Budapest University of Technology and Economics
Faculty of Transportation Engineering and Vehicle Engineer...

1. Subject name	**Vehicle operation**				
2. Subject name in Hungarian	Gépjárművek üzeme				
3. Code	**BMEKOGGM174**	4. Evaluation type	exam 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	28	Homework	0
Reading written materials	12	Midterm preparation	10	Exam preparation	28

10. Department	**Department of Automotive Technologies**
11. Responsible lecturer	Dr. Szalay Zsolt
12. Lecturers	Dr. Török Árpád
13. Prerequisites	

14. Description of lectures

Time frame, maintenance, energy-, material and information technological environment of the vehicle operation. Characteristic uncertainties in the vehicle operation and vehicle dimensioning. Basics of probability analysis. Practical methods of reliability analysis: block -diagram method and fault-tree analysis. Random faults and defects in vehicle operation. Methods of determining reliabilty and availability. Availability definitions. Renewal processes. Modelling of operation processes by semi-Markovian approach. Application of the theory of mass service systems. Queueing problem. Optimum storing processes. Elements of material damages, leading to component failures. General approach to system diagnosis. Vehicle diagnosis based on dynamical simulation for ensureing the criteria presribed by transportation safety rules. Identification of the weak-spots using diagnostic tests.

15. Description of practices

16. Description of labortory practices

Vehicle Damage, Slip Brake Brake Test, Chassis Control, Adjustment, Wheel Balancing, Shock Diagnostic Methods, Engine Mechanical Status Diagnostics, Accident Data Recording Equipment (UDS) Data Processing, [Presentation] of Modern Diagnostic Station, where students become familiar with Periodic Technical Review Technology as described below :
Identification, Testing of accessories, Checking of traction conditions, Devices for measuring noise and used diagnostic tests for establishing conditions of circulation.

17. Learning outcomes

A. Knowledge
- is familiar with the basic tasks, principles and methods of vehicle operation
- is familiar with the maintenance, repair and wear and tear of the entire vehicle life cycle
- knows vehicle diagnostic processes, methods, protocols
- is familiar with modern testing methods, environmental compliance principles and regulations
- acquire knowledge in various repair technologies

B. Skills
- is able to interpret the results of different test methods
- is familiar with the process of recording accident data and the associated processing process to perform such a task
- is able to consult a specialist on various maintenance processes, to consider the risks
- is able to participate in the design of a modern maintenance process
- is able to perform planning tasks related to vehicle life cycle

C. Attitudes
- Interested in vehicle operation

- Suitable for taking environmental concerns into account when designing
- Suitable for participating in a multi-field team

D. Autonomy and Responsibility
- Can assess the vehicle diagnostic results responsibly
- Can independently make decisions in vehicle maintenance decisions

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

One midterm exam and individual lab works. The final grade is the result of the exam.

19. Opportunity for repeat/retake and delayed completion

In the delayed completion period the midterm exam can be retaken or one of the individual lab works can be completed.

20. Learning materials

Lecture Notes

| **Effective date** | 10 October 2019 | **This Subject Datasheet is valid for** | 2024/2025 semester II |