

**CVX4446 Construction Engineering and Materials**

<b>Level</b>	4
<b>Course Code</b>	CVX4446
<b>Course Title</b>	Construction Engineering and Materials
<b>Credit value</b>	4
<b>Core/Optional</b>	Core (Civil)
<b>Course Aim/s</b>	To provide an understanding of basic construction procedures, equipment and Planning and be able to make engineering decisions on basic construction materials giving consideration to cost, quality and the desired application.
<b>Course Learning Outcomes (CLO):</b>	<p>At the completion of this course student will be able to:</p> <p>CLO1: Gain a knowledge how an efficient engineering construction should be carried-out, it's expected functionalities and correct practices to be adopted. Introduction and identification of activities for building &amp; civil engineering projects, site investigation &amp; preparation and foundation details &amp; pile driving, etc.</p> <p>CLO2: Describe the basic construction procedures, construction equipment and their operation: Describe how pumping and de-watering is carried-out at civil engineering sites and the equipment used for those processes.</p> <p>CLO3: Identify aggregate properties of concrete and engineering importance for structural construction; describe behaviour expected from aggregates for various structural constructions.</p> <p>CLO4: Interpret elastic-plastic stress-strain behaviour of flexible pavements and study highway pavement failure types due to stresses and strains in highway subgrade, base, sub-base and surface dressings.</p> <p>CLO5: Explain correct practices of concrete; batching &amp; mixing, transporting &amp; unping, placing &amp; compacting. Explain technical aspects of building services such as water supply and drainage, and basic principles on electrical installations.</p> <p>CLO6: Explain the importance of standards laid down by the Sri Lanka Standards Institution (SLSI) and other bodies in relation to size, sampling and test requirements. [Uni – Structural]</p> <p>CLO7: Slect good quality materials by visual identification and / or by simple tests. / use materials according to acceptable / laid down procedures / applications. [Multi – Structural]</p> <p>CLO8: Describe how materials deteriorate and take precautions to arrest. [Multi – Structural]</p> <p>CLO9: Perform simple laboratory tests that quantify engineering properties of construction materials; interpret the suitability of the material for applications based on observed engineering properties/parameters. [Relational]</p> <p>CLO10: Describe manufacturing processes of different construction materials and products. [Multi – Structural]</p>
<b>Content (Main topics, sub topics)</b>	<p><b>Outline Syllabus:</b></p> <p>Unit 1:Construction Engineering</p> <p>Session 01:Earth moving equipment</p> <p>Session 02:Hauling &amp; Hoisting equipment</p> <p>Session 03:Earth compaction equipment</p> <p>Session 04:Pumping &amp; De-watering equipment</p> <p>Session 05:Properties of concrete: Testing</p> <p>Session 06:Concrete Practice: Batching &amp; Mixing Concrete</p> <p>Session 07:Concrete Practice: Transporting &amp; Pumping</p> <p>Session 08:Concrete Practice: Placing &amp; Compacting</p> <p>Session 09: Concrete Practice: Construction joints, Curing &amp; Finishing</p> <p>Session 10: Properties of hardened concrete</p> <p>Session 11: Formwork</p> <p>Session 12: Site investigation &amp; Preparation</p> <p>Session 13: Excavation &amp; Foundation</p>

Session 14: Piles and pile driving  
Session 15: Road Construction - 1  
Session 16: Road Construction - 2  
Session 17: Water supply and Drainage  
Session 18: Building Services - 1  
Session 19: Building Services - 2

Unit 2 :Materials

Session 20:Specifications  
Session 21:Cement  
Session 22:Lime'  
Session 23:Sand and Stones  
Session 24:Mortars  
Session 25:Bricks  
Session 26:Polymer Adhesives and coatings  
Session 27:Fibre Glass  
Session 28:Metal  
Session 29: Timber  
Session 30:Blocks  
Session 31:Asbestos Products  
Session 32:Cast Iron  
Session 33:Aluminium  
Session 34:Copper, Lead and Alloys  
Session 35:Tiles  
Session 36:Finishing Materials  
Session 37:Raw materials and Production processes of geosynthetics  
Session 38:Types of Geosynthetics  
Session 39:Application of Geosynthetics  
Session 40:Biodegradable geosynthetics

**Laboratory work**

1. Tests on bricks and cement blocks
2. Tests on Aggregates
3. Tests on Concrete for Workability.
4. Vane Shear Test