

Óbuda University Bánki Donát Mechanical Safety Engineering Faculty		Institute of Materials Science and Manufacturing Department of Materials and Metal Forming		
<i>Name of the subject:</i> Materials Technology 2		<i>NEPTUN-code:</i> BAGAC23NEC		
<i>Subject leader:</i> dr. Pál Rác		<i>Title:</i> associate professor		
Course description:				
The students will acquire the knowledge of fundamentals of metal casting, powder metallurgy and heat treating technologies. Equilibrium and non-equilibrium, structures, properties, process parameters and technologies of quenching, tempering, annealing and normalising will be discussed. Other major technologies to study include thermochemical heat treatment processes and their basic parameters, case hardening, nitriding of steels, surface heat treatment technologies, evaluation and optimising of technologies. Heat treating furnaces, cooling media, atmospheres, and testing of heat treated parts are studied as well.				
Lessons per week:	Lectures: 2	Labs: 0	Practice: 0	Consultation by request
Evaluation:	examination			

1. Lecture program	
Date	Subject
09.11.	General overview of materials technologies. Metal casting processes; expendable and reusable molds.
09.18.	Process parameters, capabilities of metal casting technologies.
09.25.	Powder metallurgy, producing, consolidation and sintering of powders.
10.02.	Major applications of powder metallurgy; electrical materials, construction parts, cemented carbides, porous products, ceramic materials.
10.09.	Equilibrium and non-equilibrium transformation of steels.
10.16.	Quenching and tempering of steels.
10.23.	National Day
10.30.	Test #1
11.06.	Annealing and normalising of steels.
11.13.	Thermochemical heat treatment processes. Nitriding, carburising and case hardening of steels.
11.20.	No lessons are this day.
11.27.	Aluminium and aluminium alloys. Tempering of aluminium alloys.
12.04.	Test #2
12.11.	Processing of plastics.

2. References
S. Kalpakjian: Manufacturing Processes for Engineering Materials, Addison-Wesley Publishing Company.
J. A. Schey: Introduction to Manufacturing Processes, McGraw-Hill Book Company.
P. Rác: Lecture presentation slides; www.elearning.uni-obuda.hu

3. Requirements	
a) Taking part on lessons: Visiting lectures is obligatory.	
b) Tests and other tasks	
Date	Tests
7.	Test #1
13.	Test #2
14.	Repeater tests
c) Terms of signature Students who accomplish semester requirements get signature. Both of two test results (or repeater tests) should be at least 2. If mark of any of them after repeater tests is 1 then student cannot get signature.	
d) Repeater tests Failed tests can be rewritten on last week of the lesson period of the semester.	
e) Repeater test in examination period of the semester Failed signature can be earned in first two weeks (10 working days) of the examination period. The date of it is given by the reader before the end of the lesson period.	
f) Examination During the examination period student should take an oral examination. Dates of examination are given by the reader before the end of the lesson period.	

Budapest, 2014.08.15.

dr. RÁCZ, Pál
associate professor