Ref No:

SRI KRISHNA INSTITUTE OF TECHNOLOGY , BANGALORE-90

COURSE PLAN

Academic Year 2019-20

Program:	B E – Civil Engineering
Semester :	3
Course Code:	18CV34
Course Title:	Building material and construction
Credit / L-T-P:	3/3-0-0
Total Contact Hours:	40
Course Plan Author:	Dhanalakshmi M

Academic Evaluation and Monitoring Cell

#29, Hesaragatta Main Road, Chimney Hills
Chikkabanavara Post Bangalore-560090
PH-080-23821488/23821315
www.Skit.org, Email: skitprinci1@gmail.com

Table of Contents

Note : Remove “Table of Content” before including in CP Book
Each Course Plan shall be printed and made into a book with cover page
Blooms Level in all sections match with A.2, only if you plan to teach / learn at higher levels

A. COURSE INFORMATION

1. Course Overview

Degree:	Engineering	Program:	civil
Year / Semester :	2nd year, 3rd sem	Academic Year:	19-20
Course Title:	Building material and construction	Course Code:	18cv34
Credit / L-T-P:	3/4-0-0	SEE Duration:	180 Minutes
Total Contact Hours:	50	SEE Marks:	60 Marks
CIA Marks:	40	Assignment	1 / Module
Course Plan Author:	Dhanalakshmi M	Sign	Dt:
Checked By:	Shiva Prasad D G	Sign	Dt:
CO Targets	CIA Target : 88 %	SEE Target:	72 %

Note: Define CIA and SEE % targets based on previous performance.

2. Course Content

Content / Syllabus of the course as prescribed by University or designed by institute. Identify 2 concepts per module as in G.

Module	Content	Teaching Hours	Identified Module Concepts	Blooms Learning Levels
1	**Building Materials**: Stone as building material; Requirement of good building stones, Dressing of stones, Deterioration and Preservation of stone work. Bricks; Classification, Manufacturing of clay bricks, Requirement of good bricks. Field and laboratory tests on bricks; compressive strength, water absorption, efflorescence, dimension and warpage. Cement Concrete blocks, Stabilized Mud Blocks, Sizes, requirement of good blocks. Mortar: types and requirements. Timber as construction material. Fine aggregate: Natural and manufactured: Sieve analysis, zoning, specify gravity, bulking, moisture content, deleterious materials. Coarse aggregate: Natural and manufactured: Importance of size, shape and texture. Grading of aggregates, Sieve analysis, specific gravity, Flakiness and elongation index, crushing, impact and abrasion tests.	5	Characteristics of building materials, Properties of aggregates	L2
2	**Foundation**: Preliminary investigation of soil, safe bearing capacity of soil, Function and requirements of good foundation types of foundation, introduction to spread, combined, strap, mat and pile foundation. **Masonry:** Definition and terms used in masonry. Brick masonry, characteristics and requirements of good brick masonry, Bonds in brick work, Header, Stretcher, English, Flemish bond, Stone masonry, Requirements of good stone masonry, Classification, characteristics of different stone masonry, Joints in stone masonry. Types of walls; load bearing, partition walls, cavitywalls.	4	Foundation characterization, masonry structures	L3
3	**Lintels and Arches** Definition, function and classification of lintels, Balconies, chejja and canopy. Arches; Elements and Stability of an Arch. Floors and roofs: Floors; Requirement of good floor, Components of ground floor, Selection of flooring material, Laying of Concrete, Mosaic, Marble, Granite, Tile flooring,	4	Super structural elements, Building material components	L4

	Cladding of tiles. Roof;-Requirement of good roof, Types of roof, Elements of a pitched roof, Trussed roof, King post Truss, Queen Post Truss, Steel Truss, Different roofing materials, R.C.C.Roof.			
4	**Doors, Windows and Ventilators**: Location of doors and windows, technical terms, Materials for doors and windows, Paneled door, Flush door, Collapsible door, Rolling shutter, PVC Door, Paneled and glazed Window, Bay Window, French window. Ventilators. Sizes as per IS recommendations. **Stairs:** Definitions, technical terms and types of stairs, Requirements of good stairs. Geometrical design of RCC doglegged and open-well stairs. **Formwork:** Introduction to form work, scaffolding, shoring, under pinning	5	Infill components of super structure, Characteristics of stairs	L4
5	**Plastering and Pointing** : purpose, materials and methods of plastering and pointing, defects in plastering-Stucco plastering, lathe plastering **Damp proofing**- causes, effects and methods. **Paints**- Purpose, types, ingredients and defects,Preparation and applications of paints to new and old plastered surfaces, wooden and steel surfaces	6	Rendering works, painting	L4
-	**Total**	**50**	**-**	**-**

3. Course Material

Books & other material as recommended by university (A, B) and additional resources used by course teacher (C).

1. Understanding: Concept simulation / video ; one per concept ; to understand the concepts ; 15 – 30 minutes
2. Design: Simulation and design tools used – software tools used ; Free / open source
3. Research: Recent developments on the concepts – publications in journals; conferences etc.

Modules	Details	Chapters in book	Availability
1	Text books:		**-**
	1. Sushil kumar "building materials and construction", 20th edition, reprint 2015, standard publishers.	3,4,6,7,9	In Lib
	2. Dr. B C Punmia, Ashok kumar jain, Arun kumar jain, "Building construction", lakxmi publication, New Delhi	4,6,7,8,9, 10	In Lib
	3. Rangawala S. C. "Engineering Materials", charter publishing house, anand, India.	1,2,4,5,6, 8,9,10	In dept
2	Reference books		
	1. S.K. duggal,"building materials ", 4th edition new age international ltd, 2016	1,2,3,4,6	In Lib
	2. jagadish K.S, "Alternative building materials technology", new age international, 2007	5,6,7,8,9	In Lib
	3. M S Shetty, "Concrete technology", S Chand & Co. New Delhi	2,3	In dept
3	Others (Web, Video, Simulation, Notes etc.)		**-**
D	**Software Tools for Design**	**-**	**-**

E	**Recent Developments for Research**	**-**	**-**
F	**Others (Web, Video, Simulation, Notes etc.)**	**-**	**-**
1			
?			

