COURSE SYLLABUS
SEMESTER AUTUMN 2022/2023

Name of Couse	**Road and Railway Design 1.**
Couse Code	**MSB231ANEP**
Allotment of Hours per Week	**2 lectures, 1 practice**
Number of Credits	**4**
Program	**Civil Engineer BSc**
School	**full-time**
Evaluation	**exam**
Semester	**Autumn 5th**
Prerequisites	**-**
Department	**Civil Engineering**
Instructors	***Eller Balázs***

INTRODUCTION, GENERAL COUSE DESCRIPTION

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.

LEARNING OBJECTIVES

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.

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.

Topic names:

History of Roads and Road Transport
Vehicle's Motion on the Road - Resistances - Sight Distances & Geometric Elements
Elements and Co-ordination of Horizontal & Vertical Alignment
Junctions, Intersections & Interchanges
Road Signs, Signals & Pavement Markings
Traffic Flow Analysis - Capacity & Level of Service
Road Traffic Accidents
Materials of Asphalt Mixtures & Quality Control
Flexible & Rigid Pavements – Drainage Systems
Pavement Design and Dimensioning
Road Construction Technologies
Road Maintenance and Pavement Management

Practice:
Solving at Home (individually) the Numerical Examples related to Lectures No. 2, 3, 5. 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.

ATTENDANCE AND GRADING

Attendance:

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.

Signature / Semester Rating Condition:

Attendance of lectures, in-class activity (attending minimum 70% of the lectures)

Exam:

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

Composition of final grade:

2 mid-term test (sum 40 pts), 1 exam (sum 45 pts), 3 homeworks (sum 15 pts)

%	Grades
85-100	5

70-84,5	4
55-69,5	3
40-54,5	2
0-39,5	1

READINGS AND REFERENCE MATERIALS

[1.] Daniel J Findley, Bastian Schroeder, Christopher Cunningham, Tom Brown: Highway Engineering: Planning, Design and Operations. Elsevier Inc. (2016)

[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)

[6] Lecture notes

SCHEDULE

		TERM OD STUDY, WEEKS OF EDUCATION															EXAM PERIOD				
SEMESTER SPRING 2019/2020		**1.**	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**	**8.**	**9.**	**10.**	**11.**	**12.**	**13.**	**14.**	**15.**	**1.**	**2.**	**3.**	**4.**	**5.**
Lecture topics Nr.		x	x	x	x	x	x	planned field trip	x		x	x	x	x	x	x					
Practice/Lab Nr.		x	x	x	x	x	x		x		x	x	x	x	x	x					
Closed thesis																					
Home work	**outgoing**		x	x		x															
	submission deadlines																				
Records	**submission deadlines**														x						
Others	**e.g. reports**																		Signature, mid-tern grade cannot be replaced		
	Test								x						x	x					
Signature / Mid-term grade																s/gr					
Scheduled dates for exams																					

September 4th, 2022

Eller Balázs

Instructors