



**DR. A P J ABDUL KALAM UNIVERSITY,
INDORE**

SYLLABUS

For

DIPLOMA CIVIL ENGINEERING

(THIRD YEAR, 5th SEM)

Dr. A P J Abdul Kalam University, Indore

DR. A P J ABDUL KALAM UNIVERSITY, INDORE

Syllabus for Diploma Civil Engineering

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Unit 1 INTRODUCTION

Definition – Irrigation and irrigation engineering, advantages of irrigation, ill effects of over irrigation, and types of irrigation project purpose wise and administrative wise, Methods of irrigation. Analyze data for irrigation project, supervision of reservoir and canal structure, weir and barrages, lift irrigation scheme, its suitability, advantages and limitations Capacity of reservoir ,Principle of Hydrology Relation between water and crop Rainfall, Crops, Dams Weir, Barrages, Area Capacity curve Capacity Canal Concept of runoff duty delta and base period

Unit 2 HYDROLOGY

Hydrological cycle, Definition of rainfall , rain gauge and rain gauge station , types of rain gauges (names only) average annual rain fall and its calculation , definition of run off, factor affecting run off, calculation of run off by run off coefficient, English formula , Stranges and Binnie's tables and curves. Maximum flood discharge and methods of calculation. Unit hydrograph Yield and Dependable yield and methods calculation.

Unit 3 WATER REQUIREMENT OF CROPS

Cropping seasons and crop in Madhya Pradesh. Definition – Crop period base period Duty Delta , factors affecting Duty , relation between Duty Delta and base period Definition – CCA , GCA, IA, intensity of irrigation time factor capacity factor. Crop rotation. Problems on water requirement and capacity of canal. Assessment of irrigation water

Unit 4 INVESTIGATION AND RESERVOIR PLANNING

Survey for irrigation project data collected for irrigation project. Area capacity curve, silting of reservoir, rate of silting, factors affecting silting, methods to control levels and respective storage in reservoir. Fixing control levels

Unit 5 DAMS AND SPILLWAYS

Types of dams – Earthen dams and Gravity dams (masonry and concrete) Comparison of earthen and gravity dams with respect to foundation, seepage, construction and maintenance Earthen Dams – Components and their function , typical cross section seepage through embankment and foundation seepage control through embankment and foundation . Methods of constructions, types of failure of earthen dams and remedial measures. Gravity Dams Theoretical and practical profile, typical cross section, drainage gallery, joint in gravity dam, high dam and low dam Spillways-Definition, function, location and components. Emergency and services, ogee spillway and bar type spillway, discharge over spillway. Spillway with and with out gates

Unit 6 SMALL IRRIGATION STRUCTURE , BANDHARA, PERCOLATION TANKS AND LIFT IRRIGATION

Advantages and disadvantages of Bandhara irrigation layout and component parts, solid and open Bandhara. Percolation Tanks – necessity and importance, selection of site. Layout of lift irrigation scheme. Irrigation department standard design and specification. Small irrigation structures, like Stop dam, stop dam cum cause way, ring bund , small ponds

Unit 7 DIVERSION HEAD WORKS

Weirs – components parts, function and types, layout of diversion head works with its components and their function, canal head regulator, silt excluders and silt ejectors. Barrages – components and their function. Difference between weir and barrage irrigation department standard design and specifications.

Unit 8 CANALS

Classification of canals according to alignment and position in the canal network. Design of most economical canal section. Canal lining – Definition, purpose, types of canal lining advantages of canal lining properties of good canal lining material. C.D. works- different C.D. works, canal falls, escapes, cross regulators and canal outlets

LIST OF REFERENCE BOOKS

1. Irrigation and water power Engineering by B.C. Punmia
2. Introductory Irrigation Engineering by B.C. Punmia Laxmi Publication, Delhi.
3. Fundamental principle of Irrigation Engineering by V.B. Priyani
4. Fundamental principle of Irrigation Engineering by Bharat Singh
5. Irrigation Engineering. & Hydraulic structures by S.K. Garg Khanna publisher, New Delhi
6. Principles of Irrigation. Engineering by S.K. Verma
7. Irrigation Engineering by Birdie.

