GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT
COURSE CURRICULUM

Course Title: Advanced Building Materials
(Code: 3325003)

Diploma Programmes in which this course is offered	Semester in which offered
Architectural Assistantship	**Second Semester**

1. RATIONALE

This course deals with some more types of materials used in the construction industry. Various factors affecting the selection of materials for given situations are also discussed. This course, thus, helps the student to understand the application of modern materials.

2. LIST OF COMPETENCIES

The course content should be taught so that the student understands various materials used for construction of a building and develop different skills so that they are able to acquire following competencies:

i. **Identify various building materials according to their requirements and applications**
ii. **Select and apply various building materials according to use, site specifications and available market forms and sizes, colour, etc.**

3. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	**T**	**P**	**C**	**ESE**	**PA**	**ESE**	**PA**	
3	0	0	3	70	30	00	00	100

Legends: L-Lecture; **T** – Tutorial/Teacher Guided Theory Practice; **P** - Practical; **C** – Credit
ESE - End Semester Examination; **PA** - Progressive Assessment.

Note: It is the responsibility of the institute heads that marks for **PA of theory** & **ESE and PA of practical** for each student are entered online into the GTU Portal at the end of each semester within the dates specified by GTU.

4. DETAILED COURSE CONTENT

Unit	Major Learning Outcomes	Topics and Sub-topics
Unit – I **Floor and Wall finishes**	1.a Enlist Various Floor finishes and their uses With neat sketches. 1.b Mention various Types of flooring. 1.c Describe Various factors affecting the selection of floor finishes. 1.d Explain various types of Wall finishes and its uses. 1.e Enlist various types of Wall finishes. 1.f Give requirements and Uses of specified Wall finishes.	**1.1 Factors** affecting the selection of floor finishes **1.2 Types of flooring and their uses** **Wood** - Strip flooring, block flooring, Timber board, Timber Sheet, etc **Tiles** – Vitrified, Mosaic, Ceramic, Linoleum, Thermoplastic tiles, Flexible PVC Tiles, Cork tiles, quarry tiles, rubber tiles **Terrazzo**, marble finish, IPS, Kota, Granite, Cement Concrete Tile, Asbestos tile **1.3 Requirements and uses** of the following types of wall finishes. Materials: 1. Wall papers 2. Cement mortar plaster 3. Tiles 4. Gypsum plaster 5. Stucco plaster 6. Special External Finishes for plaster surface • Rough cast • Smooth cast • Barium plaster
Unit– II **Ceiling and Roofing Materials**	2.a Enlist various Ceiling Materials. 2.b Explain various types of ceiling materials and its requirements. 2.d Give sizes, uses & requirements of Various roofing Materials. 2.e Explain various Types of Roofing Materials with neat sketches.	**2.1 Requirements & uses** of the following ceiling materials: 1. Ply wood 2. Hard board 3. Plain A.C. Sheet 4. Fiber board 5. Asbestos tiles 6. Glass roof tiles 7. Thermocole sheets 8. Gypsum plaster board 9. Sprayed plaster 10. Fiber Glass **2.2 Standard sizes**, **uses** & their requirements: 1. G.I. Sheet 2. Mangalore tiles 3. Acrylic Sheet 4. PVC Sheet

