


**Government of Karnataka**  
**Department of Technical Education**  
**Board of Technical Examinations, Bengaluru**

	Course Title: <b>MATERIALS OF CONSTRUCTION LAB</b>		
	Credits (L:T:P) : <b>0:2:4</b>	Total Contact Hours: <b>78</b>	Course Code: <b>15CE14P</b>
	Type of Course: <b>Practical, Demo &amp; Assignments</b>	Credit : <b>03</b>	Core/ Elective: <b>Core</b>

**Pre-requisites:** Basic knowledge of science in secondary education.

**Course Objectives:** Identification & understanding the properties & uses of various building materials.

**Course Outcomes:**

On successful completion of the course, the students will be able to:

Course Outcome	
<b>CO1</b>	Understand the important properties of various building materials
<b>CO2</b>	Recognize the need & to engage in independent lifelong learning in identifying miscellaneous materials..
<b>CO3</b>	Apply the properties of materials in societal & environmental context & demonstrate knowledge for sustainable development.
<b>CO4</b>	Apply knowledge of building materials to provide predictive capability to optimize building performance & to minimize building failure

 **Mapping Course Outcomes with Program Outcomes**

		Programme Outcome											
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Course Outcome	<b>CO1</b>	S	S		M		S	S	S		S		S
	<b>CO2</b>	S	S	S	M	M	M	S		S		M	S
	<b>CO3</b>	S	S	S	S		S	S		S	M	M	S
	<b>CO4</b>	S	S		S	M	S	S	S	S	S		

S: Strong Relationship

M: Moderate Relationship

## COURSE CONTENT

Unit	Major Topics	Hours Allotted
1	BUILDING UNITS	12
2	FLOORING MATERIAL	6
3	BINDING MATERIAL	6
4	CLADDING & ROOFING MATERIAL	9
5	FINISHING, DECORATIVE & FALSE CEILING MATERIAL	9
6	TIMBER	6
7	PLASTICS & GLASS	6
8	COATING MATERIAL	6
9	MISCELLANEOUS MATERIALS	9
10	MINI PROJECT	9
	<b>Total</b>	<b>78</b>

### UNIT –I BUILDING UNITS

#### i) Stones

Identification & understanding the properties & uses of the following stones: Granite, Trap, Basalt, Sandstone, Limestone, Gneiss, Laterite, Marble, Quartzite, Slate.

Identification	Geological Classification	Properties	Uses

#### ii) Bricks

Identification & understanding the properties & uses of the following bricks:

Ground moulded, Table moulded, Machine moulded (Wire cut), Soil stabilized blocks, Concrete blocks (solid-hollow), Fly ash bricks, Fire bricks, Light weight blocks (clay hollow blocks & autoclave aerated concrete blocks)

Specimen tabular column

Identification	Standard size	Properties	Uses

### UNIT-II FLOORING MATERIAL

Identification & understanding the properties & uses of the following flooring materials: Granolithic, CC with red oxide finish, Shahabad, Vitrified, Marble, Granite, Pressed Clay tiles, Interlocking pavers, Cobble stone, Wooden flooring

Identification	Properties	Uses

### UNIT-III BINDING MATERIAL

Identification & understanding the properties & uses of the following binding materials  
Cement, White cement, Lime, Clay, Fly ash, Plaster of Paris, Lime putty, Water proofing compound, and White cement based putty.

Specimen tabular column

Identification	Properties	Uses

### UNIT IV CLADDING & ROOFING MATERIAL

Identification & understanding the properties & uses of the following Cladding material-  
Exterior surface wall cladding material, Bath & kitchen wall cladding, Sloped roof cladding.

Roofing Material- Mangalore tiles, Country tiles, A C sheet, Plastic sheets, Non asbestos Hi tech roofing sheet, Meta colour sheets, Alpha sheet, corrugated aluminium sheets, Puff-sandwiched roofing sheets.

Identification	Properties	Uses

### UNIT V FINISHING, DECORATIVE & FALSE CEILING MATERIAL

Identification & understanding the properties & uses of the following: Mortar plaster, Stucco plaster, Designer tiles, Acoustic ceiling board, Gypsum ceiling board, Fibre board, Pulp board, Straw board, Polystyrene, Thermocol, Hair felt.