Unit 1 Overview Of Estimating & Costing

Meaning of the terms estimating, costing. Purpose of estimating and costing . Types of estimate - Approximate and Detailed. Approximate estimate Types- Plinth area rate method, Cubic Content method, Service Unit method, Typical bay method, Approximate Quantity method , Problems on Plinth area rate method & application of Service unit method for selection of service unit for different types of civil Engineering Structures. Types of detailed estimate, Detailed estimate for new work. Revised estimate. Supplementary estimate. Revised & Supplementary estimate. Maintenance & Repair estimate. Uses of detailed estimate

Unit 2 Detailed Estimate

Unit quantity method, Total quantity method, Data required for detailed estimate. Factors to be considered during preparation of detailed estimate, Specification, Quantity availability of material, Location of site, Labour Component. Steps in preparing detailed estimate. Taking out quantities, squaring, abstracting. Preparing check list – by adoption of Sequence of execution. drafting Brief Specification of items, contents of measurement Sheet , Abstract sheet , face sheet

Unit 3 Mode of Measurements.

General Rules for fixing units of Measurements for different– items of work as per IS 1200 & As per PWD Hand Book , Desired accuracy in taking measurements of various items of work & rules for deductions as per IS 1200 & P.W.D. handbook.

Unit 4 Procedure for Preparing Detailed Estimate

Procedure for taking out quantities for various items of works by P.W.D & IS 1200 for.

a) for Load bearing Structure –Long Wall and short wall method, Center line method .

b) Framed Structure building. --

- By using thumb rules for reinforcement quantity calculation

- By preparing bar bending Schedule

Provisions in detailed estimate for contingencies, work charged establishment, Provisional items, Provisional Sum,

Provision for water Supply & Sanitary works, Electrical wiring & installations, centage charges, Tools & Plants, Prime cost, Day work.

Unit 5 Rate analysis

Meaning of term Rate analysis –Factors affecting rate analysis, lead, lift, task work, materials and labour component, Market Rate and labour rate.

Transportation of Materials, load factor for different materials. Standard lead , extra lead, Transportation Charges , Labour - Categories of labours, labour rates, overheads contractor's profit, water charges, taking out quantities of materials for different items of works.

Preparing rate analysis of different items of work

Standard Schedule of rates, full rates & labour rates.

Unit 6 Taking out quantities of work for different Civil Engineering Works

Roads, Dam , Canals ,Railway embankments, methods of mean area , mid sectional area, trapezoidal, Prismoidal formula. Calculation of quantity of earth work. Estimate of Road of 1km. length for pavement surface – WBM Bitumen Cement concrete road Use of software for estimation & for analysis of rates.

LIST OF REFERENCE BOOKS

1. Estimating & costing in Civil Engineering by B.N. Datta UBS Publishers Distributors Pvt Ltd New Delhi
2. Estimating & costing, Specification and Valuation in Civil Engineering by M. Chakraborti M. Chakraborti , Calcutta
3. Estimating & costing by S.C. Rangwala Charotar Publication Anand
4. Civil Engineering Estimating, Contracts and accounts Vol . I by B.S. Patil Orient Longman, Mumbai
5. Estimating & costing by G. S. Birdie Dhanpat Rai and Sons Delhi

Unit 1 Procedure of Execution of work by P.W.D.

Organization of P.W.D. functions of their personnel. P.W.D. procedure of initiating the work administrative approval, technical sanction, budget provision. Method 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

Definition of contract, objects of contract, requirements of valid contract. 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, labor contract, demolition contract, fee contract, target contract, negotiated contract. Class of contractor, Registration of contractor. BOT Project.

Unit 3 Tender & Tender documents

Definition of Tender, necessity of Tender, Types of Local & Global.Tender Notice, points to be included while drafting Tender Notice, Drafting of Tender Notice. Meaning of terms: Earnest money, security deposit, validity period, right to reject one or all tenders, corrigendum to tender notice and its necessary. Tender documents – List, scheduled A, Schedule B, Schedule C. 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 item, escalation, arbitration, price variation clause, defect liability period, liquidated and un liquidated damages. Filling the tender by contractor and points to be observed by him.Procedure of submitting filled in Tender document. Procedure of opening tender, comparative statement, scrutiny of tenders, award of contract, acceptance letter and work order. Unbalanced Tender, Ring Formation.

Unit 4 Accounts of P.W.D.

Various Accounts Forms and their uses – measurement, Books, Nominal Muster Roll, Imprest Cash, indent, Invoice, Bills, Vouchers, Cash Book, Temporary advance

Unit 5 Payment 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

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 specifications. Preparing detailed specifications of items in Civil engineering works, standards specification book. Legal aspects of specification.

Unit 7 CASH, BILLS, AUCTION & T.A. RULES

Procedure to settle account of money received, modes of payment, permanent and temporary advance, comparison, checking of bills and vouchers, auction procedure, T.A. rules etc.