4. Course Prerequisites

Refer to GL01. If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.
Students must have learnt the following Courses / Topics with described Content . . .

Modules	Course Code	Course Name	Topic / Description	Sem	Remarks	Blooms Level
1	17CIV14	Elements of civil engineering	Basic concepts of buiding materials	1	Knowledge of basic terminologies of building materials is required	L2
	-	-	-	-		-

5. Content for Placement, Profession, HE and GATE

The content is not included in this course, but required to meet industry & profession requirements and help students for Placement, GATE, Higher Education, Entrepreneurship, etc. Identifying Area / Content requires experts consultation in the area.
Topics included are like, a. Advanced Topics, b. Recent Developments, c. Certificate Courses, d. Course Projects, e. New Software Tools, f. GATE Topics, g. NPTEL Videos, h. Swayam videos etc.

Modules	Topic / Description	Area	Remarks	Blooms Level
1				
2				
3				
4				
5				
-				

B. OBE PARAMETERS

1. Course Outcomes

Expected learning outcomes of the course, which will be mapped to POs. Identify a max of 2 Concepts per Module. Write 1 CO per Concept.

Modules	Course Code.#	Course Outcome **At the end of the course, student should be able to . . .**	Teach. Hours	Concept	Instr Method	Assessment Method	Blooms' Level
1	18CV34	Students should be able to understand the characteristics and properties of materials for building construction	8	Characteristics and properties	Lecture/ demonstrate	CIE/Assignment/unit test	L2
2	18CV34	Students should be able to understand the suitability of foundations based on soil condition.	8	Foundation characterization	Lecture / PPT	CIE/Assignment/unit test	L2
2	18CV34	Students should be able to identify and distinguish among masonry	8	Masonry works	Lecture / PPT	CIE/Assignment/u	L2

		works				nit test	
3	18CV34	Students should be able to demonstrate the stability of super structural elements of buildings	8	super structural elements	Lecture / PPT	CIE/Assignment/unit test	L3
4	18CV34	Students should be able to analyze the suitability of infill components of super structure used for construction	8	infill components	Lecture	CIE/Assignment/unit test	L4
4	18CV34	Students should be able to develops the capability of characterizing and analyzing the stairs	8	Characteristics of stairs	Lecture and Tutorial	CIE/Assignment/unit test	L5
5	18CV34	Students should be able to analyze the rendering works involved as per the materials and methods involved in building construction	8	rendering works	Lecture	CIE/Assignment/unit test	L4
	-	**Total**	**40**	-	-	-	-

2. Course Applications

Write 1 or 2 applications per CO.
Students should be able to employ / apply the course learnings to . . .

Modules	Application Area Compiled from Module Applications.	CO	Level
1	Used for different types of civil works	CO1	L2
2	Helpful in selection of required Sub structural works	CO2	L2
2	Helpful in selection of required Masonry works	CO3	L2
3	Used in construction of Lintels, arches, roofs and floors	CO4	L3
3	Selection of different types of doors, windows and ventilators	CO5	L4
4	For the designing of staircase	CO6	L5
5	For the selection of paints and varnishes for all types of buildings	CO7	L4

3. Mapping And Justification

CO – PO Mapping with mapping Level along with justification for each CO-PO pair.
To attain competency required (as defined in POs) in a specified area and the knowledge & ability required to accomplish it.

Modules	Mapping		Mapping Level	Justification for each CO-PO pair	Level
-	**CO**	**PO**	-	**'Area': 'Competency' and 'Knowledge' for specified 'Accomplishment'**	-
1	CO1	PO1	L1	Knowledge of basic science is required to know the properties of materials	L1
1	CO1	PO6	L3	Knowledge of application in the society to overcome health and societal issues is required	L3
1		PO7	L2	Knowledge of understanding regarding the sustainable development of environment is required	L2
1	CO2	PO2	L2	Knowledge of identification of different types of soil is required	L2
1	CO3	PO2	L2	Knowledge of identification of types of masonry work is required	L2
1	CO4	PO4	L3	Knowledge of stability of materials is required to analyse and interpretate different super structural elements	L3
1		PO7	L2	Knowledge of super structural elements is required to know the impact on development	L2
1	CO5	PO1	L3	Knowledge of basic science is required to know the components of infill materials	L3
2		PO2	L4	Knowledge of analysis is required to check the suitability	L4
2		PO7	L2	Knowledge of materials impact on environment is required	L2
2	CO6	PO1	L3	Basic knowledge of maths is required to solve the problems on stairs	L3
2		PO2	L4	Knowledge of analysis of staircase using basic science and maths is required	L4
2		PO3	L6	Knowledge of design solutions for complex problems on stairs are	L6

				required	
2	CO7	PO2	L4	Knowledge of natural and engineering science is required to select the materials for rendering works	L4
3		PO7	L2	Knowledge of identification of different rendering materials is required to know the impact on environment	L2

4. Articulation Matrix

CO – PO Mapping with mapping level for each CO-PO pair, with course average attainment.

