



**3-Year Diploma Engineering Curriculum and  
Syllabus for Civil Engineering (CE)**

**SIXTH SEMESTER**

**A. THEORY**

Sl No.	Code Number	Subject	Contact Hours				Credit Point
			L	T	P	Total	
1	TIU-DCE-T312	Design of Steel Structures	3	1	0	4	4
2	TIU-DCE-T314	Environmental Engineering	3	1	0	4	4
3	TIU-DCE-T316	Construction, Planning and Management	3	0	0	3	3
4	TIU-DCE-T318	Transportation Engineering-II	3	0	0	3	3
5	TIU-DCE-E30X*	Elective	3	0	0	3	3
Total Theory			17				17

**B. PRACTICAL**

5	TIU-DCE-L312	Geotechnical Engineering Lab	0	0	3	3	2
Total Practical			3				2

**C. SESSIONAL**

6	TIU-DCE-P398	Project	0	0	3	3	3
7	TIU-DCE-S398	Seminar	0	0	2	2	2
8	TIU-DCE-G398	Grand Viva-Voce	0	0	0	0	2
9	TIU-DES-S398	Entrepreneurship Skill Development	0	0	0	0	2
Total Sessional			5				9

Total of Semester

25 28

*\* X to be replaced by 2/4/6/8 or any other number depending upon the subject offered  
(Vide the List of Elective subjects for Elective Subjects)*

**List of Elective Subjects:**

TIU-DCE-E302	Advanced Concrete Technology	TIU-DCE-E306	Advanced Construction Techniques and Equipment
TIU-DCE-E304	Hydraulic Structures	TIU-DCE-E308	Architectural Practice and Interior Design



## **DESIGN OF STEEL STRUCTURES**

TIU-DCE-T312

L-T-P: 3-1-0

Credits: 4

### **UNIT 1: INTRODUCTION**

Advantages and disadvantages of steel as construction material: Use of steel table (SP6- Part1); Types of loads on steel structure and its I. S. code specification. Geometrical properties of gross and effective cross sections– Classification of Cross Sections as per IS:800-2007.

### **UNIT 2: PLASTIC ANALYSIS**

Methods– Elastic, Plastic and Advanced method of analysis based on IS: 800-2007– Idealized Stress vs. Strain curve– Requirements and Assumptions of Plastic method of analysis–Shape Factors– Collapse load.

### **UNIT 3: LIMIT STATE METHOD (L.S.M)**

Design of Tension Members by L.S.M, Design of Compression Members by L.S.M.  
Design of Flexural Members by L.S.M: Effective span of Beams, Design strength of bending,(Flexure), Limiting deflection of beams–Design of laterally supported Simple beams using single / double rolled steel sections.

### **UNIT 4: DESIGN OF CONNECTIONS AND DETAILING**

Types of connections– Bolted, Riveted and Welded connections– Rigid and Flexible connections.  
Bolted Connection– Types of bolts– Bearing type Bolts– Nominal and Design shear strengths of bolts - Nominal and Design bearing strengths of bolts– Reduction factors for over sized and slotted holes– Nominal and Design tensile strengths (tension capacity) of bolts.- Welded Connection- Types of welds– Fillet welds– Minimum and maximum sizes– Effective length of weld- Fillet welds on inclined faces–Design strengths of shop/site welds– Butt welds– Effective throat thickness and effective length of butt weld

### **UNIT 5: STEEL ROOF TRUSS**

Types of steel roof truss & its selection criteria: Calculation of panel point load for Dead load; Live load and wind load as per I.S. 875-1987 -Analysis and Design of steel roof truss.  
Design of Angle purlin as per I. S. Code  
Arrangement of members at supports.