Unit 8 TIME SCHEDULE FOR WORKS

Importance of management of works Gantt bar chart, limitation of chart, CPM network, project chart

Unit 9 MISCELLANEOUS

Necessity of maintaining daily dairy, need for presence of sub engineer, A/R & S/R , charge to be handled to be cash transferred, inspection of rest houses. Measures to improve the efficiency of labour, causes of accident, trade unions, aims of labour legislation, labour courts, attitudes of sectional officers towards labour

LIST OF REFERENCE BOOKS

1. A.B.C. of PWD Accounts by C.M. Kaul
2. Overseer accounts & Duties by Kumar
3. PWD Managements, Accounts & Labour Relation by H.S. Pandit
4. Construction Management & PWD Accounts by Agrawal & Arora
5. MPPWD Manual Vol-I & Vol-II
6. Manual of Labour Relations by R.C. Shrivastava
7. Civil Engineering management by O.N. Wakhle, D.K. Publisher
8. Estimating & costing in civil Engg by B.N. Datta USB Publisher
9. Estimating & costing by G.S. Birdie Dhanpat rai & son

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 Tender Notice for construction of a Civil Engineering work (W.B.M. Road, Residential Building)
4. Preparation of Tender Document for the building. (Detailed Estimate prepared for R.C.C. building in estimating and costing shall be used)
5. Collection of various account forms from PWD & wiring report on in it.
6. Writing a report on store procedure and account producer of PWD. For it A – 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.
8. Preparing muster rolls.
9. Preparing imprest account and temporary advance forms and developing skill for filling in forms.
10. Solving CPM and Net work problems
11. CPM PERT RELATED SOFTWARE
12. Preparation a ‘ E’ Tendering of a particular project .

VISITS:

1. Visit to public sector/Govt. Industry/ Organization.like PWD ,RES,
2. Visit to private sector Industry.

Unit 1 ROAD ENGINEERING

Importance of road in India. Classification of roads according to Nagpur plan (Location and function), and third road development plan. Traffic and tonnage, Classification of urban roads. different road yojana ,like pradhan mantra gram sadak yojana ,Mukhya mantra sadak yojna .

Unit 2 INVESTIGATION FOR ROAD PROJECT

Reconnaissance survey, Preliminary survey and Location survey for a road project. Detailed survey for cross drainage- L-section and C/S sections. Fixing the alignment of road, factors affecting alignment of road. 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. Survey for availability of construction material, location plan of quarries

Unit 3 GEOMETRIC DESIGN OF HIGHWAYS

Camber- definition, purpose, types, IRC – specifications. Kerbs, road margin, road formation, right of way. Design speed- IRC – specifications. Gradient – definition, types, IRC specification. Sight distances– definition, types, IRC specification. Curves–Necessity, types– horizontal, vertical and transition curves. Widening of roads on curves. Super Elevation – definition, formula for calculating super elevation, minimum and maximum values of super elevation, and methods of providing super elevation. Sketching of standard C/S of national highway in embankment and cutting. Simple problems on geometric design of road

Unit 4 CONSTRUCTIONS OF ROADS PAVEMENTS AND MATERIALS

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. Pavement – objective of pavement, structure of pavement, function of pavement components, types of pavement. Construction of earthen road – general terms used- borrows pits, spoil bank, lead and lift, balancing of earthwork. Construction procedure. Soil stabilized roads – necessity, methods of soil stabilization, brief details of mechanical soil stabilization. Water bound macadam roads – materials used, size and grading of aggregates and screening, construction procedure including precautions in rolling. 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. Cement concrete pavements- Construction procedure and equipments, Construction joints, joint filler, joint sealer.

Unit 5 TRAFFIC ENGINEERING

Traffic volume study, Traffic control devices-road signs, marking, Signals, Traffic Island. Road intersections- intersections at grade and grade separator intersections. Road accident. Building

code IS:1904. Definition of active earth pressure and passive earth pressure, structures subjected to earth pressure in the field

Unit 6 HILL ROADS

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

Unit 7 DRAINAGE OF ROADS

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

Unit 8 MAINTENANCE AND REPAIRS OF ROADS

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

Unit 9 ARBORICULTURE

Road side arboriculture, necessity, planning of plantation of trees selection of types of trees and development of nursery considering the environment aspects.

