

## MOHAMED SATHAK A J COLLEGE OF ENGINEERING Chennai 603103

Fromat no. TLP 05

Rev.Date 01/02/2021

Rev. No.

# **LESSON PLAN - THEORY**

	Departmen	t of Civil Engineerin	g
Name of the Subject	CONSTRUCTION MATERIALS	Name of the handling Faculty	
Subject Code	CE8391	Year / Sem	II / IV
	Com	rsa Ohiactiva	

#### **Course Objective**

To introduce students to various materials commonly used in civil engineering construction and their properties.

#### **Course Outcome**

To compare the properties of most common and advanced building materials.

To understand the typical and potential applications of these materials.

To understand the relationship between material properties and structural form.

To understand the importance of experimental verification of material properties.

To understand about modern materials.

Lesson	Plan
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Sl. No.	Topic(s)	T / R*	Periods Required	Mode of Teaching (BB / PPT / NPTEL / MOOC / etc )	Blooms Level (L1 L6)	СО	РО
	UNIT I S	 TONES – BR	ICKS – (	CONCRETE BL	OCKS		
1	Stone as building material	T1	1	BB	L2	CO1	PO1,PO2,PO3
2	Criteria for selection	T1	1	BB	L2	CO1	PO1,PO2,PO3
3	Tests on stones	T1	1	BB	L3	CO1	PO1,PO2,PO3
4	Deterioration and Preservation of stone work	T1	1	BB	L3	CO1	PO1,PO2,PO3
5	Bricks – Classification	T1	1	BB	L3	CO1	PO1,PO2,PO3
6	Manufacturing of clay bricks	T1	1	BB	L3	CO2	PO1,PO2,PO3
7	Tests on bricks	T1	1	BB	L3	CO2	PO1,PO2,PO3
8	Bricks for special use	T1	1	BB	L3	CO2	PO1,PO2,PO3
9	Light weight concrete blocks	T1	1	ВВ	L3	CO2	PO1,PO2,PO3

### Suggested Activity:

Evaluation method: Paper base evaluation

IINIT II I IMF _	CEMENT _	AGGREGATES -	MORTAR
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10	Lime – Preparation of lime mortar	T1	1	BB	12	CO1	PO1,PO2,PO3
11	Cement – Ingredients – Manufacturing process	T1	1	BB	L2	CO1	PO1,PO2,PO3
12	Types and Grades	T1	1	BB	L2	CO1	PO1,PO2,PO3

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13	Properties of cement and Cement mortar	T1	1	BB	L3	CO1	PO1,PO2,PO3
14	Hydration – Compressive strength	T1	1	BB	L3	CO1	PO1,PO2,PO3
15	Tensile strength – Fineness– Soundness and consistency – Setting time	T1	1	ВВ	L3	CO1	PO1,PO2,PO3
16	Industrial byproducts – Fly ash – Aggregates – Natural stone aggregates – Crushing strength	T1	1	BB	L3	CO1	PO1,PO2,PO3
17	Impact strength – Flakiness Index – Elongation Index	T1	1	BB	L3	CO1	PO1,PO2,PO3
18	Abrasion Resistance – Grading – Sand Bulking	T1	1	BB	L3	CO1	PO1,PO2,PO3

Suggested Activity: Assignment -

Evaluation method: Paper base evaluation

		UNIT I	II CONC	CRETE			
19	Concrete – Ingredients	T1	1	BB	L2	СОЗ	PO1,PO2,PO3
20	Manufacturing Process	T1	1	BB	L2	CO3	PO1,PO2,PO3
21	Batching plants – RMC	T1	1	BB	L2	CO3	PO1,PO2,PO3
22	Properties of fresh concrete	T1	1	BB	L3	CO3	PO1,PO2,PO3
23	Properties of hardened concrete	T1	1	PPT	L3	CO4	PO1,PO2,PO3
24	Mix specification	T1	1	PPT	L3	CO4	PO1,PO2,PO3
25	High Strength Concrete and HPC – Self compacting Concrete	T1	1	PPT	L3	CO4	PO1,PO2,PO3
26	Other types of Concrete	T1	1	PPT	L3	CO4	PO1,PO2,PO3
27	Durability of Concrete.	T1	1	PPT	L3	CO4	PO1,PO2,PO3

Suggested Activity: Assignment -

Evaluation method : Paper base evaluation

	UNIT	IV TIMBER	AND OT	HER MATERIA	ALS		
28	Timber – Market forms	T1	1	PPT	L3	СОЗ	PO1,PO2,PO3
29	Industrial timber– Plywood – Veneer – Thermacole	T1	1	PPT	L3	CO3	PO1,PO2,PO3
30	Panels of laminates	T1	1	PPT	L3	СОЗ	PO1,PO2,PO3
31	Steel – Aluminum and Other Metallic Materials	T1	1	PPT	L3	CO3	PO1,PO2,PO3
32	Composition	T1	1	PPT	L3	СОЗ	PO1,PO2,PO3
33	Aluminium composite panel – Uses	T1	1	BB	L3	CO3	PO1,PO2,PO3
34	Market forms – Mechanical treatment	T1	1	BB	L3	CO3	PO1,PO2,PO3
35	Paints - Varnishes	T1	1	PPT	L3	CO3	PO1,PO2,PO3
36	Distempers – Bitumens.	T1	1	PPT	L3	CO3	PO1,PO2,PO3
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Suggested Activity: Assignment -

