Critical Thinking in Environmental Science- EVS 4021
Fall semester 2013 (3 credits)
Tuesdays 1:55-3:50 PM and Thursdays 3:00-3:50 PM
Location: Chemistry (CHE) 237

Prerequisites: NE classification, senior standing
Instructor: Dr. Dana Bigham
Office Hours: Tuesdays 10:30 AM-12:00 PM - 101B Bryant Hall
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Email: dbigham@ufl.edu

UF’s School of Natural Resources and Environment Mission: To enhance understanding of the interaction of natural systems and society and to develop the intellectual capacity to address the environmental and natural resources issues facing Florida, the nation, and the world.

Teaching Philosophy: My primary goal as an instructor is to facilitate a comfortable learning environment where you can challenge yourself and others to develop solutions to real-world issues. Through discussion of complex environmental science issues, I want you to ask the “why” questions. My end goal is for you to integrate these “why” inquires to develop curiosity and a comprehensive understanding about science and its global implications. I bring enthusiasm to the classroom and encourage you to do the same. In doing so, we can learn and teach together.

Course Description: Develop critical thinking and communication skills in the practicing environmental scientist; analyze the strengths and limitations of arguments regarding environmental science, policy and management; and practice crafting arguments consistent with the scientific method.

Course Framework: This is the required capstone course for the major in Environmental Science. The course is about the scholarship of integration. By the senior year, Environmental Science majors have acquired comprehensive knowledge in the science and policy tracks and are ready to explore implications of what has been learned, confront conflicts in classical paradigms, and apply knowledge and skills to real-world and emerging problems. Students adopting this mode of thought will be equipped to deal with a high level of complexity and to continue learning and adapting as they gain experience during further academic study and their work lives.

Course Objectives: Upon successful completion of this course, the student will be able to:

1) Understand and focus thinking in scientific matters: ability to clearly formulate questions, evaluate evidence, detect assumptions and gaps in data, notice when evidence is ignored, recognize appropriate support from or excessive reliance on conceptual generalizations (theory), ascertain and acknowledge biases driven by beliefs, worldviews, or preferences, weigh the validity of conclusions based on the strength or weakness of evidence, willingness to discard positions with little or contrary evidence, assign degrees of likelihood to conclusions you are willing to accept and advocate, and prepared to challenge and refute problematic arguments.

2) Become explicitly aware of the scientific process and how to invoke it in your real-time thinking.

3) Formulate and present strong, logical, science-based arguments and evaluate and discuss arguments made by others.

4) Integrate prior knowledge of how biophysical systems work to better understand the constraints and opportunities for natural resource and environmental management.

5) Gain an understanding of the crucial role of social processes, communities, and institutions in effective natural resource and environmental management.

6) Develop habits of disciplined thinking applicable to topics in the natural and social sciences.
Course Topics and Materials: Substance of the course covers several topics in the environmental science:

- Role of a scientist
- Human population
- Resource use (energy, water, and food)
- Pollution and contamination/quality (air and water)
- Social and economic aspects of environmental problems
- Environmental policy and management

Your work with these topics is intellectual fitness training through dialogue: integrating new information, forming or revising conceptual generalizations, facing ideas that challenge prevailing worldviews, applying the scientific method to contemporary problems, distinguishing reliable knowledge from plausible assertions, dealing with uncertainty, fairly assessing the claims and arguments encountered, and developing logical and intellectually responsible arguments within the framework of science.

The course uses well-written books, scientific articles, and non-science sources to examine what we know and how we think about environmental science. All materials will be provided on a CD the first week of class. Weekly topics evolve during the semester based on student presentations and accompanying discussions. Therefore, readings may be discarded and new ones included.

Class Expectations and Your Role:

Assigned readings (every class): It is expected that all assigned readings be completed before each class meeting. Readings are used as text for discussion in class and are an absolute requirement to actively participate. Materials should be read as a critical reader. Your responsibility is to analyze the arguments and form your own opinion. For example, ask yourself "what claims are made," what is the supportive evidence," “is information omitted or biased,” or "in what context is the author making their argument?"

