

Course Title	Materials Science and Engineering II				
Course Code	MME 255				
Course Type	Compulsory				
Level	Undergraduate				
Year / Semester	2 nd Year / 3 rd semester				
Teacher's Name	Theodora Krasia-Christoforou				
ECTS	5	Lectures / week	3+1 hours	Laboratories / week	0
Course Purpose and Objectives	The main objective is the understanding of the structure-physical properties relationship for the whole range of materials - metals, ceramics and polymers.				
Learning Outcomes	<ul style="list-style-type: none"> • Explain the differences in the electrical properties of metals, semiconductors and insulators • Explain electrical phenomena in semiconductor devices • Describe the basic mechanisms of heat absorption and conduction in solids • Explain the thermal expansion effect in solids • Explain the origin of magnetism in diamagnetic, paramagnetic, ferrimagnetic and ferromagnetic materials • Describe the particular magnetic characteristics of soft and hard magnetic materials • Explain the optical properties of conductive, semiconductor and non-conductive materials • Describe how to select materials for different technological applications 				
Prerequisites	MME 155	Required	None		
Course Content	This course is the second part of the series "Materials Science and Engineering". The first part of the course focuses on the thermal (heat capacity, thermal expansion, thermal conductivity), electrical (electrical conduction, semiconductivity, dielectric materials), magnetic (diamagnetism, paramagnetism, ferromagnetism, antiferromagnetism, soft and hard magnetic materials, storage) and optical properties of metals, ceramics and polymers. The last part of the course discusses both how to select materials for engineering applications and the economic, environmental and social issues related to the science and technology of materials.				

Teaching Methodology	<ul style="list-style-type: none"> • Lectures • Tutorials • Homework problems • Demonstrations (during lecture) • Presentations by students of group projects (on topics of materials and technologies related to the course) • 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	<ul style="list-style-type: none"> • Callister, W.D., <i>Materials Science and Engineering</i>, 5th Edition, (translated in Greek). Tziolas.
Assessment	<ul style="list-style-type: none"> • Homework exercises 10% • Group project 20% • Midterm Exam 30% • Final Exam 40%
Language	Greek