

CHE 410: Energy and Environment

Spring 2014

Syllabus

COURSE DETAILS

Instructor	Dr. Adam St. Jean W325 Kingsbury Hall 603-862-3656 Adam.St.Jean@unh.edu (Best Method of Contact)
Office Hours	Monday 1:00 PM – 3:00 PM Wednesday 11:00 AM – 1:00PM Thursday 1:00 PM – 2:00 PM Other times by appointment
Lecture Hours	Tues/Thurs 9:40a – 11:00a Parsons N108
Textbooks	Hinrichs, Roger A., and Merlin Kleinbach. Energy: Its Use and the Environment. 5th ed. Boston, MA: Brooks/Cole, 2013. Print. Course notes and supplemental materials will be used. Any additional required reading will be made available on the course Blackboard page or handed out during class.
Technology	This course requires purchase of an iClicker 2. These devices will be used to provide interactive engagement opportunities during class. You can purchase the device at the Bookstore or other retailer. Be sure to purchase the iClicker 2 . If you have trouble registering you device for this class, please contact the IT Support Center on the Main Level of Dimond Library. Your device must be purchased and functional by the third class.

An electronic copy of this syllabus and schedule can be found in the Course Information folder on the class Blackboard site.

COURSE OBJECTIVES

Participants in the class should be able to:

1. *Apply* the fundamental concepts of energy-related physics to *perform* basic energy calculations.
2. *Identify* and *explain* the technical aspects of current and emerging energy sources and applications.
3. *Identify* and *evaluate* current issues dealing with energy and environment, and how these affect the different sectors like industry, home, agriculture, business, etc.
4. *Identify* and *explain* the emerging technologies and issues with renewable energy and the corresponding environmental impacts.
5. *Recognize* that energy and environmental issues can be addressed from a variety of ways, including technical, economic, political, safety etc.
6. *Use* the library and internet to research topics in energy and environment and *address* an assigned topic through writing.
7. *Appreciate* opposing viewpoints within the scope of energy/environmental topics and *be able to have* an informed and supported opinion on those topics.

COURSE ORGANIZATION

This is a lecture course that covers a wide range of topics that will help the student discover an understanding of current Energy and Environmental problems and solutions. The discovery of knowledge is intended for any UNH student, at any level and at any major. Most topics are presented by the instructor, while some may be presented by guest speakers who are experts in the presentation topic. This course seeks to teach relevant material, but also to promote interactive learning, and to facilitate development of communication and critical thinking skills.

Attendance

Attendance is **very important** in this course because lectures form the basis of the course material. While the course notes/slides will be available on Blackboard for each lecture, there is significantly more information presented verbally during lecture than is documented on the notes/slides.

Participation

In order to encourage interactive learning in and out of the classroom, participation will be included in your final grade. Participation will be evaluated in two ways: 1) in class using the iClicker and 2) online using the Discussion Boards.

iClicker: The majority of classes will include various clicker-related activities. Participation credit will be evaluated from the participation in these activities. To encourage active participation in each question or activity, any response will earn 100% credit (1 point.) To encourage accurate participation, correct answers will earn 5% extra credit (1.05 points.) In order to account for unforeseen circumstances, I will drop four (4) iClicker

grades during the semester. Cases involving a *valid, pre-arranged* reason for missing more than 4 classes will be dealt with on a case-by-case basis. **Entering answers on more than one clicker is a form academic dishonesty and will be dealt with accordingly (penalty up to and including failure of the course.)**

Discussion Boards: In this class, we will use the Discussion Board feature of Blackboard to promote an interactive learning environment that is less intimidating than the large lecture hall. You will be randomly distributed into small discussion groups (~15 students each) and assigned a discussion board. ***Discussion board posts must be completed by the end of day on Thursdays, as indicated in the course schedule.***

Quality of postings

Below are desired attributes for a posting.

- Ability to synthesize the main concepts from instructor, course content, external resources and class community.
- Use of proper grammar.
- Ideas are organized, persuasive and elevate the overall dialogue.
- Opinions are substantiated.
- Demonstration of critical or creative thinking.
- Evidence of preparation.

