

COURSE SYLLABUS

ACADEMIC YEAR 2021/2022 SEMESTER FALL

Name of Course	Reinforced Concrete Structures 3
Course Code	MSB394ANEP
Allotment of Hours per Week	1/2/0
Number of Credits	4
Program	Full time
Evaluation	Exam
Semester	5th
Prerequisites	Reinforced Concrete Structures 2
Department	Civil Engineering
Instructor	Tamás Juhász (responsible), András Dormány (teacher)

INTRODUCTION, GENERAL COURSE DESCRIPTION

Students will gain from this course:

- Knowledge on the principles of precast prestressed concrete technology and its applications in civil engineering structures,
- Understanding of the construction technology using precast structural elements,
- Knowledge on the different precast building systems,

- preliminary design of precast structural elements.
- Understanding the types and effects of lateral action on reinforced concrete structures.
- basic knowledge of structural stiffening systems to resist lateral forces.

LEARNING OBJECTIVES

Short description:

This course is aimed to provide basic and advanced knowledge on the principles of the precast concrete technology and different types of precast building systems. Topics covered by the course include: precast frame analysis, precast concrete floor system, basic principles of designing precast structural elements, basic conceptual design principles to resist lateral action (wind & earthquakes), Types of structural connection between precast elements,

Methodology:

- Lectures: will give the theoretical background on precast technology advantages and the differences between precast and cast in place concrete, second part will be about stiffening of structural systems, calculate and distribute the lateral action on structures.

- Practical class: to design structural element slabs beams columns and demonstrate the theoretical knowledge second part calculate the designed lateral action on high-rise building.

- Exams: Accumulated knowledge is tested in two exams: a midterm and a final exam.

Both feature multiple-choice, true-false questions or structural design calculations.

Schedule:

Week	Topic of lecture
Week 1	Orientation, introduction of precast technology

Week 2	Manufacturing and advantages/disadvantages of precast systems
Week 3	Principle of prestressing for precast slabs systems.
Week 4	Precast structural frame analysis (column)
Week 5	Precast structural frame analysis (beam)
Week 6	Types of joints and connections between precast structural elements
Week 7	Midterm exam.
Week 8	<i>Fall Break – no class</i>
Week 9	Introduction of lateral actions on a structure
Week 10	Calculation of the wind load on high-rise building
Week 11	Structural systems to resist seismic actions
Week 12	Seismic static analysis Equivalent static force method
Week 13	Seismic Dynamic analysis response spectrum
Week 14	Final exam
Week 15	Make up exam

ATTENDANCE AND GRADING

Attendance:

Attending is required all classes, and will impact the grade (max. 10%). Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lesson will be grounds for failing the class. To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 20 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

Grading:

Combination of exam and semester assignment results (50 points each). The student has to presubmit the semester assignment 2 times during the study period in order to check the readiness of the assignment. In case of late submission penalties are applied according to the followings: at most 1 week late: 10 points, at most 2 weeks late: 20 points, more than 2 weeks: the assignment is not acceptable.

Offered exam grade:

Evaluation in percents	Numeric grade
89%-100%	5
77%-88%	4
66%-76%	3
55%-65%	2
0-54%	1

READINGS AND REFERENCE MATERIALS

[1] Eurocode 1: Actions on structures - Part 1-4: General actions - Wind actions

[2] Kim S. Elliot: Precast concrete structures, Second Edition, ISBN: 13: 978-1-4987-2399-2.

[3] Eurocode 8 General Rules and Seismic Actions (EN.1998:2004)

SCHEDULE

		STUDY PERIOD															EXAM PERIOD				
2021/2022. FALL		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	1.	2.	3.	4.	5.
Lecture		1	2	3	4	5	6	7		8	9	10	11	12	13	14					
Practice		1	2	3	4	5	6	7		8	9	10	11	12	13	14					
Midterm/Final Exam								X							X						
Assignment	publishing		X																		
	submission															X					
Signature																	X				
Expected exam date																	X		X	X	