-	-	Course Outcomes	Program Outcomes														-
Modules	CO.#	**At the end of the course student should be able to . . .**	PO1	PO2	PO3	PO4	PO5	PO6	PO8	PO7	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	Level
1	CO1	Students should be able to understand the characteristics and properties of materials for building construction	2	X	X	X	X	1	2	X	X	X	X	X	L2	X	X	L2
1	CO2	Students should be able to understand the suitability of foundations based on soil condition.	X	3	X	X	X	X	X	X	X	X	X	X	L3	X	X	L2
2	CO3	Students should be able to identify and distinguish among masonry works	X	3	X	X	X	X	X	X	X	X	X	X	L4	X	X	L2
2	CO4	Students should be able to demonstrate the stability of super structural elements of buildings	X	X	X	2	X	X	2	X	X	X	X	X	L4	X	X	L3
3	CO5	Students should be able to analyze the suitability of infill components of super structure used for construction	2	3	X	X	X	X	2	X	X	X	X	X	L4	X	X	L2
3	CO6	Students should be able to develops the capability of characterizing and analyzing the stairs	1	2	3	X	X	X	X	X	X	X	X	X	L3	X	X	L2
4	CO7	Students should be able to analyze the rendering works involved as per the materials and methods involved in building construction	X	3	X	X	X	X	2	X	X	X	X	X	L2	X	X	L3
-	18CV34	**Average attainment (1, 2, or 3)**	**1.67**	**2.8**	**-**	**2**	**-**	**1**	**2**	-	-	-	**-**	-	**-**	-	**-**	**-**
-	*PO, PSO*	*1.Engineering Knowledge; 2.Problem Analysis; 3.Design / Development of Solutions; 4.Conduct Investigations of Complex Problems; 5.Modern Tool Usage; 6.The Engineer and Society; 8.Environment and Sustainability; 8.Ethics; 9.Individual and Teamwork; 10.Communication; 11.Project Management and Finance; 12.Life-long Learning; S1.Software Engineering; S2.Data Base Management; S3.Web Design*																

5. Curricular Gap and Content

Topics & contents not covered (from A.4), but essential for the course to address POs and PSOs.

Modules	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping
1					
2					
3					
4					
5					

6. Content Beyond Syllabus

Topics & contents required (from A.5) not addressed, but help students for Placement, GATE, Higher Education, Entrepreneurship, etc.

Modules	Gap Topic	Area	Actions Planned	Schedule Planned	Resources Person	PO Mapping
1						
1						
2						
2						
3						
3						
4						
4						
5						
5						

C. COURSE ASSESSMENT

1. Course Coverage

Assessment of learning outcomes for Internal and end semester evaluation. Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

Modules	Title	Teach. Hours	No. of question in Exam						CO	Levels
			CIA-1	CIA-2	CIA-3	Asg	Extra Asg	SEE		
1	Building Materials	10	2	-	-	1	1	2	CO1	L2
2	Foundation and Masonry	10	2	-	-	1	1	2	CO2, CO3	L2
3	Lintels and Arches, Floors and roofs	10	-	2	-	1	1	2	CO4	L3
4	Doors, Windows and Ventilators, Stairs	10	-	2	-	1	1	2	CO5, CO6	L5
5	Plastering and Pointing, Paints	10	-	-	4	1	1	2	CO7	L4
-	**Total**	**50**	**4**	**4**	**4**	**5**	**5**	**10**	**-**	**-**

2. Continuous Internal Assessment (CIA)

Assessment of learning outcomes for Internal exams. Blooms Level in last column shall match with A.2.

Modules	Evaluation	Weightage in Marks	CO	Levels
1, 2	CIA Exam – 1	30	CO1, CO2, CO3	L2
3, 4	CIA Exam – 2	30	CO4, CO5, CO6	L3, L5
5	CIA Exam – 3	30	CO7	L4
1, 2	Assignment - 1	10	CO1, CO2, CO3	L2
3, 4	Assignment - 2	10	CO4, CO5, CO6	L3, L5
5	Assignment - 3	10	CO7	L4
1, 2	Seminar - 1			
3, 4	Seminar - 2			
5	Seminar - 3			
	Other Activities – define – Slip test		CO1 to Co7	L2, L3, L4 . ..
	Final CIA Marks	**40**	**-**	**-**

D1. TEACHING PLAN - 1

Module - 1

Title:	BUILDING MATERIALS AND CONSTRUCTION	Appr Time:	10 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Students should be able to understand the characteristics and properties of materials for building construction	CO1	L2
b	***Course Schedule***	-	-
Class No	**Module Content Covered**	**CO**	**Level**
1	**Building Materials**: Stone as building material; Requirement of good building stones, Dressing of stones,	CO1	L2
2	Deterioration and Preservation of stone work.	CO1	L2
3	Bricks; Classification, Manufacturing of clay bricks	CO1	L2
4	Requirement of good bricks. Field and laboratory tests on bricks	CO1	L2
5	compressive strength, water absorption, efflorescence, dimension and warpage	CO1	L2
6	Cement Concrete blocks, Stabilized Mud Blocks, Sizes	CO1	L2
7	requirement of good blocks. Mortar: types and requirements. Timber as construction material	CO1	L2
8	Fine aggregate: Natural and manufactured: Sieve analysis, zoning, specify gravity, bulking	CO1	L2
9	moisture content, deleterious materials. Coarse aggregate: Natural and manufactured, Importance of size, shape and texture	CO1	L2
10	Grading of aggregates, Sieve analysis, specific gravity, Flakiness and elongation index, crushing, impact and abrasion tests.	CO1	L2
c	**Application Areas**	**CO**	**Level**
1	Different types of construction works	CO1	L2
d	**Review Questions**	-	-
1	What is meant by dressing of stones? List out the surfaces finishes and explain a)Rock faced finish b)Furrowed finish c)Boasted finish	CO1	L2
2	Write a note on preservation of stone work.	CO1	L2
3	List any 4 commonly used building stones, their properties and uses.	CO1	L2
4	Write a brief note on deterioration of stone work.	CO1	L2
5	Write a brief note on classification of stone masonry.	CO1	L2
6	List out the requirements of a good bricks.	CO1	L2
7	Write a brief note on classification of bricks & their qualities.	CO1	L2
8	Write a brief note on a)Intermittent up drought kiln b)Bull's trench kiln	CO1	L2
9	Explain moulding process involved in manufacturing of clay bricks.	CO1	L2
10	List and explain the different tests on aggregates	CO1	L2
11	List and explain the different tests on bricks	CO1	L2
12	Write a brief note on timber	CO1	L2
e	**Experiences**	-	-
1			
2			
3			
4			
5			

