



Indra Ganesan

COLLEGE OF ENGINEERING

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Accredited by NAAC with 'B+' Grade, 2(f) & 12B Status Institution by UGC

IG Valley, Madurai Main Road, Manikandam, Tiruchirappalli - 620012

NAAC DOCUMENTS

QUALITY INDICATOR FRAME WORK

CRITERION – 1

CURRICULAR ASPECTS

SUBMITTED BY

IQAC

INTERNAL QUALITY ASSURANCE CELL

INDRA GANESAN COLLEGE OF ENGINEERING





Indra Ganesan

COLLEGE OF ENGINEERING

Madurai Main Road (NH-45B), Manikandam, Tiruchirappalli - 620 012
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
NAAC Accredited, 2(F) Status Institution by UGC



Criteria 1	Curricular Aspects	100
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1.1 Curricular Planning and Implementation (20)

1.1.1 The Institution ensures effective curriculum planning and delivery through a well-planned and documented process including Academic calendar and conduct of continuous internal Assessment

Table of Content

S. No	Description
1.	Preface of the Course File
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INDRA GANESAN COLLEGE OF ENGINEERING

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF AGRICULTURAL ENGINEERING

PREFACE OF THE COURSE FILE

Batch : 2017-2021

Academic Year : 2018-2019 /ODD

Program : CIVIL ENGINEERING

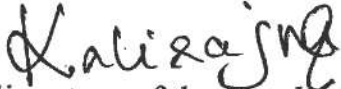
Year & Semester : 2nd Year / 3th Semester / 'A' Section

Course Code : CE8391


NBA Course Code:C205

Name of the Course : CONSTRUCTION MATERIALS

Faculty in-charge : M.KALIRAJ (AP)


Signature of the Faculty in-charge


HoD / CIVIL


Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

INDRA GANESAN COLLEGE OF ENGINEERING

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DEPARTMENT OF CIVIL ENGINEERING

REVIEW OF COURSE FILE

(to be pasted on the inner side of the file-backside).(#-State Yes/No.)

S.N	Details	Date:	R-I-*	R-II-*&	R-III-*&	R-IV-*&\$	R-V-*&\$@
1.	Preface of the course file		Y				
2.	Vision, Mission, PEOs, POs, PSOs, Blooms taxonomy		Y				
3.	Subject handlers of yesteryears		Y				
4.	Timetable/Workload of the staff – Distribution of teaching load – Roles and Responsibilities		Y				
5.	Syllabus signed by staff & HoD		Y				
6.	Lecture Schedule signed by staff & HoD		Y				
7.	Course Committee meeting circular and minutes		Y				
8.	Identification of Curricular gap and Content Beyond the syllabus		Y				
9.	Self-study topics		Y				
10.	Previous AU Question papers		Y				
11.	Unit wise Q&A and Objective type questions		Y				
12.	Unit wise course material			Y	Y	Y	
13.	Assignment question paper with sample answer sheets and mark entry			Y	Y	Y	
14.	Tutorial question paper with key and mark entry			Y	Y	Y	
15.	Class test/IA test Q Paper with Key, sample answer papers and mark entry			Y	Y	Y	
16.	IA Test- result analysis-CAP-evidence-root cause analysis.			Y	Y	Y	
17.	Retest –Q paper-Attendance-marks			Y	Y	Y	
18.	AU Web portal entry sheet			Y	Y	Y	
19.	Very poor performance in first two tests-action taken.-communication to parents-evidence				Y	Y	
20.	Absence for two tests-action taken-communication to parents-evidence.				Y	Y	
21.	Indiscipline of student reported, if any						
22.	Special class/coaching class/remedial class/attendance-CAP			Y	Y	Y	
23.	Conduct of Seminar, Quizzes - proof						
24.	Content beyond the syllabus - proof						Y
25.	Student feedback on faculty						Y
26.	Course end survey						Y
27.	Internal Assessment sheet						Y
28.	AU question paper with students feedback						Y
29.	Discrepancy of the question paper and correspondence, if any						Y
30.	AU result analysis-Details of arrear students.						Y
31.	AU grade sheet						Y
32.	CO – PO & PSO attainment sheet						Y
	Signature of Course handling faculty		<i>Kaling</i>	<i>Kaling</i>	<i>Kaling</i>	<i>Kaling</i>	<i>Kaling</i>
	Signature of HoD		<i>Srinivas</i>	<i>Srinivas</i>	<i>Srinivas</i>	<i>Srinivas</i>	<i>Srinivas</i>

