

Introduction to Building Technology

Introduction to Building Technology

Key concepts, components, and processes that shape modern construction

1. What Is Building Technology?

Aspect	Description
Definition	The application of engineering, science, and design principles to create safe, functional, and sustainable built environments.
Scope	Structural systems, envelope (walls, roofs, windows), services (MEP), materials, construction methods, and digital tools.
Goal	Optimize performance, cost, durability, energy efficiency, and occupant wellbeing.

2. Core Disciplines

Discipline	Primary Focus	Typical Output
Structural Engineering	Load-bearing systems, stability, seismic & wind resistance.	Beams, columns, foundations, frames.
Architectural Design	Spatial organization, aesthetics, human experience.	Layouts, façades, interior finishes.
Mechanical, Electrical & Plumbing (MEP)	Heating, ventilation, air-conditioning, power distribution, water supply, fire protection.	Ductwork, wiring, piping, control systems.
Building Physics	Heat, moisture, acoustics, lighting, indoor air quality.	Energy models, thermal bridges analysis, acoustic ratings.
Construction Management	Planning, scheduling, cost control, quality assurance.	Gantt charts, BIM coordination, risk registers.
Sustainability & Green Building	Life-cycle impact, renewable energy, resource efficiency.	LEED/BREEAM credits, carbon-footprint calculations.

3. Building Elements & Systems

Introduction to Building Technology

3.1 Structural System

- **Foundations** – shallow (spread footings) vs. deep (piles, caissons).
- **Load-bearing Frame** – steel, reinforced concrete, timber, or hybrid.
- **Lateral-resistance** – shear walls, braced frames, moment-resisting frames.

3.2 Building Envelope

Component	Function	Common Materials
Walls	Insulation, moisture control, load transfer	Masonry, CLT, insulated panels
Roofs	Weather protection, thermal barrier	Metal decking, membrane roofing, green roofs
Windows & Glazing	Daylighting, solar gain control	Double/triple glazing, low-E coatings

3.3 Services (MEP)

- **HVAC** – central plant, VRF, heat pumps, natural ventilation.
- **Electrical** – power distribution, lighting, emergency systems.
- **Plumbing & Drainage** – potable water, wastewater, rainwater harvesting.
- **Fire Protection** – detection, suppression (sprinklers), egress design.

3.4 Interior Fit-out

- Partitions, finishes, acoustical treatments, furniture integration.

4. Materials Overview

Material	Strengths	Limitations	Typical Applications
Concrete	High compressive strength, fire-resistant	Low tensile strength (requires reinforcement)	Foundations, slabs, columns
Steel	Excellent tensile/compressive strength, ductility	Prone to corrosion, thermal conductivity	Frames, beams, connectors

Introduction to Building Technology

Material	Strengths	Limitations	Typical Applications
Timber / CLT	Renewable, lightweight, carbon?sequestering	Moisture sensitivity, fire rating (needs treatment)	Floors, walls, low?rise structures
Masonry (brick, block)	Thermal mass, durability	Heavy, labor?intensive	Infill walls, façades
Glass & Glazing	Transparency, daylighting	Solar gain, thermal loss	