Evaluation method: Paper base evaluation

37   Glass - Ceramics				UNIT	V REP	ORT PR	EPARA'	ΓΙΟΝ				
Section   Sect	37	Glass -	Ceramics				1		Ι,	າ	CO5	PO1.PO2.PO3
39   Fibre glass reinforced plastic	38											
40   Clay products - Refractories		-		-		2				.3	CO5	
1		-	<u> </u>			1			L	.3	CO5	
42   Applications of laminar composites	40	Clay pr	oducts – Refractories	1	<u> </u>	1	B.	В	L	.3	CO5	PO1,PO2,PO3
43   Geomembranes and Geotextiles for earth   T1	41	Compos	site materials – Types	1	Γ1	2	B	В	L	.3	CO5	PO1,PO2,PO3
1	42	1	•	7	Γ1	1	B	В	L	.3	CO5	PO1,PO2,PO3
Feathards method: Paper base evaluation	43			1	Γ1	1	B	В	L	.3	CO5	PO1,PO2,PO3
Content Beyond the Syllabus Planned						•	•					
Text Books  1 Varghese, P.C., "Building Materials", PHI Learning Pvt. Ltd, New Delhi, 2012.  2 Rajput. R.K., "Engineering Materials", S. Chand and Company Ltd., 2008.  3 Shetty, M.S., "Concrete Technology (Theory and Practice)", S. Chand and Company Ltd., 2008.  4 Gambhir, M.L., "Concrete Technology", 3 rd Edition, Tata McGraw Hill Education, 2004  5 Duggal.S.K., "Building Materials", 4 th Edition, New Age International, 2008.  Reference Books  1 Jagadish, K.S., "Alternative Building Materials Technology", New Age International, 2007  2 Gambhir, M.L., & Neha Jamwal, "Building Materials, products, properties and systems", Tata McGraw Hill Educations Pvt. Ltd, New Delhi, 2012.  3 IS456 – 2000: Indian Standard specification for plain and reinforced concrete, 2011  4 IS4926–2003: Indian Standard specification for ready—mixed concrete, 2012  5 IS383–1970: Indian Standard specification for coarse and fine aggregate from natural Sources for concrete, 2011  6 ISI542–1992: Indian standard specification for sand for plaster, 2009  Website / URL References  1 https://notel.ac.in/courses/105/102/105102088/  Evel 1 (L1): Remembering Lower Fixed Hour Thinking Level 2 (L2): Understanding Thinking Level 5 (L5): Evaluating Order Thinking Level 6 (L6): Creating Thinking Level												
Text Books  1 Varghese.P.C., "Building Materials", PHI Learning Pvt. Ltd, New Delhi, 2012.  2 Rajput. R.K., "Engineering Materials", S. Chand and Company Ltd., 2008.  3 Shetty.M.S., "Concrete Technology (Theory and Practice)", S. Chand and Company Ltd., 2008.  4 Gambhir.M.L., "Concrete Technology", 3 rd Edition, Tata McGraw Hill Education, 2004  5 Duggal.S.K., "Building Materials", 4 th Edition, New Age International, 2008.  Reference Books  1 Jagadish.K.S., "Alternative Building Materials Technology", New Age International, 2007  2 Gambhir. M.L., & Neha Jamwal., "Building Materials, products, properties and systems", Tata McGraw Hill Educations Pvt. Ltd, New Delhi, 2012.  3 1S456 – 2000: Indian Standard specification for plain and reinforced concrete, 2011  4 1S4926–2003: Indian Standard specification for ready—mixed concrete, 2012  5 1S383–1970: Indian Standard specification for coarse and fine aggregate from natural Sources for concrete, 2011  6 1S1542–1992: Indian standard specification for sand for plaster, 2009  Website / URL References  1 https://nptel.ac.in/courses/105/102/105102088/  Evel 2 (1.2): Understanding Triniki ng Exams  Evel 2 (1.2): Understanding Thinki ng Exams  Mapping syllabus with Bloom's Taxonomy LOT and HOT  Unit No Unit Name L1 L2 L3 L4 L5 L6 LOT HOT Total  Unit 1 STONES – BRICKS – CONCRETE BLOCKS 0 2 7 0 0 0 9 9 0 9  Unit 2 LIME – CEMENT – AGGREGATES – MORTAR	1											
Varghese,P.C., "Building Materials", PHI Learning Pvt. Ltd, New Delhi, 2012.   Rajput. R.K., "Engineering Materials", S. Chand and Company Ltd., 2008.   Shetty,M.S., "Concrete Technology (Theory and Practice)", S. Chand and Company Ltd., 2008.   Gambhir,M.L., "Concrete Technology", 3 rd Edition, Tata McGraw Hill Education, 2004   Duggal,S.K., "Building Materials", 4 th Edition, New Age International, 2008.   Reference Books	2											