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Indra ganesan college of engineering

Department of Civil Engineering

Work Load - Odd Semester 2018-19

S.NO.	Teacher's Name	Course Code	Course Name	Semester	Lecture / week	Total
1	Mr.S.Ramalingam (1+0)	CE 8703	Structural Design and Drawing	VII	4	4
2	Mr.R.Sivasankar (2+0)	CE8701	Estimation, costing, & Valuation Engineering	VII	4	8
		CE8302	Fluid Mechanics	III	4	
3	Mr.K.Sengottian (2+1)	CE8301	Strength of Materials-I	III	4	12
		CE8502	Structural Analysis I	V	4	
		CE8712	Design Project	VII	4	
4	Ms Geena	EN 8491	Water Supply Engineering	V	4	12+1
		EN8591	Municipal Solid Waste Management	VII	4	
5	Ms.G.Bharani (2+1)	CE8501	Design of Reinforced Cement Concrete Elements	V	5	13+2
		CE6704	Estimation and Quantity Surveying	VII	4	
		CE8511	Soil Mechanics Laboratory	V	4	
6	Mr.K.Saravanan (2+1)	CE6701	Railway, Airport, Harbour Engineering	VII	4	12+1
		CE8591	Foundation Engineering	V	4	
		CE8361	Surveying lab	III	4	
7	Mr.M.Kaliraj (2+1)	CE8391	Construction Materials	III	4	12
		ORO551	Renewable Energy Sources	V	4	
		CE8311	Construction Materials Lab	III	4	
8	Mrs.K.Gaythri (2+1)	CE8351	Surveying	III	4	12+1
		CE8512	Water and Waste Water Analysis Laboratory	V	4	
9	Ms.E.Vinodha (2+1)	CE8392	Engineering Geology	III	4	8+1
		GE8071	Disaster Management	V	4	
		CE8513	Survey Camp	V	0	


Time Table Co-ordinator


HOD


Dr. G. Balakrishnan, M.E., Ph.D.,

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Manikandam, Trichy-620 012.

OBJECTIVE:

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

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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 – Concrete blocks – Lightweight 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 – fine aggregates – river sand – crushed stone sand – properties – coarse Aggregates – Crushing strength – Impact strength – Flakiness Index – Elongation Index – Abrasion Resistance – Grading		
UNIT III	CONCRETE	9
Concrete – Ingredients – Manufacturing Process – Batching plants – mixing – transporting – placing – compaction of concrete – curing and finishing – Ready mix Concrete – Mix specification.		
UNIT IV	TIMBER AND OTHER MATERIALS	9
Timber – Market forms – Industrial timber – Plywood – Veneer – Thermocol – Panels of laminates – Steel – Aluminum and Other Metallic Materials – Composition – Aluminium composite panel – 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**OUTCOMES:**

On completion of this course the students will be able to


- Compare the properties of most common and advanced building materials.
- understand the typical and potential applications of lime, cement and aggregates
- know the production of concrete and also the method of placing and making of concrete elements.
- understand the applications of timbers and other materials
- Understand the importance of modern material for construction.

TEXT BOOKS:

- Varghese.P.C, "Building Materials", PHI Learning Pvt. Ltd, New Delhi, 2015.
- Rajput. R.K., "Engineering Materials", S. Chand and Company Ltd., 2008.
- Gambhir.M.L., "Concrete Technology", 3rd Edition, Tata McGraw Hill Education, 2004
- Duggal.S.K., "Building Materials", 4th Edition, New Age International, 2008.

