

Syllabus
Environmental Biology
FALL 2016
EVSS 610

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Office Hours: Tuesday 1-2 or by appointment via email.

Class hours: Tuesday/Thursday 3:05-4:20 pm Room: RSS 102

Description of Course: Environmental biology is a core course for graduate students in the MES program. We will combine introductions of topics, literature discussions and student presentations. We will be exploring a range of topics from a biological perspective from Climate Change to Genetically Modified Organisms from microbes to landscapes. Through readings in the primarily literature we will explore a new topic each week, yet you will notice through time that topics are inter-related and we will examine links through the semester. Broader impacts of this course including: familiarizing you with how to read a scientific paper, exposing you to cutting-edge experimental designs, methodologies, statistical techniques, and how to dig into the Environmental Biology literature on a broad range of topics. For such a field, we will look at the breadth of current understanding and make connections across diverse topics. There is no way to 'cover' it all. For each discussion, I will choose recent papers on the topic. Each student will engage the class in guided discussion during the semester (alone and in small groups).

Instructional objectives and student learning outcomes: The learning outcomes for this semester are 1) to gain an understanding of the broad scope of environmental biology from a natural science perspective, 2) to discuss topics and data presented in recent primary and scholarly literature, 3) to synthesize primary literature across a diverse set of topics and 4) through readings, presentations and discussion learn how environmental biologists do their work. Students will develop skills in reading, evaluating and discussing scholarly literature in environmental biology. Students will also learn how to search for and synthesize scholarly literature in environmental biology, and present complex ideas in writing. Link scholarly topics and presentation in the news. Students will develop critical thinking, writing, and presentation skills. Additionally, goals are for students to learn to facilitate discussion among other professionals in the field engage with professionals with diverse backgrounds, actively participate in discussion, prepare for discussion through prior development of questions and topics.

Text: *Primary Literature Articles posted on OAKS, bring paper copies or computer/tablet electronic copy with you to class. NB: I prefer paper copies.*

Course pre-requisites: meet requirements for admission to the MES program

Week	Course schedule	Written Work Due Dates
Aug 23 Aug 25	Introduction to the course The Interface of Environmental Biology and Policy	
Week 2		
Aug 30	Climate Change	Handout envt. bio in our lives paper.
Sept 1	Climate Change	
Week 3		
Sept 6 Sept 8	Biology of environmental disasters Biology of environmental disasters	Env. Bio in our lives 1. paper due
Week 4		
Sept 13 Sept 15	Urban Ecology Urban Ecology	
Week 5		
Sept 20	GMO's (Genetically Modified Organisms)	Hand out of Mid-term exam
Sept 22	GMO and Crop Biology	
Week 6		
Sept 27	Invasive Species	Mid term Exam Due on OAKS, incl. paper topic in exam
Sept 29	Invasive Species	
Week 7		
Oct 4	Endangered Species/Endangered ecosystems	Env. Bio in our lives paper 2 handout
Oct 6	Endangered Species/Reserve design	
Week 8		
Oct 11 Oct 13	Fisheries Oceans	Env. bio in our lives paper 2 due
Week 9		
Oct 18 Oct 20	Environmental Microbiology Environmental Microbiology	Outline with citations of final paper due
Week 10		
Oct 25	Ecology and Evolution of Disease	

Oct 27	Ecology and Evolution of Disease	Draft of final paper due for peer review
Week 11		
Nov 1	Pollution	
Nov 3	Pollution	Peer review due
Week 12		
Nov 8	Election Day: Fall Break	
Nov 10	Ecosystem services	Final paper due
Week 13		
Nov 15	Ecology in Charleston/Lowcountry	Final Exam Handed out
Nov 17	Student presentations	
Week 14		
Nov 22	Student presentations	
Nov 23-Nov 27	Thanksgiving break	
Week 15		
Nov 29	Student presentations	
Dec 1	Student presentations	Final Exam Due (OAKS) Dec 13 by 7pm

*The syllabus is subject to change, any changes will be announced in class. Assignment due dates are listed above.

Attendance policy: Attendance is required as the student learning objectives are a combination of readings, discussion, engagement with peers and presentations. Please communicate with the professor *in advance* if class may be missed for professional MES obligations (e.g. presentation of thesis work at a scholarly conference). Students remain responsible for preparation of questions and course reading even when absent. In case of illness, please communicate with the professor prior to the start of class.

Grading policy: grades will be based on the following work:

Midterm Exam - 500 Pts.

Final Exam – 500 Pts.

Env. Bio. In Our Lives 1. Paper – 400 Pts.

Env. Bio. In Our Lives 2. Paper – 400 Pts.

