



Course Syllabus

Course Code	Course Title	ECTS Credits
CEE-353	Reinforced Concrete II	5
Prerequisites	Department	Semester
CEE-351	Engineering	Spring
Type of Course	Field	Language of Instruction
Required	Civil & Environmental Engineering	English
Level of Course	Lecturer(s)	Year of Study
1 st Cycle	Dr Marios Kyriakides	3 rd
Mode of Delivery	Work Placement	Corequisites
Face-to-face	N/A	None

Course Objectives:

The main objectives of the course are to:

- explain the principles of analysis and design of reinforced concrete structures;
- become familiar with European design standards (Eurocodes);
- introduce the basic concepts for the design of earthquake-resistant RC structures.

Learning Outcomes:

After completion of the course students are expected to be able to:

- use Eurocodes (EC) for determining the design loads, safety factors and other requirements.
- know the typical procedure for designing a RC building.
- analyze a simple structural system, such as a single-storey building, and calculate the design values of the response quantities for each structural component.
- identify the critical limit state for each structural member.
- apply the principles, procedures and current code requirements to the analysis and design of reinforced concrete members.
- know, in general, the behavior of concrete structures under seismic actions and the principles of seismic design.

Course Content:

- Serviceability, durability and stability requirements: Detailing requirements, span-effective depth ratios, calculation of crack width, and calculation of deflections.
- Slabs: Types of slabs, one-way and two-way slabs. Methods of analysis of slabs. Design of slabs for punching shear. Design of slabs for bending and shear. Serviceability limit state requirements. Floor-load distribution to beams.
- Analysis and design: Analysis and design of various types of RC members according to EC2 and EC8, namely continuous beams, short and flexural columns, and footings. Role of stirrups and of confinement.
- Construction detailing: Technical drawing, development of reinforcement.
- Introduction to earthquake-resistant design: Basic concepts of seismic design of reinforced concrete structures, ductility and brittleness, beam-column joints, role and behaviour of shear walls, requirements of Eurocode 8.
- Seismic performance: Ductility of RC members, introduction to non-linear analysis.

Learning Activities and Teaching Methods:

Lectures, in-class examples and exercises, and homework assignments.

Assessment Methods:

Homework assignments, mid-term exam, and final exam.

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Reinforced Concrete Design: to Eurocode 2, 7 th Edition	W.H. Mosley, J.H. Bungey, R. Hulse	Red Globe Press	2012	978-0230302853

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Design of Reinforced Concrete, 10 th Edition	Jack C. McCormac, Russell H. Brown	Wiley	2015	978-1118879108

Reinforced Concrete Structures: Analysis and Design, 2 nd Edition	David A. Fanella	McGraw-Hill Education	2016	978-0071847841
Properties of Concrete, 5 th edition	A.M. Neville	Prentice Hall	2012	978-0273755807
Reinforced Concrete: Mechanics and Design, 6 th Edition	James G. MacGregor, James K. Wight	Prentice Hall	2011	978-0132176521
Farzad Naeim	The Seismic Design Handbook – 2 nd Edition	Kluwer Academic Publishers	2001	978-0792373018