

Biodiversity, Ecology, and Conservation Biology (Biol 211-07 Spring 2017)

Lectures:	Monday and Wednesday 5:45-7:00, Harbor Walk West (HWWE) 307
Discussions:	Wednesday 2:30-5:30 Harbor Walk West (HWWE) 307
Instructor:	Professor Courtney Gerstenmaier
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Office Hours:	Monday 4:30-5:30 and Wednesday 1:30-2:30 in HWWE 311 or by appointment

Course Overview: This course focuses on biology at the level of the whole organism and above, including how organisms interact with their environment, how organisms are related, and how human activity affects the diversity of life on Earth. During the semester, you will be introduced to three areas of focus: (1) population biology, including population ecology and evolution; (2) interactions among organisms and their environments at the community, ecosystem and biosphere levels, and (3) biodiversity and the study of how groups of organisms are related by common descent.

Course Objectives:

This course is intended to foster an understanding of the diverse ways organisms interact with the environment, the fundamental principles of ecology, evolution, and conservation biology, and to learn about the three domains of biodiversity on Earth. More specifically as a student in this course you will

- Explore the modern synthetic view of evolution which integrates genetics, molecular biology and many other areas of biology into an explanation of how evolution occurs.
- Explore mechanisms (or processes) of evolution including
 - How populations evolve at the genetic level (evolutionary genetics).
 - How new species arise (speciation)
 - How biologists are revealing the way life diversified on earth and what the current “tree of life” looks like (systematics & phylogeny)
- Explore the evidence in support of evolutionary theory and processes.
- Explore the features of the diverse species that inhabit the planet to discover
 - The anatomical, physiological and behavioral associations between related groups of organisms
 - The contributions of the diverse groups of living organisms to ecological systems and human welfare
 - An astonishing variety of lifestyles, traits, and solutions to the challenges of life
- Explore how populations of organisms change in abundance and distribution (population ecology)
- Explore ecological interactions between species within communities (community ecology)
- Explore processes and changes that occur at the level of ecosystems.
- Apply evolutionary and ecological concepts and theories to issues related to the conservation of biodiversity on earth (conservation biology).

Student Learning Outcomes

At the end of this course, students are expected to be able to:

- Describe the processes by which populations of organisms change in size
- Explain the forces that lead to evolutionary change in populations and diversification among species
- Interpret phylogenetic trees to comprehend the evolutionary relationships they depict
- Discuss how interactions with the physical environment and with other organisms influence populations and communities
- Build a foundation of knowledge about life’s diversity and its interrelatedness
- Apply ecological and evolutionary principles to the conservation of biodiversity

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- Apply the following skills used by professional biologists: use primary literature, generate scientific questions and pose testable hypotheses, analyze data to evaluate hypotheses, use quantitative models to describe biological processes, and communicate these to a scientific audience.

Resources: Biological Science **5th** edition by Scott Freeman et al.

Prerequisite: Biol 111/Biol 111L, Biol 112/Biol 112L

Corequisite: Biol 211D

COURSE POLICIES

Lecture: Attendance in lecture will set you on the road to success in this course and will be taken. Lecture is an excellent time to ask questions and participate in an active discussion of topics and hands on activities. We adhere to the College of Charleston Absence Policy, as described in the student handbook. Miss lecture? Get notes and handouts from another student. If you will have a planned absence on the day of an exam – you must notify me BEFORE the exam is given. Any make up (with a documented reason) must be completed before the exam is returned to the class (1-5 d from scheduled exam time). All excuses must be documented via the Dean of Undergraduate Study. Stay tuned in lecture for announcements about posting of critical information on OAKS including hand outs, study guides, extra credit opportunities, practice problems, and online quizzes.

Discussion: You will conduct two main projects during discussion. Some of the work on these projects will be completed in pairs or small groups. Part of your grade will be based on working effectively within your group, including peer evaluations of your work. However, you will complete most assignments individually, and most of your grade will be based on your own work, for which you alone are responsible. You are required to attend every 3-hour discussion for its duration, and you are expected to arrive on time and prepared to carry out the day's work. Attendance and participation will contribute to your grade.

Participation and conduct – Your conduct during lecture and discussion is expected to be respectful of your classmates and instructor, the learning environment and yourself. This means giving your full attention to whomever has the floor and staying on topic during discussions. Please do not disrupt class by using cell phones or other electronic devices (unless for Poll-everywhere), by leaving early or arriving late, or by using the bathroom excessively. Participation in lecture will be evaluated in part on participation of polled questions. You can reply to polls via txt message, smart phone app, laptop, or note card depending on your preference.

