

MM 416E Energy Engineering				DEPARTMENT of MECHANICAL ENGINEERING					
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project /Field Study	Homework	Other	Total	Credit	ECTS Credit
8	42	0	-	-	42	41	125	3	5.0
Language	English								
Compulsory / Elective	Compulsory								
Prerequisites	MM 204E								
Course Contents	Aims of energy engineering and fields of interest. Energy and energy economy. Economical and environmental analyses of energy conversion systems. Thermal power plants with steam, gas and steam-gas cycles. Cycle analysis, synthesis and optimisation of thermal power plant design. Fossil fuels, combustion and steam production systems. Nuclear fuels, nuclear reactions and nuclear power plants. Solar energy and applications. Building elements of thermal power plants and operational problems.								
Course Objectives	To teach importance of energy engineering. To teach energy and environmental issues. To introduce thermal power systems and energy conversion. To instruct the design of various thermal power plant types. To give an understanding of heat generation processes. To teach main components of thermal power plants.								
Learning Outcomes and Competences	Importance of energy engineering. Consciousness for energy and environmental issues. Understanding of energy and energy economy. Perception of thermal power and energy conversion systems. Ability for designing of various thermal power plant types. Knowledge on heat generation processes and main components of thermal power plants.								
Textbook and /or Reference	1. Power Plant Engineering, P.K. Nag, McGraw-Hill, 2008 2. M.M. El- Wakil, Powerplant Technology, McGraw-Hill, 1984. 3. E.S. Rubin, Introduction to Engineering and the Environment, McGraw-Hill, 2001. 4. L.R. Radovic, Energy and Fuels in Society, McGraw-Hill, 1992. 5. R.J. Heinsohn and R.L. Kabel, Sources and Control of Air Pollution, Prentice Hall, 1999.								
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. Senol BASKAYA, Assoc.Prof. Atilla BIYIKOGLU								
Week	Subject								
1	Introduction: Economics of Power Generation								
2	Analysis of Steam Cycles								
3	Combined Cycle Power Generation								
4	Combined Cycle Power Generation								
5	Fuels and Combustion								
6	Fuels and Combustion								
7	Combustion Mechanism, Equipment and Firing Methods								
8	Combustion Mechanism, Equipment and Firing Methods								
9	Nuclear Power Plants								
10	Hydroelectric Power Plant								
11	Energy Storage								
12	Nonconventional Power Generation: Direct Energy Conversion								
13	Nonconventional Power Generation: Direct Energy Conversion								
14	Renewable Energy								