

MEEN 4800.063

Energy and Environmental Sustainability

Fall 2025

Course Description: This course will examine the intersection of energy and the environment, with a focus on sustainability. The course will cover topics related to energy production and consumption, renewable energy sources, energy efficiency, and the impacts of energy use on the environment. Students will learn about the key concepts and tools necessary to analyze and evaluate energy systems, as well as the environmental and social impacts of different energy sources and technologies. Students will learn about policies and strategies for promoting sustainable energy use and reducing the negative environmental impacts of energy production and consumption. Through case studies and hands-on exercises, students will gain practical skills in designing and implementing sustainable energy solutions.

Catalog Description: An overview of sustainability themes related to energy and the environment. Key aspects of energy production and consumption, renewable energy sources, energy efficiency, and the impacts of energy use on the environment. Students explore the geopolitical and social implications of various energy sources and technologies and learn to develop environmental impact assessments of major energy systems and emerging technologies. An overview of the U.N. Sustainable Development Goals and implementation is provided. Through team-based case studies and practical exercises, students develop the skills needed to design and implement sustainable energy solutions.

Prerequisite(s): Consent of instructor.

Instructor: Dr. Kuruvilla John
Professor
F115B
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Course Materials:

1. Textbook: *None*
2. Academic articles and reports from various sources, including scientific journals and government agencies.
3. Videos and documentaries on energy and environmental sustainability.
4. Software tools for analyzing and modeling energy systems.

Reference Books:

1. *Energy and Society: An Introduction, 3rd Edition* by Harold H. Schobert.
2. *Sustainable Energy: Choosing Among Options* by Jefferson W. Tester, Elisabeth M. Drake, Michael J. Driscoll, and Michael W. Golay
3. *Sustainable Energy Systems Engineering: The Complete Green Building Design Resource* by Peter Gevorkian.
4. *Sustainable Energy Solutions for Climate Change* by Mark Diesendorf.

Course Goals and Learning Outcomes:

By the end of this course, students will be able to:

1. Develop a deep understanding of the key concepts and principles related to energy and environmental sustainability.
2. Evaluate and analyze the environmental impacts of different energy sources and technologies.
3. Identify and assess the potential for renewable energy sources to contribute to a sustainable energy system.
4. Critically evaluate energy policies and regulations and propose strategies for improving energy and environmental sustainability.
5. Develop skills in conducting research, data analysis, and communication of findings related to energy and environmental sustainability.

Course topics:

1. Introduction to energy and environmental sustainability
2. Energy economics and policy
3. Energy sources and technologies
4. Energy and climate change
5. Renewable energy technologies
6. Energy efficiency and conservation
7. Energy storage and distribution
8. Environmental impacts of energy systems
9. Social and economic impacts of energy systems
10. Sustainable energy solutions
11. Case studies and review exercises

Course format: 3 hours of lecture per week; Tuesdays & Thursdays, 7:00– 8:20 p.m.

Office hours: By appointment only

Grading:	Class participation	20%
	Assignments and quizzes	30%
	Unit exam	20%
	Semester project	30%
Total		100%

Communication Practices:

Connect with me through email and/or by attending office hours. During busy times, my inbox becomes rather full, so if you contact me and do not receive a response within two business days, please send a follow-up email. A gentle nudge is always appreciated.

Students will be notified by Eagle Alert if there is a campus closing that will impact a class and will be informed that the calendar is subject to change, citing the [Campus Closures Policy](https://policy.unt.edu/policy/15-006) (<https://policy.unt.edu/policy/15-006>).

Disability Accommodation:

The University of North Texas makes reasonable accommodations for students with disabilities. To request accommodations, you must first register with the Office of Disability Access (ODA) by completing an application for services and providing documentation to verify your eligibility each semester. Once your eligibility is confirmed, you may request your letter of accommodation. ODA will then email your faculty a letter of reasonable accommodation, initiating a private discussion about your specific needs in the course.

You can request accommodations at any time, but it's important to provide ODA notice to your faculty as early as possible in the semester to avoid delays in implementation. Keep in mind that you must obtain a new letter of accommodation for each semester and meet with each faculty member before accommodations can be implemented in each class. You are strongly encouraged to meet with faculty regarding your accommodations during office hours or by appointment. Faculty have the authority to ask you to discuss your letter during their designated office hours to protect your privacy. For more information and to access resources that can support your needs, refer to the [Office of Disability Access](https://studentaffairs.unt.edu/office-disability-access) website (<https://studentaffairs.unt.edu/office-disability-access>).

Academic Success Resources:

UNT strives to offer a high-quality education in a supportive environment where you can learn, grow, and thrive. As a faculty member, I am committed to supporting you, and I want to remind you that UNT offers a range of mental health and wellness services to help maintain balance and well-being. Utilizing these resources is a proactive way to support your academic and personal success. To explore campus resources designed to support you, check out [mental health services](https://clear.unt.edu/student-support-services-policies) (<https://clear.unt.edu/student-support-services-policies>), visit unt.edu/success, and explore unt.edu/wellness. To get all your enrollment and student financial-related questions answered, go to scrappysays.unt.edu.

GenAI Use:

In this course, you are encouraged to use Generative AI (GenAI) tools such as Claude, ChatGPT, Gemini, Grok, or others to support your learning and develop skills for a GenAI-oriented workforce. This use will help us stay technically proficient and ethically grounded. However, GenAI should complement, not replace, our course materials. If something seems unclear, feel free to ask.

I use GenAI to enhance materials, streamline tasks, generate prompts, create scenarios, draft syllabi, build study guides, and analyze performance. I will always disclose how I use GenAI, and I expect the same from you.

In line with the UNT Honor Code, all work you submit must be your own. Using GenAI tools without attribution or relying on them to complete assignments violates academic integrity and will be addressed according to our policy.

Academic Integrity and Honor Code:

Every student in my class can improve by doing their work and trying their hardest with access to appropriate resources. Students who use other people's work without citations will be violating UNT's Academic Integrity Policy. Please read and follow this important set of [guidelines for your academic success](https://policy.unt.edu/policy/06-003) (<https://policy.unt.edu/policy/06-003>). If you have questions about this or any UNT policy, please email me or come discuss this with me during my office hours.

Honor Code: "I commit myself to honor, integrity, and responsibility as a student representing the University of North Texas community. I understand and pledge to uphold academic integrity as set forth by [UNT Student Academic Integrity Policy, 06.003](https://policy.unt.edu/policy/06-003) (<https://policy.unt.edu/policy/06-003>). I affirm that the work I submit will always be my own, and the support I provide and receive will always be honorable."

Attendance Policy:

Research has shown that students who attend class are more likely to be successful. You should attend every class unless you have a university excused absence, such as active military service, a religious holy day, or an official university function, as stated in the [Student Attendance and Authorized Absences Policy \(PDF\)](https://policy.unt.edu/policy/06-039) (<https://policy.unt.edu/policy/06-039>). Because this course involves collaboration, participation is essential to learning. Our project-based activities require you to be actively engaged in discussions and group work. I understand tardiness and absences may occur. If you are late to class, please drop me an email to let me know the circumstances. If you cannot attend a class due to an emergency, please let me know. Your safety and well-being are important to me.