



1. Subject name	Diesel and electric traction				
2. Subject name in Hungarian	Dízel- és villamos vontatás				
3. Code	BMEKOVRM610	4. Evaluation type	exam grade	5. Credits	5
6. Weekly contact hours	3 (16) Lecture	1 (5) Practice	0 (0) 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					150
Contact hours	56	Preparation for seminars	10	Homework	10
Reading written materials	42	Midterm preparation	12	Exam preparation	20
10. Department	Department of Aeronautics and Naval Architectures				
11. Responsible lecturer	Dr. Szabó András				
12. Lecturers	Dr. Szabó András, Hillier István, Kiss Csaba				
13. Prerequisites					
14. Description of lectures					
Design properties of railway Diesel engines, dynamical processes of injection and control systems. Turbocharging systems of railway diesel engines. Analysing of the vibrations caused by powertrain elements. Functional properties of Diesel-hydraulic and Diesel-electric powertrain systems, machine-group optimization, transient operation processes. Energy supply of the electric vehicles, pantograph systems, protection and safety-technique features. Electro-mechanical and controlled systems of the electric traction units. Analysis of the work done and energy-consumption of Diesel and electric traction units.					
15. Description of practices					
In the framework of practical lessons solving tasks connected with the themes of the lectures. Suiting of the transmission systems elements, determination of the interaction curves.					
16. Description of laboratory practices					
17. Learning outcomes					

A. Knowledge

- Understands and applies the upload systems of railway diesel engines and the theoretical background of their operation.
- Understands and can apply the mathematical procedures which are appropriate to solve the problems of the railway power transmission.
- Understands and competently applies the methods which are appropriate to determine the characteristics of the energetic and environment-load of railway traction.

B. Skills

- Able to apply the required mathematical and technological knowledge for solving the problems of the railway traction.
- Able to identify, to evaluate and manage by system-approach the effect mechanism of the railway traction systems and processes.
- Able to execute the condition surveys connected with diesel and electric traction, and based on this able to elaborate the complex developing proposals.

C. Attitudes

- Open and receptive to know the development possibilities and knowledges which are taken place on the field of the railway traction.
- Accepts the professional and ethical values-system connected with the professional area of the railway.
- Pursuing to develop of new the methods and tools connected with the railway traction.
- Pursuing to use complex and on system-oriented mentality based approach in the work.

D. Autonomy and Responsibility

- Pro-activity in the solution of professional tasks, the self-standing application of the knowledges.

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

During the semester there is necessary the individual solving of some tasks (ability, attitude, responsibility). The criterion of signature is both the active participation at the class (attitude), and the complete solving of the semester's tasks (knowledge, ability, autonomy). During the semester there is necessary to successfully write two midterm tests (knowledge, ability, autonomy). In the fields of attitudes and autonomy the results achieved in the semesters are included in the final classification by weight 50%. At the end of semester there is an examination (knowledge, ability, attitude).

19. Opportunity for repeat/retake and delayed completion

Possibility to refit the control works and the homeworks, to repeat the examination, properly to the Study and Exam Regulations.

20. Learning materials

Gábor P.: Villamos vasutak. Department's publication.

Varga J. (sz): Vasúti Diesel-vontatójárművek, Technical Publisher, Bp. 197-

Szüle D.: Hidrodinamikusan erőátvitel. Technical Publisher, Budapest, 197-

Zobory I.: Hidrodinamikusan erőátvitel. Department's publication. BME VJT, Bp. 200-

Szabó A.: Villamos erőátvitel. Department's publication, BME VJT, Bp. 200-

Varga Jenő: Vasúti diesel vontatójárművek. Bp. 197-

Other department's publications.

Effective date	10 October 2019	This Subject Datasheet is valid for	Inactive courses
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