Tweets (every class): For each class meeting, students are expected to post a concise summary for at least two of the assigned readings on the course Twitter account (EVS4021@EnvStudies). The goal of the tweets is to provoke other's thoughts and create engaging class discussions. Thus, students are expected to review peer's tweets and initiate discussion with complimentary tweets. To receive credit, the two article summary tweets and discussion tweets must be completed 24-hours prior to each class meeting.

Article Investigation (weekly): Students locate their own article supporting or refuting the assigned reading(s) for the week. One article a week is required. The student may choose to prepare the article for the Tuesday or Thursday class meeting. The article will be handed in either by sending a PDF copy via email or bringing a hard copy to class.

Presentations: Each student will complete two presentations. In class, the student presents a review of an article and leads the subsequent discussion. Reviews of articles include clearly conveying the concepts, importance, and implications of the article material to the class. The first presentation will be an assigned article and the second presentation will be an article of the student’s choosing.

International Challenge Activity: Students experience "living" in another country abiding by availability of resources, different environmental standards, and cultural customs. Individual experiences will be shared in small group discussions to analyze and develop solutions to construct an environmentally friendly city.

Essays: There are two essays, a midterm and final essay, during the semester. Essays demonstrate your ability to analyze material presented in the course- including searching data sources for a complete, current understanding of the subject, links to socioeconomics/ other disciplines, and proposed solutions and their prospects. An essay may, for example, consist of two or three question subjects with a degree of choice among questions.

Course Grading Scale:

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<th>Grade</th>
<th>Percentage</th>
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<tr>
<td>A</td>
<td>93.4-100%</td>
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<tr>
<td>A-</td>
<td>90-93.3%</td>
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<tr>
<td>B</td>
<td>83.4-86.6%</td>
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<tr>
<td>B-</td>
<td>80-83.3%</td>
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<tr>
<td>C</td>
<td>73.4-76.6%</td>
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<tr>
<td>C-</td>
<td>70-73.3%</td>
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<td>D</td>
<td>63.4-66.6%</td>
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<td>D-</td>
<td>60-63.3%</td>
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<td>E</td>
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Evaluation Criteria:

Class Participation (25%): This is a Socratic method, discussion-based course. Gaining critical thinking skills depends on your leadership and participation in class. You are expected to come to class prepared and contribute relevant points and questions to the discussion. Although active participation may seem difficult at first, the ability to communicate ideas is an essential skill. Participation includes in-class and EVS4020 Twitter site involvement.

Each student is evaluated at the end of the semester using the following criteria:

- 100 points: Verbal contributions were inquisitive and informative in every class meeting and prior to every class meetings on the EVS4020 Twitter site. Other students benefited from these contributions and, if absent, the quality of the discussion would diminish significantly.

- 80 points: Verbal contributions were inquisitive and informative in most class meetings and prior to most class meetings on the EVS4020 Twitter site. Other students benefited from these contributions and, if absent, the quality of the discussion would diminish considerably.

- 60 points: Verbal contributions were inquisitive and informative in an occasional class meeting and occasional on the EVS4020 Twitter site. Other students sometimes benefited from these contributions and, if absent, the quality of the discussion would diminish somewhat.

- 40 points: Verbal contributions were limited in class meetings and limited on the EVS4020 Twitter site. Student was not prepared. Other students did not benefit from contributions and, if absent; the quality of the discussion would not change.

- 0 points: Verbal contributions were seldom in class meetings and seldom on the EVS4020 Twitter site. Student was never prepared and did not contribute any value to the group discussion.

Articles (10%): A copy of the related articles must be turned in each week. Each student is allowed to abstain from finding an article one week during the semester (15 weeks total). This means it is expected to submit 14 articles, so 14/14 (100%), 13/14 (92.8%), 12/14 (85.7%), etc.

