Geol 1120 (CT2 seminar) Syllabus Spring 2017

Class Meeting Time: MWF 10:10-11:00 AM in Bracket 213

Instructor: Scott Brame 340B Brackett (enter through Suite 340)
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Office Hours: Tuesdays 9-1 and by appt.

Textbook: Custom Textbook for Geol 112, or Resources of the Earth, 4th ed., by Craig, Vaughn and Skinner

Course Description: We live in a complicated world that depends upon an uninterrupted supply of resources in the form of materials and energy. We want to recognize that many of these resources are in short supply and, even if they are not, that most of the current methods used in resource extraction are radically degrading the natural resources upon which we depend upon for our continued existence as a species on this planet.

General Ed requirement: This course satisfies these two general education requirements: *Math or Natural Science* and *Science* and *Technology in Society (STS)*

Course Goals: We will investigate the challenges in managing our mineral and energy related resources in a sustainable manner and maintaining the high standard of living to which we have become accustomed. This course examines the implications of resource depletion and the degradation of our environment as these resources are mined, used, and discarded. In addition, we will examine ways (techniques and policies) to minimize the detrimental effects and explore potential solutions.

Grading:

Class Activities	10%
Quizzes	20%
Hour Test 1	20%
Hour Test 2	25%
Final	25%

Grading scale:

A: 90-100
B: 80-90
C: 70-80
D: 60-70
F: below 60

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 Earth Resource (ER) concepts, analysis of case studies, synthesis of alternative solutions, and the articulation of these ideas at higher levels of abstraction.

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. These tests are online and are taken outside of the normal classtime.

Excelling in this Class: You will have to do more than just know the definitions of key terms. Your goal is learn how to effectively articulate and **apply** your knowledge of 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 to consider: Higher Order and the related ones.

Higher Order Outcomes: 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 ER problems

Most environmental resource 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 ER problems from several viewpoints

Deciphering the multiple levels inherent in a typical environmental resource issue 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 ER field into another ER 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 ER 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 ER 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 reveals much about your ability to connect, analyze and synthesize.

Related 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 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

Attendance policy: Attendance is expected. Any material covered in class and announcements made (including changes in assignments and policy) in class are **your** responsibility.

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

Cell Phone Policy: It is not acceptable to have your cell phone ring or to be text messaging during class. If it does ring, you can be asked to leave class for that day.

Class Disruption: You will be asked to leave the class if you prevent others from learning and dropped from the course if such behavior continues.

Readings: As with any class, reading the assigned sections **before** class will enhance your ability to understand the material being presented

In-class Activities: You are required to complete the in-class activity by the end of the class in which they are presented. There is no schedule for these activities, they will come up randomly. You will need a laptop or smartphone to complete these.

Quizzes: Online quizzes are designed to encourage reading of the material. **They must be submitted (online) at or before the beginning of the class time for which they are listed on the schedule.** Your lowest quiz grade will be dropped.

Laptops: Laptops are permitted if their use is related to the class. Checking email, facebook, playing video games, surfing, etc. are detrimental to the learning process and are not appropriate uses of class time. You can be dismissed from the class if it interferes with other student's learning.

Academic Integrity: All infractions of the University policy on Academic Integrity will be reported to the Dean of Curriculum, in accordance with University regulations. No exceptions. For details, see pp. 28-9 of the Undergraduate Announcements.

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

Reading assignments from the *Custom Edition* of *Resources of the Earth*, 4th ed, by Craig et al.

Jan	11	Intro, p. 1-4, Watch Story of Stuff, http://storyofstuff.org/movies/story-of-stuff/
	13	Minerals: Foundation of Society, p. 5-19, **Quiz on Story of Stuff**
	16	**MLK Day**
	18	Plate Tectonics, p. 22-35
	20	Minerals and Plate Tectonics, p. 36-42, **Pre-CAT test must be taken by midnight**
	23	Earth Resources through History, p. 43-58, **Quiz on p. 22-42**
	25	Earth Resources through History, 59-75
	27	Earth Resources through History: finish up
	30	Environmental Impacts and Resource Use, p. 78-87
Feb	1	Environmental Impacts of Resource Use, p. 88-101, **Quiz on p. 78-101**
	3	Environmental Impacts of Resource Use, p. 101-114
	6	Disposal and Recycling, p. 114-121, **Quiz on p. 101-121**
	8	Ethics and Progress: eReserve: TBA
	10	Film: Surviving Progress, https://www.youtube.com/watch?v=G5N5NLIbaj0 0-18:50, 25:30-46:00, 43:45-1:00:00
	13	Review
	15	**Hour Test 1**

	17	Film: Kilowatt Hours: **http://www.youtube.com/watch?v=izSEIhoI8aA&feature=related**
	20	Energy: p. 123-127, Coal: p. 130-144
	22	Oil: p. 145-161
	24	Oil: p. 162-175, **Quiz on p. 130-175**
	27	Film: Blind Spot, https://www.youtube.com/watch?v=yah_a6yz8FI watch 2:35-55:00,
March	1	Natural gas: p. 176-187**, Quiz on p. 176-187**
	3	Heavy Oil and Tar Sands: p. 181-187,
	6	Nuclear Power, p. 190-202
	8	Nuclear Power: p. 202-210, p. 236-237, **Quiz on p. 191-203**
	10	Solar Power: p. 210-216
	13	Hydroelectric and Wind power: p. 216-223
	15	Ocean and Geothermal Energy: p. 223- 232
	17	No class
	20	**Spring Break**
	22	**Spring Break**
	24	**Spring Break**
	27	Biofuels and Hydrogen: p. 233-236, **Quiz on p. 210-236**
	29	Review
	31	**Hour Test 2**
April	3	Water Resources: p. 271-285
	5	Water Resources: p. 286-296
	7	No class
	10	Water Resources: p. 297-312,
	12	Water Resources: p. 312-326, **Quiz on p. 271-326**
	14	Soils: p. 327-337
	17	Soils: p. 338-348, **Quiz on p. 327-348**
	19	Fertilizer: p. 245-257
	21	eReserve: Agriculture and Raising Livestock
	24	Film: Food, Inc., **Post-CAT test must be taken by midnight**
	26	eReserve: Climate Change
	28	Review for Final