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| Óbuda University Bánki Donát Faculty of Mechanical and Safety Engineering | **Institute of Materials and Manufacturing Science**Department of Materials Technology |
| **Lecture name and Neptun code:** MaterialsBAXAI1ABNE **Credits: 4** **Course type:**Full-time |
| Bachelor course: **Technical Management** |
| **Lecturer:**  | Dr. habil. Tünde Kovács, PhD associate professor  |
| **Number of sessions/week/term:** weekly | Lecture: 2  | Practise:1 |
| **Exam/ course assignment:** Exam  | **Language:** English |
| **Course objective** |
| 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. |

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| **Week** | **Semester program (Lecture and Practise)** |
| 1. | Introduction, Structure of the materials.  |
| 2. | Material testing. Destructive and nondestructive testing. |
| 3. | Metals and alloys. Properties and applications of the metals and alloys. |
| 4. | Metal manufacturing processes. |
| 5. | Polimers and polimer technologies, application of the polimers. |
| 6. | **1. Test**  |
| 7. | Ceramics and composites |
| 8. | Bio and biocompatible materials. |
| 9. | Damage of the materials |
| 10. | Aspects of the material selections |
| 11. | **2. Test**  |
| 12. | Special manufacturing of the materials |
| 13. | Summing the semester program. |
| 14. | Repeated test |

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| **Semester week** | **Test** |
| 6. | First test |
| 11. | Second test |
| 14. | Repeated test |
| **Course assessments:**Week No. 7 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 7th and 13th weeks (both tests needs to be minimum pass mark) and you participate in lecture and practice classes. The term is not successful the lack of above requirements.Evaluation happens by scoring. The tasks are theoretical and practical. 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 is acceptable over 75%. |
| **The method of the supplement:** You can take an improver exam only one time set out by tutor in the first 10 days of the exam period with the payment of examination fee. This is the writing exam with the whole curriculum. Examination method is writing. |
| **Compulsory literature**

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| **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.** |

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Budapest, 10.06. 2023.

**Dr. habil. Tünde Kovács**

**associate professor**

Lecturer