Draft final paper – 300 Pts

Peer review of paper – 200 Pts

Final paper – 500 Pts

Presentation of final paper – 200 Pts

Active participation in Class Discussions, leading discussions, discussion leading essay, daily discussion questions, current event presentations (missing class, yet handing in the questions allows you to make up only a fraction of the points for that day) – 2,500 Pts.
Total semester points: 5,500.

Final grades will be calculated based on percent points earned out of the total available semester points.

Grades for Graduate Students: 92% A (Quality points: 4), 88-91% B+ (3.5), 80-87% B (3.0), 77-83% C+ (2.7), 70-76 C (2.0), below 70% F (0.0), XF Failure due to academic dishonesty

College Required Syllabus Material

- 1. 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.
- 2. Center for Disability Services (<http://disabilityservices.cofc.edu/for-faculty/faqs.php>)**
 - 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.
 - The College will make reasonable accommodations for persons with documented disabilities. Students should apply for services at the Center for Disability Services/SNAP located on the first floor of the Lightsey Center, Suite 104. Students approved for accommodations are responsible for notifying me as soon as possible and for contacting me one week before accommodation is needed.
 - This College abides by section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act. If you have a documented disability that may have some impact on your work in this class and for which you may require accommodations, please see an administrator at the Center of Disability Services/SNAP, 843.953.1431 or me so that such accommodation may be arranged.

3. College of Charleston Honor Code and Academic Integrity

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>

Narrative description of course with due dates and Dr. Murren's expectations:

Going green (i.e. reducing our paper consumption): This semester we will endeavor to keep paper consumption to a minimum. We will be using OAKS that you can access via your MyCharleston portal and the acorn icon. That is where you will find the readings for the week & hand in papers/exams. This tool will also hopefully also allow us to follow up with discussion of topics outside of class, alert class members to local environmental biology events. This is also where you will find an e-copy of the syllabus, my contact info. The increased use of color in the literature in Environmental Biology makes black and white print outs miss some of the important information the authors wish to convey. Honestly, in class I find paper copies of the readings to work best for me in being an effective instructor. There are a few assignments that actually worked more poorly as electronic assignments, and we will print those!

Accessing OAKS will be important for success in this class. I also ask that you go to the site and download readings well in advance of class – so that you are not prevented from getting needed materials as outages do happen. Note that previous students who work in federal labs cannot access this portal from their work computers.

Since you are all graduate students, I encourage you to have laptops/tablets during class – but don't let them be a physical barrier to discussion. There you can store readings, and type in notes from discussions. A tablet can be useful devices for reading and notetaking on PDFs, engagement of current events articles. Additionally the most recent versions of Acrobat have decent note-taking tools such as comment bubbles and highlighting that can be saved, and there are other Apps and computer based software at a nominal fee. Texting, emailing, social media is not acceptable during this professional environment of the 75 minutes of class. We may need to look up references during discussion.

Components of the Course:

Lecture/Introduction: For some topics our discussions will be enriched, if we spend some class time to introduce the topic, describe some modeling or other technical approaches, or other introductions sometimes prior to the next topic (10 minutes). Occasionally, I will invite local environmental biology guests. Given active discussion, you should also have prepared pre-class dictionary searches, or Web of Science searches to find further clarification for yourself while you are reading, and be prepared to ask me questions during the introduction. A good introductory biology or ecology book may be instrumental depending on your prior experience in courses or positions.

Discussion: We will discuss articles from the primary literature that I have chosen in advance. You will notice at the beginning of the semester, it may take substantial amount of time to really read a paper well (we'll discuss what I mean by this in class). You will likely spend as much time dissecting tables and figures as you will reading the text - and we will spend a good component of our discussion working through those presentations. As the semester progresses and your skills are honed, you will find that you can read more quickly. Be sure to allocate sufficient time to read (reading for me always includes a pencil and marginal notes, and library access to follow up with question), gain an understanding, look up additional definitions etc. (e.g. it can easily

take me 1½ hrs to read a dense 8 page paper). I plan to have *lively* discussions this semester. Many of these topics are closely related to my research topics and I can get very excited about them. Come with questions, opinions, and get fired up! A well prepared class who brings with them varied interests will make this semester really fun, engaging, and useful in your studies at CofC and beyond!

Each student will lead discussion multiple times during the semester.

On the week that you lead, you will prepare

- **TWO “slides” (one per paper) with bulleted discussion points printed – photocopied for all students and for me.** This will be a tool to aid our discussion, and note taking.
 - **For each assigned paper this will include**
 - **1) bulleted list type summary of main points**
 - **2) your view of the paper**
 - **3) two questions per paper to start off in class discussion or break out group discussions**

Also, at the end of the discussion of each paper the discussion leader will aim to sum up our discussion in a few bullet points (oral or noted on the board). These can be considered the take home points. The leader will also spend a few minutes formally developing take home points with the group for the broader topic for that discussion period or week.