Module – 2

Title:	BUILDING MATERIALS AND CONSTRUCTION	Appr Time:	10 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1.	Students should be able to understand the suitability of foundations based on soil condition.	CO2	L2
2.	Students should be able to identify and distinguish among masonry works	CO3	L2
b	***Course Schedule***	-	-
Class No	**Module Content Covered; foundation**	**CO**	**Level**
17	Preliminary investigation of soil, safe bearing capacity of soil	CO2	L2
18	Function and requirements of good foundation types of foundation	CO2	L2
19	introduction to spread, combined, strap, mat and pile foundation	CO2	L2
20	**Masonry:** Definition and terms used in masonry	CO3	L2
21	Brick masonry, characteristics and requirements of good brick masonry	CO3	L2
22	Bonds in brick work, Header, Stretcher, English, Flemish bond,	CO3	L2
23	Stone masonry	CO3	L2
24	Requirements of good stone masonry	CO3	L2
	Classification, characteristics of different stone masonry, Joints in stone masonry.	CO3	L2
	Types of walls; load bearing, partition walls, cavitywalls	CO3	L2
c	**Application Areas**	**CO**	**Level**
1	In the construction of subsurface structures		L3
2	In the preparation of masonry work		L3
d	**Review Questions**	-	-
12	Explain joints in stone masonry.	CO3	L2
13	With a neat sketch explain the elements of an arch.	CO3	L2
14	Explain the characteristics of brick bond or rules for bonding.	CO3	L2
15	With a neat sketch write a brief note on i)English bond ii)Flemish bond	CO3	L2
16	List out the advantages of cavity walls.	CO3	L2
17	Write a brief note on classification of lintels.	CO3	L2
18	Write a brief note on preliminary investigation on soils	CO2	L2
19	Explain functions and requirements of good foundation	CO2	L2
20	Explain the characteristics and requirements of good brick masonry	CO3	L2
21	Write a brief note on different types of walls	CO3	L2
22	Write a brief note on Requirements of good stone masonry	CO3	L2
23			
e	**Experiences**		
1			
2			
3			
4			
5			

E1. CIA EXAM – 1

a. Model Question Paper - 1

Crs Code:	CV34	Sem:	5	Marks:	30	Time:	75 minutes
Course:	Building materials and construction						

-	-	**Note: Answer any 3 questions, each carry equal marks.**	**Marks**	**CO**	**Level**
1	1) a	What is meant by dressing of stones? List out the surfaces finishes and explain a)Rock faced finish b)Furrowed finish c)Boasted finish	10	CO2	L2
	b	Write a note on preservation of stone work.	5	CO2	L2
		OR			
2	2) a	List any 4 commonly used building stones, their properties and uses.	8	CO2	L2
	b	Write a brief note on deterioration of stone work.	4	CO2	L2
	c	Write a brief note on classification of stone masonry.	3	CO3	L2
		MODULE-2(15 marks)			
3	3) a	With a neat sketch explain the elements of an arch.	9	CO3	L2
	b	Explain the characteristics of brick bond or rules for bonding.	6	CO3	L2
		OR			
4	4) a	Explain the characteristics and requirements of good brick masonry	10	CO3	L2
	b	List out the advantages of cavity walls.	5	CO3	L2

b. Assignment -1

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions							
Crs Code:	18CV34	Sem:	III	Marks:	10	Time:	90 – 120 minutes
Course:	BUILDING MATERIALS AND CONSTRUCTION						

Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.

SNo	USN	Assignment Description	Marks	CO	Level
1		What is meant by dressing of stones? List out the surfaces finishes and explain a)Rock faced finish b)Furrowed finish c)Boasted finish	5	CO2	L2
2		Write a note on preservation of stone work.	5	CO2	L2
3		List any 4 commonly used building stones, their properties and uses.	5	CO2	L2
4		Write a brief note on deterioration of stone work.	5	CO2	L2
5		Write a brief note on classification of stone masonary.	5	CO3	L2
6		List out the requirements of a good bricks.	5	CO3	L2
7		Write a brief note on classification of bricks & their qualities.	5	CO3	L2
8		Write a brief note on a)Intermittent up draught kiln b)Bull's trench kiln	5	CO3	L2
9		Explain moulding process involved in manufacturing of clay bricks.	5	CO3	L2
10		List and explain the different tests on aggregates	5	CO2	L2
11		List and explain the different tests on bricks	5	CO3	L2
12		Write a brief note on timber	5	CO3	L2
13		Explain joints in stone masonry.	5	CO3	L2
9		With a neat sketch explain the elements of an arch.	5	CO3	L2
10		Explain the characteristics of brick bond or rules for bonding.	5	CO2	L2
11		With a neat sketch write a brief note on i)English bond ii)Flemish bond	5	CO3	L2
12		List out the advantages of cavity walls.	5	CO3	L2
13		Write a brief note on classification of lintels.	5	CO3	L2
14		Write a brief note on preliminary investigation on soils	5	CO3	L2
15		Explain functions and requirements of good foundation	5	CO3	L2

16		Explain the characteristics and requirements of good brick masonry	5	CO3	L2
17		Write a brief note on different types of walls	5	CO2	L2
18		Write a brief note on Requirements of good stone masonry	5	CO2	L2
19					

