

SYLLABUS:

EARTHSC/ENR 2155

ENERGY AND ENVIRONMENT

SPRING 2023

Tuesday and Thursday from 12:45 pm – 2:05 pm in Denny Hall 214

Instructors:	Jeffrey Jacquet, Ph.D (ENR)	Michael Braunagel, M.S. (ES)
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Teaching Assistants:

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Peter Haber (ES)
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All Office Hours by Appointment (In person or Via Zoom). Please email to request an appointment.

Course Information

Course description

This course will provide students with a scientific understanding of energy, energy choices, and their implications for sustaining Earth's living systems. In addition, the course will present different conceptual approaches to the on-going energy problem that confronts human society. Energy conservation, energy efficiency, and the transition to renewable and alternative energy sources will be discussed. An important goal for the course is to enable students to evaluate energy choices for a sustainable future.

Course goals and outcomes

Goals: Students understand the principles, theories, and methods of modern science, the relationship between science and technology, the implications of scientific discoveries and the potential of science and technology to address problems of the contemporary world.

Expected Learning Outcomes:

1. Students understand the basic facts, principles, theories, and methods of modern science.
2. Students understand key events in the development of science and recognize that science is an evolving body of knowledge.
3. Students describe the inter-dependence of scientific and technological developments.
4. Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

Mode of delivery

This course will be presented 100% in person. However, we anticipate the need for remote attendance due to a need for self-quarantine, illness, or other factors. Lectures will be simulcasted on Zoom at go.osu.edu/2155 and recordings will be made available.

Students can attend the live Zoom session for up to 12 of the 25 attendance generating lectures/activities (students can attend up to 50% of the classes on Zoom) after which zoom attendance is not eligible for attendance credit. Attendance on Zoom will be automatically recorded by the Zoom platform.

- The in person/zoom learning classes will take place every **Tuesday and Thursday from 12:45 pm – 2:05 pm in Denny Hall 214**

How this course works:

The course is broken down into weekly Modules that are posted on Carmen. Each module on Carmen will contain the following:

- o A description of the topics to be covered for each class and the instructor that will be leading the class (either Jacquet or Braunagel, or both).
- o Readings due to be read before that class.
- o Any other instructor notes or announcements that pertain to the module.
- o Lecture slides will be posted to the Carmen Module immediately before the class begins.

Additionally, six homework assignments will be assigned throughout the semester and 3 exams will be given. These will be listed in the Carmen Assignments page and will be linked to the Course Calendar on Carmen (see schedule below).

Course materials

There is not a required textbook for this course. The following text is a recommended companion to the course:

Pasqualetti, Martin J. *The Thread of Energy*. 2021 Oxford University Press, New York, NY
ISBN: 978-0-19-939480-7

Grading

The following are the points and/or percentage values for each assignment:

Assignments	Points and/or Percentage
Attendance	50
4 Homework Assignments (40 pts each) (there are 5 assignments; however, the lowest score will be dropped)	160
Final Project	60
Exam 1	100
Exam 2	100
Final Exam	130
Total	600

Assignment Information

Grades are based on exams, homework assignments, and attendance.

Homework

There will be 6 homework assignments throughout the semester, including a final class project. The nature of assignments will include a variety of formats including reading responses, video responses, worksheets, or other materials. Assignments will typically be assigned and submitted via the Carmen course site. Note, your lowest score of the first five assignments will be dropped. The sixth assignment (the “Final Project”) cannot be dropped.

Exams

Exams will be primarily a combination of multiple choice and short answer/essay components. The first two exams will not be cumulative. However, the final exam will be cumulative in nature, but with a focus on the subject matter covered in the final third of the course. A “study guide” (a list of topics that may be on the exam) will be posted approximately 1 week before each exam.

Attendance and Participation

Attendance is required. The lectures are delivered to provide the opportunity for class discussion and questions. Your presence is what makes class enjoyable! The attendance is worth 50 points, to be divided equally by the number of lectures or other attendance generating activities (approximately 24). Attendance will be taken each day. Students are allowed 2 “free” unexcused absences before attendance points are impacted.

This course will be presented 100% in person. However, we anticipate the need for remote attendance due to a need for self-quarantine, illness, or other factors. Lectures will be simulcasted on Zoom at go.osu.edu/2155 and recordings will be made available.