Discussions articles and assignments – Over the semester you will read several articles that will be the basis for class discussions, both in lecture and discussion. Your grade for these discussions will be based on attendance, active participation, and completion of discussion question (DQ) assignments. Articles and DQ assignments will be available via OAKS, as will detailed guidelines on how to prepare for discussions.

Exams: We will have three tests and a final cumulative exam (with some new material) that will be administered during the lecture portion of the course. These tests are designed to assess your knowledge of the subjects covered. They will consist of multiple choice, true-false, matching, and short answer questions.

Note: Missing an assignment, test, or final without permission from the instructor will result in a zero. Make-up assignments/tests/finals will not be given except under extenuating circumstances. If the student cannot be present, they are expected to contact the instructor BEFORE the assignment/test/final and will be asked to obtain an official excuse from the dean of undergraduate affairs office before rescheduling. Whether the student is allowed to make- up the assignment/test/final is entirely at the discretion of the instructor regardless of a letter from the dean

Electronic resources – Course information will be available via OAKS, including details of assignments, assigned articles, lecture notes, and quizzes. I will use email, as well as OAKS, to communicate with you regularly; you are responsible for receiving and reading these communications, so please be sure to check your *g.cofc.edu* email account as well as the course OAKS site frequently.

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All written assignments must be typed. Computers will be also used extensively in discussion, including Excel and Powerpoint. We have access to Biology department computers, but any student with their own laptop is encouraged to bring it to discussion. For work outside of class, Addlestone library has computers available with the necessary software.

Classroom Courtesy: A movie theater and a classroom might not have much in common except when it comes to the distraction of electronic devices. Students are asked to keep all cell phones and other devices that beep in silent mode and out of sight unless being used for taking notes. No electronics will be allowed during exams. Exceptions will be made in extreme situations such as spouses anticipating the birth of a child or a serious emergency. Permission to leave an electronic device on should be obtained prior to class.

Center for Student Learning: I encourage you to utilize the Center for Student Learning's (CSL) academic support services for assistance in study strategies, speaking & writing strategies, and course content. They offer tutoring, Supplemental Instruction, study strategy appointments, and workshops. Students of all abilities have become more successful using these programs throughout their academic career and the services are available to you at no additional cost. For More information regarding these services please visit the CSL website at <http://csl.cofc.edu> or call (843) 953-5635.

Student Accommodations: Any student eligible for and needing accommodations because of a disability is requested to speak with the professor during the first two weeks of class or as soon as the student has been approved for services so that reasonable accommodations can be arranged. For More information visit: <http://disabilityservices.cofc.edu/index.php>

Academic Integrity: Students are expected to behave in an honest and responsible manner. Violations of the honor code are offensive and will generally be dealt with severely. We will adhere to the following policy as quoted from the Honor Council's recommended guidelines:

"Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student's actions are related more to a misunderstanding will be handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student's file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student's transcript for two years after which the student may petition for the XX to be expunged. The F is permanent. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration--working together without permission-- is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others' exams, fabricating data, and giving unauthorized assistance.

Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.

Students can find the complete Honor Code and all related processes in the Student Handbook at <http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php>

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Tentative Lecture Schedule

Date	Topic	Readings
Jan 11 – Wed	Introduction, Biodiversity, and Conservation Biology	Ch. 1, Ch. 57
Jan 16 – Mon	MLK Day	
Jan 18 – Wed	Biodiversity and Conservation Biology	Ch. 57
Jan 23 – Mon	Population Ecology	Ch. 54
Jan 25 – Wed	Population Ecology	Ch. 54
Jan 31 – Mon	Population Ecology	Ch. 54
Feb 01 – Wed	Community Ecology	Ch. 55
Feb 06 – Mon	Exam 1	
Feb 08 – Wed	Community Ecology	Ch. 55
Feb 13 – Mon	Community Ecology	Ch. 55
Feb 15 – Wed	Ecosystems	Ch. 56
Feb 20 – Mon	Ecosystems	Ch. 56
Feb 22 – Wed	Climate and the biosphere	Ch. 52
Feb 27 – Mon	Climate and the biosphere	Ch. 52
Mar 01 – Wed	Behavioral ecology	Ch. 53
Mar 06 – Mon	Spring Break	
Mar 08 – Wed	Spring Break	
Mar 13 – Mon	Exam 2	
Mar 15 – Wed	Phylogenies and history of life	Ch. 28
Mar 20 – Mon	Phylogenies and history of life	Ch. 28
Mar 22 – Wed	Bacteria and archaea	Ch. 29
Mar 27 – Mon	Protists	Ch. 30
Mar 29 – Wed	Plants	Ch. 31
Apr 03 – Mon	Plants	Ch. 31
Apr 05 – Wed	Fungi	Ch. 32
Apr 10 – Mon	Exam 3	
Apr 12 – Wed	Animals	Ch. 33
Apr 17 – Mon	Protostomes	Ch. 34
Apr 19 – Wed	Deuterostomes	Ch. 35
Apr 24 – Mon	Deuterostomes	Ch. 35
Apr 26 – Wed	Review/ Make-Up Lecture	

