

MENG 4342 – Energy Management
Course Syllabus

Semester / Year	Spring 2023
Catalog Description	<i>An introduction to concepts and tools related to energy management program, energy audit, energy accounting, economic analysis, and energy conservation measures for systems that use energy. The course focuses on energy use in buildings.</i>
Prerequisites	MENG 3401 and MENG 3310
Section Number	MENG 4342.001, MENG 4342.040
Instructor Name	Dr. Nelson Fumo
Contact Information	nfumo@uttyler.edu
Class Type / Instruction Mode / Location	Tyler: Lecture/Face-to-Face/RBN 3038 HEC: Lecture/Zoom Synchronous/A218
Class Time	MENG 3211.001 and MENG4342.040: Tu and Th 3:30PM - 4:50PM
Office Hours	Mo 11:00AM - 12:00PM, Tu/Tr 2:00PM - 3:00PM
No. of Credits	3
Required Textbook	None
Optional References	The instructor will provide documents and references, but students are encouraged to look for useful material on the topics covered.
Additional Rules and Requirements	The exams are face-to-face in the classroom (Tyler RBN 3038 and HEC A218).
Evaluation Method	Homework 20% Exam 1 10% Exam 2 15% Exam 3 25% Final exam 30%
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: January 23 Last date to withdraw from one or more 15-week courses: March 23 Final date: April 29 UT Tyler College of Engineering Career Fair: Tuesday, February 21.
Attendance / Makeup policy / other rules	<ol style="list-style-type: none"> Attendance is not mandatory but strongly recommended since no questions about missing class will be answered and no makeup for exams will be given. Late work will not be accepted without a serious and compelling reason and instructor approval (contact the instructor as soon as the assignment has been given). If a late assignment is accepted, late submission penalty will be applied at the sole discretion of the instructor (as a reference 20% may be taking for each day of delay). Questions will be answered if the student proves that he/she has tried to come up with the solution/answer. If an online exam is planned due to special circumstances, such as weather or COVID restrictions, the function LockDown Browser will



	<p>be used/required, and not partial credit will be offered. That means that CANVAS will grade every question as correct or incorrect.</p> <p>What is LockDown Browser: it is a custom browser that locks down the testing environment in Canvas. When students use LockDown Browser to access a quiz, they are unable to print, copy, visit other websites, access other applications, or close a quiz until it is submitted for grading.</p> <p>5. This is a face-to-face for Tyler students and a synchronous zoom (in a classroom) class for HEC students. However, due to the especial circumstances, students that contact the instructor before the lecture and justify the in-class absence with an appropriate document will be allowed to join the zoom meeting. If this procedure is not followed the instructor will remove the student from the zoom room. Keep in mind that this flexibility does not apply to exams.</p> <p>Meeting ID: 936 9422 4961 Passcode: EMS23</p>
<p>Course Learning Objectives / ABET & PEOs Relation</p>	<p>By the end of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Recognize the importance of the energy management. 2. Plan and conduct energy audits. 3. Analyze energy accounting data. 4. Develop economic analysis of energy management projects. 5. Identify and assess energy conservation measures for lighting systems, HVAC systems, and other systems that use energy.
<p>Tentative Topics / Course Plans</p>	<ul style="list-style-type: none"> · Module 1 – Energy Management Program This module is about what needs to be done to develop an Energy Management Program (energy team, energy policy, assess performance, set goals, create an action plan, evaluate progress, report and recognize achievements). · Module 2 – Energy Auditing This module covers the fundamentals of planning, conducting, and reporting results from energy audits as mean to assess performance and identification of energy conservation opportunities. · Module 3 – Energy Accounting This module will illustrate how energy usage data can be organized and plotted in order to be used as a key source of information for analysis of how the energy is being used in the facility as well as the results of implementation of projects to reduce energy use. · Module 4 – Economic Analysis



	<p>This module is a review of economic analysis of energy projects. The economic analysis is done to prioritize different projects for energy use reduction and cash flow structure.</p> <ul style="list-style-type: none">· Module 5 – Technology [Systems and equipment] The Technology (Systems and equipment) module covers approaches on how to evaluate energy consumption. The module focuses mainly in HAVC systems and illuminating systems since they are present in any facility. Cogeneration and renewable energy are also discussed as alternative energy for energy use and emission reduction.· Module 6 – Resources This is a module proposed to find out about additional tools, software, and other resources to support an energy management program and perform energy management activities. <p>See class schedule in next page</p>
University Policies	https://www.uttyler.edu/academic-affairs/files/syllabus_information_2021.pdf



Day	Date		Specific Class Activity
Tu	Jan 10		Lecture 1 - Fundamental Concepts
Th	12	Module 1	Lecture 2 - Energy Management
Tu	17		Lecture 3 - Energy management process
Th	19	Module 2	Lecture 4 - Energy Audits
Tu	24		Lecture 5 - Energy Audits - What to do
Th	26		Review of Assignments
Tu	31	Module 2	Lecture 6 - Energy Audits - EEM
Th	Feb 2		Lecture 7 - Energy Accounty - Fundamentals
Tu	7	Module 3	Lecture 8 - Energy Accounting - Data Analysis
Th	9		Lecture 9 - Energy Accounting - Weather Normalization
Tu	14		Exam 1
Th	16		Lecture 10 - Pay Back Period
Tu	21		Lecture 11 - Mathematics of Interest
Th	23	Module 4	Lecture 12 - Projects Assessment
Tu	28		Lecture 13 - Life-Cycle Cost Analysis
Th	Mar 2		Lecture 14 - Problems on Economic Analysis
Tu	7		Review for Exam 2
Th	9		Exam 2
Tu	14		Spring Break - No classes
Th	16		
Tu	21		Lecture 15 - Lighting Systems
Th	23		Lecture 16 - CHP-CCHP
Tu	28		Lecture 17 - Air Distribution
Th	30	Module 5	Lecture 18 - Hydronic Systems
Tu	Apr 4		Lecture 19 - Refrigeration Cycle
Th	6		Lecture 20 - HVAC - Problems 1
Tu	11		Lecture 21 - HVAC - Problems 2
Th	13		Exam 3
Tu	18	Module 6	Lecture 22 - Resources
Th	20		Review for Final Exam
Finals Calendar			Final Exam