

Name of the Course: **Diploma in Civil Engineering** Subject: **Building Services and Entrepreneurship Development** Course code: **CE** Course Duration: 6 semester  
 Course offered in the Semester: **FIFTH**  
 Subject code: Question code: Marks: 100

Teaching Scheme	Examination Scheme
Theory –3 lecture per week	Class Test(CT) - 20
Tutorial – Nil	Assessment, Assignment, Quiz - 10
Practical - Nil	End Semester Exam(ESE) - 70
Credit - 3	Total Marks – 100

**Aim:-**

1. Testing of proficiency of students in the field of Civil engineering

**Objective:-**

Students will be able to:

1. Plan and design various building services required in residential and commercial buildings.
2. Apply various methods of providing these services & its maintenance.

**Pre-Requisite:-**

1. Students should be perfect in their selected subject / topic / theme.

Unit no	Topic	Contact period	Marks
<b>Part A: Building Services</b>			
1	<b>Plumbing</b>	<b>10</b>	
2	<b>Installation of Lifts</b>	<b>6</b>	
3	<b>Fire Protection</b>	<b>3</b>	
4	<b>Lighting and Ventilation</b>	<b>3</b>	
<b>Part B: Entrepreneurship Development</b>			
1	<b>Entrepreneurship, Creativity &amp; Opportunities</b>	<b>3</b>	
2	<b>Information and Support Systems</b>	<b>3</b>	
3	<b>Market Assessment</b>	<b>2</b>	
4	<b>Business Finance &amp; Accounts</b>	<b>3</b>	
5	<b>Business Plan &amp; Project Report</b>	<b>3</b>	
6	<b>Enterprise Management and Modern Trends</b>	<b>2</b>	

**Contents: Theory (A: Building Services:) 3Hrs/week**

**Unit -1Plumbing**

1.1 Elements of plumbing

Objectives of plumbing, purpose of plumbing, role of plumber, licensing of plumbers their functions, sewer Air, supply pipes, drainage & vent pipes application for obtaining supply connection.

1.2 Pipes joints & fittings

Introduction. Types of Pipe – G.I. Pipes, PVC Pipes, Copper pipes, C.I. Pipes, A.C. Pipes, prestressed concrete pipes, joints in pipes, method of fixing pipes such as G.I. fitting C.I. fitting.

1.3 Valves & Terminal Fittings

Types of valves & its purpose, sluice valve, reflux valve, scour valve, Air relief valve, pressure relief valve, gate valves, Bio-taps & stop valve self closing valve. Flush valve, mixing valve.

#### 1.4 Sanitary fixture & Building drainage system

Building sanitary fittings – water closet, flushing appliances, urinals, washbasins, flushing cisterns, principles of building drainage, siphonic action, traps & its types, capacity & sizing of pipe, soil pipe, waste pipe, rain water pipe, system of plumbing, Installation of pipes, testing of pipes.

### **Unit 2: Installation of Lifts**

2.1 Lift – Lift floor-Lift Landing-----Storey-----Nomenclature of Floors& Storeys-----Total Headroom---Lift Landing---Lift landing door---Lift car---Lift door---Call indicator---Lift suspension ropes---Lift guides---Lift well---Lift pit--- Lift well Enclosure--- Lift rated load—Lift rated Speed---- Lift contract Speed-----  
- Lift machine--- Lift Overhead Beam (Definitions only).

Classification of Lift

Passenger lift---Goods Lift---Hospital Lift---Service Lift (Dumb waiter)---Firemans Lift.

#### 2.2 Design Considerations

Number of Lifts & capacity: Occupated Load ,Quantity of service, Quality of Service, Car speed, Determination of handling capacity  $[(H=300*Q*100/T*P)$  where  $T=R_i/N]$ -Positioning of Lifts =Shape & Size of Lift car-Acess to Machine Room & Lift Pits—Safety Measures.

### **Unit 3 Fire Protection**

3.1 General Cassification of Buildings Based on Occupancy criteria of Fire Resistance –Compustible Material ---Occupancy or use Group—Types of construction.

#### 3.2 General Requirements of Fire Protection

Maximum Height---FAR---Open Spaces: additional Provisions for high rise buildings, Mixed Occupancy—Fire Wall, Fire Stop or enclosure of all openings—Automatic Fire Detection & Alarm system---Fixed fire fighting Installations/Requirements for A, B & Occupancy buildings :Wet Riser, Wet riser –cum—downcomer, Automatic Sprinkler installation, Static reservoir, Dry riser.

#### 3.3 Exit Requirements

Types of Fire Exits---General Exit Requirement---Occupant Load---Capacity of Exits---Arrangement of exits: travel distance---Doorways---Corridors & Passageways---Internal Staircases---Fire Escapes or external Stairs—Roof exit---horizontal exits---Fire tower---Ramps.

### **Unit 4 Lighting andVentilation**

#### 4.1 Natural Ventilation

Wind action---Stact Effect---Cross Ventilation ----Position of openings----Size of openings----Control of openings: sashes, canopies, louvers---Humidity control: Wind scoop.

#### 4.2 Mechanical Ventilation

Fans: Propeller & Centrifugal----Installation of Fans: local & Central---Systems of ventilation: exhaust, plenum (positive ventilation) & combined----Filters: dry, wet, washing & electrostatic----Determining rate of ventilation ---Mechanical cooling (Heat –Pump circuit): refrigerant, copmpressor, condenser, pressure release valve, evaporator---refrigerator & Air cooler-----Ton of refrigeration—Simple Air conditioner: Propelling , filtering, washing, humidifying, cooling,dehumidifying, heating or re-heating— Building installation of air conditioners: central handling, local handling & induction system—control systems: sensors, control unit, servo---mechanisms.

#### 4.3 Principles of Lighting

Aims of God Lighting –Planning the Brightness Pattern—Considering the Visual task, the immediate background of the task(central field & visual field)and the general surroundings(peripheral field)--- Glare, direct, reflected & veiling—Recommended values of illumination level for homes, restaurants, cinemas, theatres, schools & colleges, hospitals, offices(values only).

#### 4.4 Daylighting

Sources of light of a point inside a building, skylight, externally reflected light, internally reflected light, direct sunlight—working plane, Daylight factor.

#### 4.5 Artificial lighting

Necessity of Artificial lighting—Selection of light sources &luminaries depending on general lighting, direct lighting, local lighting---Determination of luminous flax & number of lamps.Lighting Arrester.

**Practical:**

1. Practical on joining P.V.C. / G.I. Pipes & fittings/Models and writing report on the process
2. Practical based on sanitary fitting like, traps, wash basin & water closet fittings.
3. Prepare drawing for water supply. Layout plan for campus showing following details service pipe, communication pipe, consumer pipe, water meter, rain water pipes
4. Prepare drawing for drainage line plan for campus showing following details: Inspection chambers sewage pipes, traps, man holes.
5. Market survey for different materials available in market their trade names & rates used for water proofing, termite proofing and damp proofing treatment and writing report on the materials collected.

