
	SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY COURSE PLAN (THEORY)	
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ACADEMIC YEAR: 2018-2019(Odd)

Subject Code	CE8391		L	P	T	C
Subject Title	CONSTRUCTION MATERIALS		3	0	0	3
Year / Dept / Sem	II / CIVIL / III	Regulation Year		2017		
Faculty Name / Desg / Dept	Mr.K.KALIRAJAN M.E., / Assistant Professor / CIVIL					
Course Prerequisite	1. The students must have details about basic construction materials. 2. They have more details about properties of concrete and timbers.					

SYLLABUS

CE8391	CONSTRUCTION MATERIALS	L T P C
		3 0 0 3
UNIT I	STONES – BRICKS – CONCRETE BLOCKS	9
Stone as building material – Criteria for selection – Tests on stones – Deterioration and Preservation of stone work – Bricks – Classification – Manufacturing of clay bricks – Tests on bricks – Compressive Strength – Water Absorption – Efflorescence – Bricks for special use – Refractory bricks – Cement, Concrete blocks – Light weight concrete blocks.		
UNIT II	LIME CEMENT – AGGREGATES – MORTAR	9
Lime – Preparation of lime mortar – Cement – Ingredients – Manufacturing process – Types and Grades – Properties of cement and Cement mortar – Hydration – Compressive strength – Tensile strength – Fineness– Soundness and consistency – Setting time – Industrial by products – Fly ash – Aggregates – Natural stone aggregates – Crushing strength – Impact strength – Flakiness Index – Elongation Index – Abrasion Resistance – Grading – Sand Bulking.		
UNIT III	CONCRETE	9
Concrete – Ingredients – Manufacturing Process – Batching plants – RMC – Properties of fresh concrete – Slump – Flow and compaction Factor – Properties of hardened concrete – Compressive, Tensile and shear strength – Modulus of rupture – Tests – Mix specification – Mix proportioning – BIS method – High Strength Concrete and HPC – Self compacting Concrete – Other types of Concrete – Durability of Concrete.		
UNIT IV	TIMBER AND OTHER MATERIALS	9
Timber – Market forms – Industrial timber– Plywood – Veneer – Thermacole – Panels of laminates – Steel – Aluminium and Other Metallic Materials – Composition – Aluminium composite panel – Uses – Market		

forms – Mechanical treatment – Paints – Varnishes – Distempers – Bitumens.

UNIT V MODERN MATERIALS

9

Glass – Ceramics – Sealants for joints – Fibre glass reinforced plastic – Clay products – Refractories – Composite materials – Types – Applications of laminar composites – Fibre textiles – Geomembranes and Geotextiles for earth reinforcement.

TOTAL: 45 PERIODS

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", 3rd Edition, Tata McGraw Hill Education, 2004.
5. Duggal.S.K., "Building Materials", 4th Edition, New Age International , 2008.

REFERENCES:

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.

Course Objectives (CO)	<p>CO1: To introduce students to various materials commonly used in civil engineering construction.</p> <p>CO2: Students will be introduced to properties of various materials commonly used in civil engineering construction.</p> <p>CO3: Students will be introduced to the manufacturing and types of cement.</p> <p>CO4: To introduce students to tests and mix proportioning of concrete.</p> <p>CO5: To introduce students to forms of timber and composition of Aluminium.</p> <p>CO6 : Students will be introduced to various composite materials and their types.</p>
Expected Course Outcomes (ECO)	<p>At the end of the course, the students should be able to:</p> <p>EC01. Compare the properties of most common and advanced building materials.</p> <p>EC02. Understand the typical and potential applications of these materials.</p>

				EC03. Understand the relationship between material properties and structural form.								
				EC04. Understand the importance of experimental verification of material properties.								
Mapping of CO & PO(Specify the PO's) - <i>(Fill the cols with the legend given below)</i>												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	2	-	1	-	-	-	-	-	-	-	-	2
C02	2	1	-	-	-	-	-	-	2	2	-	2
C03	1	-	1	-	-	-	-	-	-	-	-	2
C04	1	2	-	2	-	-	-	-	-	-	-	2
C05	2	-	1	-	-	-	-	-	2	1	1	2
C06	2	2	-	2	-	-	-	-	2	-	-	2
Bridging the Curriculum Gap (Additional Topics beyond syllabus/Seminars/Assignments)				BCG1: Paver blocks and their manufacturing process BCG2: Tests on Aggregate BCG3: Plaster of Paris								
Related Website URLs				W1: http://nptel.ac.in/courses/105106118/9 W2: www.library.ctr.utexas.edu/ctr-publications/0-5831-3.pdf W3: www.e-periodica.ch/cntmng?pid=bse-cr-001:1968:8::203								
Related Video Course Materials (min. 3 no.s)				V1: https://youtu.be/UzuVARqd5DI V2: https://www.youtube.com/watch?v=pjwrXLWhISE V3: https://www.youtube.com/watch?v=HLnV-fdf9k								