REFERENCES:

- Jagadish.K.S, "Alternative Building Materials Technology", New Age International, 2007.
- Gambhir. M.L., & Neha Jamwal., "Building Materials, products, properties and systems", Tata McGraw Hill Educations Pvt. Ltd, New Delhi, 2012.
- IS456 - 2000: Indian Standard specification for plain and reinforced concrete, 2011
- IS4926 - 2003: Indian Standard specification for ready-mixed concrete, 2012
- IS383 - 1970: Indian Standard specification for coarse and fine aggregate from natural Sources for concrete, 2011
- IS1542-1992: Indian standard specification for sand for plaster, 2009
- IS 10262-2009: Indian Standard Concrete Mix Proportioning –Guidelines, 2009



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DEPARTMENT OF CIVIL ENGINEERING

Lecture Schedule

Degree/Program: **B. E.CIVIL ENG**

Course code &Name: **CE8391- CONSTRUCTION MATERIALS**

Duration: **2018-2019(ODD)**

Semester: **III**

Section : **A** Faculty: **M.KALIRAJ (AP)**

OBJECTIVES:

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

PREREQUISITES: Manufacturing process, building materials

COURSE OUTCOMES:

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C205.1	Compare the properties of most common and advanced building materials	1,2,3,4,6,7,9,10,11,12	1,2,3
C205.2	Analyzing the typical and potential applications of lime, cement and aggregates	1,2,3,4,6,7,9,10,11,12	1,2,3
C205.3	Know the production of concrete and also the method of placing and making of concrete elements.	1,2,3,4,6,7,9,10,11,12	1,2,3
C205.4	Applying the applications of timbers and other materials	1,2,3,4,6,7,9,10,11,12	1,2,3
C205.5	Illustrate the importance of modern material for construction	1,2,3,4,6,7,9,10,11,12	1,2,3

S. N O	Planned date	Topics to be covered	Reference/ Teaching aids and methods	Period
		UNIT I- STONES, BRICKS, CONCRETE BLOCKS		
1	03.07.18	Introduction bricks, concrete blocks	T1, R2/BB	1
2	04/07/18	Stone as building material	T1, R2/BB	3
3	05/07/18	Criteria for selection	T1, R2/BB	2,3
4	06/07/18	Deterioration and Preservation of stone work	T1, R2/BB	3

5	07/07/18	Classification of bricks	T1, R2/BB	1
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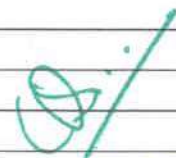
6	09/07/18	Manufacturing of clay bricks	T1, R2/BB	3,6
7	10/07/18	Compressive Strength	T1, R2/BB	1
8	11/07/18	Water Absorption	T1, R2/BB	3
9	11/07/18	Efflorescence, test on bricks	T1, R2/BB	3
10	12/07/18	Bricks for special use -Refractory bricks, Concrete blocks, Lightweight concrete blocks	T1, R2/BB	2,3

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		UNIT-2 LIME, CEMENT, AGGREGATES, MORTOR		
11	19/07/18	Lime – Preparation of lime mortar	T2, R4/BB	2,3
12	20/07/18	Cement, Ingredients, Manufacturing process, types and Grades	T2, R4/BB	3
13	21/07/18	Properties of cement and Cement mortar	T2, R4/BB	6
14	23/07/18	Compressive strength ,Tensile strength	T2, R4/BB	1
15	24/07/18	Fineness, hydration	T2, R4/BB	1
16	25/07/18 26/07/18	Soundness and consistency, Setting time ,fine aggregates, river sand , crushed stone sand	T2, R4/BB	3 2,6
17	27/07/18	Crushing strength, Impact strength	T2, R4/BB	3
18	28/07/18	Flakiness Index, Elongation Index	T2, R4/BB	3
19	30/07/18	Abrasion Resistance	T2, R4/BB	1
20	31/07/18	Grading	T2, R4/BB	1

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		UNIT-3 CONCRETE		
21	07/08/18	Introduction on concrete	T3, R4/BB	1
22	08/08/18	Ingredients	T3, R4/BB	3
23	09/08/18	Manufacture Process	T3, R4/BB	2,6
24	10/08/18	Batching plants	T3, R4/BB	3
25	11/08/18	transporting	T3, R4/BB	6
26	13/07/18	compaction of concrete	T3, R4/BB	1
27	14/08/18	curing and finishing	T3, R4/BB	1
28	16/08/18	Ready mix Concrete	T3, R4/BB	2,6


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29	17/08/18	Mix specification	T3, R4/BB	3
30	18/08/18	QUIZ AND ANALYSIS	T3, R4/BB	2

