

General Information:

Name of Course: **PRESTRESSED CONCRETE STRUCTURES**

Course Code: PM-TATNM063OA
Semester: 2nd
Number of Credits: 2
Allotment of Hours per Week: 2 Lectures /Week
Evaluation: Signature (with grade)
Prerequisites: None

Instructor: **Dr. Zoltan ORBAN**
Office: 7624, Pécs, Boszorkany u. 2. Office N° B315
E-mail: orbanz@mik.pte.hu

Introduction, General Course Description:

This course is aimed at providing basic and advanced knowledge on the mechanics, design and construction of prestressed concrete structures. Topics covered will include: basic concept of prestressing, prestressing systems and technologies, stress distribution in prestressed concrete structures, determination of prestress losses, flexural and shear behaviour at service and ultimate loads, 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.

Learning Objectives:

Students will gain from this course:

- Knowledge of the concept of prestressing,
- Advanced knowledge on the design, construction and maintenance of prestressed concrete structures,
- Specific knowledge on strengthening structures with prestressing.

Methodology:

- **Lectures:** will give an introduction to the concept and design procedures of prestressed concrete structures.
- **Practical class:** Students will be assigned tasks to complete. These tasks may expand on design of prestressed concrete structures and may have “research components” where students need to gather information required to complete a task and present its conclusions.
- **Exams:** Accumulated knowledge is tested in two exams: a midterm and a final exam. Both feature multiple-choice, true-false or short essay questions.

Schedule:

Week	Topic of lecture
Week 1	Course description. Orientation.
Week 2	Concept of prestressing.
Week 3	Materials and technologies of prestressing.
Week 4	Design of prestressed concrete beams 1. & 1st assignment.
Week 5	Design of prestressed concrete beams 2. Consultation.
Week 6	Ultimate and serviceability limit states.

Week 7	Prestressing losses.
Week 8	Midterm exam. Submit of 1st assignment.
Week 9	<i>Break – no class</i>
Week 10	Prestressed concrete slabs 1. & 2 nd assignment.
Week 11	Prestressed concrete slabs 2. Consultation.
Week 12	Prestressed concrete slabs 3. Consultation.
Week 13	Strengthening of structures with prestressing.
Week 14	Final exam
Week 15	Second exam (only if required). Submit of 2nd assignment.

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:

- 10% - Attendance
- 40% - Assignments
- 25% - Midterm Exam
- 25% - Final Exam

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

Students with Special Needs:

Students with a disability and needs to request special accommodations, please, notify the Deans Office. Proper documentation of disability will be required. All attempts to provide an equal learning environment for all will be made.

Readings and Reference Materials:

Naaman, A. E: Prestressed Concrete Analysis and Design, 3rd edition, 2012., ISBN 13: 9780967493923.

Collins, M. P. & Mitchell, D: Prestressed Concrete Basics, 1st edition, 1987., Canadian Prestressed Concrete Institute, ISBN 0-9691816-6-3