**ENVIRONMENTAL ENGINEERING**

**TIU-DCE-T314**

**L-T-P: 3-1-0**

**Credits: 4**

**UNIT 1: ENVIRONMENTAL POLLUTION AND CONTROL**

Introduction- Environment, Ecosystem, Environmental Pollution and its Types and sources, Causes of Pollution, Effects of Pollution - control of water pollution - soil pollution - sources of soil pollution - effects of soil pollution - control of soil pollution - noise pollution - sources of noise pollution - effects of noise pollution - control of noise pollution - air pollution - sources of air pollution - effects of air pollution on human beings, plants, animals, materials - air pollution control equipment - control devices for particulate contaminants  
Environmental degradation - ozone layer depletion – greenhouse effect - acid rain.  
Existing laws related to Environmental Pollution.

**UNIT 2: PUBLIC WATER SUPPLY**

*Quantity of Water-* Demands of water - Domestic, Industrial, Commercial & Institutional, Public use, Losses and wastes, Fire demand; Factors affecting rate of Demand, Variations of water demands, Forecasting of population, Methods of forecasting of population, Design period for water supply scheme. Estimation of quantity of water supply required for a town or city.

*Sources of Water-* Surface and Subsurface sources of water, Water conservation, Ground water recharging – Necessity Importance and advantages.

*Quality of Water-* Need for analysis of water, Characteristics of water- Physical, Chemical and Biological. Meaning and importance of parameters – Total solids, hardness, chlorides, dissolved Oxygen, pH, Fluoride, Nitrogen and its compounds, Bacteriological tests, E coli index, MPN. Water quality standards as per B.I.S. code.

*Purification of Water-* Screening- Types of screens, Aeration- objects and methods of aeration, Plain sedimentation, Sedimentation with coagulation, principles of coagulation, types of coagulants, Jar Test, process of coagulation, types of sedimentation tanks, Filtration-theory of filtration, classification of filters: slow sand filter, rapid sand filter, pressure filter, domestic filter, filter media, construction and working of slow sand filter and rapid sand filter, Disinfection: Objective, methods of disinfection, Chlorination-Application of chlorine, forms of chlorination, types of chlorination practices, residual chlorine and its importance, Flow diagram of water treatment plants, Water softening, fluoridation techniques, Low cost water Treatments: Necessity and importance in rural areas, Prevention of pollution of bores and bore wells.

*Methods of distribution of water-* Gravity, pumping and combined system Service reservoirs – functions and types, Layouts of distribution of water- Dead end system, grid iron system, circular system, radial system - their suitability, advantages and disadvantages



### **UNIT 3: DOMESTIC SEWAGE**

*Introduction-* Importance and necessity of sanitation, Necessity to treat domestic sewage, Recycling and Reuse of domestic waste. Definitions- Sewage, sullage, types of sewage  
*Building Sanitation and Plumbing-* Definitions of the terms related to Building Sanitation-Water pipe, Rain water pipe, Soil pipe, Sullage pipe, Ventpipe, Building Sanitary fittings- Water closet – Indian and European type, flushing cistern, wash basin, sinks, Urinals, Traps- types, qualities of good trap, Systems of plumbing –one pipe, two pipe, single stack, choice of system Principles regarding design of building drainage, layout plan for building sanitary fittings (drainage plan), inspection and junction chambers, their necessity, location, size and shape. Maintenance of sanitary units.

*Systems of Sewerage-* Types of Sewers, Systems of Sewerage, Design of sewers, self cleansing velocity and non scouring velocity, Laying, Testing and maintenance of sewers.

*Sewer Appurtenances-* Manholes and Drop Manhole-component location, spacing, construction details, Sewer Inlets, Street Inlets, Flushing Tanks – manual and automatic parts,

*Analysis of Sewage-* Characteristics of sewage – major parameters.

*Treatment of Sewage-* Objects of sewage treatment, General layout and flow diagram, Screening, Grit removal, Skimming, Sedimentation of sewage, Sludge digestion, Trickling filters, Activated sludge process, Disposal of sewage.