		UNIT IV- TIMBER AND OTHER MATERIALS		
31	31/08/18	Timber -Market forms	T2, R1/BB	3

32	01/09/18	Industrial timber	T2, R1/BB	3
33	03/09/18	Plywood, Veneer, Thermocol	T2, R1/BB	1
34	04/09/18	Panels of laminates	T2, R1/BB	1
35	05/09/18	Steel	T2, R1/BB	3
36	06/09/18	Aluminum and Other Metallic Materials	T2, R1/BB	2,6
37	07/09/18	Aluminium composite panel	T2, R1/BB	3
38	08/09/18	Mechanical treatment	T2, R1/BB	1
39	08/09/18	Paints, Varnishes	T2, R1/BB	5
40	10/09/18	Distempers, Bitumens.	T2, R1/BB	1

		UNIT V- MORDERN MATERIALS		
41	19/09/18	Glass	T4, R1/BB	3
42	20/09/18	Ceramics	T4, R1/BB	2,6
43	22/09/18	Sealants for joints	T4, R1/BB	5
44	24/09/18	Fibre glass reinforced plastic	T4, R1/BB	1
45	25/09/18	Clay products	T4, R1/BB	1
46	26/09/18	Refractories	T4, R1/BB	3
47	27/09/18	Composite materials	T4, R1/BB	2,6
48	28/09/18	Applications of laminar composites	T4, R1/BB	3
49	29/09/18	Fibre textiles	T4, R1/BB	5
50	01/10/18	Geomembranes&Geotextiles for earth reinforcement	3	

Sl.	Title of the Book	Author	Year
1.	Building Materials	Varghese.P.C, Duggal.S.K	2015, 2008
2.	Engineering Materials	Rajput. R.K	2008
3.	Concrete Technology	Gambhir.M.L.	2004

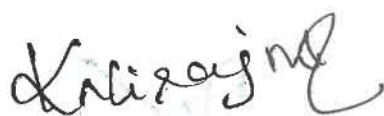

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BookReference – References

Sl	Title of the Book	Author	Publisher	Year
1	Alternative Building Materials Technology	Jagadish.K.S,	New Age International	2007
2	Building Materials, products, properties and systems	Gambhir. M.L., & Neha Jamwal	Tata McGraw Hill Educations Pvt. Ltd, New Delhi	2012
3	Indian Standard specification for plain and reinforced concrete	IS456 - 2000	-	2011
4	Indian Standard specification for ready-mixed concrete	IS4926 - 2003	-	2012
5	Indian Standard specification for coarse and fine aggregate from natural Sources for concrete	IS383 - 1970	-	2011
6	Indian standard specification for sand for plaster	IS1542-1992	-	2009
7	Indian Standard Concrete Mix Proportioning	IS 10262-2009	-	2009



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Signature of the Faculty in-charge


HoD / CIVIL

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DEPARTMENT OF CIVIL ENGINEERING

Identification of Curricular Gap & Content Beyond Syllabus(CBS)

Name of the Faculty : Course Code & Name: CE8404/ CONCRETE TECHNOLOGY

Degree & Program: B.E. /CIVIL Semester : V Academic Year: 2018-2019(ODD)

I. Mapping of Course Outcomes with POs & PSOs.(before CBS)

Table.1 Mapping of COs, C, PSOs with POs - before CBS.

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C205.1	-	3	2	2	3	-	3	-	2	3	1	2	3	2
C205.1	-	3	2	2	3	-	3	-	2	3	1	2	3	2
C205.1	-	3	2	2	3	-	3	-	2	3	1	2	3	2
C205.1	-	3	2	2	3	-	3	-	2	3	1	2	3	2
C205.1	-	3	2	2	3	-	3	-	2	3	1	2	3	2
C205.1	-	3	2	2	3	-	3	-	2	3	1	2	3	2
C205	-	3	2	2	3	-	3	-	2	3	1	2	3	2

II. Identification of content beyond syllabus.

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Table.2 Identification of content beyond syllabus

Details of Content Beyond Syllabus(CBS) added	POs strengthened/ vacant filled	CO/Unit
CONCRETE TECHNOLOGY	PO7 ,PO10 Vacant filled	C304.3& C304.4 III&IV

III. Mapping of Course Outcomes with POs & PSOs. (After CBS)

Table.3 Mapping of COs, C, PSOs with POs- after CBS.

