



**4-Year Bachelor of Technology (B.Tech.) Curriculum and
Syllabus for Civil Engineering (CE)
Third Semester**

A. THEORY

Sl No.	Code Number	Subject	Contact Hours				Credit Point
			L	T	P	Total	
1	TIU-UEN-T201	Career Advancement & Skill Development	3	0	0	3	3
2	TIU-UMA-T205	Transform Calculus	3	0	0	3	3
3	TIU-UCE-T201	Surveying – I	3	0	0	3	3
4	TIU-UCE-T203	Strength of Materials	4	0	0	4	4
5	TIU-UCE-T205	Fluid Mechanics – I	4	0	0	4	4
6	TIU-UCE-T207	Engineering Geology	3	0	0	3	3
Total Theory			20				20

B. PRACTICAL

7	TIU-UCE-L201	Strength of Materials Lab	0	0	3	3	2
8	TIU-UCE-L203	Engineering Geology Lab	0	0	3	3	2
Total Practical			6				4

C. SESSIONAL

9	TIU-UCE-S201	Building Planning and Drawing	0	0	3	3	2
10	TIU-UCE-S203	CAD Lab	0	0	3	3	2
11	TIU-UES-S299	Entrepreneurship Skill Development	0	0	0	0	2
Total Sessional			6				6

Total of Semester

32 30



Third Semester

TRANSFORM CALCULUS

TIU-UMA-T205

L-T-P: 3-0-0

Credits: 3

Laplace Transform: Definition of Laplace Transform, linearity property, conditions for existence of Laplace Transform. First and second shifting properties, Laplace Transform of derivatives and integrals, unit step functions, Dirac delta-function, error function. Differentiation and integration of transforms, convolution theorem, inversion, periodic functions. Evaluation of integrals by Laplace Transform. Solution of initial and boundary value problems.

Fourier Series: Periodic functions, Fourier series representation of a function, half range series, sine and cosine series, Fourier integral formula, Parseval's identity.

Fourier Transform: Fourier Transform, Fourier sine and cosine transforms. Linearity, scaling, frequency shifting and time shifting properties. Self-reciprocity of Fourier Transform, convolution theorem. Applications to boundary value problems.

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External Expert	External Expert	HOD	Dean	Vice Chancellor
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SURVEYING – I

TIU-UCE-T201

L-T-P: 3-0-0

Credits: 3

Introduction: Definition, classification of surveying, objectives, principles of surveying.

Chain surveying: Chain and its types, Optical square, Cross staff, Reconnaissance and site Location, Locating ground features by offsets – Field book. Chaining for obtaining the outline of structures, Methods for overcoming obstacles, Conventional symbols, Plotting chain survey and Computation of areas, Errors in chain surveying and their elimination: Problems.

Compass Surveying: Details of prismatic compass, Use and adjustments, Bearings, Local attraction and its adjustments. Chain and compass surveying of an area, Booking and plotting, Adjustments of traverse, Errors in compass surveying and precautions: Problems.

Plane Table Surveying: Equipment, Orientation, Methods of Plane Tabling, Three Point Problems. **Leveling:** Introduction, Basic definitions, Detail of dumpy Level, Temporary adjustment of Levels, Sensitiveness of bubble tube; Methods of leveling – Differential, Profile & fly Leveling, Effect of curvature and refraction, Automatic levels, Plotting longitudinal sections and Cross sections; Measurement of area and volume.

Contouring: Topographic Map, Characteristics of Contour, Contour Interval. Methods of Locating Contours, Interpolation of Contours

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STRENGTH OF MATERIAL

TIU-UCE-T203

L-T-P: 4-0-0

Credits: 4

Condition of Equilibrium, Degree of Freedom, Relation between different Elastic moduli, Composite section, thermal stress, Principle stress, principle plane, and Mohr's circle, Hoop and Meridional Stress in the cylinder, conical and spherical cell.

Shear force and bending moment diagrams, statically determinate beam subjected to concentrated, uniformly distributed, and linearly varying load, relationship between load shear force and bending moment, bending of beam, elastic flexure formula, Bending and shear stress, unsymmetrical bending, shear centre and shear flow.

Slope and deflection of determinant beam using double integration method, Area moment theorem, Torsion and circular solid and hollow shafts.

Strain Energy and complementary strain energy, strain energy due to axial loading, bending and shear, columns: Fundamentals, criteria for stability for equilibrium, Column buckling theory, Eulers load for column with different end condition –limitation and problems, eccentric load and secant formula.

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FLUID MECHANICS-I

TIU-UCE-T205

L-T-P: 4-0-0

Credits: 4

Introduction to fluids and fluid mechanics: Definition of fluids, Classification of fluids, Viscosity Surface Tension.

Fluid Pressure and its measurement: Pressure at a point, Pascal's Law, Pressure variation with depth, Concepts of Absolute, Gauge, Atmospheric and Vacuum pressure, Barometer, Manometers and its different types.

Hydrostatic Forces on surfaces: Horizontal Plane Surface, Vertical Plane Surface, Centre of Pressure, Vertical Plane Surface of arbitrary shape submerged in a liquid, Inclined Plane Surface submerged in a liquid, Curved surface submerged in liquid.

