

Department of Civil Engineering
Amity School of Engineering & Technology (ASET)
Amity University, Noida, Uttar Pradesh

BUILDING MATERIALS

Course Code: Credit Units: 03

Course Objective:

The course covers building materials and their testing, cement and its applications in foundation and structural members of building. Different areas and utilities of building like floors, doors etc.

Course Contents:

Module I

Building stones - Classification of rocks - Quarrying - Dressing - Properties and uses of common type of stones; Timber - Defects - Seasoning - Decay - Preservation - Plywood, fibre board, particle board; Clay products - Bricks - Manufacture - IS classifications - Properties and testing - Types of bricks - Tiles - Manufacture, properties and uses - Types of tiles; Ceramic products - Lime - Classification - Manufacture, properties and uses.

Module II

Introduction to Cement, Mortar & Concrete Iron and steel - Structural sections - Properties and uses of structural steel - Recent developments;

Miscellaneous materials – **Glass - Manufacturing Process, Types of Glass (Basic & Processed), use of appropriate glass at critical locations ensuring Human Safety, Manifestation, Safety glass test requirements etc.**

Foundation - Timbering of foundation trenches - Bearing capacity of soils - Improvement of bearing capacity - Settlement of foundation - Description of spread, grillage, raft and pile foundations, Foundation failure; Brick and stone masonry - Bonds in brick work - Types of stone masonry - Cavity walls - Lintels and arches; Partition walls - Types and features.

Module III

Floors and flooring – Different types and applications; Ceramic tiles- Types of tiles, application methodology, mortars, adhesives and grouts, Doors, windows and ventilators - Different types; Finishing works, Hardware for Doors, Windows, Glass & Furniture; Building repairs - Shoring - Underpinning – Scaffolding; Tall buildings - Framed structures - Steel and concrete frames – Joints in steel and concrete frames; Introduction to prefabrication; Fire proof construction - Fire load - Fire resisting properties of building materials – Fire extinguishing methods – Fire proof construction methods; IS Codal provision.

Module IV

Vertical transportation: Stairs - Types and design considerations; Elevators - Types and design considerations; Escalators - features, operation & arrangement; Ramps. Ventilation and air conditioning: Ventilation requirements - Natural and mechanical ventilation; Air conditioning. Plumbing services: Typical details of water supply and sewage disposal arrangements for buildings – Standard requirements.

Module V

Fly ash: properties, various usages, standard specifications & Codal provision on fly ash, few examples of fly ash use in various civil engineering applications. Green building concept: Basic concept, Green building material's availability & its use. Concrete Chemicals & Ready mix concrete: Availability of Various chemicals & its usage, Cement & Concrete Admixtures, requirement of Ready mix Concrete. Materials for water proof & Damp Proofing: Different water proofing materials & its utilization, Damp Proofing of walls above & below Ground level, water proofing of roofs and Reflective surfaces over roofs.

Learning Outcome:

1. An ability to understand various building materials & technology being used in construction project
2. An understanding of basic building elements
3. An exposure to latest/innovative building materials and technologies in market
4. A basic concept of green materials

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

- Punmia B. C, Ashok Kr. Jain, Arun Kr. Jain, Building Construction, Laxmi Publications, New Delhi. (2008).
- Shetty M. S, Concrete Technology, S. Chand & Co., New Delhi (2008).
- Duggal, S. K, Building Materials, 2nd ed., New Age (New Delhi) 2008.
- K. S. Jagadish, B. V. Venkatarama Reddy, K. S. Nanjunda Rao, Alternative Building Materials and Technologies, New Age, New Delhi (2008)
- **CCPS - Guidelines on Use of Glass in Buildings – Human Safety**
- **CCPS – Construction Products in India**
- **CCPS – Manual for Hand Held Power Tools**
- National building code 2005
- IS Codes on Materials