ENSP 2000 Environmental Science (CT seminar)
Spring 2014 Sect. 3
MWF 11:15-12:05

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Office Hours: Monday and Wednesday: 1:30-4:30, and by appt.

About this Course: Environmental Science (ES) is an exploration of the causes and effects of environmental related concerns that affect us in our daily lives. A critical analysis of these environmental problems will reveal that they are a direct result of existing laws, policies, business practices, and consumer demand.

Course Goals:

- Create an awareness of the effect of environmental related concerns in our daily lives
- Develop a broad foundation of essential ES concepts that should enable you to recognize and formulate potential solutions for many of the environmental problems that we currently face
- Uncover the dependencies between related ES topics such as sustainability, ecological services, economics, social demands, biodiversity, resource use, and energy sources
- Adopt a critical thinking approach that will enhance your ability to excel not just in this class, but in other classes as well as your professional and personal life

Critical Thinking (CT^2) Integration: This course is a CT^2 seminar that purposely integrates critical thinking approaches and activities into the course experience. The emphasis of a CT^2 class is not to memorize facts and regurgitate them on an hour test. The CT^2 experience is designed to improve your critical thinking skills through an exploration of ES concepts, analysis of case studies, synthesis of alternative solutions, and the articulation of these ideas at higher levels of abstraction.

Excelling in this Class: You will have to do more than just know the definitions of key ES terms, that *task* is not the primary *goal* of a critical thinking experience. Your goal is learn how to effectively articulate and **apply** your knowledge of ES concepts on the hour tests. The application of concepts will be closely tied to the Student Outcomes listed below.

Student Outcomes: An important facet of developing your critical thinking skills is the process of tying desired outcomes to an action. Each of the outcomes listed below will have specific tasks associated with them so that you can practice and improve these skills throughout the semester. There are two levels of outcomes for you to address: Higher Order and Lower Order.

<u>Higher Order Outcomes</u>: Many of these outcomes are abstract, but we will be working on making them more concrete through specific activities.

Critically examining complex challenges presented by ES problems

Most environmental problems have complex backgrounds and conflicting factors. If we are to have a truly sustainable world, we must balance the competing interests of society, economy, and the environment. This implies that we must closely examine each competing interest.

Analyzing multi-dimensional ES problems from several viewpoints

Deciphering the multiple levels inherent in a typical environmental issues is not a simple process. Because of the different competing interests, you must dig deeply into underlying causes and break them down into their individual components. This process requires looking

beyond your current knowledge base and being open to new ideas from other individuals in ways you had not yet considered.

Connecting the ideas and logic inherent in one concept to other concepts
The process of connection often requires the extrapolation of a concept you learned in one ES field into another ES field. Throughout the semester, we will be encountering issues that are directly and indirectly related to a concept we covered earlier. Your goal is to view this class as a process of building and extending your current knowledge base. In other words, almost all the topics are connected in one way or another. On the **Hour Tests**, you will be assessed to determine how well you are able to make these connections.

Devise new and alternative solutions to complex multi-dimensional ES problems
Environmental issues often do not have simple solutions. You will challenged to apply novel solutions that may not have a precedent in that particular field. The reality is that if you want to change the status quo, you will need to think "outside the box".

Articulate basic and complex Environmental Science concepts and communicate these concepts with others in both formal and informal settings
Communicating on multiple levels is the goal of this class. You should be able to discuss relevant topics not only is class, but with your friends, environmental professionals, and future employers. How you construct your speech reveal much about your ability to connect, analyze and synthesize.

Lower Order Outcomes: These are designed to assist you in achieving the Higher Order outcomes. This is just a partial list. You should make your own list of LO outcomes that you think are necessary as we progress through the semester.

- Separating fact from inferences
- Interpreting relationships (numerical, etc.) in graphs and figures
- Identifying correct and incorrect conclusions
- Identifying key assumptions and determining which as correct and incorrect

Activities and Outcomes
The student outcomes are tagged to specific in-class and out-of class activities.

Higher Order Outcomes	Activity
Examining complex challenges	Chapt 1 activity
Analyzing multi-dimensional problems	Film: Story of Stuff Discussion
Extrapolation of concepts	Case Study comparisons
Devise alternative solutions	Film: Kilowatt Ours summary
Communicate concepts	Project Presentations

The **Lower Order** outcomes will be covered during specific class times as listed on the schedule, and at times *not listed* on the schedule as they apply to the content being covered.

CT^2 Artifacts: You are required to have something to show for your CT^2 experience. For example, the case study comparison listed as an activity for the Extrapolation of Concepts outcome would be a relevant artifact.

Pre- and Post CAT Testing: An essential part of the Critical Thinking initiative is the assessment process. You are required to be tested to determine changes in your critical thinking ability over the course of the semester.

Textbook: *Environment: The Science Behind the Stories*, Fourth Edition, Jay Withgott;

Scott Brennan, ISBN (print) 0-321-71273-0, Mastering Environmental Science is required (access comes with book and includes ebook) **Mastering Course ID**:

Attendance: Attendance is expected and **mandatory** for pre- and post CAT testing (see below). Any material covered in class and announcements made (including changes in assignments and policy) in class are **your** responsibility. Given the focus of this class on critical thinking, attendance will often be the deciding factor in your grade.

