

CONSTRUCTION MATERIALS**Course Code : 352303**

Programme Name/s : Architecture Assistantship/ Architecture/ Interior Design & Decoration/ Interior Design/
Programme Code : AA/ AT/ IX/ IZ
Semester : Second
Course Title : CONSTRUCTION MATERIALS
Course Code : 352303

I. RATIONALE

The course is designed to expose students to traditional and contemporary materials and processes of elementary construction experienced in routine construction technique. The course shall broadly emphasize on the concepts of sustainability in terms of eco-friendly materials and sustainable construction practices. The course shall discuss the properties of material and its effective concepts used in the construction systems.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

Select the relevant type of construction material for the given building structure.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

Students will be able to achieve & demonstrate the following COs on completion of course based learning

- CO1 - Use the construction materials on given construction projects/site.
- CO2 - Understand the variety of Material and their prices
- CO3 - Undertake the relevant masonry construction in the given building /project
- CO4 - Apply appropriate opening for given construction project.
- CO5 - Apply proper hardware and fittings in building as per latest trends.

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SLH	NLH			Theory	Based on LL & TL		Based on SL							
				CL	TL	LL						Practical									
				FA-TH	SA-TH	Total	FA-PR	SA-PR			SLA										
Max	Max	Max/Min	Max	Min	Max	Min	Max	Min													
352303	CONSTRUCTION MATERIALS	CMT	DSC	4	-	5	1	10	5	3	30	70	100	40	25	10	-	-	50	20	175

Total IKS Hrs for Sem. : 2 Hrs

Abbreviations: CL- ClassRoom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# On Line Examination , @\$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.
7. * Self learning includes micro project / assignment / other activities.

V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	TLO 1.1 Describe the construction material applications in the field of Building Industry TLO 1.2 Classify the given construction material according to sources with examples. TLO 1.3 Describe the criteria to select the construction materials for the given situation. TLO 1.4 Suggest the construction material in the given situation.	Unit - I Overview of Construction Materials 1.1 Application of the construction materials in building industry 1.2 Identification of given construction material and its sources. 1.3 Check the feasibility of the construction material for given situation. 1.4 Justify material selection for given situation.	Demonstration Model Demonstration Chalk-Board Collaborative learning Presentations
2	TLO 2.1 Describe the properties and structure of the given natural construction material. TLO 2.2 Explain the given type of defect(s) in natural construction material TLO 2.3 Explain the procedure of preservation of timber in the given situation. TLO 2.4 Select the natural construction material for the given situation. TLO 2.5 Choose the relevant type of integrated material for the given type of construction work.	Unit - II Natural Construction and Sustainable Constructional Materials 2.1 Explain the properties and structure of the given natural construction material. 2.2 Criteria to Identify defect(s) in natural construction material 2.3 Procedure of preservation of timber 2.4 Justification of natural construction material for the given situation. 2.5 Justify relevant type of integrated material for the given type of construction work.	Demonstration Case Study Presentations Hands-on Collaborative learning Site/Industry Visit

