



Course Syllabus

Course Code	Course Title	ECTS Credits
CEE-458	Masonry Structures	5
Prerequisites	Department	Semester
CEE-351	Engineering	Fall/Spring
Type of Course	Field	Language of Instruction
Elective	Civil & Environmental Engineering	English
Level of Course	Lecturer(s)	Year of Study
1 st Cycle	Dr Rogiros Illampas	4 th
Mode of Delivery	Work Placement	Corequisites
Face-to-face	N/A	None

Course Objectives:

The main objectives of the course are to:

- Introduce the various types, properties and characteristics of the most common masonry materials (masonry units and mortars).
- Understand the basic structural behavior of reinforced and unreinforced masonry structures.
- Learn methods for estimating the mechanical properties and characteristic strength of plain and reinforced masonry walls.
- Provide the principles of analysis and design of low-rise, bearing wall buildings through working examples, according to the most recent code requirements.

Learning Outcomes:

After completion of the course students are expected to:

- Apprehend the most important masonry construction methods.
- Acquire the basic knowledge of the materials involved in the construction of masonry structures.
- Understand the mechanical properties and deformation properties of masonry walls.
- Learn how to calculate the loads for a given simple masonry structure and perform a static and dynamic analysis.

- Be able to understand and apply the basic design principals for reinforced and unreinforced masonry structures according to the latest design codes.
- Understand the effects of seismic loads on masonry structures and recognize the major factors that are related to the severity of these effects.

Course Content:

- Introduction and Terminology. Basic structural requirements according to codes. Principles of limit states design
- Materials: Types and characteristics of masonry units. Properties of mortar. Reinforcing steel and concrete infill.
- Mechanical properties and deformation properties of masonry walls.
- Durability issues.
- Types of loads on masonry structures.
- Seismic loads
- Analysis methods.
- Computation of masonry's characteristic strength based on material's properties
- Design of unreinforced masonry walls subjected to vertical, shear, lateral or combined loads: Partial factors. Ultimate and serviceability limit states verification.
- Design of reinforced masonry walls subjected to shear, bending, bending and axial or pure axial loading. Partial factors. Ultimate and serviceability limit states verification.
- Pre-stressed masonry
- Construction detailing
- Site and laboratory tests on masonry structures

Learning Activities and Teaching Methods:

Lectures, in-class examples and exercises

Assessment Methods:

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

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Design of Masonry Structures	A.W. Hendry	CRC Press	2017	978-1138470293

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Designers' Guide to Eurocode 6: Design of Masonry Structures (e-book)	John Morton	ICE Publishing	2011	978-0727741844
Design of Structural Masonry (e-book)	William M.C. McKenzie	Palgrave Macmillan	2001	978-0230628069
Masonry Structural Design	Richard Klingner	McGraw-Hill Professional	2010	978-0071638302