

MM 438 Theory of Combustion				DEPARTMENT of MECHANICAL ENGINEERING					
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project /Field Study	Homework	Other	Total	Credit	ECTS Credit
8	42	0	-	20	13	-	75	3	3.0
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	MM 204 E								
Course Contents	A definition of combustion. Combustion modes and flame types. Combustion and thermo chemistry; thermodynamics laws, reactant and product mixtures, adiabatic flame temperatures, chemical equilibrium. Introduction to mass transfer; rudiments of mass transfer, some applications of mass transfer. Chemical kinetics; elementary reaction rates, rates of reaction for multistep mechanisms. Laminar premixed flames; physical description, analysis, factors influencing flame velocity and thickness, quenching, flammability, and ignition, flame stabilization. Laminar Diffusion Flames; unreacted constant-density laminar jet, physical description of jet flame, theoretical descriptions, counter flow flames.								
Course Objectives	To make it understand the importance of combustion. In the view of knowledge on combustion, to train engineers who are able to develop combustion technologies and systems with minimum cost while achieving the task of producing more reliable and less pollute combustion systems.								
Learning Outcomes and Competences	To achieve applications on combustion using the knowledge gained in Thermodynamics, Heat and Mass Transfer. To equip the student with a detailed knowledge about chemical reactions								
Textbook and /or Reference	“An Introduction to Combustion: Concepts and Applications,” Stephen R. Turns, McGraw-Hill, 2nd Press, 2000, 620 pp.								
Assessment Criteria						If any, mark as (x)		Percentage (%)	
	Midterm Exams					X		40	
	Quizzes					-		-	
	Homeworks					X		10	
	Projects					-		-	
	Term Paper					X		10	
	Laboratory Work					-		-	
	Other					-		-	
Final Exam					x		40		
Instructors	Assoc.Prof. Atila BIYIKOGLU								
Week	Subject								
1	Introduction; Combustion and thermo-chemistry								
2	Introduction; Combustion and thermo-chemistry								
3	Introduction to mass transfer								
4	Introduction to mass transfer								
5	Chemical kinetics								
6	Chemical kinetics								
7	Conservation equations for reacting flows								
8	Conservation equations for reacting flows								
9	Laminar premixed and diffusion flames								
10	Laminar premixed and diffusion flames								
11	Droplet evaporation and burning								
12	Introduction to turbulent flows								
13	Turbulent premixed and non-premixed flames								
14	Burning of solids								