

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 (BAGAT1ENNM)		
Credit points: 4				
<i>Full-time course</i>				
Course given for: Mechatronics Engineering MSc.				
Subject leader:	Dr. Viktor Gonda		Instructors:	Dr. Viktor Gonda
Prerequisite	-			
Classes per week:	Lecture: 2	Seminar: 0	Laboratory: 0	Consultancy: upon request
Evaluation (s,v,f): v	written examination			
Course description				
In the first part of the course, a review of deformation phenomena; deformation micro mechanisms and material properties is given and discussed for structural materials. In the second part, materials applications and some advanced materials technologies are described and discussed for different fields as microelectronics, aerospace, automotive, and energy storage.				

1. Schedule		
Academic week	Topic	Reference
1.	Introduction and schedule.	[1] Ch. 1
2.	Draft discussion	
3.	The elastic moduli.	[1] Part B
4.	Yield strength, tensile strength, hardness and ductility.	[1] Part C
5.	Fast fracture, toughness and fatigue.	[1] Part D
6.	Creep deformation and fracture.	[1] Part E
7.	Corrosion.	[1] Part F
8.	Friction, abrasion and wear.	[1] Part G
9.	Materials characterization.	[2] pp. 1019-1034.
10.	Materials in microelectronics.	[2] pp. 1079-1088.
11.	Materials for aerospace applications.	[2] pp. 1055-1066.
12.	Materials for energy-storage.	[2] pp. 1067-1078.
13.	Advanced lightweight materials and manufacturing processes for automotive applications.	[2] pp. 1045-1054.
14.	Course evaluation	

2. References
[1] M. F. Ashby and D.R.H. Jones: Engineering materials 1. Butterworth-Heinemann, 1996.
[2] Materials & Engineering: Propelling Innovation; MRS Bulletin; December 2015 Vol. 40 No. 12.

3. Requirements

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

b) Tests:

Week	
8.	Report deadline 1.
13.	Report deadline 2.

c) Terms of signature

Presence of at least 70% of classes. Average test results at least 51%.

d) Determination of final mark

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

e) Repeater tests

Failed tests can be rewritten on last week of the lesson period of the semester in 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, 2018. 02. 12.

Dr. Viktor Gonda, associate professor