LIST OF REFERENCE BOOKS

1. Highway Engineering by Khanna & Justo Khanna Pub.
2. Traffic Engineering by L.R. Kadiyali
3. Transportation Engineering by N.L.Arora,S.P.Luthara I.P.H. New Delhi
4. Transportation Engineering by Vazarani & Chandola Khanna Pub.
5. Road, Railway, Bridges by Biridi & Ahuja. S.B.H.New Delhi
6. Transportation Engineering by Kamala T.M.H. New Delhi
7. DATA book of P.W. D.
8. MOST

IS / International Codes. : IRC 36 – 1970, IRC 16 –1965, IRC 20 -1966

SUGGESTED TERMS –WORK

List of Assignments:

1. Road project for a road of minimum 0.5 km. length having at least one small cross drainage work.

Site selection.

Reconnaissance survey.

Fixing the alignment.

Detailed profile survey along the alignment and cross section of road and CD Work.

Prepare computer generated drawing of longitudinal section and typical cross sections of the road in cutting and filling.

Prepare computer generated drawing of proposed typical CD work/culvert. (Using CAD)

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.
6. Prepare a visit report. Which should consist of (a) List of various defects observed b) Suggestions regarding the possible remedial measure.
7. 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.
8. Study of Different Highway software. Road SOR , MOST
1- Geometrics 2- Pythagoras 3- C-Lx

Unit 1 INTRODUCTION TO RCC

S.I. Units, Meaning of R.C.C. purpose of reinforcement. Materials of reinforcement steel as a reinforcing material. Types of steel used for reinforcement mild steel, Tor steel, permissible stresses in concrete and steel. Different mixes of concrete to be used for R.C.C. work use of I.S. code No. 456-2000 and I.S. 875-1984 for designing R.C.C. structures. Introduction to RCC design software like STRUUDS, resist,

Unit 2 FIXED & CONTINUOUS BEAM

Concept of fixity, effect of fixity, advantages and disadvantages of fixed beam. Fixed end moments from first principle for beam subjected to UDL over entire span, central point load, Point load other than mid span. Application of standard formulae in finding moments and drawing S.F. and B.M. diagrams for a fixed beam. Clapeyron's theorem of three moment (no derivation). Application of theorem maximum up to three spans and two unknown support moment only, Support at same level, spans having same moment of inertia subjected to concentrated loads and uniformly distributed loads over entire span. Drawing SF and BM diagrams for continuous beams.

Unit 3 Working Stress Method & Prestressed Concrete

Introduction to reinforced concrete, R.C. Sections their behavior, grades of concrete steel. Permissible stresses, Assumptions in W.S.M. Equivalent bending stress distribution diagram for singly reinforced section. Concept of under-reinforced, over-reinforced and balanced section, neutral axis co-efficient Simple numerical problems on determining design constants, moment of resistance and area of steel for singly & doubly reinforced beam. Concept of pre stressed concrete, externally and internally pre stressed member. Advantages and disadvantages of pre stressed concrete. Methods of pre stressing, pre tensioning and post tensioning. Losses in pre stressing.(No numerical problems shall be asked in written examination on pre-stressed concrete).

Unit 4 Limit State Method

Definition, types of limit states, partial safety factors for materials strength, characteristics strength, characteristics load, design load. Loading on structure as per I.S. 875. 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.

Unit 5 Analysis and Design of Singly Reinforced Sections (LSM)

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. 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. Simple numerical problems on determining design constants, moment of resistance and area of steel.

Unit 6 Analysis and Design of Doubly Reinforced Sections (LSM)

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

Unit 7 Shear, Bond and Development Length (LSM)

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. Bond and types of bond, Bond Stress, check for bond stress, Development length in tension and compression, anchorage value of hooks 90° bend and 45° bend Standard Lapping of bars, check for development length. Simple numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of the section in shear. Design of shear reinforcement; Minimum shear reinforcement in beams; Determination of Development length required for tension reinforcement of cantilevers beams and slab, check for development length.

Unit 8 Analysis and Design of T-Beam (LSM)

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

Unit 9 Design of Slab (LSM)

Design of simply supported one-way slabs for flexure check for deflection control, and shear. Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear. Design of two-way simply supported slab for flexure with corner free to lift. Design of dog-legged staircase. Simple numerical problems on design of one-way simply supported slabs cantilever slab & two –way simply supported slab. (No problem on design of dog-legged staircase shall asked in written examination.)

Unit 10 Design of Axially Loaded Column and Footing (LSM)

Assumptions in limit state of collapse- compression.

