

2/4 B.Tech. THIRD SEMESTER

CE3T2

BUILDING MATERIALS AND CONSTRUCTION

Credits: 3

Lecture: 3 periods/week

Internal assessment: 30 marks

Tutorial: 1 period /week

Semester end examination: 70 marks

Pre-requisites: Engineering chemistry, engineering geology and physics

Learning objectives:

- To learn the availability, types, uses and various tests for building materials.
- To know about activities in building construction.

Course outcomes:

At the end of course the student will be able to

1. Understand the process of making quality stones and bricks with their applications.
2. Assess quality of timber and steel in a detailed manner on the usage in the present-day construction.
3. Acquire the knowledge about paints, varnishes, distempers and acoustics of buildings.
4. Understand types of foundation and stone, brick & block masonry for the different construction activities in the building construction
5. Comprehend floors & roofs and application of damp proofing, scaffolding, shoring, underpinning and formwork.

BUILDING MATERIALS

UNIT – I

STONES:

Qualities of a good building stone; Stone quarrying; Tools for blasting; Materials for blasting; Process of blasting; Precautions in blasting; Dressing of stones; Common building stones of India.

BRICKS:

General; Composition of good brick earth; Harmful ingredients in brick earth; Classification of brick earth; Manufacture of bricks; Comparison between clamp burning and kiln burning; Qualities of good bricks; Tests for bricks; Classification of bricks; Substitutes for bricks.

UNIT – II

TIMBER:

Definition; Classification of trees; Structure of a tree; Felling of trees; Defects in timber; Qualities of good timber; Decay of timber; Preservation of timber; Fire resistance of timber; Seasoning of timber; Market forms of timber; Industrial timber; Advantages of timber construction; Use of timber; Indian timber trees.

STEEL:

General; Manufacture of steel; Uses of steel; Factors affecting physical properties; Defects in steel; Market forms of steel; Properties of mild steel; Properties of hard steel; Corrosion of ferrous metals.

UNIT – III

PAINTS, VARNISHES AND DISTEMPERS:

General; Painting; Varnishing; Distemping; Wall paper; White washing; Colour washing.

ACOUSTICS OF BUILDINGS:

Important Technical terms; Requirements of sound effects; Factors to be considered in Acoustics of building; Sound absorbing materials; Sound insulation.

BUILDING CONSTRUCTION

UNIT – IV

FOUNDATIONS:

Concept of foundations; Factors affecting selection of foundations; Types of foundations; Strip, Isolated, Strap, Combined Footings, Grillage foundations, Piles and their classification; Foundation on black cotton soils.

STONE, BRICK & BLOCK MASONRY:

Technical terms; Classification of stone masonry; Types of bonds in brickwork and their suitability, Plan, elevation and section of brick bonds up to two bricks thickness; Classification of walls, Block masonry – Hollow concrete blocks – FAL- G Blocks, Hollow clay Blocks.

UNIT – V

FLOORS & ROOFS:

Technical terms; Types of ground floors; Classification of roofs.

DAMP PROOFING, SCAFFOLDING, SHORING, UNDER PINNING & FORMWORK:

Causes of dampness; Methods of preventing dampness; Types of scaffolding; Types of shoring; Methods of underpinning; Types of formwork;

Learning resources

Text books:

1. Engineering Materials, (36th edition) by Rangwala, S.C., Anand Charotar Publishing House, 2009.
2. Building construction, (10th edition) by Punmia, B. C., Laxmi Publications, Bangalore, 2009.

Reference books:

1. Building construction and construction materials by Birdie, G.S. and Ahuja, T.D., Dhanpath Rai Publishing company, New Delhi, 1986.

e-learning resources:

<http://nptel.ac.in/courses.php>

<http://jntuk-coeerd.in/>