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C205.1	-	3	2	2	3	-	3	-	2	3	1	2	3	2
C205.1	-	3	2	2	3	-	3	-	2	3	1	2	3	2
C205.1	-	3	2	2	3	-	3	-	2	3	1	2	3	2
C205.1	-	3	2	2	3	-	3	-	2	3	1	2	3	2
C205.1	-	3	2	2	3	-	3	-	2	3	1	2	3	2
C205.1	-	3	2	2	3	-	3	-	2	3	1	2	3	2
C205	-	3	2	2	3	-	3	-	2	3	1	2	3	2

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PHOTO CLICK FROM CENTENT BEYOND THE SYLLABUS:

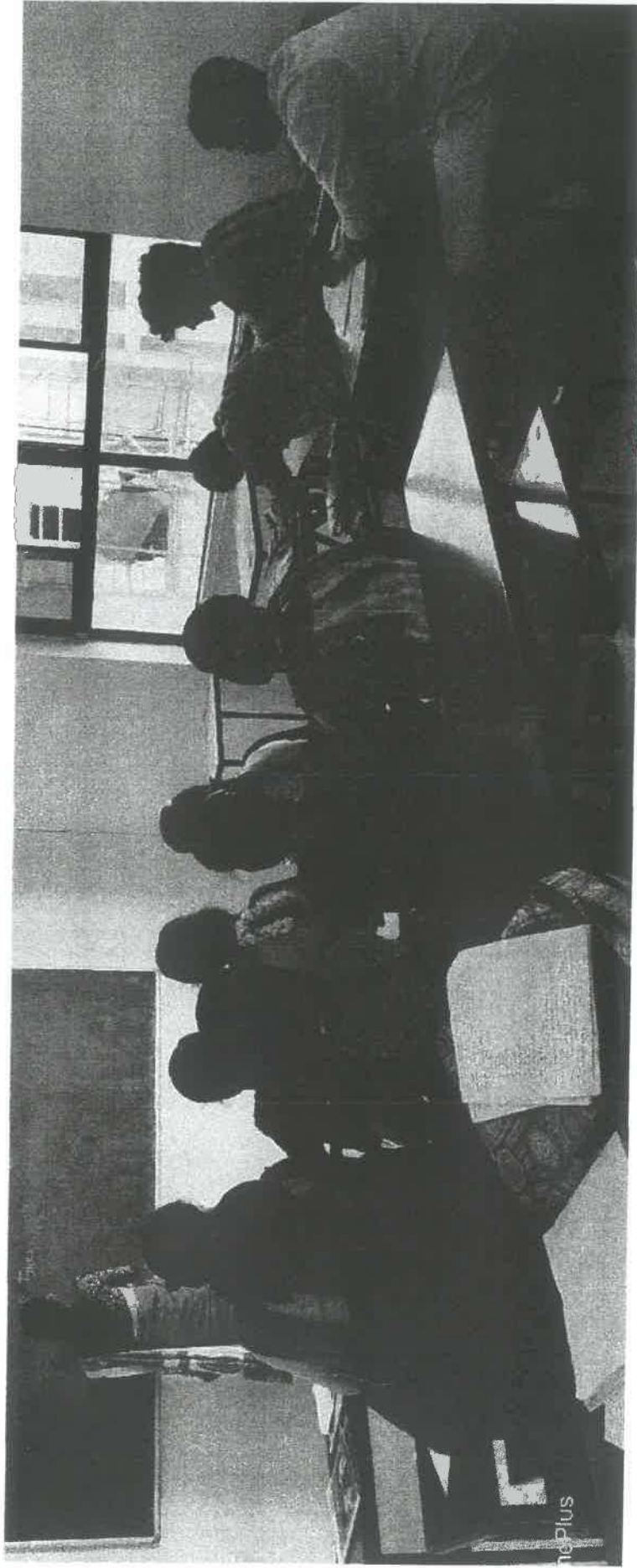
TOPIC: CE8404/ CONCRETE TECHNOLOGY.

NAME OF THE FACULTY: M. KALIRAJ

VENUE: II CIVIL CLASS ROOM.

