CE 203 – MATERIALS SCIENCE

2019-2020 FALL SEMESTER

Instructor: Dr. Ayhan Öner Yücel **Email:** aoyucel@adu.edu.tr

Course website: https://akademik.adu.edu.tr/fakulte/muhendislik/personel/aoyucel/dersler

Course Schedule: Tuesday 13:30 - 16:15 (MA201)

Office Hours: Wednesday 13:30 – 15:30

Objectives of the Course: Providing students with the concepts of material science, and helping them gain ability for evaluation and relation between concepts and behavior of engineering materials.

Course Content: Engineering requirements of materials; the structure of matter; atomic arrangements, structural imperfections, atom movements. Mechanical properties. Concepts of force, stress, deformation and strain; elasticity; elastic and plastic behavior; viscosity; rheological models. Creep, relaxation, brittleness, ductility, hardness, fatigue, toughness, resilience, and damping characteristics of materials.

Attendance: Minimum **70%** lecture attendance is mandatory. In order to be eligible for the final exam, it is expected to continue at least **70%** of the lectures.

Course Assessment:

Midterm Examination……40%
Final Examination……..…60%

Textbook:
Erdoğan, T.Y., Tokyay, M., Yaman, İ.Ö., Erdoğan, S.T. Introduction to Materials Science for Civil Engineers, METU Press, Ankara, 2010.

Reference Books:
1) Callister, William D., David G. Rethwisch, Materials Science and Engineering: An Introduction; 9781118319222, Edition: 9; 2015. (Library: TA 403 C35 2015 k.1)

Course Learning Outcomes:

- Understand the relations between atomic bonding and the properties of materials.
- To choose the most appropriate material for a specific application by considering engineering properties of materials.
- To learn the standard test conducted on materials of construction.
- To recognize the mechanical properties of the material.
- Learning the behavior of the material.

TENTATIVE COURSE SCHEDULE

Week		Subjects
1	24.09.2019	Introduction
2	01.10.2019	Interatomic Bonding
3	08.10.2019	Structure of Materials
4	15.10.2019	Structural Imperfections
5	22.10.2019	Concepts of Force and Stress
6	29.10.2019	**Republic Day of Turkey**
7	05.11.2019	Concepts of Deformation and Strain
8		**Midterm Week**
9		
10	26.11.2019	Mechanical Properties of Materials (elasticity, plasticity, viscous deformation)
11	03.12.2019	
12	10.12.2019	
13	17.12.2019	
14	24.12.2019	Some Important Behavioral/Material Properties (fatigue, creep, hardness, thermal prop's)
15	31.12.2019	