

# MATERIAL SCIENCE

**UNIT CODE:** CON/CU/CET/CC/04/6/A

## Relationship to Occupational Standards

This unit addresses the unit of competency: Apply Construction Materials Science

**Duration of Unit:** 90 Hours

## Unit Description

This unit describes the competence in applying building materials science. It involves identifying essential construction materials, selecting quality construction materials, testing construction materials and demonstrating knowledge in use of construction materials.

## Summary of Learning Outcomes

1. Identify essential construction materials
2. Identify properties of construction materials
3. Manufacture construction materials
4. Select quality construction materials
5. Use construction materials appropriately
6. Test construction materials
7. Handle construction materials safely

## Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Identify essential construction materials	<ul style="list-style-type: none"><li>• Engineering drawings interpretation</li><li>• Bills of quantities</li><li>• Construction materials</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Oral</li><li>• Practical tests/Project</li></ul>
2. Identify properties of construction materials	<ul style="list-style-type: none"><li>• Physical properties of construction materials</li><li>• Chemical properties of construction materials</li><li>• Mechanical properties of construction materials</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Oral</li><li>• Practical tests/Project</li></ul>

3. Manufacture construction materials	<ul style="list-style-type: none"> <li>• Raw materials used in manufacturing construction materials</li> <li>• Procedures of manufacturing construction materials</li> <li>• Plant and equipment used in manufacturing construction materials</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Oral</li> <li>• Practical tests/Project</li> </ul>
4. Select quality construction materials	<ul style="list-style-type: none"> <li>• Properties of quality construction materials</li> <li>• Construction materials Cost and quality relationship</li> <li>• Selection of Construction materials</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Oral</li> <li>• Practical tests/Project</li> </ul>
5. Use construction materials appropriately	<ul style="list-style-type: none"> <li>• Construction methods and processes</li> <li>• Appropriate use of construction materials</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Oral</li> <li>• Practical tests/Project</li> </ul>
6. Test construction materials	<ul style="list-style-type: none"> <li>• Materials testing parameters</li> <li>• Destructive tests</li> <li>• Non-destructive tests</li> <li>• Materials testing procedures</li> <li>• Quality assurance and control</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Oral</li> <li>• Practical tests/Project</li> </ul>
7. Handle construction materials safely	<ul style="list-style-type: none"> <li>• User safety in handling construction materials</li> <li>• Construction Materials handling and storage</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Oral</li> <li>• Practical tests/Project</li> </ul>

### Suggested Methods of Instruction

- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Projects
- Field trips

- Trainee group discussions

### **Recommended Resources**

- Computer
- Laboratory testing equipment
- Laboratory apparatus
- Hand tools
- Machine tools
- Computer software
- Construction materials
- Computers
- Stationery
- Manufacturer's catalogues
- Safety boots
- Goggles
- Gas masks
- Helmets
- Gloves
- Dust coats
- First aid kit
- Ear muffs
- Dust masks
- Overalls

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