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

Unit 11 Principal of earth quake engineering

Introduction ,RICHTER SCALE, Soft story effect, detailing of structural elements ,ductile detailing ,earthquake zone in India Different earthquake I S codes (IS 1893-1984) IS 4326-1976 .causes of failure of structure during earth quake ,principal of constructing earthquake resistant buildings .

List of Reference Books

1. Limit State Theory & Design of Reinforced Concrete by Dr. V.L. Shah & Late Dr. S.R. Karve. Structure Publications
2. Fundamentals of Reinforced concrete by N.C. Sihna & S.K. Roy S.Chand& Company
3. Reinforced concrete Design (IS 456-2000) Principles & Practice by N.Krishna Raju R.N. Pranesh New Age International
4. Prestressed Concrete by N. Krishna Raju
5. Reinforced concrete Design by S.U. Pillai & Devdas Menon Tata Mcgraw Hill.
6. Limit State Design of Reinforced Concrete by P.C. Varghase Prentice Hall of India.
7. R.C.C. Design by Shah & Kale

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.

Introduction to RCC design software STRUUDS

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. components 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.

1. FIELD VISITS –

- I. Visit to a construction site where the RCC work is in progress.
- II. Visit to a construction site where the irrigation work is in progress.
- III. Visit to a bridge site. Batching plant for cement concrete and bituminous road
- IV. Visit to water treatment plant.
- V. Visit to a dam site Canal site .
- VI. Visit for a power plant site .
- VII. Visit for a construction site where multistoried mal /shoping complex i

2. SEMINAR –

- I. Seminar on low cost housing,
- II. interlinking of rivers & irrigation structure rain water harvesting
- III. Cement concrete roads & joints in cement concrete roads.
- IV. Traffic engineering
- V. Ductile detailing,
- VI. use of different ISI codes for civil engineers ,releted to RCC & Earth quake resistant structure
- VII. Earthquake resistant structure ,design concepts for buildings

Unit 1 Industrial /field /site Visits

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/ Fields – (Any three visits)

- i) Irrigation project for observing components of dam and canal.
 - ii) Concrete mixing & batching plant
 - iii) Residential apartment /public building to study plumbing system.
 - iv) Hot mix plant
 - v) Market rate analysis of different materials and labour rate for different type of civil works.
 - vi) Visit to a site where RCC work is in progress, slab casting Road work , Thermal Power Plant
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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 .RMC ,Highway project (DPR)
- b) To set up a small scale industry.
- c) Planning and design of irrigation project. Lift irrigation project
- d) design of earth quake resistant structures.

Unit 3 Information Search (data collection and writing a report on the topic)

- a) Collecting an estimate from P.W.D.
- b) International Plumbing code and material specifications from market.
- c) Collecting market rates for material and labor for building items .
- d) Collecting D.S.R. /C.S.R. from PWD and its use for preparing revise estimate

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 -

- i) Recent trends in civil engineering as a service industry.
- j) Waterproofing and leakage prevention. sound proofing ,air ducting
- k) Troubleshooting in plumbing system.
- l) Causes of failure of road.
- m) interlinking of rivers
- n) traffic volume study

Unit 5 Seminar :

Seminar topic shall be related to the subjects of fourth/fifth semester. Each student shall submit a report of at least 05 pages and deliver a seminar. A power point presentation preferred to caliber student skill.

(Presentation time – 5 minutes)

List of Reference Books:

1. Time management by Marshall Cooks Adams Viva Books
2. Basic Managerial Skills for All by E.H. Mc Grath , S.J. Pretice,Hall of India Pvt Ltd
3. Body Language by Allen Pease, Sudha Publications Pvt. Ltd.
4. Creativity and problem solving by Lowe and Phil, Kogan Page (I) P Ltd
5. Decision making & Problem Solving by Adair J. , Orient Longman
6. Develop Your Assertiveness by Bishop Sue, Kogan Page India
7. Organizational Behavior by Steven L McShane and Mary Ann Glinow, Tata McGraw Hill
8. Organizational Behavior by Stephen P. Robbins Pretice, Hall of India, Pvt Ltd
9. Presentation Skills by Michael Hatton, (Canada – India Project) ISTE New Delhi
10. Stress Management Through Yoga and Meditation by Sterling Publisher Pvt Ltd
11. Target setting and Goal Achievement by Richard Hale ,Peter Whilom, Kogan page India
12. Time management by Chakravarty & Ajanta, Rupa and Company
13. Working in Teams by Harding ham, A Orient Longman