

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
INTRODUCTION to MATERIAL SCIENCE	EUT1124030	Fall Semester	2+0	2	2
<b>Prerequisites Courses</b>					
<b>Recommended Elective Courses</b>					
<b>Language of Instruction</b>	Turkish				
<b>Course Level</b>	First Cycle (Bachelor's Degree)				
<b>Course Type</b>	Elective				
<b>Course Coordinator</b>	Assist.Prof. Seher Oya AKMAN				
<b>Name of Lecturer(s)</b>	Lect. Basri GÜNDOĞDU				
<b>Assistant(s)</b>					
<b>Aim</b>	The course aims to introduce fundamentals of material science. The course also aims to inform students on how the properties affecting performance change with respect to the material structure and the processes carried out.				
<b>Course Content</b>	This course contains; The importance of material selection in design ,Chemical properties of materials (atomic structure and crystallography) ,Mechanical properties of metals (creep, relaxation, fracture and fatigue) Mechanical properties of metals (application) Phase diagrams ,Metals, Metal alloys, Fabrication and processing of metals, Thermal processing of metals, Ceramics, Ceramic structures and Mechanical properties, Types of ceramics and applications, Fabrication and processing of ceramics,Fabrication and processing of ceramics,Seminar: Glass Technology ,Polymers, Chemical properties of polymers, Mechanical behaviour of polymers, Synthesis of polymers,Composite materials, Particle-reinforced composites, Fibre-reinforced composites, Structural composites,Corrosion and degradation, Electrical conduction, thermal properties, magnetic properties and optical properties of materials ,Economic, environmental, and societal issues in material science and engineering,Economic, environmental, and societal issues in material science and engineering.				
<b>Course Learning Outcomes</b>			<b>Teaching Methods</b>	<b>Assessment Methods</b>	
1. Identifies material types and properties in engineering and design.			37, 9	A, E	
2. Develops different materials for design projects.			37, 9	A, E	
3. Analyzes standards, environmental protection laws, recycling criteria.			37, 9	A, E	
<b>Teaching Methods</b>	37: Computer-Internet Supported Instruction, 9: Lecture Method				
<b>Assessment Methods</b>	A: Traditional Written Exam, E: Homework				
<b>Lecture Schedule</b>					
Sequenc e	Topics	Preliminary Preparation			
1	The importance of material selection in design				
2	Chemical properties of materials (atomic structure and crystallography)				
3	Mechanical properties of metals (creep, relaxation, fracture and fatigue) Mechanical properties of metals (application) Phase diagrams				
4	Metals, Metal alloys, Fabrication and processing of metals, Thermal processing of metals				
5	Ceramics, Ceramic structures and Mechanical properties				
6	Types of ceramics and applications, Fabrication and processing of ceramics				
7	Fabrication and processing of ceramics				
8	Seminar: Glass Technology				
9	Polymers, Chemical properties of polymers, Mechanical behaviour of polymers, Synthesis of polymers				
10	Composite materials, Particle-reinforced composites, Fibre-reinforced composites, Structural composites				
11	Corrosion and degradation				
12	Electrical conduction, thermal properties, magnetic properties and optical properties of materials				
13	Economic, environmental, and societal issues in material science and engineering				
14	Economic, environmental, and societal issues in material science and engineering				
<b>Evaluation Methods</b>		<b>Weight(%)</b>			
Midterm Exam		50			
General Exam		50			

Resources
To be distributed by the lecturer.
1. Callister, W. and Rethwish, D. G. (2015). Materials Science and Engineering. (9th Edition) John Wiley and Sons (Asia). Kitabın bir kopyası (TA403/C355) koduyla Medipol Kavacak Kampüsü kütüphanesinde mevcuttur.
2. Callister, W. and Rethwish, D. G. (2013). (8. Baskı'dan çeviri) Malzeme Bilimi ve Mühendisliği (Çeviri Editörü: Kenan Genel. (9th Edition). Nobel Akademik Yayıncılık
3. Malzeme Bilgili Ders Notları İTÜ Makina Fakültesi-Prof. Dr. Ahmet Aran
4. www.materialconnexion.com