Unit	Major Learning Outcomes	Topics and Sub-topics
Unit– III **Building fixtures, Paints & Varnishes**	3.a Explain various types of Building fixtures and Hardware With neat sketches. 3.b Describe the given fixture with neat sketches 3.c Define Painting and its objectives. 3.d Give characteristics of an ideal paint. 3.e Give composition of an oil borne paint. 3.f Enlist various Types of paints. 3.g Describe types of paints. 3.h Explain uses and requirements of various types of Paints & Varnishes. 3.i Define Painting and its objectives. 3.j Give characteristics of an ideal paint. 3.k Enlist various Types of Varnishes. 3.l Describe types of Varnishes. 3.m Explain uses and requirements of various types of Paints & Varnishes.	**3.1 Types, sizes & uses** of building fixtures and hardware as per ISI. 1. Tower bolt 2. Hinges 3. Door handles 4. Door springs & Floor springs 5. Latches 6. Aldrop 7. Floor door stopper 8. Locks 9. Door closer 10. Patch Fittings (all fittings for glass) 11. Wire mesh (mosquito & fly proof) 12. Magic eye (eye hole) **3.2 Painting and Objectives for painting** **3.3 Characteristics of an ideal paint** **3.4 Ingredients of an oil borne paint** **3.5 Types , Requirement & uses** 1. Aluminiun Paint 2. Anti Corrosive Paint 3. Cellulose Paint 4. Cement Paint 5. Emulsions 6. Oil Paints 7. Water based paints 8. Plastic Paints 9. Synthetic Rubber Paint 10. Silicate Paint 11. Enamel Paint **3.6 Failure of paint.** **3.7 Defects in Painting** **3.8 Varnishing & its objectives** **3.9 Characteristics of an ideal Varnish.** **3.10 Ingredients of a varnish.** **3.11 Types of varnishes, Requirement & uses of different types of varnishes**
Unit – IV Clay and Cement Products	4.a Explain various Types of Clay products. 4.b Describe Stoneware products. 4.c Explain various Types of Cement products. 4.d Describe Cement hollow blocks, cement grills & decorative post for railing.	**4.1 Roofing** Tiles **4.2 Earthenware** products **4.3 Stoneware** products **4.4 Terra cotta** and other clay wares, porcelain **4.5 Asbestos** cement sheets **4.6 A.C. Pipes** **4.7 Cement hollow** blocks, cement grills (jalis) & decorative post for railing.
Unit – V Ferrous Metal and Non-ferrous	5.a Explain various ferrous Metal. 5.b Describe Different forms of M.S. Sections with neat sketches. 5.c Give Various categories of steel. 5.e Explain properties of specified steel. 5.f Explain Properties & uses of Aluminum. 5.g Describe Aluminum alloys.	**5.1 Steel - Properties, uses of different types of Steel** (1) C.I.(2) W.I.(3) M.S. **5.2 Different forms** of M.S. Sections. **5.3 Various categories** of steel. **5.4 Advantages** of Tor Steel over Mild Steel (M.S) **5.5 Aluminum** **5.6 Properties** & uses of Aluminum **5.7 Aluminum** alloys- Properties & uses **5.8 Different market** forms of Aluminum

5. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARK (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1.	Floor and Wall finishes	09	07	07	00	14
2.	Ceiling and Roofing materials	09	07	07	00	14
3.	Building fixtures, Paints & Varnishes	12	14	07	07	28
4.	Clay and Cement Products	06	03	03	01	07
5.	Ferrous and Non Ferrous Metals	06	04	03	00	07
	Total	**42**	35	27	08	**70**

Legends: R = Remember; U = Understand; A = Apply and above levels (Bloom's revised taxonomy)

Note: This specification table shall be treated as only general guideline for students and teachers. The actual distribution of marks in the question paper may vary from above table.

6. SUGGESTED LIST OF EXERCISES/PRACTICALS

The assignments should be properly designed and implemented with an attempt to develop different types of skills leading to the achievement of the competency – Knowledge and use of advanced building materials in building construction

S. No.	Unit No.	Practical Exercise
1	**I**	Market survey, sample collection of various building materials, know-how of application, exploring the characteristics of each material Site visits for studying and understanding application of building materials
2	**II**	
3	**III**	
4	**IV**	
5	**V**	

Note: The above assignments are for guideline only. The remaining theory hours are for revision and guidance.

7. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities like: Visit Exhibitions held for Building Materials and **share with class**, attend hands-on workshops for material study/examination, attend course/topic based seminars at **other departments**, visit on-going construction sites refer to internet based assignments, teacher guided self learning activities, course/library/internet/lab based Mini-Projects, etc. These could be individual or group-based.

8. SUGGESTED LEARNING ACTIVITIES

A. List of Books

Sr. No.	Title of Book/Journals	Author	Publication
1.	Engineering Materials (Material Science)	S.C Rangwala	Charotar Publications, Anand
2.	Building Construction	B.C.Punmia	Laxmi Publications Pvt Ltd.
3.	Indian Architect & Builder	Magazine/Journal	Jasubhai Media Publications Ltd, Mumbai

B. List of Major Equipment/ Instrument

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C. List of Software/Learning Websites

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9. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

- **Prof. Bhaskar J. Iyer**, H.O.D Architecture, Govt. Polytechnic Vadnagar,
- **Prof. Ushma U.Anerao**, H.O.D Architecture, Govt. Polytechnic for Girls, Ahmedabad
- **Prof. Abhijit R.Rathod**, Lecturer in Architecture, Govt. Polytechnic for Girls, Ahmedabad
- **Prof. Vishal Mashruwala**, Lecturer in Architecture, Govt. Girls Polytechnic, Surat.

Co-ordinator and Faculty Members from NITTTR Bhopal

- **Prof. M.C.Paliwal,** Associate Professor, Deptt. of Civil & Environmental Engg