

**CHEN 3660: Energy Fundamentals**  
**Spring 2022, MWF 10:40AM-11:30AM**  
**Jennie Smoly Caruthers Biotechnology Building (JSCBB) A115**

Instructors: Prof. Wilson Smith, SEEC N330B,  
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Teaching Assistants: Paige Brimley, [Paige.Brimley@colorado.edu](mailto:Paige.Brimley@colorado.edu)  
 Office Hours: TBD

- Please feel free to email instructors or TAs but be sure to include "CHEN 3660" at the beginning of your subject line so we can find it amongst all of our other emails.

Textbook (Required): "Energy Science: Principles, Technologies, and Impacts, 3rd Edition" by John Andrews and Nick Jelley. *Other reading, videos, and background materials will be provided as PDF files and links on Canvas*

Course Websites: Canvas: <https://canvas.colorado.edu/courses/79331> (assignments, posted material)

Zoom: <https://cuboulder.zoom.us/j/93311344325>

Gradescope: <https://www.gradescope.com>

- Announcements, homework assignments, quizzes, and other communication will be run through Canvas. Assignments will be turned in on Gradescope. Class will meet on Zoom

<u>Grading:</u>	In-class clickers and class participation:	15 %
	Weekly reading quizzes:	20 %
	Homework assignments:	20 %
	Midterm exam:	20 %
	Final project:	20 %
	Peer evaluation:	5 %

Key Dates:

***MIDTERM: 3/18 evening***

***PROJECTS: 4/23-4/28***

Grading elements:

- Clicker questions (or, in event of recorded lecture, participation quizzes) will typically be based on information from readings or lecture, and will be graded (2 points for participation, 1 for correct answer). Some clicker questions will be "survey-style" (with all answers awarded 3 points). We will scale to 100%, allowing a buffer for a reasonable number of missed classes, technical difficulties, etc
- Reading quizzes, due on Wednesdays by 8:00 AM, will cover the reading material assigned in the previous week. Reading quizzes cannot be made up, but we will drop the lowest quiz score (including missed quizzes) from your final grade.
- Homework assignments will cover the topics discussed in class as well as others that you will have to research on your own. The goal of the homeworks is to get you thinking broadly about problem solving. A number of homeworks will also help foster your progress toward the final course project.
- The course project will consist of a team poster presentation. The grading rubric will be posted on Canvas.
- Homeworks and tests will usually be submitted to and graded with Gradescope. At the start of the semester you should receive an emailed invitation from Gradescope to join our class. If you do not, please contact the instructor.

iClickers: Due to the remote instruction mode, iClickers questions will be administered with the iClicker Reef App. Download and registration instructions can be found at:  
<https://oit.colorado.edu/services/learning-spaces-technology/cuclickers>

Homework and Project Teams:

- Homeworks and the course project will all be completed in teams of 3-4 students. The procedure for signing up for teams will be described early in the semester.
- Teams will only be changed if team members vote to remove a student from the group, in which case each of the remaining parties can choose to finish out the semester on their own or to seek admittance onto another existing team. All notices of team switching must be communicated to the instructor via email.

Course Description:

Modern society is built on a foundation of energy. Beginning with the industrial revolution, the availability, cost and use of energy began to dramatically change how humans lived and worked. Energy drives our politics, our economics and holds our society up. Energy Fundamentals will examine the history, basic principles, technologies, markets, policies, and future of the energy space. Successful completion of this course will prepare you for a career in the energy sector, regardless of where you may land.

