



University of Nicosia, Cyprus

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

Objectives of the Course:

The main objectives of the course are:

1. To explain the principles of analysis and design of reinforced concrete structures
2. The introduction to European design standards (Eurocodes)
3. To introduce the basic concepts for the design of earthquake-resistant RC structures

Learning Outcomes:

After completion of the course students are expected to:

- Get familiar with and 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
- Be able to analyse 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 behaviour of concrete structures under seismic actions and the principles of anti-seismic design

Course Contents:

Limit states: Ultimate limit states, serviceability limit state

Actions: load combinations, load safety factors, Eurocode 1 provisions

Slabs: type of slabs, floor loads, one-way slabs, methods of analysis of two-way slabs, design of slabs for bending and shear, deflections, serviceability limit state, floor-load distribution to beams.

Analysis and design: Analysis and design of various types of RC members according to EC2 and EC8, continuous beams, short and flexural columns, role of stirrups, confinement, footings and retaining walls.

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 behavior of shear walls, design of shear walls, requirements of Eurocode 8.

Seismic performance: Ductility of RC members, introduction to Non-linear analysis, behavior models

Learning Activities and Teaching Methods:

Lectures, in-class examples and exercises, Homework assignments

Assessment Methods:

Homework assignments, mid-term exam(s), final exam.

Required Textbooks/Reading:

| Authors | Title | Publisher | Year | ISBN |
|------------------------------------------|--------------------------------------------------------------|-----------------------|------|------------------------|
| W.H. Mosley, J.H. Bungey, R. Hulse | Reinforced Concrete Design: to Eurocode 2, 6th edition | Palgrave Macmillan | 2007 | 978- 023050071 6 |

Recommended Textbooks/Reading:

| Authors | Title | Publisher | Year | ISBN |
|------------------------------------------|-------------------------------------------------------------|-------------|------|------------------------|
| Jack C. McCormac, Russell H. Brown | Design of Reinforced Concrete, 9th Edition SI Version | Wiley | 2013 | 978-1-118- 31868-3 |
| David A. Fanella | Reinforced Concrete Structures: Analysis and Design | McGraw-Hill | 2010 | 978- 007163834 0 |
| Robert Park, Thomas Paulay | Reinforced Concrete Structures | Wiley | 1975 | 978- 047165917 4 |