



Course Syllabus

Course Code	Course Title	ECTS Credits
CEE-320	Structural Analysis II	5
Prerequisites	Department	Semester
CEE-220	Engineering	Fall/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 Panayiotis Polycarpou	3 rd
Mode of Delivery	Work Placement	Corequisites
Face-to-face	N/A	None

Course Objectives:

The main objectives of the course are to:

- Introduce students to the Virtual Work Method for calculating displacements.
- Extend the student's knowledge on the principles of elastic theory and their implementation for the analysis of indeterminate frame structures.
- Explain the various methods of analysis of indeterminate structures, such as beams, trusses, and frames.
- Provide realistic applications to trusses, beams and frames encountered in professional practice.
- Help students to gain the means of checking computer results for the analysis rather than simply relying on the generated output.

Learning Outcomes:

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

- Apply the Virtual work method for calculating displacements in beam, trusses and frames.
- Choose and implement the appropriate method for the analysis of various types of indeterminate structures in two dimensions.
- Perform analysis of indeterminate beams, trusses and frame structures, subjected to static loads, temperature changes and applied displacements (settlements).
- Draw the axial force, shear force and bending moment diagrams of indeterminate beams

and frames

- Describe the various assumptions and limitations of the classical methods of structural analysis.

Course Content:

- The Virtual Work Method for calculating displacements in trusses, beams and frames.
- Indeterminate structures: Advantages and disadvantages.
- Compatibility of deformations. Force method of analysis: Beams, frames and trusses.
- Effects of support settlements and temperature changes.
- Analysis of indeterminate structures with internal and external redundant forces/moments.
- Displacement method of analysis: Kinematic indeterminacy, Slope-deflection equations. Moment distribution (Cross) method.
- Complex Structures. Symmetry and anti-symmetry.
- Fundamentals of Matrix Structural Analysis; Introduction to the Matrix Stiffness Method.

Learning Activities and Teaching Methods:

Lectures, in-class examples and exercises

Assessment Methods:

Homework assignments, mid-term exams, final exam.

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Structural Analysis, SI Edition, 5 th Ed.	Aslam Kassimali	Cengage Learning	2015	9781285051505

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Structural Analysis, 9 th Edition	R.C. Hibbeler	Prentice Hall	2015	9780133955361
Structural and Stress Analysis	Megson, T. H. G	Elsevier	2005	9780750662215 (E-book)
Fundamentals of Structural Analysis, 4 th Edition	K. Leet, CM Uang & A. Gilbert	McGraw-Hill	2011	9780073401096