Óbuda University Bánki Donát Faculty of Mechanical and Safety Engineering	Insitute of Mechatronics and Vehicle Engineering

Subject title and code: **Introduction to the Mechatronics,** BMXMIE1BNF **Credits:** *4*

Full-time study 1 *ac. year* 1 *semester*

The course is available at: mechatronical engineering

Supervised by: István Nagy **Instructors:** István Nagy

Prerequisite (neptun code):

Weekly number of lessons

Lecture: 2	Group seminar: 0	Lab: 0	Consultation: see on institute WEB-link

Way of assessment: Midterm mark (Written)

Online consultation *(in case it's required): based on online reservation… (BBB link)*

Educational goal: *The aim of education is to give the students general information about MECHATRONIC system's classifications, basic definitions, key elements of mechatronic systems, basic calculations related to the key elements. At the end of semester Student's micro-conference about mechatronics. The aim of conference is get experience in conference paper writing and presentation's taking. The conference paper (essay) submission is mandatory for pair of students.*

Schedule

Education week	Topics
1.	Managing the semester- requirements for successful finishing of subject. **Introduction** to the subject: mechatronic definitions, key elements of mechatronic, main branches of mechatronics – *taste the subject*, through the examples
2.	**Interfacing** and signal classifications (input/output interfaces; analogue, digital, stochastic signal classifications, main features).
3.	**signal processing (A/D, D/A – conversions, filtering, quantization, sampling rate, DAQ) -**
4.	**Sensors** (rotational, linear; optical sensors
5.	**Sensors** (US,IR, heat, pressure, torque, vision system – stereo camera); **Actuators** (3 main types: switches, valves, motors);
6.	System **modelling** and analogies2 (**mechanical, electrical**, **electro-mechanical** parts modelling, **Introduction to Control Engineering**
7.	**State holiday**
8.	**1st Test Paper**
9.	**Control engineering (HW control elements, SW control programs, feed backed/non-feed backed control and PID control,)**
10.	**Control** (block) **diagrams** (control diagram's elements **mathematics** for simplification);
11.	**Rectory – holiday**
12.	**Control System's examinations** based on TIME and FREQUENCY domain
13.	**2nd Test Paper**
14.	Preparing for **IMSmC2025** Conference, submissions of semestral works.

Mid-semester requirements

Test		Assignment to be submitted		Lab measurement	
amount	dates	amount	deadlines	amount	dates
2	see schedule	1	13th week	0	

According to the Study and Examination regulations of Óbuda University attendance of group seminars and lab exercises are mandatory.

Other requirements for participation in sessions not covered by the regulations and restrictions on substitutions:

The lectures are **mandatory**, 30% absence allowed, see “Study and Exam regulations” . The participation on IMSmC conference and presentation is also mandatory, one of the condition for getting the midterm mark, otherwise the good presentation increasing the grading earned by TPs.

Test		Assignment to be submitted		Lab measurement	
maximum points available	minimum score required to pass /test	maximum points available	minimum score required to pass / assignment	maximum points available	minimum score required to pass /lab
100/TP…points	40/TP…points	100points	50points	…points	…points

Total number of points achievable in semester: 300points				
Grading thresholds	**satisfactory** 50 % and above	**average** 65 % and above	**good** 75 % and above	**excellent** 90 % and above
Other evaluation criteria: During the semester 2TPs will be written, where each has to be over 40%. The TPs with lower level has to be repeated. During the semester an assignment (essay) has to be submitted for the **IMSmC2025** Conference. The conference paper has to be presented on the IMSmC Conference – see conf. Link				
Receive a signature denied entry: over 30% absence (exception, excused absence) the student will be disabled;				
Required references: http://siva.bgk.uni-obuda.hu/jegyzetek/Mechatronikai_alapismeretek/English_Mechatr/IntroToMechatr/Literature/				
Recommended references: see, moodle				
Quality assurance methods of the subject:				

Things, that are not included, can be found within the regulations of Óbuda University.