

Course Syllabus

SMFT 697 - Special Topics - Ecology & Conservation Biology for Teachers

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Office Hours: Mondays 10-noon; Thursdays 1-3 PM and right after class on Wednesdays or by appointment.

Meeting Times/Location – Wednesdays – 271 RITA

Course Description

The course will introduce teachers to content and methodology necessary to teach ecology and conservation biology concepts in both formal and informal educational settings. The courses will utilize a case-based learning approach in which important science-related issues will be explored in order to provide a context for learning abstract biological concepts. The course will explore evolutionary and ecological concepts in the context of human influences on the biosphere with the goal of learning how we can conserve ecosystems, biodiversity and live sustainably on planet Earth. Since this is a course for teachers of science, the course will model innovative teaching strategies (interactive class discussions, inquiry-based labs, case-based learning, small-group collaborative learning and technology-supported lectures) which students can employ in their own teaching.

Instructional Objectives

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

- review the theory of evolution, as posed by Charles Darwin.
- 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
- 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 ecological interrelatedness
- apply ecological and evolutionary principles to the conservation of biodiversity

- 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 ideas (in writing & orally) to diverse audiences (scientific, general public etc...)

Teaching & Learning Approaches

In this course we will work both individually and collaboratively to solve (or better understand) real-world biology-related questions/problems/issues. This will be done to develop a better understanding of essential connections between different areas of biology; how to apply and synthesize biological concepts and principles; find and evaluate biological information; and communicate ideas and information about biology to a variety of audiences. In short, we will be immersed in biology in the context of critically important questions and issues that face us both as future professional educators, but also as citizens of this planet.

The teaching approaches used in this class are likely to be different from those that you have experienced in other science classes. Here are some of the things you should know about the class learning approaches:

1. **Case Studies** - We will be working on several case studies during the semester, which serve to provide an engaging real-world and meaningful focal point for learning. The case studies will revolve around topics that you would find interesting and are relevant to your personal, academic, future professional or civic lives. Please visit the **What & Why of Problem & Case Studies Based Learning** in the Content section of our course OAKS page for more information about the learning approaches we will use in this class.
2. **Learning will be an ACTIVE process!** Although I do lecture in this class, I also use a variety of other more active learning strategies. When I do lecture, it will almost always be in response to something that you first do (an activity) before or in class.
3. **To learn in this class, YOU will have to begin by first trying to learn on your own!** Every problem we explore in this class will require that you do some background research to inform your understanding. Most classes will require that you come prepared to class having completed the research for that class.
4. **I do NOT expect you to learn completely on your own!** Instead, I expect that you will FIRST TRY to learn it on your own, at home, through reading and homework activities. Class time will then be used to provide you with feedback on what you have learned and hopefully correct/challenge misconceptions and deepen understanding by applying what we learn to the case study we are working on.
5. **Exams are only ONE way learning progress will be assessed!** At the end of the problems or case studies you will present your solutions or recommendations. The format for presenting your solutions will vary. Some examples include: a written policy brief, a brief reflection paper, or a newspaper or magazine editorial.
6. **Much of the learning in this class will happen collaboratively** – Teamwork will always be done in class. For the most part you will not have to meet with other team members outside of class, unless you want to! The only expectations I have for team work is that you come to class having completed homework; that you contribute ideas; that you respectfully listen to others; and that you offer constructive evaluation of other's ideas. I think you will come to find that explaining/defending/evaluating ideas in class will foster much deeper learning.
7. **Peer Evaluation** – Periodically, over the course of the semester, each member of every team will be asked to complete a peer evaluation form. This is an opportunity to assess your own, and your teammates' contribution to the collaborative work done in this class. Now, I suspect that as professional teachers and graduate students, you already have developed the skills necessary to work well with others. So in this class, the main goal of this is to provide you with an example of how you can facilitate effective collaborative learning in your own classes.

8. **Feedback...Feedback...Feedback!** Among the most important reasons for using the teaching strategies in this class is that they are intended to provide you with constant and on-going feedback on your learning. If you find that you are still struggling with a concept after a class, then come and see me! I think you will find that I am happy to help anyone who wants to learn!

Assignment Expectations

I have certain expectation for how you should submit assignments, and these are mostly just to make the process of reviewing, grading and providing feedback on your work more effective and efficient.

