



Course Code CVEE-458	Course Title Masonry Structures	ECTS Credits 6
Department Engineering	Semester Fall, Spring	Prerequisites CVEE-320, CVEE-352
Type of Course Elective	Field Civil and Environmental Engineering	Language of Instruction English
Level of Course 1 st Cycle	Year of Study 4 th	Lecturer(s) Dr Panayiotis Polycarpou
Mode of Delivery Face-to-face	Work Placement N/A	Co-requisites None

Objectives of the Course:

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 Contents:

- 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, projects, exams, discussion

Assessment Methods:

Homework, Project, Mid-Term(s), Final Exam.

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
John Morton	Designers' Guide to Eurocode 6: Design of Masonry Structures (e-book)	ICE Publishing	2011	978-0-7277-4184-4

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
William M.C. McKenzie	Design of Structural Masonry (e-book)	Palgrave Macmillan	2001	9780230628069
The Institution of Structural Engineers	Manual for the design of plain masonry in building structures to Eurocode 6	The Institution of Structural Engineers	2008	978-1-906335-02-1
Richard Klingner	Masonry Structural Design	McGraw-Hill Professional	2010	978-0071638302