



1. Subject name	Automotive vehicle systems				
2. Subject name in Hungarian	Közúti járművek szerkezetana				
3. Code	BMEKOGGM712	4. Evaluation type	mid-term grade	5. Credits	4
6. Weekly contact hours	2 (28) Lecture	0 (0) Practice	1 (14) Lab		
7. Curriculum	Autonomous Vehicle Control Engineering MSc (A)	8. Role	Optional (oc) at Autonomous Vehicle Control Engineering MSc (A)		
9. Working hours for fulfilling the requirements of the subject					120
Contact hours	42	Preparation for seminars	10	Homework	20
Reading written materials	28	Midterm preparation	20	Exam preparation	0
10. Department	Department of Automotive Technologies				
11. Responsible lecturer	Dr. Zöldy Máté				
12. Lecturers	Nyerges Ádám				
13. Prerequisites					
14. Description of lectures					
<p>The target of the subject is to present the vehicle systems and structures. Within the framework of the subject the vehicle engines, transmissions, suspension systems, brake systems and frame structures are taught. In the Autonomous Vehicle Control Engineers MSc tematics, the target of the subject is to caught up the <a href="#">students</a>, who do not have vehicle engineer BSc. By the subject the <a href="#">students</a> are able to recognise the important parts and systems of road vehicles, they know their function and operation.</p> <p>Structures of road vehicles, vehicle categories according to UN, elements and orientation of the transmission system.</p> <p>The types and the operation of internal combustion engines, fuels, emission.</p> <p>The geometry of the cranktrain, the indicator diagram, the power, the torque, the efficiency and the fuel consumption of the internal combustion engines.</p> <p>Structure of internal combustion engines, lubrication system, cooling system.</p> <p>Fuel systems and charging of internal combustion engines.</p> <p>Wheel dimensions, tyre parameters, suspension geometry, Ackermann governing.</p> <p>Structure an operation of clutches and manual transmissions.</p> <p>Dual clutch transmissions, hydrodynamical clutch and gearboxes.</p> <p>Planetary gear. Automatized and automatic transmission systems.</p> <p>Final gears, differentials, wheel bearings.</p> <p>Types of suspension systems, shock absorbers.</p> <p>Hydraulic brake systems, ABS.</p> <p>Air brake systems.</p> <p>Frameworks and structures of road vehicles, passive safety systems.</p>					
15. Description of practices					
16. Description of labortory practices					
<p>Vehicle presentation: cross-engine front-wheel drive vehicle.</p> <p>Vehicle presentation: long-wheel-drive rear-wheel drive vehicle.</p> <p>Vehicle Show: Bus.</p> <p>Engine Assembly.</p> <p>Brake pad measurement of internal combustion engine characteristics.</p> <p>Measuring and controlling the brake booster of an internal combustion engine.</p> <p>Mounting of manual transmissions.</p> <p>Clutch and differential assembly.</p> <p>Brake System Presentation.</p>					
17. Learning outcomes					

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#### A. Knowledge

- knows the basic structure of road vehicles
- knows the operation of the internal combustion engine, its lubrication and cooling systems, and processes
- knows the indicator diagram, performance and efficiency of internal combustion engines
- knows the basic wheel models and the Ackermann steering
- is familiar with the basic structure and operating principles of knobs and transmissions
- knows the types and operating principles of automated transmissions
- is familiar with the models describing the types of running gear and their general operation
- is familiar with the principles and operation of braking systems
- knows the basic passive safety solutions.

#### B. Skills

- is able to test and evaluate the basic systems of vehicles
- is able to perform simple vehicle diagnostic tasks in case of appropriate model-specific further education
- is capable of creating the operating models of various vehicle elements
- is capable of jointly examining vehicle structure models, modeling a complete drive chain

#### C. Attitudes

- strives to better understand vehicle structures, research and explore new solutions
- open to technical approaches to problems and tasks raised by new systems
- is able to carry out the assigned tasks in a team

#### D. Autonomy and Responsibility

- is able to independently model an unknown vehicle structure solution
- can independently process vehicle diagnostic results
- is responsible for evaluating a diagnostic measurement task

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

The semester mark reflects the results of the two midterm tests and the homework (1/3-1/3-1/3 weight). Participation in the lab, the two successful midterm tests and the accepted homework are the prerequisite for fulfilling the subject.

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### 19. Opportunity for repeat/retake and delayed completion

One midterm test can be retried, tasks must be given accurately.

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### 20. Learning materials

Automotive Engines and Testing note

Automotive Engines I-II. note

Vehicle Power Transmission Note I.

Vehicle Suspension I-II. note

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<b>Effective date</b>	10 October 2019	<b>This Subject Datasheet is valid for</b>	Inactive courses
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