



1. Subject name	Automotive network and communication systems
------------------------	---

2. Subject name in Hungarian	Automatizált járművek kommunikációs rendszerei
-------------------------------------	--

3. Code	BMEKOGGM709	4. Evaluation type	mid-term grade	5. Credits	4
----------------	--------------------	---------------------------	----------------	-------------------	---

6. Weekly contact hours	2 (28) Lecture	0 (0) Practice	2 (28) Lab
--------------------------------	----------------	----------------	------------

7. Curriculum	Autonomous Vehicle Control Engineering MSc (A)	8. Role	Mandatory (mc) at Autonomous Vehicle Control Engineering MSc (A)
----------------------	--	----------------	--

9. Working hours for fulfilling the requirements of the subject	120
--	-----

Contact hours	56	Preparation for seminars	10	Homework	20
----------------------	----	---------------------------------	----	-----------------	----

Reading written materials	34	Midterm preparation	0	Exam preparation	0
----------------------------------	----	----------------------------	---	-------------------------	---

10. Department	Department of Automotive Technologies
-----------------------	---------------------------------------

11. Responsible lecturer	Dr. Szalay Zsolt
---------------------------------	------------------

12. Lecturers	Dr. Tihanyi Viktor
----------------------	--------------------

13. Prerequisites	
--------------------------	--

14. Description of lectures	
------------------------------------	--

The target is to present the communication systems of vehicles with advanced driver assistance systems. ECU level communications, communication types between ECU-s like CAN, LIN, MOST, FlexRay, Ethernet. Communication between vehicles, V2x. ADAS related localization and mapping systems and their communication protocols. Cyber security aspects. Electromagnetic compatibility. Diagnosis and testing and validation of communication systems.

Topics include:

- Network and Communication systems introduction
- ECU level communications, UART, SPI, I2C, Parallel
- Communication between ECU, CAN
- Communication between ECU, LIN
- Communication between ECU, MOST
- Communication between ECU, Flexray
- Communication between ECU, Automotive Ethernet
- Vehicle level communication, V2x
- ADAS mapping communication
- Cyber security
- Electromagnetic compatibility
- Diagnostics
- Testing and validation of vehicle communication systems

15. Description of practices	
-------------------------------------	--

16. Description of laboratory practices	
--	--

The lab enables the practical implementation of individual student work. Some of the systems presented in the presentation are also presented in practice.

17. Learning outcomes	
------------------------------	--

A. Knowledge

- knows the automotive communication systems
- knows the communication technologies of the automotive industry
- is familiar with the communication security issues of automotive systems
- knows electromagnetic compatibility issues of communication systems, their testing and validation

B. Skills

- is able to use in-vehicle communication protocols
- is capable of designing appropriate communication interfaces
- can select a protocol for a particular autonomous vehicle function

C. Attitudes

- responsive to understanding new communication solutions

D. Autonomy and Responsibility

- takes responsibility of the work done

18. Requirements, way to determine a grade (obtain a signature)

Individual homework which determines the final grade.

19. Opportunity for repeat/retake and delayed completion

Delayed completion of individual homework.

20. Learning materials

Lecture Notes

Effective date	10 October 2019	This Subject Datasheet is valid for	2023/2024 semester II
-----------------------	-----------------	--	-----------------------