Identification	Properties	Uses

### UNIT VI TIMBER

Identification & understanding the properties & uses of the following timber Teak, Honne, Sal, Casuarina, Deodar, Jackfruit, Mahogany, Mango, Neem, Silver oak, Bamboo.

Industrial timber- Veneers, Plywood, Fibre board, Hardboard, Block board, Laminated sheets

Identification	Properties	Uses

## UNIT-VI PLASTICS & GLASS

Identification & uses of the following material

Glass panels- Plain, Dark cool, Brown cool, printed; Mesh glass, Wired glass, Glass bricks, Structural glass, Ribbed glass, Perforated glass, Foam glass, Fibre glass, Float glass, Toughened glass.

Plastics- Thermosetting plastic articles, Polycarbonate.

Identification	Uses

## UNIT-VIII COATING MATERIAL

Identification & understanding the uses of the following paints, primers, varnishes & distemper

Paints- Exterior primer water based, Metal-wood & wall primer, emulsion paint, enamel paint, cement paint (Snowcem), Texture paints, Interior paints

Varnish-French polish, Metallic paint (grills & all purpose)

Distemper- Water based & weather proof exterior emulsion.

Identification	Uses

## UNIT-XI MISCELLANEOUS MATERIALS

Identification & uses of the following material

Metal paste, Epoxy resin, Epoxy water proofing, Silicon paste, Glass fibre reinforced polyesters, Synthetic rubber adhesives, Tile joint filler material, Sealants, PVC products, Asphalt, Expanded metal strips for joints, FRP, Geo fabrics & Geogrids.

Identification	Uses

## UNIT-X MINI PROJECT

Each Student should collect at least five different building materials & prepare the report.



### TEXT BOOKS & REFERENCE BOOKS

1. Materials by SC Rangwala
2. Engineering Building materials by S S Bhavikatti
3. Engineering Materials by GJ Kulkarni
4. Engineering Materials by Sushil Kumar
5. Market brochures

## E-Links

1. [www.constructionmaterials.com/](http://www.constructionmaterials.com/)
2. [en.wikipedia.org/wiki/Building material](http://en.wikipedia.org/wiki/Building_material)
3. [en.wikipedia.org/wiki/List\\_of\\_building materials](http://en.wikipedia.org/wiki/List_of_building_materials)
4. [www.exponent.com](http://www.exponent.com)
5. <http://www.tce.co.in/>
6. [www.prakruthibuilding.com](http://www.prakruthibuilding.com)
7. <http://www.aboutcivil.org>

**Course Delivery:** The course will be delivered through Tutorials and Demonstration of materials.

## Course Assessment and Evaluation Scheme:

Method	What	To whom	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes	
Direct Assessment	CIE*	IA	Students	Two IA Tests (average of two tests will be computed)	10	Blue books (Test Papers)	1,2,3,4
				Record writing (average of marks allotted for each experiment)	10	Lab Record	1,2,3,4
				Mini project	05	Report	1,2,3,4
				<b>Total</b>	<b>25</b>		
	SEE*	End Exam		End of the course	50	Answer scripts at BTE	1,2,3,4
Indirect Assessment	Student Feedback on course	Students	Middle of the course	---	Feedback forms	1,2,3 Delivery of course	
	End of Course Survey		End of the course	---	Questionnaires	1,2,3,4 Effectiveness of Delivery of instructions & Assessment Methods	

\*CIE – Continuous Internal Evaluation

\*SEE – Semester End Examination

**Note:** I.A. test shall be conducted as per SEE scheme of valuation. However the obtained marks shall be reduced to 10 marks. (Any decimals shall be rounded off to next higher digit)

**Questions for CIE and SEE will be designed to evaluate the various educational components such as:**

- |  |                |
|--|----------------|
| 1. Remembering and Understanding :                   | 60 % weightage |
| 2. Applying the knowledge acquired from the course : | 25 % weightage |
| 3. Analysis :  | 10 % weightage |
| 4. Evaluation :                                      | 02 % weightage |
| 5. Creating new knowledge :                          | 03 % weightage |