**Part B: Entrepreneurship Development****Objective:-**

Students will be able to:

1. Identify entrepreneurship opportunity.
2. Acquire entrepreneurial values and attitude.
3. Use the information to prepare project report for business venture.
4. Develop awareness about enterprise management.

**Contents: Theory (B: Entrepreneurship Development) Hrs/week****Unit -1 Entrepreneurship, Creativity & Opportunities**

- 1.1 Concept, Classification & Characteristics of Entrepreneur
- 1.2 Creativity and Risk taking.
  - 1.2.1 Concept of Creativity & Qualities of Creative person.
  - 1.2.2 Risk Situation, Types of risk & risk takers.
- 1.3 Business Reforms.
  - 1.3.1 Process of Liberalization.
  - 1.3.2 Reform Policies.
  - 1.3.3 Impact of Liberalization.
  - 1.3.4 Emerging high growth areas.
- 1.4 Business Idea Methods and techniques to generate business idea.
- 1.5 Transforming Ideas in to opportunities transformation involves Assessment of idea & Feasibility of opportunity
- 1.6 SWOT Analysis

**Unit -2 Information and Support Systems**

- 2.1 Information needed and their Sources Information related to project, Information related to support system, Information related to procedures and formalities
- 2.2 Support Systems
  1. Small Scale Business Planning, Requirements.
  2. Govt. & Institutional Agencies, Formalities
  3. Statutory Requirements and Agencies.

**Unit -3 Market Assessment**

- 3.1 Marketing –Concept and Importance
- 3.2 Market Identification, Survey Key components
- 3.3 Market Assessment

**Unit -4 Business Finance & Accounts****Business Finance**

- 4.1 Cost of Project
  - 4.1.1 Sources of Finance
  - 4.1.2 Assessment of working capital
  - 4.1.3 Product costing
  - 4.1.4 Profitability
  - 4.1.5 Break Even Analysis
  - 4.1.6 Financial Ratios and Significance

**Business Account**

- 4.2 Accounting Principles, Methodology
  - 4.2.1 Book Keeping

4.2.2 Financial Statements

4.2.3 Concept of Audit,

### Unit -5 Business Plan & Project Report

5.1 Business plan steps involved from concept to commissioning: Activity Recourses, Time, cost

#### 5.2 Project Report

1. Meaning and Importance
2. Components of project report/profile (**Give list**)

#### 5.3 Project Appraisal

1. Meaning and definition
2. Technical, Economic feasibility
3. Cost benefit Analysis

### Unit -6 Enterprise Management and Modern Trends

6.1 Enterprise Management: -

1. Essential roles of Entrepreneur in managing enterprise
2. Product Cycle: Concept And Importance
3. Probable Causes Of Sickness
4. Quality Assurance - Importance of Quality, Importance of testing

6.2 E-Commerce Concept and process

6.3 Global Entrepreneur

#### Text Books:- Nil

Name of Authors	Titles of the Book	Edition	Name of the Publisher
<b>Building Services:</b>			
S. Deolalikar	Plumbing Design & Practice		Tata M.C. Graw hill publishing company, New Delhi
Prof. S.M. Patil	Building services		Patil Publication & Goregaon, Mumbai
S.R. Mohan & Vivek Anand	Design & Practical Handbook on plumbing		Standard Publishing, New Delhi
Sandeep Mantri	A to Z of practical building and its		Mantri Institute of Development & research, Pune.
Bindra & Arora	Building Construction		Dhanpatrai publishing
Rangwala	Building Construction		Charotor publishing House Anand
	National Building Code – 1983		Bureau of Indian Standards, New Delhi
The Kolkata Municipal Corporation Building Rules, Latest edition, Tax Law/other local bodies			
Rajeev Roy	Entrepreneurship		Oxford University Press
Michael Schaper and others	Entrepreneurship and small business		Wiley-India
E Gordon K. Natrajan	Entrepreneurship Development		Himalaya Publishing. Mumbai
Preferred by Colombo plan staff college for Technical education.	Entrepreneurship Development		Tata McGraw Hill Publishing co. ltd. New Delhi.
J.B. Patel D.G. Allampally	A Manual on How to Prepare a Project Report		EDI STUDY MATERIAL Ahmadabad (Near Village Bhat, Via Ahmadabad Airport & Indira Bridge), P.O. Bhat 382428,

			Gujrat,India P.H. (079) 3969163, 3969153 E-mail : ediindia@sancharnet.in/olpe@ediindia.org Website : http://www.ediindia.org
J.B.Patel S.S.Modi	A Manual on Business Opportunity Identification & Selection		
S.B.Sareen H. Anil Kumar	National directory of Entrepreneur Motivator & Resource Persons.		
Gautam Jain Debmuni Gupta	New Initiatives in Entrepreneurship Education & Training		
P.C.Jain	A Handbook of New Entrepreneurs		
D.N.Awasthi , Jose Sebastian	Evaluation of Entrepreneurship Development Programmes		
V.G.Patel	The Seven Business Crisis & How to Beat Them.		
Poornima M. Charantimath	Entrepreneurship Development of Small Business Enterprises		Pearson Education, New Delhi
Entrepreneurship Development			McGraw Hill Publication
J.S. Saini B.S.Rathore	Entrepreneurship Theory and Practice		Wheeler Publisher New Delhi
	Entrepreneurship Development		TTTI, Bhopal / Chandigadh
<b>2) Video Cassettes</b>			
<b>SUBJECT</b>			<b>SOURCE</b>
Five success Stories of First Generation Entrepreneurs			EDI STUDY MATERIAL Ahmadabad (Near Village Bhat, Via Ahmadabad Airport & Indira Bridge), P.O. Bhat 382428 , Gujrat,India
Assessing Entrepreneurial			

Competencies		P.H. (079) 3969163, 3969153 E-mail :
Business Opportunity Selection and Guidance		ediindia@sancharnet.in/olpe@ediindia.org Website : http://www.ediindia.org
Planning for completion & Growth		
Problem solving-An Entrepreneur skill		

**Glossary:**

**Industrial Terms:**

Terms related to finance, materials, purchase, sales and taxes.

**Components of Project Report:**

1. Project Summary (One page summary of entire project )
2. Introduction (Promoters, Market Scope/ requirement)
3. Project Concept & Product (Details of product)
4. Promoters (Details of all Promoters- Qualifications, Experience, Financial strength)
5. Manufacturing Process & Technology
6. Plant & Machinery Required
7. Location & Infrastructure required
8. Manpower ( Skilled, unskilled )
9. Raw materials, Consumables & Utilities
10. Working Capital Requirement (Assumptions, requirements)
11. Market ( Survey, Demand & Supply )
12. Cost of Project, Source of Finance
13. Projected Profitability & Break Even Analysis
14. Conclusion.

