



1. Subject name	Reinforcement Learning for vehicle control				
2. Subject name in Hungarian	Megerősítéssel tanulás a járműirányításban				
3. Code	BMEKOKAD017	4. Evaluation type	exam grade	5. Credits	3
6. Weekly contact hours	2 (0) Lecture	0 (0) Practice	0 (0) Lab		
7. Curriculum	PhD Programme	8. Role	Specific course		
9. Working hours for fulfilling the requirements of the subject					90
Contact hours	28	Preparation for seminars	14	Homework	30
Reading written materials	0	Midterm preparation	0	Exam preparation	18
10. Department	Department of Control for Transportation and Vehicle Systems				
11. Responsible lecturer	Dr. Bécsi Tamás				
12. Lecturers	Dr Bécsi Tamás, Dr. Aradi Szilárd				
13. Prerequisites					
14. Description of lectures	Problem solving, placement in machine learning. Heuristics, dynamic and static heuristics. Effectiveness and complexity of algorithms. Curse of dimensions. The Markov decision model, the hidden Markov decision model. Traceability problem. Classic solutions for self-learning systems, case study for routing algorithms. Fundamentals of neural networks, supervised teaching, general network structures. Discrete, continuous and regular tasks. Reverse learning, Imitation learning. Demonstrator and demonstration, policy, loss function and algorithms. Value based learning, Q-learning. The exploration-exploitation dilemma. Variations of Q learning, Deep Q, DQN. Behavior based learning algorithms, Policy gradients, deterministic, and stochastic policy.				
15. Description of practices					
16. Description of laboratory practices					
17. Learning outcomes	A. Knowledge B. Skills C. Attitudes D. Autonomy and Responsibility				
18. Requirements, way to determine a grade (obtain a signature)	Final exam and three homeworks.				
19. Opportunity for repeat/retake and delayed completion					
20. Learning materials					
Effective date	27 November 2019	This Subject Datasheet is valid for	Inactive courses		