Topics including but not limited to [approximate # lectures]:

- Energy sector scale, markets, and history [2]
- Energy efficiency and thermodynamics [3]
- Fossil energy [4]
- Nuclear Energy [2]
- Solar thermal and geothermal [3]
- Solar PV [5]
- Wind energy [3]
- Hydropower [2]
- Energy from biomass [4]
- Electric power, storage, and the grid [2]
- Electrochemical systems [5]
- Residential, industrial, transportation, and industrial energy use [2]
- Resource use, supply, and demand [1]
- Sustainability, climate concerns, policy, science, strategy, and the future of energy [2]

Course Objectives:

- Apply engineering expertise to energy systems
- Examine important areas of the energy sector
- Expand conceptual understanding of energy technologies
- Prepare you for a career in the energy sector
  - Improve critical thinking and communication skills
  - Develop broad understanding of the size/scale/cost/status of the energy sector
- Make the course interesting and widely applicable to all careers in the energy sector

Expectations:

- Attend class and be on time.
- Complete reading and turn in assignments on time
- Be respectful of other students
- No phones/email/multitasking during class
- Participate in class discussions and in clicker questions

## Additional Class Policies:

### **CLASSROOM BEHAVIOR**

Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#).

### **REQUIREMENTS FOR COVID-19**

As a matter of public health and safety, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements and all public health orders in place to reduce the risk of spreading infectious disease. Students who fail to adhere to these requirements will be asked to leave class, and students who do not leave class when asked or who refuse to comply with these requirements will be referred to [Student Conduct and Conflict Resolution](#). For more information, see the policy on [classroom behavior](#) and the [Student Code of Conduct](#). If you require accommodation because a disability prevents you from fulfilling these safety measures, please follow the steps in the “Accommodation for Disabilities” statement on this syllabus.

CU Boulder currently requires masks in classrooms and laboratories regardless of vaccination status. This requirement is a precaution to supplement CU Boulder’s COVID-19 vaccine requirement. Exemptions include individuals who cannot medically tolerate a face covering, as well as those who are hearing-impaired or otherwise disabled or who are communicating with someone who is hearing-impaired or otherwise disabled and where the ability to see the mouth is essential to communication. If you qualify for a mask-related accommodation, please follow the steps in the “Accommodation for Disabilities” statement on this syllabus. In addition, vaccinated instructional faculty who are engaged in an indoor instructional activity and are separated by at least 6 feet from the nearest person are exempt from wearing masks if they so choose.

If you feel ill and think you might have COVID-19, if you have tested positive for COVID-19, or if you are unvaccinated or partially vaccinated and have been in close contact with someone who has COVID-19, you should stay home and follow the further guidance of the [Public Health Office](#) ([contacttracing@colorado.edu](mailto:contacttracing@colorado.edu)). If you are fully vaccinated and have been in close contact with someone who has COVID-19, you do not need to stay home; rather, you should self-monitor for symptoms and follow the further guidance of the [Public Health Office](#) ([contacttracing@colorado.edu](mailto:contacttracing@colorado.edu)).

### **ACCOMMODATION FOR DISABILITIES**

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#). Contact Disability Services at 303-492-8671 or [dsinfo@colorado.edu](mailto:dsinfo@colorado.edu) for further assistance. If you have a temporary medical condition, see [Temporary Medical Conditions](#) on the Disability Services website.

### **PREFERRED STUDENT NAMES AND PRONOUNS**

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

## **Honor Code**

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code academic integrity policy. Violations of the Honor Code may include, but are not limited to: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code ([honor@colorado.edu](mailto:honor@colorado.edu); 303-492-5550). Students found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found on the [Honor Code website](#).

## **Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation**

CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. The university will not tolerate acts of sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, or protected-class discrimination or harassment by or against members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or email [cureport@colorado.edu](mailto:cureport@colorado.edu). Information about university policies, [reporting options](#), and the support resources can be found on the [OIEC website](#).

Please know that faculty and graduate instructors have a responsibility to inform OIEC when they are made aware of incidents of sexual misconduct, dating and domestic violence, stalking, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about their rights, support resources, and reporting options. To learn more about reporting and support options for a variety of concerns, visit [Don't Ignore It](#).

## **Religious Holidays**

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, please contact the instructor to make arrangements. Requests will be accommodated insofar as possible but must be made at least 3 weeks in advance of any course event to be impacted. See the [campus policy regarding religious observances](#) for full details.

