

# TOROS ÜNİVERSİTESİ

Faculty Of Engineering  
Industrial Engineering (English)

## Course Information

MATERIAL SCIENCE					
Code	Semester	Theoretical	Practice	National Credit	ECTS Credit
		Hour / Week			
INE413	Fall	3	0	3	4

Prerequisites and co-requisites	none
Language of instruction	English
Type	Elective
Level of Course	Bachelor's
Lecturer	Yrd. Doç. Dr. Fikri EGE
Mode of Delivery	Face to Face
Suggested Subject	none
Professional practise ( internship )	None
Objectives of the Course	The aim of Material Science is to introduce the micro structure of materials by using physics, chemistry and mathematics disciplines, to explain the relation between micro structure and properties and to classify the materials according to the basic principles and concepts.
Contents of the Course	Atomic Structure, Atomic Order, Crystalline Structures, Microstructure Defects: Amorphous structure, Solid solutions, Atomic diffusion, Grain boundary, Dislocations, Mechanical Properties: Stress, Deformation, Elasticity, Elastic and plastic behaviour, Creep, Relaxation, Hardness, Toughness, Resilience,

## Learning Outcomes of Course

#	Learning Outcomes
1	Students use the knowledge on material structures in production systems.
2	Students use the important knowledge on materials science in production systems.
3	Students use the knowledge about basic concepts of material structures in production systems.
4	

## Course Syllabus

#	Subjects	Teaching Methods and Technics
1	Introduction, Definition, Benefits of Material Knowledge, Classification of Materials, Standard, Sustainability	Lecturing
2	Micro Structure of Materials, Interatomic Bonds	Lecturing
3	Atomic Order, Crystal Structure, Amorphous Structure	Lecturing
4	Interatomic Distances, The relation between Interatomic Bonds and Properties	Lecturing
5	Mechanical Properties of Materials, Stress-Strain Relation, Behaviour under Tensile Stress	Lecturing
6	Behaviour of Materials under Compression, Shear and Flexure	Lecturing
7	Midterm Exam	Exam
8	Technological Properties: Hardness, Abrasion, Fatigue, Creep, Relaxation	Lecturing
9	Material Types	Lecturing
10	Material Types	Lecturing

11	Optical properties	Lecturing
12	Electrical properties	Lecturing
13	Thermal properties	Lecturing
14	Material choices	Lecturing
15	Material choices	Lecturing
16	Final Exam	Exam

## Course Syllabus

#	Material / Resources	Information About Resources	Reference / Recommended Resources
1	Materials Science and Engineering Properties Charles Gilmore		

## Method of Assessment

#	Weight	Work Type	Work Title
1	40%	Mid-Term Exam	Mid-Term Exam
2	60%	Final Exam	Final Exam

## Relationship between Learning Outcomes of Course and Program Outcomes

#	Learning Outcomes	Program Outcomes	Method of Assessment
1	Students use the knowledge on material structures in production systems.	9	1,2
2	Students use the important knowledge on materials science in production systems.	9	1,2
3	Students use the knowledge about basic concepts of material structures in production systems.	9	1,2
4			

PS. The numbers, which are shown in the column Method of Assessment, presents the methods shown in the previous table, titled as Method of Assessment.

## Work Load Details

#	Type of Work	Quantity	Time (Hour)	Work Load
1	Course Duration	14	3	42
2	Course Duration Except Class (Preliminary Study, Enhancement)	14	3	42
3	Presentation and Seminar Preparation	0	0	0
4	Web Research, Library and Archival Work	0	0	0
5	Document/Information Listing	0	0	0
6	Workshop	0	0	0
7	Preparation for Midterm Exam	1	3	3
8	Midterm Exam	0	0	0
9	Quiz	0	0	0
10	Homework	0	0	0
11	Midterm Project	0	0	0
12	Midterm Exercise	0	0	0
13	Final Project	0	0	0
14	Final Exercise	0	0	0

15	Preparation for Final Exam	1	3	3
16	Final Exam	0	0	0
				<b>90</b>