*Miscellaneous treatments -* Septic tank (including design as per IS code), Oxidation pond, Oxidation ditch

### **UNIT 4: INDUSTRIAL WASTE**

Industrial Waste Water Characteristics of Industrial waste water from sugar, Dairy, Distillery, Textile, Paper and Pulp and Oil industry; and their suggestive treatments (only brief idea)

### **UNIT 5: SOLID WASTES FROM THE SOCIETY**

*Solid Waste Management Definitions* – Refuse, Rubbish, Garbage, Ashes, Constituents of solid wastes Sources of solid wastes, Collection of Solid Wastes. Methods of collection of solid wastes Methods of treatment and disposal of solid waste.

*Hazardous Wastes-* Introduction, Types of hazardous wastes. Characteristics of hazardous wastes. Treatment and disposal of hazardous wastes.

### **UNIT 6: ENVIRONMENTAL SANITATION**

*Rural Sanitation-* Necessity and importance, Rural sanitation- Types of Privies – Aqua privy and Bore Hole Latrine- construction and working, Composting (Nadep or Vermiculture)

*Emerging Trends ( only brief idea )* Sant Gadge Baba Swachhatha Abhiyan Low cost Latrines, Jalswarajya Scheme



## **CONSTRUCTION PLANNING & MANAGEMENT**

**TIU-DCE-T316**

**L-T-P: 3-0-0**

**Credits: 3**

### **UNIT1: INTRODUCTION**

Definition of Construction Management (CM) and its system; Benefits of CM; Roles, responsibilities and Risks of personnel involved in CM; Definition of Construction Industry and its trend; Various stages of a construction project

### **UNIT2: CONTRACT MANAGEMENT**

Definition of contract; Types of contract system; Components of contract documents; Floating of Tender; Steps involved in award of contract; Execution and Monitoring of contract documents.

### **UNIT3: CONSTRUCTION ORGANIZATION**

Organization Structure & types; Concept of hierarchy; Communication within the hierarchy; Payroll & Records.

### **UNIT4: RESOURCE MANAGEMENT**

Definition – Need for resource management – Optimum utilization of resources- finance, materials, machinery, human resources – Resource planning – Resource leveling and its objectives

### **UNIT5: INFRASTRUCTURE MANAGEMENT**

Explanation of site-layout; Approach road; Provision of water connection, Electricity connection, Establishing communication system, Drainage system; Provision for site-office, workshop, warehouse, security room

### **UNIT6: PLANNING AND SCHEDULING TECHNIQUES**

Bar charts and linked Bar charts, Network analysis and Critical Path Method (CPM), PERT (Program Evaluation and Review Technique), Advantages and disadvantages of CPM & PERT

### **UNIT7: COST MANAGEMENT CONTROL ESTIMATE.**

Direct cost, Indirect cost, Contingency, Cost-volume relationship

### **UNIT8: QUALITY MANAGEMENT AND SAFETY IMPORTANCE OF QUALITY**

Elements of quality – Quality assurance techniques (inspection, testing, sampling) Importance of safety – Causes of accidents – Role of various parties (designer / employer / worker) in safety management – Benefits – Approaches to improve safety in construction



**TRANSPORTATION ENGINEERING- II**

**TIU-DCE-T318**

**L-T-P: 3-0-0**

**Credits: 3**

**UNIT -1 OVERVIEW OF TRANSPORTATION ENGINEERING**

Role of transportation in the development of nation.

Modes of transportation system – roads, railway, airways, waterways, other mode of transport,

Importance of each mode, comparison and their relative merits and demerits.

Necessity & importance of Cross drainage works for roads & railways.

**UNIT -2 RAILWAY ENGINEERING.**

Railway as a mode of land transport, Classification of Indian Railways, zones of Indian Railway, classification of Indian railway lines, general features of Indian railway, organization of Indian railway; Alignment- Factors governing rail alignment; Rail Gauges – types, factors affecting selection of gauge, advantages of uniform gauge; Rail track cross sections – standard cross section of BG & M.G; Single & double line in cutting and embankment.

