the case of a true medical emergency *suffered on the day of the exam*, which must be documented with a doctor's note. Other professional, unavoidable conflicts (e.g., med school interviews) must be approved by me

well in advance. Extracurricular activities and family vacations do not qualify. For approved absences, make-ups may be given, by my choice, within a day or so of the scheduled time.

Late assignments. Assignments are *due at the date and time indicated*. Those handed in past the deadline without prior approval will have about 5% deducted per day, including weekends. No credit will be given for any work turned in after the assignment has been discussed in class or handed back. Make arrangements with me if you plan to turn in an assignment late. *Do not put a late assignment under any office door*—it should be handed to me or uploaded to the dropbox.

Computer resources. Written assignments (other than notes in response to DQs) must be word-processed, and other computer software (Excel, Powerpoint) will be necessary. The computer lab in the Biology department is generally open, except when reserved (check door for posting). Desktop and laptop computers are available in Addlestone library.

Disabilities. Any student with a documented disability who has been approved to receive accommodations through SNAP please feel free to discuss this with me during office hours.

### ACADEMIC INTEGRITY

This course asks you to set goals and perform tasks like a professional biologist. Likewise, you will be expected to uphold the standards of integrity expected of a professional. Lying, cheating, attempted cheating, and plagiarism related to exams, discussions, or recitation work are violations that will be identified and handled in accordance with the College's honor code. Be sure that you understand violations of the honor code, including both obvious and subtle points of plagiarism, as covered in the student handbook (<http://cofc.edu/generaldocuments/handbook.pdf>). Consult the handbook and please talk with me if you have any doubts or questions about whether your work, especially your writing, is conforming to these expectations.

Many of your recitation projects will involve working in groups. However, the work you submit **must still be completed independently**. There is a fine line between collaboration and copying, but if I suspect that one student has copied the work of another, one of two situations will result:

- (a) For lesser and unintentional offenses, I will have you sign a "Class 3 violation" form acknowledging your understanding of the mistake. You will receive a penalty on the assignment and the form will be placed in your file with the Dean of Students. A second such violation in this or any future class will result automatically in an honor board hearing. You have the right to decline the Class 3 sanction and have an honor board hearing instead.
- (b) More serious cases of suspected academic dishonesty will be reported directly to the Dean of Students for consideration by the honor board. **Putting yourself in this position risks an XF for the course, a mark that indicates failure due to academic dishonesty.** Along with common problems (e.g., unauthorized collaboration, unauthorized study aids, copying, falsifying excuses, taking or giving unauthorized assistance), please be aware that re-submitting work you did for other classes or projects is also a violation. We have digital copies of assignments submitted by students in previous semesters, and reuse of such materials will result in reporting to the Dean of Students.

My experience is that honor board members, most of whom are students, take these issues seriously. Severe punishments are mandatory if found in violation. **It is far better to turn in your own sub-standard work than to risk an XF on your transcript for cheating or sloppy plagiarism.** Academic dishonesty is a huge waste of my time and your academic record.

## LECTURE AND READING SCHEDULE

Lectures will make reference to assigned readings but will not simply repeat them. You will get more from lecture if you do the reading before and review it after. Exam questions will be drawn from both lectures and readings.

<i>WkDay</i>	<i>Dates</i>	<i>Unit</i>	<i>Topic</i>	<i>Readings*</i>
1 T	Aug 21	1	Introduction to Biodiversity	Ch 1, 54
<b>POPULATIONS &amp; SPECIES</b>				
R	Aug 23	2	Population & Conservation Genetics	Ch 23 (review Ch 22)
2 T, R	Aug 28, 30		Pop. & Cons. Genetics (cont.)	Ch 23 (cont.)
3 T, R	Sep 4, 6	3	Population Ecology	Ch 51
4 T, R	Sep 11, 13		Population Ecology (cont.)	Ch 51, Westemeier et al.**
5 T	Sep 18		<b>EXAM 1</b>	
<b>COMMUNITIES &amp; ECOSYSTEMS</b>				
R	Sep 20	4	Species Interactions	Ch 52
6 T, R	Sep 25, 27	5	Ecological Communities	Ch 52 (cont.)
7 T, R	Oct 2, 4	6	Ecosystems	Ch 53
8 T, R	Oct 9, 11		Climate and the Biosphere	Ch 49, Bertness**
9 T	Oct 16		<b>EXAM 2</b>	
<b>BIODIVERSITY</b>				
R	Oct 18	7	Origins of Biodiversity	Ch 24 (rev. Ch 22)
10 T	Oct 23		Phylogenies: the Tree of Life	Ch 25
R	Oct 25	8	Bacteria & Archaea, Protists	Ch 26, 27
11 T	Oct 30		Bacteria & Archaea, Protists (cont.)	Ch 26, 27 (cont.)
R	Nov 1	9	Plants, Fungi	Ch 28, 29
12 T	Nov 6		*** <i>Fall break—no class</i> ***	
R	Nov 8		Plants, Fungi (cont.)	Ch 28, 29 (cont.)
13 T, R	Nov 13, 15	10	Animals	Ch 30
14 T	Nov 20		Animals (cont.)	Ch 30, 31
R	Nov 22		*** <i>Thanksgiving – no class</i> ***	
15 T	Nov 27		Animals (cont.)	Ch 32
R	Nov 27		<b>EXAM 3</b>	
T	Dec 11		<b>FINAL EXAM (12-3 p.m.)</b>	

\***Note:** chapter numbers are for *Freeman 6/e*.