**Suggested list of assignment:**

- 1 Assess yourself-are you an entrepreneur?
- 2 Prepare project report and study its feasibility.

**Reference books:**

- (1) National Building Code of India Group 4—Part viii----Building services/Bureau of Indian Standards.

Name of the Course: **Diploma in Civil Engineering** Subject: **Contracts and Accounts**  
 Course code: **CE** Course Duration: 6 semester Course offered in the Semester: **FIFTH**  
 Subject code: Question code: Marks: 50

Teaching Scheme	Examination Scheme
Theory – 2 lecture per week	Class Test(CT)-10
Tutorial – Nil	Assessment, Assignment, Quiz – 5
Practical - Nil	End Semester Exam(ESE) -35
Credit - 2	Total Marks – 50

**Aim:-**

1. Study of contracts, costing and budgeting of building constructions.

**Objective:-**The students shall be able to:

1. Differentiate between types of contract.
2. Prepare tender documents.
3. Draft tender notice for various types of construction
4. Prepare specification of an item of construction.
5. Calculate the value of a land and old buildings

**Pre-Requisite:-**

1. Student should know tentative rates of materials to be used.
2. Student should have knowledge of accounting.

Unit no	Topic	Contact period	Marks
1	Procedure of Execution of Work By P.W.D.	4	4
2	Contract	4	6
3	Tender & Tender Documents	4	6
4	Accounts in P.W.D.	3	3
5	Payments to Contractors	3	3
6	Specifications	5	4
7	Valuation	6	6
8	Arbitration	3	3

**Contents: THEORY (CONTRACTS AND ACCOUNTS) 2 Hrs/week Marks**

**Unit-1 Procedure of Execution of Work By P.W.D.**

- 1.1 Organization of P.W.D., functions of their personnel.
- 1.2 P.W.D. procedure of initiating the work, administrative Approval, technical sanction, budget provision.
- 1.3 Methods used in P.W.D. for carrying out works contract method and departmental method, rate list method, piece work method, Day's work method, department method (NMR and casual muster roll.)

**Unit -2 Contract**

- 2.1 Definition of contract, objects of contract, requirements of valid 'Contract'

- 2.2 Types of engineering contract - lump sum contract, item rate contract, percentage rate contract, cost plus percentage, cost Plus fixed fee, cost plus variable percentage and cost plus variable fee contract, labour contract, demolition contract, fee contract, Target contract, negotiated contract .
- 2.3 Class of contractor, Registration of contractor.
- 2.4 BOT PROJECT.

### **Unit – 3 Tender & Tender Documents**

- 3.1 Definition of Tender, Necessity of Tender, Types-Local And Global.
- 3.2 Tender Notice, Points To Be Included While Drafting Tender Notice, Drafting Of Tender Notice.
- 3.3 Meaning of Terms: Earnest Money, Security Deposit, Validity Period, Right To Reject One or All Tenders, Corrigendum To Tender Notice And Its Necessity.
- 3.4 Tender Documents – List, Scheduled A, Schedule B, Schedule C.
- 3.5 Terms Related To Tender Documents – Contract Conditions, Time Limit, Time Extension, Penalty, Defective Material And Workmanship, Termination of Contract, Suspension Of Work, Subletting Of Contract, Extra Items, Escalation, Arbitration, Price Variation Clause, Defect Liability Period, Liquidated And Unliquidated Damages.
- 3.6 Filling the tender by contractor and points to be observed by him.
- 3.7 Procedure of submitting filled in tender document, procedure of opening tender , comparative statement , scrutiny of tenders, award of contract, acceptance letter and work order.
- 3.8 Unbalanced Tender, Ring Formation.

### **Unit – 4 Accounts in P.W.D.**

- 4.1 Various Account Forms and their Uses, Measurement-books, Nominal Muster Roll, Imprest Cash, Indent, Invoice, Bills, Vouchers, Cash Book, Temporary Advance.

### **Unit – 5 Payments to Contractors**

Mode of payment to the contractor, interim payment and its necessity, advance payment, secured advance, on account payment, final payment, first and final payment, retention money, reduced rate payment, petty advance, mobilization advance.

### **Unit – 6 Specifications**

- 6.1 Necessity and importance of specifications of an items, points to be observed in framing specifications of an item, types of specification –brief and detailed, standard and manufacturers specification.
- 6.2 Preparing detailed specifications of items in civil engineering works. Standard specification book
- 6.3 Legal Aspects Of Specification.

### **Unit – 7 Valuations**

- 7.1 Definition, necessity of valuation, Definitions – cost price, value, difference between them, characteristics of value, factors affecting value.
- 7.2 Types of value: - book value, scrap value, salvage, Value, speculative value, distress value, market value, monopoly value, sentimental value, factors affecting value .
- 7.3 Depreciation, obsolescence, sinking fund; Methods of calculation of depreciation – straight line method, Sinking fund method constant percentage method quantity survey method.
- 7.4 Computation of capitalized value, gross income, outgoing, net Income, years purchase. types of outgoing and their percentages.
- 7.5 Valuation of lands & buildings, factors affecting their valuation, Book value method, replacement value method and comparison method.
- Use of valuation tables .deferred value of land.
- 7.3 Fixation of rent as per PWD practice

### **Unit 8: Arbitration**

- 8.1 Introduction
- 8.2 Procedure of Arbitration

### **Assignment:**

### **Skills to be developed:**

### **Intellectual skills:**

1. Know the importance of specification in civil engineering works.
2. Draft tender notice and prepare tender documents.



3. Identify and use various account forms used in pwd

**Motor skill:**

1. Write the detailed specification.
2. Draft brief tender notice for construction of wbm road.
3. Prepare tender document for construction of a residential building.
4. Prepare valuation report for land and building.
5. Prepare tender document for a civil engineering work.

**List of Assignments:**

1. Collecting old set of tender document and writing a report on it
2. Collection of tender notices published in newspapers for various items of civil engineering works. (At least 5) write salient features of them.
3. Drafting a tender notice for construction of a civil engineering work (Residential building on which estimation and drawing have already been made in the previous semester)
4. Preparation of tender document for the building. (Detailed estimate prepared for residential building in Estimating and costing shall be used)
5. Collection of various account forms from PWD & writing report on it
6. Writing a report on store procedure and account producer of PWD. For it a Guest lecture of PWD official may be arranged.
7. Writing detailed specifications for one item from each of following:
  - A) Building construction system.
  - B) Irrigation engineering system.
  - C) Transportation engineering system.
  - D) Environment engineering system.

