T.C. ESKİŞEHİR OSMANGAZİ UNIVERSITY
ARCHITECTURE AND ENGINEERING FACULTY
MECHANICAL ENGINEERING DEPARTMENT

COURSE INFORMATION FORM

SEMESTER	Spring

COURSE CODE	151814237	**COURSE NAME**	Engineering Thermodynamics I

SEMESTER	WEEKLY COURSE PERIOD			COURSE OF			LANGUAGE
	Theory	**Practice**	**Laboratory**	**Credit**	**ECTS**	**TYPE**	**LANGUAGE**
4	3	0	0	3	5	COMPULSORY (X) ELECTIVE ( )	Turkish

COURSE CATAGORY			
Basic Science	**Basic Engineering**	**Mechanical Engineering Subjects [if it contains considerable design, mark with (√)]**	**Social Science**
		( )	

ASSESSMENT CRITERIA			
	Evaluation Type	**Quantity**	**%**
	Mid-Term	1	40
	Quiz		
MID-TERM	Homework		
	Project		
	Report		
	Others (………)		
FINAL EXAM		1	60
PREREQUIEITE(S)			
COURSE DESCRIPTION	Basic concepts of thermodynamics, Pure substance, the first law of thermodynamics for closed systems and control volumes, Carnot cycle and the second law of thermodynamics.		
COURSE OBJECTIVES	To give students detailed knowledge of basic thermodynamic principles and their applications, the importance of heat and work, heat engines, refrigeration systems, heat pump systems, cycles, power generation systems and major components used in these systems and their analyses, and give basic information about losses and efficiencies.		
ADDITIVE OF COURSE TO APPLY PROFESSIONAL EDUATION	The students will be capable to analyze energy conversion systems and thermal power plants, understand losses, calculate overall efficiencies, follow and understand the new developments in the power plant technology area, and put their skills in practice in the field of power plant technology.		
COURSE OUTCOMES	1.Capable to know the basic concepts of Thermodynamics. 2. Recognizes the phases of pure substances, phase-change processes and property diagrams for phase-change processes. 3. Manages the use of thermodynamic property tables. 4. Applies the first law of thermodynamics to closed systems and control volumes 5. Calculates the thermal efficiencies and coefficients of performance of heat engines, refrigerators and heat pumps		
TEXTBOOK	Yunus Ali Çengel and Michael A. Boles, " Thermodynamics: An Engineering Approach ", Seventh Edition, McGraw-Hill Book Company, 2011.		
OTHER REFERENCES	.		
TOOLS AND EQUIPMENTS REQUIRED			

	COURSE SYLLABUS	
WEEK	**TOPICS**	
1	Introduction to Engineering Thermodynamics – I. Basic Concepts of Thermodynamics.	
2	Pure substance, its phases, phase change processes, property diagrams	
3	Property tables, the ideal-gas equation of state, compressibility factor.	
4	Heat, work, the first law of Thermodynamics for closed systems.	
5	The internal energy, enthalpy, and specific heats of ideal gases	
6	The first law of Thermodynamics for control volumes , steady-flow engineering devices.	
7	Transient control volumes	
8	Mid-Term Examination	
9	Mid-Term Examination	
10	Reversible and irreversible processes, Carnot cycle	
11	The Carnot heat engine, the Carnot refrigerator and heat pump.	
12	The Carnot heat engine, the Carnot refrigerator and heat pump	
13	Second-law analysis of engineering systems.	
14	Second-law analysis of engineering systems.	
15,16	Final Exam	

NO	PROGRAM OUTCOMES	3	2	1
1	Sufficient knowledge of engineering subjects related with mathematics, science and Mechanical engineering; an ability to apply theoretical and practical knowledge on solving and modeling of Mechanical engineering problems.	X		
2	Ability to determine, define, formulate and solve complex Mechanical engineering problems; for that purpose an ability to select and use convenient analytical and experimental methods.		X	
3	Ability to design a complex system, a component and/or an engineering process under real life constrains or conditions, defined by environmental, economical and political problems; for that purpose an ability to apply modern design methods.			X
4	Ability to develop, select and use modern methods and tools required for Mechanical engineering applications; ability to effective use of information technologies.			X
5	In order to investigate Mechanical engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results.		X	
6	Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence.		X	
7	Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language.		X	
8	Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement.	X		
9	Understanding of professional and ethical issues and taking responsibility	X		
10	Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development.			**X**
11	Knowledge of actual problems and effects of engineering applications on health, environment and security in global and social scale; an awareness of juridical results of engineering solutions.			**X**
1:None. **2**:Partially contribution. **3**: Completely contribution.				

Prepared by: Prof. Dr. Haydar ARAS   **Date: 13/11/2017**

Signature(s):