COURSE INFORMATION FORM

Course Name	Course Code
INTRODUCTION TO METALLURGICAL AND MATERIALS ENGINEERING	151911199

Semester	Number of Course Hours per Week		ECTS
	Theory	Practice	
1	2	0	2

Course Category (Credit)				
Basic Sciences	Engineering Sciences	Design	General Education	Social
√	√			

Course Language	Course Level	Course Type
Turkish	Undergraduate	Compulsory

Prerequisite(s) if any	-
Objectives of the Course	The aim is to introduce students to the historical development and current applications of Metallurgical and Materials Engineering, enable the students to understand the concepts and processes related to the field and to introduce their fields of study, and also to enable them to understand engineering responsibilities and ethical principles.
Short Course Content	Definition of Metallurgical and Materials Engineering, its importance, fields of study, development of materials throughout history, classification of materials (metallic materials, ceramic materials, polymers, composites), structure of materials (atomic and crystal structure, microstructure), properties of materials, processes applied to materials, production (metallic and non-metallic materials) and forming processes, characterization of materials, quality control, material selection in engineering applications, economic and environmental issues, advanced materials and application examples, ethics in engineering.

	Learning Outcomes of the Course	Contributed PO(s)	Teaching Methods *	Measuring Methods **
1	Defines Metallurgical and Materials Engineering, explains the importance, fields of study of and the development of materials throughout history.	1	1, 2, 5, 11	A, B, K
2	Classifies material types.	1	1, 2, 5, 11	A, B, K
3	Understands the structure and properties of materials. Explains the relationship between these concepts.	1	1, 2, 5, 11	A, B, K
4	Understands the production and shaping processes applied to materials. Gains knowledge about the effects of these processes on the structure and properties of materials.	1	1, 2, 5, 11, 13	A, B, K
5	Defines the characterization methods of materials. Understands the importance of quality control in production processes.	1	1, 2, 5, 11	A, B, K
6	Gains knowledge about the types and application areas of new generation and advanced materials.	1	1, 2, 5, 11, 13	A, B, K
7	Understands materials selection procedure for various applications.	1	1, 2, 5, 8, 11, 13	A, B, K
8	Expresses engineering responsibility and ethical principles.	9	1, 2, 5, 8	A, B, K

***Teaching Methods** **1:**Expression, **2:**Discussion, **3:**Experiment, **4:**Simulation, **5:**Question-Answer, **6:**Tutorial, **7:**Observation, **8:**Case Study, **9:**Technical Visit, **10:**Trouble/Problem Solving, **11:**Induvidual Work, **12:**Team/Group Work, **13:**Brain Storm, **14:**Project Design / Management, **15:**Report Preparation and/or Presentation

****Measuring Methods** **A:**Exam, **B:**Quiz, **C:**Oral Exam, **D:**Homework, **E:**Report, **F:**Article Examination, **G:**Presentation, **I:**Experimental Skill, **J:**Project Observation, **K**:Class Attendance; **L**:Jury Exam

Main Textbook	William D. Callister, David G. Rethwisch, Malzeme Bilimi ve Mühendisliği (Materials Science and Engineering), 8. basımdan çeviri.
Supporting References	Electronic data bases
Necessary Course Material	

Course Schedule	
1	Definition, importance and fields of study in Metallurgical and Materials Engineering
2	Historical development of materials
3	Structure of materials
4	Material types – Metals
5	Material types – Non-metallic materials
6	Mechanical properties of materials
7	Electrical, optical, thermal, magnetic properties and corrosion behavior of materials
8	Mid-Term Exam
9	Production and shaping of materials
10	Production and shaping of materials
11	Advanced materials
12	Characterization and quality control of materials
13	Material selection
14	Engineering ethics
15	Overview and discussion
16,17	Final Exam

Calculation of Course Workload			
Activities	**Number**	**Time (Hour)**	**Total Workload (Hour)**
Course Time (number of course hours per week)	14	2	28
Classroom Studying Time (review, reinforcing, prestudy,….)	14	1	14
Homework			
Quiz Exam	2	1	2
Studying for Quiz Exam	2	1	2
Oral exam			
Studying for Oral Exam			
Report (Preparation and presentation time included)			
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam	1	1	1
Studying for Mid-Term Exam	1	4	4
Final Exam	1	1	1
Studying for Final Exam	1	8	8
		Total workload	**60**
		Total workload / 30	**2**
		Course ECTS Credit	**2**

Evaluation	
Activity Type	**%**
Mid-term	40
Quiz	5
Quiz	5
Bir öğe seçin.	
Bir öğe seçin.	
Final Exam	50
Total	100

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	**PROGRAM OUTCOME**	**Contribution**
1	To possess sufficient knowledge in mathematics, science, and engineering subjects related to Metallurgical and Materials Engineering; the ability to apply theoretical and practical knowledge in these areas to model and solve engineering problems.	5
2	The ability to identify, define, formulate, and solve complex engineering problems by selecting and applying appropriate analysis and modeling methods.	1
3	The ability to design a complex system, process, device, or product under realistic constraints and conditions to meet specific requirements by applying modern design methods.	1
4	The ability to develop, select, and use modern techniques and tools necessary for engineering applications encountered as a Metallurgical and Materials Engineer; the ability to effectively	1
5	The ability to design experiments, conduct experiments, collect data, analyze results, and interpret findings for the investigation of engineering problems.	1
6	The ability to work effectively individually, as well as within disciplinary and interdisciplinary teams.	1
7	The ability to communicate effectively in Turkish, both verbally and in writing; knowledge of at least one foreign language.	1
8	The awareness of the necessity for lifelong learning; the ability to access information, follow developments in science and technology, and continuously renew oneself.	1
9	Awareness of professional and ethical responsibility.	1
10	Knowledge about business practices such as project management, risk management, and change management; awareness of entrepreneurship, innovation, and sustainable development.	1
11	Knowledge about the universal and societal impacts of engineering applications on health, environment, and safety; awareness of the legal consequences of engineering solutions.	1
12	Awareness of quality consciousness and sustainability in material selection, product development, and production processes in engineering applications; awareness of quality	1
13	The ability to confidently approach problems encountered in engineering applications.	1

LECTUTER(S)				
Prepared by	Assoc. Prof. Dr. S. Mine Toker	Dr. Işın AKAY ERDOĞAN		
Signature(s)				

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