Permanent ways: Ideal requirement, component parts, conning of wheel, tilting of rail and adzing of sleepers

Rails: function & its types. Requirement of ideal rail section, standard rail section, weight, length and specification of rail section, important test for determining serviceability of rail section, wear in rail and methods to reduce wear; defects in rail, failure in rail

Rail Joints – requirements, types; welded rails – purpose, advantage and success of welding of rails, length of welded rails; Creep of rail – causes, measurement & prevention of creep.

Sleepers: functions & Requirement, types – wooden, metal, concrete sleepers & their suitability and relative merits and demerits, sleeper density. (Problem on sleeper density)

Ballast: function & requirements of good ballast, different types with their properties, relative merits & demerits., size and section of ballast, quantity and renewal of ballast, terminology – packing, boxing and ballast crib

Rail fixtures & fastenings: fish plate, bearing plates, spikes, bolts, keys, anchors & anti creepers.

Railway Track Geometrics: Gradient & its types, grade compensation on curves(problems) Super elevation – governing formula, limits of Super elevation on curves, cant deficiency, cant excess and negative cant (along their permissible value), realignment of curves by string line method.

Branching of Tracks: Definition of point & crossing, a simple split switch turnout consisting of points and crossing lines. Sketch showing different components, their functions & working.

Line sketches of track junctions- symmetrical split, three throw switch, crossovers, scissor cross over, diamond crossing, single and double slip, gathering lines or ladder track, triangle

Inspection of points and crossings

Station and Yards: Site selection for railway stations, Requirements of railway station, Types of stations (way side, crossing, junction & terminal), Station yards, types of station yard, Passenger yards, Goods yard, Locomotive yard – its requirements, water column, Marshalling yard – its



types; level crossing

Track laying: Preparation of subgrade; collection of materials; setting up a material depot and carrying out initial operations such as adzing of sleepers bending of rails, assembling of crossing.

Definition of base and rail head, transportation by material trolleys, rail carriers and material train;

Methods of track laying (parallel, telescopic and American method); organization of labour at rail head; ballasting the track

Track Maintenance: Necessity, types, routine maintenance of formation and side slopes, rails, fixtures and drainage, special maintenance of defective rails and sleepers; Tools required and their function, organization, duties of permanent way inspector, gang mate, key man

Track Drainage: need for proper track drainage, Sources of percolated water in track, requirements of a good track drainage system, practical tips of good surface drainage, track drainage system, subsurface drainage

Modern Method of track maintenance: Mechanized method of track maintenance, off-track tampers, on-track tampers, future of track machines in Indian railways, measured shovel packing, directed track maintenance, classification of track renewal, criteria of track renewal, through sleeper renewal, track relaying works, mechanized relaying, track renewal trains

### **UNIT – 3 BRIDGE ENGINEERING :**

Site selection and investigation, Factors affecting selection of site of a bridge. Bridge alignment, Collection of design data, Classification of bridges according to function, material, span, size, alignment, position of HFL.

Component parts of bridge. Plan & sectional elevation of bridge showing component parts of substructure & super structure. Different terminology such as effective span, clear span, economical span, waterway, afflux, scour, HFL, freeboard, etc.

Foundation – function, types (well foundation & caisson [open type only], their details of construction with sketches, laying of foundation on a. dry soil b. soil charged with water and c. under water, coffer dam – their types and construction, depth of foundation

Piers- definition, parts, function - requirements, types -solid (masonry and RCC), open cylindrical and abutment piers, terminology – height of piers, water way, afflux and clearance.

Abutment – function, types

Wing walls – functions and types.

Bearing – functions, types of bearing for RCC & steel bridges.

Approaches –in cutting and embankment.

Bridge flooring- open and solid floors

Permanent and Temporary Bridges-: Permanent Bridges - Sketches & description in brief of Culverts, causeways, masonry, arch, steel, movable steel bridges, RCC girder

Bridge, prestressed girder bridge, cantilever, suspension bridge.

