



1. Subject name	Discrete Control Design				
2. Subject name in Hungarian	Diszkrét irányítások tervezése				
3. Code	BMEKOKAM658	4. Evaluation type	exam 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	Specialization (sp) at Vehicle Engineering MSc (J)		
9. Working hours for fulfilling the requirements of the subject					120
Contact hours	56	Preparation for seminars	18	Homework	20
Reading written materials	8	Midterm preparation	8	Exam preparation	10
10. Department	Department of Control for Transportation and Vehicle Systems				
11. Responsible lecturer	Dr. Gáspár Péter				
12. Lecturers	Dr. Gáspár Péter, Dr. Bécsi Tamás				
13. Prerequisites					
14. Description of lectures					
<p>System Theory, Theory of Linear Time-Variable Dynamic Discrete Time Systems. Z-transformation. Dynamics and mathematical description of discrete time systems. Design of P, PI and PID controllers. State feedback. Designing observers.</p> <p>In the second half of the subject, high-level control planning and optimization techniques are described. Soft Computing Methods, Fuzzy Theory, Genetic Algorithms, Optimization.</p>					
15. Description of practices					
16. Description of laboratory practices					
Implementation of the methods learned during the lectures, by using MATLAB, Simulink and embedded platforms					
17. Learning outcomes					
<p>A. Knowledge</p> <ul style="list-style-type: none"> • is familiar with the theory of describing discrete time linear systems • knows the basic discrete regulatory design and monitoring design principles • knows the basics of Fuzzy systems • knows the basics of genetic algorithms <p>B. Skills</p> <ul style="list-style-type: none"> • is able to design and analyze discrete linear controllers • is able to apply basic soft-computing techniques <p>C. Attitudes</p> <ul style="list-style-type: none"> • is interested in modern IT solutions • capable of algorithmic thinking that can be applied in other areas <p>D. Autonomy and Responsibility</p> <ul style="list-style-type: none"> • in addition to known environments, it is able to acquire other unknown program languages and development tools in autodidact 					
18. Requirements, way to determine a grade (obtain a signature)					
Two midsemester exams, which are the prerequisite of the final exam. The final grade depends only on the final exam.					
19. Opportunity for repeat/retake and delayed completion					
Both midterm exams can be retried once.					
20. Learning materials					
Lecture Notes					
Effective date	10 October 2019	This Subject Datasheet is valid for		Inactive courses	

