The University of Texas at TYLER
COLLEGE OF ENGINEERING

Department of Mechanical Engineering
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MENG 4350 – Introduction to Renewable Energy Systems
Course Syllabus

Semester / Year	Fall 2021
Catalog Description	The course will introduce renewable energy technologies with an emphasis on solar and wind energy potential and application to power generation. Topics include solar and wind energy principles, solar and wind site assessment, solar panel and wind turbine components, power generation machinery, control systems, connection to the electric grid, and maintenance.
Prerequisites	MENG 3401 Thermodynamics
Section Number(s)	001,030,040 & 041
Instructor	Dr. S Maloney
Contact info	smaloney@uttyler.edu
Class Type / Location	f2f + zoom
Class Times	Tue/Thur 5:30PM-6:50PM
Office Hours	Mon/Tue 7:30AM to 09:00AM
Credits	3 credit hours with 3 hours of lecture per week
Textbooks and Reference Materials	No textbook is required as lectures will reference material from a range of text and provide a full complement of lecture notes. 1. J. F. Maxwell, J. G. McGowan, and A. L. Rogers, Wind Energy Explained – Theory, Design, and Applications, John Wiley & Sons, 2010, ISBN: 978-0-470-01500-1. 2. M. Boxwell, The Solar Electricity Handbook – 2021 Edition: A simple, practical guide to solar energy – designing and installing solar photovoltaic systems, Greenstream Publishing
Optional References	1. Kanoglu, et.al. Fundamentals and Applications of Renewable Energy 1st Edition, McGraw Hill Education, 2019 2. Boyle, Godfrey. Renewable Energy: Power for a Sustainable Future, Fourth Edition. Oxford University Press, 2018. 3. Tester, et al. Sustainable Energy, Choosing Among Options, 2nd Edition. MIT Press, 2012. 4. Usher, Bruce. Renewable Energy: A Primer for the Twenty-First Century, Columbia University Press, 2019
Additional requirements	N/A

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Instruction / Evaluation Method/	**Assignments** This course will rely on a variety of methods to assess and evaluate student learning, including: **Course Projects:** Students will be divided into project groups and will be required to work together on a solar project and a wind project using the tools presented in the lectures. **Quizzes:** Each section will have an associated quiz that is due upon the completion of the lesson. **Essay:** Students will be required to write a 1000-word essay on selected renewable energy topics.
Homework	Practice questions shall be assigned and graded
Grading Policy / Scale	Grading in this course will be based on the following: - Group Projects: 60% (2 x 30%) - Essay 20% - Quizzes: 20% (2 x 10%) Scale: A = > 90, B = > 80, C = > 70, D = > 60, F < 60. Grade appeal: grades can be appealed by meeting the instructor during office hours, but no later than a week after the grade has been given.
Important events/dates	Labor Day: September 6, 2021, Holiday Thanksgiving Break: November 22-27, 2021 Holiday Essay Submission: November 4, 2021 Final Project Report Submission: November 18, 2021 Final Project Presentations: December 2, 2021
Attendance / Makeup policy	Attendance at every meeting is strongly encouraged but not mandatory. There will be no makeup for missed in-class work. An opportunity to make up a missed exam/assignment may be available to students with an excused absence. Be advised that makeup exams/assignments maybe more challenging. Excused absences include absences for University-sponsored events and for religious observances (see the University policy link above for the procedures to follow). Other makeups are granted only in extreme cases and at the discretion of the instructor. Excused absence due to illness will require evidence of treatment by medical personnel or at a medical facility.
Course Learning Objectives / ABET & PEOs relation	By the end of this course students will be able to: 1. Identify solar and wind energy system components 2. Calculate the available solar and wind power in a particular location 3. Select and size solar and wind systems for energy applications 4. Perform economic analysis of solar and wind energy projects

Lesson Plan

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Lesson 1	Orientation/Syllabus Review
Lesson 2	The Energy Landscape
Lesson 3	Overview of Renewable Energy Technologies
Lesson 4	Principles of Solar Radiation **(Form Project Teams & Essay Distribution)**
Lesson 5	Solar Thermal and Solar Electric Photovoltaics (PV) & Applications
Lesson 6	PV System Components, Design, Selection & Sizing
Lesson 7	Solar Energy System Engineering Economics Basics
Lesson 8	Solar Farm Feasibility Studies Basics
Lesson 9	Origin and Power in the Wind and Historical Perspectives on Wind Turbines
Lesson 10	Wind Energy System Components, Turbine Design & Control
Lesson 11	Electrical Aspects of Wind Turbines
Lesson 12	Wind Energy System Selection & Sizing
Lesson 13	Wind Energy System Engineering Economics Basics
Lesson 14	Wind Farm Feasibility Studies Basics

