

COURSE SYLLABUS AND COURSE REQUIREMENTS

ACADEMIC YEAR 2024-2025 SEMESTER I.

<i>Course title</i>	<i>Road pavements and railway structures</i>
<i>Course Code</i>	<i>MSB233AN</i>
<i>Hours/Week: le/pr/lab</i>	<i>2/0/0</i>
<i>Credits</i>	<i>3</i>
<i>Degree Programme</i>	<i>Civil engineering BSc</i>
<i>Study Mode (TVSZ-ben training schedule)</i>	<i>full time</i>
<i>Requirements</i>	<i>mid-term grade</i>
<i>Teaching Period</i>	<i>autumn</i>
<i>Prerequisites</i>	<i>-</i>
<i>Department(s)</i>	<i>Civil Engineering</i>
<i>Course Director</i>	
<i>Teaching Staff</i>	<i>Balázs Eller</i>
<i>Hours/Week: le/pr/lab</i>	<i>2/0/0</i>

COURSE DESCRIPTION

A short description of the course (max. 10 sentences).

Neptun: Instruction/Subjects/Subject Details/Basic data/Subject description

Types, composition and functions of road pavement structures, their climatic and traffic loading, deterioration features. Theoretical and practical pavement structure design methods, analytic road pavement structure design. Road pavement structural design software. Design of the strengthening of existing road pavement structures. Earthworks for road pavement structures. Characterization of the condition of existing road structures. New structure design. Strengthening of the asphalt pavement. Base layers, pavement bases. Asphalt mixes for road construction. Analysis of asphalt mixes. Asphalt and concrete pavements, and their maintenance tasks. Stone pavements, the idea of preventive maintenance, surface dressings, recycling and re-use innovative technologies.

The dynamics of the railways. The elements of the superstructure: rail, sleeper, fastenings, ballast. The strengthening of the structure by protection layer. Level crossings, and extraordinary types of superstructures. The structural design of turnouts. The structure of the welded tracks. Superstructures of high speed railways.

SYLLABUS

Neptun: Instruction/Subjects/Subject Details/Syllabus

1. GOALS AND OBJECTIVES

Goals, student learning outcome.

Neptun: Instruction/Subjects/Subject Details/Syllabus/Goal of Instruction

By the end of the course, students should have a solid foundation in road pavement and railway structure principles, enabling them to contribute to the efficient and sustainable development of transportation infrastructure. They should be capable of analyzing and designing road pavements, evaluating railway structures, and making informed decisions regarding maintenance and rehabilitation strategies.

2. COURSE CONTENT

Neptun: Instruction/Subjects/Subject Details/Syllabus/Subject content

TOPICS

LECTURE

1. *Road Condition and maintenance*
2. *New structure design*
3. *Base of the pavements*
4. *Concrete pavements*
5. *Road Strengthening*
6. *Railway structures*

PRACTICE

7. The Railway substructure and protection layers
8. The rail and the connections
9. The fastenings and the sleepers
10. The railway ballast

DETAILED SYLLABUS AND COURSE SCHEDULE

ACADEMIC HOLIDAYS INCLUDED

LECTURE

week	Topic	Compulsory reading; page number (from ... to ...)	Required tasks (assignments, tests, etc.)	Completion date, due date
1.	Introduction, details			
2.	Road Condition and maintenance	PPT Nr. 1.		
3.	New structure design	PPT Nr. 2.		
4.	Base of the pavements	PPT Nr. 3.		
5.	Concrete pavements	PPT Nr. 4.		
6.	Road Strengthening	PPT Nr. 5.		
7.	TEST		TEST 1.	
8.	Railway structures	PPT Nr. 7.		
9.	AUTUMN BREAK			
10.	The Railway substructure and protection layers	PPT Nr. 8.		
11.	The rail and the connections	PPT Nr. 9.		
12.	The fastenings and the sleepers	PPT Nr. 10.		
13.	The railway ballast	PPT Nr. 11.		
14.	TEST		TEST 2.	

3. ASSESSMENT AND EVALUATION

(Neptun: Instruction/Subjects/Subject Details/Syllabus/Examination and Evaluation System)

ATTENDANCE

In accordance with the Code of Studies and Examinations of the University of Pécs, Article 45 (2) and Annex 9. (Article 3) a student may be refused a grade or qualification in the given full-time course if the number of class absences exceeds 30% of the contact hours stipulated in the course description.

Method for monitoring attendance (e.g.: attendance sheet / online test/ register, etc.)

Attendance sheet.

ASSESSMENT

Cells of the appropriate type of requirement is to be filled out (course-units resulting in mid-term grade or examination). Cells of the other type can be deleted.

Course-unit with final examination

Mid-term assessments, performance evaluation and their weighting as a pre-requisite for taking the final exam

(The samples in the table to be deleted.)

Type	Assessment	Weighting as a proportion of the pre-requisite for taking the exam
1. Test 1	max. 25 points	50 %
2. Test 2	max. 25 points	50 %

Requirements for the end-of-semester signature

(Eg.: mid-term assessment of 40%)

mid-term assessment of 40%

Re-takes for the end-of-semester signature (PTE TVSz 50§(2))

The specific regulations for grade betterment and re-take must be read and applied according to the general Code of Studies and Examinations. E.g.: all the tests and the records to be submitted can be repeated/improved each at least once every semester, and the tests and home assignments can be repeated/improved at least once in the first two weeks of the examination period.

All the assignments can be fixed once, all the tests can be retaken.

Type of examination (written, oral):written

The exam is successful if the result is minimum 40 %. (The minimum cannot exceed 40%.)

Calculation of the grade (TVSz 47§ (3))

The mid-term performance accounts for 50 %, the performance at the exam accounts for 50 % in the calculation of the final grade.

Calculation of the final grade based on aggregate performance in percentage.

Course grade	Performance in %
excellent (5)	85 % ...
good (4)	70 % ... 85 %
satisfactory (3)	55 % ... 70 %
pass (2)	40 % ... 55 %
fail (1)	below 40 %

The lower limit given at each grade belongs to that grade.

4. SPECIFIED LITERATURE

In order of relevance. (In Neptun ES: Instruction/Subject/Subject details/Syllabus/Literature)

COMPULSORY READING AND AVAILABILITY

[1.] Lecture notes (can be found in TEAMS)

RECOMMENDED LITERATURE AND AVAILABILITY

- [1] Wolfgang Kühn: Fundamentals of Road Design, WIT Press, 2013, p. 327, ISBN 978-1-84564-097-2
- [2] J. S. Mundrey: Railway Track Engineering, Tata McGraw-Hill Education, 2010, p. 630, ISBN 978-0-07-068012-8
- [3] Sz. Fischer, B Eller., Z. Kada, A. Németh: Railway construction, University of Győr, 2015,