

B-TECH CIVIL ENGINEERING
III SEMESTER

Code	Subjects
	Theory
CE301	Mathematics-III
CE302	Building Materials
CE303	Building Construction
CE304	Mechanics of Solids-I
CE305	Mechanics of Fluids
CE306	Surveying-I
	Practical
CE307	Survey Lab-I
CE308	Material Testing Lab-I
CE309	Building Planning and Drawing

CE301- MATHEMATICS -III

Unit - I

Laplace Transform: Definitions - Laplace transform of unit impulse and step functions - Laplace transform of periodic functions - Exponential shift formula- Initial and final value theorems – Laplace transform of derivatives and integrals - Convolution theorem - Inverse Laplace transform - Methods of determining inverse Laplace transform -Solution of linear differential equations using Laplace transforms.

Unit – II

Function Of A Complex Variable: Functions of a complex variable - continuity, derivative and analytic function - Cauchy - Riemann equations – Necessary and sufficient conditions for analyticity - Harmonic and orthogonal properties of real and imaginary parts - Conformal mapping - Bilinear transformations.

Unit – III

Complex Integration: Cauchy's theorem -Cauchy's integral formula - Taylor's and Laurent series – Residue theorem - Contour integration round the unit circle and semi-circular contour.

Unit – IV

Fourier Series: Dirichlet's conditions - Expansion of periodic functions into Fourier series- Change of interval- Half-range Fourier series. Complex form of Fourier series - Root mean square value - Parseval's theorem on Fourier coefficients - Harmonic analysis.

Unit – V

Fourier Transform: Fourier Integral (statement only) - Fourier transform, Inverse Fourier transform, Fourier sine and cosine transforms, definitions and properties.

Text Books

1. Venkataraman M.K., Engineering Mathematics, Vol. II The National Publishing Company, Madras (2009) (For Units I, II and III)
2. Venkataraman M.K., Engineering Mathematics, Vol. III The National Publishing Company, Madras (2009) (For Units IV and V)

Reference Books

1. Bali N.P. & Manish Goel, A Text Book of Engineering Mathematics, Laxmi Publications, New Delhi 2008.
2. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley Eastern Ltd. (2005).

3. Grewal B.S, Higher Engineering Mathematics, Khanna Publishers, Delhi (2008).

CE302 BUILDING MATERIALS

Unit-I

Bricks – classification and testing of bricks-Fire bricks-Building blocks- solid, hollow and paving blockstypes and applications. Lime –types and applications. Pozzolanic materials – fly ash, rice husk ash and GGBFS – Industrial wastes for concrete making.

Unit-II

Tiles – ceramic, terrazzo and clay tiles – types and uses. Materials of finish for residential, commercial and industrial floors. Materials of wall finish – interior and exterior. Wall paneling materials. Materials for architectural finishes.

Unit-III

Materials for building services-Timber-Market forms-Industrial Timber-Plywood Veneer-Thermo Cole- Panels of laminates-Steel-composition-Uses-Market forms-Mechanical Treatment- Aluminium and plastics - Paints-Varnishes-Distemper

Unit IV

Pavement Grade bitumen – Asphalt - cut back bitumen - Bituminous Emulsion - Mastic Bitumen - Bituminous felt – Joint filler compound – Joint sealant compound – Anti-stripping compound – Polymer modified bitumen – Latex modified bitumen – crumb rubber modified bitumen

Unit-V

Glass-Ceramics-Sealants for joints-Sheets for pitched roof coverings-Fibre glass reinforced plastic-Clay products-Refractories –Composite materials-Types- application of laminar composites-Fibre textiles- Mats and pads for earth reinforcement- Polymers and resins for building repair.

Text Books

1. Surendra Singh, Building Materials, Vikas Publishing Company, New Delhi, 2002.
2. Rajput,R.K., Engineering Materials, S.Chand & Co. Ltd., New Delhi, 2000.

Reference Books

1. Khanna, S.K., Justo, C.E.G, Highway Engineering, Nem Chand & Bros, Roorkee, 2007.
2. Kadiyali, L. R, Highway Engineering, Khanna Publishers, New Delhi, 2007

CE 303 BUILDING CONSTRUCTION

Unit-I

Introduction-basic functions of building- building component and their basic requirements

Foundation-need for foundation-Concept of bearing capacity-types of foundation-recommended foundation for different soils.

Unit –II

Masonry construction- Stone masonry –types. Brick masonry-bonds-types. hollow block masonry-reinforced masonry-composite masonry. Walls-types and their uses. Floors and roofs-different types of floors and their suitability. floor finishes- Roofs-different types of flat, pitched and curved roofs- roof coverings.