\*\***Readings** announced in class or by OAKS will be available on the OAKS class page.

## RECITATION SCHEDULE

Projects 1 and 2 will be major in/out-of-class projects and project 3 will be a smaller in-class project. Although some of the work on these projects will be completed in groups, you will be graded individually on DQs, worksheets, quizzes, and written assignments. Due dates are noted below; additional details will be given in class.

Wk	Day	Date	Recitation activity	Due at or before
1	T, R	Aug 21,23	Intro: observations and questions	Questions Worksheet
2	T, R	Aug 28,30	Project 1: project intro, questions	Deep Sea Worksheet <sup>a</sup>
3	T, R	Sep 4,6	Project 1: organizing/graphing data	Predictions <b>Worksheet<sup>c</sup></b>
4	T, R	Sep 11,13	Project 1: statistical analysis of data	Graphing <b>Worksheet<sup>c</sup></b>
5	T, R	Sep 18,20	Project 1: data and poster workshop	Stats <b>Worksheet<sup>c</sup>, Quiz<sup>d</sup></b>
6	T, R	Sep 25,27	Project 1: <b>Research Poster Session</b>	<b>PROJ 1: <u>Poster<sup>f</sup></u></b>
7	T, R	Oct 2,4	Project 2: project intro, species evaluation	Article <b>DQs<sup>a</sup></b>
8 <sup>e</sup>	T, R	Oct 9,11	Project 2: library resources, lit search	<b>Ranking of choices<sup>g</sup></b>
9	T, R	Oct 16,18	Project 2: working group priorities, Qs	<b>Annotated bibliography<sup>g</sup></b>
10	T, R	Oct 23,25	Project 2: experimental design workshop	Suarez <b>Worksheet<sup>b</sup></b> Project <b>Worksheet<sup>b</sup></b>
11	T, R	Oct 30,Nov 1	Project 2: proposal writing workshop	<b>Pre-proposal<sup>c</sup></b> <b>Intro &amp; significance<sup>b</sup></b>
12	T	Nov 6	<i>Fall break (Tuesday only)</i>	<b>PROJ 2: <u>Proposal<sup>b</sup></u> (S10)</b>
12/13	R ,T	Nov 8,13	Mini-project 3: building phylogenies	<b>PROJ 2: <u>Proposal<sup>b</sup></u> (S11)</b>
13/14	R ,T	Nov 15,20	Mini-project 3: using phylogenies	<b>Phylogeny I worksheet<sup>c</sup></b>
14	R	Nov 22	<i>Thanksgiving break (Thursday only)</i>	
15	T, R	Nov 27,29	Project 2: <b>Proposal Panel</b>	<b>Phylogeny II Worksheet<sup>c</sup></b> <b><u>PROJ 2: Revised proposal</u></b> <b><u>Powerpoint presentation</u></b>

### Notes

<sup>a</sup> Due by OAKS dropbox by the start of recitation

<sup>b</sup> Due in Dropbox by normal time of recitation

<sup>c</sup> Due as hard copy in my mailbox or by Dropbox three days *before* recitation

<sup>d</sup> Statistics quiz to be given at the start of recitation

<sup>e</sup> Due as hard copy in my mailbox or by Dropbox five days *before* recitation

<sup>f</sup> Due by Dropbox at 5pm on day before recitation, and as a printed poster in recitation

<sup>g</sup> Due by 5pm in Dropbox on day *before* recitation

## READING & PREPARING FOR DISCUSSIONS

Over the semester you will read several articles that will be the basis of class discussions, both in lecture and in discussion sections. To prepare for these discussions, follow the detailed guidelines given on the course webpage and complete the DQ assignments. Remember that your grade for the discussion portion of the course will be based on attendance, completion of Discussion Questions (DQs), and active participation.

## GRADING and SUMMARY OF ASSIGNMENTS

Your grade in this course is based on 4 exams that will combine material from lecture and readings, on the many components of each of the 3 recitation projects, and on DQs and discussion participation. You may also complete "Current Topics" for extra credit. Final grades will be based on a curve, computed at the very end of the course, with the mean in the B- to C+ range. Exceptional improvement will be rewarded, and your active participation in office hours, lecture and lab may also be a positive factor in cases where your final course grade is near a boundary. See the lecture and recitation schedules for all dates.

Exercise	Coverage	% of grade	Notes
Triterm Exam I	weeks 1-4	} 32	<b>a</b>
Triterm Exam II	weeks 5-8		<b>a</b>
Triterm Exam III	weeks 9-15		<b>a</b>
Final Exam	cumulative	18	
Recitation Project I	worksheets/poster	12	<b>b</b>
Recitation Project II	proposal/presentation	20	<b>b</b>
Recitation Mini-Project III	phylogenies	6	<b>b</b>
DQs, discussions, quizzes		12	<b>c</b>
Current Topics	recent press	extra credit	<b>d</b>
General participation	in all activities	fudge factor	<b>e</b>

### Notes:

- Your lowest midterm exam score will be counted as 8% of your grade, and your other two midterm exam scores will each be counted as 12% of your grade.
- Points awarded for each project include attendance, worksheets, and final products.
- DQs are due in word-processed form **by email** to me [podolskyr@cofc.edu](mailto:podolskyr@cofc.edu) or as a photocopy *before* the discussion.
- Extra credit: for each of the three sections of the course, you may submit up to one Current Topics report anytime before the exam for that section.
- Get to know your professors, and let them get to know you! Your active participation in office hours, lecture and recitation may be a positive factor in cases where your final course grade is near a boundary.