Questions: For every discussion, all students (including the presenter see above) will prepare four (4) **thoughtful** questions with associated text (2 per paper), and type them, *print them and bring them to class*. You will use them in class as points of discussion to ask the leader and to contribute to the overall discussion. **Emailed questions are not accepted.** If you miss class – you may make up this portion of the class, and post questions in a special folder on OAKS. However, there is no way to make up participation in discussion.

By thoughtful question and associated text, I mean: Example 1: “How does the split block design affect this experiment? I understand that the author set up two treatments, water and light, but I don’t understand how the split block is set up. Is it that each tray of plants either receives a specific level of the water treatment rather than an individual plant receiving the treatment?” Example 2: “Does the author actually detect selection? I note on page 100 that the author asserts that they find directional selection. However in Table 1 on page 98, there is no significant term suggesting natural selection”. These questions, asking these questions during discussion and your leading discussion throughout the semester will form the participation portion of your grade.

Current Issues in Environmental Biology: Each class meeting we will start with a ‘current issue’. Each student will be responsible for finding news articles during the semester. We will devote <5 minutes at the beginning of the class to discuss environmental biology in the news. Articles can be from the New York Times, Washington Post, Post and Courier, NSF, as well as AP or Reuters **as long as articles are reasonably long.** For your presentation time, you will read and post the

link on the discussion board of OAKS. You should familiarize yourself with the topic such that you can describe what the article is about as well as answer questions regarding the article for a few minutes. The presenter may be required to do some follow up research as questions arise during discussion for a subsequent class – or via e-discussion on OAKS. I challenge you to find hopeful articles as well as the inevitable doom and gloom.

Exams: There will be a Mid-Term exam and a Final Exam – both take home and follow the honor code. The mid-term exam will be related to the discussions for the first section of the course. The final exam will be cumulative. The exams will be essay type, and the questions are intended to be thought provoking and work with the material we have discussed, and *not* regurgitation of facts. They are intended to be a thought exercises as well as a way to assess your understanding of the material, ability to synthesize and make links across topics. Students will work independently on exams.

Short papers: We will have two short environmental biology impact papers on a current issue in environmental biology. More details to be announced in class.

Final Paper: Students will write a paper that focuses on a topic in Environmental Biology that is of interest to you. Since this is a science core class, the focus of this paper will be the scientific/biological aspects of the topic.

This paper can act as the background section for a longer grant proposal or a preface section to your thesis/internship report. This will be a five page paper with the focus being in synthesis of a broad body of literature in environmental biology (between 25 and 30 citations). The topic can be of policy interest, but the paper will be biological science in content. Excellent topics for your paper include background of the biological aspects of your thesis/internship project, or issues of biological concern in our region. If you have any questions about potential topics, feel free to come and discuss with me. More details to follow.

Papers will be subject to “peer review”. Once the first draft of the paper is completed, I will assign student partners for peer review papers. Students will edit the paper carefully for typos, grammatical problems, etc. The reviewer will write a formal review (in the same manner that all scientists do for journal articles of their peers). A formal review will summarize the logic of the paper (if the summary departs significantly from the author’s intent, the author will have a strong message that his/her point was not clear). The review will address quality of writing, logic of argument, will highlight both good and weak points, and summarize the message of the paper in a single sentence. The reviewer will make specific recommendations for improvements.

Students will get their drafts back, with the reviewer’s comments. Students should feel free to meet with me to discuss if the review is unclear. The final draft will be due after the peer review period, at which point the original draft and the review will also be handed in together with the final paper. I will look over the review for thoroughness, thoughtfulness and professionalism. The writer will be evaluated on the quality of the paper, as well as specific responses to the peer review editor’s comments (details on how you incorporated suggestions and corrections). Any major objections to the reviewer’s comments should be discussed with the reviewer and me. A formal one page written **response to reviewer’s comments** will be included with the final draft.

This will describe how your final draft reflects the changes suggested by the reviewer. This process is intended both to encourage students to interact without competition, as well as expose students to the process that professional scientists follow for editing and communicating suggestions. You will also benefit by reading a paper in another subject, as well as the process of examining a topic in depth. As a way to share what you have learned in your written paper with the class, we will dedicate time to oral presentations.

Note: Email is an excellent way to contact me.

Late work will be reduced 5% per day, participation for missed discussion cannot be made up. No late finals will be accepted. Please be professional during class and respect other students.

Seminar Series of interest: (I will also announce additional seminars of interest).

Biology Department Seminars & Marine Biology Seminars

<http://biology.cofc.edu/departmental-seminars/index.php>

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