Unit-III

Vertical transportation-stair cases-types- layout design. Lifts-ramps – escalators. Doors and windows-location and size specifications-types-fixtures and fastenings for doors and windows-ventilators.

Unit –IV

Building finishes-plastering-methods and types- special external finishes for plastered surfaces-defects in plastering- pointing- white washing-colour washing – painting, varnishing and distempering. Proofing for dampness and fire-anti termite protection.

Unit –V

Temporary structures- form work-scaffolding- shoring-underpinning. Acoustics of buildings – sound absorbent material and sound insulation Ventilation, air conditioning and thermal insulation-functional requirement of ventilation system-system of ventilation and their choice. Air conditioning-purposes and classification- systems of air conditioning. Thermal insulation-principles-heat insulating materials and methods of heat insulation

Text Books

1. Arora . S.P. Bindra S.P . A Text of Building Construction, Dhanpat rai & Sons, New Delhi, 2002.
2. Punmia, B.C, Building Construction, Lakshmi Publications Pvt. Ltd., New Delhi, 2002.

CE 304 MECHANICS OF SOLIDS-I

Unit – I

Simple Stresses and Strains – Tension, compression and shear stresses - Hooke's law - compound stresses - thermal stresses – Compound bars. Analysis of trusses by methods of joints and sections.

Unit – II

Shear force and bending moment diagrams for beams and simple frames - Theory of simple bending – Bending stress distribution at sections.

Unit – III

Theory of simple Torsion – Torsional rigidity – Composite shafts in series and parallel. Thin cylinders and shells – Thick cylinders.

Unit – IV

Shear stress distribution due to bending – Shear center. Springs – Closed and open coiled springs – Leaf springs. Complex stresses – Principal planes and stresses-Mohr's circle.

Unit – V

Columns – Euler's theory – Rankine – Jordon formula – Columns with initial curvature and eccentric loads –Long columns- Laterally loaded columns. Masonry dams and retaining walls – Middle Third rule – Stability Check.

Text books

1. Bhavikatti. S. S., Strength of Materials, Vikas Publishing House (P) Ltd., New Delhi, Second Edition, 2002.
2. Punmia. B. C., Jain, A. K., and Jain, A. K., Strength of Materials and Theory of Structures, Vols. I & II, XI Edition, Laxmi Publications (P) Ltd, New Delhi, 2002.
3. Hearn, E. J., Strength of Materials, Pergamon Press, Oxford, 1997.

CE 305 MECHANICS OF FLUIDS

Unit - I

Fluid Properties: Density, specific weight, specific volume, specific gravity, compressibility, viscosity, surface tension, capillarity, vapour pressure. Fluid Statics: Pressure in a fluid, pressure head, Measurement of pressure, Hydrostatic forces on submerged plane and curved surfaces, Buoyancy, Metacentre, stability of floating and submerged bodies.

Unit-II

Fluid Kinematics: Stream line, streak line, Path line and stream tube. Types of flow, steady, unsteady, uniform, non-uniform, laminar, turbulent, rotational and irrotational flows. Equation of continuity for one, two, three dimensional flows, Stream function and velocity potential function, flow net analysis,. Dynamics of Flow: Euler's equation of motion, Bernoulli's equation, simple applications of Bernoulli's equation, Momentum equation. Kinetic energy and Momentum correction factors.

Unit - III

Boundary Layer Theory:: Boundary Layer thickness, Displacement thickness, Momentum thickness, Energy thickness, Boundary layer growth and separation. Laminar flow: Laminar flow through pipes, Hagen - poissuille flow, energy loss. Turbulent flow: Turbulent flow through pipes, Darcy's equation, Minor losses, Energy and hydraulic gradients, pipes in series and parallel.

Unit- IV

Flow measurement: Pitot tube, Venturimeter, orificemeter, Flow nozzle, and mouthpieces, flow over notches and weirs, Venturiflume and Standing wave flume, Velocity measurement in open channel.

Unit - V

Dimensional Analysis and Similitude: Dimensional analysis - Rayleigh's method, Buckingham's π theorem, Dimensionless numbers, Laws of similitude, Model Analysis, Distorted models, Principles of analogy.

Text Books

1. Modi, P.N., and Seth, S.M., Hydraulics, Fluid Mechanics and Hydraulic Machines, Standard Book Home, New Delhi, 2005.
2. Rajput,R.K., Text Book of Fluid Mechanics and Hydraulic Machinery, S.Chand & Company, Ltd., New Delhi, 2005.