**Text Books:-**

Name of Authors	Titles of the Book	Edition	Name of the Publisher
B.N. Datta	Estimating & costing in Civil engineering		UBS Publishers
M. Chakraborti	Estimating & costing, Specification and Valuation in Civil Engineering		M. Chakraborti , Calcutta
S.C. Rangwala	Estimating & costing		Charotar Publication
B.S. Patil	Civil Engineering Contracts and Accounts Vol I , II		Orient Longman
G. S. Birdie	ESTIMATING & COSTING		DhanpatRai and Sons
<b>VIDEO CASSETTES / CDS: MSBTE CAI Package</b>			

**Reference books: - Nil**

**Suggested List of Laboratory Experiments: - Nil**

**Suggested List of Assignments/Tutorial: - Nil**

Name of the Course: **Diploma in Civil Engineering** Subject: **Transportation Engineering II**  
 Course code: **CE** Course Duration: 6 semester Course offered in the Semester: **FIFTH**  
 Subject code: Question code: Marks: 100

Teaching Scheme	Examination Scheme
Theory – 3 Lecture per week	Class Test(CT)- 20
Tutorial – Nil	Assessment, Assignment, Quiz - 10
Practical - Nil	End Semester Exam(ESE) - 70
Overall Contact hour per week – 3 hour/week	Total Marks - 100
Credit - 3	

**Aim:-**

1. Study of surveying, designing and making of highway.

**Objective:-** Student should be able to:

1. Survey and investigation for location of new road.
2. Organize, supervise and co-ordinate construction activities of road.
3. Prepare & interpret the drawings related to the work.
4. Select & test materials on site and laboratory as per requirements.
5. Handle skilled workers and monitor quality control parameter related to work
6. Improve, maintain and repairs of existing roads.

**Pre-Requisite :-**

1. Student should be able to read and draw morphological nature of land.

Unit no	Topic	Contact period	Marks
1	Road Engineering	3	4
2	Investigation for Road Project	3	4
3	Geometric Design Of Highways	12	18
4	Construction of Roads Pavements and materials	12	16
5	Traffic Engineering	5	10
6	Hill Roads	3	6
7	Drainage of Roads	3	4
8	Maintenance and Repairs of Roads	3	4
9	Introduction to Airport Engineering	4	4

**Contents: Theory (Transportation Engineering II) 3 Hrs/week Marks**

**Unit -1 Road Engineering :**

- 1.1 Importance of road in India. Characteristics of road transport, Scope of highway Engineering
- 1.2 Classification of roads according to Nagpur plan (Location and function), and modified classification of road by third road development plan(1981-2001) Traffic and tonnage,
- 1.3 Classification of urban roads.
- 1.4 Road patterns

**Unit -2 Investigation for Road Project**

- 2.1 Reconnaissance survey, Preliminary survey and Location survey for a road project.
- 2.2 Detailed survey for cross drainage- L-section and C/S sections.
- 2.3 Fixing the alignment of road, factors affecting alignment of road.
- 2.4 Drawings required for road project- Key map, Index map, Preliminary survey plan and detailed location survey plan, L section and C/S sections cross drainage work, land acquisition plan, drawing of road intersections
- 2.5 Survey for availability of construction material, location plan of quarries.
- 2.6 Project Report
- 2.7 Highway project – steps involved in a new project and in a realignment project

**Unit – 3 Geometric Design Of Highways**

- 3.1 Camber- definition, purpose, types, IRC – specifications.

- 3.2 Kerbs, traffic separators or medians, road margin, carriage way, road formation, right of way
- 3.3 Design speed- IRC – specifications
- 3.4 Gradient – definition, types, IRC specification.
- 3.5 Sight distances– definition, types, IRC specification.
- 3.6 Curves–Necessity, types– horizontal, vertical and transition curves.
- 3.7 Widening of roads on curves.
- 3.8 Super Elevation – definition, formula for calculating super elevation, minimum and maximum values of super elevation, and methods of providing super elevation, design of super elevation
- 3.9 Sketching of standard C/S of national highway in embankment and cutting.
- 3.10 Simple problems on geometric design of road.

#### **Unit – 4 Construction of Roads Pavements and materials**

- 4.1 *Types of road materials and Tests* – soil, aggregates, bitumen, Cement Concrete. Test on soil sub grade- C.B.R. test, Test on Aggregate – Los Angeles abrasion, impact, and shape test. Tests on bitumen- Penetration, Ductility and Softening point test.
- 4.2 *Pavement* – objective of pavement, structure of pavement, function of pavement components, types of pavement.
- 4.3 *Construction of earthen road* – general terms used- borrows pits, spoil bank, lead and lift, balancing of earthwork. Construction procedure.
- 4.4 *Soil stabilized roads* – necessity, methods of soil stabilization, steps involved in constructing mechanically stabilized road
- 4.5 *Water bound macadam roads* – materials used, size and grading of aggregates and screening, construction procedure including precautions in rolling.
- 4.6 *Construction of bituminous roads* - Terms used– bitumen, asphalt, emulsion, cutback, tar, common grades adopted for construction.  
Types of bituminous surface – prime coat, tack coat, seal coat, Surface dressing – procedure of construction, bituminous penetration macadam, and Bitumen/Tar carpets – procedure of construction.
- 4.7 *Cement concrete pavements*- Construction procedure and equipments, Construction joints, joint filler, joint sealer.

#### **Unit – 5 Traffic Engineering**

- 5.1 Traffic volume study
- 5.2 Traffic control devices- road signs, marking, Signals, Traffic island.
- 5.3 Highway intersection – a. at grade intersections ( non channelized, channelized intersection and traffic rotaries) and b. grade separated or fly over intersections and interchange
- 5.4 Road accident. Building code IS:1904

#### **Unit – 6 Hill Roads**

- 6.1 Parts and functions of hill road components, types of curves, Hill road formation.
- 6.2 Land slides- causes and prevention.
- 6.3 Structures- drainage structures.

#### **Unit – 7 Drainage of Roads**

- 7.1 Surface drainage – side gutter, catch water drains, surface drainage.
- 7.2 Sub-surface drainage –Longitudinal drains and cross drains.

#### **Unit – 8 Maintenance and Repairs of Roads**

- 8.1 Necessity of maintenance of roads
- 8.2 Classification of maintenance operation – ordinary, routine and periodic maintenance.
- 8.3 Maintenance of W.B.M., bituminous and cement concrete roads.

