Course Title	**Materials for Energy and Environment**				
Course Code	**MME 458**				
Course Type	Technical Elective Course				
Level	Undergraduate				
Year / Semester	4th year / 7th or 8th Semester				
Teacher's Name	Ioannis Giapintzakis				
ECTS	7	Lectures / week	3+1 hours	Laboratories / week	0
Course Purpose and Objectives	The main objective of the course is to familiarize the students with materials and technologies for production, conversion, storage, transport and use of energy, as well as capturing and storing pollutants such as CO_2.				
Learning Outcomes	• Identify and discuss materials and technologies for energy production • Identify and discuss materials and technologies for energy storage • Identify and discuss materials and technologies for energy transport • Identify and discuss materials and technologies for energy conversion • Identify and discuss materials and technologies for CO2 capture and storage • Describe the operation mechanism of different types of solar cells, fuel cells and batteries • Identify material properties critical for designing such devices				
Prerequisites	MME 255	Required	None		
Course Content	The course addresses questions such as: How will we meet rising energy demands? What are our options? Are there viable long-term solutions for the future? In addition, the course introduces the students to the fundamental materials science at the heart of: Renewable energy sources, Nonrenewable energy sources, Future transportation systems, Energy efficiency, Energy storage and, CO_2 capture and storage.				
Teaching Methodology	• Lectures • Tutorials, homework problems • Presentations by students of group projects (on topics of materials and technologies related to the course), written report. • Communicative, Collaborative • During the first week of the semester, the course syllabus is given to students, which includes information on the course content, expected learning outcomes, assessment and office hours.				
Bibliography	• *Fundamentals of Materials for Energy and Environmental Sustainability*, edited by D. Ginley and D. Cahen. Materials Research Society & Cambridge University Press.				

Assessment	• Written report 25% • Project presentation 15% • Midterm Exam 20% • Final Exam 40%
Language	Greek