

MM 548 Fundamentals and Applications of Fuel Cells				MECHANICAL ENGINEERING DEPARTMENT					
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project/Fiel d Study	Homework	Other	Total	Credit	ECTS credit
1,2	30	12				146	188	3	7.5
Language	Turkish								
Compulsory / Elective	Optional								
Prerequisites	-								
Course Contents	Introduction to fuel cells. Advantages, disadvantages, benefits and applications of fuel cells. Basic principles of fuel cells. Electro-chemical processes and generation of electricity. Types of fuel cells. Classification of fuel cells based on temperature and fuels used. Fuels used in fuel cells, their advantages and disadvantages, and properties. Structure and basic parts of fuel cells. Principles, structures and applications of fuel cells using hydrogen. Production, storage and usage of hydrogen in fuel cells.								
Course Objectives	To teach the fundamentals of fuel cells. Describe advantages and disadvantages of the fuel cells, describe structure and basic parts of the fuel cells, expalin types of the fuel cells and describe the splication areas of the fuel cells.								
Learning Outcomes and Competences	Understanding of the basic prncples and use of fuel cells.								
Textbook and /or Reference	Course notes								
Assessment Criteria					If any, mark as (X)		Percentage (%)		
	Midterm Exams				X		40		
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam				X		60		
Instructors	Prof. Beycan IBRAHIMOGLU								
Week	Subject								
1	Introduction: advantages, disadvantages, benefits and applications of fuel cells.								
2	Basic principles of fuel cells: electro-chemical processes and generation of electricity.								
3	Types of fuel cells: classification of fuel cells based on temperature and fuels used.								
4	Fuels used in fuel cells: advantages and disadvantages, and properties.								
5	Structure of fuel cells: basic components and their functions.								
6	Hydrogen based fuel cells: structure and main components.								
7	Hydrogen based fuel cells: basic principles.								
8	Midterm exam I								
9	Hydrogen based fuel cells: applications.								
10	Hydrogen production techniques								
11	Storage of hydrogen								
12	Application of hydrogen based fuel cells								
13	Midterm exam II								
14	Improment needed for wider application of fuel cells								