# ENGINEERING STRUCTURES DESIGN

**UNIT CODE:** CON/CU/CET/CR/05/6/A

**Relationship to Occupational Standards**
This unit addresses the unit of competency: Design engineering structures

**Duration of Unit:** 220 Hours

**Unit Description**
This unit specifies the competencies required to design engineering structures. This involves load estimation, designing structural elements, assessing of cost effectiveness of designs, analysing site test data and modifying structural designs.

**Summary of Learning Outcomes**
1. Calculate load estimates
2. Design structural elements
3. Assess cost effectiveness of the design
4. Modify structural designs

**Learning Outcomes, Content and Suggested Assessment Methods**

| Learning Outcome | Content | Suggested Assessment Methods |
|---|---|---|
| 1. Calculate load estimates | • Architectural drawings<br>• Codes of practice<br>• Structural building use<br>• Structural loading<br>• Structural load analysis | • Oral<br>• Written<br>• Project/Practical assignment |
| 2. Design structural elements | • Structural element types<br>• Structural element design methods and calculations<br>• CAD software<br>• Design standards<br>• Codes of practice | • Oral<br>• Written<br>• Project/Practical assignment |
| 3. Assess cost effectiveness of the design | • Cost saving design methods<br>• Building design analysis<br>• Bill of quantities<br>• Construction materials<br>• Research | • Oral<br>• Written<br>• Project/Practical assignment |

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|---|---|---|
| 4. Modify structural design | • Site survey data analysis<br>• Construction hypotheses<br>• Structural design modification | • Oral<br>• Written<br>• Project/Practical assignment |

**Suggested Methods of Instruction**

- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Projects
- Group discussions

**Recommended Resources**

- Computers
- Printers
- Measurement tools
- Survey instruments
- CAD software
- Stationery
- Workstations
- Civil Engineering laboratories
- Legal documents (Engineers Act)
- Civil Engineers Code of Practice
- Antiglare screen protection
- First aid kits