MENG245 – Thermodynamics I

Department:
Mechanical Engineering

Program Name: Mechanical Engineering	**Program Code:** 23	
Course Code: MENG245	**Credits:** 3 CR	**Year/Semester:** 2017-2018 Fall

☒ Required Course ☐ Elective Course (click on and check the appropriate box)

Prerequisite(s):
N/A

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.

Course Web Page:

staff.emu.edu.tr/devrimaydin

Textbook(s):
Thermodynamics: An Engineering Approach, Çengel and Boles, McGraw-Hill, 8th Edition 2015

Indicative Basic Reading List :
(There are many books in the library)

Topics Covered and Class Schedule:
(4 hours of lectures per week)

Week 1	Introduction to Thermodynamics
Week 2	Properties of Pure Substances
Week 3-4	The First Law of Thermodynamics for Closed Systems
Week 5-6	The First Law of Thermodynamics for Open Systems
Week 7	**First Mid-Term Examination**
Weeks 8-9	Revision
Week 10-11	The Second Law of Thermodynamics
Week 12-13	**Second Mid-Term Examination**
Weeks 14	Entropy
Week 15:	**Final Examination**

Laboratory Schedule:
(2 hours of laboratory per week)

Week 4	Measuring The Absoloute Zero Temperature
Week 6	The Heat Engine
Week 9	Boiler Experiment

Course Learning Outcomes:

At the end of the course, student must be able to

1. Understand properties of real substances, such as steam and ideal gases
2. Learn how to use tabular data and equations of state
3. Understand and use the process diagrams.
4. Understand closed systems and control volumes.
5. Understand the first law and its basic applications.
6. Understand the second law and its basic applications.
7. Understand entropy generation.

	Method	**No of assignments**	**Percentage**
Assessment	Midterm Exam(s)	2	40%
	Lab Work(s)	3	10%
	Quizzes	4	10%
	Final Examination	1	40%

[1]**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).

[2]Assignments containing copied material from internet sources and other works will be treated as an act of plagiarism. This is a disciplinary matter and the assignment is evaluated as "0".

Contribution of Course to Criterion 5

Credit Hours for:
Mathematics & Basic Science : 3
Engineering Sciences and Design : 1
General Education : 0

Relationship of Course to Program Outcomes
The course has been designed to contribute to the following program outcomes:

(a) apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments as well as interpret data
(e) identify, formulate, and solve engineering problems
(i) A recognition of the need for, and an ability to engage in life-long learning
(k) use the techniques, skills, and modern engineering tools necessary for engineering practice

Prepared by: Asst. Prof. Dr. Devrim Aydın	**Date Prepared:** September 2017