

Biodiversity, Ecology and Conservation Biology
Biology 211
College of Charleston, Department of Biology
Spring 2016

Lecture: 211 (sections 05)

Monday, Wednesday, Friday 307 10:30 am – 11:20 pm HWWE

Discussion:

211-D05 Monday 11:30 am-2:30 pm room HWWE 307

Instructor: Dr. Claudia H. Stewart Alt

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Office hours: Tuesday 10 – 12 am and by appointment

Learning objectives: The learning objectives of this course are to become familiar with ways organisms interact with the environment, to know fundamental principles of ecology, evolutionary and conservation biology, and to learn about the **three domains of biodiversity** on Earth. In addition, learning objectives include

- 1) Developing critical thinking skills
- 2) Writing skills
- 3) Develop your toolbox of scientific methods
Including
 - a) Formulate questions and hypotheses generation,
 - b) Data organization,
 - c) Data analyses and evaluation of statistical hypotheses,
 - d) Working with quantitative models
 - e) Graphing and interpretation of graphs
 - f) Reading primary literature in biology
 - g) Synthesizing, summarizing and appropriate citation of primary literature
 - h) Working independently and in collaborations with other students
 - i) Presenting findings in written, poster and oral formats

These steps will be practiced throughout the semester including participation in a **CURE** (Course Based Research Experience), acting as a scientist by participating in biological discovery to be shared with students and researchers globally.

Throughout the semester, I will include conceptual and quantitative aspects of relevant ecological and evolutionary knowledge.

The first two thirds of the course are conceptual and quantitative. Many of these topics you may have encountered briefly in 111 or 112*. I will take these ecological and evolutionary principles to the next level engaging quantitative and modelling aspects to inquiry. We will read and write graphs to develop conceptual and quantitative components of evolutionary and ecological topics and how they relate to conservation biology. Learning in this portion of the course will include understanding models, working with data, working with models to make predictions as well as grounded in historical

development of modern hypotheses and examining the body of evidence for our current understanding. I provide problem sets, worked problems in class and quizzes as ways to develop these skills.

In the third section of the course, I will introduce you to the diversity of life on the planet. As conservation of biodiversity includes phylogenetic understanding I emphasize reading, building and creating phylogenies. To be able to bring these concepts to upper division comparative courses, this component of the course also requires a concerted effort in developing skills for learning material and synthesizing this material in a united framework. These skills and understanding of relationships among organisms are essential for future biology major courses as well as careers across the spectrum of biology from conservation to medicine.

I believe strongly in the art of note taking. This is an essential skill -- regardless of your postgraduate plans. There is abundant scholarly evidence that suggest that posting powerpoint slides online does not aid in student learning, I will therefore only make them available after each lecture.

I will provide tools for success:

- 1) Posted handouts of the topics/material presented during lecture. You are advised to bring those along to class to take notes on them.
- 2) Office hours during which you're welcome to come and ask questions including re-examine the slides,
- 3) Practice quantitative problem sets

Tips for success:

- 1) Coming to class having already read the material presented in the text
- 2) Take notes on the handouts and come to class with questions.
- 3) Re-writing your notes including graphs and phylogenies, making flash cards
- 4) Study by actively quizzing your classmate
- 5) Use textbooks additional resources to challenge yourself with additional quantitative problems. Students who succeed develop skills in learning how to study that matches their learning style outside of the classroom – I'll help you identify and develop those skills. I'll emphasize skills and approaches to help you develop good study skills that go beyond the biology classroom.

Center for Student Learning offers tutoring, study skills appointments, and workshops. Services are available to all students 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.

Discussion sessions: The discussion sections are a *critical* component of this course. Discussion is where we will build many of the tools of how scientists do science. Particularly, we will spend time working on data analysis, presentation and scientific writing. Students will work both independently and in groups (as scientists do in their daily lives). In the discussion sections, we will investigate a multi-week research project and practice different aspects of problem solving and data analyses. We will develop skills for examining, visualizing and analyzing data. We will examine the primary literature extensively and investigate published data. (see separate discussion syllabus).