*Temporary Bridges-* timber, flying, floating bridges

Inspection & Maintenance Of Bridge: Inspection of bridges, Maintenance of bridges & types routine & special maintenance.





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## **ADVANCED CONCRETE TECHNOLOGY**

**TIU-DCE-E302**

**L-T-P: 3-0-0**

**Credits: 3**

### **UNIT 1**

RMC concrete- manufacture, transporting, placing, precautions. Methods of concreting- Pumping, under water concreting, shotcrete, High volume fly ash concrete concept, properties, typical mix.

### **UNIT 2**

Fiber reinforced concrete - Fibers types and properties, Behavior of FRC in compression, tension including pre-cracking stage and post-cracking stages, behavior in flexure and shear.

Ferro cement - materials, techniques of manufacture, properties and application.

### **UNIT 3**

Light-weight concrete properties. Typical light weight concrete mix

High density concrete and high performance concrete-materials, properties and applications, typical mix.

### **UNIT 4**

Test on Hardened concrete-Effect of end condition of specimen, capping, H/D ratio, rate of loading, moisture condition. Compression, tension and flexure tests.

Tests on composition of hardened concrete-cement content, original w/c ratio. NDT tests concepts- Rebound hammer, pulse velocity methods.





## **HYDRAULIC STRUCTURES**

**TIU-DCE-E304**

**L-T-P: 3-0-0**

**Credits: 3**

### **UNIT 1: RESERVOIR PLANNING**

Introduction, types of reservoirs, Investigations of reservoir planning.

Selection of site for a reservoir, Zones of storage in a reservoir, Reservoir yield, Mass curve and demand curve.

### **UNIT 2: DAMS**

Definition, Classification of dams, Factors governing selection of type of dam

Selection of site for a dam.

### **UNIT 3: DESIGN AND CONSTRUCTION OF GRAVITY DAMS**

Introduction, Factor acting on a gravity dam,

Load analysis for design: Weight of the dam, water pressure, uplift pressure, wave pressure, silt pressure, earthquake force.

Stability Analysis: Assumptions, mode of failure, overturning failure, sliding failure, shear friction factor, tension failure, compression failure.

### **UNIT 4: EMBANKMENT DAMS**

Introduction, Types of earth dams, Foundation of earth dams.

Design of earth dams, Causes of failure of earth dams, Criteria for safe design of earth dams.

### **UNIT 5: SPILLWAYS**

Introduction, Essential requirements of a spillway, Spillway capacity, Components of spillway,

Types of spillway: Free overfall, overflow and Chute spillway.



## **ADVANCED CONSTRUCTION TECHNIQUES & EQUIPMENTS**

**TIU-DCE-T306**

**L-T-P: 3-0-0**

**Credits: 3**

### **UNIT 1: ADVANCED CONSTRUCTION MATERIALS**

Fibres And Plastics. Types of fibres – Steel, Carbon, Glass fibres. Use of fibres as construction materials. Properties of fibres. Types of Plastics – PVC, RPVC, HDPE, FRP, GRP etc. Coloured plastic sheets. Use of plastic as construction Material.

Artificial Timber Properties and uses of artificial timber. Types of artificial timber available in market, strength of artificial timber.

Miscellaneous materials Properties and uses of acoustics materials, wall claddings, plaster boards, Micro-silica, artificial sand, bonding agents, adhesives etc.

### **UNIT 2: ADVANCED CONCRETING METHODS**

Prestressed Concrete Grades of Concrete and prestressing cables for prestressed concrete. Methods of pre-tensioning and post tensioning. Equipments and accessories for prerstressing. Precautions during prestressing of members.

Under water Concreting Underwater concreting for bridge piers and bored pile construction.

Tremy method of underwater concreting. Procedure and equipments required for tremy method. Properties, workability and water cement ratio of the concrete required.

