



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Diploma Architecture

Level: Diploma

Branch: Architecture

Course / Subject Code : DA02063071

Course / Subject Name : Building Materials - II

w. e. f. Academic Year:	2025-26
Semester:	Second
Category of the Course:	Professional Core Courses (PC)

Prerequisite:	Students should have a basic understanding of conventional building materials such as bricks, cement, timber, and metals, along with their properties, uses, and construction techniques. They should also be familiar with material classification and simple testing methods.
Rationale:	This course is in continuation with the “Building Materials” offered in their previous semester. It introduces the learners to various Advanced Building Materials used in the construction industry. In this course knowledge of various properties and uses of different building materials are imbibed in learners in such a way that this knowledge will enable them to take suitable material selection related decisions for architectural projects. In this course, the technology related to some of the important and widely used construction materials have been dealt with. This course will enrich architecture students in performing their task with required competency.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes
01	Understand the properties and uses of various materials used for building construction
02	Compare the different alternative materials suitable for the given requirement
03	Select suitable materials for building construction for the given requirement

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+P	Assessment Pattern and Marks				Total Marks
L	T	P	C	Theory		Tutorial / Practical		
				ESE (E)	PA / CA (M)	PA/CA (I)	ESE (V)	
3	0	0	3	70	30	20	0	120



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Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	<p>Finishes: Floor, Wall, Ceiling and Roofing</p> <p>1.1 Factors affecting the selection of finishes: Base, room size and use, climatic conditions, maintenance, cost, appearance, safety and durability.</p> <p>1.2 Types of flooring materials, their properties and their uses:</p> <p>1.2.1 Stone – Natural stone like Marble, Granite, Kota, etc. and artificial stone</p> <p>1.2.2 Wood – Strip-flooring, block-flooring, Timber board, Timber Sheet, MDF/HDF (engineered wood), hardwood, bamboo</p> <p>1.2.3 Tiles–Vitrified, Mosaic, Ceramic, Thermoplastic, Flexible PVC, rubber, etc.</p> <p>1.2.4 Glass– Blocks, Toughened glass, Coloured glass, Textured glass, etc.</p> <p>1.2.5 Terrazzo, Marble finish, IPS, etc.</p> <p>1.3 Requirements, properties and uses of the following types of wall finishes:</p> <p>1.3.1 Wall papers</p> <p>1.3.2 Tiles</p> <p>1.3.3 Wood</p> <p>1.3.4 Cement mortar plaster</p> <p>1.3.5 Gypsum plaster</p> <p>1.3.6 Stucco plaster</p> <p>1.3.7 Sprayed plaster</p> <p>1.3.8 Special External Finishes for plaster surface</p> <ul style="list-style-type: none">• Roughcast• Smoothcast• Barium plaster <p>1.4 Requirements, properties and uses of ceiling materials:</p> <p>1.4.1 Plywood</p> <p>1.4.2 Hardboard</p> <p>1.4.3 Aluminium Composite Sheet</p>	15	35



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	<ul style="list-style-type: none">1.4.4 Fiberboard1.4.5 Glassroof tiles1.4.6 Thermocole sheets1.4.7 Gypsum board1.4.8 Fiber Glass1.4.9 Plaster of Paris <p>1.5 Standard sizes, properties, uses and their requirements for roofing</p> <ul style="list-style-type: none">1.5.1 Profile Roofing Sheet and its types1.5.2 Fibre sheets & Polycarbonate sheets1.5.3 Mangalore tiles1.5.4 Acrylic Sheet1.5.5 PVC Sheet1.5.6 A.C. Sheet		
2.	<p>Building fixtures, Paints, Varnishes and Distempers</p> <p>2.1 Types, sizes and uses of building fixtures and hardware as per ISI</p> <ul style="list-style-type: none">2.1.1 Tower bolt2.1.2 Hinges2.1.3 Door handles2.1.4 Door springs & Floor springs2.1.5 Latches2.1.6 Aldrop2.1.7 Floor door stopper2.1.8 Locks2.1.9 Door closer2.1.10 Patch Fittings (all fittings for glass)2.1.11 Wire-mesh (mosquito & fly-proof)2.1.12 Magic eye (eyehole) <p>2.2 Painting and Characteristics of an ideal paint</p> <ul style="list-style-type: none">2.2.1 Ingredients of an oil borne paint <p>2.3 Types of paints - advantages and uses</p> <ul style="list-style-type: none">2.3.1 Aluminum Paint2.3.2 Anti-Corrosive Paint2.3.3 Cellulose Paint	15	35



