# MEEN 4810-017 Topics in MEE

**FALL 2025**

**Instructor**: Dr. Vish Prasad, Professor

**Email:** vish.prasad@unt.edu

**Lecture Time:** Tue and Thu 5:30-6:50 PM

**Room:** NTDP B140

**Office Hours:** Thursday 3-4 PM

**Course Description**

Concept of energy and energy conversion; Fossil fuels: coal, oil, and natural gas; Thermal power plants; Energy distribution; Direct energy conversion; Nuclear energy; Renewable energy: hydroelectric power, solar energy and photovoltaic, wind energy, tidal energy, geothermal energy, biomass fuel, hydrogen energy, and fuel cell; Energy storage and battery; and Future Technologies.

**Prerequisites:** Consent by department

**Textbook:** No required textbook,

Websites referred to, and the Publications of World Energy Council

**References:** Efstathios E. Michaelides, Alternative Energy Sources, Springer-Verlag, 2012, ISBN 973-3-642-20950-5.

John Twidell and Tony weir, Renewable Energy Sources, 2nd edition Taylor & Francis, 2006.

Tushar K. Ghosh and Mark A. Prelas, Energy Resources and Systems, Vol. 1: Fundamentals and Non-Renewable Resources, Springer-Verlag, 2009.

Tushar K. Ghosh and Mark A. Prelas, Energy Resources and Systems, Vol. 2: Renewable Resources, Springer-Verlag, 2011.

Gerard M. Crawley, Ed., Fossil Fuels, World Scientific, 2016.

Gerard M. Crawley, Ed., The World Scientific Handbook of Energy, Vol. 3, World Scientific, 2013.

Umesh C. Sharma, Non-Conventional Sources of Energy, Studium Press, Houston, 2014.

J. W. Tester et al., Sustainable Energy: Choosing Among options, MIT Press, 2005.

Aldo Vieira da Rosa, Fundamentals of Renewable Energy Processes, Elsevier, 2009.

Paul Kruger, Alternative Energy Resources: The Quest for Sustainable Energy, John Wiley, 2006.

Christian Ngo and Joseph B. Natowitz, Our Energy Future: Resources, Alternatives and the Environment, 2nd Edition, John Wiley, 2016.

V. V. N. Kishore, Renewable Energy Engineering and Technology: Principles and Practice, Fundamentals of Renewable Energy Processes, Earthscan, 2009.

Topics to Be Covered:

1. Energy: Basics
2. Energy Sources
3. Fossil Fuels: Coal
4. Petroleum
5. Natural Gas
6. Nuclear Energy
7. Solar Energy
8. Wind Energy
9. Hydropower
10. Challenges to Alternative Energy
11. Geothermal Energy
12. Ocean energy
13. Biomass and Biofuels
14. Energy from the Waste
15. Energy Storage and Secondary Resources
16. Hydrogen as a Fuel
17. Future Resources

* Methane Hydrate
* Fusion Energy
* Helium 3: Energy from the Moon
* Space Solar Power
* Radiant Energy

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| **Evaluation** |  |

***Undergraduates***

Home Works: 20%

Attendance and Class Participation: 10%

Midterm Examination: 30%

Final Examination: 40%

## Home Work:

## There may be 5-6 home works/assignments for this course, each consisting of 2-4 essay-type problems. Each question may require write up of about 1,000 words in your own words. The answers should contain facts, major (highly prioritized) issues/aspects/points, analysis, and diagrams/charts as needed to support your viewpoints/answers.

## Course policy

* + Attendance is mandatory for this course. In the case of absence due to unavoidable reasons, substantial documented evidences must be provided. 5% of the credit will be deducted for each absence.
  + Power point slides for each class will be posted on Canvas a few days before the lecture. You are advised to go through those slides in advance. This would help in following the lectures and Q&A.
  + Several assignments will be given. In preparing your answers/write-ups you are encouraged to consult reference materials and browse internet. Also, you can borrow diagrams/charts /tables in support of your answers. The typed answers should be submitted on-line by the due dates.
  + All assignments and reports for the project must be submitted at the beginning of the lecture on prescribed deadlines or earlier, else there may be late penalty of 20%. Under no circumstances late assignment will be accepted three days after the deadline and score for such assignments will be zero.
* All tests will cover materials presented through the slides, discussed during the lectures, and contained in the reading/homework assignments.
* Makeup tests will not be given unless substantial documented evidence is provided for a reasonable excuse of absence. In the absence of the documented evidence the score for the test will be zero.
* The course writing assignments and tests are individual work by a student. A student is expected to work on her/his own and write the report/test using own words and figures/charts with proper references.
* Any questions regarding the test grades should be clarified within a week of returning the test. If not, it will be considered that the you have accepted the grade and the corresponding grades will be considered definite.
* No student shall be compelled to attend a class or sit for a test on a day or time prohibited by his or her religious belief. However, the student must inform the instructor well in advance.
* Dishonesty in this class will be handled as per the University of North Texas policy (<http://www.unt.edu/csrr>).
* Student Perceptions of Teaching (SPOT) Completion: The students should complete the SPOT, which is a short survey. The SPOT is a requirement for all organized classes at UNT. SPOT will be made available to students at the end of the semester to provide them a chance to comment on how this class is taught. The instructor is very much interested in constructive feedbacks from the students to continually improve his teaching of this course.
* If a student needs any special accommodations according to the American Disability Act, he or she should let the instructor know in advance.

## Disability Accommodation:

The University of North Texas complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. The University of North Texas provides academic adjustments and auxiliary aids to individuals with disabilities, as defined under the law. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please see the instructor and/or contact the Office of Disability Accommodation at 940-565-4323 during the first week of class.