Ready Mix concrete Necessity and use of Ready Mix Concrete. Production and equipments for RMC. Ready Mix Concrete plant. Conveying of RMC. Transit mixers- working and time of transportation. Workability and water cement ratio for RMC Strength of RMC.

Tremi Concreting method Definition, application of vacuum dewatering concreting. Equipments used in tremi concreting. Procedure of vacuum dewatering concreting (Tremix).

Special Concretes Properties, uses and procedure of Roller compacted concrete. Properties and uses of High Impact Resisting concrete. Properties, uses and constituents of Steel fibre reinforced concrete. Percentage of steel fibers in SFRC. Effect of size, aspect ratio and percentage of steel fibers on strength of concrete.

Shortcrete and Guniting Introduction of shortcrete/guniting, techniques behind shortcreting, methods of shortcreting and its practical uses.

Introduction to the concept of green concrete and mass concrete

### **UNIT 3: FORMWORK**

Steel Formwork, H frames, Steel plates, Steel props, Telescopic props, Girders or trestles. Tubular formwork. Slip formwork- meaning, use of slip formwork. Process of concreting with slip forms.



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Construction of Multi-storeyed Buildings Use of lifts, belt conveyors, Pumped concrete, Equipments and machinery required for construction of Multi-storeyed Buildings. Precautions and safety measures.



Prefabricated Construction Meaning of prefabrication and precast. Methods of prefabrication- plant prefabrication and site prefabrication. Linear members, rigid frames, roofing and flooring members, R.C. Doors and windows, wall panels, Jointing of structural members.  
Soil Reinforcing techniques Necessity of soil reinforcing, Use of wire mesh and geo-synthetics. Strengthening of embankments, slope stabilization in cutting and embankments by soil reinforcing techniques.

#### **UNIT 4: HOISTING AND CONVEYING EQUIPMENTS**

Hoisting Equipments Principle and working of Tower cranes, Crawler cranes, Truck mounted cranes, gantry cranes, Mast cranes, Derricks.

Conveying Equipments Working of belt conveyors. Types of belts and conveying mechanism. Capacity and use of dumpers, tractors and trucks.

#### **UNIT 5: EARTH MOVING MACHINERY**

Excavation Equipments Use, Working and output of bulldozers, scrapers, graders, and power shovels, JCB, draglines.

Compacting Equipments Use of rollers, Roller types- Plain rollers, Sheep footed rollers, Vibratory rollers, and pneumatic rollers. Rammers- use and working.

#### **UNIT 6: CONCRETING EQUIPMENTS**

Concrete Mixers Types of concrete mixers. Weigh batching equipments, Equipments for transportation of concrete trollies, lifts. Transit mixers, Concrete vibrator- Needle vibrators, Screed vibrators. Automatic concrete plants – layout, process and working.

Stone Crushers Types of stone crushers, capacities and working. Equipments for production of artificial sand.

#### **UNIT 7: MISCELLANEOUSEQUIPMENTS AND EQUIPMENT MANAGEMENT**

Miscellaneous Equipments Pile driving equipment, Pile hammers selection of hammers. Working of hot mix bitumen plant, Bitumen paver. Grouting equipments, Floor polishing machine.

Equipment Management Standard equipment, Special equipment, Selection of equipment, Owning and operating cost of construction equipment. Economic life of construction equipment, Preventive maintenance of equipment, Break down maintenance of equipments.



**ARCHITECTURAL PRACTICE & INTERIOR DESIGN**

**TIU-DCE-T308**

**: 3-0-0**

**Credits: 3**

**UNIT 1: ARCHITECTURAL DESIGN**

Review of principles of Architecture. Site selection, climatic conditions, sun control, orientation, of building & site. Building by laws & its applications.

**UNIT 2: BUILDING AESTHETICS**

Feeling for aesthetics and utility, composition, unity, mass, composition, order, expression, proportion, scale, accentuation & rhythm, contrast, balance, pattern.Character of Building.