Students can attend the live Zoom session for up to 10 of the approximate 20 lectures (50%) after which zoom attendance is not eligible for attendance credit. Field trips and other activities will require in-person attendance. Attendance on Zoom will be automatically recorded by the Zoom platform.

Office hours: We are available to help you to learn, understand, and grow as individuals. If your question is something that you believe may be of interest to others in the class, please post to the “Ask the instructor” discussion board. Office hours are by appointment in person or digital via Carmen Zoom. You are encouraged to reach out to any of the TAs or instructors.

Make-up Work

Make-up for missed work may not be scheduled in the case of an unexcused absence (and in some cases, may not be rescheduled for logistical reasons). There are three situations that constitute an “excused absence” from class. They are: 1) students who participate in a *documented* University sanctioned event, 2) students who have a *documented* death in the family, and 3) students who have received *documented* medical attention for an illness. Students who will be participating in University sanctioned events should provide the instructor with a copy of the scheduled events and those classes that will be missed. This documentation should be on University letterhead, signed by the coach/supervisor, and given to the instructor within the first two weeks of the semester.

Late Assignment Policy

To receive full credit for assignments, work should be turned-in on time and in condition to be evaluated. Work with excessive deficiencies may be returned for resubmission and will be treated as if they are late. Late assignments may incur a deduction of 10% of the total point value for each 24-hour period (or portion) that they are late (including weekends). In-class assignments missed because of an unexcused absence may not be made-up or repeated; an alternative written report assignment may be scheduled for those missed because of an excused absence. **Grading scale**

93–100: A
90–92.9: A-
87–89.9: B+
83–86.9: B
80–82.9: B-
77–79.9: C+
73–76.9: C
70 –72.9: C-

67 –69.9: D+

60 –66.9: D

Below 60: E

Please note: Carmen Canvas, OSU's grading and class management software, does not round fractions up. Please take that into account in computing grades. I do not manually round up grades. There will be opportunities for extra credit for students who choose to earn those points.

Course Schedule

Schedule is subject to change. Please see Carmen for the most-up to-date schedule.

** Designates Field Trip*

Date			Topic	Instructor	Reading	Homework
Tues	Jan	10	Intro to Class, Energy Basics	JJ and MB	CH 1	
Thurs	Jan	12	Energy Basics: What is energy	JJ and MB	CH 1	HW 1 Assigned
Tues	Jan	17	Energy Basics: Units and Measures	Braunagel		
Thurs	Jan	19	Energy Basics: Trends and Forecasts	Jacquet	CH 14; 10 Nature Article	
Tues	Jan	24	Energy Systems and OSU Systems #1 *	MB and JJ		HW 1 DUE HW 2 Assign
Thurs	Jan	26	Energy Systems and OSU Systems #2*	JJ and MB		
Tues	Jan	31	Climate Change Science	Braunagel	CH 5	HW2 DUE
Thurs	Feb	2	Climate Change Impacts	Jacquet	CH 6	
Tues	Feb	7	Exam ONE			HW3 Assigned
Thurs	Feb	9	Fossil Fuels: Coal	Braunagel	CH 2 (p. 17-22)	
Tues	Feb	14	Fossil Fuels: Coal	Jacquet		
Thurs	Feb	16	Renewable Energy: Solar	MB and JJ	CH 2 (p. 13-17)	HW3 DUE HW4 Assign
Tues	Feb	21	Renewable Energy: Wind	JJ and MB		
Thurs	Feb	23	Solar Field Trip*		CH9	
Tues	Feb	28	Fossil Fuels: Oil	MB and JJ	CH 2 (p. 22-23)	
Thurs	Mar	2	Fossil Fuels: Methane	MB and JJ	CH9	HW4 DUE
Tues	Mar	7	Hydrogen	MB, JJ and TBA		
Thurs	Mar	9	EXAM TWO			
T/R	Mar	13-17	OSU SPRING BREAK			
Tues	Mar	21	Geothermal & Biomass	Jacquet		HW 5 Assigned
Thurs	Mar	23	Nuclear	Jacquet	CH 2 (p. 23-24)	
Tues	Mar	28	Nuclear	Braunagel	CH 2 (p. 23-24)	
Thurs	Mar	30	Hydro Power, Tidal and Wave	Braunagel		
Tues	Apr	4	EV CAR SHOW*	JJ and MB	CH 7; 10	
Thurs	Apr	6	A Just Energy Transition/Smart Grid	JJ and MB		
Tues	Apr	11	Decarbonization/Energy Policy			Final Projects Due
Thurs	Apr	13	Final Project Presentations			
Tues	Apr	18	Final Project Presentations			
Thurs	Apr	20	Final Project Presentations			
FINAL EXAM: Wednesday, April 27 2:00-3:45pm						

Attendance, participation, and discussions

Credit hour and work expectation

This is a 3-credit-hour course. According to Ohio State policy, students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of (C) average.