REG: 2017

YEAR:II YEAR



(Handwritten signature in blue ink)

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PPT PRESENTATION & BOARD CLASS

Concrete

- One of the very important and widely used material in construction
- The Grade of the concrete is specified by its 28 day's cube strength (E.g. M20 means the cube strength is 20 N/sq.mm)
- Concrete used on works is specified according to IS 456 (2000).

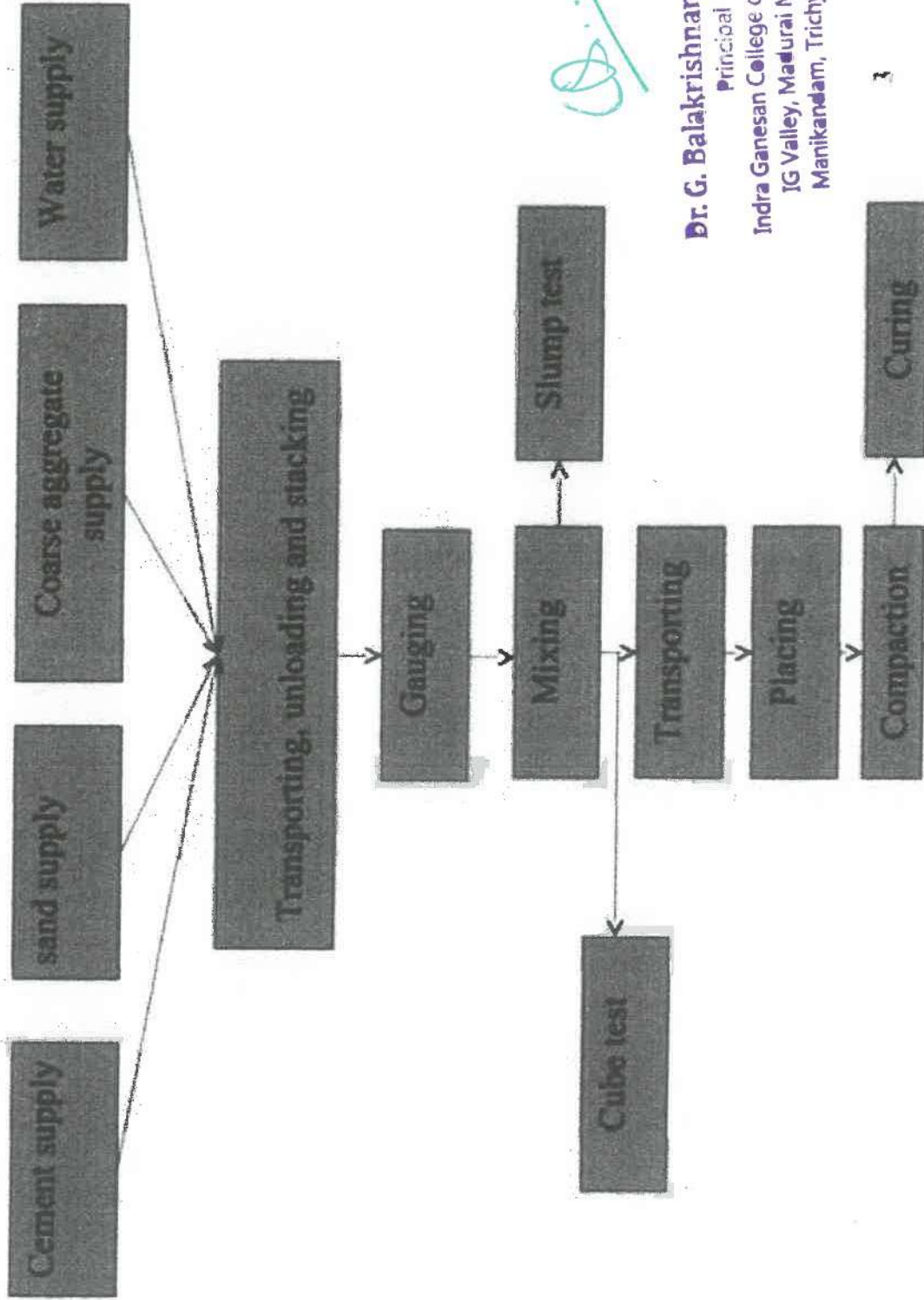


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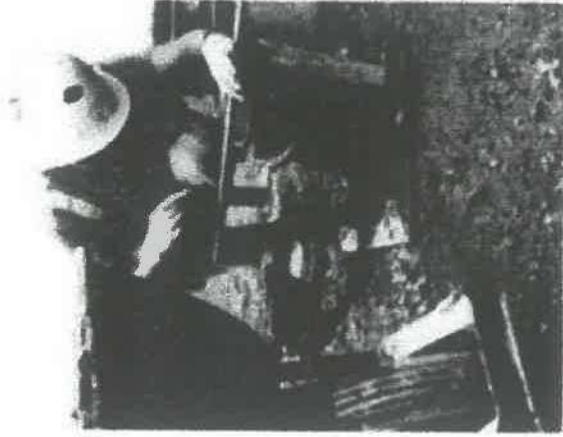
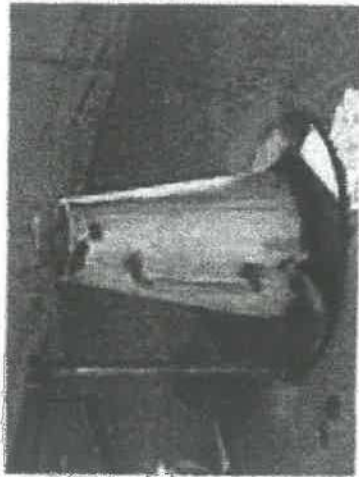
Concrete chain



(Signature)