Prerequisites for this course include successful completion of Biology 111, Biology 111L, Biology 112 and Biology 112L. Suggested Math knowledge: through algebra or pre-calculus.

Text: Biological Science 5th edition (one with the Chinese water dragon), Freeman

Course Policies

Lecture attendance: Attendance in lecture will set you on the road to success in this course. 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. If you will have a planned absence on the day of an exam – you must notify us 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 attendance: Attendance to discussion sections is a **required** component of this course, and is **mandatory**. Your group members will be counting on your presence, effort and intellectual engagement in the project. You must attend your assigned section. Participation in both independent and group aspects will contribute to your grade. *Writing assignments in discussion are a large component of the overall course grade.* You lose much more than the minor participation points associated with that week. If you miss a discussion section, it is the student's responsibility to contact the professor – work must be made up. If the discussion project is not completed, it is likely that you will *fail the course*. Two unexcused absences in discussion will result in failure of the course. Please contact me if you know ahead of time you must miss class (e.g. sports, academic conference presentation).

Assignments and late policy: Regardless of what area you will be working in, timekeeping is an essential skill. Therefore, assignments will be turned in on time to be considered! Zero points will be awarded for an assignment if it is not turned in on time. All assignments will be turned in online via OAKS dropbox.

Texting: Over the years instructors have found that texting in class is annoying to your classmates and to the instructor. Please respect you fellow classmates as well as your instructor and don't do it. Emergency? Please step out of the classroom.

Computers: All assignments will be required to be completed on a word processor, Microsoft or LateX (or other necessary software (e.g. Excel saved in version MS 2010, Powerpoint MS 2010, statistical software). A Computer lab is available in Harbor Walk (HWWE 206) and is generally open during the day. The Biology computer lab may be reserved for classes or labs so check the door for postings. There are additional computer labs in the Addlestone library and other locations around campus. In general, this course is paperless, if you feel you work better by writing things down, it is up to you to print and bring those handouts to class.

Class Courtesies: Be on time, put cell phones and other devices that beep in silent mode (do not talk on the phone or text message, IM, use Facebook or conduct web searches not associated with assignments during discussion or lecture), do not eat, drink or smoke in the HWWE Laboratory, do study, do ask questions, *make class success a priority by not scheduling other appointments during class time*, be courteous to your colleagues.

Academic honesty: As is the tradition at the College of Charleston, the academic honesty policy and the honor code are followed in this course (see student handbook for details) which includes, but is not

limited to, plagiarism, class disruption, courtesy to peers and faculty, including email correspondence. If you have questions on how to properly cite, paraphrase or document literature sources, it is your responsibility to consult the instructor for assistance. We are here to help you learn – particularly prior to the assignment due date, including figuring out how to cite appropriately. That said: **PLAGIARISM, INCLUDING FROM WIKIPEDIA, WILL RESULT IN A ZERO ON THE ASSIGNMENT, AND POSSIBLE FAILURE IN THE COURSE AS WELL AS HONOR BOARD REFERRAL.**

Course requirements & Course Points

In Class Exams:	25%
Final:	20%
Quizzes (on OAKS), discussion participation	10%
RAT (Rapid Assessment Tool)	5%
In discussion hand-ins	20%
Paper	15%
Participation	5%
Extra credit	5%

Grading Policy:

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

Other aspects of grading follow the CofC standards. Last day of drop/add January 13th, to drop with Grade of “W” February 8th.

Missed deadlines & tests:

If you fail to attend a RAT, Exam or assignment deadline, you will be rewarded 0 points for that particular grade. The only exceptions are when you provide official documentation (e.g. doctors note) to the Absence Memo Office. Provided I receive the documentation through the Absence Memo Office, I will not count a RAT & will find a date for an exam resit. In exceptional circumstances I may also accept late submissions for assignments.

