

Civil Engineering Department

Bridge Course-6 hrs

PART – 1

Introduction and building materials

1.1 History of civil engineering

1.2 Branches of civil engineering

- Structural engineering
- Geotechnical engineering
- Transportation engineering
- Water resources engineering
- Environment engineering
- Construction Technology
- Earthquake engineering

1.3 Role of civil engineer in society

1.4 Building materials: Concept and uses

- Cement
- Bricks
- Aggregate
- Concrete
- Stone
- Timber
- Metals

Activity: Identification of various building materials viz; Cement, bricks, aggregate, metal (Rolled steel section)

PART – 2

DESIGN LOADS AND INTRODUCTION OF BUILDING BYE-LAWS

2. Introduction of building bye-laws

- A bye-law is a local law framed by a sub ordinate authority.
- It is defined as the standards and specification designed to grant minimum safe guard to the workers during the construction; to the health and comfort of the users and to provide enough safety to the public in general.

2.1 Importance and Objectives of bye-laws

- Easier for engineers and architect for pre-planning activities of the building.
- For prevention of the haphazard development w/o any resemblance to the development of the area as a whole.
- Afford safety against fire, noise, health hazard and structure failure

2.2 Components of a structure

- a. Sub structure
 - i. Foundation
- b. Super structure
 - i. Column
 - ii. Beam
 - iii. Slab
 - iv. Plinth
 - v. Stair and staircase
 - vi. Wall
 - vii. Lintel
 - viii. Flooring
 - ix. Roof

2.3 Different types of loads

- c. Dead load
- d. Live load (Imposed load)
- e. Wind load
- f. Snow load
- g. Seismic load

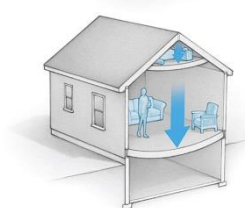


Fig -1 Dead load



Fig - 2 Live load



Fig - 3 Wind load



Fig - 4 Earthquake load

Fig - 5 Snow load



Fig - 6 Rain load



Activity: Calculation of plot area and carpet area of your house

PART-3

FUNCTIONAL REQUIREMENTS OF Buildings

3.1 Introduction

Planning of a building is defined as an arrangement of all units of a building on all floors and at all levels enclosed by walls and roofs.

3.2 Orientation of a building

- Cross Ventilation
- Damp proof course
- Placing of walls
- Projections
- Roof
- Treatment of ground
- Wind direction

3.3 Functional requirement of a building

- The structure of the building should be strong and sound enough to resist load comes on it.
- The building should be well planned to give maximum comfort and convenience to the occupants of the building.
 - Comfort and convenience
 - Dimensional stability
 - Durability
 - Economy
 - Fire protection
 - Thermal insulation
 - Light and ventilation
 - Damp proofing
 - Strength
 - Termite Proofing

Activity: Drawing line diagram of a residential building as per orientation

PART-4

Transportation engineering

4.1 Modes of transportation

- Roads
- Railways
- Water ways
- Airways
- Discuss the advantages and disadvantages of each mode with their limitations

4.2 Types of Road as per function

- Expressway, NH, SH, MDR, ODR, VR

4.3 Modern modes of transportation

- BRTS
- Metro rail

4.4 Types of road as per material

- Bituminous road
- Concrete road

4.5 Traffic signs

- Regulatory signs
- Warning signs
- Informatory sign

4.6 Traffic signals

4.7 Traffic markings

4.8 Introduction to PPP concept

BOT, DFBO, BOLT, BOOS

Activity: Showing various signs, marking and traffic awareness

PART-5
Water resource engineering

5.1 Hydrological cycle

- Components
- Applications

5.2 Sources of water

- Surface water sources
- Sub-surface water sources
- Water resources potential in the major river basins of India

5.3 Water shed development

- Concept
- Water shed characteristics
- Objectives and methods

5.4 Conservation of water

- Objectives
- Methods

Rainwater harvesting

Lakes and reservoirs

Ancient water bodies

Check Dams

5.5 Storage and conveyance of water

- Dams- Major dams in India
- Canals – Major canals in India

Activity: Preparing report on major dams in India in group of 6 students

PART-6

Area and VOLUME CONCEPTS

6.1 AREA AND VOLUME:

- Calculating area and volume of simple geometrical shapes
- Calculating area of plot with irregular boundary from field notes
- Calculating area of plot with irregular boundary

6.2 LINEAR MEASUREMENT:

- Definition
- Use of linear measurement
- Instruments used for linear measurement (chain, tape)

6.3 ELEVATION:

- Introduction to leveling & contours
- Define contour line
- Uses of contour map

6.4 ESTIMATION:

- Definition & uses of estimation
- Units of measurements used in Estimate of different building components (e.g. excavation for foundation, brick masonry wall, openings for doors & windows, flooring ,plastering ,white washing,)
- Estimates for building construction materials (brick, tiles, cement, sand, aggregate etc.) For specific volume of building item.

Activity: Calculation of area of an irregular boundary by various methods