**UNIT 3: DESIGN OF PROJECTS**

1. A case study of Residential building.
2. A case study of public / commercial building.
3. Aspect of working drawing- plan,elevation

and section

**UNIT 4: LANDSCAPING**

Soft and Hard landscaping. Basic Principle of landscaping. Assessment of land.  
Design procedure. A case study of land scape for public/ commercial building campus.

**UNIT 5:ELEMENTS AND PRINCIPLES OF DESIGN**

Elements such as form, texture, light, colour, effect of light on colour and texture, space organization of space in design, space pattern. Importance of colour as art element. Various colour scheme.

**UNIT 6: ANTHROPOMETRICS DATA**

Relation of human measurement to furniture and movement and to circulation patterns.

**UNIT 7: INTERIOR MATERIALS**

Different interior materials, paneling, partitions, finishing, materials, furniture. False ceiling, flooring, paints.

**UNIT 8: INTERIOR OF RESIDENTIAL BUILDING:**

Use of space, circulation, standard size of furniture. Plans and elevation of interior with furniture for living space, dining space, kitchen, bed room, guest room etc.

**UNIT 5- INTERIOR OF SMALL COMMERCIAL BUILDING:**

Planning of interior for small commercial units such as offices, consulting chambers, shops etc. Furniture details such as executive table, architectures table etc. used in commercial units.



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**GEOTECHNICAL ENGINEERING LABORATORY**

**TIU-DCE-G398**

**: 0-0-3**

**Credits: 2**

**Practicals:**

1. Determination of grain size distribution of given soil sample by mechanical (sieve analysis) method as per IS Code.
2. Determination of water content of given soil sample by oven drying method as per IS Code.
3. Determination of Liquid limit & Plastic limit of given soil sample as per IS Code.
4. Determination of bulk unit weight dry unit weight of soil in field by core cutter method as per IS Code.
5. Determination of bulk unit weight dry unit weight of soil in field by sand replacement method as per IS Code.
6. Determination of MDD & OMC by standard proctor test on given soil sample as per IS Code.
7. Determination of shear strength of soil using direct shear test.
8. Determination of shear strength of soil using unconfined compressive strength.
9. Determination of shear strength of soil using Laboratory Vane shear test.



## **CIVIL ENGINEERING PROJECT**

**TIU-DCE-P398**

**: 0-0-3**

**Credits: 3**

### ASSIGNMENT- I:

Planning and design for residential apartment (G+2)

Note: *building shall comprise of two flat per floor each containing two rooms, bath, WC, kitchen, front verandah with a provision of common staircase and mummy for utilization of roof space and overhead water tank (around 210 sq m. covered area for each building unit) Ground floor to be used for parking spaces. Architecture planning, load calculation & design of all structural components, preparation of drawing sheet – a typical floor plan, roof plan with provision of drainage, sectional elevation including staircase, trench plan, front view, structural details – reinforcement of: floor slab (as a whole), critical beam, central column and corner column including footing, tie beam (tie beam layout plan and reinforcement detailing), stair with landing and estimate of different items of the building, calculation of FAR.*

### ASSIGNMENT 2:

Arrange 4 building units ( *AS DESIGNED IN ASSIGNMENT I*) in a 2200 sq. m of vacant land adjacent to the 12 m wide road including placing of essential service unit like deep tube-well, pump house, underground reservoir, four 1BHK security quarter, internal bituminous road over WBM, surface drain network and boundary wall with main gate

Skills to be developed:

- 1) Decide and collect data for projects.
- 2) Read and interpret the drawing, data.
- 3) Design the components.
- 4) Plan for different phases skills of a task.
- 5) Prepare drawings for project.
- 6) Use of computer for drawing, networking.
- 7) Work in a group for a given task.

The project report shall be in the following format:

**Topic and objectives-** Collection of data, required survey work, Management and construction procedure Resources scheduling and networking

**Design details-** Required drawing set Utility to society if any Conclusion