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Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
3	<p>TLO 3.1 Explain significance of masonry in construction industry.</p> <p>TLO 3.2 Explain the difference between brick and stone masonry</p> <p>TLO 3.3 Introduce special types of bricks.</p> <p>TLO 3.4 Apply different sizes and bonds for brick masonry.</p> <p>TLO 3.5 Analyze the material and application for given situation.</p>	<p>Unit - III Construction techniques of building components Masonry & Installations</p> <p>3.1 Masonry in different material like brick, stone, mud block, etc.</p> <p>3.2 Brick & Stone masonry-Types of masonry; random rubble, polygonal, & dry rubble works.</p> <p>3.3 Special type bricks like King closer, Queen Closer, Bull Nose, Etc.</p> <p>3.4 Types of Bricks; bonds in ½ brick & 1 brick; header, stretcher English & Flemish bonds.</p> <p>3.5 Justification of material used for given situation.</p>	<p>Model</p> <p>Demonstration</p> <p>Demonstration</p> <p>Site/Industry Visit</p> <p>Presentations</p> <p>Cooperative Learning</p> <p>Hands-on</p>
4	<p>TLO 4.1 Explain openings and its types and the difference between various types of openings.</p> <p>TLO 4.2 Limitations and scope with respect to size of opening.</p> <p>TLO 4.3 Explain arches with different styles and applications</p> <p>TLO 4.4 Explains projections like weather sheds & awnings; lofts in rooms.</p>	<p>Unit - IV Openings. Lintels, Projections and Arches</p> <p>4.1 Openings-Doors, windows, ventilators, and other openings focusing on different modes of operation and their effects on the jambs.</p> <p>4.2 Doors, Windows, Lintels, Arches, Etc.</p> <p>4.3 Arches-Types of arches, classification according to center, shape.(No theory questions for the topic Arches)</p> <p>4.4 Projections-Different types of weather sheds & awnings; lofts in rooms;</p>	<p>Model</p> <p>Demonstration</p> <p>Demonstration</p> <p>Case Study</p> <p>Collaborative learning</p> <p>Hands-on</p>
5	<p>TLO 5.1 Explain significance of joinery in doors, windows.</p> <p>TLO 5.2 Explain the different types of joinery.</p> <p>TLO 5.3 Introduce special types fixing, material and hardware.</p> <p>TLO 5.4 Apply different shutters such as framed, paneled, flush, glazed, and composite</p> <p>TLO 5.5 Explain wood derivatives and adhesives, hardware, sealants used for various furniture's in residential building.</p>	<p>Unit - V Doors, Windows & Ventilators with Jambs, Frames, Casings and Joinery</p> <p>5.1 Types of Doors and Windows with various joinery detailing and fixing.</p> <p>5.2 Joinery used in furniture making and in modular furniture used in residential building.</p> <p>5.3 Basis of modes of operation, positioning, placing of hardware; detailed study of modes of operation (Horizontal, vertical & inclined movement)</p> <p>5.4 study of types of shutters such as framed, panelled, flush, glazed, and composite focusing on different materials wood, metal, glass, & plastics</p> <p>5.5 Residential furniture/modular furniture, wood derivatives and adhesives, hardware, sealants used for various furniture's in residential building.</p>	<p>Model</p> <p>Demonstration</p> <p>Demonstration</p> <p>Hands-on</p> <p>Collaborative learning</p> <p>Chalk-Board</p>

VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES.

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
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Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Students will be able to understand the basic properties of construction materials and their applications in the construction industry.	1	*Introduction to basic properties of construction materials.	2	CO1
LLO 2.1 Students will be able to differentiate between types of materials used in construction.	2	*Study of different types of materials used in construction.	2	CO1
LLO 3.1 Students will be able to apply different techniques used to install and use various materials.	3	*Ongoing residential building site visit for material used, techniques and execution.	2	CO1
LLO 4.1 Students will be able to understand natural properties of construction materials..	4	*Conduct a site visit at the green building for natural and sustainable materials.	2	CO2
LLO 5.1 Students will be able to select the natural and sustainable materials.	5	*Introduction to various natural and sustainable materials.	2	CO2
LLO 6.1 Students will be able to evaluate the natural and sustainable materials.	6	*Conduct a market survey for natural and sustainable materials.	2	CO2
LLO 7.1 Student will bale to understand the concept of Different types of Bonds in Brick Masonry.	7	*Conduct a site visit at brick masonry work.	2	CO3
LLO 8.1 Student will bale to understand the concept of stone Masonry.	8	*Conduct a site visit at stone masonry work.	2	CO3
LLO 9.1 Student will bale to understand the concept of Special type of Bricks in various combination.	9	*Study the Special type of Bricks in various combinations.	2	CO3
LLO 10.1 Students will be able to understand the types of Doors, Windows and ventilators.	10	*Study the different types of doors, windows and ventilators.	2	CO4
LLO 11.1 Students will be able to finalize the positions of doors, windows, ventilators.	11	*Conduct a site visit at ongoing execution work of doors, windows and ventilators.	2	CO4
LLO 12.1 Students will be able to understand the concept of Arches, Lintels, Projections.	12	*Conduct a site visit at the ongoing execution work of Arches, Lintels, and Projections.	2	CO4
LLO 13.1 Students will be able to understand the properties of hardware and fitting material.	13	Study of Hardware and fitting materials.	2	CO5
LLO 14.1 Students will be able to evaluate the hardware and fitting material.	14	Conduct a market survey for hardware and fitting material.	2	CO5
LLO 15.1 Students will be able to understand the concept of fittings and hardware materials.	15	Conduct a site visit at the execution of hardware and fitting material.	2	CO5
Note : Out of above suggestive LLOs - <ul style="list-style-type: none"> *' Marked Practicals (LLOs) Are mandatory. Minimum 80% of above list of lab experiment are to be performed. Judicial mix of LLOs are to be performed to achieve desired outcomes. 				

VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)

Assignment

MSBTE Approval Dt. 29/11/2023

Semester - 2, K Scheme

CONSTRUCTION MATERIALS**Course Code : 352303**

- Construction Techniques of Building Components, Masonry and Installation
- Opening - Lintels, Projections and Arches
- Joinery
- Openings : Jams, Frames & Castings

Note :

Openings : Doors, Windows & Ventilators Basis of mode of operation, positioning, placing of hardware, detailed study of

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Drawing Board, drafting table and stool and drafting materials like metric scale box ,T square, pair of Setsquare	All
2	stationary : A1 Size Drawing Papers, various grades of pencils and allied stationary	All
3	Scientific Calculator, Measuring Tape	All

IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)

Sr.No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	Overview of Construction Materials	CO1	12	4	4	5	13
2	II	Natural Construction and Sustainable Constructional Materials	CO2	10	4	4	5	13
3	III	Construction techniques of building components Masonry & Installations	CO3	10	4	5	5	14
4	IV	Openings. Lintels, Projections and Arches	CO4	14	5	5	5	15
5	V	Doors, Windows & Ventilators with Jams, Frames, Casings and Joinery	CO5	14	4	5	6	15
Grand Total				60	21	23	26	70

X. ASSESSMENT METHODOLOGIES/TOOLS**Formative assessment (Assessment for Learning)**

- Term Work, Self learning (Assignments)

Summative Assessment (Assessment of Learning)

- Term Work, Self learning (Assignments)

XI. SUGGESTED COS - POS MATRIX FORM

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Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	3	1	2	2	2	2	3			
CO2	3	2	1	2	2	3	3			
CO3	2	2	1	1	2	3	3			
CO4	3	3	3	3	3	2	3			
CO5	3	2	2	2	1	3	3			

Legends :- High:03, Medium:02,Low:01, No Mapping: -
*PSOs are to be formulated at institute level

XII. SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	F D K CHING	Building Construction Illustrated	Van Nostrand
2	V.N. Chanapattan	Materials of Civil and Interior Construction	SAIRAJ GRAPIC
3	W. B. Mc Kay	Building Construction vol-1	W. B. Mc Kay Collection buildingtechnologyheritagelibrary;
4	Rangwala	Engineering materials	Charoter Publication
5	R.Berry	Barry Construction of Buildings Volume - 1	Blackwell Science
6	Mario dal Fabro	How to Build Modern Furniture	McGraw Hill Book Company ,New York
7	Christopher Natale	Furniture Design and Construction for Interior Designer	Bloomsbury

XIII. LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	www.basicconstructionco.com	Basic Construction
2	www.understandconstruction.com	Understand construction techniques
3	www.basiccarpentrytechniques.com	basic carpentry techniques
4	understandconstruction.com	Concrete Frame Structures

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