

Env Sci 203/ Civ Env 203  
Energy and the Environment  
Lectures: Tu-Th 2:00 – 3:20 pm, Tech L221  
Discussion section: Th 9:30- 10:50 am, Abbott Auditorium, Pancoe  
Canvas website: <https://canvas.northwestern.edu>

Instructor: Neal Blair  
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Teaching assistant: Yechan Won  
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Office Hours: by appointment

**Course description:** We are faced with major global challenges involving the sustainable use of resources and stewardship of the environment. These include sustainable energy production and its impacts on other resources. This course will be an introduction to this topic, focusing on the science behind it and approaches to engineering relevant solutions.

**Prerequisites:** CHEM 103, MATH 224

**Teaching method:** Lectures, demonstrations, and discussions

**Readings:** Posted on Canvas or retrieved from library

#### **Evaluation methods**

Progress in the course will be monitored by a series of problem sets, class activities and exams. The grades will be weighted in the following manner:

|                      |     |
|----------------------|-----|
| Homework assignments | 40% |
| Class participation  | 20% |
| Exams (2)            | 40% |

*Final letter grade assignments for course*

A = 94-100, A- = 90-93

B+ = 87-89, B = 84-86, B- = 80-83

C+ = 74-79, C = 68-73; C- = 60-67

D = 50-59

F < 50

*Late assignments will not be accepted without prior approval from the professor or teaching assistant.*

**Tentative Schedule**

As with the environment, schedule may be changed as a result of weather or other factors

*Lectures: Note there will be in-lecture activities for grade. Prior notice of timing will not be given thus attendance is highly recommended. Make-up assignments will be provided only if prior notice of expected absence is provided to instructor before lecture.*

**Bring paper, a writing utensil (preferably a pencil), and a scientific calculator or equivalent (e.g. laptop with Excel) to class. These will be needed for in-class problem solving.**

| <b>Date</b> | <b>Topic</b>                                      |
|-------------|---|
| 9/19        | Introduction                                      |
| 9/21        | Population impacts                                |
| 9/26        | Conventional fossil fuels                         |
| 9/28        | Conventional fossil fuels                         |
| 10/3        | TBD   |
| 10/5        | TBD   |
| 10/10       | Unconventional fossil fuels                       |
| 10/12       | Fossil fuel environmental impacts I               |
| 10/17       | Fossil fuel environmental impacts II              |
| 10/19       | Fossil fuel environmental impacts III             |
| 10/24       | Exam  |
| 10/26       | Biodiesel   |
| 10/31       | Anaerobic processes and fermentation              |
| 11/2        | Biogas (methane)                                  |
| 11/7        | Bioethanol  |
| 11/9        | Biofuel environmental impacts I                   |
| 11/14       | Biofuel environmental impacts II                  |
| 11/16       | Biofuel environmental impacts III/ Biofuel ethics |
| 11/21       | Exam  |
| 11/27       | WCAS Reading Period begins- No class              |
|             |   |

## **Course goals**

By the end of the course the students should be able to:

1. Research information in the scientific peer reviewed literature
2. Assemble and synthesize information to answer research questions
3. Clearly communication information in written formats
4. Identify the major environmental issues associated with energy use
5. Identify and describe engineering solutions to environment issues
6. Perform fundamental physical-chemical calculations that constrain the energy-environment system

## **Collaborations and Academic Ethics**

Discussion is encouraged between class participants however assignments turned in for grades should be the work of the individual. Sources of information for all work should be carefully cited. Violations of the principles of academic integrity can result in severe penalties, including expulsion from the University. All students should review College guidelines on [Academic Integrity](#).

## **Disability Accommodations**

Any student with a documented disability needing accommodations is requested to speak directly to the Office of Services for Students with Disabilities (SSD) (847-467-5530) and the instructor as early as possible in the quarter (preferably within the first two weeks of class). All discussions will remain confidential.