#### **Unit – 9 Introduction to Airport Engineering**

- 9.1 Introduction & Role of civil engineer.
- 9.2 Terminology
- 9.3 Layout of airport & function of different units.
- 9.4 Airport Grading and Drainage

**List of Assignments:**

1. Road project for a road of minimum 0.5 km. length having at least one small cross drainage work.
  - 1.1 Site selection.
  - 1.2 Reconnaissance survey.
  - 1.3 Fixing the alignment.
  - 1.4 Detailed profile survey along the alignment and cross section of road and CD Work.
  - 1.5 Prepare computer generated drawing of longitudinal section and typical cross sections of the road in cutting and filling.
  - 1.6 Prepare computer generated drawing of proposed typical CD work/culvert. (Using CAD)
  - 1.7 Draw a layout plan of Airport.
2. Visit to a road under construction/constructed to study the construction of
  - (a) WBM road (b) flexible pavement (c) Rigid pavement roads for observing the type of construction and construction equipments.
3. Preparing drawings of detailed cross sections of
  - (a) Major district road (b) State Highway (c) National highway (d) Express Highway in cutting and banking showing details and dimensions with proper scale. (Any two)
4. Traffic volume study and its representation of an important road intersection in your city.
5. Visit to a W.B.M. and Bituminous road for observing the different types of defects in roads. Prepare a visit report. Which should consist of (a) List of various defects observed (b) Suggestions regarding the possible remedial measure.

**Text Books:-**

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Khanna & Justo	Highway Engineering		Khanna Publication
Transportation Engg	A.K. Upadhyay		<b>Katson Books</b>
L.R. Kadiyali	Traffic Engineering --		
N.L. Arora, S.P. Luthara	Transportation Engineering		I.P.H. New Delhi
Vazarani & Chandola	Transportation Engineering		Khanna Publication
Biridi & Ahuja	Road, Railway, Bridges		S.B.H. New Delhi
Kamala	Transportation Engineering		T.M.H. New Delhi
K.L. Bhanot & S.B. Sehgal	Highway Engineering & Airport		S. Chand & company
	<b>IS / International Codes</b> IRC 36 - 1970, IRC 16 - 1965, IRC 20 - 1966		

**Suggested List of Laboratory Experiments :- Nil****Suggested List of Assignments/Tutorial: - Nil**

Name of the Course: **Diploma in Civil Engineering** Subject: **Design of RCC Structures**  
 Course code: **CE** Course Duration: 6 semester Course offered in Semester: **FIFTH**  
 Subject code: Question code: Marks :100

Teaching Scheme	Examination Scheme
Theory : 4 Lectures per week	CT- 20
Tutorial: Nil	Attendance, Assignment & Quiz: 10
Practical : Nil	End Semester Exam(ESE) : 70
Credit :- 4	Total Marks:100

**Aim:-**

1. Study of design of structure.

**Objective:-**

Students will be able to:

1. Analyze the section by LSM.
2. Select Proper materials and Calculate the design values for the materials.
3. Calculate the loads on structural components as per IS 875 (Part-I &II) provisions.
4. Read and interpret structural drawing.
5. Understand the basic principles of design of R.C.C. sections.
6. Use & Correlate the specifications of **IS 456-2000: code& SP-16**.
7. Draw and appreciate the proper reinforcement detailing of R.C. structural member and their connection using **SP-34 & IS 13920**.
8. Prepare the detailed drawing of structural elements with key plans and schedule of reinforcement
9. Design singly reinforced, Doubly reinforced and flanged section of beams, simply supported one way & two way slabs, cantilevers slab, axially loaded columns & footings by LSM.

**MODULAR DIVISION OF THE SYLLABUS**

UNIT	TOPICS	CONTACT PERIOD	MARKS
1	INTRODUCTION	04	6
2	Working Stress Method	04	4
3	Limit State Method	04	6
4	Analysis and Design of Singly Reinforced Sections (LSM)	08	6
5	Analysis and Design of Doubly Reinforced Sections (LSM)	06	8
6	Shear, Bond and Development Length (LSM)	07	8
7	Analysis and Design of T-Beam (LSM)	06	6
8	Design of lintel	04	6
9	Design of Slab (LSM)	08	8
10	Design of Axially Loaded Column and Footing (LSM)	08	8
11	Prestressed concrete	05	4
<b>TOTAL:</b>		<b>64</b>	<b>70</b>

## DETAIL COURSE CONTENT

### Unit1: Introduction

- 1.1 Aim of design, Concept of R.C.C., Necessity of steel as reinforcement and its position in a Simply Supported and continuous member.
- 1.2 Design- Functional Design & Structural Design.  
Scope of a Structural Designer- Structural Planning, Calculation of loads, Analysis, Design & Detailing, Advantages of symmetrical planning over un-symmetrical planning  
Loads: Dead load, Imposed load, Wind loads & other loads as per IS 875(Part-I to Part III)  
Earthquake forces. – IS 1893- 2002(Part -1), Seismic zones, Combination of loads.
- 1.3 Methods of design-working stress method, limit state method – Introduction of IS 456 and SP-16
- 1.4 Detailing- introduction of SP-34 & IS13920 Necessity of IS 13920-1993

### Unit2: Working stress method

- 2.1 Introduction
- 2.2 R.C. Sections, their behaviour, Grades of concrete & steel, permissible stresses,
- 2.3 Assumptions in W.S.M..
- 2.4 Equivalent bending stress distribution diagram & Moment of Resistance for singly reinforced rectangular section – balanced, under-reinforced & over-reinforced sections – numerical problems

### Unit3: Limit State Method

- 3.1 Definition, types of limit states, partial safety factors for materials strength, characteristic strength, characteristic load, design load. Loading on structure as per I.S 875.
- 3.2 I.S. Specification regarding spacing of reinforcement in slab, cover to reinforcement in slab, beam column & footing, minimum reinforcement in slab, beam & column, lapping, anchoring effective span for beam, & slab.

### Unit4: Analysis and Design of Singly Reinforced Sections (LSM)

- 4.1 Limit State of collapse ( Flexure), Assumptions, stress- Strain relationship for concrete and steel, neutral axis, Stress block diagram and Strain diagram for singly reinforced section.
- 4.2 Concept of under- reinforced, over-reinforced and balanced section, neutral axis co-efficient, limiting value of moment of resistance and limiting percentage of steel required for balanced singly R.C. Section.
- 4.3 Simple numerical problems on determining design constants, moment of resistance and area of steel .

### Unit5: Analysis and Design of Doubly Reinforced Sections (LSM)

- 5.1 General features, necessity of providing doubly reinforced section, reinforcement limitations.
- 5.2 Analysis of doubly reinforced section, strain diagram, stress diagram, depth of neutral axis, moment of resistance of this section.
- 5.3 Simple numerical problems on finding moment of resistance and design of beam sections.

### Unit6: Shear, Bond and Development Length (LSM)

- 6.1 Nominal Shear stress in R.C. Section, design shear strength of concrete, Maximum shear stress, Design of shear reinforcement, Minimum shear reinforcement, forms of shear reinforcement.
- 6.2 Bond and types of bond, Bond Stress, check for bond stress, Development length in tension and compression, anchorage value for hooks 90° bend and 45° bend Standard Lapping of bars, check for development length.
- 6.3 Simple numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of this section in shear. Design of shear reinforcement; Minimum shear reinforcement in beams; Determination of Development length required for tension reinforcement of cantilever beam and slab, check for development length.