1. All assignments should be completed by the due date (on the class schedule)
 - Assignments must be submitted **according to the assignment guidelines posted for each assignment on OAKS**. In general, this means they should be uploaded to the proper OAKS Dropbox, and **submitted as a PDF file**. OAKS will send you an email confirming that you submitted your assignment. If you do not get this email, try resubmitting it. If still no confirmation is provided, contact your instructor, and include a copy of your assignment as an attachment.
 - Most homework assignments should be completed by the due date, and late homework will not be accepted. Moreover, you must complete your homework to be eligible to participate with your team on teamwork assignments done in class the day a homework assignment is due. For some of the more significant end-of-case study writing assignments, late work will be accepted, but will be lowered by one letter grade for each class day it is late. Consult each assignment's guidelines for information on late submission policies.
2. **Back-up your work on a jump drive or in a cloud-based storage app like Dropbox or Google Drive. A last minute computer crash is NOT an excused reason to submit a late assignment.**

Attendance

What we learn in this course cannot simply be found in a textbook, or by reviewing a classmate's lecture notes! Instead, we will be relying on each other to share ideas, explore our conceptions, elaborate on the biology we learn and explore connections of this knowledge to important biological issues and questions. **For this reason you have to come to both class and discussion!**

- **Excused Absences:** The following is a list of the only acceptable reasons for missing a class or exam:
 - Illness or other medical emergencies.
 - Family emergencies.
 - Family or religious engagements/celebrations - You must make me and your teammates aware of these BEFORE you miss class.
 - Unexcused absences will have substantial effect on your class participation & effort grade (see below). **You can be dropped from the course if you have more than one unexcused absences.**
 - Moreover, we will frequently have in-class assignments and quizzes. If you miss a class for an unexcused reason on one of these days, you will receive a zero (0) on that assignment. These missed grades CANNOT be dropped!
 - Most importantly, if you miss a class (excused or unexcused) it is your responsibility to inform your teammates, and to find out from them what your responsibilities are to the team for the next class period. You should also consult the class OAKS page to find out what you missed and what is due for the next class.

Readiness Assurance Tests (RATs)



What is a RAT? Remember that I said that one of the expectations for this class was that you FIRST TRY to learn on your own. RATs are intended to find out what you have learned from assigned readings or research. RATs are short (5-10 minute) quizzes or activities, done at the start of classes. RATs are intended to reveal, to both you and your instructor, difficulties that you are still having with concepts explored in the reading. They are also intended to help you to deepen your understanding of important biological concepts by engendering discussion on their application to problems we are exploring. **Most RAT's will first be taken individually, and then in your teams.** Therefore, you will receive both an individual grade and a team grade on each RAT. Some RATs will be activities done as a team, and may be graded. **If there is a reading assignment for a class...simply anticipate that there will be a RAT!** THERE ARE NO MAKEUPS FOR RATs. The relationship between exams (aka Progress Reports) and RATs are discussed in the next section.

Progress Reports (aka Exams)

Why do I call them “Progress Reports”? Have you ever thought about the purpose of exams in school? For many students exams serve to motivate them to learn under the threat of a punishment (a bad grade), or the promise of a reward (a good grade). However, I believe that our students are capable of becoming *self-actualized learners* - a person who values knowledge for its own sake and appreciates the self-enriching nature of learning. Self-actualized learners rarely need external motivations to learn; instead they recognize its intrinsic value in their lives. It is my hope that the relevant, engaging, and critically important issues that we explore in the course will serve to foster these more intrinsic learning motivations, and help you to discover how you can foster a sense of the value of learning in your own teaching and in your own lives.

So, in this class the purpose of the exams is to provide you with feedback on the extent to which you have mastered the underlying biological. In short, they are meant to inform you of your learning progress in this course! Since this is their purpose, I refer to these periodic assessments as *Progress Reports*.

Concept Mastery & Progress Reports: There will be 3 progress reports given in this class. For each progress report there is a Key Concepts Study guide posted on OAKS, which will help guide your studying. Your goal is to try to master of all of the course concepts by demonstrating an understanding of each and all of them. Each concept you master adds to your progress report grade. After each of the first two progress reports you will be provided a summary of the concepts you mastered, and those you did not. If you do not demonstrate mastery of a concept on one of the first two progress reports, you will have a chance to review these concepts and demonstrate mastery on the 3rd progress report given on the final exam day for this class. So, in this class you will receive ONE progress report grade, which reflects the percent of the concepts you mastered over the entire course. So, if you do not master a concept the first time, **remember that you will have another chance to demonstrate mastery on the last progress report!** This kind of grading is called Specifications or Standards-based assessment, and we will discuss more about the why behind this form assessment in class.

RATs-Progress Reports & Concept Mastery – One other function of RATs is to determine if you have mastered (understand and can apply) course concepts. If you demonstrate on the RATs, that you have mastered a concept on your own, you will NOT be re-assessed on the concept on the progress report. So, progress reports will be tailored to you and what you have mastered over the course.

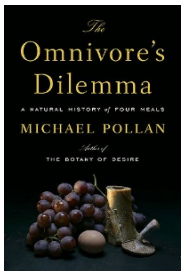
Make-ups for progress reports (PR) will be given only to students who have documented, legitimate excuses. If you know you are going to miss one ahead of time, contact me before the progress report and we will schedule a make-up. Otherwise, **you must contact me no later than the day of the PR to schedule a make-up.** You must document the absence as excused through student affairs (see Attendance section above).

Textbook & Other Readings:

SimUText – This is an online interactive textbook, parts of which you will download to your personal computer. We will be using several chapters from this textbook, and more information on downloading the chapters will be provided in class, and it is also FREE to you (actually I will pay for your subscription out of the course budget).