Buoyancy and Floatation: Buoyant force and Centre of buoyancy, Archimedes' Principle, Metacentre and Metacentric height, Determination of metacentric height, Conditions of equilibrium for a floating and a submerged body.

Kinematics of fluid flow: Classification of flows, Lagrangian and Eulerian approaches for flow description, Conservation of mass for fluid flow, Stream function, Velocity potential.

Dynamics of inviscid fluid flow Conservation of momentum: Equation of motion along a streamline,

Euler's Equation, Conservation of energy: Bernoulli's Equation, Application of Bernoulli's Equation.

Practical Application of Bernoulli's theorem: Venturimeter, Orificemeter, Pitot tube, Free liquid jet,

Impulse-momentum principle: forces exerted by a flowing fluid on a pipe bend.

Orifices & Mouthpieces: Definition & Classification of orifices, Hydraulic Coefficients, Discharge through fully and partially submerged orifice, Time required for emptying a tank through an orifice at the bottom, Definition and Classification of Mouthpieces, Discharge through an external Mouthpiece, Discharge through an Internal or Re-entrant or Broda's Mouthpiece.



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ENGINEERING GEOLOGY

TIU-UCE-T207

L-T-P: 3-0-0

Credits: 3

Geology and its importance in Civil Engineering.

Mineralogy: Definition, internal and external structure of minerals, study of crystals, Classification and physical properties of minerals.

Classification of rocks: Igneous rocks: Origin, mode of occurrence, forms & texture, classification and

engineering importance. Sedimentary rocks: Process of sedimentation, classification and engineering importance. Metamorphic rocks: Agents and types of metamorphism, classification and engineering importance.

Weathering of rocks: Agents and kinds of weathering, soil formation & classification based on origin.

Geological work of rivers: Origin and stages in the system, erosion, transportation and deposition. **Structural geology:** Introduction to structural elements of rocks, dip & strike, definition, description, classification of folds, faults and joints, importance of geological structures in Civil Engineering. **Earthquakes and seismic hazards:** Causes and effects, seismic waves and seismographs, Mercalli's intensity scale and Richter's scale of magnitude.

Engineering properties of rocks: Porosity, permeability, compressive strength, tensile strength and abrasive resistance.

Rocks as construction materials: Qualities required for building and ornamental stones, foundations, concrete aggregate, railway ballast, road metal, pavement, flooring and roofing.



Geophysical exploration: Methods of Geophysical Exploration, electrical resistivity method field procedure – sounding and profiling, electrode configuration, and interpretation of resistivity data. Geophysical surveys in ground water and other Civil Engg. Projects.

Applied Geology: Surface and subsurface geological and geophysical investigations in major Civil Engg. Projects. Geological studies of Dams and reservoir sites, Geological studies for selection of tunnels and underground excavations.

Landslides: Types of landslides, causes, effects and prevention of landslides.

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STRENGTH OF MATERIALS LAB

TIU-UCE-L201

L-T-P: 0-0-3

Credits: 2

1. Tension test
2. Bending test on (Steel / Wood) Cantilever beam.
3. Bending test on simple support beam.
4. Torsion test
5. Hardness test
6. Spring test
7. Compression test on wood or concrete
8. Impact test
9. Shear test
10. Verification of Maxwell's Reciprocal theorem on beams.
11. Use of electrical resistance strain gauges
12. Continuous beam – deflection test.



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ENGINEERING GEOLOGY LAB

TIU-UCE-L203

L-T-P: 0-0-3

Credits: 2

1. Study of crystals with the help of crystal models
2. Identification of Rocks and Minerals [Hand Specimens]
3. Microscopic study of Rocks and minerals
4. Study of Geological maps, interpretation of geological structures Thickness problems, Bore-hole Problems

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BUILDING PLANNING AND DRAWING

TIU-UCE-S201

L-T-P: 0-0-3

Credits: 2

Classification of buildings - Principles of planning - Dimensions of buildings - Building bye-laws for floor area ratio, open spaces - Orientation of buildings - Lighting and Ventilation- Planning and preparing sketches and working drawings of Residential buildings (Flat and sloping roof), Schools, Hostels, Hospitals, buildings. Detailed working drawings of the component parts - Doors and Windows - Roof Trusses - Staircases-Toilets

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CAD LAB

TIU-UCE-S203

L-T-P: 0-0-3

Credits: 2

Fundamentals of Engineering Drawings: Construction of plane and complex geometrical figures; Construction of Curves and Helix; Principles of Projections; Projections of Straight Lines and Solids; Section of Solids; Mechanical Parts Drawing.

Drawing using AutoCAD: Starting a New Drawing/Opening an existing drawing; Drawing Commands; Hatching Command; Text (multi-line & single line) and Formatting; Text Styles; View Commands & Drawing Settings and Aids; Modify Commands; Dimension Command; Formatting Dimension Style and Multi-layer Style; Drawing Settings and Aids; Saving and Plotting.

Isometric Drawing

Individual Project / Team Project

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