

**ENST 320b: Energy and Air Sustainability**

**Section 33023**

**Units: 4**

**Spring 2021, MWF 10-10:50 am PST**

**Location:** Online

**Instructor:** Dr. Audra Bardsley aka Dr. B, pronouns: she/her

**Office:** Zoom personal meeting room – see Blackboard for details

**Office Hours:** TBD

**Email:** aibardsl@usc.edu

**Course Description**

Modern society would cease to operate without our ability to harness energy. Yet, our reliance on energy sources like fossil and nuclear fuels come with broad reaching consequences, not least of which is climate change. Even so-called clean and renewable energy source are not free from unintended impacts, logistical challenges, and economic impracticalities. In short, there is no perfect solution. In this course, we will explore the life cycles of various energy sources to understand the benefit and harms associated with each, and how we might move ahead with decision making for our shared energy future.

*Recommended preparation:* ENST 100 and CHEM 103 or equivalent

**Email/Course Communication Policy**

This course will use Blackboard for communication, information and turning in assignments. When applicable, lecture recordings will be made available after the synchronous virtual lecture is given.

When reaching out by email, please put '320b' in the email title and a bit about the reason you are reaching out, e.g. 'assignment question'. I will do my best to respond to you within 24 hours. If you don't hear from me in 2 days, please send me a reminder email. I usually go by 'Dr. B' in my classes and you can address me that way in email as well.

*Special note: We are living in an unusual and often very stressful time. If you are experiencing particular life or academic challenges this semester, please email me. You don't need to share all the details if you don't feel comfortable, but we can start a conversation and find solutions that will help you be as successful as possible this semester.*

## Required Readings and Supplementary Materials

Energy, Environment, and Climate (Third Edition) by Richard Wolfson (ISBN-13: 978-0393622911, ISBN-10: 0393622916) – please note, previous editions will not have the same exercises that we use for problem set assignments.

Additional readings (or videos/podcasts) may be assigned periodically throughout the semester.

## Description of Assignments

### Blackboard Participation Modules

This semester class will consist of both asynchronous and synchronous components. Unless I instruct you otherwise, we will meet live on Zoom every Friday. In lieu of meeting on Monday and Wednesday, you will work through a series of modules on Blackboard that will consist of recorded sections of lecture, sometimes supplemented by other resources, and questions, quizzes or activities that you will need to complete for credit. These are separate from problem sets and can be completed at your own pace so long as they are submitted before the due date.

### Problem Sets

Decision making for our shared energy future requires understanding transformations of energy among different forms, and the transformation from energy to work, all of which are governed by quantitative physical principles. We will practice performing calculations to help us understand these transformations and tradeoffs among various energy scenarios. Students will have approximately a week to complete each problem set and solutions will be discussed either synchronously or asynchronously. Office hours are always available for additional help. A dedicated scientific calculator would be helpful.

### Semester Project

Classes in Environmental Studies often focus on the ways in which humans are mismanaging resources and degrading ecosystems. Though very important to consider, dwelling solely on the humankind's missteps and the dire consequences can be disheartening to say the least. For the semester project, students will work in groups of 3-4 to produce a creative work that examines an environmental victory related to air or energy sustainability. It can take a variety of forms (video, podcast, song, comic book, etc.), but must also be accompanied by an individually written account of the process and works cited. Groups may choose a case study, such as air pollution remediation efforts in Los Angeles, or focus on a particular place, such as Germany and their efforts to invest in solar energy. The projects will be evaluated for originality, accuracy and thoroughness of research, attention to detail, and quality of finished project. Storyboards, which provide a visual outline of the project, will be due during the 4th week of the semester. Check ins and progress write ups will be required throughout the semester.

