

Óbuda University Bánki Donát Faculty of Mechanical and Safety Engineering		Institute of Materials Science and Manufacturing Engineering Group of Materials Technology		
Name and code of subject: Materials Science		BAXATE2MNE		
Credit points: 2 <i>Full-time course</i>				
Course given for: Mechatronics Engineering MSc.				
Subject leader:	Dr. Viktor Gonda		Instructors:	Péter Varga
Prerequisite	-			
Classes per week:	Lecture: 2	Seminar: 0	Laboratory: 0	Consultancy: upon request
Evaluation (s,v,f): v	written examination			
Course description				
Throughout the course, a review of deformation phenomena; deformation micro mechanisms and material properties is given and discussed for structural materials. The characterization of materials, the structure of metals, ceramics and polymers, and their structure specific properties are discussed.				

1. Schedule			
Academic week	Topic	Reference	
		For presentation	Preparatory
1.	Introduction and schedule		
2.	Bonding in materials, the structure of metals	[1] Ch. 4, 5 [2] Ch. 2	[3] Ch. 1, 2, 3, 5
3.	Public holiday		
4.	Stresses, strains, the elastic moduli. Stiffness limited design	[1] Ch. 3, 6, 7	[3] Ch. 1
5.	Strength, ductility and hardness of materials. Yield limited design	[1] Ch. 8 - 12	[3] Ch. 1, 6
6.	Fast fracture, toughness and fatigue	[1] Ch. 13 - 19	[3] Ch. 1
7.	Test 1.		
8.	Creep deformation and fracture. Diffusion	[1] Ch. 20 - 23	
9.	Corrosion. Friction, abrasion and wear	[1] Ch. 24 - 29	
10.	Structure and properties of ceramics	[2] Ch. 15 - 18	
11.	No class		
12.	Structure and properties of polymers	[2] Ch. 21 - 23	
13.	Test 2.		
14.	Repeated test		

2. References
[1] M. F. Ashby and D.R.H. Jones: Engineering materials 1. Butterworth-Heinemann, 2012.
[2] M. F. Ashby and D.R.H. Jones: Engineering materials 2. Butterworth-Heinemann, 1998.
[3] J. Verebély-Dévényi, P. Rác: Engineering materials, Óbuda University, 2012.

3. Requirements

a) **Attendance:** Compulsory, students should notify instructors of excused absences in advance, where possible.

b) Tests:

Week	
7.	Test 1.
13.	Test 2.
14.	Repeated test

c) Terms of signature

Presence of at least 70% of classes. Average test results on both tests at least 51%.
A presentation given by the student on a predetermined topic.

d) Determination of final mark

Final mark is based on the average percentage of the average of the two test results (<50%: (1), 51-62%: (2), 63-74%: (3), 75-86%: (4), 87-100%: (5)), and the mark of the presentation.

e) Repeater tests

Failed tests can be rewritten on last week of the lesson period of the semester if average result is at least 20%.

f) Repeater test in examination period of the semester

A repeater test can be written until the second week of the examination period. The exact date is given by the instructor before the end of the lesson period.

Budapest, 2023. 02. 13.

Péter Varga, lecturer