### Unit7: Analysis and Design of T-Beam (LSM)

- 7.1 General features, advantages, effective width of flange as per IS:456-2000 code provisions.
- 7.2 Analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis, moment of resistance of T-beam section
- 7.3 Design of T-beam for moment and shear for Neutral axis within or up to flange bottom.
- 7.4 Simple numerical problems on deciding effective flange width (Problems only on finding moment of resistance of T-beam sections shall be asked in written examination.)

**Unit8: Design of lintel**

8.1 Design of lintel for flexure under triangular load only for brick work above it and for its self weight – typical problem solution.

8.2 Design of shear reinforcement for lintel – typical problem solution.

**Unit9: Design of Slab (LSM)**

9.1 Design of simply supported one-way slabs for flexure check for deflection control, and shear.

9.2 Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear.

9.3 Design of two-way simply supported slabs for flexure with corner free to lift.

9.4 Design of dog-legged staircase.

9.5 Simple numerical problems on design of one-way simply supported slabs cantilever slab & two-way simply supported slab

**Unit10: Design of Axially Loaded Column and Footing (LSM)**

10.1 Assumptions in limit state of collapse – compression

10.2 Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties.

10.3 Analysis and design of axially loaded short, square, rectangular and circular columns with lateral ties only; check for short column and check for minimum eccentricity may be applied.

10.4 Types of footing, Design of isolated square footing for flexure, and shear.

10.5 Simple numerical problems on the design of axially loaded short columns and isolated square footing. (Problems on design of footing shall be asked in written examination for moment and two way shear only.)

**Unit11: Prestressed Concrete**

11.1 Introduction to prestressed concrete.

11.2 Externally and internally prestressed member.

11.3 Advantages and disadvantages of prestressed concrete.

11.4 Methods of prestressing, pretensioning and posttensioning. Losses in prestressing.

11.5 Concept of prestressing – Stress concept, Load balancing concept

**I.S. Codes:**

1. IS 456:2000 - Plain and Reinforced concrete code of Practice.

2. SP16- Design Aids for reinforced concrete to IS 456.

3. I.S. 875 (Part 1-5) - 1987 code of practice of design loads for Buildings and structures.

Part 1 - Dead load

Part 2 - Imposed (live) load

Part 3 - Wind load

4. SP 24 - Explanatory Handbook on IS 456

5. IS 1343-1980 - Indian Standard code of (Reaffirmed 1990) Practice for Prestressed concrete.

6. SP34 : 1987 - Handbook on concrete reinforcement and Detailing.

7. IS 13920-1993 DUCTILE detailing of R. C. Building subjected to Seismic forces.

**Term work as per AICTE**

Term work shall consist of sketch book, design of R.C.C structural components.

**Sketch book:**

Sketch book consists of approximately ten plates from R.C.C. Design shall include important information of clauses of IS 456-2000 code. Typical sketches of components members/stress distribution &

strain distribution diagrams R.C.C. section/detailing of reinforcement in joints/members. Design of R.C.C.

structural components by LSM.

The students should make detailed simple design and drawing of reinforcement detailing on two full imperial size sheets finished in pencil on *any five* of the following R.C.C. component members of a two storied building with detailing of reinforcement (G+1) at the joints as per requirements & IS 13920

1. One-way simply supported slab.

2. Two-way simply supported slab.

3. Cantilever slab/chajja.

4. T-Beam.

5. Column and column footing.

6. Dog-legged staircase

<b>Name of Authors</b>	<b>Titles of the Book</b>	<b>Edition</b>	<b>Name of the Publisher</b>
<b>N. Subramanian</b>	<b>Design of Reinforced Concrete Structure</b>		<b>Oxford University Press</b>
<b>Pillai and Menon</b>	<b>Design of RCC structure</b>		<b>Tata-Mcgrawhill</b>
<b>Sayal and Goyel</b>	<b>Design of RCC structure</b>		
<b>Punmia Jain Jain</b>	<b>Reinforced Concrete</b>		
<b>Verghese</b>	<b>Limit State method of RCC design Vol I &amp; II</b>		
<b>A.K.Jain</b>	<b>Limit State method of design</b>		
<b>Nilam Sharma</b>	<b>Design of RCC structure</b>		



Name of the Course: **Diploma In Civil Engineering** Subject: **Geotechnical Engineering II**  
 Course code: **CE** Course Duration :6 semesters Course offered in the Semester: **FIFTH**  
 Subject code: Question code: Marks : 50

Teaching Scheme	Examination Scheme
Theory - 2 Lectures per week	Class Test(CT)- 10
Tutorial - Nil	Attendance/Assignment/Quiz - 5
Practical - Nil	End Semester Exam(ESE) - 35
Credit – 2	Total Marks - 50

**Aim:-**

Study of different types of foundation and their practical applications and their suitability.

**Objective:-** Students will be able to:

1. Estimate the bearing capacity of different types of foundation.
2. Estimate the probable settlement of structures.
3. Know the different methods in use to improve the strength of foundation soil.

**Pre-Requisite:-**

- Student should be conversant with the topics covered in the curricula pursued in previous semester

Unit no	Topic	Contact period	Marks
1	<b>Foundation – types and design criteria</b>	2	5
2	<b>Bearing Capacity of soil</b>	8	10
3	<b>Settlement of Shallow Foundations</b>	6	8
4	<b>Deep Foundations</b>	8	6
5	<b>Ground Improvement techniques</b>	8	6

**Content: Theory (Geotechnical Engineering II) 2 hours/week**

**Unit – 1 Foundation – types and design criteria**

**Unit -2 Bearing Capacity of soil**

- 2.1 Concept of bearing capacity, ultimate bearing capacity, net ultimate bearing capacity, factor of safety, safe bearing capacity and allowable bearing pressure
- 2.2 Terzaghi's analysis and assumptions made and formula
- 2.3 Effect of water table on bearing capacity
- 2.4 Determination of bearing capacity for different foundation (isolated and strip foundation only on homogeneous soil deposits) as per IS code method
- 2.5 Field methods for determination of bearing capacity – Plate load test and standard penetration test. Test procedures as Per IS:1888& IS:2131
- 2.6 Typical values of bearing capacity from building code IS:1904
- 2.7 Basic concept of Soil-Structure interaction
- 2.8 Method of calculation of allowable bearing pressure and settlement criteria (no numerical problems) and permissible values (uniform and differential) of settlement as per relevant IS code

**Unit3: Settlement of Shallow Foundations**

**3.1 Introduction**

- 3.2 Steps involved in settlement computation – immediate settlement and consolidation settlement
- 3.3 Estimation of settlements for cohesionless soils
  - 3.3.1 Schmertmann's method
  - 3.3.2 Semi-empirical method of settlement analysis – a. plate load test b. static cone penetration test
- 3.4 Estimation of settlement for cohesive soils
  - 3.4.1 Thin clay layer sandwiched between thick sand layers – numerical problems
  - 3.4.2 Clay layer resting on cohesionless soil or rock – numerical problems

**Unit 4: Deep Foundations**

**1. Pile foundation**

- 4.1.0 Introduction, Pile Foundation: Definition & Suitability of pile foundations
- 4.1.1 Classification of Pile foundations – based on material used ( timber piles, concrete piles, steel piles); based on method of installation- (driven piles, driven cast in situ piles, bored piles),

classification based on load transfer mechanism from pile to soil and functions(bearing piles, friction piles, sheet piles, fender piles, tension piles, under-reamed piles etc.)

