

COURSE SYLLABUS AND COURSE REQUIREMENTS

ACADEMIC YEAR 2025/2026 SEMESTER 1

<i>Course title</i>	REHABILITATION OF STRUCTURES
<i>Course Code</i>	MSM408AN
<i>Hours/Week: le/pr/lab</i>	2/0/0
<i>Credits</i>	2
<i>Degree Programme</i>	Structural Engineering MSc
<i>Study Mode</i>	Full time
<i>Requirements</i>	Midterm grade
<i>Teaching Period</i>	Fall semester (1)
<i>Prerequisites</i>	
<i>Department(s)</i>	Department of Civil Engineering
<i>Course Director</i>	Dr. Zoltan Orban
<i>Teaching Staff</i>	

COURSE DESCRIPTION

This course is aimed to provide basic and advanced knowledge on the principles of the rehabilitation and strengthening of structures constructed from various types of materials. Topics covered by the course include: deterioration of structural materials and structures, assessment of structures, basic principles of structural rehabilitation and strengthening, concrete and masonry repairs, methods of strengthening steel, concrete and timber structures, introduction of specific technologies such as strengthening with shotcrete, strengthening and repair with high performance concrete (HPC), strengthening with fibre reinforced plastics (FRP), design examples and case studies on strengthening bridges, buildings and other civil engineering structures.

SYLLABUS

1. GOALS AND OBJECTIVES

The aim of this course is to provide general knowledge about rehabilitation of engineering structures.

Students will gain from this course:

- Knowledge on the principles of rehabilitation and strengthening of civil engineering structures,
- Understanding of the deterioration processes of structural materials,
- Knowledge on the assessment methods of deteriorated structures,
- Overview on specific repair and strengthening methods of structures built from various construction materials.

2. COURSE CONTENT

TOPICS

LECTURE

1. Principles of rehabilitation. Reliability concept.
2. Deterioration and rehabilitation of concrete and reinforced concrete structures
3. Strengthening with FRP materials. Near surface reinforcing systems.
4. Repair and strengthening of masonry structures and bridges.
5. Seismic retrofit.
6. Specific strengthening materials and methods.

DETAILED SYLLABUS AND COURSE SCHEDULE

ACADEMIC HOLIDAYS INCLUDED

LECTURE

week	Topic	Compulsory reading	Required tasks	Completion date
1	Introduction.			
2	Basic terms. Principles of rehabilitation. Reliability concept.			
3	Deterioration of concrete and reinforced concrete structures.	[1], [4]		

4	Rehabilitation of concrete and reinforced concrete structures.	[1], [3], [4]		
5	Strengthening with FRP materials.	[1], [2]		
6	Near surface reinforcing systems.			
7	Repair and strengthening with high performance concrete.	[1], [3], [4]		
8	<i>Autumn break</i>			
9	Repair and strengthening of masonry structures and bridges.	[1]		
10	Repair and strengthening of masonry structures and bridges II.	[1]		
11	Specific strengthening materials and methods. Seismic retrofit.	[1] [2]		
12	Student's presentations /Assignment 2/		Assignment 1 and 2	24 November
13	Exam		Exam	1 December
14	Student's presentations, re-take exam		Assignment 2	8 December

3. ASSESSMENT AND EVALUATION

Attendance

Absences from lectures during the semester must not exceed 30%.

Method for monitoring attendance

Attendance sheet

ASSESSMENT

Course resulting in mid-term grade (PTE TVSz 40§(3))

Mid-term assessments, performance evaluation and their ratio in the final grade (The samples in the table to be deleted.)

Type	Assessment	Ratio in the final grade
Assignment 1: Essay	max 25 points	25 %
Assignment 2: Presentation	max 25 points	25 %
Exam test	max 50 points	50 %

Opportunity and procedure for re-takes (PTE TVSz 47§(4))

During the 13th week and the first week of the exam period, you can re-take or correct the Exam once.

Grade calculation as a percentage

based on the aggregate performance according to the following table

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

COMPULSORY READING AND AVAILABILITY

[1] Presentation materials in digital format /downloadable/

RECOMMENDED LITERATURE AND AVAILABILITY

[2] Externally bonded FRP reinforcement for RC structures, fib Bulletin 14., 2001.

- [3] "Case Studies of Rehabilitation, Repair, Retrofit and Strengthening of Structures", ISBN 978-3-85748-124-6
- [4] EN 1504 European standard series