	MOHAMED SATHAK A J COLLEGE OF ENGINEERING Chennai 603103	Fromat no.	TLP 05
		Rev.Date	01/02/2021
	LESSON PLAN - THEORY	Rev. No.	0

Department of Civil Engineering			
Name of the Subject	CONSTRUCTION MATERIALS	Name of the handling Faculty	Mr B. Sarangan
Subject Code	CE8391	Year / Sem	II / IV

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

Sl. No.	Topic(s)	T / R* Book	Periods Required	Mode of Teaching (BB / PPT / NPTEL / MOOC / etc)	Blooms Level (L1-L6)	CO	PO
UNIT I STONES – BRICKS – CONCRETE BLOCKS							
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	BB	L3	CO2	PO1,PO2,PO3
Suggested Activity:							
Evaluation method : Paper base evaluation							
UNIT II LIME – CEMENT – AGGREGATES – MORTAR							
10	Lime – Preparation of lime mortar	T1	1	BB	L2	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

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**	BB	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 III CONCRETE							
19	**Concrete – Ingredients**	**T1**	**1**	BB	L2	CO3	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 OTHER MATERIALS							
28	**Timber – Market forms**	**T1**	**1**	PPT	L3	CO3	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	CO3	PO1,PO2,PO3
31	**Steel – Aluminum and Other Metallic Materials**	**T1**	**1**	PPT	L3	CO3	PO1,PO2,PO3
32	**Composition**	**T1**	**1**	PPT	L3	CO3	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
Suggested Activity: Assignment -							
Evaluation method : Paper base evaluation							

UNIT V REPORT PREPARATION							
37	Glass – Ceramics	T1	1	BB	L3	CO5	PO1,PO2,PO3
38	Sealants for joints	T1	2	BB	L3	CO5	PO1,PO2,PO3
39	Fibre glass reinforced plastic	T1	1	BB	L3	CO5	PO1,PO2,PO3
40	Clay products – Refractories	T1	1	BB	L3	CO5	PO1,PO2,PO3
41	Composite materials – Types	T1	2	BB	L3	CO5	PO1,PO2,PO3
42	Applications of laminar composites	T1	1	BB	L3	CO5	PO1,PO2,PO3
43	Geomembranes and Geotextiles for earth reinforcement.	T1	1	BB	L3	CO5	PO1,PO2,PO3

Suggested Activity: Assignment -

Evaluation method : Paper base evaluation

Content Beyond the Syllabus Planned

1	
2	

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	IS1542–1992: Indian standard specification for sand for plaster, 2009

Website / URL References

1	https://nptel.ac.in/courses/105/102/105102088/

Blooms Level

Level 1 (L1) : Remembering	Lower Order Thinking	Fixed Hour Exams	Level 4 (L4) : Analysing		Higher Order Thinking	Projects / Mini Projects
Level 2 (L2) : Understanding			Level 5 (L5) : Evaluating			
Level 3 (L3) : Applying			Level 6 (L6) : Creating			

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	0	9
Unit 2	LIME – CEMENT – AGGREGATES – MORTAR	0	3	6	0	0	0	9	0	9
Unit 3	CONCRETE	0	0	9	0	0	0	9	0	9

Unit 4	TIMBER AND OTHER MATERIALS	0	0	9	0	0	0	9	0	9
Unit 5	MODERN MATERIALS	0	0	9	0	0	0	9	0	9
Total		0	5	40	0	0	0	45	0	45
Total Percentage		0	11.111	88.88889	0	0	0	100	0	100

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2											1	2
CO2	3	2											1	2
CO3	3	2											1	2
CO4	3	2											1	2
CO5	3	2											1	2
Avg	3	2	#DIV/0!	#DIV/0!	#DIV/0!	######	######	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	2

Justification for CO-PO mapping

CO1	**By learning about the different types of construction materials, this will help in applying Engineering and science knowledge to find the solutions of constructional issues (PO1).This will help in solving engineering problems (PO2).(PSO1) ability to design and analyze construction of modern structures and helps to give the solutions of eco friendly materials**
CO2	**By learning about the different types of construction materials, students can able to solve problems (PO1), This will help in analyzing complex problems (PO2). By learning about different construction practices and uses can able to design high rise structures, based on the properties (PSO1)**
CO3	**By learning about concrete, students can able to solve problems related to concrete (PO1), This will help in analyzing complex problems on structure components (PO2).By learning the construction materials, students can able to design different structures (PSO1)**
CO4	**Understanding the concept of timber and timber products helps in applying through the fundamental engineering knowledge (PO1), This will help in analyzing the different natural foundation for the structures (PO2). By learning the structure, types of foundations adopted can be designed (PSO1)**
CO5	**Understanding the concept of modern materials required for structures helps in applying through the fundamental engineering knowledge (PO1), This will help in analyzing the different construction for structures (PO2). By learning the geological structure, types of foundations adopted can be designed (PSO1).**

3	**High level**	**2**	**Moderate level**	**1**	Low level

*Kindly sign with date

Name & Sign of Faculty Incharge :

Name & Sign of Subject Expert :

Head of the Department :

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