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	<p>2.3.4 Cement Paint</p> <p>2.3.5 Emulsion paint</p> <p>2.3.6 Enamel Paint</p> <p>2.3.7 Graphite paint</p> <p>2.3.8 Inodorous paint</p> <p>2.3.9 Luminous paint</p> <p>2.3.10 Oil Paints</p> <p>2.3.11 Plastic paint</p> <p>2.3.12 Silicate paint</p> <p>2.3.13 Synthetic rubber paint</p> <p>2.4 Process of painting-painting on different surfaces</p> <p>2.5 Defects in Painting</p> <p>2.6 Varnishing & Characteristics of an ideal Varnish</p> <p>2.7 Ingredients of a varnish</p> <p>2.8 Types of varnishes, requirement & uses of different types of varnishes</p> <p>2.9 Process of varnishing</p> <p>2.10 Distempering: properties, ingredients, process of distempering</p> <p>2.11 White-washing</p> <p>2.12 Colour-washing</p>		
3.	<p>Clay and Cement Products</p> <p>3.1 Roofing Tiles: Mangalore Tiles</p> <p>3.2 Earthenware Products</p> <p>3.3 Stoneware Products and porcelain: uses and advantages</p> <p>3.4 Terra-cotta: advantages, disadvantages, uses.</p> <p>3.5 Porcelain</p> <p>3.6 Glazing: purpose, types</p> <p>3.7 Clay blocks</p> <p>3.8 Cement hollow blocks, cement grills and decorative posts for railings</p>	5	10
4.	<p>Ferrous and Non-ferrous Metals</p> <p>4.1 Steel - Properties, uses of different types of Steel (i) C.I. (ii) W.I. (iii)M.S. (iv) G.I</p> <p>4.2 Different forms of M.S. Sections.</p>	5	10



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	4.3 Various categories of steel. 4.4 Advantages of Tor Steel over Mild Steel (M.S) 4.5 Aluminum 4.6 Properties & uses of Aluminum 4.7 Aluminum alloys- Properties &uses 4.8 Different market forms of Aluminum		
5.	Composite and Insulating Materials 5.1 Composite Materials: Function, advantages 5.2 Fly-ash: Disposal and Uses 5.3 Electrical Insulators: Types, properties 5.4 Heat insulating materials: Types and uses	5	10
Total		45	100

Suggested Specification Table with Marks (Theory):

Unit No.	Unit Title	Distribution of Theory Marks						Total
		R Level	U Level	A Level	N Level	E Level	C Level	
I	Finishes: Floor, Wall, Ceiling and Roofing	6	6	12	0	0	0	24
II	Building fixtures, Paints, Varnishes and Distempers	6	6	12	0	0	0	24
III	Clay and Cement Products	2	2	3	0	0	0	7
IV	Ferrous and Non-ferrous Metals	2	2	4	0	0	0	8
V	Composite and Insulating Materials	2	2	3	0	0	0	7
Total		29	29	42	0	0	0	70

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

S. No.	Title of Book	Author	Publication with place, year and ISBN
1	Engineering Materials (Material Science)	Rangwala	Charotar Publishing House Pvt. Ltd., Anand,



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			ISBN: 9789385039171
2	Building Materials	S. K. Duggal	New Age International (P) Limited, Publishers ISBN (13):978-81-224-2975-6
3	Building Construction	S.C.Rangwala	Charotar Publishing House Pvt. Ltd., Anand, ISBN: 9788185594873
4	A text book of Building Construction	Dr. B. C. Punmia, Ashok KumarJain, ArunKumarJain	Laxmi Publications (P) Ltd., ISBN: 81-7008-053-3
5	The text book of Building Construction	S. P.Arora, S. P. Bindra	DhanpatRai Publications, ISBN 13: 9788189928803 ISBN: 978-1-84569-956-7 (online)
6	Material Architecture Paperback – Illustrated	John Fernandez	Routledge ISBN-10 : 0750664975 ISBN-13 : 978-0750664974

(b) Open-source software and website:

1. <https://nptel.ac.in/courses/124105013>
2. <https://nptel.ac.in/courses/124106455>

Suggested Course Practical List: NA

List of Laboratory/Learning Resources Required: NA

Suggested Project List:

- a) Conduct Market survey for the building materials.
- b) Prepare a report on the market survey supported with the photographs.
- c) Comparative study of traditional vs. advanced building materials

Suggested Activities for Students:

- a) Study of on-going constructions works and documentation of the same in the form of a report with photographs and sketches.
- b) Sample collection and material board preparation

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