

TANTÁRGYI TEMATIKA ÉS TELJESÍTÉSI KÖVETELMÉNYEK
2019/2020. I. FÉLÉV

Cím	ROAD AND RAILWAY DESIGN 1.
Tárgykód	MSB231AN-EA_00; MSB231AN-GY-01
Heti óraszám: ea/gy/lab	2/1/0
Kreditpont	4
Szak(ok)/ típus	Civil Engineering
Tagozat	Full Time
Követelmény	Examination (with grade)
Meghirdetés féléve	2019-2020/1 (Autumn Term)
Előzetes követelmény(ek)	Basics of Physics, Mathematics and Soil Mechanics
Oktató tanszék(ek)	Department of Civil Engineering
Tárgyfelelős és oktatók	Dr. András Timár, professor emeritus

TANTÁRGY CÉLKITŰZÉSE/OBJECTIVES

Célok/Objectives: The Course is dealing mainly with road engineering, being a discipline branching from Civil Engineering, that involves the planning, design, construction and maintenance of roads, aiming to ensure safe and effective transport of people and goods. Its objective is to provide appropriate knowledge concerning: (i) basic principles of planning and design of road infrastructure; (ii) locate the alignment of a road and its adaptation to the requirements of environmental protection and safety; (iii) technologies of road construction and maintenance.

TARTALMA/CONTENTS

Rövid leírás/Short description: Students will be prepared to design the horizontal and vertical alignment of roads and intersections/interchanges, taking into account expected future traffic flows. It will be explained, how to select appropriate building materials and apply quality control measures related to flexible (asphalt concrete) and rigid (cement concrete) pavements. Development of methods used for structural design of pavement is demonstrated. Road geometric design primarily refers to the visible elements of roads, but civil engineers must also consider environmental and social impacts of their design on the surrounding infrastructure and pavement maintenance in the future. Considerations will be properly addressed, how to fit a road successfully to a site's topography, including an efficient drainage system. A broad overview of traffic signs and markings, road accident analysis and safety concerns will be carried out. Technologies for building and maintaining roads have evolved over time and become increasingly sophisticated, therefore should be considered as part of road design and maintenance know-how. Finally the objectives and conditions of successful implementation of a Pavement Management Systems (PMS) will be discussed.

Témakörök/Topics: Physics of vehicles moving on a road, Alignment, Junctions, Road signs, Traffic Flow characteristics, Road accidents, Road building materials, Pavements' dimensioning, Construction and maintenance.

Előadás/Lecture:

Weeks & Dates

1. 02.09.2019. History of Roads and Road Transport
2. 09.09.2019. Vehicle's Motion on the Road - Resistances - Sight Distances & Geometric Elements
3. 16.09.2019. Elements and Co-ordination of Horizontal & Vertical Alignment
4. 23.09.2019. Junctions, Intersections & Interchanges
5. 30.09.2019. Road Signs, Signals & Pavement Markings
6. 07.10.2019. Traffic Flow Analysis - Capacity & Level of Service
7. 14.10.2019. **Mid-Term Written Examination**
8. 21.10.2019. Road Traffic Accidents
9. 28.10.2019. *Mid-Term Recess*
10. 04.11.2019. Materials of Asphalt Mixtures & Quality Control
11. 11.11.2019. Flexible & Rigid Pavements – Drainage Systems
12. 18.11.2019. Pavement Design and Dimensioning
13. 02.12.2019. Road Construction Technologies
14. 09.12.2019. Road Maintenance and Pavement Management

Following each Lecture slides related to it will become downloadable using the following link:

ftp://witch.pmmf.hu:2001/Tanszeki_anyagok/Epitomernok_Tanszek/Timar_Andras/Road_and_Railway_Design_1/

Gyak/Lab/Exercises/Home Work: Solving at Home (individually) the Numerical Examples related to Lectures No. 2, 3, 5, 7 and 10. Typical numerical examples with suggested solutions will be made downloadable using the same link given above. Following each Lecture, an appropriate consultation period is available to seek for guidance, aiming to overcome eventual difficulties encountered when students are looking for solution of these numerical examples at home.

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE/REQUIREMENTS & EVALUATION METHODS

Részvétel/Participation: It is required to attend all lectures (to be controlled), while attendance will impact the grade (max. 20%). Unexcused absences will adversely affect the grade and in case of absence from more than 30% of the total number of lectures will be grounds for failing the entire Course. To be in class at the starting time and stay there until the scheduled end of the lecture is required, delayed arrival or early departure of more than 20 minutes will be considered as an absence. In the case of an illness or family emergency, a valid written excuse, such as a doctor's note should be presented.

Félévközi jegy feltétele/Conditions of Acknowledgement:

- Attendance of lectures, in-class activity (attending minimum 30% of the lectures)
- Passing the quiz-like (22 Questions, each with 3 optional Answers + 3 Numerical Examples), written Mid-Term Examination (*Scope:* Lectures 1-6) - repeated failure involves denial to attend the final written examination

Vizsga/Final Examination: Passing the quiz-like (22 Questions, each with 3 optional Answers + 3 Numerical Examples), written Final Examination (*Scope:* All Lectures), within the Examination Period. Each right answer's value is 3 point, each rightly solved example's value is 11 points, thus the maximum achievable sum of points equals 99.

Az érdemjegy kialakításának módja/*Calculation of Final Grade:*

- 20% - Attendance (A)
- 30% - Mid-term written examination (MTE)
- 50% - Final written examination (FE)

$$\text{Final Grade} = 0.2 \times A + 0.3 \times \text{MTE} + 0.5 \times \text{FE}$$

Points achieved	99-85	84-75	74-65	64-50	49 or less
GRADE	5 (excellent)	4 (good)	3 (fair)	2 (passable)	1 (failed)


KÖTELEZŐ ÉS AJÁNLOTT IRODALOM/*RECOMMENDED READINGS*

- [1.] **Daniel J Findley, Bastian Schroeder, Christopher Cunningham, Tom Brown:** *Highway Engineering: Planning, Design and Operations*. Elsevier Inc. (2016)
<https://www.amazon.com/Highway-Engineering-Planning-Design-Operations/dp/012801248X>
- [2.] **Design Manual for Roads and Bridges (UK)**
<http://www.standardsforhighways.co.uk/ha/standards/dmrb/index.htm>
- [3.] **Highways England:** *Guidance - Standards for Highways online resources*
<https://www.gov.uk/guidance/standards-for-highways-online-resources>
- [4.] **New York State Department of Transportation (USA):** *Highway Design Manual*
<https://www.dot.ny.gov/divisions/engineering/design/dqab/hdm>
- [5.] **Transportation Research Board (TRB):** *Highway Capacity Manual* (Online Edition 2010)
<http://hcm.trb.org/?qr=1>

ÜTEMEZÉS

		SZORGALMI IDŐSZAK, OKTATÁSI HETEK															VIZSGAIDŐSZAK				
2019/2020. I. FÉLÉV		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	1.	2.	3.	4.	5.
Előadás tematika sorszáma		1	2	3	4	5	6	EX	7		8	9	10	11	12	EX					
Gyakorlat/Labor sorszáma																					
Zárthelyi dolgozat								EX													
Otthoni munka	kiadása		1	2		3			4				5								
	beadási határidők																				
Jegyző-könyvek	beadási határidők																				
Egyebek	pl. beszámolók,																				
	stb.																				
Aláírás / Félévközi jegy megadása																a /fj					
Vizsgák tervezett időpontjai																	EX	EX	EX		

2019. szeptember 1.


Dr. Timár András
 tantárgyfelelős