

## Materials & Construction Methods

**Course Code:**

**Level:** 5

**Credits:** 4

**Pre-Requisite:** Materials Study & Survey

**Duration** Contact Hours:

i. Theory: Nil

ii. Practical: Nil

iii. Self-Study/Project/Industry: 120 (4 Cr x 2.0 x15)

### Aim

The aim of the subject is to develop a deeper understanding of materials and construction methods. The understanding of application of these materials is explored in detail through lectures, case studies and site visits. Furthermore, material applications and details of structural and non-structural building components are explored. Students also can experience material capacity, their behavior as well as construction methods in demonstrations and site experiments.

### Expected Learning Outcomes

At the end of the course, the student is expected to be able to:

- 1) Develop a strong understanding of technical terms and nomenclature.
- 2) Research, select and specify materials for interior applications.
- 3) Explore and Experiment with material and their properties.
- 4) Conceptualize and design basic joinery, junction and other fixing details using various materials.

### Learning and Teaching Strategy

The course is delivered via face-to-face mode, supplemented by assigned readings before and after classes as well as market surveys.

### Course Content

#### Unit I: Natural Wood & Engineered Wood

- Natural Wood: Joineries & Junctions in Furniture, Interior partitions, False Ceiling and Paneling
- Engineered Wood Construction: Joineries & Junctions. Application of Veneer and Laminates
- Moldings and Beadings- Applications and Fixing in Interiors.
- Types of Finishes- Paints & Polishes

#### Unit II: Glass, Plastic & Polymers

- Study of Assembly and Construction- Application of Glass, PVC & Rubber in various building elements & components,
- Use of Glass in Furniture- Fixing & Assembly.
- Glazed Doors & Windows- Hardware and Assembly
- UPVC Doors and Windows- Hardware and assembly
- Glass Skylights, PVC roofing, Glass fiber reinforced plastic sheets for roofing.

#### Unit III: Natural Stones and Tiles

- Dry Cladding & Wet Cladding Methods. Study of standard details.
- Types of finishes in Natural Stone.
- Natural stones, engineered stones, Mosaic and Terrazzo- Pattern Making and Construction methodologies.
- Tiles – Natural stones, Ceramic, Porcelain- Construction using mortar and adhesives.

#### Unit IV: Concrete

- Application of RCC in various building elements such as shallow foundation for isolated column, RCC wall, DPC / Plinth & floor / roof beam.
- Construction of different types of RCC and Precast stairs.
- Concrete Construction Methods- cast in Situ, Precast, etc.- Joineries and Junctions
- Polishing of Concrete-Different Methods and Finishes

**Unit V: Metal (Steel, Aluminum, Zinc, Brass, etc.)**

- Aluminum Partitions and Assembly, ACP Cladding- Fixing and Application
- Methods of connecting steel work- Welding, Bolting, Riveting, etc. Types of Connections: L connections, T connections, Angled Connections, etc.
- Zinc and Brass Hardware, Sections, and interior applications.

**Suggested Assessment Scheme**

Assessment 1: Natural Wood & Engineered Wood Joineries- Two Details	20%
Assessment 2: Glass, Plastic and Polymers-Two Details	20%
Assessment 3: Stones and Tiles -Two Details	20%
Assessment 4: Concrete & Steel-Two Details	20%
Assessment 5: Class Test	20%

**References**

**Required Texts**

- Ching, F.D.K. (2014). Building Construction Illustrated. Fifth Edition. New York: Van Nostrand Reinhold Co.
- Neufert, E. & Neufert, P. & Kister, J. 2012. Architects' Data, Chichester, West Sussex, Wiley-Blackwell.
- McKay, J.K. (1990) Building Construction, London, Longman Group.

**Reference Texts**

- R1: S.P.Arora, S.P. Bindra, 2010 "Building Construction Including Engineering Material". Dhanpat Rai Publications (P) Ltd., New Delhi
- R2: Handbook on Concrete Reinforcement and Detailing, SP 34:1987, BIS New Delhi, 2002
- R3: CPWD specifications (Vol.1), Director General of Works, New Delhi, 2009
- R4: P. Kumar Mehta 1999 "Concrete Technology for Sustainable Development in the twenty-first century", Cement Manufactures Association, New Delhi
- R5: Hegger, Auch-schwelk, Fuchs, Rosenkranz:2006, "Construction material manual"; Birkhauser, Munich.
- R6: Schittich, Staib, Balkow, Schuler, Sobek, 2007, Glass Construction Manual, 2nd revised and expanded addition, Birkhauser
- R7: Robin Barry, "The construction of buildings (Vol. I-V)", 2000, Blackwell publishing
- R8: Handbook on Building Construction Practices, 1997, SP62:1997, BIS New Delhi
- R9: Plunket, D. (2015) Constructions & Detailing for Interior Design, London, Laurence King Publishing.