



HASAN KALYONCU UNIVERSITY
Faculty of Engineering
Course Description Form

COURSE: Materials Science					
CODE: CE241		SEMESTER: FALL			
LANGUAGE: ENGLISH		TYPE: COMPULSORY			
PRE-REQUISITES: - CO-REQUISITES: -		THEORY	PRACTICAL	CREDIT	ECTS
WEEKLY HOURS: 3		3	0	3	4

CONTENT OF THE COURSE:

Introduction to materials science and classification of atomic structures of the materials. Atomic bonding and arrangement. molecular structure. Crystal structures and imperfections. Solid-state diffusion. Phase diagrams and solidification. Metals, ceramics, polymers. Composites. Corrosion and degradation of materials. Mechanical properties of materials; stress and strain, behaviour under tension and compression, toughness, fatigue, creep.

OBJECTIVE OF THE COURSE:

To enable students to have the required knowledge about the internal structure of engineering materials and to understand the evolution of internal structures according to types of materials.

WEEKLY SCHEDULE AND PRE-STUDY PAGES

Week	Topics
1	Chapter 1: Introduction to structure of materials
2	Chapter 2: Internal structures of materials, atomic structure
3	Chapter 2: Atomic bonding and arrangement, molecular structure
4	Chapter 3: Crystal structures and defects
5	Chapter 3: Amorphous structures, defects and imperfections in solids
6	Chapter 4: Structure of solids
7	Chapter 4: Structure of solids
8	Midterm Week
9	Chapter 5: Introduction to mechanical properties of materials
10	Chapter 5: Mechanical properties of materials, stress and strain
11	Chapter 5: Mechanical properties of materials, toughness
12	Chapter 5: Mechanical properties of materials, elastic deformation
13	Chapter 5: Mechanical properties of materials, fatigue
14	Chapter 5: Mechanical properties of materials, creep

TEXTBOOK: Lecture Notes

REFERENCE BOOKS

- ERDOĞAN T.Y., Materials of Construction, METU Press Publishing Company, Ankara, Turkey
- ONARAN, K., Malzeme Bilimi, Bilim Teknik Yayınevi, ISBN:975 540-017-6

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
LO1	3	0	0	0	2	0	0	0	0	0	0
LO2	3	0	0	0	2	0	0	0	0	0	0
LO3	3	0	0	0	3	0	0	0	0	0	0
LO4	3	0	0	0	3	0	0	0	0	0	0
LO5	3	0	0	0	3	0	0	0	0	0	0
PO: Program Outcomes LO: Learning Outcomes Values: 0: None 1: Low 2: Medium 3: High											

INSTRUCTOR(S):	Assoc.Prof.Dr.Amjad Khabaz
FORM PREPARATION DATE:	22.05.2019

LEARNING OUTCOMES OF THE COURSE:
<p>LO1: Knows internal structure of material properties and interprets changes</p> <p>LO2: Evaluates changes of mechanical properties depend on change of internal structure</p> <p>LO3: Evaluates behavior of materials under the loads.</p> <p>LO4: Interprets stress-strain behaviour and diagram of materials.</p> <p>LO5: Evaluates physical properties of materials.</p>

<p>CONTRIBUTION OF THE COURSE TOWARDS PROVIDING VOCATIONAL EDUCATION: Students learn about the design of behaviors by having knowledge about the atomic and macro-level properties of materials used in civil engineering.</p>
