



1. Subject name	Mechatronics, microcomputers				
2. Subject name in Hungarian	Mechatronika és mikroszámítógépek				
3. Code	BMEKOKAM604	4. Evaluation type	mid-term grade	5. Credits	4
6. Weekly contact hours	2 (10) Lecture	0 (0) Practice	2 (11) Lab		
7. Curriculum	Vehicle Engineering MSc (J)	8. Role	Mandatory (mc) at Vehicle Engineering MSc (J)		
9. Working hours for fulfilling the requirements of the subject					120
Contact hours	56	Preparation for seminars	18	Homework	4
Reading written materials	18	Midterm preparation	24	Exam preparation	0
10. Department	Department of Control for Transportation and Vehicle Systems				
11. Responsible lecturer	Dr. Gáspár Péter				
12. Lecturers	Lövétei István				
13. Prerequisites					
14. Description of lectures					
The development and disciplines of mechatronics. Theoretical structures of automats (controlled and regulated machines). A historical overview of the development of computing. Integrated circuit technology. Generation of microcontrollers, its main types. Main elements of robot controllers (overview). Sensors, actuators. Programming of embedded systems. Tools of the hardware engineering (AutoCad, OrCad, Protel). Simulation softwares (Symula, MatLab). Motor controlling, regulation. Pneumatic machines. Transport application examples (cars platoon on public roads, the 75 Hz train controlling system).					
15. Description of practices					
16. Description of laboratory practices					
Microcontroller - type 8051 - programming by Assembly and C languages. Machine and compiled languages in microcomputer programming. Architectures of microcontrollers, push button and led controlling. Programming of clocks, timers, interrupts and AD converters. Programming of virtual display and Num Pad.					
17. Learning outcomes					
A. Knowledge					
<ul style="list-style-type: none"> • knows the basics of building embedded systems • knows the basic serial communication techniques • knows the basic principles of A / D and D / A conversion • knows basic signal processing algorithms 					
B. Skills					
<ul style="list-style-type: none"> • capable of programming embedded systems • is able to design data collection systems 					
C. Attitudes					
<ul style="list-style-type: none"> • is interested in modern IT solutions 					
D. Autonomy and Responsibility					
<ul style="list-style-type: none"> • is able to apply the knowledge acquired here to other similar, yet unknown systems 					
18. Requirements, way to determine a grade (obtain a signature)					
2 midterm exams from theory and two individual programming task (one ASM code, one C code). The final grade is the mean of the grades of the four tasks.					
19. Opportunity for repeat/retake and delayed completion					
Both midterm exams can be retried once, both individual tasks can be delayed completed.					
20. Learning materials					
Chew/Sen Gupta: Embedded Programming, Second Edition, 2008, ISBN: 978-0-9800541-0-1, Lecture notes					

Effective date	10 October 2019	This Subject Datasheet is valid for	Inactive courses
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