S.No	Topic Name	Book - P. No	Teaching Aids	No of hrs	Cumulative hrs
UNIT I STONES - BRICKS - CONCRETE BLOCKS					
1.	Stone as building material – Criteria for selection	T2 11-15	Class room teaching	1	1
2.	Tests on stones – Deterioration and Preservation of stone work	T2 15-24	Class room teaching	2	3
3.	Bricks – Classification	T2 50-52	Assignments	1	4
4.	Manufacturing of clay bricks	T2 40-48	Class room teaching	1	5
5.	Tests on bricks – Compressive Strength	T2 53-58	Class room teaching	2	7
6.	Water Absorption – Efflorescence	T2 59-62	Class room teaching	2	9
7.	Bricks for special use – Refractory bricks	T2 63-69	Seminars	1	10

8.	Cement, Concrete blocks	T2 152-60	Class room teaching	1	11
9.	Light weight concrete blocks	T2 124-141	Assignments	1	12
UNIT II LIME CEMENT – AGGREGATES – MORTAR					
1.	Lime – Preparation of lime mortar	T2 192-193	Class room teaching	1	13
2.	Cement – Ingredients – Manufacturing process	T2 192-204	Class room teaching	1	14
3.	Types and Grades – Properties of cement and Cement mortar	T2 337-342	Assignments	2	16
4.	Hydration – Compressive strength – Tensile strength – Soundness and consistency – Setting time	T2 342-354	Class room teaching	2	18
5.	Industrial by products – Fly ash – Aggregates – Natural stone aggregates	T2 323-325	Class room teaching	2	20
6.	Crushing strength – Impact strength – Flakiness Index – Elongation Index	T2 332-334	Class room teaching	2	22
7.	Abrasion Resistance – Grading – Sand Bulking.	T2 244-248	Class room teaching	2	24
UNIT III CONCRETE					
1.	Concrete – Ingredients – Manufacturing Process	T2 151-152	Class room teaching	1	25
2.	RMC – Properties of fresh concrete-Slump – Flow and compaction Factor	T2 160-163	Class room teaching	2	27
3.	Properties of hardened concrete	T2 163	Assignments	1	28
4.	Compressive, Tensile and shear strength – Modulus of rupture	T2 288-294	Class room teaching	2	30
5.	Tests – Mix specification – Mix proportioning – BIS method	T2 295-300	Class room teaching	2	32
6.	High Strength Concrete and High performance concrete	T2 304	Class room teaching	1	33
7.	Self compacting Concrete – Other types of Concrete	T2 305-311	Class room teaching	2	35
8.	Durability of Concrete	T2-312	Seminars	1	36
UNIT IV TIMBER AND OTHER MATERIALS					
1.	Timber – Market forms – Industrial timber	T1 472-476	Class room teaching	2	38
2.	Plywood – Veneer – Thermacole	T1 440	Class room teaching	2	40
3.	Panels of laminates – Steel – Aluminium and Other Metallic Materials	T1 442	Class room teaching	2	42
4.	Composition – Aluminium composite panel	T1 456-458	Class room teaching	2	44
5.	Uses – Market forms – Mechanical treatment	T1 468-471	Class room teaching	2	46

6.	Paints – Varnishes – Distempers – Bitumens.	T1 472	Class room teaching	2	48
UNIT V MODERN MATERIALS					
1.	Glass – Ceramics	T1 73-87	Class room teaching	1	49
2.	Sealants for joints – Fibre glass reinforced plastic	T1 511-517	Class room teaching	2	51
3.	Clay products – Refractories	T1 491-499	Class room teaching	2	53
4.	Composite materials – Types	T1 574-581	Class room teaching	2	55
5.	Applications of laminar composites – Fibre textiles	T1 395	Class room teaching	2	57
6.	Geomembranes	T1 397-398	Seminars	2	59
7.	Geotextiles for earth reinforcement	T1 396	Seminars	1	60

	<i>Prepared by</i>	<i>Approved by</i>
Signature		
Name	Mr.K.KALIRAJAN	Prof.P.SURESH KUMAR
Designation	Assistant Professor / CIVIL	HOD /CIVIL
Signed date		

LEGEND:

METHODOLOGY TO MAP OBJECTIVE WITH OUTCOME

Course outcomes are achieved through

- a.** Suitable Analogies.
- b.** Class room teaching.
- c.** Assignments.
- d.** Tutorials
- e.** Weekly, monthly and model exams.
- f.** Brain storming.
- g.** Group discussion and role play.
- h.** Seminars