### In-Class Group Activities

*Note: due to the remote nature of class this semester, in-class group activities will not be for credit, but students should make an effort to attend synchronous portions of class and participate.* Most topics this semester will include a synchronous 'in-class activity' that involves groups of ~4 students working together to answer a quantitative question in breakout rooms before we come together as a class to discuss. For instance, students might be asked to calculate how much lower a gas bill would be if an apartment building switched from natural gas water heaters to solar water heaters and how long it

would take for the infrastructure investment to be paid off. Then they would have to figure out the cost of the units and installations, federal and state tax incentives etc. and estimate how long it would take for a commercial building to make up the cost of upgrading their system. This breaks up lecture, and allows students to both practice mathematic flexibility, and apply the concepts they have learned to real-world situations.

**Additional Notes on Assignments**

Late assignments will not be accepted for credit, unless explicit permission has been given for extenuating circumstances. As noted above in the email policy section, I understand that this is a difficult time so please reach out if you have concerns.

**Exams**

There will be three non-cumulative exams this semester – two midterms and one final exam.

**Grading Breakdown**

<u>Assignment</u>	Points	% of Final Grade
<b>Midterm 1</b>	100	19%
<b>Midterm 2</b>	100	19%
<b>Final Exam</b>	100	19%
<b>Problem Sets (1 x 5 pts; 7 x 10 pts)</b>	75	14%
<b>Semester Project Storyboard &amp; Status Updates</b>	25	5%
<b>Semester Project</b>	75	14%
<b>Blackboard Participation (10 x 5 pts)</b>	50	10%
<b>TOTAL</b>	<b>525</b>	<b>100%</b>

**Grading Scale**

Course final grades will be determined using the following scale. Points earned will be divided by points possible and result rounded to the nearest full percentage point.

A	93-100
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	59 and below

## **Zoom Etiquette**

We are all adjusting to the online learning environment. For me and many of you this will be our first experience interacting in a virtual classroom. A few reminders for online lecture/discussion:

- PLEASE NOTE: synchronous session will be recorded and distributed on Blackboard since we may be experiencing extenuating circumstances like living in different time zones or other challenges, however live attendance is always encouraged and preferred if possible
- Sharing course materials outside the learning environment is prohibited under USC policy (*SCampus Section 11.12(B)*)
- Please mute your mic when not speaking
- Use of webcam is encouraged and preferred, just remember to be properly attired (I know someone accidentally attended a work meeting shirtless during a heat wave, just saying...) and use backgrounds if you'd prefer some more privacy
- If you are unable to keep their camera on during a synchronous Zoom session, please contact me prior to the class session to discuss expectations and accommodations needed
- If you live with others, headphones with a mic might be helpful
- As long as you can focus, eating is totally fine – we may be coming from all different time zones/schedules
- Please do your best to focus on our class discussion, avoiding browsing social media/internet
- You can use the chat box or hand raising feature to ask questions during lecture or comment during discussion
- Come to synchronous meetings prepared
- We are all under extra pressure during this unusual time, please be thoughtful and respectful towards your classmates and me; more on that in the next section

## **Classroom Ground Rules**

Below is a brief summary of ground rules and expectations for our classroom. You can find a more comprehensive version of this list on the Environmental Studies Program website.

- Share responsibility for including all voices in the conversation
- Listen respectfully
- Be open to changing your perspectives based on what you learn from others
- Understand that we are bound to make mistakes in this space
- Understand that your words have effects on others
- Take pair work or small group work seriously
- Understand that others will come to these discussions with different experiences from yours
- Make an effort to get to know other students
- Understand that there are different approaches to solving problems

## Course Schedule: A Weekly Breakdown

For the best learning experience, you are expected to have read assigned material by the date the topic is discussed in class and complete appropriate assignments or Blackboard participation modules by the due date. Article and supplemental readings will be posted online. ***The readings and schedule of topics may be adjusted throughout the semester depending on progress of the class.***