D2. TEACHING PLAN - 2

Module – 3

Title:	BUILDING MATERIALS AND CONSTRUCTION	Appr Time:	8Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Students should be able to demonstrate the stability of super structural elements of buildings		
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
1	**Lintels and Arches** Definition, function and classification of lintels, Balconies, chejja and canopy.	CO4	L2
2	Arches; Elements and Stability of an Arch.	CO4	L3
3	Floors and roofs: Floors; Requirement of good floor, Components of ground floor	CO4	L2
4	Selection of flooring material	CO4	L3
5	Laying of Concrete, Mosaic, Marble, Granite	CO4	L3
6	Tile flooring, Cladding of tiles	CO4	L3
7	Roof;-Requirement of good roof, Types of roof	CO4	L2
8	Elements of a pitched roof, Trussed roof	CO4	L3
9	King post Truss, Queen Post Truss, Steel Truss	CO4	L3
10	Different roofing materials, R.C.C.Roof.	CO4	L2
c	**Application Areas**	**CO**	**Level**
1	In the construction of super structure	CO4	L3
2	Selection of roofs and floors	CO4	L3
d	**Review Questions**	-	-
1	Write a brief note on selection of flooring materials.	CO4	L2
2	Explain briefly i)Mosaic flooring ii)Tile flooring iii)Terrazo flooring	CO4	L3
3	With a neat sketch explain king post truss.	CO4	L3
4	List out the advantages and disadvantages of flat roofs.	CO4	L2
5	Explain briefly Tile flooring, Cladding of tiles	CO4	L3
6	List out the Requirement of good roof,	CO4	L2
7	Write a brief note on Elements of a pitched roof, Trussed roof	CO4	L2
8	With a neat sketch write a brief note on King post Truss, Queen Post Truss, Steel Truss	CO4	L3
9	List and explain different roofing materials, R.C.C.Roof.	CO4	L3
10	Write a Definition and explain briefly the functioning and classification of lintels, Balconies, chejja and canopy.	CO4	L3
11	Write a brief note on Elements of an Arch.	CO4	L2
	Write a brief note on Requirement of good floor,	CO4	L2
	Write a brief note on Selection of flooring material	CO4	L3
	Explain the process of Laying of Concrete, Mosaic, Marble, Granite	CO4	L3
	What are the different Types of roof we usually see in residential building	CO4	L2
	Explain the concept of Stability of an Arch.	CO4	L3
	Explain the Components of ground floor	CO4	L3
e	**Experiences**	-	-

1			
2			
3			
4			
5			

Module – 4

Title:	Building materials and construction	Appr Time:	8 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Students should be able to analyze the suitability of infill components of super structure used for construction	CO5	L4
2	Students should be able to develops the capability of characterizing and analyzing the stairs	CO6	L5
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
1	**Doors, Windows and Ventilators**: Location of doors and windows, technical terms,, Flush door,	CO5	L4
2	Materials for doors and windows, Paneled door	CO5	L4
3	Collapsible door, Rolling shutter, PVC Door	CO5	L4
4	Paneled and glazed Window, Bay Window	CO5	L4
5	French window. Ventilators. Sizes as per IS recommendations	CO5	L4
6	**Stairs:** Definitions, technical terms	CO6	L2
7	types of stairs, Requirements of good stairs	CO6	L4
8	Geometrical design of RCC doglegged and open-well stairs.	CO6	L5
9	Geometrical design of RCC doglegged and open-well stairs.	CO6	L5
10	**Formwork:** Introduction to form work, scaffolding, shoring, under pinning	CO6	L4
c	**Application Areas**	**CO**	**Level**
1	Selection of different types of doors and windows	CO5	L4
2	In the construction of staircase for a building	CO6	L5
d	**Review Questions**	-	-
1	Write a brief note on technical terms of doors and windows,	CO5	L2
2	Explain the concept of Location of doors and windows	CO5	L4
3	List and explain the Materials for doors and windows, Paneled door	CO5	L2
4	List and explain the Materials Collapsible door, Rolling shutter, PVC Door	CO5	L2
5	List and explain the Materials Paneled and glazed Window, Bay Window	CO5	L2
6	Explain French window and Ventilators.	CO5	L4
7	Write a brief note on Sizes of doors and windows as per IS recommendations	CO5	L4
8	Explain the technical terms involved in stairs	CO6	L2
9	What are the different types of stairs explain them	CO6	L2
10	Write a brief note on Requirements of good stairs	CO6	L2
11	design a RCC doglegged stairs.	CO6	L5
12	design a open-well stairs	CO6	L5
14	Explain the importance of form work,, shoring, under pinning	CO6	L3
15	Explain the importance of shoring, under pinning	CO6	L3
16	Explain the importance of scaffolding	CO6	L3
e	**Experiences**	-	-
1			
2			

3			
4			
5			

E2. CIA EXAM – 2

a. Model Question Paper - 2

Crs Code:	18CV34	Sem:	3	Marks:	30	Time:	75 minutes
Course:	Building materials and construction						

-	-	**Note: Answer any 2 questions, each carry equal marks.**	**Marks**	**CO**	**Level**
1	1) a	Explain briefly i)Mosaic flooring ii)Tile flooring iii) Terrazo flooring	9	CO5	L4
	b	With a neat sketch explain king post truss	6	C05	L4
		OR			
2	2) a	Write a brief note on Elements of an Arch	8	C05	L2
	b	Write a brief note on Selection of flooring material	7	C05	L3
		MODULE-4(15 marks)			
3	3) a	List and explain the Materials Collapsible door, Rolling shutter, PVC Door	10	C05	L2
	b	Write a brief note on technical terms of doors and windows,	5	C05	L2
		OR			
4	4) a	The inside dimensions of a staircase in a residential building are 2.00X4.60m. The height of floor is 3.30m and the roof consists of RCC slab of 120mm thickness. Design a proper layout of an RCC stair for this building.	10	C06	L5
	b	Write a brief note on Requirements of good stairs	5	C06	L2

b. Assignment – 2

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions							
Crs Code:	18CV34	Sem:	III	Marks:		Time:	minutes
Course:	BUILDING MATERIALS AND CONSTRUCTION						

Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.