Quantity of postings

Per forum, a minimum of 3 postings spread out over the duration of the week are expected. **You must spread your posts out over different days.** Posting twice on one day is not acceptable. Posts completed in the same day will not be counted as more than one post. When you contribute over several days, you are more able to synthesize other perspectives and contribute to an evolving discussion. A good rule of thumb is to post early in the week after you have reviewed the related materials and reading. Allow others to respond and then post again after the dialogue has developed. Please feel free to contribute as many posts as you like. The more discussion is created, the more you will get out of the experience. **Either an original post, or a reply to a classmate's post, can count towards the required number of posts. However, at least one post must be original and not a reply.**

Etiquette

- Divergent opinions: Academic debate and differences are embraced in higher education and the forums in this course. Be mindful and respectful of *how* you articulate a difference or divergent opinion.
- 'I agree' statements: Unsubstantiated 'I agree' posts will not count to final participation grade without articulated rationale to support opinion.
- Off-topic postings: Discussions occasionally veer off-topic. This is normal. These posts will not count and students are asked to stay on-topic.
- Long responses: Grades will be influenced by an ability to demonstrate an understanding of the topic or question and on one's ability to be concise.

Homework Assignments

Homework assignments will be posted on the course Blackboard site. An announcement of a new assignment posting will be made in class and/or via email. These assignments may take a variety of forms, including but not limited to, reading assignments, problems sets, on-line evaluations (multiple choice, T/F, short answer questions, etc), and short research projects. Most often the assignment will be completed and submitted via Blackboard, but occasionally a hard-copy will be required. Late assignments ***will not*** be accepted, except in the most extreme circumstances. ***Homework is due on Tuesday by the end of day, as indicated in the course schedule.***

Quizzes

Quizzes will be given via Blackboard. The quizzes will evaluate comprehension of material covered in lectures and/or required reading assignments. They are designed to help keep you on track throughout the semester. Also, quizzes will have a style and content that is similar to the exams; this should help you to understand expectations. You may use your course notes during the quizzes, but I suggest that you study/review and attempt to answer the questions from your memory and understanding. This will help you prepare for exams and more accurately evaluate your progress and understanding of the material. **Quizzes are to be completely individually. Any violation of this policy will result in automatic failure of the course.** These quizzes are timed and may be taken twice, if desired. Your grade will be the average of your attempts. They may be taken at any time during the week, but must be completed by the posted due date. The lowest quiz grade will be dropped and excluded from the quiz average. ***Quizzes are due on Sunday by the end of day, as indicated on the course schedule.***

Exams

There will be 2 Midterm Exams and a Final Exam in this course. Exams are open notes and will be administered online via Blackboard. **Exams are to be completely individually. Any violation of this policy will result in automatic failure of the course.** Unlike quizzes, exams can only be taken once. The Midterm Exams will be offered during announced times, in lieu of a class period. The exam time window will begin at 8AM and be open until 6PM. Exams must be completed in one attempt. The Final exam will be scheduled during Final Exam week. The composition of the Midterm Exams is as noted in the class schedule. All exams may be considered cumulative.

Grading Scheme

The grades in CHE 410 will be based as follows:

iClicker Exercises	10%
Discussion Board	10%
Weekly Quizzes	10%
Homework Assignments	10%
Mid-Term Exams	35%
<u>Final Exam</u>	<u>25%</u>
Total	100%

The standard assignment of letter grades for numerical scores will be used. It is unlikely that any scaling will occur in the course. However, in situations where it is deemed appropriate, a scale may be included.

CLASSROOM EXPECTATIONS

Questions, discussion, debate, and full participation is expected in this course. However, to insure a climate of learning for all, disruptive or inappropriate behavior (repeated outbursts, disrespect for the ideas of others, etc) may result in exclusion (removal) from this class. As a reminder, cell phone/pda, etc. use, including text messaging, is not permitted in this class by Faculty Senate rule. (2009, Behavioral Intervention Team)

Students wishing to use laptops/tablets for note taking may do so, but should sit in the back rows of the classroom. This is to minimize the distraction that your computer screen may cause to those sitting behind you.

