



**MENG 4349 – Introduction to Renewable Energy Systems**  
**Course Syllabus**

<b>Semester / Year</b>	Fall 2023
<b>Catalog Description</b>	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.
<b>Prerequisites</b>	MENG 3401 Thermodynamics
<b>Section Number</b>	030 & 040
<b>Instructor Name</b>	Dr. M. A. Rafe Biswas
<b>Contact Information</b>	Email: <a href="mailto:mbiswas@uttyler.edu">mbiswas@uttyler.edu</a> , Zoom ID & Phone: 903 566 6115 , Office: HEC A214
<b>Class Type / Instruction Mode / Location</b>	Face-to-Face Lecture HEC B210/ Zoom Lecture TBD
<b>Class Time</b>	T/Th 2 – 3:30PM
<b>Office Hours</b>	MW: 2:30 PM – 4:00 PM, or By appointment
<b>No. of Credits</b>	3
<b>Required Textbook</b>	Demirel, Yaşar. Energy : Production, Conversion, Storage, Conservation, and Coupling, Praxis, 2012. (ProQuest Ebook Central, <a href="https://ebookcentral.proquest.com/lib/uttyler/detail.action?docID=883989">https://ebookcentral.proquest.com/lib/uttyler/detail.action?docID=883989</a> )
<b>Optional References</b>	Recommended textbooks (some available via library using patriots account) – Kanoglu, et.al. Fundamentals and Applications of Renewable Energy 1st Edition, McGraw Hill Education, 2019 Rauf, S. Bobby. (2011). Finance and Accounting for Energy Engineers. Fairmont Press, Inc. Retrieved from - <a href="https://ebookcentral.proquest.com/lib/uttyler/reader.action?docID=3239056&amp;ppg=1">https://ebookcentral.proquest.com/lib/uttyler/reader.action?docID=3239056&amp;ppg=1</a> Physics of Energy Conversion by Katharina Krischer, Konrad Schönleber, and Konrad Schönleber, De Gruyter, Inc., 2015. ( <a href="https://ebookcentral.proquest.com/lib/uttyler/reader.action?docID=1867270">https://ebookcentral.proquest.com/lib/uttyler/reader.action?docID=1867270</a> ) Fuel Cell Fundamentals by Suk-Won Cha, Whitney Colella, Fritz B. Prinz, and Ryan O'Hayre, John Wiley & Sons, Incorporated, 2016. ( <a href="https://ebookcentral.proquest.com/lib/uttyler/reader.action?docID=4505263&amp;ppg=1">https://ebookcentral.proquest.com/lib/uttyler/reader.action?docID=4505263&amp;ppg=1</a> ) Additional Material on Canvas: Websites, Class Handouts, Tutorials on MATLAB and Simulink by Mathworks, Inc.
<b>Additional Rules and Requirements</b>	MATLAB, Simulink & Simscape by MathWorks, Inc. (available through virtual desktop – one.uttyler.edu and IT support)



	The use of cellular phones during the lectures is prohibited. If a student uses the cellular phone (call, text, internet), he/she will be asked to leave the classroom and penalties of missing the class will apply. It is highly recommended to keep your cellular phone off.
<b>Evaluation Method</b>	<b>Project</b> <b>50%</b> <b>Exam, Assignments, &amp; Class Participation and Conduct</b> <b>50%</b>
<b>Grading Policy / Scale</b>	Letter grades, scale: A: 90 – 100; B: 80 – 89; C: 70 – 79; D: 60 – 69; F: < 60
<b>Important Events / Dates</b>	Census date: September 1 Last date to withdraw from one or more 15-week courses: October 30 Final Project Report: Finals week (week of December 3)
<b>Attendance / Makeup policy / other rules</b>	Attendance is expected per university policy. Attendance of lectures may be regularly checked using Canvas.  Make-up exams or assignments if approved will be administered during finals week.  No email submission of assignment(s). All assignments MUST be submitted to Canvas for grading.  Student with SAR status should contact the UT Tyler Office of Student Accessibility and Resources for exam arrangements.  Any minor violation of the Student Behavior by a student will result in a full letter grade reduction for each incident and any single major violation such as cheating and plagiarism by a student will result in automatic failing grading in the course.  Late submissions of assignments, lab reports (e.g., if due at 11:59:00 pm, then any time after such as 11:59:30 pm is late) will result in 10 % deduction per day from the graded score until down to 10% remaining. Late or no submission for any exam results in automatic grade of zero.  Questions involving knowledge covered in class will be answered if the student proves that they have tried to come up with the answer. Solution to homework and quizzes will not be given. However, students can work on the right solution by checking their work with the instructor.  Grade appeal: grades can be appealed by sending a Canvas message in written or typed format and then meeting the instructor during office hours, but no later than a week after the grade has been posted. Moreover, students may appeal any grade reduction to the instructor if valid excuse with documentation is provided.  Note: your final semester grade is based on the 10-point scale. No curving or scaling will be applied even if you receive borderline grade such as 79.99.
<b>Course Learning Objectives /</b>	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



<b>ABET &amp; PEOs Relation</b>	3. Select and size solar and wind systems for energy applications 4. Perform economic analysis of solar and wind energy projects
<b>Tentative Topics / Course Plans</b>	<ul style="list-style-type: none"><li>• Energy Types</li><li>• Modeling and analysis of energy systems</li><li>• Selected Renewable &amp; Alternative Energy topics</li><li>• Wind energy</li><li>• Fuel cell</li><li>• Solar Thermal</li><li>• Solar Electric Photovoltaics (PV)</li><li>• Self-directed project</li></ul>
<b>University Policies</b>	<a href="https://www.uttyler.edu/academic-affairs/files/syllabus_information_2021.pdf">https://www.uttyler.edu/academic-affairs/files/syllabus_information_2021.pdf</a>