SNo	USN	Assignment Description	Marks	CO	Level
1		Write a brief note on selection of flooring materials.			L3
2		Explain briefly i)Mosaic flooring ii)Tile flooring iii)Terrazo flooring		CO5	L4
3		With a neat sketch explain king post truss.		CO5	L4
4		List out the advantages and disadvantages of flat roofs.		CO5	L2
5		Explain briefly Tile flooring, Cladding of tiles		CO5	L4
6		List out the Requirement of good roof,		CO5	L2
7		Write a brief note on Elements of a pitched roof, Trussed roof		CO5	L2
8		With a neat sketch write a brief note on King post Truss, Queen Post Truss, Steel Truss		CO5	L4
9		List and explain different roofing materials, R.C.C.Roof.		CO5	L4
10		Write a Definition and explain briefly the functioning and classification of lintels, Balconies, chejja and canopy.		CO5	L4
11		Write a brief note on Elements of an Arch.		CO5	L2
12		Write a brief note on Requirement of good floor,		CO5	L2
13		Write a brief note on Selection of flooring material		CO5	L4
9		Explain the process of Laying of Concrete, Mosaic, Marble, Granite		CO5	L4
10		What are the different Types of roofs we usually see in residential building		CO5	L2

11		Write a brief note on technical terms of doors and windows,		CO5	L2
12		Explain the concept of Location of doors and windows		CO5	L3
13		List and explain the Materials for doors and windows, Paneled door		CO5	L3
14		List and explain the Materials Collapsible door, Rolling shutter, PVC Door		CO5	L3
15		List and explain the Materials Paneled and glazed Window, Bay Window		CO5	L3
16		Explain French window and Ventilators.		CO5	L4
17		Write a brief note on Sizes of doors and windows as per IS recommendations		CO5	L4
18		Explain the technical terms involved in stairs		CO6	L2
19		What are the different types of stairs explain them		CO6	L3
20		Write a brief note on Requirements of good stairs		CO6	L2
21		design a RCC doglegged stairs.		CO6	L5
22		design a open-well stairs		CO6	L5
23		Explain the importance of form work,, shoring, under pinning		CO6	L4
24		Explain the importance of shoring, under pinning		CO6	L4
25		Explain the importance of scaffolding		CO6	L4

D3. TEACHING PLAN - 3

Module – 5

Title:	BUILDING MATERIALS AND CONSTRUCTION	Appr Time:	8 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Students should be able to analyze the rendering works involved as per the materials and methods involved in building construction		L4
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
1	**Plastering and Pointing** : purpose, materials and,- **Damp proofing**	CO7	L2
2	Methods of plastering and pointing	CO7	L3
3	defects in plastering	CO7	L4
4	Stucco plastering, lathe plastering	CO7	L4
5	causes for damp proofing, effects and methods	CO7	L2
6	**Paints**- Purpose, types	CO7	L2
7	ingredients and defects	CO7	L4
8	Preparation and applications of paints to new and old plastered surfaces,	CO7	L4
9	Preparation and applications of paints to new and old plastered surfaces,	CO7	L4
10	wooden and steel surfaces		L4
c	**Application Areas**	**CO**	**Level**
1	Selection and preparation of paints	CO7	L4
d	**Review Questions**	-	-
1	Briefly write the importance of Plastering and Pointing	CO7	L4
2	write a brief note on materials and purpose plastering and pointing	CO7	L2
3	Explain briefly the causes of Dampness in building	CO7	L2
4	Discuss the effects of damp proofing on buildings	CO7	L4
5	Explain the different Methods of plastering and pointing	CO7	L4
6	Explain the defects in plastering	CO7	L4
7	Explain briefly Stucco plastering, lathe plastering	CO7	L3

8	Explain the causes for damp proofing, effects and methods	CO7	L3
9	List out the different types of paints used in buildings	CO7	L2
10	List and explain the different ingredients used for the preparation of paints	CO7	L2
11	Mention the defects that are usually observed in painting of a building	CO7	L2
12	Explain the Preparation of paints to new surfaces,	CO7	L4
13	Explain the Preparation of paints to old surfaces,	CO7	L4
14	Explain the applications of paints to new surfaces,	CO7	L4
15	Explain the applications of paints to old surfaces,	CO7	L4
16	Explain the concept of varnishes used for wooden and steel surfaces	CO7	L3
17	Explain the purpose of painting	CO7	L2
18			
19			
20			
17			
e	**Experiences**	-	-
1		CO10	L2
2			
3			
4		CO9	L3
5			

E3. CIA EXAM – 3

a. Model Question Paper - 3

Crs Code:	18CV34	Sem:	3	Marks:	30	Time:	75 minutes
Course:	BUILDING MATERIALS AND CONSTRUCTION						

-	-	**Note: Answer any 2 questions, each carry equal marks.**	**Marks**	**CO**	**Level**
1	1) a	Explain the different Methods of plastering and pointing	9	CO7	L4
	b	Explain the defects in plastering	6	CO7	L4
		OR			
2	2) a	write a brief note on materials and purpose plastering and pointing	8	CO7	L2
	b	Discuss the effects of damp proofing on buildings	7	CO7	L4
		MODULE-5(15 marks)			
3	3) a	List and explain the different ingredients used for the preparation of paints	8	CO7	L2
	b	Explain the Preparation of paints to new surfaces,	7	CO7	L4
		OR			
4	4) a	Explain the concept of varnishes used for wooden and steel surfaces	8	CO7	L3
	b	Explain the applications of paints to old surfaces,	7	CO7	L4

b. Assignment – 3

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions							
Crs Code:	17CV551	Sem:	I	Marks:	5 / 10	Time:	90 – 120 minutes
Course:	Air Pollution & Control						
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							