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Slump test to test workability



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Cube test to test the strength

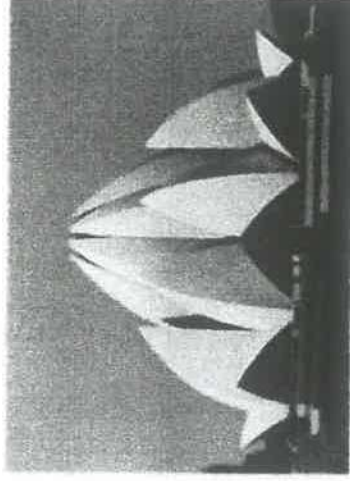
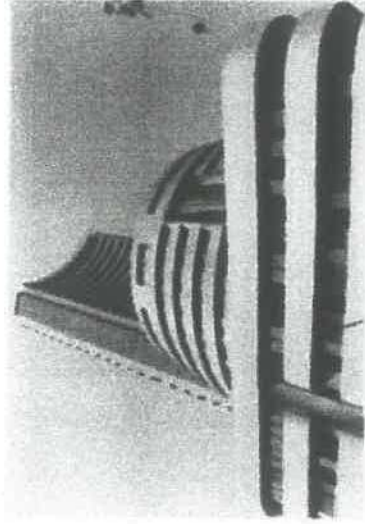


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Formwork system

It is a mold used to shape the concrete and support the concrete until it attains sufficient strength to carry its own weight.

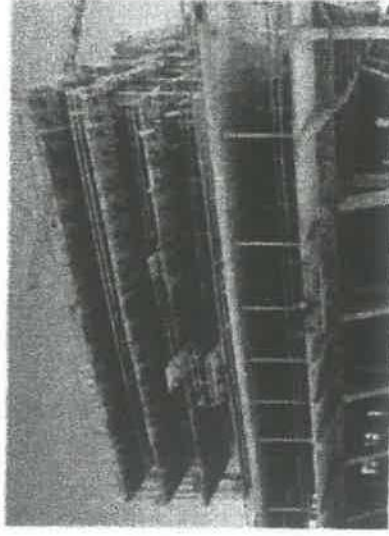


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Types of Formwork

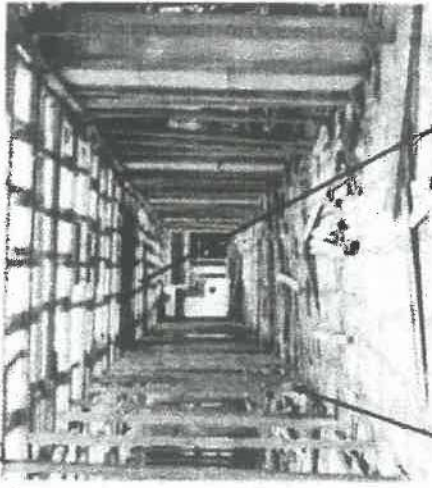
Formwork can be divided into two approaches :

