CVX7640 Structural Design

Level	7
Course Code	CVX7640
Course Title	Structural Design
Credit value	6
Core/Optional	Core (Civil Engineering)
Course Aim/s	To equip the students with necessary knowledge and skill to design structures with common construction materials
Course Learning Outcomes (CLO):	At the completion of this course student will be able to: CLO1: Describe the concepts of structural design and the commonly used design philosophies. CLO2: Analyze and quantify possible loads and combinations thereof, on structures due to gravitational (weight) and lateral (wind) actions. CLO3: Appreciate Timber, RC, Masonry, PC and Steel as widely used structural material with varying strengths and weaknesses CLO4: Categorize & quantify different structural strength parameters of these materials. CLO5: Design & Detail structural members and their integration through connections to form structures using Timber, RC, Masonry, PC and Steel according to relevant codes of practice
Content (Main topics, sub topics)	**Outline Syllabus:** Unit 1: Structural Design in Timber (To BS 5268) Session 01: Introduction to Structural Design in Timber Session 02: Design of Timber Flexural Members Session 03: Design of Axially Loaded Timber Members Session 04: Design of Connections in Timber Structures Session 05: Design Examples in Timber Unit 2: Structural Design in Reinforced Concrete (To BS 8110) Session 06: Introduction to Structural Design in Concrete Session 07: Frame Analysis for Concrete Design Session 08: Redistribution of Moments Session 09: Stability & Serviceability Requirements for Concrete Structures Session 10: Design for Torsion in Concrete Structures Session 11: Design of Reinforced Concrete Solid Slabs Session 12: Design of Reinforced Concrete Flat Slabs Session 13: Design of Reinforced Concrete Beams I Session 14: Design of Reinforced Concrete Beams II Session 15: Design of Reinforced Concrete Columns Session 16: Design of Reinforced Concrete Foundations Unit 3: Structural Design in Masonry (To BS 5628) Session 17: Introduction to Masonry Structure Session 18: Load Transfer and Evaluation of Stresses for Masonry Structures Session 19: Vertical Load Resistance of Masonry Elements Session 20: Wind Loads on Masonry Structures Session 21: Design of Masonry Walls Session 22: Masonry Design Example Unit 4 Structural Design in Prestressed Concrete (To BS 8110) Session 23: Introduction to Prestressed Concrete Session 24: Material for Prestressed Concrete Session 25: Structural Behavior of Prestressed Concrete Session 26: Limit State Design of Prestressed Concrete Session 27: Loss of Prestress Session 28: Analysis of Prestressed Section Session 29: Deflection of a Prestressed Concrete Beam Session 30: Shear in a Prestressed Concrete Beam

	Session 31: Design of a Prestressed Concrete Member Unit 5 Structural Design in Steel (To BS 5950) Session 32 Introduction to structural Design in Steel Session 33 Design of Steel Members in Tension Session 34 Design of Steel Members in Compression Session 35 Design of Steel Members in Tension Subject to Bending Session 36 Design of Steel Members in Compression Subject to Bending Session 37 Design of Steel Flexural Members I Session 38 Design of Steel Flexural Members II Session 39 Design of Connections in Steel Structures Session 40 Design Examples in Steel Structures
	Design Classes: 1. Design structural elements and integrated structure in timber for a practical case according to BS 5268 guidelines. 2. Design structural elements and integrated structure in RC for a practical case according to BS 8110 guidelines. 3. Design structural elements and integrated structure in masonry for a practical case according to BS 5628. 4. Design a PC structural element for a practical case according to BS 8110 guidelines. Design structural elements and integrated structure in steel for a practical case according to BS 5950 guidelines.