Extra Credit: I will offer potential extra credit with a maximum 5% value of the final grade. 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 20th 2016) to be considered. Before you start I strongly advice you to come and see me to discuss the specifics of the assignment.

Option 1) Ft. Johnson Marine Seminars: Friday 4-5 pm at Ft. Johnson Marine Campus:

To receive credit for this option you must post in OAKS dropbox a typed one page summary of the seminar which includes a description of the work presented, including what you learned in the seminar. Each individual summary is worth 1%.

Option 2) A 2 page summary/review of at least 5 recent primary research papers (not published reviews!) on a topic of your interest (all need to be on the same broad topic), highlighting and discussing differences in methods, findings and conclusions. This summary is worth 5%.

Option 3) 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.

Discussion Section: **Discussion sections start **January 18, 2016**. These are a mandatory component of this course. Please see separate syllabus and hand outs for further details of written assignments.

Lecture Schedule

The material in this syllabus is subject to scheduling changes.

Date	Topic	Readings
Jan 08 – Fri	Introduction	
Jan 11 – Mo	Conservation	Ch 52
Jan 13 – Wed	Evolutionary Theory - History	Ch 25
Jan 15 - Fri	Evolutionary Processes 1	Ch 26*
Jan 18 – Mo	Martin Luther King, Jr Holiday, No Class	
Jan 20 – Wed	Evolutionary Processes 2	Ch 26
Jan 22 – Fri	Population Genetics	Ch 27*
Jan 25 – Mo	Population Ecology: distribution & life history	Ch 54
Jan 27 – Wed	Population Ecology: population growth 1	Ch 54
Jan 29 – Fri	Population Ecology: population growth 2	Ch 54*
Feb 01 – Mo	Communities – Species Interactions 1	Ch 55
Feb 03 – Wed	Communities – Species Interactions 2	Ch 55
Feb 05 – Fri	Exam	
Feb 08 – Mo	Species Interactions: Parasites	Ch 55
Feb 10 – Wed	Ecosystems and Global Ecology 1	Ch 56
Feb 12 – Fri	Ecosystems and Global Ecology 2	Ch 56*
Feb 15 – Mo	Global biochemical cycles	Ch 57
Feb 17 – Wed	Disturbances and biodiversity	Ch 55 & 27
Feb 19 – Fri	Species Concept and Phylogeny	Ch27*
Feb 22 – Mo	IPCC climate	Guest lecture
Feb 24 – Wed	IPCC biological impacts	IPCC Report
Feb 26 – Fri	IPCC Paris	
Feb 29 – Mo	Exam	
Mar 02 – Wed	Travel through time	
Mar 04 – Fri	Archaea	Ch 29
Mar 07 – Mo	Spring Break	
Mar 09 – Wed	Spring Break	
Mar 11 – Fri	Spring Break	
Mar 14 – Mo	Bacteria	Ch 29
Mar 16 – Wed	Intro to Eukaryote & Protists	Ch 30
Mar 18 – Fri	Plants	Ch 31*
Mar 21 – Mo	Fungi	Ch 32
Mar 23 – Wed	Introduction to Animals	Ch 33

Mar 25 – Fri	Deutostomes	Ch 34*
Mar 28 – Mo	Protostomes	Ch 35
Mar 30 – Wed	Protostomes	Ch 35
Apr 01 – Fri	Viruses	Ch 36
Apr 04 – Mo	Exam	
Apr 06 – Wed	Form, Function & transport in plants	Ch 37 & 38
Apr 08 – Fri	Plant Sensory Systems, Signals & Responses	Ch 39 & 40*
Apr 11 – Mo	Animal Form & Function	Ch 43
Apr 13 – Wed	Animal Nutrition	Ch 44
Apr 15 – Fri	Human Nutrition	*
Apr 18 – Mo	Animal Nervous System	Ch 46
Apr 20 – Wed	Waste production	

Reading day: April 22nd, FINAL EXAM: Monday April 25th, 8 – 11am, HWWE 307