

MM 203E Thermodynamics I				DEPARTMENT OF MECHANICAL ENGINEERING					
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project / Field Study	Homework	Other	Total	Credit	ECTS Credit
3	42	-	-	-	-	83	125	3	5.0
Language	English								
Compulsory / Elective	Compulsory								
Prerequisites	None								
Course Contents	System and its surroundings, properties of a substance, Thermodynamic equilibrium, ideal gas equation of state, energy. Transfer of energy between system and its surrounding, change state and thermodynamic process, reversible and irreversible processes, simple system, enthalpy, constant-volume and constant-pressure specific heats, pure substance thermodynamic surfaces. The first law of thermodynamics for a control volume, the second law of thermodynamics, entropy, numerical value of entropy. The second law of thermodynamics for a control volume, efficiency, Thermodynamical analysis of processes, the third law of thermodynamics.								
Course Objectives	To teach basic principles of classical thermodynamics. To train students to identify, formulate and solve engineering problems in thermodynamics. To teach the application of second law analysis methods for thermodynamic systems.								
Learning Outcomes and Competences	Gaining the ability to use thermodynamic terminology and concepts appropriately. Learning the methods to determine and calculate the appropriate energy and mass transfers to solve steady and transient system applications. Understanding of reversible and irreversible process. Learning the methods to apply the concepts of irreversibility, availability and efficiency to various systems.								
Textbook and /or Reference	1) R.E. Sonntag, C. Borgnakke, and G.J. Van Wylen, Fundamentals of Thermodynamics, 6 th Ed., John Wiley & Sons, 2003 2) M.J. Moran and H.N. Shapiro, Fundamentals of Engineering Thermodynamics, 5 th Edition, John Wiley & Sons, 2004. 3) Y.A. Çengel and M.A. Boles, Thermodynamics: An Engineering Approach, 4 th Edition, McGraw-Hill, 2002.								
Assessment Criteria						If any, mark as (x)		Percentage (%)	
	Midterm Exams					X		40	
	Quizzes					X		10	
	Homeworks					X		10	
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
Final Exam					X		40		
Instructors	Prof. Mecit SIVRIOGLU, Assoc.Prof. Atilla BIYIKOGLU, Assist.Prof. Oguz TURGUT								
Week	Subject								
1	Basic Concepts and Definitions								
2	Properties of Pure Substances								
3	Properties of Pure Substances								
4	Energy Transfer by Heat, Work, and Mass								
5	Energy Transfer by Heat, Work, and Mass								
6	The First Law of Thermodynamics								
7	The First Law of Thermodynamics								
8	The First Law of Thermodynamics								
9	The Second Law of Thermodynamics								
10	The Second Law of Thermodynamics								
11	Entropy								
12	Entropy								
13	Irreversibility and Availability								
14	Irreversibility and Availability								