Final Exam is Wednesday, May 3rd from 4pm-7pm

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Tentative Discussion Schedule

Date	Discussion Activity	Homework	Due
Jan 11	Introduction to scientific papers, how to ask biological questions	DQs	
Jan 18	Project 1: article discussion, data sets introduction	Data Worksheet	DQs printed copy or emailed prior to discussion
Jan 25	Project 1: Graphing data	Graphing Worksheet	Data worksheet
Feb 1	Project 1: Statistical analysis	Stats Worksheet	Graphing worksheet
Feb 8	Project 1: Poster workshop	Project 1 poster	Stats worksheet due Monday Feb 6 th during lecture
Feb 15	Project 1: Research Poster Session		Poster due
Feb 22	Project 2: Article discussion, topic introduction	Ranking of choices	DQs printed copy or emailed prior to discussion
Mar 1	Project 2: Library resources, begin literature search	Annotated bibliography	Ranking of choices
Mar 8	SPRING BREAK	Annotated bibliography	
Mar 15	Project 2: Research priorities, working group meeting	Suarez Worksheet Project Worksheet	Annotated bibliography
Mar 22	Project 2: Article discussion, experimental design workshop	Pre-proposal	Suarez worksheet due in discussion Project worksheet due on Monday during lecture
Mar 29	Project 2: Peer editing and pre-proposal feedback	Project 2 proposal draft	Pre-proposal due Tuesday, March 28 by email
Apr 5	Project 3: Building phylogenies	Phylogeny 1 worksheet	Project 2 proposal
Apr 12	Project 3: Using phylogenies to study trait evolution	Phylogeny 2 worksheet Project 2 proposal and powerpoint	Phylogeny 1 worksheet due on Tuesday, April 11
Apr 19	Proposal Presentations, funding panel		Phylogeny 2 worksheet due on Tuesday, April 10 Project 2 proposal powerpoint
Apr 26	No Discussion		

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Grades

Grading of Assignments: The following criteria will be used to calculate the grade.

Portion of Course	Item	Percentage of Grade
Lecture	Three exams	25
	Final exam (half cumulative)	15
	Participation	10
	Subtotal	50
Discussion	Project 1 (scientific poster)	10
	Project 2 (scientific paper and presentation)	20
	Mini project 3	5
	Weekly assignments	10
	Participation	5
	Subtotal	50

Grading Scale:

	B+: 87-89	C+: 77-79	D+: 67-69	
A : 93-100	B : 83-86	C : 73-76	D : 63-66	F: <59
A-: 90-92	B- : 80-82	C- : 70-72	D- : 60-62	

Other aspects of grading follow the CofC standards. The last day of drop/add is Wednesday, January 18th. The last day to withdraw with a grade of "W" is Thursday, March 23rd.

Extra Credit: I will offer potential extra credit with a maximum 5% value of the final grade by completing 5 additional assignments. NOTE: These extra credits are a token to encourage general science involvement. *Your time is better spent studying for an exam!!* Extra credit must be submitted by the last day of lectures (April 26th 2017) to be considered.

Option 1) *A 1-page review of a recent news headline you think was misrepresented. This requires a comparison of the news report with the original science paper and a discussion why you think the science paper was misrepresented.*

Option 2) *Attend a biology science seminar and post a typed 5-sentence summary of the seminar. This summary must include what you learned from this seminar, what seemed interesting or exciting, and how if at all it relates to you. Here is the link to the relevant seminar series:*

<http://gricemarinelab.cofc.edu/research/marine-science-seminar/index.php>

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