

<b>Óbuda University Bánki Donát Faculty of Mechanical and Safety Engineering</b>		<b>Department of Materials Technology</b>	
<b>Lecture name and Neptun code:</b> Chemistry and materials science BAXCM2EBNF <b>Credits: 4</b>			
<b>Course type:</b> Full-time			
Bachelor course: <b>Technical Management</b>			
<b>Lecturer:</b>	Dr. Tünde Kovács associate professor	<b>Practice:</b>	Péter Varga
<b>Number of sessions/week/term:</b>	Weekly	Lecture: 2	Practise:2
<b>Exam/ course assignment:</b>	Exam	<b>Language:</b>	English
<b>Course objective</b>			
General overview and classification of engineering materials. Mechanical properties of metals, polymers, ceramics and composites. Mechanical materials testing. Tensile test, hardness test, impact test. Creep and fatigue of metals. Non-destructive testing. Investigation methods for determining the chemical composition and submicroscopic structure of materials. Structure of materials.			

<b>Week</b>	<b>Semester program (Lectures)</b>
1.	Introduction, Structure of the Materials. Chemical properties of materials.
2.	Material testing. Destructive testing.
3.	Nondestructive testing.
4.	Metals and alloys. Properties and applications of the metals and alloys.
5.	Metal manufacturing processes.
6.	<b>1. Test</b>
7.	Polimers and polimer technologies, application of the polimers.
8.	Ceramics and composites
9.	Bio and biocompatible materials.
10.	Damage to the materials. Aspects of the material selections.
11.	Summing the semester program
12.	Vacation
13.	<b>2. Test</b>
14.	Repeated test

<b>Semester week</b>	<b>Test</b>
6.	First test
13.	Second test
14.	Repeated test

**Course assessments:**

Week No. 6 and Week No.13 tests in writing. You can go to take an exam if you can fulfil the requirements of the tests in writing in the 7<sup>th</sup> and 13<sup>th</sup> weeks (both tests need to be minimum pass mark) and you participate in lecture and practice classes. The term is not successful because of the lack of the above requirements. Evaluation happens by scoring. The tasks are theoretical and practical. Participation in the practices is required.

Intervals of the grade:

under 50%: 1 (unsatisfying, gig)  
50-62,5 %: 2 (pass mark)  
62,5-75 %: 3 (satisfactory mark)  
75-87,5 % 4 (class)  
87,5-100% 5 (Excellence)

The exam will be in the exam period in writing. Instead of the writing exam, the results of the average tests are acceptable over 75%.

**The method of the supplement:** You can take an improver exam only one time set out by the tutor in the first 10 days of the exam period with the payment of the examination fee. This is the writing exam with the whole curriculum. The examination method is writing.

<b>Compulsory literature</b>	
1)	Askeland, D.R., Fulay, P. P., Wright, W. J.: The Science and Engineering of Materials, Stamford, 2011
2)	Ashby, Jones: Engineering Materials 1, Butterworth-Heinemann, Oxford, 2012.
3)	Ashby, Jones: Engineering Materials 2, Butterworth-Heinemann, Oxford, 2012.
4)	Callister: Materials Science and Engineering, John Wiley & Sons, New York, 2007.
5)	Smallman, R. E., Ngan, A. H.W.: Physical Metallurgy and Advanced Materials, Elsevier, 2007
6)	Verebély-Dévényi, J., Rácz, P.: Engineering materials, Óbuda University, 2012.

Budapest, 2024.02.01.

**Dr Tünde Kovács**  
Lecturer

### Semester Program of Practices

<b>Weeks</b>	<b>Date</b>	<b>Practices</b>	<b>Room</b>
1	14. February	Introduction of academic requirements, safety instruction	F 16
2	21. February	Hardness tests	P 22A
3	28. February	Tensile test (exercise)	F 16
4	06. March	Tensile test	F 16
5	13. March	Charpy Impact test	P 22 A
6	20. March	Crystallography	F 16
7	27. March	Recrystallisation of metals	F 16
8	03. April	Microscopy	F 16
9	10. April	Metals in practice	F 16
10	17. April	Polymers in practice	F 16
11	24. April	Vacation	
12	01. May	Vacation	
13	08. May	Ceramics in practice	F 16
14	15. May	Consultation	F 16