

Óbuda University Bánki Donát Faculty of Mechanical and Safety Engineering			Institute of Mechanical Engineering and Technology Department of Manufacturing Engineering		
Name of the subject: <b>Manufacturing processes and automated production equipments BGXGFE2MNF</b> Credit: <b>4</b> Full time course Term: <b>2024/2025 II.</b>					
Programme: Mechanical engineering MSc English			Timetable:		
Teacher responsible for the subject:	Mikó Balázs (PhD.habil; ass. prof.)		Teachers:	Dr. Mikó Balázs Dr. Czifra György	
Prerequisites:		-			
Hours per week:	Lecture: <b>2</b>	Practice.: <b>2</b>	Labs: <b>0</b>	Consultation: 0	
Way of closing the semester:	<b>Exam</b>				
Curriculum					
<i>The aim of the subject is to introduce the principles and methods of designing manufacturing processes, including the role and tasks of the equipment. An essential part of the design methods is to learn the elements of the tolerancing task, dimensional chain analysis and geometric tolerancing. Students will learn about the structure of production cells, flexible manufacturing systems, the functions of their subsystems, tools and methods of cell, machine, tool and workpiece inspection. During the exercises, they will perform drawing and process analysis and solve two project tasks: design of a welding machine and analysis of the assembly process in a traditional environment and according to Lean principles.</i>					
Schedule					
Week no.	Topics				
1.	Subject Guide Engineering design principles and methods		Technical documentation		
2.	Production cells, flexible manufacturing systems		Design process and steps for manufacturing cells		
3.	Manufacturing apparatus, Welding fixtures		Welding machine design project task		
4.	Tolerancing, GPS/GD&T		Drawing analysis		
5.	Assembly process design		Progress report 1		
6.	Assembly process motion analysis		"LEGO" exercise		
7.	Dimension chain analysis		Dimension chain analysis example		
8.	Manufacturability analysis		Technology analysis of components		
9.	Cell monitoring, machine monitoring, tool monitoring, workpiece monitoring		Progress report 2		
10.	Diagnostic and maintenance methods for production lines		Maintenance instruction workshop		
11.	Optimisation, optimisation procedures		Presentation workshop		
12.	Production logistics (kanban, milkrun, ladder layout, product tracking, material handling, sorting)		Consultation		
13.	Project presentation				
14.	Test				
Requirements					
1 project work (max 40 / min 20 points): Welding fixture design (WFD) process analysis project (PAP) report preparation					
1 test in 14th week (max 60 / min 30 points),					
0-50 %      – 1 (fail);      50-60 %      – 2 (pass);      60-70 %      – 3 (satisfactory)					
70-85 %      – 4 (good);      85-100 %      – 5 (excellent)					

**Literature:**

- [1] S. Kalpakjian; S.R. Schmid: Manufacturing engineering and technology; Pearson Singapore 8<sup>th</sup> ed. 2020.
- [2] Handouts in the Moodle system

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Dr. MIKÓ Balázs