

<b>Óbuda University</b>		Institute of Mechanical Engineering and Technology		
<b>Donát Bánki Faculty of Mechanical and Safety Engineering</b>				
<b>Name of subject: Mechatronics Constructions</b>				<b>Credit: 3</b>
<i>Mechatronics MSc, English language course 2022/2023. II. semester</i>				
Subject leader:	<b>Dr. Árpád CZIFRA</b>	Lecturer:	<b>Dr. Árpád CZIFRA</b>	
Prerequisites:	-			
Weekly hours:	Lecture: 2	Group seminar: 0	Lab: 0	Consultation:
Requirements:	<b>Exam</b>			
<b>Course description:</b>				
Overview of advanced topics of mechanical engineering design: Mechanical theories in design. Dynamics of machines. Principles of tribology. Special aspects in machine design: DfX techniques. Analysis (construction, kinematics and design) of applied mechanical elements in devices of mechatronics: High-precision sliding and rolling bearings, hydrostatic bearings. Linear techniques: ball screws, linear bushings, etc. Special clutches. Brake systems. Driving system: planetary gear, harmonic drives and cyclo drive systems.				
<b>Shedule:</b>				
Week	Topic			
1.	Dimensioning of static systems. Theory of load carrying capacity			
2.	Dimensioning of dynamic systems. Fatigue, cumulative damage theory.			
3.	Tribology: friction, wear, surface roughness.			
4.	Dynamics of machines: balances.			
5.	Dynamics of machines: vibrations.			
6.	The engineering design process.			
7.	Planetary gears: basic principles			
8.	Planetary gears: kinematic design.			
9.	Harmonic drives and cyclo drive systems.			
10.	High-precision sliding and rolling bearings, hydrostatic bearings			
11.	Linear techniques.			
12.	Special clutches.			
13.	Brake systems.			
14.	Repetition. Closing.			
<b>Tasks in semester</b>				
Week	Homeworks and tests			
8.	Midterm test (20 points).			
9.	Announcement of Homework (20 points)			
12.	Submission of Homework:			
<b>Conditions for the signature:</b>				
One must participate in at least 70% of all classes.				
One obligatory homeworks must be solved and submitted until the deadline. Wrong and/or not accepted homeworks (min 8 points must be collected) should be submitted again.				
One midterm tests must be written. The points of midterm test must be no less than 8 (40%).				
To get a signature one must collect minimum 20 points as sum points of Homework+Midterm test (50%).				
In case of failed signature, one repeated test can be written in the first 10 day of exam season. If the repeated test is not accepted, then the semester is invalid and no signature will be given.				
<b>Exam:</b> written (max 40 point).				
Examination note (based on the sum of the semester and exam points – max 80 point) 0-40 point: fail (1); 41-50 point: pass (2); 51-60 point: satisfactory (3); 61-70 point: good (4), 71-80 point: excellent (5).				
<b>Recommended references:</b>				
Lecture notes in ÓE E-learning system.				
Godfrey Onwubolu: Mechatronics: Principles and Applications, Butterworth-Heinemann, 2005				

Date: 02. 21., 2023.

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Árpád Czifra, subject leader