

Óbuda University		Institute of Mechanical Engineering and Technology		
Donát Bánki Faculty of Mechanical and Safety Engineering				
Name of subject: Mechatronics Constructions (BAXMSE1MNF)		Credit: 4		
<i>Mechatronics MSc, English language course 2026/2027. I. semester</i>				
Subject leader:	Dr. habil Árpád CZIFRA	Lecturer:	Dr. habil Árpád CZIFRA	
Prerequisites:	-			
Weekly hours:	Lecture: 2	Group seminar: 0	Lab: 0	Consultation:
Requirements:	Exam			
Course description:				
The aim of the course is to review advanced methods of machine design and to learn about the structural solutions that are key elements of the drive technology of mechatronics structures.				
Shedule:				
Week	Topic			
1.	Dimensioning of static systems. Theory of load carrying capacity			
2.	Dimensioning of dynamic systems. Fatigue, cumulative damage theory.			
3.	Unbalanced mechanical systems.			
4.	Vibrations and machine foundation.			
5.	Basics of tribology. Surface tribology.			
6.	Friction and wear.			
7.	Midterm test			
8.	Planetary gears: basic principles. Announcement of HW.			
9.	Planetary gears: kinematic design. Announcement of students presentations.			
10.	Harmonic drives and cyclo drive systems.			
11.	High-precision sliding and rolling bearings, hydrostatic bearings			
12.	Linear techniques. Submission of HW.			
13.	Retake of midterm test.			
14.	Pre-exam: Students presentations.			
Tasks in semester				
Week	Homeworks and tests			
7.	Midterm test (20 points).			
8.	Announcement of Homework (20 points)			
12.	Submission of Homework:			
Conditions for the signature:				
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, retake exam can be written in the first 10 day of exam season. If the retake exam is failed, then the semester is invalid, and no signature will be given.				
Pre-exam: Students can prepare a presentation on a topic agreed upon with the teacher, which they will present in the last week of semester (max 20 points)				
Exam: There are three occasions in the exam season to pass the written exam based on semester topics. (max 40).				
Grades (based on the sum of the midterm test, the HW and the presentation or written exam points) – max 60 points in case of pre-exam; max 80 points in case of written exam: 0-50%: fail (1); 51-62%: pass (2); 63-74%: satisfactory (3); 74-86%: good (4), 87-100%: excellent (5).				
Recommended references:				
Lecture notes in ÓE E-learning system.				
Godfrey Onwubolu: Mechatronics: Principles and Applications, Butterworth-Heinemann, 2005				

Date: 06. 09., 2026.

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Dr. Árpád CZIFRA, subject leader