Conservation Biology for All, Sodhi & Ehrlich, Eds. (2010) - This is an open-source (free) Conservation Biology textbook which you can use as an informational resource for research in this course. A link to a PDF of the text is provided in the Readings section of OAKS Content.

OpenStax: Biology, 2nd Ed. – This is a free online general biology textbook. There are lot’s of formats for downloading the text. I will place a PDF of the text in the Readings section of OAKS content.



Book Club Reading Assignment: *The Omnivore’s Dilemma* by Michael Pollan. Reading the book, and participating in the discussion at the end of term is a required part (10%) of your grade in the class. You will need to purchase (or check out) the book. Various on-line book sellers have used and electronic copies that are pretty inexpensive. You might also try the local public library or *Overdrive* – an app that allows you access to local library E-books. See OAKS Content for guidelines for participating in the book club!

Other reading assignments will be posted in the Readings section of OAKS content.

Grade Determination

Individual vs. Team Work - The majority of your grade will be determined by work that you do individually (~85-90%); however we will be working in teams extensively during class, so about 10-15% of your grade will be determined by work that you collaborate on with your teammates. You will periodically complete peer evaluations, which allow you to assess your team members’ and your own contribution to the team effort. Team grades can be adjusted (both up or down) based on peer evaluation scores.

Grade Scale	Final Grade Computation
A 90 -100 %	Progress Reports – 40% End of Case Study Writing Assignments – 20% Labs, Class & Homework Assignments – 20% Class Participation – 10%
B+ 87-89 %	
B 80-86 %	
C+ 77-79 %	
C 70-76 %	
F 0 – 69 %	

**How you can get the full 10% of participation & effort grade:*

- 1. Always come to class, prepared having completed the readings/homework to the best of your ability. Much of your grade on homework will be based on effort – the extent to which you tried to incorporate concepts from research/reading into your homework.*

2. *Participate in small group and class discussions by asking, trying to answer questions and constructively/thoughtfully/respectfully challenging ideas presented in class...even those presented by your instructor!*
3. *Try to use/apply knowledge from homework to complete RATs and other in class activities.*
4. *Work effectively with your team. This will be assessed using periodic peer evaluations.*
5. *Read and follow assignment guidelines carefully.*
6. *Incorporate feedback from me into revisions of your work and later assignments.*
7. *Come and get help early and often if you find you are struggling!*

Honor Code and Academic Integrity

In this class we will, largely, be working in small teams, much like professionals do when they collaborate on projects. The collaborative work we do in this class is meant to encourage you to work together with your teammates to help each other learn. This will require that you share, justify and evaluate the ideas expressed among your teammates. So in short, you are allowed to work together on problem project assignments in this class. Working together means identifying knowledge your team needs to proceed, sharing research knowledge and resources, evaluating each other's ideas/solutions/recommendations & providing constructive feedback to your teammates. However, **each of you must individually write the final problem project assignment.** When you write, the ideas you express will, of course, be a collection of those constructed by your team and supported by background research, but what you write should ultimately be written individually by you and in your own words. Any information, concepts, ideas that you acquire from outside research sources must be summarized/explained in your own words, and appropriately cited (both in a work cited section and parenthetically in the body of the paper). In short, this class will be structured to allow you to work together to form your ideas, but you must ultimately express these ideas in your own words! In fact, I hope you come to realize that the act of expressing and justifying your ideas is learning!

Therefore the following constitutes what is and is not plagiarism in this class. For more information about writing in this class, consult the "Things to Consider When Writing in this Class" in the Research and Writing section of the course OAKS page.

Plagiarism	NOT Plagiarism!
Copying ideas constructed by another member of your team, from the class, or from other students who have taken this class in the past.	Summarize the ideas expressed by team or class members in your own words. Use these ideas to justify your solutions, conclusions or recommendations.
Copying (essentially word for word) the ideas (information, findings, analysis, and conclusions) expressed in a research resource (article, web site, textbook)	Summarize the thoughts expressed in the research resource in your own words. Use these ideas to justify your solutions, conclusions or recommendations and cite the source.
Summarizing information or ideas expressed in a research resource (i.e. a research article or web site) without citing the source. <u>Without a citation, you are implying that the ideas are yours, when they are not!</u>	Cite your research using APA citation style formatting both parenthetically, and in a Works Cited section at the end of the paper. Citing your sources is <u>always</u> required, unless otherwise specified in the assignment guidelines!
Using, in whole or in part, papers written for other classes to write an assignment for this class, without obtaining prior permission from the instructor.	If you have written a paper for another class which relates to a project we are working on, talk with your instructor about what you can and can't use!
Quoting – Although not technically plagiarism, it is NOT acceptable in this class to present ideas, concepts, findings, as quoted text... <u>EVEN if you provide a citation.</u>	FIRST - explain information/ideas/concepts/findings that you get from research resources in your own words, and cite the source. Word for word quotes should ONLY be used in this class to support or drive home an idea that you have

	already constructed in your own words from research or your own findings.
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So, I should remind you that...

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>