Student participation requirements

Because this course requires is in person, your attendance is partly based on your in class attendance and participation. The following is a summary of everyone's expected participation:

- Attending lectures.
 - Tu/Th 12:45-2:05pm (see detailed schedule)
- Weekly assignments.
 - Will be posted on the online course page and will be announced in lecture when they are assigned.
- Office hours: We are available to help you to learn, understand, and grow as individuals. If your question is something that you believe may be of interest to others in the class, please post to the “Ask the instructor” discussion board. Office hours are in person or digital via Carmen Zoom.

Grading and feedback

For large weekly assignments, you can generally expect feedback within 7-10 days.

E-mail

Please email both instructors for fastest response. We will aim to reply to e-mails within 24 hours on school days. However, feel free to send a follow up email if you receive no response.

Discussion board

We will check and reply to messages in the discussion boards every 24 hours on school days.

Discussion and communication guidelines

The following are our expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- Tone and civility: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online and is not always appreciated in-person. The instructors and TAs all work very hard to provide a positive learning experience. Please keep this in mind and remain civilized and respectful in your class communications.
- Citing your sources: When we have academic discussions, please cite your sources to

back up what you say. (For the textbook or other course materials, please use APA style. For online sources, be sure to include a link).

Encouraging an optimal learning experience

Previous courses have provided insights from students on how to improve the learning experience and optimize outcomes. Here are a few tips from previous students to encourage your success in this course:

- Students kept up with the Schedule and assignment due dates.
- Students made sure they had access to a reliable internet connection.
- Students had access to at least one reliable device and a backup plan in case of a technological issue.
- Students have made plans to back up work. OSU provides free access to data storage through [Microsoft One Drive](#).
- Students reported that completing assigned readings before class helped them to be prepared to follow along with lectures and participate in discussions.
- Students scheduled time to complete activities at a steady pace during the week. Keeping a schedule prevented a last minute rush and kept the workload manageable.
- ▮ Students approached the material by thinking about the connections between readings, lectures, and assignments.

Course technology

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help/hours>, and support for urgent issues is available 24x7.

- Carmen:
 - Carmen, Ohio State's Learning Management System, will be used to host materials and activities throughout this course. To access Carmen, visit [Carmen.osu.edu](https://carmen.osu.edu). Log in to Carmen using your name.# and password. If you have not setup a name.# and password, visit my.osu.edu.
 - Help guides on the use of Carmen can be found at <https://resourcecenter.odee.osu.edu/carmen>
 - This course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.
 - [Carmen accessibility](#)
- Secured Media Library
 - Some of the videos for this course will be posted in the University's Secured Media Library. The link will be posted on the class Carmen page and you will be automatically directed to the correct video.

- [Secured Media Library](#) help guide
- Carmen Zoom:
 - Office hours may be held through Ohio State's conferencing platform, Carmen Zoom. A separate guide to accessing Carmen Zoom and our office hours is posted on the course Carmen page under Files.
 - Students may use the audio and video functions if a webcam and microphone are available. If not, there is still a chat function within Carmen Zoom for the student to live chat with the professor or TA in the virtual office hours room.
 - [Carmen Zoom](#) help guide
- Turnitin:
 - Students at The Ohio State University are accountable for the integrity of the work they submit. Therefore, you should be familiar with the guidelines provided by the [Committee on Academic Misconduct \(COAM\)](#) and [Section A of OSU's Code of Student Conduct](#) in order to meet the academic expectations concerning appropriate documentation of sources. In addition, OSU has made Turnitin, a learning tool and plagiarism prevention system, available to instructors. For this class, you will submit your papers to Turnitin from Carmen. When grading your work, I will interpret the originality report, following [Section A of OSU's Code of Student Conduct](#) as appropriate. For more information about Turnitin, please see [the vendor's guide for students](#). Note that submitted final papers become part of the OSU database.
- Top Hat
 - Top Hat is a web-based response system that allows students to use their own devices provide responses in the classroom. This course uses Top Hat during in-class sessions to generate class discussion and gauge student opinions and interest.
 - [Top Hat](#) help guide
- Self-Service and Chat support: <http://ocio.osu.edu/selfservice>
- Phone: 614-688-HELP (4357)
- Email: 8help@osu.edu
- TDD: 614-688-8743

