

VSS UNIVERSITY OF TECHNOLOGY, BURLA, ODISHA
CIVIL ENGINEERING DEPARTMENT
CURRICULUM
For
B.TECH – 3rd SEM

THEORY

BCE202-MECHANICS OF MATERIALS – I (3-1-0) CR-04

Module – I

1. Direct Stress: Load, Stress, Principle of St. Venant, Strain, Hooke's Law, Modulus of Elasticity, Composite bars in tension and compression, temperature stresses in composite rods, statically indeterminate problems
2. Shear Stress: Shear stress, Complementary shear stress, shear strain, modulus of rigidity

Module – II

3. Two dimensional stress and strain systems: Principal stresses, Maximum shear stresses, Analysis of stresses, Mohr's stress circle.
4. Principal strains and principal axes of strain measurement, calculation of principal stresses from principal strains, Analysis of strains, Mohr's strain circle.

Module – III

5. Simple bending of beams: Theory of pure bending of initially straight beams, Distribution of normal and shear stresses, Composite beams.
6. Torsion in solid and hollow circular shafts, Twisting moment, strength of solid and hollow circular shafts, strength of shafts in combined bending and twisting, closed coil helical spring.
7. Theories of Failure: Maximum normal stress theory, maximum normal strain theory, maximum shearing strain theory, maximum strain theory, maximum distortion energy theory, maximum octahedral shearing stress theory, comparison of failure theories for 2-D stress system, Mohr's theory of failure.

Module – IV

8. Thin cylinders and spheres: Stresses in thin cylinders and spherical shells under internal pressure, wire winding of thin cylinders.
9. Buckling of Columns: Short and long columns, eccentric loading of columns, core of the section. Euler's theory of initially straight columns with various end conditions. Columns with initial curvature.

Reference Books:

1. Strength of Materials by G.H. Ryder, Macmillan
2. Strength of Materials by S. P. Timoshenko and D. H. Young
3. Mechanics of Materials by E. Popov

BCE203-CIVIL ENGG. MATERIALS & CONSTRUCTION (3-1-0) CR-04

Module I

Bricks: Methods of bricks manufacture, testing of bricks
Cement, classification, chemical composition, hydration, tests for cement.
Concrete: Composition, Water- Cement ration, workability.

Module – II

Masonry arches: Terms used types of arches, stability, line of thrust, depth of arch at the crown.
Cavity walls: Purpose, method of construction

Stairs: Terms used, types of stairs, essential requirements, wooden stairs, concrete stairs, metal stairs.

Module – III

Fire resistive construction: Fire resistive construction, fire resistance of common building materials, protection for girders and columns, fire fighting appliances.

Plastering: Materials for plastering, methods of plastering, defects in plastering and remedy.
Damp prevention: causes, effects, different methods of prevention of dampness.

Module – IV

Types of Doors and Windows.

Painting and decoration: Oil painting and Varnishing, enamel painting, Washes and distemper, defects in painting.

Glazing: Varieties of glass, decorative glass, door and window glazing.

Repair of building: Annual and special repair of buildings, Maintenance of buildings, Types of cracks in Building, Types of building Joint.

Stone: Indian building stones, their properties and uses, methods of quarrying

Timber: Preservation and seasoning of timber

Foundation: Brief idea on various types of foundation.

REFERENCE BOOKS:

1. A Text book of Building Construction, A.P. Arora and S.P. Bindra, Dhanpat Rai & Sons.
2. A Text Book of Building Materials, C.J. Kulkarni

3. Building Materials, Varghese, PHI, Pvt. Ltd.
4. Building Construction, Varghese, PHI, Pvt. Ltd.

SESSIONAL

BCE291-BUILDING DRAWING (0-0-3) CR-02

1. Plan, elevation, side view of residential/office building
2. Drawing of 2 bedroom/3 bedroom houses (single and two storied), ground and first floor plans, elevation and section for load bearing and framed structures
3. Detailing of doors/windows
4. Drawing of several types of footing, brick work, floor staircase, masonry, arches and lintels.
5. Types of steel roof trusses
6. Project on establishment like Bank building/Post Office/Hostel/Library/Auditorium/Factory building etc.
7. Introduction to Auto-CAD: Use of Auto-CAD in building drawing.

BCE292-CONCRETE LAB. (0-0-3) CR-02

1. Fineness of Cement by Sieve analysis and by air permeability method.
2. Standard consistency & Setting times of cement
3. Specific gravity & Soundness of cement
4. Compressive strength of cement
5. Shape size test, Water absorption & Compressive strength of Brick
6. Grain size distribution, Specific gravity and water absorption of fine and coarse aggregates.
7. Unit mass and Voids of concrete aggregates and Bulking of fine aggregates
8. Slump test & Compaction factor test of wet concrete.
9. Stress-strain curve, modulus of elasticity, and poisson's ratio of concrete.
10. Modulus of Rupture of concrete
11. Flexural strength and split tensile strength tests of concrete.

BME293-MATERIAL TESTING LAB. (0-0-3) CR-02