SNo	USN	Assignment Description	Marks	CO	Level
1		Explain briefly Stucco plastering, lathe plastering	5	CO7	L4
2		Explain the causes for damp proofing, effects and methods	5	CO7	L3
3		List out the different types of paints used in buildings		CO7	L2
4		List and explain the different ingredients used for the preparation of paints	5	CO7	L2
5		Mention the defects that are usually observed in painting of a	5	CO7	L2

		building			
6		Explain the Preparation of paints to new surfaces,	5	CO7	L4
7		Explain the Preparation of paints to old surfaces,	5	CO7	L4
8		Explain the applications of paints to new surfaces,	5	CO7	L4
9		Explain the applications of paints to old surfaces,	5	CO7	L4
10		Explain the concept of varnishes used for wooden and steel surfaces	5	CO7	L3
11		Explain the purpose of painting	5	CO7	L2
12		Briefly write the importance of Plastering and Pointing , write a brief note on materials and purpose plastering and pointing	5	CO7	L4
13		Explain briefly the causes of Dampness in building	5	CO7	L3
9		Discuss the effects of damp proofing on buildings	5	CO7	L4
10		Explain the different Methods of plastering and pointing	5	CO7	L3
11		Explain the defects in plastering	5	CO7	L4

F. EXAM PREPARATION

1. University Model Question Paper

Course:		BUILDING MATERIALS AND CONSTRUCTION						Month / Year		Dec/2019	
Crs Code:		18CV34	Sem:	III	Marks:	100		Time:		180 minutes	
-	**Note**	Answer all FIVE full questions. All questions carry equal marks.							**Marks**	**CO**	**Level**
1	a	Write the requirements of good building stones.							4	CO1	L2
	b	Briefly explain the causes of deterioration of stone work.							6	CO1	L2
	c	Briefly explain classification of bricks with respect to properties.							6	CO1	L2
		OR									
-	a	Write a note on classification of Mortar.							4	CO1	L2
	b	Briefly explain the importance of size, shape and texture on coarse aggregates.							6	CO1	L2
	c	Explain Flakiness Index and Elongation Index test on coarse aggregates.							6	CO1	L2
2	a	With the help of sketches, write the features of English bond and Flemish bond.							5	CO3	L2
	b	Briefly explain classification of stone masonry.							6	CO3	L2
	c	Define a Cavity wall. Write the advantages of cavity wall							5	CO3	L2
		OR									
-	a	Write the functions and requirements of good foundation. .							6	CO2	L2
	b	with the help of sketches : i) Combined footing ii) Strap footing							6	CO2	L2
	c	Explain with sketch, any one type of Pile foundation.							4	CO4	L2
3	a	Explain the procedure of laying Terrazo flooring.							4	CO4	L3
	b	Write the requirements of good roof.							4	CO4	L2
	c	With the help of neat sketch, explain King Post Truss.							8	CO4	L3
	d	OR									
-	a	Briefly explain classification of Lintels.							6	CO4	L2
	b	With sketches, explain classification of Arches based on number of centers.							6	CO4	L3
	c	What are the factors that affect the choice of a flooring materials							4	CO4	L3
4	a	With the help of neat sketch explain I) Paneled Door ii) Collapsible Door.							8	CO5	L4
	b	With , the help of neat sketches, explain : i) Paneled and Glazed window ii) Bay window							8	CO5	L4
		OR									
	a	With the help of neat sketches, explain types of stairs							8	CO6	L4
	b	Write short notes on :							8	CO6	L4

		i) Shoring ii) Underpinning			
5	a	Write the purposes of Plastering.	5	CO7	L2
	b	Explain various types of Plaster finishes.	6	CO7	L2
	c	Explain Stucco plastering.	5	CO7	L4
		OR			
	a	Explain the constituents of Paint.	5	CO7	L2
	b	Explain the procedure of pointing to plastered surface	5	CO7	L4

2. SEE Important Questions

Course:	BUILDING MATERIALS AND CONSTRUCTION					Month / Year	dec /2019	
Crs Code:	18CV34	Sem:	3	Marks:	100	Time:	180 minutes	
	Note	Answer all FIVE full questions. All questions carry equal marks.				-	-	
Module	Qno.	Important Questions				**Marks**	**CO**	**Year**
1	1) a	What is meant by dressing of stones? List out the surfaces finishes and explain a)Rock faced finish b)Furrowed finish c)Boasted finish				9	CO1	2016
	b	Write a note on preservation of stone work.				5	CO1	2015
	2) b	Write a brief note on deterioration of stone work.				4	CO2	2015
	c	Write a brief note on classification of stone masonry.				3	CO2	2014
	3) a	List out the requirements of a good bricks.				6	CO3	2016
	b	Write a brief note on classification of bricks & their qualities.				9	CO3	2016
	4) a	Write a brief note on a)Intermittent up draught kiln b)Bull's trench kiln				10	CO2	2016
	b	Explain moulding process involved in manufacturing of clay bricks.				5	CO2	2017
2	1) a	Explain joints in stone masonry.					CO3	2015
	b	With a neat sketch explain the elements of an arch.				10	CO4	2018
	2) a	Explain the characteristics of brick bond or rules for bonding.					CO3	2017
	b	With a neat sketch write a brief note on i)English bond ii)Flemish bond					CO4	2015
3	3)	Explain the characteristics and requirements of good brick masonry					CO4	2015
	1) a	Explain briefly i)Mosaic flooring ii)Tile flooring iii) Terrazo flooring				9	CO5	2016
	b	With a neat sketch explain king post truss				6	CO6	2016
	b	Write a brief note on Selection of flooring material				7	CO5	2015
4	b	Write a brief note on technical terms of doors and windows,				5	CO6	2015
	2) a	The inside dimensions of a staircase in a residential building are 2.00X4.60m. The height of floor is 3.30m and the roof consists of RCC slab of 120mm thickness. Design a proper layout of an RCC stair for this building.				10	CO6	2014
	b	Write a brief note on Requirements of good stairs				5	CO6	2014
5	3) b	Explain the defects in plastering				6	CO7	2017
	b	Discuss the effects of damp proofing on buildings				7	CO7	2015
	c	Explain the Preparation of paints to new surfaces,				7	CO7	2016
	4) a	Explain the concept of varnishes used for wooden and steel surfaces				8	CO7	2017
	b	Explain the applications of paints to old surfaces,				7	CO7	2015

