

Óbuda University Bánki Donát Faculty of Mechanical and Safety Engineering			Institute: <i>Institute of Mechanical Engineering and Technology</i>		
Name of the subject: Manufacturing Engineering 2 BGXGTE3BNE / BAGGT23NED/C Full time course Term: 2023/2024 I. Credit: 4					
Programme: Mechatronic Eng BSc II English			Timetable: Lec.: Mo. 13:30-15:10 Room 134. Sem: Mo. 15:20-17:00 Room 134.		
Teacher responsible for the subject:	Mikó Balázs (PhD.habil; ass. prof.)		Teachers: Mikó Balázs (PhD.habil; ass. prof.)		
Prerequisites:		-			
Hours per week:	Lecture: 2	Practice.: 0		Labs: 2	Consultation:
Way of closing the semester:	Exam				
Curriculum					
<i>The aim of the course is to familiarise students with the manufacturing technologies of mechanical components, the basic types of manufacturing tools and manufacturing processes.</i> <i>The course will cover the types of machining processes, tools, and the design of conventional and CNC machine tools. The technologies of fine surface machining (grinding, sanding, ...), laser, plasma and water jet machining, spark cutting technologies will be discussed. Special attention is paid to the production technologies of plastic and composite parts and to additive manufacturing processes. Basic measurement skills are also taught.</i>					
Schedule					
Week no.	Topics				
1.	Introduction Manufacturing process planning, requirements and process elements, Documenting			Project work discussion	
2.	Cutting technology, Tool wear, forces, cooling			Blank materials, selection and calculation, tolerances and manufacturing errors	
3.	Basic cutting methods and machine tools: turning			Edge geometry and tool materials	
4.	Basic cutting methods and machine tools: drilling, milling			Manufacturing process planning (calculation example)	
5.	Basic cutting methods and machine tools: planning, shaping, broaching, grinding			Positioning and fixtures, typical fixtures in machining	
6.	CNC machine tool			NC programming	
7.	Education break				
8.	Plastic part production technologies			Design for manufacturing: plastic parts	
9.	Composite technologies			Injection mould	
10.	Additive manufacturing			Consultation	
11.	Education break				
12.	Metrology			Measuring lab	
13.	Safety and ergonomics in machining workshop			Consultation	
14.	Test			Presentation	
Requirements					
1 test in 13th week (max 40 points), 1 optional experimental work (3+2 points) 4 small test (4x3 points) 1 homework (max 20 points)					
0-60 %		– 1 (fail); 60-70 %		– 2 (pass); 70-80 % – 3 (satisfactory)	
80-90 %		– 4 (good); 90-100 %		– 5 (excellent)	

Literature:

- [1] Handouts in the Moodle system
- [2] S. Kalpakjian; S.R. Schmid: Manufacturing engineering and technology; Pearson Singapore 7th ed. 2014. (Chapters: 21-26.)
- [3] G. Schneider: Cutting tools applications (electronically available)

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Prerequisites:		-			
Hours per week:	Lecture: 2	Practice.: 0	Labs: 2	Consultation:	
Way of closing the semester:	Exam				
Curriculum					
<i>The aim of the subject is to present the basics of manufacturing and cutting technology, the positioning and fixtures and machine tools. The tool geometry, materials, wear process and life time are presented. The different cutting methods (turning, milling, drilling, grinding, planning, shaping, broaching), tools and related machine tools are described.</i>					
Schedule					
Week no.	Topics				
1.—	Introduction Manufacturing process planning, requirements and process elements, Documenting		-		
2.—	Blank materials, selection and calculation, tolerances and manufacturing errors		Safety and ergonomics in machining workshop		
3.—	Cutting technology		Manufacturing process planning 1 HW1 out		
4.—	Edge geometry and tool materials		Manufacturing process planning 2		
5.—	Tool wear, forces, cooling		Manufacturing process planning 3		
6.—	Basic cutting methods and machine tools: turning,		Manufacturing process planning 4		
7.—	Basic cutting methods and machine tools: turning,		Manufacturing process planning 5		
8.—	Basic cutting methods and machine tools: milling		Manufacturing process planning 6		
9.—	Basic cutting methods and machine tools: drilling		Manufacturing examples		
10.—	Basic cutting methods and machine tools: Grinding		Positioning and fixtures, typical fixtures in machining		
11.—	Metrology		Measuring lab 1		
12.—	Measuring devices		Measuring lab 2 Deadline of HW1		
13.—	Test		-		
14.—	Retake test		-		
Requirements					
1 test in 13th week (max 40 points), 1 optional experimental work (3+2 points) 4 small test (4x3 points) 1 homework (max 20 points) — 0-60 % — 1 (fail); — 60-70 % — 2 (pass); — 70-80 % — 3 (satisfactory) — 80-90 % — 4 (good); 90-100 % — 5 (excellent)					

Literature:

- [4] Handouts in the Moodle system
- [5] S. Kalpakjian; S.R. Schmid: Manufacturing engineering and technology; Pearson Singapore 7th ed. 2014. (Chapters: 21-26.)
- [6] G. Schneider: Cutting tools applications (electronically available)