Food and beverages are not allowed in the classroom, with the exception of water bottles.

ACADEMIC DISHONESTY

Honesty is a core value of the University of New Hampshire and violations of any form will not be tolerated. Any violations of UNH academic honesty and integrity standards will be pursued through appropriate University channels. This includes, but is not limited to, cheating, plagiarism and misrepresentation. **Violations of this policy will result in consequences, up to and including failure of the course.** A full description of the policy can be found at <http://www.unh.edu/vpsas/handbook/academic-honesty>

FEEDBACK

In general, your ideas, comments, suggestions, questions, etc. are welcome. Please be aware that your grade will be based on your coursework and participation, as explained above. You are welcome to contact the instructor at any time for anything connected with the course and your progress.

COURSE SCHEDULE

This schedule is **tentative** and is subject to change at any time. Significant changes, such as to exam or assignment dates, will be made well in advance and with timely communication. Topics may be shuffled or changed depending on the pace of the course, at the availability of guest speakers, or if new information becomes available.

Week	Class	Date	Topic	Reading Due	Assignment Due
1	1	1/21	Course Expectations		
	2	1/23	Scientific Units and Conversion		
		1/26			Quiz 1: Syllabus
2	3	1/28	Introduction to Energy 1	Ch. 1 A - D	
	4	1/30	Introduction to Energy 2	Ch. 1 E - I	Discussion 1: Introductions
		2/2			
3	5	2/4	Energy Mechanics 1	Ch.2 A - C	Homework 1: Conversions and Intro
	6	2/6	Energy Mechanics 2	Ch.2 D - G	
		2/9			Quiz 2: Conversions and Intro
4	7	2/11	Energy Mechanics 3	Ch. 3 A - C	
	8	2/13	Conservation of Energy	Ch. 3 D - G	Discussion 2: Energy Mechanics
		2/16			
5	9	2/18	Exam Review 1		Homework 2: Energy Mechanics
	10	2/20	Exam 1 (Classes 1-9)		
		2/23			
6	11	2/25	Heat and Work 1	Ch. 4 A - C	
	12	2/27	Heat and Work 2	Ch. 4 D, skim F	Discussion 3: Heat and Work
		3/2			
7	13	3/4	Home Energy Conservation	Ch. 5 A- C, skim D - H	Homework 3: Heat and Work
	14	3/6	Fossil Fuels 1	Ch. 7 A - C	
		3/9			Quiz 3: Heat and Work
8	3/10 - 3/14		Spring Recess		
9	15	3/18	Fossil Fuels 2	Ch. 7 D	Homework 4: Home Energy and Oil
	16	3/20	Fossil Fuels 3	Ch. 7 E - G	
		3/23			Quiz 4: Home Energy Conversation and Oil
10	17	3/25	Energy and Air Pollution	Ch. 8 A - C, skim D/F	
	18	3/27	Climate Change	Ch. 9 A - D	Discussion 4: Fossil Fuels
		3/30			
11	19	4/1	Exam Review 2		Homework 5: Coal, Gas, Climate Change
	20	4/3	Exam 2 (Classes 11-19)		
		4/6			
12	21	4/8	Electricity 1	Ch. 10 A-C, E, H	
	22	4/10	Electricity 2	Ch. 10 I, Ch. 11 A - C	Discussion 5: Climate Change
		4/13			
13	23	4/15	Wind and Water	Ch. 12 A- B, E-G	Homework 6: Electricity
	24	4/17	Solar	Ch. 6 A, B, D - F	
		4/20			Quiz 5: Electricity
14	25	4/22	Nuclear 1	Ch. 13 A, B, D, F - H	
	26	4/24	Nuclear 2	Ch. 14 A - C, E - I	Discussion 6: Renewable Energy
		4/27			
15		4/29	Biomass	Ch. 17 A - D	Homework 7: Wind, Water, Solar, Nuclear
		5/1	Geothermal	Ch. 18 A - G	
		5/4			Quiz 6: Wind, Water, Solar, Nuclear
16		5/8	Final Exam (Tentative) - 2/3 New material, 1/3 Cumulative		