2 Rajput. R.K., "Engineering Materials", S. Chand and Company Ltd., 2008.  3 Shetty.M.S., "Concrete Technology (Theory and Practice)", S. Chand and Company Ltd., 2008.  4 Gambhir.M.L., "Concrete Technology", 3 rd Edition, Tata McGraw Hill Education, 2004  5 Duggal.S.K., "Building Materials", 4 th Edition, New Age International, 2008.  Reference Books  1 Jagadish.K.S., "Alternative Building Materials Technology", New Age International, 2007  2 Gambhir. M.L., & Neha Jamwal., "Building Materials, products, properties and systems", Tata McGraw Hill Educations Pvt. Ltd, New Delhi, 2012.  3 IS456 – 2000: Indian Standard specification for plain and reinforced concrete, 2011  4 IS4926–2003: Indian Standard specification for ready-mixed concrete, 2012  5 IS383–1970: Indian Standard specification for coarse and fine aggregate from natural Sources for concrete, 2011  6 IS1542–1992: Indian standard specification for sand for plaster, 2009  Website / URL References  1 https://nptel.ac.in/courses/105/102/105102088/  Evel 2 (L2): Understanding  Thinking  Projects / Mini Projects / Min					1	Text Book	s					
3 Shetty.M.S., "Concrete Technology (Theory and Practice)", S. Chand and Company Ltd., 2008.  4 Gambhir.M.L., "Concrete Technology", 3 rd Edition, Tata McGraw Hill Education, 2004  5 Duggal.S.K., "Building Materials", 4 th Edition, New Age International, 2008.  Reference Books  1 Jagadish.K.S., "Alternative Building Materials Technology", New Age International, 2007  2 Gambhir. M.L., & Neha Jamwal., "Building Materials, products, properties and systems", Tata McGraw Hill Educations Pvt. Ltd, New Delhi, 2012.  3 IS456 – 2000: Indian Standard specification for plain and reinforced concrete, 2011  4 IS4926–2003: Indian Standard specification for ready—mixed concrete, 2012  5 IS383–1970: Indian Standard specification for coarse and fine aggregate from natural Sources for concrete, 2011  6 IS1542–1992: Indian standard specification for sand for plaster, 2009  Website / URL References  1 https://nptel.ac.in/courses/105/102/105102088/  Level 1 (L1): Remembering	1	Varghe	se.P.C, "Building Materials", PHI	_earning	Pvt. Ltd	, New Dell	ni, 2012.					
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Gambhir. M.L., & Neha Jamwal., "Building Materials, products, properties and systems", Tata McGraw Hill Educations Pvt. Ltd, New Delhi, 2012.  3					Ref	erence Bo	ooks					
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Nebsite / URL References   1	5	IS383-1	970: Indian Standard specification	for coars	se and fir	ne aggrega	te from na	itural Sou	rces for c	oncrete, 2	011	
International Projects   International Proje	6	IS1542-	-1992: Indian standard specification	for sand	l for plas	ster, 2009						
Level 1 (L1): Remembering		1		V	Vebsite	/ URL R	eferences					
Level 1 (L1): Remembering       Lower Order Thinking       Fixed Hour Thinking       Level 5 (L5): Evaluating       Higher Order Thinking       Projects / Mini Projects         Mapping syllabus with Bloom's Taxonomy LOT and HOT         Unit No       Unit Name       L1       L2       L3       L4       L5       L6       LOT       HOT       Total         Unit 1       STONES - BRICKS - CONCRETE BLOCKS       0       2       7       0       0       9       0       9         Unit 2       LIME - CEMENT - AGGREGATES - MORTAR       0       3       6       0       0       0       9       0       9	1	https://	nptel.ac.in/courses/105/102/105/	102088/								
Level 2 (L2): Understanding  Level 3 (L3): Applying  Mapping syllabus with Bloom's Taxonomy LOT and HOT  Unit No  Unit Name  Unit 1  STONES - BRICKS - CONCRETE BLOCKS  Unit 2  Lime - CEMENT - AGGREGATES - MORTAR  Unit 2  Unit 2  Unit 1  Corder Thinking Projects / Mini Projects  Level 5 (L5): Evaluating  Level 5 (L5): Evaluating  Level 5 (L5): Evaluating  Level 5 (L5): Evaluating  Thinking  Projects / Mini Projects		4 / 7 4:	<u> </u>	<del></del>						1	1	
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