



# MSE 226 ENGINEERING MATERIALS

## SPRING 2021-2022



<b>INSTRUCTOR</b>	Assist. Prof. Dr. İlkey Kalay <b>Office:</b> N-B15 <b>E-mail:</b> ikalay@cankaya.edu.tr <b>Office Hours:</b> Tuesday 10:20-11:10 Thursday 10:20-11:10* *Use e-mails as much as possible out of office hours
<b>SCHEDULE</b>	<b>Lecture:</b> Section (01) Tuesday 11:20-13:10 (M-101) Friday 09:20-10:10 (H-A04) Section (02) Thursday 11:20-13:10 (H-A04) Friday 10:20-11:10 (H-A04)

### COURSE DESCRIPTION

The course is designed to cover the following subjects: classification of materials, atomic structure, periodic table, molecular structure, bonding in solid materials, structure of crystalline solids, mechanical properties of the materials, phase diagrams, thermal processing of metal alloys, corrosion, properties and introduction to ceramics, glasses and composites.

### ANNOUNCEMENTS

Check course website, <http://mse226.cankaya.edu.tr/> frequently for announcements about the course, lecture notes, homework assignments, grades and etc.

### TEXTBOOK

W.D. Callister, Jr., D. G. Rethwisch, *Materials Science and Engineering: An Introduction*, John Wiley and Sons, 8<sup>th</sup> edition, 2000.

### GRADING

Midterm I	25 %
Midterm II	25 %
Homework Assignments +Quiz	10 %
Final Examination	40 %
<b>TOTAL</b>	<b>100 %</b>

\*Minimum of 70 % attendance in class is mandatory.

### COURSE OUTLINE

Week	Topics Covered	CH.s
1	Definition and classification of materials	CH. 1-8
2	Fe-C Phase diagram (steel and cast iron)	CH. 9
3	Phase Transformations of metallic materials	CH. 10
4	IT and CCT diagrams	CH. 10
5	Thermal processing of metallic materials	CH. 11
6	Thermal processing of metallic materials cont.	CH. 11
7	Corrosion and Degradation of Materials	CH. 17
8	Structure and properties of ceramics	CH. 12
9	Processing and applications of ceramics	CH. 13
10	Structure and properties of polymers	CH. 14
11	Processing and applications of polymers	CH. 15
12	Composites (structure, properties and applications)	CH. 16
13	Electrical Properties	CH. 18
14	Thermal, Magnetic and Optical Properties Wrap-up and concluding remarks	CH. 19-21

**Attendance:** Minimum of 70 % attendance in class is mandatory.