Readings: As with any class, reading the assigned sections **before** class will enhance your ability to understand the material being presented. A goal of this class will be to encourage you to read critically using in- and out-of-class activities.

Grading:

Mastering ES	10%
Top Hat … ….	10%
In/Out class activities…	10%
Project	10%
Hour Test 1	15%
Hour Test 2	20%
Final	25%

Grading scale:

A:	91-100
B:	81-90
C:	71-80
D:	61-70
F:	below 61

Waiting Policy: If the instructor fails to show within 10 minutes of the starting time of the class you are allowed to leave.

Use of Technology: Computers and cell phones are permitted if their use is related to the class. Checking email, facebook, playing video games, internet surfing, etc. during class is detrimental to the development of your critical thinking skills. As usual, it is not acceptable to have your cell phone ring or to be text messaging during class.

Instructor Evaluations: All students are ***strongly urged*** to submit an evaluation.

Mastering ES: You will be required to complete assignments and quizzes in a timely fashion using this online service that is included with the purchase of your book. **The HW and quizzes must be completed by classtime on the day they are due!**

Tophat : Similar to the clicker principle but more versatile, we will use TopHat to conduct polls about your comprehension of content, quizzes and interactive demonstrations in class. Instead of a clicker, you will be able your cell phone, smartphone, ipad or laptop. With this technology, you can ask questions during lecture without interrupting the teacher and receive instant feedback. The cost is $20 (the total cost for all classes that use this technology is $38 for 5 years, so if you take another class it will only cost $18 and is free after that).

Reading Schedule

Reading assignments for: **Environment: The Science behind the Stories** with MasteringEnvironmentalScience™ (4th Edition) , by Jay H. Withgott and Scott R. Brennan
ISBN: 0321712730

Jan	9	What is Critical Thinking? **Class activity**: Identifying Assumptions
	11	Introduction, Chapt 1: p. 2-9
	14	Chapt 1: Nature of Science and Sustainability, p. 10-20
	16	**CAT pre-testing (mandatory attendance)**
	18	Chapt 2: Matter, Energy, and Geology, p. 23-33**, Chapt 1 Master. HW and Quiz due**

	21	**No class** – MLK Day
	23	Chapt 3: Speciation and Extinction, p. 52-73, **Chapt 2 Mastering HW and Quiz due**
	25	Chapt 3: **Class activity**: Interpret relationships in graphs and figures
	28	Chapt 4: Community Ecology, p. 76-89
	30	Chapt 4: Ecological succession and biomes,p. 90-104,
Feb	1	Chapt 5: Ecosystems and nutrients, p. 107-118**, Chapt 4 Master. HW and Quiz due**
	4	Chapt 5: Ecological Services and Geochemical cycling, p. 121-132,
	6	Chapt 6: Ethics and Environmental History, p. 137-146, watch *Story of Stuff*
	8	Chapt 6, Economics, p. 146 – 157, examine figure 6.14 (p. 154), **Class activity:** Identify correct and incorrect conclusions
	11	Review
	13	**Hour Test 1**
	15	Chapt 9: Soils, p. 223-231
	18	Chapt 9: Erosion and Desertification, p. 231-245, **Chapt 9 Mastering HW and Quiz due**
	20	Chapt 10: Agriculture and Pest Control: p. 251-261
	22	Chapt 10: GMOs, Animals, and Sustainable Ag, p. 261-275, **Chapt 10 HW and Quiz due**
	25	Film: *Food, Inc*. if you miss class watch clips at: http://www.youtube.com/watch?v=0z9DadeSsGw&feature=related http://www.youtube.com/watch?v=a3P5tmkjHa8 http://www.youtube.com/watch?v=enwU5jIXSlU http://www.youtube.com/watch?v=xThSnJb8miQ&feature=related
	27	Chapt 23: Mineral Consumption, p. 644-661
March	1	Chapt 23: Sustainable Mineral use, p. 654-661,
	4	Chapt 15: Water Resources, p. 400-415
	6	Chapt 15: Water Pollution, p. 416-428, **Chapt 15 Mastering HW and Quiz due**
	8	Review
	11	**Hour Test 2**
	13	Film: Kilowatt Ours
	15	Chapt 19: Coal and Oil, p.528-543, **Class activity**: Separate fact from inferences
	18	**Spring Break**
	20	**Spring Break**
	22	**Spring Break**
	25	Chapt 19: Fossil Fuel Problems, p. 544 -557, **Chapt 19 Quiz due**
	27	Chapt 20: Nuclear Energy p. 563-576
	29	Chapt 20: Biofuels and Hydropower, p. 577-586
April	1	Chapt 21: Alternative Energy 1, p. 591-605
	3	Film: A Crude Awakening
	5	**No class**
	8	**CAT post-testing (mandatory attendance)**
	10	Chapt 21: Alternative Energy 2, p. 605-613, **Chapt 21 Mastering Quiz due**
	12	Chapt 17: Air Pollution, p. 468-486, skip sections of *Science behind the Story*
	15	Chapt18: Global Climate Change, p. 509-520, **Chapt 18 Mastering Quiz due**
	17	Review
	19	**Hour Test 3**
	22	Project presentations
	24	Project presentations
	26	Project presentations