MENG245 – Thermodynamics 1				
Eastern Mediterranean University **Faculty of Engineering**				
Department: Mechanical Engineering				
Program Code: 23	**Program:** Mechanical Engineering	**Year/Semester:** 2021-2022 SPRING		
Course Code: MENG245	**Course Title:** Thermodynamics 1	**Credit hours**		
		Lecture	**Tut/Lab**	**Total**
		3	**1**	**3**

Type of Course
- ☒ Engineering or Area Core
- ☐ Engineering Course offered by other programs
- ☐ Engineering or Area Elective
- ☐ Mathematics and Basic Sciences
- ☐ General Education

Hourly Contribution
- ☒ Basic Science (2)
- ☐ College-level Mathematics (-)
- ☐ Complex Engineering Problems (-)
- ☐ Engineering Design (-)
- ☒ Engineering Science (2)
- ☐ Team (-)

Criterion 5 Subject Area:
☒ (a) College-level mathematics and basic sciences with experimental experience appropriate to the program.
☒ (b) Engineering topics appropriate to the program, consisting of engineering and computer sciences and engineering design, and utilizing modern engineering tools.
☐ (c) a broad education component that complements the technical content of the curriculum and is consistent with the program educational objectives.
☐ (d) a culminating major engineering design experience that
　　☐ 1) Incorporates appropriate engineering standards and multiple constraints
　　☐ 2) Based on the knowledge and skills acquired in earlier course work.

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Course Web Page: https://staff.emu.edu.tr/uguratikol/en/Pages/MENG245---Thermodynamics-1.aspx

Textbook(s):
  Thermodynamics: An Engineering Approach, Çengel and Boles, McGraw-Hill, 9th Edition 2019.

Catalog Description: Basic concepts and definitions of thermodynamics. Properties of pure substances. The first law of thermodynamics for the closed and open systems. The second law of thermodynamics. Entropy. Second-Law analysis of engineering systems.

Prerequisite(s)	None

Student Outcomes		
1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	☒
2	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	☐
3	an ability to communicate effectively with a range of audiences	☐
4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	☐
5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	☐
6	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	☒
7	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	☐

Course Learning Outcomes	Student Outcomes							Assessment Percentages
	1	2	3	4	5	6	7	
1 Understand properties of real substances, such as steam and ideal gases	X							
Learn how to use tabular data and equations of state	X							Midterm Exam: 30%
3 Understand and use the process diagrams	X							Final Exam: 45%
4 Understand closed systems and control volumes	X							Quizes: 10%
5 Understand the first law and its basic applications	X							Experiments.: 15%
6 Understand the second law and its basic applications	X					X		
7 Understand entropy generation	X					X		
Weight of Student Outcomes	**H**					**M**		

Topics Covered and Class Schedule:	
Week 1	Fundamentals
Week 2	Pure substances
Week 3	Pure substances
Week 4	First law of thermodynamics: Closed systems
Week 5	First law of thermodynamics: Closed systems
Week 6	First law of thermodynamics: Open systems
Week 7	First law of thermodynamics: Open systems
Week 8 & 9	Midterm Examination
Week 10	Second law of thermodynamics
Week 11	Second law of thermodynamics
Week 12	Entropy
Week 13	Entropy
Week 14	Exergy
Week 15	**Final Examination**

Laboratory Work				
No.	**Experiment Title and Equipment Used**	**CLO**	**SO**	**Percentage**
1	**Title**: Absolute zero temperature experiment **Equipment:** Fast response temperature sensor and pressure connector	1	6	5%
2	**Title:** Heat engine experiment **Equipment:** Piston cylinder arrangement with a mass platform connected to the piston	6	6	5%
3	**Title:** Electric kettle boiling water experiment (home experiment) **Equipment:** The equipment is to be provided by the student	5	6	5%

Important Notes Regarding the Course: University rules and regulations are applied to this course.
For details, please see http://mevzuat.emu.edu.tr

Exam and Quiz Policy:
The midterm and final exams, and quizzes are CLOSED book.

Makeups:
1. There is no make-up or resit for the Quiz and Labs.
2. A student who fails to sit for an examination for a valid reason is given a make-up exam. Within three working days after the examination, students who wish to take a make-up must submit a **written statement** to the course instructor explaining the reason(s) for his/her request.
3. Eligibility to take a **Make-Up Exam**:
   a. Students can only take ONE make-up exam (either the mid-term or the final exam).
   b. Student must contact the Instructor immediately within "**three working days**" after the examination when (s)he has missed the mid-term exam or final exam and to discuss with the faculty about the date and time to take the make-up exam.
   c. Student must secure a "**Make-Up Exam Form**" from the department Office or from instructor website & fill-out the Form. For each Make-Up Exam, please use separate Form.
   d. Student must secure the approval from the instructor for taking the Make-Up Exam.
   e. Failure to take the Make-Up Exam at the agreed date and time will lead to a "NG" Grade for the Make-Up Exam, midterm or final.

NG Policy:

Students who do not attend any two of the above assessment activities (such as lab, mid-term exam, etc.) will be given NG (Nil Grade). Also Students attending less than 70% of the classes and/or labs will be given NG (Nil Grade). Students who obtain less than 50% in the labs will also obtain NG.

Appeals:
Any appeal against the marks of any assessment component must be made to the course instructor in writing within one week following the announcement of the marks. Any appeal concerning a semester grade must be made to the course instructor no later than the end of the registration period of the following semester.