

### CVX4545 Structural Analysis and Design II

<b>Level</b>	4
<b>Course Code</b>	CVX4545
<b>Course Title</b>	Structural Analysis and Design II
<b>Credit value</b>	5
<b>Core/Optional</b>	Core (Civil Engineering)
<b>Course Aim/s</b>	To learn advanced structural engineering analysis and design concepts and complete a relevant structural engineering design project by utilizing material taught in the course.
<b>Course Learning Outcomes (CLO):</b>	<p>At the completion of this course student will be able to:</p> <p>CLO1: Describe the fundamentals of statically indeterminate structures; Explain degree of statically indeterminacy with external and internal indeterminacy. [Uni-structural]</p> <p>CLO2: Describe theorems of moment area methods; Perform structural analysis with moment area method; Deduce three moment theorems and perform structural analysis with three moment theorems. [Relational]</p> <p>CLO3: Describe slope deflections methods of structural analysis and perform structural analysis with slope deflection methods; Perform structural analysis with moment distribution methods for statically indeterminate structures. [Relational]</p> <p>CLO4: Formulate energy methods of structural analysis; Perform structural analysis with energy methods. [Relational]</p> <p>CLO5: Describe different structural forms, material characteristics and external loadings. Introduce different design philosophies. [Uni-structural]</p> <p>CLO6: Perform structural design works on singly reinforced beams, doubly reinforced beams and columns stair cases and foundations; Interpret the flexural and shear performances of structural members. [Multi-structural]</p> <p>CLO7: Apply concepts and principles in a related area of study; analyse information and suggest solutions to problems in an employment context.</p> <p>CLO8: Communicate successfully, the results of analysis and arguments to specialist and non-specialist audiences.</p> <p>CO9: Exercise responsibilities as an individual and as a team.</p> <p>CLO10: Display qualities and transferable skills as well as subject specific skills necessary for employment, carry out further training and to manage their own learning.</p>
<b>Content (Main topics, sub topics)</b>	<p><b>Outline Syllabus</b></p> <p>Unit 1: Structural Analysis</p> <p>Session 01: Introduction to Statically Indeterminate Structures</p> <p>Session 02: Statically Indeterminacy of Structures</p> <p>Session 03: Moment Area Methods</p> <p>Session 04: Further Applications of Moment Area Method</p> <p>Session 05: Three Moment Theorem</p> <p>Session 06: Slope Deflection Method</p> <p>Session 07: Further Applications of Slope Deflection Method</p> <p>Session 08: Moment Distribution Method</p> <p>Session 09: Further Applications of Moment Distribution Method</p> <p>Session 10: Energy Theorems in Structural Analysis –Part I</p> <p>Session 11: Energy Theorems in Structural Analysis -Part II</p> <p>Session 12: Energy Theorems in Structural Analysis –Part III</p> <p>Unit 2: Structural Design</p> <p>Session 13: Concepts of Design Philosophies</p> <p>Session 14: Design Basics for Limit State Design Concepts</p> <p>Session 15: Analysis of Frames I</p> <p>Session 16: Analysis of Frames II</p> <p>Session 17: Types of Buildings and Structures</p>



	<p>Session 18: Ground Conditions and Foundations</p> <p>Session 19: Principles of Reinforced Concrete</p> <p>Session 20: Non-elastic behavior of Reinforced Concrete</p> <p>Session 21: Ultimate Flexural Strength –Part I</p> <p>Session 22: Ultimate Flexural Strength – Part II</p> <p>Session 23: Design of Beams</p> <p>Session 24: Design of Slabs</p> <p>Session 25: Slabs Spanning in Two Directions</p> <p>Session 26: Design of Reinforced Concrete Columns</p> <p>Session 27: Design of pad Foundations</p> <p>Session 28: Design of Stair Cases</p> <p><b>Design Class:</b></p> <ol style="list-style-type: none"> <li>1. Design of one-way/two-way slab panels using BS 8110 Part I Code of practice.</li> <li>2. Design of beams and columns using BS 8110 part I Code of Practice.</li> <li>3. Design of pad foundations considering different ground conditions.</li> </ol> <p><b>Design Project:</b></p> <ol style="list-style-type: none"> <li>1. The content depends on the structural area selected for design.</li> </ol>
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