Assignment	Date
Essay	Month End September
Solar Project & Quiz 1	Submit Month End October
Wind Project & Quiz 2	Submit Month End November

University, College, and Department Policies:

1. **Modifications**

The instructor reserves the right to change this syllabus partially or fully at any point in time. Sufficient time and notice will be provided to the class before the activation of the changes.

2. **UT Tyler Honor Code**

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

3. **Student Standards of Academic Conduct**

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, or material which has been submitted within a different course without explicit approval of the instructor, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

i. "Cheating" includes, but is not limited to:

- copying from another student's test paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;
- possession during a test of materials, or devices and instruments allowing access to materials, which are not authorized by the person giving the test, such as class notes or specifically designed

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"crib notes" as well as cell phones, to name a few. The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;

- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
- collaborating with or seeking aid from another student or person during a test or other assignment without explicit authorization;
- discussing the contents of an examination with another student who will take the examination;
- divulging the contents of an examination, for the purpose of preserving questions for use by another, or removing material from the exam location, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
- substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
- paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
- falsifying research data, laboratory reports, and/or other academic work offered for credit;
- taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
- misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

ii. "Plagiarism" includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the submission of it as one's own academic work offered for credit.

iii. "Collusion" includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

iv. All written work that is submitted will be subject to review by plagiarism software.

v. Penalty for any related infractions will be decided at the discretion of the instructor including, but not limited to, granting of a failing grade in part or the course or in the entire course.

4. Students Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: http://www.uttyler.edu/wellness/rightsresponsibilities.php

5. Important Covid-19 Information for Classrooms and Laboratories

Students are expected to wear face masks covering their nose and mouth in public settings (including classrooms and laboratories). The UT Tyler community of Patriots views adoption of these practices consistent with its Honor Code (Links to an external site.) and a sign of good citizenship and respectful care of fellow classmates, faculty, and staff.

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Students who are feeling ill or experiencing symptoms such as sneezing, coughing, digestive issues (e.g. nausea, diarrhea), or a higher than normal temperature should stay at home and are encouraged to use the UT Tyler COVID-19 Information and Procedures (Links to an external site.)website to review protocols, check symptoms, and report possible exposure. Students needing additional accommodations may contact the Office of Student Accessibility and Resources at University Center 3150, or call (903) 566-7079 or email saroffice@uttyler.edu.

6. Recording of Class Sessions

Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.

7. Campus Carry

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at http://www.uttyler.edu/about/campus-carry/index.php

8. UT Tyler a Tobacco-Free University

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors.
Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless
tobacco, snuff, chewing tobacco, and all other tobacco products.
There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support.
For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

9. Grade Replacement/Forgiveness and Census Date Policies

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at http://www.uttyler.edu/registrar. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.
Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.
The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

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- Submitting Grade Replacement Contracts, Transient Forms , requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

10. State-Mandated Course Drop Policy

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date). Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

11. Disability/Accessibility Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit https://hood.accessiblelearning.com/UTTyler and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at http://www.uttyler.edu/disabilityservices, the SAR office located in the University Center, # 3150 or call 903.566.7079.

The University of Texas at Tyler has a continuing commitment to providing reasonable accommodations for students with documented disabilities. Like so many things this Fall, the need for accommodations and the process for arranging them may be altered by the COVID-19 changes we are experiencing and the safety protocols currently in place. Students with disabilities who may need accommodation(s) in order to fully participate in this class are urged to contact the Student Accessibility and Resources Office (SAR) as soon as possible, to explore what arrangements need to be made to ensure access. During the Fall 2020 semester, SAR will be conducting all appointments via ZOOM. If you have a disability, you are encouraged to visit https://hood.accessiblelearning.com/UTTyler and fill out the New Student Application. For more information, please visit the SAR webpage at http://www.uttyler.edu/disabilityservices or call 903.566.7079.

Student Absence due to Religious Observance

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

12. Student Absence for University-Sponsored Events and Activities

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If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

13. Social Security and FERPA Statement

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

14. Emergency Exits and Evacuation

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

15. UT Tyler Resources for Students

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254)