UNIVERSITY of NICOSIA

Course Code	Course Title	ECTS Credits
CVEE-351	Reinforced Concrete I	5
Department	**Semester**	**Prerequisites**
Engineering	Fall, Spring	MENG-250, CVEE-220
Type of Course	**Field**	**Language of Instruction**
Required	Civil & Environmental Engineering	English
Level of Course	**Year of Study**	**Lecturer(s)**
1st Cycle	3rd	Dr Kyriacos Neocleous
Mode of Delivery	**Work Placement**	**Co-requisites**
Face-to-face	N/A	None

Objectives of the Course:

The main objectives of the course are:

1. To give the principles of the mechanics of reinforced concrete as a composite material
2. To develop an understanding of the design principles, general code requirements and design process of reinforced concrete beams and columns

Learning Outcomes:

After completion of the course students are expected to:

- Know the mechanical properties of concrete and steel
- Recognize the stress condition of which concrete member is subjected for a given problem
- Fully understand the response of steel and concrete and their composite behaviour
- Understand and recognize the various failure modes of concrete members
- Be able to calculate the design strength of a given member for each typical limit state
- Understand the meaning of design loads, safety factors and strength requirements.
- Be able to analyse and design a linear concrete member under a given loading condition

Course Contents:

Introduction: History of concrete structures, applications.

Concrete technology: materials, composition, mix design & specification, durability, shrinkage, creep, compressive strength, deformations, categories, code requirements

Reinforcing steel: Strength, properties and categorization, stress-strain curve, bond and anchorage.

Analysis and design: types of concrete members, basic design principles, actions, failure modes of members, safety factors, general code requirements, minimum and maximum reinforcement ratios, analysis of section forces (bending, compression and tension).

Beam members: rectangular and flanged (T) section, pure bending, bending without axial force, bending with axial force, shear, torsion.

Columns: rectangular sections, biaxial bending with axial load, interaction diagrams, buckling.

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	978-0230500716

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	978-0071638340