4.1.2 Estimation of Load Capacity of Piles (to resist axial force only):

a. Static formula – behaviour of piles in cohesive soil (driven piles and bored piles); piles in granular soil and (driven piles and bored piles); estimation of frictional resistance in cohesive soil – driven piles and bored piles; frictional resistance in cohesionless soil - driven piles and bored piles; estimation of end bearing – in cohesive soil and in cohesionless soil; Static Formula as per IS Code (numerical problems on single pile)

b. pile capacity from in situ soil test (SPT)(numerical problems on single pile)

c. Dynamic Formulae –dynamics of pile driving, ENR formula, Hilley’s formula(numerical problems on single pile)

d. Estimation of Load capacity from Load Test on Piles

4.1.3 Group Action in Piles - Spacing of piles; Piles group in sand and gravel; Pile groups in clay, group efficiency

## 2. Well foundations

4.2.0 Introduction

4.2.1 Classification - Open caissons, Box caissons & Pneumatic caisson; Different shapes of wells

4.2.2 Components of well foundation, physical characteristics – scour depth and grip length

4.2.3 Forces acting on well foundation

4.2.4 Construction of well foundations - Sinking of wells - Tilting and shifting of wells - Rectification of tilts and shifts

## Unit5 Ground Improvement techniques

5.1 Introduction- need for ground improvement and classification of ground improvement techniques

5.2 Principles of ground improvement – for cohesive soil and cohesion less soil.

5.3 Ground treatment in cohesive soil – preloading, vertical drain, stone column, vibroflotation

5.4 Ground treatment in cohesionless soil –drop hammer, dynamic consolidation, vibrocompaction

5.5 other methods – a. Reinforced earth (Principle, Components, Advantages, Applications) b.

Geosynthetics(Types of Geosynthetics, Functions of Geosynthetics, Applications of Geosynthetics) c.

Ground water lowering d. Foundation grouting e. Ground improvement by blasting f. In - situ ground

treatment for slopes g. Soil nailing

Name of the book	Author	Edition	Publisher
Soil mechanics and foundation engineering	VNS Murthy		Dhanpat Rai & Sons
Soil mechanics and foundation engineering	B C Punmia		
Soil mechanics and foundation engineering	B M Das		Thomson
Soil Mechanics and Foundation Engineering	P.P.Raj		Pearson

### Reference books:

Name of the book	Author	Edition	Publisher
Soil Mechanics in Engineering Practice	Karl Terzaghi, Peck and Mesri		Jhon Willey & Sons
Soil :Mechanics	Lambe and Whitman		Willey Eastern Limited

Name of Course: **Diploma in Civil Engineering** Subject: **Geotechnical Engineering Lab**  
 Course code: **CE** Course Duration: 6 semester Subject offered in Semester: **FIFTH**  
 Subject code: Question code: Marks: 100

Teaching Scheme	Examination Scheme
Theory : NIL	Term work (TW) – 50
Tutorial: NIL	Practical (PR) - 50
Practical : 3	Total marks - 100
Credit :- 2	

### Practical

#### Skills to be developed:

#### Intellectual Skills:

- Identify properties of soil.
- Interpret test results.
- Follow IS procedure of testing.

#### Motor Skills:

- Measure the quantities accurately.
- Handle the instruments carefully.

#### List of Practical (Any ten)

- Determination of water content of given soil sample by oven drying method as per IS Code.
- Determination of bulk unit weight dry unit weight of soil in field by core cutter method as per IS Code.
- Determination of bulk unit weight dry unit weight of soil in field by sand replacement method as per IS Code.
- Determination of Liquid limit & Plastic limit of given soil sample as per IS Code.
- Determination of grain size distribution of given soil sample by mechanical (sieve analysis) method as per IS Code.
- Determination of coefficient of permeability by constant head test
- Determination of coefficient of permeability by falling head test
- Practical (Live demo or Pre-recorded demo)
- Determination of shear strength of soil using direct shear test.
- Determination of shear strength of soil using Laboratory Vane shear test
- Determination of MDD & OMC by standard proctor test on given soil sample as per IS Code.
- Determination of CBR value of given soil sample.
- Determination of shear strength of soil using unconfined compressive strength.
- Determination of shear strength of soil using tri-axial shear test.

Name of Course: **Diploma in Civil Engineering** Subject: **Civil Engineering lab III**  
 Course code: **CE** Course Duration: 6 semester Subject offered in Semester: **FIFTH**  
 Subject code: Question code: Marks: 100

Teaching Scheme	Examination Scheme
Theory : NIL	Term work (TW) – 50
Tutorial: NIL	Practical (PR) - 50
Practical : 3	Total marks - 100
Credit :- 2	

### Group-I: Mechanics of structure

#### Practical:

#### Skill to be developed:

#### Intellectual Skills:

1. Interpret the results.
2. Calculate design/ quantities of parameters.

#### Motor Skills:

1. Observe the phenomenon during testing of specimen.
2. Draw the graphs and diagrams.
3. Measure different parameters accurately
4. Adjust levels by operating valves

### Group – A (Any Four)

1. Identify the components of universal testing machine.
2. Tension test on mild steel /tor steel or deformed bars .
3. Flexure test on floor tiles or roofing tiles.
4. Abrasion Test on flooring tiles.
5. Determination of coefficient of friction
6. Hardness of metal (mild steel and brass) – by Rockwell or Brinnel test

### Group – B: Hydraulics (Any Six)

#### List of Practical:

1. Measurements of pressure and pressure head by Piezometer, U-tube manometer
2. Measurement of pressure difference by U-tube differential manometer. Study of bourdon's gauge
3. Verification of Bernoulli's theorem
4. Determination of coefficient of discharge for given rectangular or triangular notch.
5. Determination of coefficient of discharge for a given Venturimeter.
6. Demonstration and use of Pitot tube and current meter.
7. Determination of hydraulic coefficients for sharp edge orifice.
8. Study of a model of centrifugal and reciprocating pump.

