

## COURSE SYLLABUS AND COURSE REQUIREMENTS

ACADEMIC YEAR 24/25 SEMESTER FALL

<i>Course title</i>	<i>REINFORCED CONCRETE STRUCTURES</i>
<i>Course Code</i>	<i>MSB165ANEP</i>
<i>Hours/Week: le/pr/lab</i>	<i>1/2/0</i>
<i>ECTS</i>	<i>4</i>
<i>Degree Programme</i>	<i>Civil Engineer BSc</i>
<i>Study Mode</i>	<i>Full-time, in-person</i>
<i>Requirements</i>	<i>Exam</i>
<i>Teaching Period</i>	<i>24/25 Fall</i>
<i>Prerequisites</i>	<i>MSB086ANEP, MSB110ANEP</i>
<i>Department(s)</i>	<i>Department of Civil Engineering</i>
<i>Course Director</i>	
<i>Teaching Staff</i>	<i>Tamas Juhasz juhasz.tamas@mik.pte.hu</i>

## COURSE DESCRIPTION

In this course, students will learn the basics of reinforced concrete structures and explore the composition of concrete and the reinforcement of mild steel under different load conditions according to Eurocode standards. The lectures and practical classes will concentrate on the structural analysis and limit state design of simply and complexly supported concrete beams.

## SYLLABUS

### 1. GOALS AND OBJECTIVES

Specific (Measurable) Student Behavioral Learning Objectives:

Upon completion of this course, the student should be able to

1. Identify and explain the characteristics of stress stages of reinforced concrete sections in flexure.
2. Analyze reinforced concrete sections under transverse shear.
3. Optimize the amount of reinforcement of concrete beams for different limit state criteria.
4. Draw reinforcement structural plans.

### 2. COURSE CONTENT

#### TOPICS

**LECTURE,  
PRACTICE, LAB**

1. *Mechanical properties of concrete and reinforcing steel*
2. *Stress stages*
3. *Design of reinforced concrete beams in flexure*
4. *Design of reinforced concrete beams in shear*
5. *Limit state design*
6. *Requirements of structural drawings*

## DETAILED SYLLABUS AND COURSE SCHEDULE, TENTATIVE

UNFORESEEABLE CIRCUMSTANCES MIGHT AFFECT THE SCHEDULE BELOW.  
ACADEMIC HOLIDAYS INCLUDED

### LECTURE, PRACTICE, LAB

week	Topic	Compulsory reading	Required tasks (assignments, tests, etc.)	Completion date, due date
1.	Registration, introduction in general	[1]	TBD	TBA
2.	Mechanical Properties and Material Models of Concrete and Reinforcing Steel, Introduction to Stress Stages	[1]	TBD	TBA
3.	Analysis of Sections in Flexure Under Stress Stage I and Stress Stage II	[1]	TBD	TBA
4.	Failure Criteria of Concrete Beams, Calculation Methods for Moment Bearing Capacity	[1]	TBD	TBA
5.	Plastic Design of Beams for Bending I, Ultimate Limit State Design	[1]	TBD	TBA
6.	Plastic Design of Beams for Bending II	[1]	TBD	TBA
7.	Biaxial Bending, The Interaction Curve Handing out take-home assignments	[1]	1 <sup>st</sup> Midterm test tentative	TBA
8.	Transverse Shear in Concrete Beams	[1]	TBD	TBA
9.	Shear Design According to Eurocode 2	[1]	TBD	TBA
10.	Complex Plastic Design of Concrete Beams, Development Length, Curtailment	[1]	TBD	TBA
11.	Serviceability Requirements, Design for Elastic Deflection	[1]	TBD	TBA
12.	Serviceability Requirements, Crack Width	[1]	TBD	TBA
13.	Engineering Drawings of Reinforced Concrete Beams, Evaluation and Grading	[1]	2 <sup>nd</sup> Midterm test tentative	Collecting take home assignments

### 3. ASSESSMENT AND EVALUATION

#### ATTENDANCE

By 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. Online attendance is not available.

#### **Method for monitoring attendance**

*Attendance will be monitored by attendance lists. All relevant university regulations apply.*

#### ASSESSMENT

*Assessment will be based on the quality of the two midterm tests, the take-home project, and the final exam.*

*The midterm tests are scheduled for the 7<sup>th</sup> and 13<sup>th</sup> academic week. The exact dates and times will be announced no later than two weeks prior to due.*

*The take-home project will be assigned on the 7<sup>th</sup> week and must be turned in by the final week. No late submission is accepted.*

*No tests scored below 40% can be accepted and must be repeated.*

*Midterm test results cannot be combined.*

*A make-up test is available on the 15<sup>th</sup> week.*

*Neatness is part of the grade for all student work.*

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

Type	Assessment	Weighting as a proportion of the pre-requisite for taking the exam
1. Take-home project	max 100 points	34 %
2. Midterm test I	max 100 points	33 %
3. Midterm test II	max 100 points	33 %

**Requirements for the end-of-semester signature**

- Each midterm test must score 40 points or beyond.
- Take-home project must score 70 points or beyond.
- Regular attendance as per the Code of Studies.

**Re-takes for the end-of-semester signature**

- A make-up test is available on the 1<sup>st</sup> week of the examination term.

**Type of examination spoken**

**The exam is successful if the result is a minimum of 40%**

**Calculation of the grade (TVS<sub>z</sub> 47§ (3))**

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

**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**

**COMPULSORY READING AND AVAILABILITY**

[1.] Bill Mosley, John Bungey, Ray Hulse Reinforced Concrete Design to Eurocode 2 7<sup>th</sup> Edition ISBN0230302858, 9780230302853