

## COURSE SYLLABUS AND COURSE REQUIREMENTS

ACADEMIC YEAR 2022/23 SEMESTER 2.

<i>Course title</i>	<i>Prestressing Technologies</i>
<i>Course Code</i>	MSM409ANEP
<i>Hours/Week: le/pr/lab</i>	1/1/0
<i>Credits</i>	2
<i>Degree Programme</i>	Structural Engineering MSc
<i>Study Mode</i>	full time
<i>Requirements</i>	mid-term grade
<i>Teaching Period</i>	Spring semester (2.)
<i>Prerequisites</i>	
<i>Department(s)</i>	Department of Civil Engineering
<i>Course Director</i>	Dr. Zoltán Orbán
<i>Teaching Staff</i>	Saied Kashkash

## COURSE DESCRIPTION

Topics covered in the course include: basic concept of prestressing, prestressing systems and technologies, stress distribution in prestressed concrete structures, determination of stress losses, flexural and shear behaviour at service and ultimate limit states, deflection and crack control, design for serviceability and ultimate limit states, design of prestressed beams and slabs, external prestressing, strengthening with prestressing, durability and maintenance of prestressed concrete structures.

## SYLLABUS

### 1. GOALS AND OBJECTIVES

This course is aimed at providing basic and advanced knowledge on the mechanism, construction methods and design of prestressed concrete structures.

### 2. COURSE CONTENT

#### TOPICS

<b>LECTURE</b>	<ol style="list-style-type: none"><li>1. <i>Concept of Prestressing</i></li><li>2. <i>Methods of Prestressing</i></li><li>3. <i>Pre-tensioned / post tensioned systems</i></li><li>4. <i>Elastic analysis, flexural and shear</i></li><li>5. <i>Losses in prestressing</i></li></ol>
<b>PRACTICE</b>	<ol style="list-style-type: none"><li>1. <i>Pre-tensioned beam design</i></li><li>2. <i>Post-tensioned slab design</i></li></ol>

## DETAILED SYLLABUS AND COURSE SCHEDULE

### LECTURE

<i>week</i>	<b>Topic</b>	<b>Compulsory reading; page number (from ... to ...)</b>	<b>Required tasks (assignments, tests, etc.)</b>	<b>Completion date, due date</b>
1.	Principles of prestressing	[1.]	...	...
2.				
3.	Methods of prestressing	[1.]		
4.				
5.	Pretensioned systems	[1.]		

6.				
7.	Post-tensioned systems	[1.]		
8.				
9.	Elastic analysis, flexural			
10.				
11.	Elastic analysis, shear	[2.]		
12.				
13.	Losses in prestressed systems	[2.]		
14.				
15.	EXAM		Test	16 May

### PRACTICE

week	Topic	Compulsory reading; page number (from ... to ...)	Required tasks (assignments, tests, etc.)	Completion date, due date
1				
2.	Design brief for a prestressed beam.	[1.], [2.]		
3.		[2.]		
4.	Description of assignment task, consultation	[2.]		
5.		[2.]		
6.	Description of assignment task, consultation	[2.]		
7.			Submit Assignment 1	24 March
8.	Design brief for post tensioned slab (Assignment 2). Consultation.	[2.]		
9.	<i>Break</i>			
10.	Description of assignment task, consultation	[2.]		
11.		[2.]		
12.	Description of assignment task, consultation	[2.]		
13.		[2.]		
14.	Description of assignment task, consultation	[2.]		
15.	Consultation		Submit Assignment 2	19 May

## 3. ASSESSMENT AND EVALUATION

### ATTENDANCE

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

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

Attendance sheet

### ASSESSMENT

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**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
EXAM	max 50 points	50 %
Assignment 1	max 25 points	25 %
Assignment 2	max 25 points	25 %

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

During the first two weeks of the exam period, you can make up or correct the final exam once.

### **Grade calculation as a percentage**

based on the aggregate performance according to the following table

<b>Course grade</b>	<b>Performance in %</b>
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/

[2.] Practical guides /downloadable/

### **RECOMMENDED LITERATURE AND AVAILABILITY**

[3.] Collins and Michell: *Prestressed Concrete Basics*, Canadian Prestressed Concrete Institute, 1987.