	Class Topics/Activities	Reading/Listening	Assignments/Deliverables
<b>Week 1</b> Jan 15	Class Introduction	Look Through Syllabus Wolfson Ch. 1, 2	
<b>Week 2</b> Jan 20, 22 NO CLASS JAN 18, MLK	Energy	Wolfson Ch. 1,2, 3	Problem Set (PS) #1, Blackboard Participation (BBP) #1 due F 1/22
<b>Week 3</b> Jan 25, 27, 29	Introduction of final project, groups assigned Energy Cont'd Energy and Heat	Wolfson Ch. 3, 4	PS #2, BBP #2 due F 1/29
<b>Week 4</b> Feb 1, 3, 5	Energy and Heat	Wolfson Ch. 4	PS #3, BBP #3 due F 2/5
<b>Week 5</b> Feb 8, 10, 12	Fossil Energy	Wolfson Ch. 5	PS #4, BBP #4 due F 2/12
<b>Week 6</b> Feb 17, 19 NO CLASS FEB 15 PRESIDENT'S DAY	Fossil Energy cont'd Impacts of Fossil Fuels	Wolfson Ch. 5, 6	Final Project Storyboards, BBP #5 due 2/19
<b>Week 7</b> Feb 22, 24, 26	Catch up Midterm 1		
<b>Week 8</b> Mar 1, 3, 5	Nuclear Energy	Wolfson Ch. 7	
<b>Week 9</b> Mar 8, 10 NO CLASS MAR 12 WELLNESS DAY	Nuclear Energy Cont'd	Wolfson Ch. 7	PS #5 due 1/10
<b>Week 10</b> Mar 15, 17, 19	Direct from the Sun: Solar Energy	Wolfson Ch. 9	BBP #6, PS #6 due 3/19
<b>Week 11</b> Mar 22, 24, 26	Indirect from the Sun: Wind, Water, Biomass	Wolfson Ch. 10	BBP #7, PS #7 due 3/26
<b>Week 12</b> Mar 29, 31, Apr 2	Catch up Midterm 2		
<b>Week 13</b> Apr 5, 9 NO CLASS APR 7 WELLNESS DAY	Energy Carriers	Wolfson Ch. 11	BBP #8 due 4/8
<b>Week 14</b> Apr 12, 14, 16	Energy Carrier Cont'd Electricity and the grid	Wolfson Ch. 11	BBP #9, PS #8 due 4/16
<b>Week 15</b> Apr 19, 21, 23	Electricity and the Grid Cont'd Catch Up	Wolfson Ch. 11	BBP #10 due 4/23

<b>Week 16</b> Apr 26, 28 NO CLASS APR 30 WELLNESS DAY	Class Presentations of Final Projects		
Monday May 10 <sup>th</sup>	<b>FINAL EXAM 8 am – 10 am</b>		

### Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](http://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Distribution or use of notes or recordings based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study is a violation of the USC Student Conduct Code (*SCampus Section 11.12(B)*). This includes, but is not limited to, providing materials for distribution by services publishing class notes. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the Internet or via any other media. (See Section C.1 Class Notes Policy).

### Support Systems

*Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call*

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. [engemannshc.usc.edu/counseling](http://engemannshc.usc.edu/counseling)

*National Suicide Prevention Lifeline – 1 (800) 273-8255*

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. [www.suicidepreventionlifeline.org](http://www.suicidepreventionlifeline.org)

*Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call*

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. [engemannshc.usc.edu/rsvp](http://engemannshc.usc.edu/rsvp)

*Sexual Assault Resource Center*

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: [sarc.usc.edu](http://sarc.usc.edu)

*Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086*

Works with faculty, staff, visitors, applicants, and students around issues of protected class. [equity.usc.edu](http://equity.usc.edu)

*Bias Assessment Response and Support*

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. [studentaffairs.usc.edu/bias-assessment-response-support](http://studentaffairs.usc.edu/bias-assessment-response-support)

*The Office of Disability Services and Programs*

Provides certification for students with disabilities and helps arrange relevant accommodations. [dsp.usc.edu](http://dsp.usc.edu)

*Student Support and Advocacy – (213) 821-4710*

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. [studentaffairs.usc.edu/ssu](http://studentaffairs.usc.edu/ssu)

*Diversity at USC*

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. [diversity.usc.edu](http://diversity.usc.edu)

*USC Emergency Information*

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. [emergency.usc.edu](http://emergency.usc.edu)

*USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.*  
Provides overall safety to USC community. [dps.usc.edu](http://dps.usc.edu)