Syllabus for ENST 320b Fall 2020

**The Science, Policy, and Business of Energy and Air Sustainability**

TTh 9:30-1050am; VKC 101

**COURSE INSTRUCTOR:**

Dr. Victoria Petryshyn.

Office: CAS 108

Email: petryshy@usc.edu

Office Hours: TBD and by appointment

**COURSE TEXTS:**

Wolfson, R., Energy, Environment, and Climate, W.W. Norton, 2017, ISBN  978-0-393-62291-1

Recent articles to supplement the course texts, provided by instructor

**COURSE OVERVIEW:**

ENST 320b presents an overview of issues related to energy and air sustainability, including the

science, policy, and business aspects (with a focus on the science part). We will also get into the issues of how our energy choices affect Earth’s climate, specifically how climate change has become a political and emotionally charged topic. Everyone who considers themselves an environmentalist has opinions on which sources of energy are “bad” and which are “good”, but what does that mean? How are these forms of energy harnessed by people, especially in the US, and how exactly are they good or bad? This course explores these questions, considering “cradle-to-grave” issues ranging from extraction of the energy resources from the environment to pollution from emissions or disposal of wastes.

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

**HOMEWORK**

The transformations of energy among different forms, and the transformation from energy to work are governed by quantitative physical principles. So yes, there will be math. It is important for us to carry out calculations in this course. Problem sets will be assigned most weeks. From time to time, students will work selected problems on the board in class. Other times, additional problems will be assigned and your work on these will be collected and graded in class. Please purchase either a green or red pen specifically for this purpose in this course.

*This semester, no late assignment will be accepted for credit.*

**EMAIL POLICY**

I attempt to be accessible to you as possible, within reason. What does this mean? If you email me at 3pm on a Tuesday, I will do my best to get back to you that day. Professors receive a high volume of email, but it is my job to respond to you. If you do not receive an email back from me in 48 hours, feel free to send a reminder, it may have been buried in the onslaught. However, if you email me at 2am Monday morning, asking for a meeting at 730am or a deferral on that day’s assignment, I will likely not be replying in time. So please, exercise common sense in your requests. Also, referring to me as ‘hey u’ or ‘Ms.’ in an email is likely to garner ire on my part. My title is “Dr.” or “Prof.”. It is in your own best interest to get used to emailing in a professional tone.

**COURSE GRADING:**

You will be graded on the basis of your performance on two midterms, a final, homework assignments, and a semester long team project. Test questions will be drawn from the material presented in lecture. Missing more than one or two lectures for other than illness or approved travel will be detrimental to success. At least 20% of the graded material will be quantitative analyses, you will need a scientific calculator. **Cell phones ARE NOT allowed as calculators on exams**. The lecture presentations will be posted on the Blackboard system for download and subsequent study. Test questions will include short essay questions and quantitative analysis. Below is a list of the graded assignments, due date and their weighted value.

Problem Sets ` throughout semester 10%

Midterm 1 October 13 20%

Midterm 2 Week of Nov 10 20%

Video Project Storyboards Sept 18 5%

Team Project Last week 15%

Final Dec 10 20%

Participation throughout semester 10%

**COURSE SCHEDULE:**

For the best learning experience, you are expected to have read the material listed below by the date it is discussed in class. The readings and schedule of topics may be adjusted throughout the semester depending on the progress of the class and addition of new content. That being said, the class lecture schedule may changed based on our discussions.

**Lecture Schedule (This may be modified- Roll With It)**:

**Week 1: Intro and Energy (Aug 25)**

Read syllabus; Wolfson Ch. 1 and 2

Initial Power Plant exercise

**Week 2: Energy in our Society (Sept 1)**  **Energy - Wolfson Ch. 3**

**Week 3: Energy and Matter (Sept 8)**

**Wolfson Ch. 4; Project Groups Discussed and Assigned**

**Week 4: Energy and Heat (Sept 15)**

**Wolfson Ch. 4; Storyboards Due**

**Week 5: Fossil Energy; Coal, Oil, Natural Gas (Sept 22)**

**Wolfson, Ch. 5**

**Week 6: Fossil Energy/Impacts of Fossil Fuels (Sept 29)  
Wolfson, Ch. 5 and 6**

**Week 7: Catch up lectures and Midterm review (Oct 6)**

**Week 8: MIDTERM OCT 13**

**FALL BREAK OCT 15-18**

**Week 9: Nuclear Energy - Fission (Oct 20)**

**Wolfson, Ch. 7**

**Week 10: Nuclear Accidents and Fusion (Oct 27)**

**Week 11: Direct from the Sun: Solar Energy (Nov 03)**

Wolfson Ch. 9

**Week 12: Indirect from the Sun: Water, Wind, and Biomass (Nov 10)**

Wolfson Chapter 10

**MIDTERM 2- TAKE HOME**

**Week 13: Energy Carries – Electricity and the Grid (Nov 17)**

(Wolfson Ch. 11)

**Week 14: April 20 – Energy Carriers Hydrogen (Nov 23)**

Wolfson Ch. 11

**Week 15: April 27 – Class Presentations (Nov 30)**

Video screenings/write ups due

FINAL EXAM: Thursday, Dec 10, 11am -1pm

**FINAL PROJECT:**

So often we focus on the ways that humans are destroying the planet, leading to eco-depression (a very real condition among climate scientists). For this project, groups are asked to focus on the ways humans have worked collaboratively to make real change and better the environment. Students will be assigned collaborative working groups of ~3 people to create a creative work (video, podcast, song, comic book, etc) that addresses an environmental victory related to air/energy sustainability. 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. Each individual student must also provide a written account of the process and information sources they used to complete the project, based on a provided template. The project will be evaluated for originality, accuracy and thoroughness of research, attention to detail, and quality of finished project. Storyboards, which map out the planned video, will be due during the 4th week of the semester. Check ins and progress write ups will be required throughout the semester.

**SUPPORT SYSTEMS**

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

[engemannshc.usc.edu/counseling](https://engemannshc.usc.edu/counseling/)

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*

[suicidepreventionlifeline.org](http://www.suicidepreventionlifeline.org/)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

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

[engemannshc.usc.edu/rsvp](https://engemannshc.usc.edu/rsvp/)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED) | Title IX - (213) 740-5086*

[equity.usc.edu](https://equity.usc.edu/), [titleix.usc.edu](http://titleix.usc.edu)

Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

*Bias Assessment Response and Support - (213) 740-2421*

[studentaffairs.usc.edu/bias-assessment-response-support](https://studentaffairs.usc.edu/bias-assessment-response-support/)

Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.

*The Office of Disability Services and Programs - (213) 740-0776*

[dsp.usc.edu](http://dsp.usc.edu/)

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

*USC Support and Advocacy - (213) 821-4710*

[studentaffairs.usc.edu/ssa](https://studentaffairs.usc.edu/ssa/)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](https://diversity.usc.edu/)

Information on events, programs and training, the Provost’s Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

*USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu/), [emergency.usc.edu](http://emergency.usc.edu/)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

*USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu/)

Non-emergency assistance or information.