Name of Course: **Diploma in Civil Engineering** Subject: **Application of CAD in Civil Engineering II**  
 Course code: **CE** Course Duration: 6 semester Subject offered in Semester: **FIFTH**  
 Subject code: Question code: Marks :75

Teaching Scheme	Examination Scheme
Theory : NIL	Term work (TW) – 35
Tutorial: NIL	Practical (PR) - 40
Practical : 3	Total marks - 75
Credit :- 2	

**Aim:-**

1. Development of computer based knowledge in surveying.

**Objective:** - Students will be able to:

1. Use different CAD commands for drawing.
2. Prepare line plans with CAD software.
3. Prepare submission drawing/working drawing for the buildings with CAD software.
4. Prepare drawings of civil engineering structures.

**Pre-Requisite:-**

1. Student should know basic functions of AutoCAD

Unit no	Topic	Contact period	Marks
1	<b>Building drawing in layers</b>	21	10
2	<b>RCC detailing I</b>	15	8
3	<b>RCC detailing II</b>	12	7

**Content: Sessional/Practical (Application of CAD in Civil Engineering II) 3 hour /week**

**Unit 1:Building drawing in layers**

**Note: single storeyed building shall comprise of two rooms, bath, WC, kitchen, front verandah with a provision of staircase and mumty for utilisation of roof space. Same plan used in subject 'Estimating and Costing' as well as 'Civil Engineering Drawing' and Application of CAD in Civil Engineering I is to be used.**

- 1.1 Layer on/off
- 1.2 Formation of layer
- 1.3 Draw plumbing and sanitary layout in separate layer
- 1.4 Taking print for separate layer drawing

**Unit 2:RCC detailing I**

- 2.1 One way slab (plan and sectional elevation along the shorter span)
- 2.2 Two way slab (plan and sectional elevation along both span)
- 2.3 Half portion of three span continuous beam with at least two cross sections at center and end of span (with provision of crank and extra top bar)
- 2.4 Lintel and chajja for a window opening of 1.5 m clear span
- 2.5 Columns with pedestal and footing (plan and sectional elevation)
- 2.6 Taking print in A4 sheet

**Unit 3:RCC detailing II**

- 3.1 2.0 metre deep underground water reservoir having stepped masonry wall (plan & sectional elevation)
- 3.2 detailing of cantilever type RCC retaining wall without shear key of height 3.0 m
- 3.3 detailing of 3 pile cap with 400 mm diameter and 22 metre RCC pile

<b>Name of Books</b>	<b>Name of the author</b>	<b>Edition</b>	<b>Name of the Publisher</b>
Autodesk official training guide	<b>Scott Onstott</b>		Wiley-India
Autodesk official training guide	<b>George Omura</b>		Wiley-India
Reference Manual of AutoCAD			AutoDesk

**Suggested List of Laboratory Experiments: - Nil**

**Suggested List of Assignments/Tutorial: - Nil**

WBSCTE

Name of Course: **Diploma in Civil Engineering** Subject: **Professional Practices III**  
 Course code: **CE** Course Duration: 6 semester Subject offered in Semester: **FIFTH**  
 Subject code: Question code: Marks: **50**

Teaching Scheme	Examination Scheme
Theory : NIL	Term work (TW) – 25
Tutorial: NIL	Practical (PR) – 25
Practical : 3	Total marks - 50
Credit :- 2	

**Aim:-**

Development of professional awareness in before and after sales and services.

**Objective:-**

Student will be able to:

- Acquire information from different sources.
- Prepare notes for given topic.
- Present given topic in a seminar.
- Interact with peers to share thoughts.
- Prepare a report on industrial visit, expert lecture

**Pre-Requisite:-**

Students should have complete knowledge of design and maintenance of the building.

**Contents: Practical/Sessional (PROFESSIONAL PRACTICES III) 3 Hrs/week**

**Unit-1: Structured industrial visits shall be arranged and report of the same should be submitted by the individual student, to form a part of the term work.**

Following are the suggested type of Industries/ Field visits (Any three visits)

- Irrigation project for observing components of dam and canal.
- Steel structure for study of its details.
- Residential apartment / public building to study plumbing & sanitary system.
- Hot mix plant

**Unit -2: The Guest Lecture/s from field/industry experts, professionals to be arranged(2 Hrs duration), minimum 2 nos. from the following or alike topics. The brief report to be submitted on the guest lecture by each student as a part of term work.**

- a) Construction of highway, material of construction, machinery used and manpower requirement .
- b) To set up a small scale industry.
- c) Planning and design of irrigation project.

**Unit – 3 Information Search, data collection and writing a report on the topic**

- a) Collecting an estimate from P.W.D.
- b) Material specifications and rate of plumbing and sanitary fittings from market
- c) Collecting market rates for material and labour for building items.

**Unit – 4 The students should discuss in group of six to eight students and write a brief report on the same as a part of term work. The topic of group discussions may be selected by the faculty members. Some of the suggested topics are -**

- a. Recent trends in civil engineering as a service industry.
- b. Waterproofing and leakage prevention.
- c. Troubleshooting in plumbing system.
- d. Causes of failure of road.

**Text Books:- Nil**

**Reference books :- Nil**

**Suggested List of Laboratory Experiments :- Nil**

**Suggested List of Assignments/Tutorial :- Nil**

Name of the Course: **Diploma in Civil Engineering** Subject: **Civil Engineering Project I**  
 Course code: **CE** Course Duration : 6 semesters Subject offered in Semester: **Fifth**  
 Subject code: Question code: Marks: **100**

Teaching Scheme	Examination Scheme
Theory : Nil	Term work (TW) – 50
Tutorial: NIL	Practical (PR) – 50
Practical :3	Total marks - 100
Credit :- 2	

**Aim:-**

1. Exposition of professional approach of students towards knowledge gain.

**Objective:-** Students will be able to:

1. Collect the information for a given project.
2. Apply principles, theorems and bye-laws in the project planning and design.
3. Interpret and analyze the data.
4. Develop professional abilities such as persuasion, confidence, and perseverance and communication skill.
5. Develop presentation skill.
6. Enhance creative thinking.

**Pre-Requisite:-**

1. Students should have entire knowledge of civil engineering.

**Contents:- Practical/Sessional (Civil Engineering Project I ) 3 Hrs/week**

**Project:**

**Skills to be developed:**

**Intellectual skills:**

- 1) Decide and collect data for projects.
- 2) Read and interpret the drawing, data.
- 3) Design the components.
- 4) Apply the principles rules regulations and byelaws.

**Motor skills:**

- 1) Plan for different phases of a task.
- 2) Prepare drawings for project.
- 3) Use of computer for drawing, networking.
- 4) Work in a group for a given task.

**Project:**

Following is the list / areas of suggested civil engineering projects to be undertaken by a group of 4 to 6 students.

**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

**CIVIL ENGINEERING PROJECTS:**

**1. 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.**

WBSCTE