### List of equipment and materials

Sl No	Description	Nos
<b>Furniture</b>		
1	Display table 4'X8'	8
2	Stools/ Chairs	40
3	Display Racks	10
4	Metal Trays	10
<b>Specimens</b>		
6	<b><u>STONES</u></b> Granite, Trap, Basalt, Sandstone, Limestone, Gneiss, Laterite, Marble, Quartzite, Slate.	Each 5Nos
7	<b><u>BRICKS</u></b> Ground moulded, Table moulded, Machine moulded (Wire cut), Soil stabilized blocks, Concrete blocks (solid-hallow), Fly ash bricks, Fire bricks, Light weight blocks (clay hallow blocks & autoclave aerated concrete blocks)	Each 5Nos
8	<b><u>FLOORING MATERIAL</u></b> Granolithic, CC with red oxide finish, Shahabad, Vitrified, Marble, Granite, Pressed Clay tiles, Interlocking pavers, Cobble stone, Wooden flooring	Each 5Nos
9	<b><u>BINDING MATERIAL</u></b> Cement, White cement, Lime, Clay, Fly ash, Plaster of Paris, Lime putty, Water proofing compound, and White cement based putty.	Each 5Nos
10	<b><u>CLADDING MATERIAL</u></b> Exterior surface wall cladding material, Bath & kitchen wall cladding, Sloped roof cladding. <b><u>ROOFING MATERIAL</u></b> - Mangalore tiles, Country tiles, A C sheet, Plastic sheets, Non-asbestos Hi tech roofing sheet, Meta colour sheets, Alpha sheet, corrugated aluminium sheets, Puff-sandwiched roofing sheets.	Each 5Nos
11	<b><u>FINISHING, DECORATIVE &amp; FALSE CEILING MATERIAL</u></b> Mortar plaster, Stucco plaster, Designer tiles, Acoustic ceiling board, Gypsum ceiling board, Fibre board, Pulp board, Straw board, Polystyrene, Thermocol, Hair felt	Each 5Nos

Sl No	Description	Nos
12	<b><u>TIMBER</u></b> Teak, Honne, Sal, Casuarina, Deodar, Jackfruit, Mahogany, Mango, Neem, Silver oak, Bamboo. Industrial timber- Veneers, Plywood, Fibre board, Hardboard, Block board, Laminated sheets	Each 5Nos
13	<b><u>PLASTICS &amp; GLASS</u></b> Glass panels- Plain, Dark cool, Brown cool, printed; Mesh glass, Wired glass, Glass bricks, Structural glass, Ribbed glass, Perforated glass, Foam glass, Fibre glass, Float glass, Toughened glass. Plastics- Thermosetting plastic articles, Polycarbonate.	Each 5Nos
14	<b><u>COATING MATERIAL</u></b> (Paint samples to be displayed on panels of size 30cm X 30cm) Paints- Exterior primer water based, Metal-wood & wall primer, emulsion paint, enamel paint, cement paint (Snowcem), Texture paints, Interior paints Varnish-French polish, Metallic paint (grills & all purpose) Distemper- Water based & weather proof exterior emulsion.	15X2=30 panel
15	<b><u>MISCELLANEOUS MATERIALS</u></b> Metal paste, Epoxy resin, Epoxy water proofing, Silicon paste, Glass fibre reinforced polyesters, Synthetic rubber adhesives, Tile joint filler material, Sealants, PVC products, Asphalt, Expanded metal strips for joints, FRP, Geo fabrics & Geogrids	Each 5Nos

**Note:** Minimum Floor area required for establishing Material-testing Lab is 60 Sqm.

### SCHEME OF VALUATION

Course: **MATERIALS OF CONSTRUCTION LAB**

Course Code: **15CE14P**

Sl. no.	Performance	Max. Marks
1	Identify & list the properties & uses of given 8 material Identification-1 mark Properties-2 marks Uses-2 marks	40
2	Viva-Voce	10
	<b>TOTAL</b>	<b>50</b>

