

UNIVERSITY OF NORTH TEXAS – Department of Mechanical Engineering
MEEN 4110-002 / MEEN 5110-001 Renewable Energy
SYLLABUS Spring 2026 3 Credit hours

Instructor: Dr. Hassan Qandil (hassan.qandil@unt.edu)
Office Hours: By appointment (Email to Schedule).
Lecture & Location: TuTh 7:00PM - 8:20PM - NTDP E265
Teaching Assistant: TBD
TA Office Hours: By appointment (Email to Schedule).

Prerequisites:

MEEN 4110: MEEN 3110; MEEN 3210, all with a grade of C or better.

Prior Knowledge:

Students are expected to have prior knowledge of:

- Engineering thermodynamics
- Heat transfer (conduction, convection, radiation)
- Basic fluid mechanics
- Energy balances for closed and open systems
- Introductory electrical concepts (power, energy, efficiency)
- Spreadsheet-based engineering calculations (Excel or equivalent)
- Ability to read technical literature and perform basic economic comparisons

Catalog Course Description:

Introduction to physics, systems and methods of energy conversion from non-conventional energy sources, such as solar, geothermal, ocean-thermal, biomass, tidal, hydroelectric, wind and wave energy. Advantages and disadvantages of alternative energy sources and engineering challenges for harnessing such forms of energy. Energy storage. Fuel cells.

Recommended Textbooks:

- *“Fundamentals and Applications of Renewable Energy”*, 2nd Edition, Mehmet Kanoğlu, Yunus A. Çengel, John M. Cimbala, McGraw Hill, 2023, [ISBN: 9781265079659](https://www.mhhe.com/cengel/kanoğlu/yunus-a-2023)

Course Objectives:

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

1. Apply thermodynamic and heat-transfer principles to renewable energy systems
2. Analyze performance and efficiency of major renewable energy technologies
3. Understand design considerations for solar thermal and photovoltaic systems
4. Evaluate wind energy systems and resource characteristics
5. Analyze geothermal and biomass energy systems
6. Understand hydrogen production, storage, and fuel cell technologies
7. Perform basic techno-economic analysis of renewable energy projects
8. Assess environmental impacts and sustainability considerations
9. Communicate engineering analysis through professional technical reports

CALCULATORS: Only those permitted on (FE) exam. No graphing calculators.

GRADES: Standard grading scale used: 90/80/70/60. Re-grade request must be made in class the day returned. **No re-grade requests after class dismissed.** Entire exam will be re-graded, which may result in lower score than originally assigned. **Make-ups are NOT allowed,** with the exception being UNT-excused absences with proper documentation.

Attendance 5% **Taken In-class** (Extra credit for lecture participation)
 Projects 20% **Online PDF submissions,** real-life problem solving / critical thinking
 Quizzes 10% **In-class,** reading comprehension / multiple choice / qualitative
 Mid-Term 30% **In-class,** reading comprehension / multiple choice / qualitative
 Final Exam 30% **In-class,** reading comprehension / multiple choice / qualitative
Extra Credit is available in-class and through Exams and Quizzes

TENTATIVE LECTURE SCHEDULE

Week	Dates	Topic	Quiz/Project
1	Jan. 12 th – Jan. 16 th	Introduction + Energy & Sustainability Overview	
2	Jan. 19 th – Jan. 23 rd	Review of Thermal Sciences	
3	Jan. 26 th – Jan. 30 th	Solar Energy Fundamentals	
4	Feb. 2 nd – Feb. 6 th	Solar Thermal Systems	
5	Feb. 9 th – Feb. 13 th	Solar Photovoltaic Systems	Quiz
6	Feb. 16 th – Feb. 20 th	PV System Design & Applications	
7	Feb. 23 rd – Feb. 27 th	Wind Energy Fundamentals	
8	Mar. 2 nd – Mar. 6 th	Midterm (Tu, Mar 5th) (In-class, same class time)	
9	Mar. 9 th – Mar. 13 th	NO CLASS - SPRING BREAK	
10	Mar. 16 th – Mar. 20 th	Geothermal Energy Systems	
11	Mar. 23 rd – Mar. 27 th	Biomass & Bioenergy	
12	Mar. 30 th – Apr. 3 rd	Hydrogen & Fuel Cells	
13	Apr. 6 th – Apr. 10 th	Renewable Energy Economics	
14	Apr. 13 th – Apr. 17 th	System Advisor Model™ (SAM™) Intro	
15	Apr. 20 th – Apr. 24 th	System Advisor Model™ (SAM™) Intro	
16	Apr. 27 th – May. 1 st	Final (Th, April 30th) (In-class, same class time)	Project

COURSE POLICY: **Course delivery method is in-person.** All course announcements, lecture notes, recorded material and assignments to be posted on MEEN 5200/MEEN 4810 Canvas courses. **Students are expected to have access to textbooks on their own.**

HOMEWORK: All **Homework submissions are online** through CANVAS and in a PDF format. **NO LATE SUBMISSIONS ALLOWED** except for students with UNT-approved excuse (please follow UNT Policy 06.039).

EXAMS: All **quizzes and exams will be in-class.** If you have an emergency and need an authorized absence as per UNT Policy 06.039, please connect with the Dean of Students' office requesting an excused absence in writing (studentaffairs.unt.edu/dean-of-students).

ATTENDANCE: Refer to [UNT's 06.039 Student Attendance & Authorized Absences Policy](#):

- The student is responsible for regular and punctual attendance and is expected to participate in all courses in which the student is enrolled.
- Communicate with the professor prior to being absent, so you can discuss and mitigate the impact of the absence on your attainment of course learning goals.
- *If a student accumulates more than two weeks of unexcused absences (four lectures), the student will be ineligible to sit for the final exam until a formal meeting with the instructor occurs to review the reasons for the absences and written approval to proceed is granted.*
- *Only University Excused Absences indicated in Policy 06.039 are acceptable.*

ACADEMIC INTEGRITY STANDARDS AND SANCTIONS FOR VIOLATIONS: According to UNT Policy 06.003, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University. Academic dishonesty will not be tolerated and will result in zero assignment score and reported to Office of Academic Integrity. No exceptions. Having any calculator not on the approved list is a violation of Academic Integrity.

ADA Policy: UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at anytime, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website (<https://disability.unt.edu/>).

ACCEPTABLE BEHAVIOR: Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. To learn more, visit UNT's Code of Student Conduct (<https://deanofstudents.unt.edu/conduct>).

STUDENT PERCEPTIONS OF TEACHING EFFECTIVENESS (SPOT) Course participates in SPOT evaluations (<http://spot.unt.edu/> or email spot@unt.edu).

RETENTION OF STUDENT RECORDS Course follows Family Educational Rights and Privacy Act (FERPA) laws and UNT Policy 10.10, Records Management and Retention.

SYLLABUS CHANGES Instructor reserves right change syllabus. Any changes announced in class and posted to CANVAS with an accompanying email to student's UNT email address.

ACCESS TO INFORMATION - EAGLE CONNECT: Students' access point for business and academic services at UNT is located at: my.unt.edu. All official communication from the University will be delivered to a student's Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mail Eagle Connect (<https://it.unt.edu/eagleconnect>).