MENG 4399 – Independent Study
Course Syllabus

Semester / Year	Fall 2024
Catalog Description	Independent study course in specific areas of Mechanical Engineering constituting a course instructed by a faculty member. May be applied toward an undergraduate degree in mechanical engineering. This course requires a detailed syllabus that is similar to existing courses in Mechanical Engineering to be approved by the Instructor and the Department Chairperson.
Prerequisites	Consent of the instructor and the department chair.
Section Number	030
Instructor Name	Dr. Mohammad A. Rafe Biswas
Contact Information	Office: HEC A214 or via Zoom (details posted on Canvas) E-mail: mbiswas@uttyler.edu Zoom ID: (903) 566-6115
Class Type / Instruction Mode / Location	One (minimum) synchronous meeting per week is required with the instructor in B222 or via Zoom
Class Time	T 2:30 to 3:30 pm
Office Hours	TTh 10:50 to 12, W 11:05 to 12:10, or By appointment
No. of Credits	3
Required Textbook	None
Optional References	Relevant literature through the university library website along with online material including software tutorial and report writing guide
Additional Rules and Requirements	Run simulations using available software 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 https://www.uttyler.edu/offices/academic-affairs/files/syllabus-information.pdf

Evaluation Method	**Attendance and weekly assignments**	**25 %**
	Midterm project report	**25 %**
	Final project report	**50 %**
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: September 9 Last date to withdraw from one or more 15-week courses: November 4 Midterm project report due October 12 Final Project Report: Finals week (week of December 9)	
Attendance / Makeup policy / other rules	Attendance and participation to lectures are expected per university's Class Attendance policy. Any violation of the Student Behavior (see below) will result in 1% or more grade reduction for each incident. Students may appeal the grade reduction to the instructor if valid excuse or reason can be given. Make-up assignments if approved will be administered during finals week.	
Course Learning Objectives / ABET & PEOs Relation	By the end of this course, students will be able to: 1. Define basic principles and state definitions related to the course material. 2. Apply math and science concepts in engineering applications. 3. Apply programming and analysis techniques in solving engineering problems with realistic constraints. 4. Communicating technical content and results at different levels and to different audiences. 5. Conduct a project demonstrating the application of learned material.	
Tentative Topics / Course Plans	- Develop and test MATLAB & Simulink® and/or another software model/interface with DAQ system to continuously run experiments of thermal fluid energy system like heat exchanger systems and evaluate the experimental data of a physical system. - Produce organized documentation including experimental manuals for relevant laboratory courses to operate the physical system and the software interface as well as a discussion on comparison of different software interfaces - Test and evaluate course content and assignments on programming with software such as MATLAB, LabVIEW and Python	
University Policies	https://www.uttyler.edu/offices/academic-affairs/files/syllabus-information.pdf	

Tentative Course Schedule

Week of		Chapter /Class Activity	Major Assignments due
Aug	26	Review Syllabus	
			Welcome and Intro
Sep	2	Literature Review of thermal fluid energy system	
	9	Literature Review of thermal fluid energy system	
	16	Analyze the DAQ and solar charging systems	Scope Report
	23	Analyze the DAQ and solar charging systems	
	30	Assess physical system of the DAQ and solar charging systems	
Oct	7	Assess physical system of the DAQ and solar charging systems	
	14	Assess physical system of the DAQ and solar charging systems	
	21	Design and Develop optimal system and material	Progress Report
	28	Design and Develop optimal system and material	
Nov	4	Design and Develop optimal system and material	
	11	Test and evaluate physical system experimentally	
	18	Test and evaluate physical system experimentally	
	25	Thanksgiving Week - No Classes	
Dec	2	Test and evaluate physical system experimentally	
	9	Finals week (No classes)	Final Project Report Due

Evaluation activities

- ➢ <u>Assignments Weekly</u> progress assignments to submit in Canvas. This includes submission of scope and literature review for the project.
- ➢ <u>Reports:</u> Each student is assigned a project to design/develop/analyze/test a system and course material and provide conclusions and recommendations through submission of reports by the end of the semester. The report should be of high quality paper to publish at a conference or in a journal. The report grades count to the final project grade.

Note: Instructions on the written and oral report format/style, grading rubric and peer evaluation forms will be given separately on Canvas. Late submissions of assignments will result in 10% deduction per day (or 24 hours) from the graded score. All late assignments must be submitted on Canvas by last class day of the semester.

Your experience in this class is important to me. If you have already established accommodations with Student Accessibility Services, please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course. If you have not yet established services through SAS, but have a temporary health condition or permanent disability that requires accommodations (conditions include but are not limited to: mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to please visit the SAR webpage at http://www.uttyler.edu/disabilityservices or call 903.566.7079. SAR offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s), and SAR. It is important to University of Texas at Tyler to create inclusive and accessible learning environments consistent with federal and state law.

NOTE: The syllabus is subject to change during the course of semester as deemed necessary.