

MENG/MSEL 5307 – Introduction to Renewable Energy Systems
Course Syllabus

Semester / Year	Fall 2026 (1 st 7-week)
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	050-, 051 & RP01
Instructor Name	Dr. M. A. Rafe Biswas
Contact Information	Email: mbiswas@uttyler.edu Zoom ID: 903 566 6115
Class Type / Instruction Mode / Location	RP01: Online Delivery 050 & 051: Room TBA
Class Time	RP01: Online Delivery 050 & 051: TBA
Office Hours	T 10 am to 12:30 pm, W 12:15 to 1 pm, or By appointment (all available via Zoom)
No. of Credits	3
Required Textbook	Hankins, Mark. <i>Stand-Alone Solar Electric Systems : The Earthscan Expert Handbook for Planning, Design and Installation</i> , Taylor & Francis Group, 2010. <i>ProQuest Ebook Central</i> , https://ebookcentral.proquest.com/lib/uttyler/detail.action?docID=585493 Jha, A. R.. <i>Wind Turbine Technology</i> , Taylor & Francis Group, 2010. <i>ProQuest Ebook Central</i> , https://ebookcentral.proquest.com/lib/uttyler/detail.action?docID=565933
Optional References	Recommended textbooks (some available via library using patriots account) – Demirel, Yaşar. <i>Energy : Production, Conversion, Storage, Conservation, and Coupling</i> , Praxis, 2012. (ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/uttyler/detail.action?docID=883989) Rauf, S. Bobby. (2011). <i>Finance and Accounting for Energy Engineers</i> . Fairmont Press, Inc. Retrieved from - https://ebookcentral.proquest.com/lib/uttyler/reader.action?docID=3239056&ppg=1 Additional Material on Canvas: Websites, Class Handouts, Tutorials on MATLAB and Simulink by Mathworks, Inc.
Additional Rules and Requirements	MATLAB, Simulink & Simscape by MathWorks, Inc. (available through virtual desktop – one.uttyler.edu and IT support) I encourage you to explore using artificial intelligence (AI) tools, such as Copilot and ChatGPT, for all assignments and assessments. Any such use must be appropriately acknowledged and cited, following the guidelines established by the IEEE Style Guide, including the specific version of the tool used. The

	submitted work should include the exact prompt you used to generate the content and the AI's complete response as an appendix. Because AI-generate content is not necessarily accurate or appropriate, you must assess the validity and applicability of any submitted AI output. You will not earn full credit if inaccurate, invalid, or inappropriate information is found in your work. http://journals.ieeeauthorcenter.ieee.org/wp-content/uploads/sites/7/IEEE_Reference_Guide.pdf								
Evaluation Method	<table> <tr> <td>Projects</td><td>30%</td></tr> <tr> <td>Quiz</td><td>30%</td></tr> <tr> <td>Assignments</td><td>30%</td></tr> <tr> <td>Discussion Board & Class Participation and Conduct</td><td>10%</td></tr> </table>	Projects	30%	Quiz	30%	Assignments	30%	Discussion Board & Class Participation and Conduct	10%
Projects	30%								
Quiz	30%								
Assignments	30%								
Discussion Board & Class Participation and Conduct	10%								
Grading Policy / Scale	Letter grades, scale: A: 90 – 100; B: 80 – 89; C: 70 – 79; D: 60 – 69; F: < 60								
Important Events / Dates	Census date: August 28 Last date to one or more courses for First 7-Week Session: September 25 Final Project Report due by October 6 https://www.uttlyer.edu/academics/academic-calendar-26-27/								
Attendance / Makeup policy / other rules	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, 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.
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 5. Demonstrate comprehensive knowledge in a research area relevant to Renewable Energy systems with a product ready for dissemination
Tentative Topics / Course Plans	• Energy Types • Analysis of energy systems • Selected Renewable & Alternative Energy topics • Wind energy • Hydrogen energy technology • Solar Thermal • Solar Electric Photovoltaics (PV) • Energy Economics • Self-directed project
University Policies	https://www.uttlyer.edu/offices/academic-affairs/faculty-resources/syllabus-information/



Course Schedule for 7 week session - <https://www.utt Tyler.edu/academics/academic-calendar.php>

		Major Assignments due
Week of	Lecture Topic/Class Activity	
1	Energy Landscape	
2	Overview of Renewable Energy Technologies	<i>Module 2 Quiz</i>
3	Selected Application of Renewable Energy Technologies	<i>Module 3 Quiz Set</i>
4	Wind Energy	<i>Module 4 Quiz</i>
5	Solar PV energy	<i>Module 5 Quiz/ Wind Energy Project</i>
6	Solar Thermal Energy	Solar Power Project
7	Energy Economics & Project	Final Project Report