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

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.
In the second half of the subject, high-level control planning and optimization techniques are described. Soft Computing Methods, Fuzzy Theory, Genetic Algorithms, Optimization.

15. Description of practices

16. Description of labortory practices

Implementation of the methods learned during the lectures, by using MATLAB, Simulink and embedded platforms

17. Learning outcomes

A. Knowledge
- 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

B. Skills
- is able to design and analyze discrete linear controllers
- is able to apply basic soft-computing techniques

C. Attitudes
- is interested in modern IT solutions
- capable of algorithmic thinking that can be applied in other areas

D. Autonomy and Responsibility
- 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