G. Content to Course Outcomes

1. TLPA Parameters

Table 1: TLPA - BUILDING MATERIALS AND CONSTRUCTION

Module	Course Content or Syllabus (Split module content into 2 parts which have	Content Teachin	Blooms' Learning	Final Bloo	Identified Action	Instructi on	Assessment Methods to

e-#	similar concepts)	g Hours	Levels for Content	ms' Level	Verbs for Learning	Methods for Learning	Measure Learning
A	B	C	D	E	F	G	H
1	Stone as building material; Requirement of good building stones, Dressing of stones, Deterioration and Preservation of stone work. Bricks; Classification, Manufacturing of clay bricks, Requirement of good bricks. Field and laboratory tests on bricks; compressive strength, water absorption, efflorescence, dimension and warpage. Cement Concrete blocks, Stabilized Mud Blocks, Sizes, requirement of good blocks. Mortar: types and requirements. Timber as construction material. .	5	L1,L2	L2	Understand	Lecture	Internal assessment and Assignment
1	Fine aggregate: Natural and manufactured: Sieve analysis, zoning, specify gravity, bulking, moisture content, deleterious materials. Coarse aggregate: Natural and manufactured: Importance of size, shape and texture. Grading of aggregates, Sieve analysis, specific gravity, Flakiness and elongation index, crushing, impact and abrasion tests.	3	L1,L2	L2	Understand	Lecture	Internal assessment and Assignment
2	**Foundation**: Preliminary investigation of soil, safe bearing capacity of soil, Function and requirements of good foundation types of foundation, introduction to spread, combined, strap, mat and pile foundation.	4	L1,L2	L2	Understand	Lecture	Internal assessment and Assignment
2	**Masonry:** Definition and terms used in masonry. Brick masonry, characteristics and requirements of good brick masonry, Bonds in brick work, Header, Stretcher, English, Flemish bond, Stone masonry, Requirements of good stone masonry, Classification, characteristics of different stone masonry, Joints in stone masonry. Types of walls; load bearing, partition walls, cavitywalls.	4	L1,L2	L2	Understand	Lecture	Internal assessment and Assignment
3	**Lintels and Arches** Definition, function and classification of lintels, Balconies, chejja and canopy. Arches; Elements and Stability of an Arch. Floors and roofs: Floors; Requirement of good floor, Components of ground floor, Selection of flooring material, Laying of Concrete, Mosaic, Marble, Granite, Tile flooring, Cladding of tiles.	4	L1,L2,	L2	Understand	Lecture	Internal assessment and Assignment
3	Roof;-Requirement of good roof, Types of roof, Elements of a pitched roof, Trussed roof, King post Truss, Queen Post Truss, Steel Truss, Different roofing materials, R.C.C.Roof.	4	L2, L3	L3	apply	Lecture	Internal assessment and Assignment

4	**Doors, Windows and Ventilators**: Location of doors and windows, technical terms, Materials for doors and windows, Paneled door, Flush door, Collapsible door, Rolling shutter, PVC Door, Paneled and glazed Window, Bay Window, French window. Ventilators. Sizes as per IS recommendations.	4	L1, L2	L2	Understand	Lecture	Internal assessment and Assignment
4	**Stairs:** Definitions, technical terms and types of stairs, Requirements of good stairs. Geometrical design of RCC doglegged and open-well stairs. **Formwork:** Introduction to form work, scaffolding, shoring, under pinning	4	L4,L5	L5	Analyse, design	Lecture	Internal assessment and Assignment
5	**Plastering and Pointing** : purpose, materials and methods of plastering and pointing, defects in plastering-Stucco plastering, lathe plastering **Damp proofing**- causes, effects and methods.	4	L2,L3	L3	apply	Lecture	Internal assessment and Assignment
5	**Paints**- Purpose, types, ingredients and defects,Preparation and applications of paints to new and old plastered surfaces, wooden and steel surfaces	4	L2, L3, L5	L5	Analyse, design	Lecture	Internal assessment and Assignment

2. Concepts and Outcomes:

Table 2: Concept to Outcome – BUILDING MATERIALS AND CONSTRUCTION

Module-#	Learning or Outcome from study of the Content or Syllabus	Identified Concepts from Content	Final Concept	Concept Justification (What all Learning Happened from the study of Content / Syllabus. A short word for learning or outcome)	CO Components (1.Action Verb, 2.Knowledge, 3.Condition / Methodology, 4.Benchmark)	Course Outcome **Student Should be able to ...**
A	*I*	*J*	*K*	*L*	*M*	*N*
1	understand the characteristics and properties of materials for building construction	Characteristics and properties	properties	properties of materials	- Understand	Students should be able to understand the characteristics and properties of materials for building construction
2	understand the suitability of foundations based on soil condition.	Foundation characterization	Characteristics and suitability	suitability	- Understand	Students should be able to understand the suitability of foundations based on soil condition.
2	identify and distinguish	Masonry works	distinguishing	identification	- Understand -	Students should be able to identify and

	among masonry works					distinguish among masonry works
3	demonstrate the stability of super structural elements of buildings	super structural elements	stability	stability	- Understand - apply -	Students should be able to demonstrate the stability of super structural elements of buildings
4	analyze the suitability of infill components of super structure used for construction	infill components	suitability	suitability	- Understand - apply - analyse	Students should be able to analyze the suitability of infill components of super structure used for construction
4	develops the capability of characterizing and analyzing the stairs	Characteristics of stairs	design	analyze	- Understand - apply - analyse -design	Students should be able to develops the capability of characterizing and analyzing the stairs
5	analyze the rendering works involved as per the materials and methods involved in building construction	rendering works	analyze	analyze	- Understand - apply - analyse	Students should be able to analyze the rendering works involved as per the materials and methods involved in building construction