Presentations (20%): Your presentations should probe or extend the subject, or it should reveal some emerging problem or issue that was not obvious earlier. Your presentation will be successful if you address most of these questions:

- What is the nature (structure, context, significance) of the emerging issue you’re presenting?
- What are your key findings and conclusions?
- How do your findings and conclusions compare with those of the author’s?
- What is the nature and relative strength of the evidence?
- Do the arguments reference or appear to rely on a well-known body of theory, concept, or idea?
- Do the arguments appear to depend on assumptions, stated or unstated?
- Are the arguments influenced by belief, political philosophy, worldview, or desired outcome?
- What is the nature of key uncertainties?
- What alternative conclusions, controversies, and questions are raised, and what is their basis?

International Challenge Activity (10%): Each student will be evaluated on the level of successful completion of the individual and group components of the activity. Evaluation guidelines will be distributed with the international challenge activity.

Midterm and Final Essays (15% and 20%, respectively): Criteria for grading papers will be: thesis/idea clearly stated, essay structure focused and easy to follow, well formatted and edited, word usage and grammar correct, written in an engaging and compelling style, concepts presented in your own words, argument factually correct and complete, peer-reviewed articles and other references included and cited appropriately, essay contains original conclusions, conclusion backed by substantial evidence, and substance of the specific argument. Essays will be computer-screen checked for plagiarism.
**Courtesy Details:**
- For everyday an assignment is turned in after the deadline, a reduction of 50% of your total score will be taken.
- If you will miss a class, please provide notification at least two weeks in advance.
- In you miss a class or assignment due to illness; a doctor’s note is required to justify your absence. Unforeseen circumstances do happen. Please contact or see me immediately in such instances.
- Do not wait until the end of the semester to discuss problems with course material or performance. Your performance and success are important to me, so see me as soon as you have concern.
- Due to the discussion-based structure of the course, the syllabus may be amended during the semester.

**Academic Honesty, Software Use, and Services for Students with Disabilities, UF Counseling Services:** The University of Florida requires all members of its community to be honest in all endeavors. Cheating, plagiarism, and other acts diminish the process of learning. When students enroll at UF they commit themselves to honesty and integrity. Your instructor fully expects you to adhere to the academic honesty guidelines you signed when you were admitted to UF.

As a result of completing the registration form at the University of Florida, every student has signed the following statement:

“I understand the University of Florida expects it students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University.”

Furthermore, on work submitted for credit by UF students, the following pledge is either required or implied:

“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”

It is to be assumed all work will be completed independently unless the assignment is defined as group project, in writing by the professor. This policy will be vigorously upheld at all times in this course.

**Software Use:** All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

**Campus Helping Resources:** Students experiencing crisis or personal problems that interfere with their general wellbeing are encouraged to utilize the university’s counseling resources. Both the Counseling Center and Student Mental Health provide confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students with personal issues or lacking clear career and academic goals, which interfere with their academic performance. The Counseling Center is located at 301 Peabody Hall (next to Criser Hall). Student Mental Health is located on the second floor of the Student Health Services in the Infirmary.

1. **University Counseling Center,** 301 Peabody Hall,
   392-1575; personal and career counseling: www.counsel.ufl.edu
2. **Student Mental Health,** Student Health Care Center,
   392-1171, personal counseling: www.hsc.ufl.edu/shcc/smhs.htm
3. **Sexual Assault Recovery Services (SARS),** Student Health Care Center,
   392-1161, sexual assault counseling; and
4. **Career Resource Center,** Reitz Union,
   392-1601, career development assistance and counseling.

**Students with Disabilities Act:** The Dean of Students Office coordinates the needed accommodations of students with disabilities. This includes the registration of disabilities, academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services, and mediating faulty-student disability related issues. It is the student’s responsibility to inform the instructor of special needs and provide written documentation of the special needs from UF’s student disability office.