Baseline technical skills necessary for online courses

- Basic computer and web-browsing skills
- Navigating Carmen

Necessary equipment

- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
- Web cam and microphone
- Necessary software
- Word processor with the ability to save files under .doc, .docx, .rtf, or .pdf. Most popular

word processing software programs including Microsoft Word and Mac Pages have these abilities.

- OSU students have access to Microsoft Office products free of charge. To install, please visit https://osuitsm.service-now.com/selfservice/kb_view.do?sysparm_article=kb04733

Other course policies

Student Academic Services

Arts and Sciences Advising and Academic Services' website provides support for student academic success. Information on advising issues such as tutoring, transfer credits, academic standing, and contact information for Arts and Sciences advisors can be obtained through this website. The site is: <http://advising.osu.edu/welcome.shtml>

Student Services

The Student Service Center assists with financial aid matters, tuition and fee payments. Please see their site at: <http://ssc.osu.edu>

Copyright Disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Diversity

The School of Communication at The Ohio State University embraces and maintains an environment that respects diverse traditions, heritages, experiences, and people. Our commitment to diversity moves beyond mere tolerance to recognizing, understanding, and welcoming the contributions of diverse groups and the value group members possess as individuals. In our School, the faculty, students, and staff are dedicated to building a tradition of diversity with principles of equal opportunity, personal respect, and the intellectual interests of those who comprise diverse cultures.

Title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been

sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Interim Ohio State Title IX Coordinator, Molly Peirano, at titleix@osu.edu

Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing.

If you are or someone you know is suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614--292--5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at 614-292-5766.

If you are thinking of harming yourself or need a safe, non-judgmental place to talk, or if you are worried about someone else and need advice about what to do, 24-hour emergency help is also available through the Suicide Prevention Hotline (Columbus: 614-221-5445)

COVID-19 and Illness Policies

University COVID policies

Health and safety requirements: All students, faculty and staff are required to comply with and stay up to date on all university safety and health guidance (<https://safeandhealthy.osu.edu>), which includes wearing a face mask in any indoor space and maintaining a safe physical distance at all times. Non-compliance will result in a warning first, and disciplinary actions will be taken for repeated offenses."

Student illness or absence

In the event you must quarantine because of exposure to someone diagnosed with COVID-19 OR you are feeling ill with COVID-19 symptoms, you still will be able to make progress in this class. Please contact your instructor right away, as some accommodations may require extra set-up or planning. The quarantine plan for this course is to join remotely via Zoom.

- Record the class session and post the recording on Carmen.
- Provide materials for each lesson on Carmen. (Least desirable on its own. Ideally used as a supplement to the others.)

If *you* are too ill to participate in this course due to COVID-19 or another illness, please contact the instructor as soon as you are able prior to the next class meeting. All materials will be made available on Carmen, including lecture recordings and slides. At least 1 hour advance notice is necessary for device and room set-up. Alternate assignments or extensions may be arranged.

Instructor illness or absence

If the *instructor* is quarantined or is experiencing respiratory symptoms but is well enough to teach, the in-person sessions will be moved online to Zoom.

If the *instructor* is too ill to teach the course for a period of time, the designated backup for this course will step in. You will be notified via email from the School of Communication.

Academic integrity policy

Policies for this course

- Written assignments: Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should follow APA style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in--but no one else should revise or rewrite your work.
- Reusing past work: In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.
- Falsifying research or results: All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your library research look more successful than it was.

Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>

Accessibility accommodations for students with disabilities

Requesting accommodations

Students with disabilities (including mental health, chronic or temporary medical conditions) that have been certified by the Office of Student Life Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office of Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614- 292-3307, slds@osu.edu; slds.osu.edu.