- Traditional approach
- Systematic approach (System formwork)



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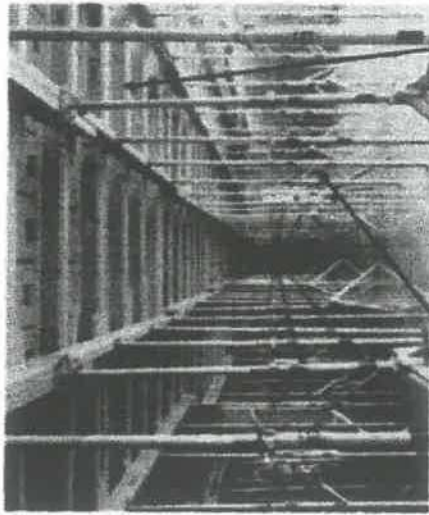
Traditional formwork system in Progress



Wooden posts (ballies)

A network of wooden beams to support the sheathing

System formwork in Progress



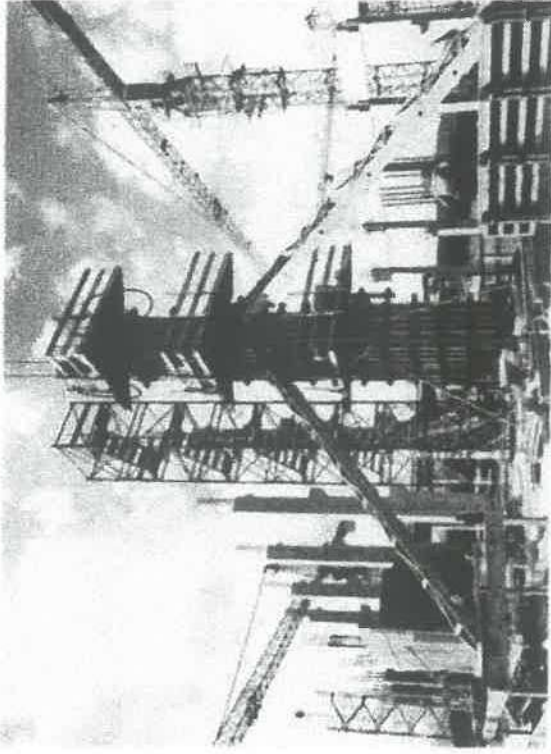
Collapsible type props (CT props)

A network of wooden H-beams to support the sheathing.

Picture's and sketch has taken from I&T DCA's formwork manuals

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Column Formwork



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Pictures and sketches taken from C&T, EXCK, Formwork manuals.

Kavirajm
Signature of the Faculty

Sirirajm
HOD/Civil

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IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
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DEPARTMENT OF CIVIL ENGINEERING

Assignment Question Paper

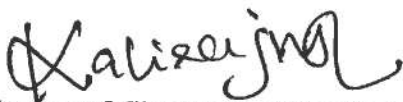
Assignment – 01			Date of Issue:	31.07.2018	Marks	10
Course code	CE8391	Course Title	Construction Materials			
Year	II	Semester/Section	III	Date of Submission:	05.08.2018	

Q.No	Questions	CO
1	Explain the classification of bricks.	CO304.1
2	Illustrate the different types of testing on aggregate.	CO304.1



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Name and Signature of the Faculty Incharge



HoD/Civil

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DEPARTMENT OF CIVIL ENGINEERING

Assignment Answer Sheet

Name of the Student : P. Aishwarya

AU Register Number: 81127103001

Assignment - 01		Date of Issue:	21.07.2018	Marks	10
Course code	CE8391	Course Title	Construction Engineering		
Year	II	Semester/Section	III / A	Date of Submission:	04.08.2018

Q.No	Questions	CO
1	Explain the classification of bricks	C205-1
2	Illustrate the different types testing on aggregate	C205-2

Mark Allocation

Rubrics	Marks Allocated	Marks obtained
Content Quality	6	4
Presentation Quality	2	2
Timely submission	2	2
Total marks	10	8

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

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Name and Signature of the Faculty Incharge

P. Aishwarya
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