Reference Books

1. Douglas, J.F., Gasiorek, J.M and Swaffield, J.A., Fluid Mechanics 4th Edn. Pearson Education India, 2002.
2. Das M.M Fluid Mechanics and Turbimachines , Prentice Hall of India (P) Ltd New Delhi, 2008.
3. Arore, K.R Fluid Mechanics, Hydraulic and Hydraulic Machines , Standard Publishers

and Distributors , New Delhi , 2005

CE 306 SURVEYING-I

Unit –I

Introduction

Definition –classification- principles – Accuracy and errors – Linear measurements –methods – ranging out survey lines -chaining –Error due to incorrect chain – chaining on uneven or sloping ground – Error in chaining – Tape correction Chain surveying – arrangements of survey lines – locating ground features – Field book – field work – Basic problems in chaining - Obstacles in chaining

Unit –II

Compass surveying – Basic terms and definitions –Bearing and angles- compass –types – Magnetic declination –Dip-Traversing - Local attraction plane table surveying-Plane table instruments and accessories- merits and demerits- methodsintersection - traversing – resection – Three point problem – Two point problem – Errors in plane tabling – Advantages and Disadvantages of Plane Tabling

Unit –III

Leveling and applications

Basic terms and definitions – Methods of leveling – levels and staves- temporary and permanent adjustments –Direct levelling – Differential leveling - booking and reducing Levels – Balancing of sightscurvature and refraction- reciprocal leveling- longitudinal and cross sections- traversing – Levelling problems – errors in Levelling Contouring – methods – characteristic and use of contours – plotting

Unit –IV

Traversing – Basic terms and definitions-Chain and compass traversing –checks in closed traverse – plotting a traverse –coordinate systems – closing errors – balancing a traverse – degree of accuracy in traversing omitted measurements- cases

Unit- V

Areas and Volumes-Areas enclosed by straight lines – Irregular figures – volume – earthwork calculations – capacity of reservoirs – mass – haul diagrams. Setting out works-introduction – Controls for setting Out – Horizontal Control – Vertical Control – Setting Out in Vertical Direction – Positioning of Structure – Setting Out Foundation Trenches of Building

Text Books

1. Punmia . B.C . , et . al.” Surveying “ , Vols, I,II and III, Laxmi Publications, 2002
2. Kanetkar, T.P. ,Surveying and leveling, Vols. I & II, United book corporation, Pune.

CE 307 SURVEY LAB-I

1. Measurement with chain and tape, ranging, offsets (perpendicular and oblique)
2. Offset survey over an ear-marked boundary.
3. Closed traverse by chain and plotting
4. Study of prismatic compass and setting out a regular polygon
5. Closed traverse by chain and compass, plotting and adjustment (graphical and analytical.
6. Plane table survey by radial resection and traverse method.
7. Two point problem
8. Three points problem (Bessels method)
9. Three point problem (Trial and error method and mechanical method)
10. Study of levelling instruments and observation of staff reading
11. Differential levelling
12. Fly levelling
13. Reciprocal levelling
14. Check levelling
15. Contour survey and plotting
16. L.S. and C.S. and plotting

CE 308 MATERIAL TESTING LAB-I

I Tests on Metals (Ferrous and Non - Ferrous) Tension Tests : To find yield stress, ultimate stress , percentage elongation and reduction of area of crosssection , Young’s modulus and Barba’s constants. Double Shear test, 180° bend test Hardness Test : Vickers ,Brinell and Rockwell Torsion Test : Wires and Rods Impact Test : Charpy and Izod Ductility Test : Erichsen cupping test Fatigue Test (demonstration)

II Test on Timber : Compression, tension , shear , bending and hardness

III Test on Plastics .

IV Test on Springs.

CE 309 BUILDING PLANNING AND DRAWING

I Planning Aspects

Principles of building planning - specifications and dimensions - building bye laws – orientation – planning of different buildings.

II Computer Aided Drafting

Basic 2D objects – Draw Tool bar – Modify standard Toolbar – Dimensioning Toolbar – Preparation of plan, elevation and Section Drawings of Simple Structural Objects -Introduction to 3D –Wire frame Modeling Solid Modeling, Solid editing – Rendering - Script files – Printing and plotting Drawings. Planning and drafting with AutoCAD and other Auto CAD layered software.

III Preparation of working drawings

Preparation of line sketches – development of line sketches - preparation of working drawing for the following types of buildings – Residential buildings, framed structures, schools, hospitals, hostels, commercial buildings, banks and factory buildings. Working drawing of doors, windows, ventilators and stair cases.

Text Books

1. George Omura, Mastering AutoCAD 2002 BPB Publishers, New Delhi, 2002
2. Rom Mansfield, The compact Guide to Microsoft Office, BPB Publishers,1994
3. Deodhar.S.V., “Building sciences and Planning”, Khanna Publishers, New Delhi , 2005